OUR HONG KONG FOUNDATION
團結香港基金

Strategic Purchasing: Enabling Health for All

Research Report

Contents

EXECUTIVE SUMMARY

HONG KONG'S HEALTH SYSTEM IS YET TO BECOME FIT-FOR-PURPOSE

In 2018, Our Hong Kong Foundation (OHKF) published the policy paper *Fit for Purpose: A Health System for the 21st Century* and recommended system-level transformations that would best equip Hong Kong's health system for meeting 21st century population health challenges. The ability of Hong Kong's longstanding hospital-based, specialist and episodic care-focused health system to overcome current and future challenges in meeting emerging healthcare needs is constrained by structural barriers. These barriers include an underdeveloped primary healthcare (PHC) system, segmented public-private healthcare service delivery and service fragmentation throughout the system. As our population ages, the new "normal" we are already seeing is a growing burden of chronic diseases that continues to exert pressure on health resources and ultimately compromises sustainability. The paper concluded that Hong Kong's health system urgently needs to reorient towards an **integrated, person-centred, primary care–led** modality to ensure comprehensive and continuous person-centred care for citizens over the life course **(Box A)**. Emphasis was placed upon the importance of pivoting towards care provision in the community that is **integrated across different levels of care, coordinated between specialities and providers, and interfaced with social care** (OHKF, 2018). Achieving this will provide a system infrastructure to meet the holistic needs of individuals, enhance health system effectiveness and efficiency, and transform Hong Kong's healthcare delivery system into one that aspires to provide "Health for All".

Box A

Key recommendation themes of the *Fit for Purpose: A Health System for the 21st Century* report

Recommendation theme 1.

Enabling person-centred care through reorienting the health system for "the community of persons"

Recommendation theme 2.

Achieving primary care-led integrated care through reorganising how services are delivered to strengthen integration within and between providers and sectors

Recommendation theme 3.

Improving health governance in primary care-led, integrated, and person-centred care through setting up governance levers and structures to support and enable development of new service models

Source: OHKF, 2018

> The World Health Organization (WHO)'s "Health for All" goal necessitates the interaction of political will, health sector cooperation, community participation and supporting technology to improve health to a level that enables all people to lead socially rewarding and economically productive lives (WHO, 1988).

The provision of person-centred integrated care necessitates concerted development of the local health system through an evaluation of current gaps in the provision and mix of different service types and the leveraging of mechanisms for how these could be better provided and/or bridged. Governance leadership will be important to achieve strategic integration throughout the system, engaging with a shared vision and supported by clear strategic goals set based on population health needs and service delivery assessment. Enabling policies, strategic purchasing and commissioning mechanisms together with enhanced workforce planning to ensure the appropriate education and professional development required for the right mix and competencies of healthcare professionals is also necessary.

Health system planning and policy formulation in Hong Kong has taken initial strides at improving coordination to realise person-centred integrated care, where the investment of resources is not only on hospital and specialist care, but also on building a community-centric PHC ecosystem. In recent years, the Hong Kong SAR Government (HKSARG, or referred to as the Government) has committed to transforming Hong Kong's treatment-oriented health system into one that is prevention-focused to meet emerging population health needs and has placed heavy emphasis on PHC development. The gradual territory-wide rollout of District Health Centres (DHCs) and the mapping of a PHC blueprint which is anticipated to be presented for public consultation in the upcoming months (at the time of writing) showcase nascent efforts to propel PHC development in Hong Kong.

Policymaking for integrated care, however, is not an exclusive domain of government, but instead necessitates cross-sector and multidisciplinary coordination. Joint planning with key stakeholders across sectors and at different levels of the health system, which includes goal setting, strategic planning and collective decision making, is necessary for achieving health system goals. **Especially in tackling segmentation between the public and private healthcare systems in Hong Kong, identified service gaps should be bridged within and between the public and private sectors.** This involves the delineation of a strategic and complementary role for the private sector in the design of a better integrated system.

While past policy plans have emphasised the need to better leverage the private sector to play a complementary role in achieving health system aims, despite the many public-private partnership (PPP) **(Box B)** initiatives, the public and private sectors continue to be segmented in terms of service provision and underlying financing mechanisms. As a result, **the supply of public healthcare services still does not meet population demands** arising from emerging healthcare needs for the prevention and management of chronic health conditions that necessitates integrated care, particularly at the primary care level. In contrast with the private sector which provides the bulk of primary care services (approximately 70%), primary care provision in the public sector is constrained. Primary care services thus predominantly necessitate out-of-pocket payments (OOPs) and remain unaffordable to vulnerable populations and the less well-off. Without better leveraging private sector capacity while improving primary care accessibility, Hong Kong's health financing system may contribute to further health system fragmentation.

> Universal health coverage (UHC) is defined by the WHO as "all people [having] access to the health services they need, when and where they need them, without financial hardship." (WHO, n.d.)

Evidently, providing accessible, affordable and well-integrated primary care that is person-centred to meet emerging population health needs and in alignment with the goals of universal health coverage (UHC) remain continuous challenges that must be addressed in Hong Kong. To overcome these challenges, selecting the right policy tools and levers is key to successful system transformation to realise set system goals. **Financing mechanisms have been recognised as a key policy lever to implement system-wide reforms that must be aligned with service delivery goals to facilitate system change.** In progressing towards the provision of person-centred integrated healthcare, health systems around the world have implemented different financing mechanisms, such as strategic purchasing and commissioning, and payment tools including capitation and performance-based payment schemes which consider service provider incentives and accountability, that are context-specific to meet the unique needs of different health systems.

Amongst the various health financing strategies and reforms proposed in past decades, Hong Kong has used PPPs as a purchasing instrument to better leverage existing resources from both sectors to provide care that meets population demands. Many of the PPP initiatives have been positioned to tackle pressing demand, are modest in scope and disease-focused. Focus has also been placed on disease prevention and primary care. Those aimed to promote primary care uptake, such as the General Outpatient Clinic-PPP (GOPC-PPP) and the Elderly Health Care Voucher Scheme (EHCVS), have been implemented as specific programmes and not designed from a systems perspective, and without the critical emphasis on care integration, they have shown varying degrees of success in actualising programme goals let alone system goals. Lessons learned from the plethora of well-intended pilot programmes, one-off projects, and prior consultations for achieving person-centred integrated care must be leveraged and successful programmes should be scaled-up in a strategic and coordinated manner. Promoting better care integration calls for a more strategic approach to commissioning care in the public sector and purchasing care from the private sector to better cater for total population needs.

In parallel to the building of a primary care ecosystem in the public sector that will take time and moving beyond injecting additional funds into the health budget, it is our view that available resources within our current portfolio must be allocated more strategically and be directed towards prioritised primary care services. **Strategic purchasing will be a critical lever in health system governance and health service planning to achieve this through enabling better allocation and utilisation of resources to meet population needs**, and the appropriate recalibration of the public-private mix to improve healthcare delivery effectiveness and efficiency **(Box B)**. Careful planning and implementation of purchasing initiatives that apply strategic purchasing can facilitate system integration. The strategic purchasing concept can be applied not just to facilitate the design of specific healthcare programmes, but also as a critical **system-level policy lever** for transforming the health system into one that is primary care-led, integrated and person-centred. As such, **decisions in strategic purchasing must become an integral function of health system governance**, aligned with the strategic goals and considered in the context of the interconnected objectives of macro, meso and micro- levels of the health system **(Box C)**.

And so, taking a system perspective, we demonstrated the application of strategic purchasing to primary care services that align with system-wide efforts to tackle a key population health challenge, namely the growing burden of chronic conditions. We also explored the potential for leveraging capacity of the private sector through PPPs as a purchasing instrument for integrated products of partnership between the public and private healthcare systems. We anticipate our demonstration to provide insights for further applications of strategic purchasing in tackling key health system gaps and combatting health system inefficiencies. Finally, looking beyond our specific application of strategic purchasing to primary care services, we put forward a framework on health systems strategic purchasing that positions this mechanism as a key policy lever for the transformation of Hong Kong's health system to become truly fit-for-purpose.

Box B

Definition of "Public-Private Partnership"

Public-private partnership (PPP) is defined as "an agreement between the government and one or more private partners (which may include the operators and the financers), according to which the private partners deliver the service in such a manner that the service delivery objectives of the government are aligned with the profit objectives of the private partners and where the effectiveness of the alignment depends on a sufficient transfer of risk to the private partners."

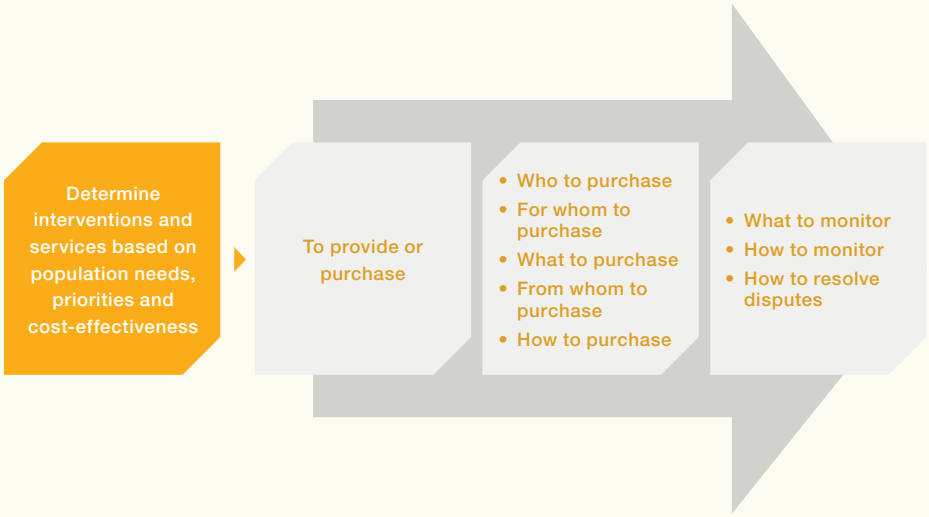
Positioned as a purchasing instrument, PPPs are split into two major modes: supply-side financing (incentives and payment guarantees), as well as demand-side financing (financial assistance and incentives to individuals). In Hong Kong, purchasing often takes the form of PPPs, although the development of these initiatives is yet to be governed by a systematic tool and are not implemented in accordance with strategic purchasing principles. Coupled with the need to overcome compartmentalisation of funding, purchasing and service delivery throughout the local health system, Hong Kong needs to consider a more strategic way of purchasing that will propel the provision of integrated care and help the system achieve set strategic goals.

Sources: Bowser et al., 2016; OECD, 2008

Box C

Definition of "Strategic Purchasing"

Strategic purchasing was discussed in OHKF's 2018 policy paper as an effective financing lever that can inform the allocation of resources throughout the health system, leading to a more cost-effective provision of healthcare services whilst maximising population health (OHKF, 2018). It is **an iterative process** also known as "active purchasing", cyclical in nature involving needs assessment, planning and monitoring, and consistently evaluated in a system-wide manner characteristic of the active process. Recognised by the WHO as an effective financing lever in achieving UHC, the strategic purchasing process entails six core decisions to be made for implementation, including "whether to **provide or purchase**", "**who** to purchase the targeted services" , "**for whom** to purchase services", "**what** services to purchase", "**from whom** to purchase services", and "**how** to purchase" that is considered across macro-, meso- and micro- levels of the health system.



Strategic Purchasing Decisions

Whether to provide or purchase	The Government should decide whether it would provide health services themselves or purchase services from other provider organisations.
Who to purchase	The Government should identify an appropriate purchaser that is equipped to focus on the type and level of health services of interest and define its role in the health system.
For whom to purchase	When designing a strategic purchasing-oriented programme, the purchaser should identify a target group with needs that would benefit from the purchasing programme.
What to purchase	The Government should assess what service gaps exist in the health system and which health goals may be met through the services purchased.
From whom to purchase	The purchaser should carefully select service providers based on their capacity, availability, accessibility, and the appropriateness of the services they provide relative to the population health goals set out by the Government.
How to purchase	To draw participation in the purchasing programme, the purchaser should utilise demand-side and supply-side instruments, contractual terms and agreements, and provider payment mechanisms that effectively incentivise providers to meet system health goals.

Source: WHO, 2000

METHODOLOGY

This report builds on the research presented in our previous policy paper and is integral to ongoing advocacy to transform Hong Kong's health system into a primary care-led, integrated, person-centred health system. In this report, OHKF together with Professor Yeoh Eng-kiong and his team in the Centre for Health Systems and Policy Research of The Jockey Club School of Public Health and Primary Care, Faculty of Medicine, the Chinese University of Hong Kong investigates how to strategically organise our health financing system to align with system goals and meet population demands for enhanced accessibility and affordability of well-integrated primary care.

Our research began with an extensive study of the literature and institutional reports in latest health financing trends globally and locally. In this report, we present insights on best practices and lessons learned from international experience on the application of strategic purchasing for chronic disease prevention and management. We also identify challenges and gaps within Hong Kong's health financing structure and analyse how capacity in the private sector can be better leveraged for primary care provision through PPPs in Hong Kong. With these insights, we assessed the feasibility of a **Chronic Disease Screening Voucher and Management Scheme** (CDSVMS, also addressed as "Scheme") for three targeted chronic conditions, namely hypertension, hyperglycaemia (diabetes), and hyperlipidaemia (collectively termed "HDH") designed based on lessons from the implementation of existing PPPs, as well as the perspectives gained from key stakeholders through interviews, and from citizens through a population-based telephone survey. We also projected the economic impact of this Scheme for Diabetes Mellitus (DM) on the health system over the course of 30 years for individuals aged 45 to 54 years of age at the start of the scheme using a Budget Impact Analysis.

To better inform the application of strategic purchasing, we highlight policy dimensions that should be accounted for in the formulation and implementation of programmes enhanced using strategic purchasing. To illustrate, we apply a synthesised framework of strategic purchasing consisting five key components of consideration to our proposed Scheme (Klasa et al., 2018). The considerations analysed include **population health, citizen empowerment, strengthening government stewardship and capacity, developing effective purchaser and provider organisations, and incorporating cost-effective contracting** **(Figure A)**.

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Figure A

The elements of strategic purchasing, based on a synthesised framework of strategic purchasing definitions

Source: Klasa et al., 2018

APPLYING STRATEGIC PURCHASING TO ENABLE A FIT-FOR-PURPOSE HEALTH SYSTEM IN HONG KONG

Achieving the vision of a fit-for-purpose health system necessitates a massive, complex, and continuous transformation of our health system and health financing structure, for which strategic purchasing is a critical and currently underutilised mechanism. Consideration needs to go into how to apply strategic purchasing to enhance programmes strategically designed to meet health system goals and population needs. Along the way, decisions need to be made on which programmes to apply strategic purchasing and how to link up programmes to promote better integrated care.

Acknowledging the many policy actions underway to promote PHC development in Hong Kong, this report leverages this momentum and proposes a **localised strategy specific to our pluralistic health system to promote innovative, effective and equitable financing of healthcare**, with a primary aim of accelerating PHC development. We present policy recommendations informed by strategic purchasing principles that seek to move Hong Kong closer towards achieving a health system which provides well-integrated primary care that is person-centred to meet population health needs.

RECOMMENDATION 1. Hong Kong should apply strategic purchasing and leverage public-private partnerships as a purchasing instrument with a strategic vision for improving primary care accessibility in Hong Kong

Mechanisms for strategic purchasing should be an integral function of health system governance in the planning process of the commissioning and purchasing of healthcare. The application of strategic purchasing for enhancing primary care accessibility necessitates these mechanisms to be aligned with strategic goals and operated across macro-, meso- and micro- levels of the health system.

- **What services to purchase?** The Government should identify service gaps in the health system and health goals that may be met through primary care services purchased. It is critical to **conduct population needs assessments and evaluations of health goal prioritisation on a continuous and regular basis.**
- **Whether to provide or purchase?** In parallel to the building of a primary care ecosystem in the public sector that will take time, resources within our current portfolio must be allocated more strategically to facilitate the purchase of prioritised primary care services. Given that the private sector currently provides the bulk of primary care services in Hong Kong, there is a need to better utilise private sector capacity in primary care provision. While Hong Kong has used PPPs as a purchasing instrument to better leverage existing resources from both sectors to provide care that meets population demands, a **more strategic approach which assesses the capacities and capabilities of private and public sector providers in making decisions for incorporating strategic purchasing mechanisms** is necessary to guide the purchase of care from the private sector to enhance the accessibility and affordability of primary care for all.
- **For whom to purchase?** Programmes applying strategic purchasing should aim to improve equitable health outcomes for all population groups through extending health service (in this case, primary care) coverage, improving public access and financial protection, advancing social equity while optimising health system efficiency using **defined or whole population targeting** (WHO, 2017b). At the same time, the targeted population should be **well-informed of their entitlements.**
- **From whom to purchase?** When selecting providers, purchasers should ensure that provider operations are well-managed with clear service contracts. Regarding the actual selection of service providers, **capacity, availability, quality, efficiency, and equity of service providers** must be considered within the context of service accessibility to encourage uptake. Efforts should be made to **incentivise the participation of service providers.** The Government should involve **cross-disciplinary service providers** to promote holistic person-centred care.
- **Who to purchase?** Purchasers of health services can be chosen from both the public and private sectors (WHO, 2019b). All purchasers should work in synergy towards the **same set of health system priorities**, using mechanisms that facilitate **knowledge-sharing between different purchasers.** The Government should identify a purchaser responsible for the provision of primary care in Hong Kong such as the Food & Health Bureau, and clearly define its role.
- **How to purchase?** The Government and purchaser should assess **how services will be purchased and at what price, using a selection of demand- or supply-side instruments, contractual terms and agreements, and provider payment mechanisms that incentivise performance.** Thought should therefore be given to how best to **integrate performance-based financing (PBF) programmes into mixed provider payments systems** to bridge gaps between providers and purchaser expectations, and incentivise change among providers for improving access and quality of services (WHO, 2017b).

> Our population-based telephone survey showed that **75.3%** of respondents were willing to join the Scheme.
>
> Economic analysis suggests that the health system will spend approximately **28% less** on direct healthcare expenses over 30 years upon the implementation of a screening voucher and management scheme for diabetes.

RECOMMENDATION 2. Hong Kong should introduce a Chronic Disease Screening Voucher and Management Scheme to enhance primary care accessibility

As an illustration of the application of strategic purchasing in the Hong Kong context, we propose the introduction of a scheme that targets chronic disease prevention and management and leverages private sector capacity. By focusing on early detection of disease through screening and well-thought-out management services in community settings, the Scheme is designed to alleviate pressure on public hospitals and curb healthcare costs associated with preventable chronic disease complications. Our demonstration hopes to pave way for the discussion of the strategic purchasing lever as part of a whole health system approach in maximising health system performance by better strategically prioritising what services to purchase, who should purchase, for whom, from whom, and how.

- **What services to purchase?** We propose that **HDH screening, re-screening, and follow-up management services and associated medications** in the private sector, as well as **management services for adults diagnosed with conditions co-morbid with HDH** in the private sector to be purchased. To facilitate access and incentivise participation in screening, we recommend that the Scheme **fully subsidises all screening services, including future rescreening.**

To prevent and/or delay the onset of chronic conditions, and prevent the development of complications, we further recommend differentiating the treatment and re-screening plans for patients identified to have different risk levels. Among patients who have been diagnosed with HDH, we recommend **the use of the Risk Assessment Management Programme (RAMP) risk-level assessment for the formulation of a personalised care plan with the potential of care subsidisation for chronic disease management.** In our analysis on the impact of the Scheme for DM only, the annual cost to the system associated with the management of patients diagnosed with DM without complications and necessitate basic outpatient follow-up care (such as medication refills, lifestyle modification consultations) has been projected to range from HKD 5,950 to HKD 15,383 per patient per year on average, depending on age group (with higher costs in older age groups) (Jiao et al., 2017). While screening services in our Scheme are without cost to the end-user, the Government needs to study the potential to subsidise or create a co-payment schedule for populations that face financial difficulties to support chronic disease management, for instance those with an income below 60% of the Median Monthly Domestic Household Income. The projected cost for chronic disease management of diagnosed patients with comorbidities associated with DM and related complications that necessitate inpatient care stands at HKD 123,364 per patient per year in direct costs to the health system (according to our suggested care protocol, these patients will be referred to public hospitals for follow-up management) (Jiao et al., 2018).

We recommend that the purchaser also consider purchasing **follow-up consultations with family doctors on lifestyle modification for users who are not diagnosed with HDH** and referrals to re-screening. Our cost projections assume that patients without diagnosed HDH may benefit from a HKD 350 subsidy, to match the approximate cost of one GOPC-PPP consultation, towards obtaining a follow-up consultation with their chosen private sector family doctor.

- **For whom to purchase?** HDH screening services in the proposed Scheme should initially be targeted at **adults in the 45–54 age group at the beginning of the Scheme** to promote earlier detection and necessary intervention for prevalent chronic conditions.
- **From whom to purchase?** The screening and management services to be purchased are proposed to be administered by **primary care service providers in the private sector**, including family physicians and allied health professionals, in conjunction with the District Health Centres.
- **Who to purchase?** The Government should **identify a central purchaser for primary care services** and clearly define its role as a purchaser.
- **How to purchase?** The Scheme will **deploy a hybrid-model comprised of a fully subsidised voucher as a demand-side instrument**, with financial flexibility for co-payment determined by the purchaser as well as **performance-based payment to providers for management services as a supply-side instrument.**

> Economic analysis suggests that the health system will prevent a total of **47,138 mortalities** over the course of 30 years if it implements a screening voucher scheme and management for diabetes.

RECOMMENDATION 3. The Government must consider key policy dimensions to ensure effective application of strategic purchasing

Key stakeholders of Hong Kong's health system in our interviews unequivocally welcome the launch of the Scheme but stressed the need for comprehensive policy, planning, and regulation of participating providers, and of addressing implementation barriers that exist in the health system. The importance of a well-designed management scheme for desirable results was also emphasised. With these insights, we recommend that the Government take into consideration the five key components of a synthesised framework of strategic purchasing as elaborated below when designing and implementing the Scheme.

3.1 Population health

Identifying population health needs and incorporating them into the purchasing process is a core element in strategic purchasing decisions. To ensure that policy decisions related to the Scheme are based on the latest population health data, **the Government should better information-sharing systems and systematise the tracking of PHC expenditure using international standards.**

The Government should better leverage and strengthen existing infrastructure, such as the Electronic Health Record Sharing System (eHRSS) to better track population health needs. To integrate data into purchasing decisions, we suggest that the Government systematise and regularise tracking of Hong Kong's PHC expenditure using international measurement standards, specifically by fully adopting the System of Health Accounts (SHA) (for more details, please refer to **Chapter 3**).

3.2 Citizen empowerment

The strategic purchasing framework advocates that government and purchasers should ensure that citizens' and patients' values, views, and choices are accounted for. Citizens should be allowed input on their benefit package, their choice of provider, and ability to hold purchasers and providers accountable for services offered. Therefore, new programmes need to consider the most relevant needs of citizens that should be solicited from the adoption of a citizen-participatory design process. At the same time, purchasers' accountability should be strengthened to enhance citizen and patient empowerment.

As an example, screening programmes are more likely to be more successful if no co-payments are involved. And so, we propose **the screening voucher to fully subsidise all initial screening and re-screening services while co-payments for management could be considered based on users' capacity and willingness-to-pay (WTP).** Our population-based survey results suggest that the WTP for managing chronic conditions ranges from HKD 51 to HKD 200 per consultation, with lower monthly household income being significantly associated with lower WTP ranges. This phenomenon should be considered in the programme design process where the Government can involve patients in devising a co-payment schedule for disease management.

3.3 Strengthening government stewardship and capacity

To build an effective strategic purchasing system, the regulation and monitoring of purchasers and providers to ensure that they are meeting agreed objectives is key. Health systems should adopt an integrated framework that defines explicit contractual terms, and government capacity to monitor, evaluate and ensure purchasing arrangements are enabling achievement of health system goals. To achieve this, **the Government's capacity to monitor the performance of primary care PPP providers must be enhanced in a regulatory framework.** At the same time, the Government needs to **identify a purchaser whose role in purchasing and payment of services is clearly delineated and defined.**

The ability to centralise policies in favour of systemic decision-making by a purchaser proves critical in the strategic purchasing process applied to the implementation of the proposed Scheme. We recommend that **the purchaser ensures coordination between existing and future PPPs to advance health system goals, regularly releases public reports on the expenditures and performance of existing PPP programmes, as well as of the Scheme upon its implementation.**

3.4 Developing effective purchaser and provider organisations

Continuous shifts in needs, demands, funding priorities, treatment options, medicines, and individual and provider behaviours need to be anticipated in the strategic purchasing process. This necessitates strategic purchasing agencies to respond to changing contexts and dynamics of the health system promptly and appropriately to manage the alignment and dynamics of various changing factors. The expectations for each participating stakeholder and alignment with health system goals should be made explicit.

As an example, **the Government should assess and enhance the capacity and capability of the health system to match the new service demands generated by the Scheme and ensure that there is alignment between the purchaser, providers, and multiple stakeholders.** As increased screening demand and need for chronic disease management will create additional strain on the health system, we recommend the purchaser to conduct a pre-implementation assessment of private sector capacity to better inform the design of care guidelines, sufficient levels of incentives, and referral protocols that are aligned between participating stakeholders. On the

same note, our key stakeholder interview findings also revealed the importance of collaborating and gaining input from various industries in the Scheme's design for desirable results. Based on our findings, we recommend that the stakeholders with whom alignment should be ensured include the pharmaceutical industry, insurance industry, and existing primary care providers in the public sector such as DHCs, and integration of the Scheme with existing programmes such as the EHCVS should be ensured.

3.5 Incorporating cost-effective contracting

Policy clarity and definition of the contracting process (specifically, the payment system and financing mechanism between purchasers and providers) is a key component of strategic purchasing. "Good contracting" will have clearly stated terms and criteria, as well as measurements of its effectiveness, that are based on evidence, premised on the availability of a health system's data on health status, health needs of its populations, and the efficiency of existing health programmes and service models. Provider payment systems should be aligned with benefit package design with consideration to **the transfer of risk** from the purchaser to service providers while maintaining communication between both parties and with patients.

To facilitate cost-effective contracting in PPP programmes, **supply-side and demand-side factors** need to be strategically addressed to promote PPP participation of providers and users. Identified barriers that deter participation need to be addressed and incentives to encourage participation considered. For instance, to maximise provider participation, the Government and purchaser should work towards **streamlining administrative requirements and disseminate clear guidelines and information on the payment mechanism to service providers.**

In relation to transfer of risk from the purchaser to service providers, we recommend **the implementation of a management Scheme for HDH in the private sector for diagnosed HDH patients, modelling off the RAMP programme currently implemented in the public sector.** The parallel RAMP protocol and programme should have in place defined risk-sharing arrangements between the public and private sectors. For instance, patients should be able to attend their RAMP programme in the private sector as they need, but if their conditions worsen and they require acute hospital inpatient services, patients should be referred to public hospitals. This will require the development of clinical guidelines and protocols. This sharing of risk perceivably helps to incentivise private sector providers to partake in the Scheme and simultaneously help manage the increasing healthcare demand on the public sector.

At the same time, clear guidelines on payment to providers should be disseminated, and the attainment of a quality standard be made a determining factor of contract renewal. Common clinical protocols, shared staff training and development programmes between the public and private sectors could also be considered.

RECOMMENDATION 4. Health system strategic purchasing should be implemented for achieving an integrated care system to enable health for all

Beyond application to specific healthcare programmes, strategic purchasing should also be positioned as a key policy lever for health system transformation towards one that is primary care-led, integrated and person-centred. This involves relevant decisions for strategic purchasing to be considered, including interconnected objectives and goals together with an aligned accountability structure across all three levels of the health system that include macro- (health system), meso- (healthcare delivery) purchaser-provider system, and micro- (person journey of healthcare delivery) levels **(Figure B)** (WHO, 2012).

Figure B

Health system strategic purchasing: the application of strategic purchasing across macro-, meso- and micro- levels of the health system

Macro-level: Health system strategic purchasing

Governance

- Assessment of population health needs and equitable access to integrated care
- Healthcare delivery evaluation
- Policy instrument choice
- Make or buy
- Strategic resource allocation to commissioners and purchasing agents

Policy parameters

- Health system objective & policy goals
- Who to purchase
- From whom to purchase
- Contracting/ commissioning
- Policy guidance and authorisation for purchasers on purchasing decisions

Collaboration

- Engagement/ Participation/ Communication
- Feedback and timely response
- Credibility/trust

Oversight & Accountability

- Selective contracting
- Licensing and accreditation
- Monitoring and evaluation
- Reviewing and auditing

Meso-level: Healthcare delivery purchaser-provider system

Purchasing, Commissioning and Provider System

- Roles, authority, and obligations of purchasers, commissioners and providers
- Engagement with governance to align functions
- Structure for communication and collaboration with health and community stakeholders

Integration of health services

- Mix, types, settings, and providers of care
- Networking of services and agreements on resource deployment
- Bridging mechanisms and structures for care transitions

Systems for coordination

- Care pathways
- Clinical protocols
- Multidisciplinary engagement
- Clustering of primary and specialist services for vertical integration
- Networking of service types for horizontal integration

Monitoring for results

- Review of process
- Monitoring and evaluation of access, safety, quality assurance, and audit systems
- Patient complaints, redress, and feedback systems
- Patient satisfaction and reported outcomes surveys

Micro-level: Person journey of healthcare delivery

Integrated care

- Timely access to preventive, curative, rehabilitative, palliative and social care
- Multidisciplinary engaged teams
- Clinical protocols
- Service navigation systems
- Provider transition review
- Affordability and equitable access to care

Person centredness

- Redesign of care process around patients
- Protocols for engagement in decisions
- Culture for care to be appropriate to the needs and preferences of each person
- Performance incentives for person centredness

Holistic care

- Monitoring of care processes
- Assessing access, affordability and continuity of care
- Review of patient journey and experience
- Evaluating interventions for co-production of health

Source: WHO, 2012

4.1 Macro-level: Health system strategic purchasing

Strategic planning and the formulation of strategic goals of a health system should be informed by a **population health needs assessment** in conjunction with evaluation of the **healthcare delivery system** as part of health system **governance.** This includes the identification of gaps in healthcare service provision, and the evaluation of the capacity and capability of public and private providers. This information should be captured by information systems to inform purchasing decisions while the system governance structure will inform decisions on who the purchasing agent should be.

Appropriate **policy instruments** are also needed to enable the implementation of strategic plans, programmes and purchasing that will include the creation of resources, regulations and legal instruments. It will be necessary to analyse the authority delegated to budget holders for the allocation of resources and uphold their accountability for the impact of the disbursement of resources. Policy parameters for purchasing agents for the service mix and types, and the configuration arrangements needed to enable integrated care will need to be defined. These include consensus between the governance and provider levels on what to purchase, from whom and how to purchase, as well as the choice of purchasing instruments and payment mechanisms.

Transformation for an integrated health system is exceedingly complex and necessitates a shared vision and **collaboration between a multitude of stakeholders** in the health sector, business sector, and civil society. Structures and mechanisms for engagement, participation, and communication at every stage of policy formulation, implementation and evaluation is required. Feedback and timely response will be necessary. A system for **oversight and accountability** of the decisions made by purchasing agents will need to be created. A framework for the monitoring of functions, review of progress, and evaluation of performance and objectives, and information systems will be needed.

4.2 Meso-level: Healthcare delivery purchaser-provider system

At this level, strategic purchasing should be focused on **health service delivery and provider organisation.** The roles, authority and obligations of providers, purchasers and commissioners must be clearly defined. Consideration is given to the types, range, and mix of care for the defined community based on healthcare needs, and on the **integration of related services,** which will require community input. This level puts focus also on the mechanisms for engagement, coordination and management of local actors, service providers and health workers. **Systems for coordination** between these parties to meet system goals are necessary and are facilitated by care pathways, clinical protocols and multidisciplinary engagement that facilitate both vertical and horizontal integration of care. **Monitoring of results** is essential and should include process review, performance monitoring, and consideration of patient feedback.

4.3 Micro-level: Person journey of healthcare delivery

The micro-level considers a person's healthcare journey during the life course that involves encounters with multiple disciplines of healthcare professionals from different specialties, in different settings, and at different levels of health service provision.

The final product of strategic purchasing must consider the person journey of healthcare delivery such that the model of patient care is designed to **centre on the individual** and enable **a seamless journey in care delivery across preventive, curative, rehabilitative, palliative, and social care** provided by multidisciplinary teams of healthcare professionals. Bridging and coordinating mechanisms also need to be considered in the purchasing process to enable **vertical** (care transition within and between primary, secondary, and tertiary levels of care) and **horizontal** (care transition between different specialties of care; between social and medical care; and transitions to and from community settings) **care integration**.

To promote holistic person-centred care that is integrated across the life course, purchasing instruments such as capitation payment and personal health budget allocations that necessitate dynamic evaluation and adjustment should be considered. Purchasing contracts and agreements should build in clauses that incentivise performance promoting person-centred care. Monitoring and evaluation tools need to consider patient care experience, satisfaction and patient-reported outcomes. Patient feedback systems should be in place and considered in the performance monitoring process.

Strategic purchasing is a key health system policy tool that will enable individuals to experience holistic person-centred care throughout an integrated care journey over the life course. It will thus be important for the strategic purchasing process to incorporate **a bottom-up perspective** that accounts for the needs and wants of system end-users that in turn, should act to link the micro-, meso- and macro- health system levels for the delivery of person-centred integrated care.

CONCLUSION

Our 2018 policy paper *Fit for Purpose: A Health System for the 21st Century* recommended system-level transformations that would best equip Hong Kong's health system for meeting 21st century population health challenges. In moving towards the visionary health system presented in our paper that is primary care-led, integrated and person-centred, we highlighted that "strategically purchasing services, allocating resources appropriately and utilising purchasing and payment mechanisms can enable coordination and integration between service providers."

The present report elaborates on strategic purchasing and puts forward that beyond facilitating the design of specific healthcare programmes, strategic purchasing serves as a critical policy lever for health system transformation to achieve a person-centred, integrated care system. We presented a framework that illustrates how the decisions in strategic purchasing should be considered in the context of the interconnected objectives and goals at all three levels of the health system, including macro- (health system), meso- (healthcare delivery purchaser-provider system), and micro- (person journey of healthcare delivery) levels to achieve better integration across preventive, curative, rehabilitative, palliative and social care provided by multidisciplinary teams.

This report also showcases a specific application of strategic purchasing for better integrated primary care in Hong Kong's pluralistic health system to meet system goals and population needs. We demonstrated the application of strategic purchasing to primary care services that align with system-wide efforts to tackle a key population health challenge, namely the growing burden of chronic conditions. We also explored the potential for leveraging capacity of the private sector through PPPs as a purchasing instrument for integrated products of partnership between the public and private healthcare systems. Specifically, we evaluated the feasibility of a proposed **Chronic Disease Screening Voucher and Management Scheme** designed based on strategic purchasing criteria that will enhance accessibility of both chronic disease screening and management, incentivise the uptake of primary care services in a targeted manner, and leverage private sector capacity to complement the public sector.

Designed to promote the prevention and early intervention of hypertension, hyperlipidaemia, hyperglycaemia in an increasingly high-risk but currently underserved population (targeted age group: 45 to 54 years), we conclude that the Scheme is particularly novel and innovative against a backdrop of a myriad of PPPs in Hong Kong. The Scheme stands out as a promising programme in consideration of its targeted design with a strong focus on prevention, wherein all eligible individuals within the targeted demographic can join. Additionally, its design as a hybrid (both demand-side and supply-side financing) purchasing model that draws upon the analysis of limitations in existing PPPs will ensure that the care provided is holistic, facilitates continuity of care, and are of high transparency, quality, and accountability. Finally, the Scheme is positioned in line with the latest government policy agenda and initiatives in PHC development. Our demonstration illustrates how applying strategic purchasing at a systems level can potentially contribute to significant cost savings for the health system and ultimately, promote system sustainability.

As the Government continues its momentum in building a solid primary care ecosystem for Hong Kong, relevant authorities need to consider how the proposed Scheme can be implemented. Importantly, the Government needs to consider the adoption of health system strategic purchasing in tackling key health system gaps, combatting health system inefficiencies and achieving a person-centred integrated care system that is necessary for Hong Kong's health system to become fit-for-purpose.

1 Hong Kong's Health System Needs to Become Fit-for-Purpose

1.1 HONG KONG' S HEALTH SYSTEM IS STILL NOT FIT-FOR-PURPOSE

Box 1.1

What is a "fit-for-purpose health system"?

A fit-for-purpose health system is responsive to a constantly changing health landscape shaped by demographic, epidemiologic, knowledge, and technological disruptions. Such a system addresses changing needs across people's life course, and it comprises a myriad of functions including encouraging health promotion and disease prevention at a young age, advocating for early management of chronic diseases to middle-aged adults, as well as catering for the diverse needs of our older populations until end stages of life. It requires that Hong Kong shifts from a treatment-focused and hospital-centric health system to one that is primary care-led and person-centred.

Source: OHKF, 2018

Hong Kong has a world-class health system along the measures of life expectancy, neonatal and maternal mortality, and is one of the world's most efficient health systems. Residents enjoyed an average life expectancy at birth of 85.5 years in 2020 (82.9 years for males and 88.0 years for females) (C&SD, 2021a). Using the latest available cross-region health expenditure statistics, Hong Kong's current health expenditure in 2018–19 took up only 5.9% of its GDP, a lower proportion compared to its high-income counterparts as classified by the World Bank, including the United Kingdom (UK) (10.0%), Japan (11.0%), and Australia (9.0%) (FHB, 2020a; The World Bank, 2020; WHO, 2021a). Achieving good health outcomes with relatively low spending on healthcare, Hong Kong was ranked by the Bloomberg Health Care Efficiency Index in 2020 to be the 2nd most efficient public healthcare system in the world after accounting for the impact of COVID-19 on mortality (Miller & Lu, 2020). Furthermore, the local public healthcare system is positioned as a "safety net" for the Hong Kong population, particularly for individuals challenged with a lack of means to pay for healthcare, as it offers quality care at the point of service with low healthcare costs and with further subsidies for vulnerable populations to facilitate healthcare access. Overall, Hong Kong's health system has contributed to the population's long lifespan, with universal access to public services at a low cost.

Despite Hong Kong's health system achievements, **inequalities in health and access to healthcare correlated with income disparities persist**. While the public sector functions as a "safety net" with affordable prices, the private sector works as a supplement by providing choices and faster access of care to people who are willing to and able to pay for themselves, either by private health insurance, or from out-of-pocket payment. However, according to the 2021 World Competitiveness Ranking, out of 64 regions, Hong Kong is ranked among the top one-third regions with the highest wealth disparities indicated by the Gini coefficient, an indicator of the wealth gap between the rich and the poor (IMD, 2021; OECD, 2002). Such wealth inequalities restrict those with less financial capacity from accessing quality healthcare in a timely manner; they have the option to seek care in the public sector, but the public sector's service capacity is overwhelmed by increasing health demands, best exemplified by long waiting times for outpatient specialist services common across specialties and geographical clusters in the Hospital Authority (HA) **(Table 1.1)**. In fact, approximately 8.4% of a Hong Kong population sample reported that they did not seek medical care due to lack of financial means in 2017, suggesting that in Hong Kong, persons

who lack financial means do not receive needed health services and may have to forgo care (Wong et al., 2018). With regards to primary care access, those who were income-poor in Hong Kong were reported as less likely to access a primary care provider and visit private primary care doctors (Chung et al., 2019).

Table 1.1

Waiting time for stable new case booking at Specialist Out-Patient Clinics (SOPCs), from 1 July 2020–30 June 2021

Specialty	Shortest median waiting time in weeks (hospital cluster)		Longest median waiting time in weeks (hospital cluster)	
Ear, Nose, Throat	26	HK East	91	Kowloon East
Medicine	29	NT West	90	Kowloon West
Gynaecology	26	HK East	70	NT West
Ophthalmology (Eye)	46	NT West	133	Kowloon Central
Orthopaedics & Traumatology	22	HK West	78	HK East & NT West
Paediatrics	8	Kowloon Central & NT East	19	NT West
Psychiatry	12	HK East	60	Kowloon East
Surgery	26	HK West	54	NT West

Note: Cases are triaged into "urgent," "semi-urgent" and "stable" categories by nurses and specialist doctors.
Source: HA, 2021j

As highlighted in Our Hong Kong Foundation's (OHKF) ***Fit for Purpose: A Health System for the 21st Century*** research report launched in 2018, the ability of our longstanding hospital-centric and treatment-focused health system to overcome current and future challenges in meeting health needs of a rapidly ageing population is constrained by structural barriers. These barriers include an **underdeveloped primary healthcare system**, **segmented public-private healthcare service delivery** and **service fragmentation**.

In reviewing the efficiency of Hong Kong's health system, the income-related inequity in access to quality care is largely attributed to the underperforming gatekeeping mechanism of primary healthcare (PHC) **arising from the segmented financing and service provision arrangements for the public and private sector** (see **Box 1.2** for the definition of PHC). The lack of a well-established and coordinated PHC system does not serve the need for continuity of care for the increasing prevalence of chronic diseases in our ageing population. The failure to receive the demand in our overstretched hospitals greatly hampers the quality of care that could be attained from an integrated health system. The current financing arrangement incentivises biased patterns of behaviour to rely on publicly-funded hospital care, resulting in health system inefficiencies and continued fragmentation of our health system. Contributing to this phenomenon, **public resources are not allocated efficiently to cater for the needs of citizens living with chronic conditions**, which are on the rise. Specifically, primary care provision in the public sector is constrained. With the bulk of primary care provided in the private sector (approximately 70%), primary care services predominantly necessitate **out-of-pocket payments (OOPs)** and remain unaffordable to many, particularly to vulnerable populations and the less well-off. Worryingly, Hong Kong's share of OOPs in its total current health expenditures stands at 29.6% in the 2019–20 financial year, with the potential for impoverishment and financial catastrophe only considered negligible when OOPs is limited to 15–20% of total health expenditures (FHB, 2020a; WHO, 2010c). Evidently, providing accessible, affordable, and well-integrated primary care that is person-centred in achieving the goals of **universal health coverage (UHC)** are continuous challenges.

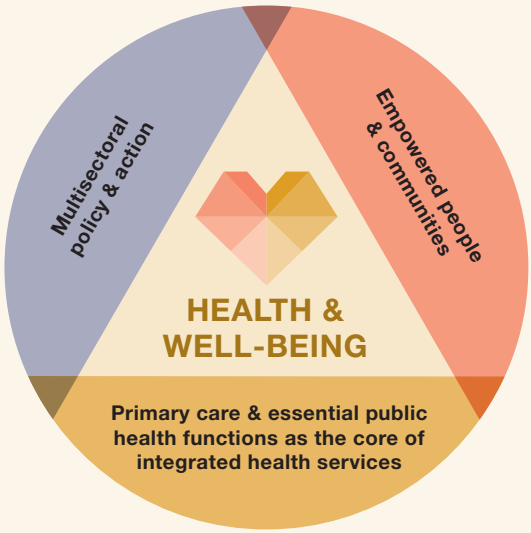
Box 1.2

Defining "primary healthcare"

Primary healthcare is a healthcare service field that has been consistently touted as necessary for equitable healthcare system development. PHC has been growing in almost all health systems, often due to its low implementation cost and comprehensiveness in scope of services. Its roots in a commitment to social justice, equity, and participation of individuals and communities positions PHC as a meaningful investment for a health financing transition to address populational health more holistically.

Figure 1.1

Components of primary healthcare



PHC components:

1. **Primary care and essential public health functions:** PHC provides for people's health needs through promotive, protective, preventive, curative, rehabilitative, and palliative care at different stages of life. Key healthcare services for individuals and families are prioritised through essential public health functions. PHC is the **first point of care** and is crucial in maintaining one's health via preventive, diagnostic, and curative/treatment services. These services are collectively termed **"primary care"**.
2. **Multisectoral policy and action:** PHC should aim to use policy and collective action to address the broader determinants of health that impact individuals and communities. Such determinants include social, economic, and environmental factors as well as individual characteristics and behaviours.
3. **Empowered people and communities:** PHC should empower individuals and communities to advocate for policies and actions that improve and protect health and well-being. This can take form through new health and social services, and programmes designed for individuals as self-carers and caregivers.

Note: Image adopted from WHO & UNICEF, 2018
Source: WHO & UNICEF, 2018

Universal health coverage is priority for health systems worldwide, as it is seen as a critical means to promote human welfare and sustained economic and social development **(Box 1.3)**. Given Hong Kong's context as discussed, providing accessible, affordable and well-integrated primary care that is person-centred in achieving the goals of UHC is a continuous challenge and renders **Hong Kong's health system not fit-for-purpose.**

Box 1.3

What is "universal health coverage" (UHC)?

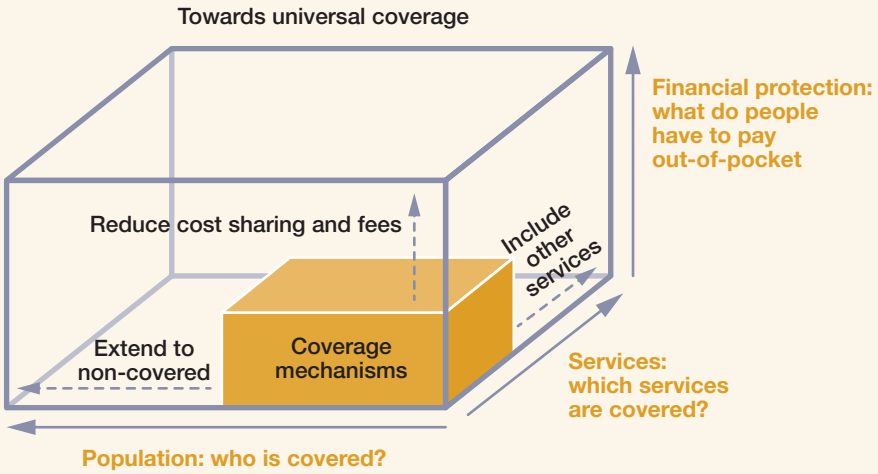
UHC is defined by the World Health Organization (WHO) as "all people [having] access to the health services they need, when and where they need them, **without financial hardship**. It includes the full range of essential health services, from health promotion to prevention, treatment, rehabilitation, and palliative care." (WHO, n.d.) UHC is based on the notion of equity in financing. People contribute on the basis of their ability-to-pay, not according to whether they fall ill.

In 2005, the World Health Assembly unanimously adopted a resolution urging countries to adopt necessary health financing reforms to achieve UHC, requiring countries to reduce its reliance on OOPs to finance their health systems.

Figure 1.2 demonstrates a "coverage" box that illustrates the three dimensions of health financing through which UHC can be achieved. When the coverage box of a country is expanded along three axes, it is further along meeting UHC. In practice, a country's coverage mechanism must cover **more people** (population axis), offer **more comprehensive services** (services axis), and **pay a greater part of the cost** (financial protection axis).

Figure 1.2

Three dimensions of the coverage mechanism towards UHC

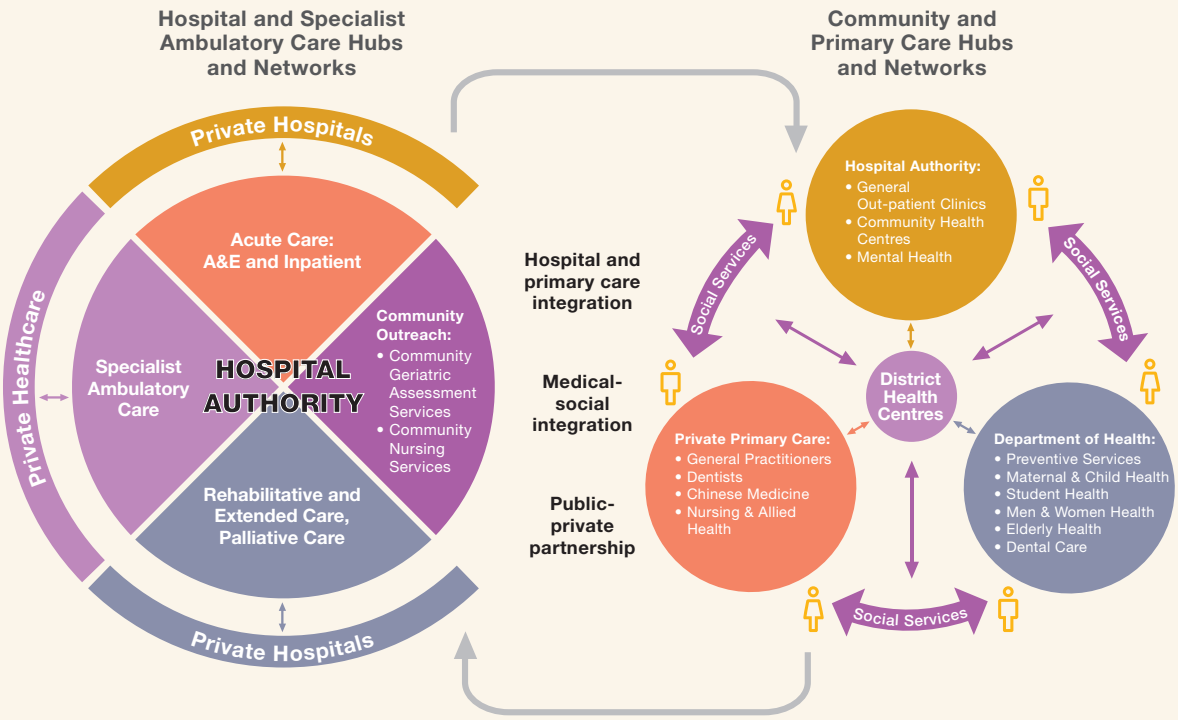


Sources: WHO, 2005b, 2010c, 2017a

In recognition that conventional disease-focused care models are no longer sufficient to address the emerging healthcare needs in the 21st century, the WHO has called for a "fundamental paradigm shift in the way health services are funded, managed, and delivered" to achieve further gains in health outcomes (WHO, 2015b). To reshape our health system to tailor for the emerging needs amidst demographic and epidemiological transitions, our research report ***Fit for Purpose: A Health System for the 21st Century*** presented a visionary transformation of the system towards one that is primary care-led, integrated, and person-centred. We put forward a conceptual integrated health services model that emphasises building and connecting primary and community care hubs to surrounding networks—in order to help the health system progress towards becoming fit-for-purpose **(Figure 1.3)**.

Figure 1.3

Simple representation of conceptual model of integrated health services



Source: OHKF, 2018

Stressing on the need to optimise the allocation and use of available resources, the model highlights the need to shift from hospital-centric to community-based care. The model also puts forward three key types of integration that need substantial work in to move closer to our visionary system, including **hospital and primary care integration, medical-social collaboration**, and **public and private partnerships.** Our vision's implications on the sustainability of Hong Kong's health system is further supported by a local study showing that **every HKD 1 invested into homecare for community-dwelling older populations would result in savings ranging from HKD 9 to HKD 69 on acute care** (Leung, 2019).

Recent progress made to actualise our visionary primary care-led health system includes the setting up of the **Steering Committee on Primary Healthcare Development** in 2017, which informs the direction for Hong Kong's PHC development, and the much anticipated **primary healthcare blueprint** which is to be presented for public consultation in the upcoming months (at the time of writing). It is thus timely and important for efforts to be accelerated in transforming our health system to provide accessible, affordable, and person-centred primary care in order to actualise the Government's undertaking to "protect and promote public health, provide lifelong holistic health care to every citizen of Hong Kong, and ensure that no one is denied adequate medical treatment due to lack of means" (HKSARG, n.d.-b).

1.2 THIS REPORT

This report builds on the research presented in our previous policy reports and is integral to ongoing advocacy to transform our healthcare system into a primary care-led health system in Hong Kong. In this report, Our Hong Kong Foundation together with Professor Yeoh Eng-kiong and his team in the Centre for Health Systems and Policy Research of The Jockey Club School of Public Health and Primary Care, Faculty of Medicine, the Chinese University of Hong Kong (CUHK-JCSPHPC) investigates **health financing levers applicable to the local context where provision of primary care is inadequate in the public sector and unaffordable to many in the private sector.** Specifically, key areas of investigation include Hong Kong's potential in application of strategic purchasing and the potential for leveraging public-private partnerships (PPPs), particularly for primary care services, so that every resident can receive the pledged quality care in an affordable and timely manner.

International evidence shows that a greater reliance on public funding sources within the health system improves access to health services and provides greater financial protection for the population at large. Throughout this report, we look at evidence from various health systems to gain insight on the application of strategic purchasing for chronic disease prevention and management and best practices for strategic purchasing designs. We explore how capacity in the private sector can be better leveraged for primary care provision through Public-Private Partnerships in Hong Kong, while also creating a better reliance on public funding, for the financing of primary care services and in accelerating its development. Specifically, we examine both supply-side and demand-side incentives and assess the feasibility of a proposed **Chronic Disease Screening Voucher and Management Scheme (CDSVMS, also addressed as "Scheme")** that utilises a voucher PPP model.

In our study which has received funding support from the **Public Policy Research Funding Scheme of the Policy Innovation and Co-ordination Office of the HKSARG** (Project number: **2020.A4.068.20B**), we conducted an in-depth examination of healthcare vouchers as a demand-side incentive and assessed the feasibility of the proposed Scheme targeted at a better-defined population and scope of services. We emphasised the importance of not just investing in preventive measures such as chronic disease screening, but also of investing in follow-up care and chronic disease management which may be needed. Specifically, the proposed Scheme is set out to remove financial disincentives for population screening for prevalent chronic conditions including hypertension, hyperglycaemia (diabetes), and hyperlipidaemia (termed collectively as HDH) targeted at the general population aged 45 years or above. We also presented proposals for subsequent chronic disease management care pathways. The proposed Scheme aims to better leverage existing resources to improve primary care accessibility, affordability, and uptake. Potential enhancements that could be made using **strategic purchasing** as a lever within the current segmented system of public and private financing with reference to evaluations of local experience and international best practices will be discussed.

Box 1.4

Definition of "strategic purchasing"

Strategic purchasing is also known as "active purchasing". It is defined as the process in which funding and legal entitlements to health services are guided by the scope and quality of services and the performance of providers, based on the health needs of the population at large (Chapter 2). Its goals align with the objectives of UHC—to enhance equity in the distribution of resources, increase efficiency, manage expenditure growth, and promote quality in health service delivery. Its ultimate goals are to maximise health outcomes, equity in financing, and financial protection.

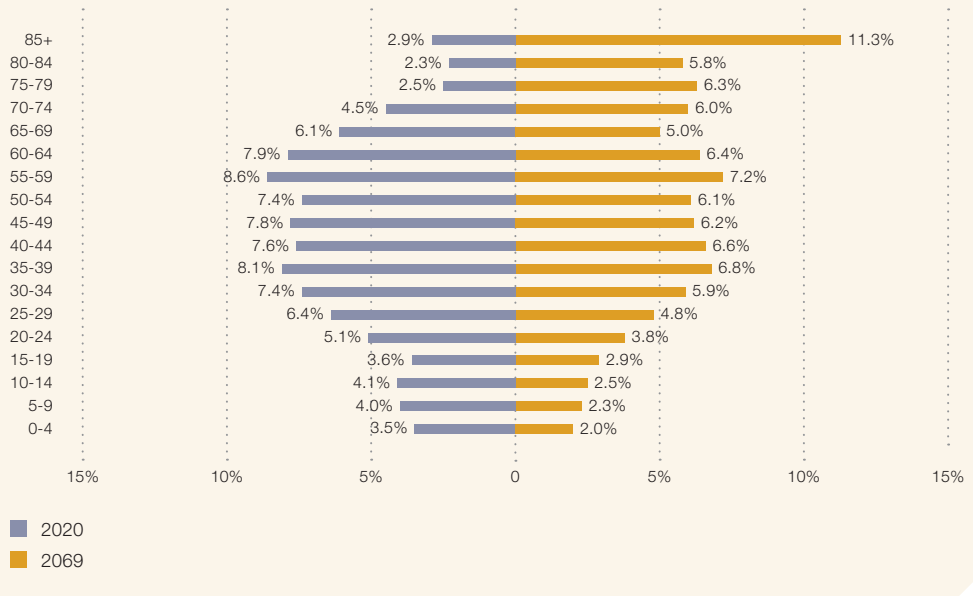
While demonstrating the potential for use of strategic purchasing for primary care services, we emphasise this lever as a governance tool in a whole health system approach in maximising health system performance. The tool enables the health system to **strategically prioritise what services to purchase, whether to provide or purchase, for whom, from whom, who to purchase, and how.** The report will include insights gained from a scoping review of worldwide experience, key stakeholder interviews, a population-based survey to gauge views of the general public, budget implications related to the introduction of the proposed Scheme using a scheme for diabetes as a proxy. It concludes with policy recommendations on strategic purchasing as an effective tool to better meet health needs and promote health equity in Hong Kong.

1.3 PEOPLE ARE LIVING LONGER, BUT NOT NECESSARILY BETTER

Population ageing and increasing chronic disease prevalence

Figure 1.4

Hong Kong population projection, 2020–2069

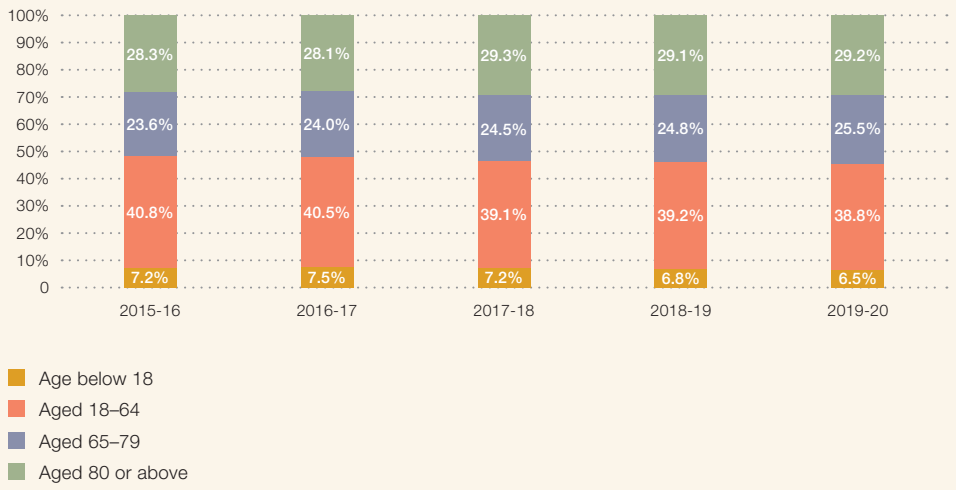


Source: C&SD, 2020a

Hong Kong's population is ageing rapidly. The latest population projection figures show that the proportion of the older population (aged 65 and above) in Hong Kong is projected to increase from 18.3% of the total population in 2020 to 34.4% of the total population by 2069, almost doubling in size (C&SD, 2020a) **(Figure 1.4)**. The observed demographic shift will foreseeably impact healthcare resources necessitated to meet the emerging healthcare demands. Currently, more than half of the public hospital resources, as proxied by the number of patient days, are utilised by our older population (HA, n.d.). The number of public hospital patient days has increased by age group in an upward trend for the past 5 years **(Figure 1.5)**, with age groups aged 65 and above constituting 54% of total patient days in 2019–20. Notably, the number of hospital beds required for populations aged 65 years and above is also more than three times that of beds required for populations under 65 years old, and more than nine times that for populations over 80 years old **(Figure 1.6)** (C&SD, 2021b; HA, 2021h).

Figure 1.5

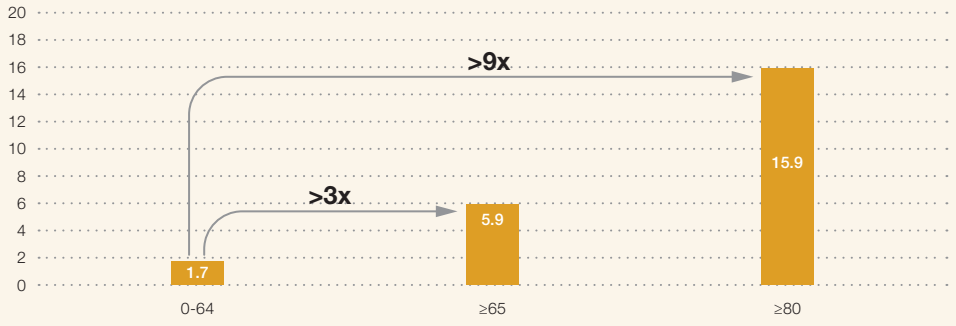
Number of patient days (%) by age group, 2015–2020



Note: Patient Days are inclusive of both inpatient patient days and day inpatient discharges and deaths, in 2019–20.
Figures may not add up to 100% due to rounding.
Source: HA, n.d.

Figure 1.6

Number of public hospital beds required per age group per 1,000 population in 2020–2021

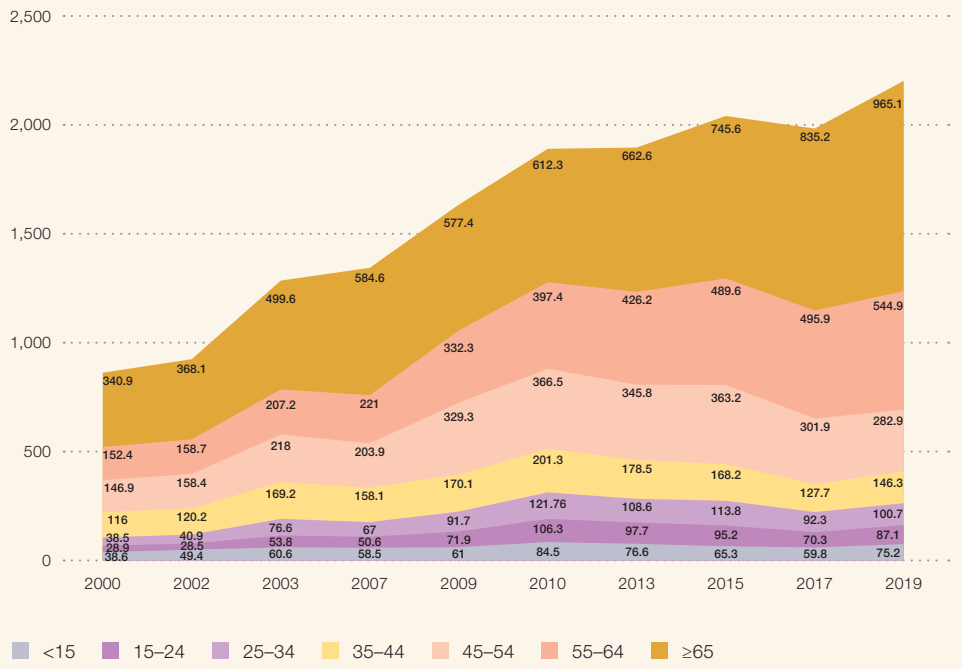


Note: Number of public hospital beds required = total number of patient days utilised per thousand population/365.
Patient days include inpatient days and day inpatient discharges and deaths.
Sources: C&SD, 2021b; HA, 2021h

As Hong Kong's population ages, **an increasing prevalence of chronic disease can also be observed** **(Figure 1.7)**. In 2019, 78.1% of people aged 65 or above had chronic health conditions, a dramatic increase from 47.9% in 2000 **(Figure 1.8)** (C&SD, 2000, 2019). From 2000 to 2019, **hypertension** remained the most prevalent chronic health condition in the age group of 65 years and above, with more than half of the older population (52%) diagnosed with high blood pressure. There is additionally a profound increase in the prevalence of **high cholesterol** (from 4.3% in 2000 to 26.1% in 2019) (≥5.2mmol/L), while **diabetes mellitus** remains among the top three chronic illnesses affecting 23% of the older population **(Figure 1.8)** (C&SD, 2000, 2019).

Figure 1.7

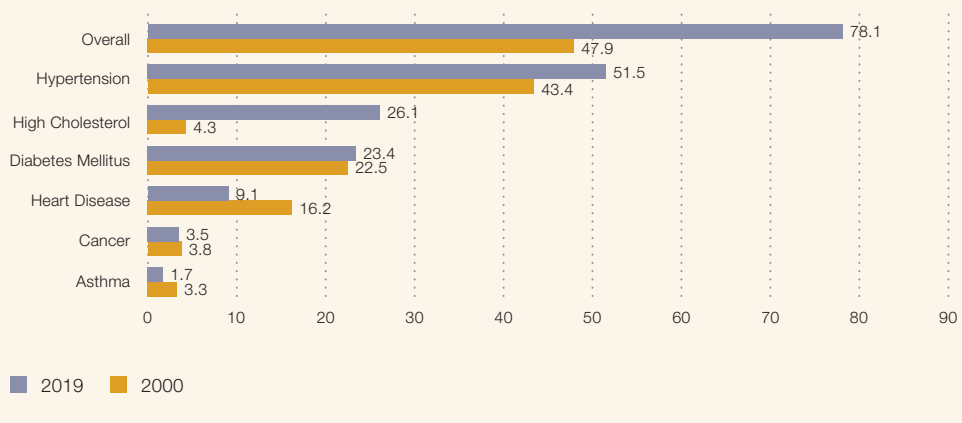
Population ('000) with chronic health conditions by age group, 2000–2019



Source: C&SD, 2019

Figure 1.8

Older population (aged 65 and over) (%) with chronic health conditions by diseases, 2000 and 2019

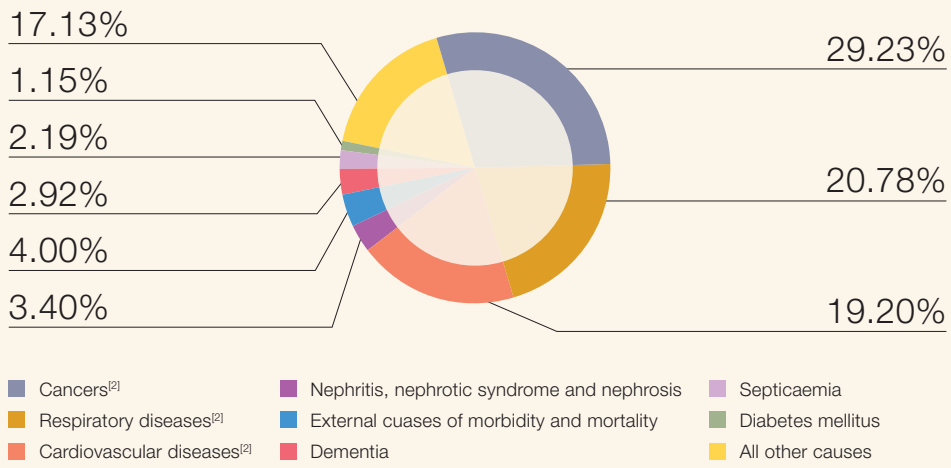


Sources: C&SD, 2000, 2019

Notably, from analysis of population survey data, **multi-morbidities, the simultaneous existence of more than one chronic condition for a patient, increases with age.** The existence of multiple complex health conditions necessitates complex interventions that further increases demand on our health system (C&SD, 2019; Yeoh, 2018a). Furthermore, chronic conditions drive premature mortality such that in 2020, around 70% of all registered deaths were attributable to major non-communicable diseases (NCDs), including cancers (29.2%), respiratory diseases (20.8%), cardiovascular diseases (19.2%), and diabetes (1.2%) **(Figure 1.9)** (CHP, 2021b). These observations point to an urgent need for better prevention, detection, and management of chronic conditions to relieve currently overburdened specialist and hospital services and improve patient health outcomes.

Figure 1.9

Leading causes of death, 2020 [1]



Notes: [1] The data used to calculate 2020 death rates are provisional figures and are subject to change.
[2] Malignant neoplasms is renamed as “cancers”; respiratory diseases include: pneumonia and chronic lower respiratory disease; cardiovascular diseases include disease of the heart and cerebrovascular diseases.
Source: CHP, 2021b

Chronic disease is not a unique condition confined only to older populations. In fact, data from 2011 showed that 26.0% of individuals aged 55–64, 10.5% of individuals aged 45–54, and 5.4% of individuals aged 35–44 were diagnosed with two or more chronic illnesses, with trends suggesting that these numbers will increase in the coming years (Ching, 2017). Targeting prevention of NCDs earlier in the life course should be a priority.

1.4 KEY SYSTEM CHALLENGES IN ACHIEVING A FIT-FOR-PURPOSE HEALTH SYSTEM IN HONG KONG

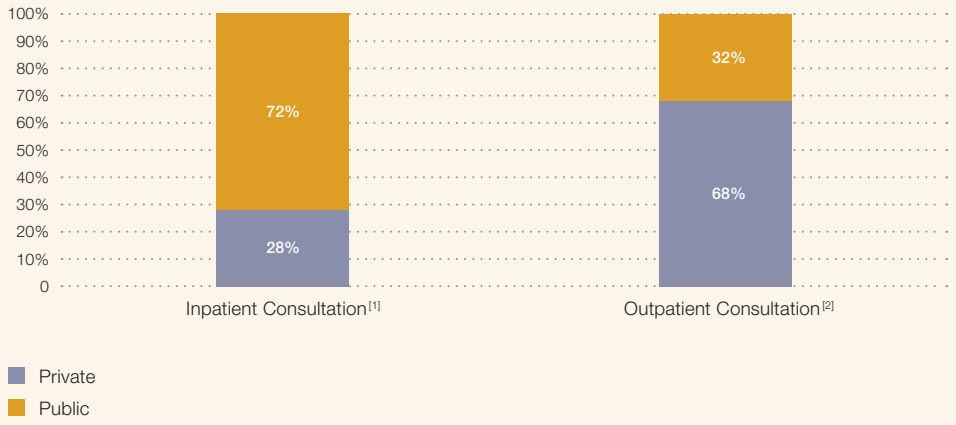
The current health system is unable to meet the challenges arising from an ageing population and an increasing prevalence of chronic diseases. Major barriers to achieving a fit-for-purpose health system are public-private healthcare segmentation, an underdeveloped primary healthcare system, and inadequate medical-social collaboration, which are discussed below.

Public-private healthcare segmentation

Hong Kong has a **pluralistic health system**, in which **segmentation between the types of healthcare services provided and funded by the public and private sectors contributes to a comparatively lower utilisation of private sector services.** Approximately 70% of outpatient services are provided by the private sector, while more than 70% of inpatient services are obtained from the public sector **(Figure 1.10)** (C&SD, 2019). This public-private split also illustrates that the public sector currently has limited capacity in providing needed outpatient care. In contrast, the private sector has more capacity to provide outpatient services and has advantages of allowing patient choice and faster access, but the higher expenses disincentivise the use of private outpatient care—including primary care deemed increasingly necessary to reduce the demand for specialist and hospital care.

Figure 1.10

Inpatient and outpatient consultation split by public and private sectors, 2019



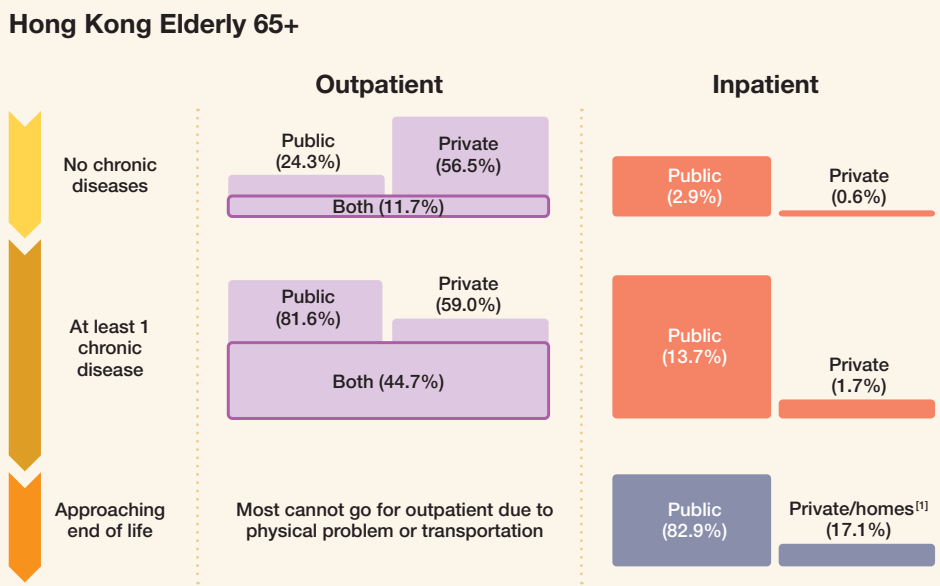
Notes: [1] Last admissions into hospitals in Hong Kong during the 12 months before enumeration by type of hospitals admitted
[2] Consultations made during the 30 days before enumeration by type of medical practitioners consulted, wherein public services are the sum of consultations of Practitioners of Western medicine in Western medicine clinics/ centres under HA/ DH, and A&E under HA, and practitioners of Chinese medicine in Chinese medicine clinics/ centres under HA; private services are the sum of consultations of private practitioners of Western medicine and private practitioners of Chinese medicine

Source: C&SD, 2019

While the public and private sectors traditionally work separately of each other, patients oftentimes utilise both sectors simultaneously. For instance, as exemplified among older patients without chronic diseases, a majority of these patients opt for outpatient care in the private sector and approximately 12% turn to dual usage of public and private services. In contrast, nearly half of older patients with at least one chronic disease will use both public and private services for outpatient management of their chronic conditions that necessitate long term care **(Figure 1.11)** (Yeoh, 2020). This suggests that the inadequate public provision of primary care and the public-private segmentation in the health system contribute to the dual use of both sectors, particularly for patients with chronic diseases, which leads to discontinuity of care for complex patient needs and contributes to inefficiencies in healthcare delivery.

Figure 1.11

Patterns of outpatient-care-seeking amongst the older population (aged 65 and above) in Hong Kong



Note: [1] percentage includes all deaths aged 65+ outside public hospitals
Sources: C&SD, 2011; Yeoh, 2018b, 2020

Underdeveloped primary healthcare

Hong Kong's underdeveloped primary healthcare system contributes to the perpetuation of the current hospital-centric model. According to a study based on patients admitted to public hospitals in 2007, nearly half of older populations' hospital admissions in the public sector could be avoided if more appropriate, timely, and effective primary care had been provided to older patients post-discharge (Yam et al., 2014). Health promotion, prevention of chronic diseases as well as disease management remain inadequate within the public sector, as highlighted by the predominantly specialist and hospital service provision model in the public sector **(Figure 1.10)**. As a result, low-income patients are given few options for preventing and managing chronic conditions. Long waiting times for specialist care delay treatment and diagnoses, which potentially induces further health complications that require costly tertiary care. Therefore, Hong Kong's PHC system must be strengthened, with emphasis on health promotion, disease prevention, and chronic disease management, instead of having all patients gravitate towards hospitals and specialists regardless of healthcare needs (OHKF, 2018).

Medical-social divide

In addition to an underdeveloped PHC system, insufficient support in community settings and ineffective coordination and collaboration between health and social service providers at various levels of care further contribute to service fragmentation throughout the system. Despite initiatives to strengthen post-discharge support for high-risk older populations, inadequate community support for discharged patients leads to preventable hospital readmissions and further drains medical resources. The unplanned readmission rate among older patients in public hospitals is close to 20% **(Figure 1.12)**. This highlights a large gap in coordinating post-discharge services provided by social service organisations in the community and discharge planning conducted by hospitals (Wong et al., 2011). Better care provision and support in community settings, particularly at the primary care level for discharged patients through strengthened medical-social collaboration, are therefore necessary to reduce preventable hospitalisations.

Figure 1.12

Observations on hospital admission amongst the older population in Hong Kong

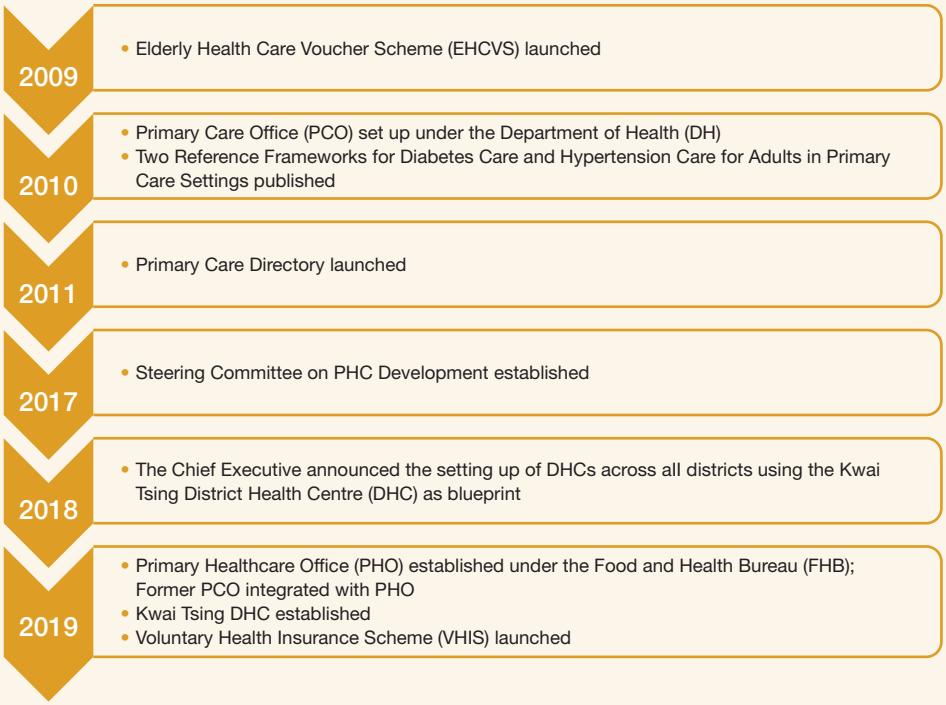
Note: [1] RCHE = Residential Care Home for the Elderly
Sources: Yeoh, 2018b, 2020

1.5 HONG KONG'S PROGRESS IN PRIMARY HEALTHCARE DEVELOPMENT

Hong Kong has made strides towards developing PHC in the post-war period, but subsequent PHC development has only been made through intermittent efforts in past decades **(Figure 1.13)**.

Figure 1.13

Major primary healthcare development milestones (2009–present)



Source: PHO, 2020

The discussion of PHC development in Hong Kong can be traced back to 1990 with the launch of the Report of the Working Party on Primary Health Care, *Health for All–The Way Ahead*. Over the past three decades, several policy papers also recommended different policies as listed in **Table 1.2**. The 2010 Primary Care Development Strategy Document **(Box 1.5)** included the prevention of chronic diseases as one of its key initiatives. Today it has become one of the key functions of the Centre for Health Protection (CHP), another arm under the DH.

More recent efforts including the work of a high-level **Steering Committee on Prevention and Control of Non-communicable Diseases** have been guiding the formulation and implementation of various action plans against NCDs, tabling performance targets with references to WHO frameworks and local contexts, including the latest *Towards 2025: Strategy and Action Plan to Prevent and Control NCD in Hong Kong* launched in 2018 **(Table 1.2)**. Other initiatives on prevention and control of disease include the **Hong Kong Cancer Strategy (2019), vaccination, dementia community support, mental health, and anti-smoking measures** (HKSARG, 2019d). These efforts of population-based interventions and multimedia literacy campaigns are yet to be reviewed for its efficacy, with regular chronic disease screening behaviour continuing to be low on citizens' health-seeking agenda (for details, please refer to **Chapter 4.2**).

Table 1.2

Major strategic papers on primary healthcare development in Hong Kong

Title	Primary Care-related Recommendations
Health for all, the way ahead: report of the Working Party on Primary Health Care, 1990 (Working Party on Primary Health Care, 1990)	(a) Establish a **Primary Health Care Authority** by the Government to monitor the delivery of primary healthcare services.
Improving Hong Kong's Health Care System – Why and For Whom?, 1999 (The Harvard Team, 1999)	(a) Expand primary outpatient services to **poor and low-income residents**, and promote the development of **Family Medicine**; (b) Conduct pilot projects to promote **integration** between primary and tertiary care and the public and private sectors by contracting out certain services such as Maternal and Child Health (MCH) Services in a particular region, or specific services which currently have long waiting lines at HA facilities.
Building a Healthy Tomorrow, 2005 (HWFB, 2005)	(a) Promote the **family doctor concept** which emphasised continuity of care, holistic care, and preventive care; (b) Put greater emphasis on **prevention of diseases and illnesses** through public education and family doctors; and (c) Encourage and facilitate medical professionals to **collaborate with other professionals** to provide coordinated services.
Your Health Your Life, 2008 (FHB, 2008b)	(a) Develop **basic models for primary care services**; (b) Establish a **family doctor register**; (c) Subsidise patients **for preventive care**; (d) Improve **public primary care**; and (e) Strengthen public health functions.
Recommendations by the Working Group on Primary Care, 2009 (Legislative Council Panel on Health Services, 2009)	(a) Develop **primary care conceptual models and clinical protocols**, especially for the prevention and management of common chronic diseases, with a view to guiding the provision of enhanced primary care; (b) Set up a **Primary Care Directory** with a view to promoting enhanced primary care through the family doctor concept and adopting a multi-disciplinary approach; and (c) Devise feasible service models to **deliver enhanced primary care services in the community** through pilot projects as appropriate, including the setting up of community health centres.
Primary Care Development Strategy Document, 2010 (FHB, 2010b)	(a) Develop **conceptual models and reference frameworks**; (b) Establish a **Primary Care Directory**; (c) Launch pilot projects to improve **chronic disease management**; (d) Set up **community health centres and networks**; (e) Strengthen primary dental care; (f) Improve community mental health care; (g) Release the **electronic health record (eHR) sharing system**; (h) Strengthen primary care-related research; (i) Establish the Primary Care Office.
Towards 2025: Strategy and Action Plan to Prevent and Control NCD in Hong Kong, 2018 (DH, 2018)	New Strategic directions are proposed in line with WHO recommendations: (a) **Government demonstrating leadership**; (b) **Schools** transformed into healthy settings (e.g., Health Promoting Schools); (c) Supportive physical and social environments created for physical activity; (d) Effective **partnerships with primary care professionals**; and (e) Consideration and adoption of "best buys" and other recommended interventions at appropriate stages. The Strategy and Action Plan (SAP) defines a set of 9 local **NCD targets** and 34 indicators derived from the WHO's global monitoring framework (GMF).

In a further effort to promote primary care uptake, the **Elderly Health Care Voucher Scheme (EHCVS)** was initiated in 2009 as a pilot scheme intended to encourage older individuals to access primary care services available within the private sector. In 2012, the pilot scheme was transformed into a recurrent programme, and further enhancements were made since then, including increasing the annual vouchers to HKD 2,000, providing a one-off voucher valued at HKD 1,000 in 2019, lowering the eligibility age from 70 to 65, and allowing more older populations to use outpatient services provided by designated departments of the Hong Kong University-Shenzhen Hospital (HKSARG, n.d.-a).

Separately, a **Primary Care Office (PCO)** was set up in 2010 under the DH. PCO provided support on policy formulation and strategic development on primary care. The office coordinates DH, HA, private healthcare providers and other relevant stakeholders for the implementation of policies and initiatives to enhance primary care (Legislative Council Panel on Health Services, 2010). Two Reference Frameworks for Diabetes Care and Hypertension Care for Adults in Primary Care Settings were also published (PHO, 2020).

Box 1.5

The Primary Care Development Strategy Document (2010)

Following WHO's frameworks in the Declaration of Alma-Ata (1978) and the Declaration of Astana (2018), Hong Kong's DH has positioned primary care as the first level of care in the whole healthcare system, while secondary and tertiary care mainly include specialist and hospital services.

The Primary Care Development Strategy Document was published and adopted in 2010, delineating the vast range of services that primary care comprises of as follows (Legislative Council Panel on Health Services, 2011):

The key attributes of good primary care entail **the provision of accessible first contact care that is comprehensive, continuing, co-ordinated and person-centred in the context of family and community.** Primary care contributes to the health of the population and covers a wide range of services which includes the delivery and provision of:

- health promotion;
- prevention of acute and chronic diseases;
- health risk assessment and disease identification;
- treatment and care for acute and chronic diseases;
- self-management support;
- rehabilitative, supportive, and palliative care for disability or end-stage diseases.

Sources: Legislative Council Panel on Health Services, 2011; Working Group on Primary Care, 2010

In 2011, PCO launched the **Primary Care Directory** (the Directory), an accessible electronic database that provides the public and healthcare service providers practice-based information and professional qualification of primary care providers in the community. PCO was further integrated with the PHO under the Food and Health Bureau in 2019, with the latter operating on an initiative-based model revolving around DHCs, reference frameworks, the Directory, primary care, family doctor and medicine promotion, and enhancing the integration across disciplines, sectors and organisations.

As an effort to steer PHC development forward in Hong Kong, a **Steering Committee on Primary Healthcare Development** chaired by the Secretary for Food and Health was established in 2017. The Committee is committed to developing a blueprint for the sustainable development of PHC through five domains: manpower and infrastructure planning, collaboration model, community engagement, planning and evaluation framework, and strategy formulation (FHB, n.d.-b; HKSARG, 2020b). Nevertheless, a comprehensive vision and timetable have yet to be announced (at the time of writing).

The setting up of **District Health Centres** (DHCs) is a major milestone in the PHC development in Hong Kong. In the 2017 Policy Address, the Chief Executive announced a plan of DHCs to further drive medical-social collaboration in providing PHC (Legislative Council Panel on Health Services, 2018a). Targeting a reduction of unnecessary hospital utilisation, DHCs seek to raise public awareness of personal health management, enhance disease prevention, and strengthen medical and rehabilitation services in the community. Based on the unique needs of populations within respective districts, its key service packages include: health promotion, health assessment, chronic disease management, and community rehabilitation. The first DHC in Hong Kong situated in Kwai Tsing District commenced operation in September 2019, followed by the second DHC in Sham Shui Po in 2021. Five more districts will witness the establishment of their own DHCs within the term of the current Government (ending 30th June 2022), with an additional 11 “DHC Express” to be rolled out in other districts as an interim measure pending the establishment of full-scale DHCs (Legislative Council of the HKSAR, 2021).

With these more recent strides and leveraging on this momentum to propel PHC development in Hong Kong, there is an opportunity to provide a clearer and more comprehensive view of how PHC development can be accelerated in Hong Kong.

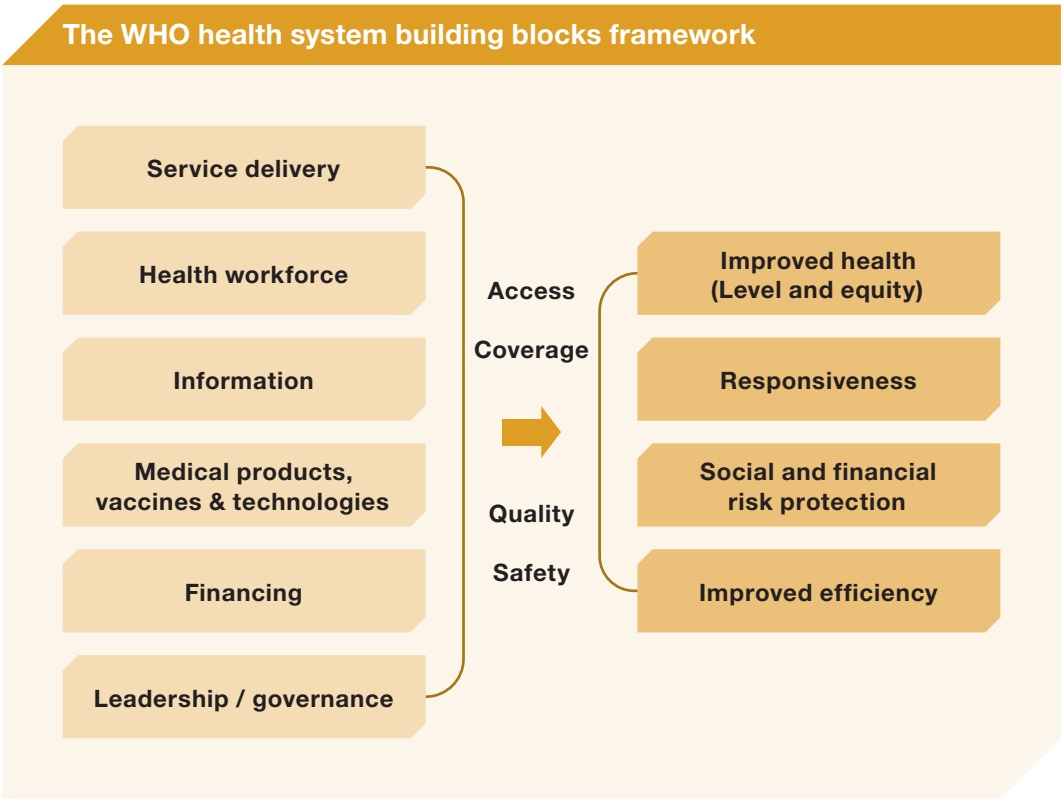
1.6 HEALTH FINANCING AS A KEY LEVER TO PROPEL PRIMARY HEALTHCARE DEVELOPMENT IN HONG KONG

1.6.1 DEFINING HEALTH FINANCING

The WHO Framework for Action published in 2007 is a guide for policymakers to understand and plan the foundation of a health system, **which describes financing as one of the six core "building blocks" of health systems (Figure 1.14)** (WHO, 2007). Working in concert with the other system building blocks, financing aims to deliver population health improvements, responsiveness to growing and shifting health needs, and financial protection and equity of payment (WHO, 2007). The WHO has defined health financing as **"a core function of health systems that can enable progress towards universal health coverage by improving effective service coverage and financial protection."** (WHO, 2005b, 2010c, 2019a) **(Figure 1.15)**

Figure 1.14

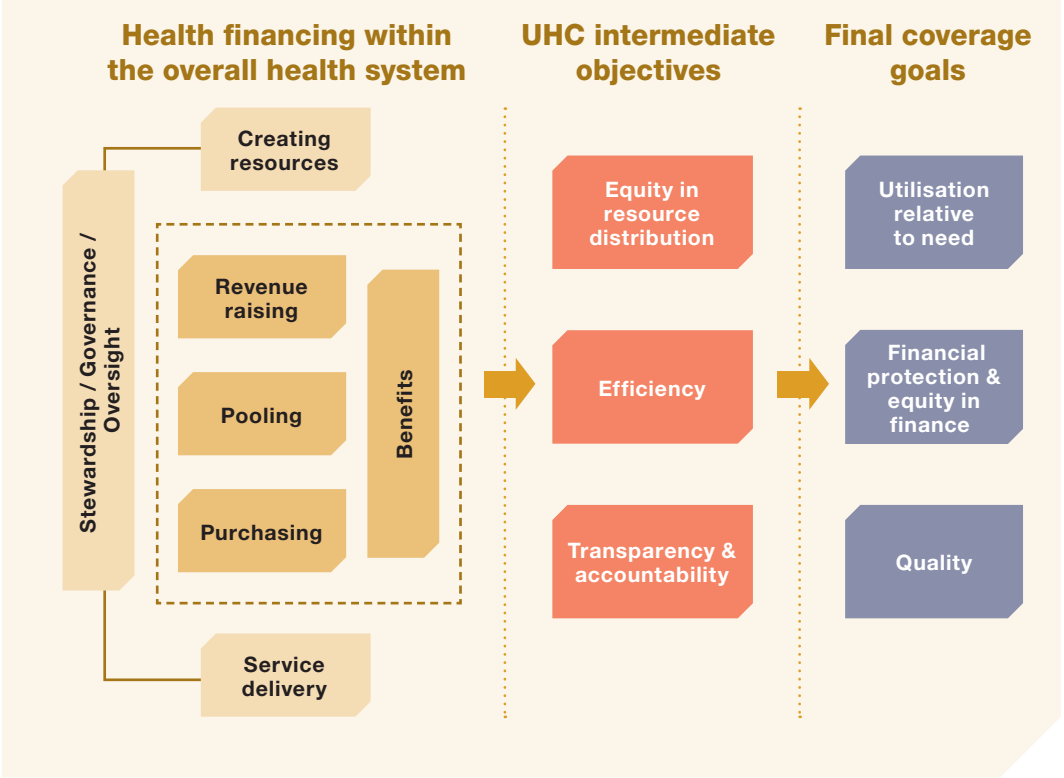
The WHO health system building blocks framework



Note: Adopted from *Everybody's Business: Strengthening Health Systems to Improve Health Outcomes: WHO's framework for action.*
Source: WHO, 2007

Figure 1.15

How health financing leads to UHC



Note: Adopted from the *Developing a National Health Financing Strategy: a Reference Guide*
Source: WHO, 2017a

Health financing policies that are prudently designed and implemented can improve the quality, equity of access, and affordability of healthcare services, which are essential concepts of UHC. In fact, studies from developed economies and health systems have provided early evidence that **health financing policy changes can improve quality of care** (Hofmarcher et al., 2007). Initial research and health financing policy implementation shifts in high-income OECD countries, such as the Netherlands, the United States, the UK, and Germany, have shown potential in care coordination and improvements in cost-efficiency (de Bakker et al., 2012; Hofmarcher et al., 2007). In particular, health systems that are considered "pro-poor" place the financial burden of payment on governments rather than individuals, with greater access to funding and regulation on payment for services to minimise impact on patients; such systems are deemed more equitable by the WHO and are more likely to achieve UHC (WHO, 2007).

Recalling **Box 1.3** on the coverage mechanism, the WHO advocates that a health financing system should move health systems in progressing towards UHC through three primary means: increasing population coverage, increasing service coverage, and increasing financial protection coverage (WHO, 2010c). Closely corresponding to these three means, the final coverage goals to be enabled by health financing policies are healthcare utilisation relative to need, financial protection and equity in finance, and quality of healthcare **(Figure 1.15)** (WHO, 2010c). To achieve these goals, governments need to consider how financing policies are designed in the three key components of health financing:

Key component #1: Revenue raising

Revenue raising addresses how funds are raised, through taxation both direct and indirect, compulsory or voluntary prepaid insurance and community schemes, direct out-of-pocket payment by patients, and/or external aid.

The 2019 *Renewed Commitment during High-Level Meeting in New York with the UN General Assembly* called for countries to move towards a predominant reliance on **compulsory, public funding sources**. This goal will require that countries develop capabilities of their health financing institutions to sustain appropriate domestic financing of health and to increase their efficiency by increasing public spending on PHC. Specifically, the **WHO calls for increasing PHC spending by 1% GDP**. Doing so would have varying effects on countries within different income categories, as proportional increases in PHC spending in high income countries will lead to much higher PHC spending per capita than in lower income countries. This increase in PHC spending can improve the quality of PHC services and make PHC more accessible through subsidised services.

Of note, efforts to "scale-up" a health system centred on increased spending have not consistently ensured that the most vulnerable populations are able to access care within the public sector. The WHO has also recognised that **simply injecting additional funds into a health budget—revenue raising—is often insufficient** for making meaningful progress in attaining UHC, which requires consideration of how funds are pooled and how they are allocated (WHO, 2019a).

Key component #2: Pooling of funds

The pooling of funds addresses how prepaid funds are accumulated for use by some or the entire population. Pooling ensures that taxes, premiums and foreign assistance used to finance health services, termed "pre-paid revenues", will be shared by a community. As a result, the risk is spread and the financial burden to an individual paying for healthcare is reduced, and any person who needs medical care would not be subject to the entire payment alone through high OOPs or face financial catastrophe (WHO, 2010b).

However, pooling fragmentation occurs when there are barriers to the redistribution and efficient use of these pre-paid funds. It can be illustrated by a split in collected funds across different budgets, called "pools", reducing the amount accessible to individuals (WHO, 2010b, 2015a). As a result, patients with less financial capacity will face higher financial risk from reduced funding in their pool than more financially capable patients, increasing disparities in healthcare access. **It is important that pooling fragmentation is reduced, so that each budget will be larger, protecting individuals from high OOP payments or reducing the required contributions to be made by patients**, resulting in a more equitable redistribution of funds.

Key component #3: Purchasing of services

The purchasing of services is a critical function of financing and entails securing, paying for and/or budgeting of funding resources to health service providers, such as physicians or hospitals, for meeting population health needs.

A significant proposition by the WHO revolves around the development and application of strategic purchasing to meet population health needs. **Strategic purchasing is a health financing strategy that seeks to align funding and financial incentives with guaranteed health services, often determined through detailed information on the performance of providers and the health needs of the population served** (WHO, 2017b). In order to fully incorporate strategic purchasing into a health system, it is crucial that information management systems are first strengthened and expanded. Data pertaining to quality and service-delivery outputs, as well

as financial data, will be critical in creating a meaningful strategic purchasing role for progressing to UHC. Therefore, many health systems will need to increase data and measurements available and create a method of data collection and centralisation. Policymakers will also have to consider how varying payment structures will incentivise (or disincentivise) efficient and effective care.

In the context of the more technical questions that strategic purchasing presents, strategic purchasing also offers a framework for better system integration through the purview of population health needs and financing (WHO, 2005a). By linking purchasing of health services to the health needs of the population, **strategic purchasing offers a vehicle for more precise health system development that can be targeted to the vulnerable and/or underserved.**

1.6.2 STRATEGICALLY DEVISING HEALTH FINANCING POLICIES TO PROPEL PRIMARY HEALTHCARE DEVELOPMENT IN HONG KONG

While the WHO has set out overarching approaches to improve the quality and affordability of healthcare services in accelerating progress towards UHC, the unique context of each health system renders it necessary to consider the best financial levers to implement. **A localised strategy to promote innovative and effective financing of healthcare that is context-specific for the pluralistic health system in Hong Kong focused on accelerating PHC development is necessary.**

In Hong Kong, the FHB has projected that Hong Kong's total health expenditure averages at an annual growth rate of 1.5% from 2004 to 2033 when healthcare is estimated to make up 27.3% of total government spending by 2033 (FHB, 2008a). The increasing prevalence of chronic conditions, underdeveloped primary care system and health system fragmentation have intensified our healthcare burden and associated costs. Our shrinking workforce and narrow tax-base would foreseeably mount pressure on our financing system. To that end, efforts need to be directed at how to better design our health financing system such that available resources within our current portfolio are used effectively and directed towards prioritised health services aligned with health system goals and maximise health system performance. In particular, exploring how the public and private healthcare sectors can be incentivised to achieve intended health system outcomes is important in transforming Hong Kong's pluralistic health system.

It is evident that we need to move beyond simply injecting additional funds into a health budget, which will not be sufficient even if can be sustained. This report examines how the purchasing of services could be a financing lever to propel PHC development in Hong Kong's pluralistic health system. Specifically, we investigate **how strategic purchasing could serve to transform Hong Kong's segmented health system to be fit-for-purpose.**

2 Strategically Purchasing to Become Fit-for-Purpose: Lessons from International Examples

2.1 STRATEGIC PURCHASING: A HEALTH SYSTEM APPROACH

2.1.1 DEFINITION OF PURCHASING AND STRATEGIC PURCHASING

As early as 1993, the World Health Organization (WHO) has called for countries and health systems to "mobilise and encourage the support of all partners in health development", including those from non-governmental organisations (NGOs) and the private sector, in order to implement and strengthen progress towards health for all (World Health Assembly, 1993). Oftentimes, this form of partnership will take place through "purchasing" arrangements, in which the public sector purchases resources and services from the public and private sectors. More specifically, "purchasing" refers to the budgeting and use of pooled funds for healthcare services from healthcare providers on behalf of a target population (WHO, 2019b). This definition is distinct from the procurement of medicine or medical supplies in bulk on behalf of a health system or healthcare provider organisation; the former is a comprehensive mechanism for meeting healthcare needs through rigorous assessment of service needs while the latter is a one-time transaction for buying medicine and supplies.

One form of purchasing that is increasingly advocated by the WHO is strategic purchasing. As a health financing mechanism, strategic purchasing is a form of **performance-based financing** wherein services are delivered based on need and purchased based on provider performance. Growing consensus recognises the need for strategic purchasing in order to progress towards universal health coverage (UHC), with numerous countries, such as Argentina, Thailand, and the Philippines, making progress towards UHC within the past two decades (WHO, 2019b). As countries and health systems engage with their own health financing transition, UHC may be closer to reality through more efficient use of financing mechanisms, such as strategic purchasing, that allows systems to reduce duplication in the use of resources and better provide service coverage. With the introduction of purchasing as a methodology for achieving UHC, especially in high income countries and health systems, the WHO and other international organisations, such as the World Bank, have created a distinction between **passive purchasing** and **active purchasing**, **also termed "strategic purchasing".** Passive purchasing refers to purchasing mechanisms wherein providers are able to receive pooled funds for services, without restrictions based on performance and for a benefits package that is poorly defined (WHO, 2019b). Passive purchasing typically occurs through one of three main avenues: 1) passive budget allocation from one sector of government to another for service delivery; 2) prospective contracting or commissioning by one branch of government with payment based on an agreement of volume and quality of services; 3) retrospective payment for services (The World Bank, 2005).

On the contrary, active purchasing is defined as the process in which funding and legal entitlements to health services are guided by the quality of services and the performance of providers, based on the health needs of the population at large. Strategic purchasing aims to maximise health system objectives through an evidence-informed process. Equally important, the WHO characterises strategic purchasing as a continuous process that requires consistent reanalysis to understand population health needs and optimal means of closing health gaps (WHO, 2000). Strategic purchasing strives to use information and available evidence to identify changing health needs to inform the type and mix of health services that should be bought from whom, with what funding mechanisms, and at what rate.

A strategic purchasing plan is crafted based on three overarching and overlapping concepts: "what to buy", "from whom to buy", and "how to buy". The question of **what services** will be needed for a health system specifically pertains to the service-mix, interventions, and medicines that will be purchased and who is entitled to access these services, which may be

based on prior financial contribution or payment. Such a consideration is based upon population needs, national health priorities and cost-effectiveness. The question of **from whom to buy** refers to the healthcare providers engaging in the services required, applying criteria in the decision making process to determine which providers should be selected. Strategic purchasing first considers whether to commission ("make") from the public sector or to buy from the private sector, choosing service providers based on capacity, capability, availability, quality, efficiency, and equity **(Box 2.1)**. Finally, the question pertaining to **how such services will be bought** revolves around determining an instrument from either demand- or supply-side mechanisms, an appropriate provider payment method and the contractual obligations in place that purchasers can use to assess provider performance.

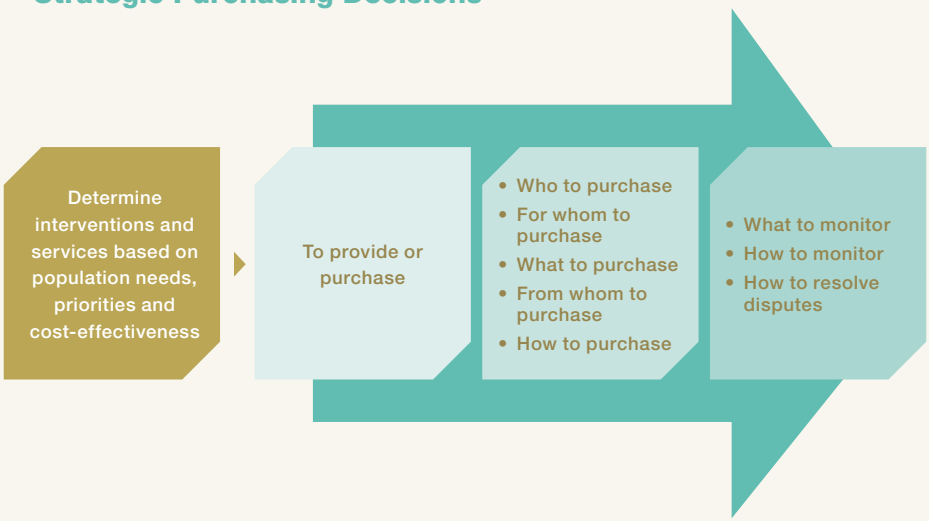
Box 2.1

How to implement strategic purchasing?

Strategic purchasing plans follow a series of decisions that guide policymakers in determining how to identify population health needs, services needed, priorities, and cost-effectiveness measures.

Policymakers must determine whether they will make the available services through the public sector or buy them from the private sector. Afterwards, they must determine the type and scope of services and decide the purchasing party, beneficiaries, specific services, providers, quantity, and payment schemes. The services must be monitored and assessed for effectiveness. While the decision-making process follows a set order, strategic purchasing demands that the process be cyclical and consistently evaluated in a system-wide manner characteristic of the active process.

Strategic Purchasing Decisions



Most health systems do not use fully passive nor active purchasing, though countries at all income levels are adapting to become more strategic in their purchasing decisions (Klasa et al., 2018). While countries have yet to implement a strategic purchasing plan that is fully aligned with the ideals set forth, including those by the WHO, progress made towards strategic purchasing in many countries have shown positive outcomes and benefits for health systems and population health. Such progress is especially notable in low to middle-income countries,

such as Thailand, the Philippines, and Vietnam, where population coverage increased after the implementation of strategic purchasing plans (Honda, 2014). From these experiences, strategic purchasing can be seen to be a powerful lever in progressing towards UHC.

Strategic purchasing is invaluable as a financing process in moving towards UHC to transform budgets into purchases while prioritising population health needs through evidence-informed service selection. Even in health systems that have nominally achieved UHC, **strategic purchasing's focus can enable access to specific services that have not been provided in a timely or high-quality manner thereby moving health systems towards an enhanced realisation of UHC**. In health systems that are still developing or relying on OOP expenditures, strategic purchasing can enhance **financial protections through reductions of OOP payments, more equitable distribution of resources, enhanced transparency**, and **accountability of providers and purchasers of care** (WHO, 2017b). In expanding the scope of services that are covered by the public sector, patients are more likely to be able to access previously costly services without having the burden of paying a significant proportion of the cost which may incur financial hardships. Additionally, service expansion may ease demand for service provision in the public sector, sharing it with the private. The framework of strategic purchasing also allows countries to make changes at a pace that is suitable for its socio-economic development, without the need for significant shifts in healthcare coverage and budgetary changes in a short span of time. The flexibility allowed by strategic purchasing ensures that gains made to service coverage are less likely to be reversed due to economic and financial setbacks.

2.1.2 THE SYSTEMS APPROACH: POLICY THEMES TO MOVE TOWARDS STRATEGIC PURCHASING

The understanding of strategic purchasing as a practicable process is an invaluable approach to purchasing and the WHO has collaborated with member states to outline a framework for crafting and implementing strategic purchasing (WHO, 2017b). This framework is based on five key policy themes of overarching health systems functions, core aspects of purchasing, and cross-cutting aspects. When considered in tandem, the framework guides policymakers and health system organisers to holistically plan a strategic purchasing proposal that strives to progress towards UHC. The five key policy themes are **governance**, **information management systems**, **benefit package design**, **mixed provider payment systems**, and **managing alignment**, **dynamics**, **and sequencing**.

Governance

The first theme from this framework is **governance**, an overarching health system function that pertains to all other themes. Governance refers to the exercise of authority and the allocation of roles, responsibilities, and interactions between providers, purchasers, beneficiaries, and society within a health system. To implement strategic purchasing for UHC, it is necessary that purchasers and providers both be accountable to serving system-wide and population health goals, as defined by policymakers and health systems planners. Purchasers defined in the governance structures need to be granted purchasing power through legal provisions in order to prompt positive shifts across the larger health system. Governance structures must also ensure that programmes and plans put in place are operating as intended.

Information management systems

Information management systems is a key policy element for the success and growth of health systems when strategic purchasing is implemented. The cornerstone of strategic purchasing is in information availability for performance aspects and population health needs and the linkage of such information to the funding of payments for providers. Information management systems should be structured on IT systems, however many health systems continue to rely on more outdated methods of data collection and storage that limit the ability

of providers to instantaneously share information with purchasers and policymakers. When designing and orienting an information management system for strategic purchasing, it is critical that such systems be dynamic and adaptive, while maintaining a clear vision of the systems' functions and objectives.

Benefit package design

The **benefit package design** has one of the most direct impacts on beneficiaries as it determines what services are available for access. The benefit package refers to the services that are purchased and paid for by the purchaser using pooled funds for beneficiaries. A package can be considered a health system commitment to the provision of specified services by designated providers in full as an entitlement to beneficiaries. The WHO suggests using the principle of "whatever is promised, should be delivered" to understand how benefit packages should be interpreted. The benefit package is intrinsically tied to the management of health financing based on revenue raising, funds pooling, and purchasing. Policymakers are thus required to explicitly determine which services are to be covered fully through budget allocations and which should be covered by separate purchasers. The benefit package should be made with financial sustainability in mind, with service coverage that is equitable and addresses population health needs, but not excessive as to be overly costly and take a significant share of health services funding.

Selecting providers

To manage alignment and dynamics within the strategic purchasing process, the health system must account for existing resources that it can leverage upon to achieve health system goals, namely healthcare service providers. Purchasers or the government need to specify how and what it will purchase from which levels of providers and if these providers will be from the public sector and/or the private sector, using criteria based on their capacity towards providing covered services, interventions, and medicines. Accreditation as well as selective contracting are key instruments in strategic purchasing for selecting providers. Specifically, an accreditation process examines a healthcare provider's capacity to meet defined quality related standards (e.g., related to structure, process and/or outcomes). As a result, the accreditation results provide relevant information to the purchaser about provider performance. Through selective contracting, a purchaser may choose between (competing) providers—in other words, it has a right not to contract with all available providers. This selection can be based on predefined criteria or a provider's accreditation results in order to further incentivise quality and good performance. Furthermore, the contracting of providers and selection mechanisms should complement the health system and health financing reforms and must respond to changing contexts and dynamics of the health system.

Mixed provider payment systems

Mixed provider payment systems are key components for the core function of health financing because of its value in incentivising necessary healthcare services from the provider-end, such as primary care, and in reforming how payment schemes can be varied and combined for performance management to promote better care. The term "mixed" in "mixed provider payment" refers to the use of different payment schemes for different services or providers with the goal of shifting to a system perspective. Aligning payment schemes to performance-based financing will create a greater understanding of underlying incentives for providers and guide purchasers in designing a better system. In considering a mixed provider payment system, the WHO states that contexts and health system objectives are critical in determining how to create an efficient payment scheme (WHO, 2019b). The context for each payment system is defined by a multitude of factors including the level of decentralisation within purchaser capacities, the degree of provider autonomy, and the type and level of care (such as family practice, emergency care, and chronic care) with the underlying goal of reducing secondary and tertiary care provision. Ultimately, strategic purchasing aims to link payment schemes to performance-based financing, so that service provision may be optimised for best population health results.

Box 2.2

Case study: Strategic purchasing in Thailand— How strategic purchasing led the charge towards UHC

Thailand's Universal Coverage Scheme (UCS) has been widely acknowledged as a successful example of implementing strategic purchasing in a way that has significantly expanded coverage. The UCS links a government office with contracted public practitioners to provide services for the indigent.

Governance: The UCS is created by the government and run by the National Health Security Office, providing coverage for 75% of the population. The Office proposes and negotiates an annual budget based on estimated rates of service use. The Office also acts as a purchasing power and negotiates lower prices for high-cost medicine.

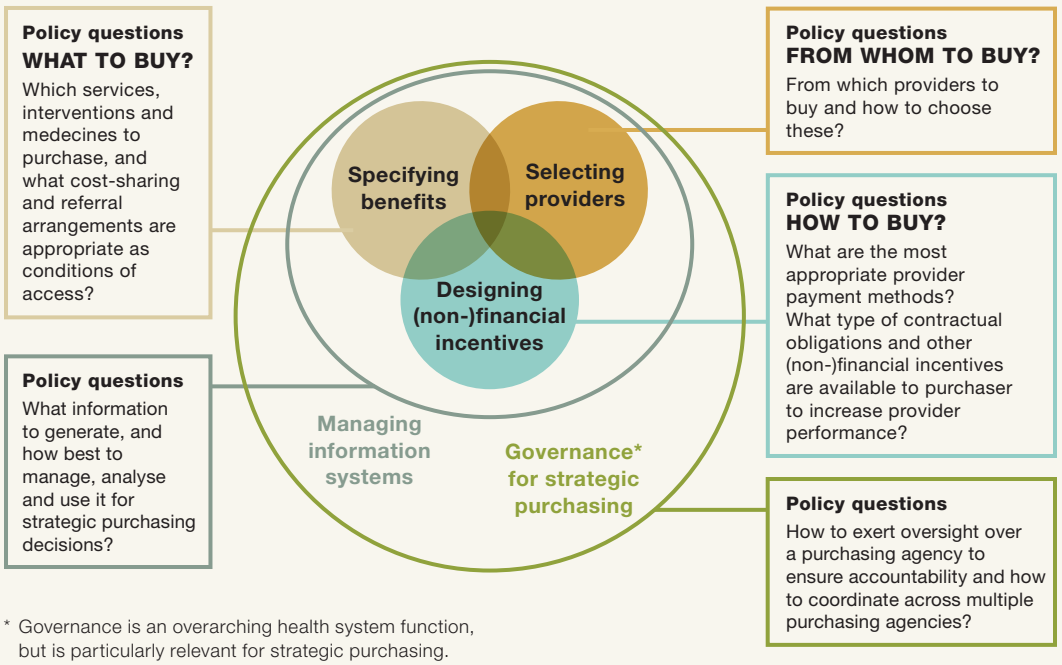
Information Management Systems: Health Technology Assessments are used to evaluate the efficacy and price-efficiency of medical interventions. It has also implemented a 24-hour call centre to receive feedback and complaints from patients.

Benefit Package Design: The UCS features a comprehensive benefit package with a small exclusion list of services that are not covered. Inclusion of services was guided by evidence of demand and equity in coverage between the UCS and private insurance companies. For instance, renal replacement therapy was initially excluded due to high costs but was later included as a result of public opinion and possible inequitable access between UCS patients and private insurance patients who did have this therapy covered.

Mixed Provider Payment Systems: Outpatient services are paid on a capitation basis, and inpatient services are paid for with prices based on the diagnosis related group (DRG) within a global budget.

Managing Alignment and Dynamics: Information systems update the National Health Security Office on reasonable use of services and scope of service needs. Providers are incentivised with remaining budget balances but are asked to pay negative balances.

Core areas of strategic purchasing and policy questions



* Governance is an overarching health system function, but is particularly relevant for strategic purchasing.

Note: Figure is adopted from WHO, 2019b
Sources: Patcharanarumol et al., 2018; Tangcharoensathien et al., 2014; WHO, 2019b

2.1.3 PUBLIC-PRIVATE PARTNERSHIPS: IMPLEMENTING STRATEGIC PURCHASING IN A MIXED SYSTEM

One of the many ways in which strategic purchasing can be implemented centres around the vehicle of public-private partnerships (PPPs), a method to better mobilise resources particularly in public-private mixed health systems with a significant private sector. PPP has been defined as "an agreement between the government and one or more private partners (which may include the operators and the financers) according to which the private partners deliver the service in such a manner that the service delivery objectives of the government are aligned with the profit objectives of the private partners and where the effectiveness of the alignment depends on a sufficient transfer of risk to the private partners" (OECD, 2008). Different countries and health systems conceptualise PPP differently in specific political, social, and economic environments, so that the range, scope, and scale of PPP programmes vary in practice. **One important conceptualisation of PPPs is to purchase services from the private sector, promoting greater private-sector participation in the government-initiated framework** (Wong et al., 2015). This form of PPP needs to be informed by the decision on the question posed by strategic purchasing of how to generate the services deemed necessary to achieve UHC—whether the health system should "make" the services through public sector providers, or if the system should "buy" the services from private providers.

In health systems, such as Hong Kong's, that features a strong public healthcare sector operating in parallel to a strong private sector, **PPPs can be strategically designed to strengthen access to needed healthcare services through leveraging private sector resources**. Moreover, PPPs can access the strengths of the design in the private sector, such as innovation, technical knowledge and skills, managerial efficiency, and technological resources, while also reinforcing the public sector's commitment to social responsibility, public accountability, and local knowledge (Rao, 2019; Roehrich et al., 2014). The combination of these two sectors has the potential to create an environment where **high quality health infrastructures and services can be delivered** (Roehrich et al., 2014). A review of PPPs launched in European countries found that private sector involvement alleviated the service demand on the public sector, reducing wait times for patients and costs to the government (Barlow et al., 2013). Beyond the financial risk that becomes shared between the two sectors in a PPP, social responsibility in the health system also becomes shared between the public and private sectors. PPPs also allow for a more nuanced discussion on creating efficiency and equity within health systems and how purchasers choose to allocate resources based on the dynamics of a health system (The World Bank, 2007). PPPs can take on many forms with varying functions. The more common forms of PPPs include and have been infrastructure based on: private financing initiatives to purchase quality services from the private sector; designing, building, and operating contracts for hospital construction; and incorporating more private sector participation in government-initiated infrastructure projects (Wong et al., 2015). More recently PPPs have also been featured in purchasing of chronic disease management from the private primary care sector.

There are two main modes of PPP of financing in strategic purchasing that can be used to stimulate change in healthcare service usage: **supply-side financing** and **demand-side financing** **(Box 2.3)**. Supply-side financing uses **incentives and payment guarantees** to motivate change in providers and those who deliver healthcare services with the goal of improving access and quality of services. Demand-side financing offers **financial subsidies and incentives to individuals** in order to stimulate demand for services, while simultaneously reducing the financial burden of care (Bowser et al., 2016).

Supply-side financing mechanisms are comprised of three main forms: **capitation, fee-for-service (FFS)**, and **performance-based payment** (Bowser et al., 2016; The World Bank, 2004). The general structure for these three forms is similar with significant overlaps of the features. A provider organisation, such as a government agency, will provide

inputs to providers, often in the form of salaries or payments, who then provide services to the beneficiaries defined; patients may also be required to provide some additional payments, i.e. co-payments, to providers in order to receive care. Under a **capitation payment structure**, providers receive a fixed amount of financial reimbursement within a given time span to care for a defined population. This payment system is likely to incentivise under-provision of care in order to maximise profits and requires closer monitoring and analysis for necessary health services and procedures to ensure they are provided. A **fee-for-service payment structure** offers a fixed payment for each service provided, facilitates access to care but also incentivises over-provision and unnecessary care. A **pay-for-performance (PFP) payment structure** attempts to link a set payment for defined health targets or outcomes. This format is also named performance-based financing or results-based financing. PFP may encourage more efficient use of resources but may over- or under-incentivise care based on the health target of each patient.

Demand-side financing operates under the principle that if individuals were not limited by financial restrictions, they would seek out healthcare services. As such, demand-side financing formats feature a payment organisation, such as a voucher agency, providing the entitlement to a subsidy to individuals, who will then seek care from providers, using the voucher as a form of payment (The World Bank, 2004; WHO, 2010a). Vouchers are meant to reduce the financial hardship incurred when seeking care by enhancing the purchasing power of patients. The use and distribution of vouchers can spur demand for specified under-utilised services, especially by specific target populations.

Box 2.3

Supply-side financing vs. demand-side financing

	Supply-side financing	Demand-side financing
Benefits	• Relatively simple to introduce and inexpensive to administer • Provide benefits to broad population groups	• Output-based payment can promote better care coordination • Evidence-based practices • Useful for targeting populations • Output-based monitoring
Drawbacks	• Difficult to specifically target populations, unless the subsidy is used for a specific health condition • Lack of patient empowerment • Lack of incentives to improve efficiency	• Higher transaction and administrative costs • Can lead to over-provision of care • Can lead to cream-skimming, where providers avoid patients with more complex health issues • Lower patient satisfaction

Source: The World Bank, 2004

Given the crucial space that health financing holds as a health system building block, health financing levers, namely strategic purchasing, will be crucial in bridging the gap between the present health system in Hong Kong and achieving one that is primary care-led. We have identified PHC as currently inadequate in the public sector and unaffordable to many in the private sector. Inadequate provision of primary care in the healthcare system is manifested through insufficient primary and secondary prevention services and suboptimal chronic disease management guidance that negatively impacts health outcomes of the population.

Through this report, we intend to show how strategic purchasing and PPPs can be utilised to bridge the PHC gap in Hong Kong and can lead to better health and well-being for all of our population. In doing so, we believe that Hong Kong's healthcare system will be one step closer to achieving our visionary primary care-led, integrated system and eventually, UHC.

2.2 GLOBAL PRACTICE IN STRATEGIC PURCHASING FOR CHRONIC DISEASE PREVENTION AND MANAGEMENT FROM THE PRIVATE SECTOR

With greater investments in healthcare, policy makers in countries of different income levels have become interested in how the role of strategic purchasing could help achieve UHC while maximising population health (WHO, 2019b). Rather than reforming the entire foundation of healthcare financing system, strategic purchasing practices seek to optimise existing health system capacity and enable long-term sustainability. Health ministries that engage in strategic purchasing have been shown to not only yield more cost-effective and efficient allocation of healthcare resources, but have also improved their accountability and created more incentives within their healthcare system (Xu et al, 2015).

As reviewed in Chapter 1, the growing burden of chronic disease can be reduced with greater access to affordable and quality primary care services, including screening, treatment, and chronic disease management services (IADB, 2011). Purchasing primary care services from the private sector has become a common strategy to expand and improve upon the prevention and management of chronic diseases. There is a question of how and to what extent the concept of strategic purchasing is adapted into those purchasing practices. Purchasing policies and initiatives for chronic disease prevention and management vary worldwide depending on contextual factors, including the structure of the health system, total disease burden, and overall level of social and economic development. In order to better understand the most adept strategic purchasing practices for the Hong Kong health system context, we conducted a comparative international review to assess best practices.

This section focuses on PPPs, specifically referring to purchasing private services, for chronic disease prevention and management in eight jurisdictions across the three types of financing systems—namely tax-based systems, social health insurance systems, and private health insurance systems. The health financing systems which consist of **almost equal sizes of public and private financing expenditure,** similar to Hong Kong where a substantial private sector runs parallel with the public sector, were further categorised as **public-private mixed health financing system and reviewed separately in our study.** The selected jurisdictions were from both the Asian continent as well as OECD member countries for each health financing type to enrich the review. We reviewed how each jurisdiction uses strategic purchasing to improve PHC investments and thus work towards UHC.

This section is organised into two parts. The first part describes the characteristics of each health financing type, their advantages in achieving UHC, as well as challenges where strategic purchasing may play a role. The second part presents **detailed strategic purchasing programmes in each jurisdiction, followed by an evaluation of their effects using a strategic purchasing framework.**

2.2.1 HEALTHCARE FINANCING SYSTEMS: NO ONE-SIZE-FITS-ALL

Healthcare financing systems comprise two fundamental components: **financing schemes**, such as social health insurance, taxation, or private health insurance, and **institutional units** to administrate the schemes, including social security agencies, private insurance companies, and other financing agencies (OECD et al., 2017). Globally, the types of financing schemes differ and are continually evolving in accordance with the ever-changing health, economic, social, and political landscapes.

Analysis of national healthcare financing schemes around the world provides key insights into the advantages and challenges of each financing scheme, albeit with consideration for the local context. Differences in healthcare financing schemes and the wide variances in country health system profiles reveal that there is no one-size-fits-all system, and each system has its own merits and limitations which merit further discussion.

Tax-based financing

Tax-based financing refers to a system in which the majority of healthcare expenditure is financed via public revenues, aside from earmarked payroll taxes (i.e., not social health insurance based), by local, regional, or national level government agencies; as such, healthcare services are accessible to all citizens (WHO, 2004). Tax-based systems frequently directly operate and manage healthcare facilities (The World Bank, 2009). Authorities decide on what share of general tax revenues is used for healthcare expenditure. Given that revenues are used by the funding body for the entire population, equity in healthcare can be more easily achieved through this system.

As the healthcare services are heavily subsidised by government, prices of healthcare services from the government are generally low. However, due to the large healthcare demand driven by the low prices as well as government's response to ration available supply, long waiting times are common within these systems. Under-provision of services limiting access to care may also be observed. For the public healthcare facilities owned and managed by government, how to improve the quality and efficiency of healthcare services remains a core issue.

Social health insurance

Social health insurance (SHI) schemes are generally characterised by independent or quasi-independent insurance funds and a reliance on mandatory earmarked payroll contributions (usually from individual and employers) (The World Bank, 2009). SHI is based on a principle of solidarity, whereby citizens, employers, and governments pay contributions into a joint fund. Contributions may be fixed or based on income (Kirch, 2008; Van der Aa et al., 2019). SHI serves as protection against unexpected costly care associated with illness. Members of SHI schemes make regular payments to the joint fund. Like tax-based systems, equity in healthcare is also achievable through SHI with collective pooling and distribution of funds.

Private health insurance

Private health insurance is typically supplied by for-profit providers, although in some cases is provided by public and not-for-profit agencies (Myint et al., 2019). Three key players are actively involved in this system: healthcare consumers (individuals), healthcare providers, and healthcare insurers. Individuals (or employers on their behalf), after registering as an insurer's policy holder, must pay a mandatory monthly or annual contribution to the insurer, and the insurer reimburses the insured or contracts to provide relevant health services (The King's Fund, 2017). When individuals seek private health insurance, they voluntarily enter into direct contracts with insurance providers and pay risk-related premiums as mandated by the insurers. Risk-related premiums refers to the cost one pays into the health insurance pool based on an individual's risk of needing care. More at-risk consumers, such as older, sicker individuals, may have to pay higher premiums for their insurance (Mossialos et al, 2002). Consequently, some governments introduced regulations on private health insurance, e.g., community rating which means everyone pays the same premium for the same designated policy, to improve equality in the insurance coverage. Nevertheless, due to disparities in structural and financial access to private health insurance, healthcare financing systems that are mostly private have not been able to provide equitable healthcare to the entire population.

Public-private mixed system

Social health insurance and tax-based systems offer viable routes to UHC. However there is evidence that a few health systems with modest levels of government spending and that use approaches that do not fit the classic tax-based model have been able to progress substantially towards UHC. These cases include Sri Lanka, Malaysia, Hong Kong, Ireland, and Australia. These health systems combine public financing and delivery with a substantial reliance on private financing and delivery. They have been described as dual-track, parallel, and hybrid systems to denote their mixed public-private funding and provision approach. These systems, which span the globe and levels of economic development, may be characterised by notable performance on health outcomes, low levels of government spending, and a significant out-of-pocket spending share in total financing.

2.2.2 INTERNATIONAL COMPARATIVE ANALYSIS: STRATEGIC PURCHASING FOR CHRONIC DISEASE SCREENING AND MANAGEMENT

Each system has its own merits and limitations and challenges which may be aggravated by escalating healthcare demand driven by population ageing and the associated increasing prevalence of chronic diseases. Rather than reforming the entire foundation of healthcare financing schemes, strategic purchasing allows mobilisation of finite resources to optimise provider systems, hence increasing capacity and enabling long-term sustainability.

To better explore how strategic purchasing works in chronic disease prevention and management which is one of the biggest challenges in Hong Kong and globally, we used a qualitative case study approach to review the purchasing programmes against a strategic purchasing framework. Different jurisdictions were chosen for diverse geographical locations and health system types (tax-based system, social health insurance system, private health insurance dominated system, and public-private mixed system). The resulting sample was of eight jurisdictions: the United Kingdom (UK), Canada, China, Japan, the United States (US), Australia, Malaysia, and Singapore. An overview of economic and health spending indicators of the jurisdictions is presented in **Table 2.1**.

For each jurisdiction, one existing purchasing programme or policy for chronic disease prevention and management was reviewed. As presented in the Section 2.1, purchasing involves mainly three sets of decisions: (a) what to purchase: identifying the interventions or services to be purchased, taking into account population needs, national health priorities, cost-effectiveness and other factors; (b) from whom to purchase: choosing service providers, giving consideration to service quality, efficiency and equity and (c) how to purchase: determining how services will be purchased, including contractual arrangements and provider payment mechanisms. The purchasing programme/policy for chronic disease screening and management in each jurisdiction was reviewed from those three perspectives in **Table 2.2**.

The key goal of this section is to evaluate to what extent these purchasing programmes fulfil the definition of strategic purchasing. Several theoretical models exist that define strategic purchasing. We used the synthesised framework of strategic purchasing constructed by Klasa et al., which was derived from systematically reviewing the existing definitions and components of strategic purchasing (Klasa et al., 2018). We benchmarked the characteristics of those purchasing programmes in **Table 2.2** against the synthesised strategic purchasing framework.

Table 2.1

Key indicators of studied countries

	Population (million)	GNI per capita, (USD)	Tax revenue (% GDP)	Current health expenditure (CHE)	CHE per capita (USD)	Government health expenditure (% govt. exp.)	OOP health expenditure (% CHE)
Jurisdictions with tax-based financing system							
United Kingdom	66.5	41,740	25.6	10.0	4,315.4	19.2	16.7
Canada	37.1	44,950	13.1	10.8	4,994.9	19.6	14.7
Jurisdictions with social health insurance							
China	1,392.7	9,600	9.1	5.4	501.1	8.6	35.8
Japan	126.5	41,150	N/A	11.0	4,266.6	23.6	12.8
Jurisdictions with private health insurance							
United States	326.8	63,510	9.9	16.9	10,623.9	22.5	10.8
Jurisdictions with public-private mixed system							
Australia	25.0	53,190	23.1	9.3	5,425.3	17.9	17.7
Malaysia	31.5	10,650	12.0	3.8	427.2	8.5	35.1
Singapore	5.6	56,900	13.1	4.5	2,823.6	15.3	31.0

Source: The World Bank, 2018

2.2.2.1 DESCRIPTIONS OF HEALTH FINANCING SYSTEMS AND PURCHASING PROGRAMMES

Tax-based systems

United Kingdom: The NHS Diabetes Prevention Programme

National Health Service (NHS) England has been at the forefront of strategic purchasing in healthcare financing, with the United Kingdom's NHS having been actively involved in purchasing, termed commissioning, since 1991 when the internal market was introduced. Clinical Commissioning Groups (CCGs) were established in 2013 and are clinically-led groups of hospital and community care groups in local areas that are responsible for deciding on the most appropriate healthcare services for local or regional populations (NHS England, n.d.-a). NHS has a statutory duty to conduct annual assessments of every CCG to identify their support needs.

Commissioning for PHC is implemented by primary care networks (PCNs). Primary care networks are large local groups of General Practitioner (GP) practices, hospitals, pharmacists, mental health and social care practitioners, and other healthcare professionals who can provide more accessible PHC to a wider population within a locality using shared resources, including medical technology, medications, and patient health records. The NHS provides guidelines to CCGs for encouraging practices to be part of local primary care networks that provide targeted chronic disease care and management (NHS England, 2019).

In recent years, the NHS Long Term Plan endorsed programmes for disease prevention and health promotion. Numerous policy and financing initiatives have been implemented in the United Kingdom to improve chronic disease management care, particularly within PHC through focusing on prevention of chronic diseases. The NHS Diabetes Prevention Programme (NHS DPP) is one such initiative aimed at providing a systemic approach to preventing diabetes at a population level (NHS England, n.d.-b). The NHS DPP advises CCGs on evidence-based diabetes measures to take heed of in order to successfully manage patients' conditions, including outlines for achieving the National Institute for Health and Care Excellence (NICE) recommended treatment targets, reducing waiting times, and reducing inpatient days. The NHS DPP promotes identifying high risk patients and referring them to programmes that focus on behavioural and lifestyle changes.

Instead of adding the preventive programme into existing primary care services provided by GPs, NHS chose to purchase the services from four provider organisations, three of which are privately run. There are 41 geographically-defined sites in total and each site can select the most suitable provider for their requirements through a local competitive process. Consequently, the implementation of DPP varies across different sites. The DPP also provides a range of incentives and support services for GPs to encourage the identification and referral of relevant patients to the programme.

NHS England invested GBP 42 millions as of 2017/18 for CCGs to improve the capacity for care and treatment of diabetes in their localities (NHS England, n.d.-a). Technical leads who focus on the monitoring and evaluation of CCG Diabetes Assessments is essential to maintaining long-term sustainability. Annual CCG Diabetes Assessments are conducted to document the overall proportion of people reaching treatment targets and specific biomarkers for diabetic, hypertensive, and hyperlipidemic patients. These assessments build year-on-year illustrations of the progress towards greater gains in chronic disease prevention, management, and treatment.

Canada: Multi-sectoral Partnerships to Promote Healthy Living and Prevent Chronic Disease

UHC is an achievable goal in Canada through the public funding system, through which the medically necessary hospital, diagnostic, and physician services are financed through general tax revenue and provided for free. Unlike the United Kingdom where the internal market through a purchaser-provider split is promoted, Canadian health authorities emphasise more on integration than competition through strategic purchasing. Hospitals are both owned and operated by health authorities in Canada. Most payments to hospitals are generally made on the basis of the previous year's allocation adjusted for inflation and budget growth, in the form of global budgets. As the Canada Medicare (the name of its publicly-funded health system) mainly focuses on hospital-based essential health services, closing the gap in community-based prevention and management of chronic diseases shifted to the top of the government agenda in light of the escalating burden of chronic conditions. One of the efforts made by government is primary prevention of chronic disease through multiple partnership projects. The public health agency of Canada's Centre for Chronic Disease Prevention (CCDP) launched the Multi-sectoral Partnerships to Promote Healthy Living and Prevent Chronic Disease initiative in 2013. This initiative involves both public and private organisations to advance the use of evidence-based intervention that address common risk factors for chronic disease.

Table 2.2

The United Kingdom and Canada comparison

Country	Key Features of Health Financing System	Strategic Purchasing Policies & Frameworks
United Kingdom	How is the healthcare system financed? Mostly financed through **taxation** NHS funding: 85% from general government revenues; 12% national health premium tax; 3% from copayments. Government pays for services, employs doctors, and runs hospitals. Supplemental private insurance is rare.	**UK NHS Diabetes Screening (The NHS Diabetes Prevention Programme (DPP) proposed and currently piloting 2015 onwards).** One of the largest diabetes screening programmes in the world considering the United Kingdom's population is >67 millions. • Who is the purchaser? **NHS England; Clinical Commissioning Groups (CCGs) from local sites.** • What to purchase? Behavioural intervention, i.e., **dietary and physical activity recommendations**, to prevent diabetes among high risk population. • From whom to purchase? Behavioural change provider organisations procured by NHS England. • How to purchase? Financial incentives were offered to GP practices to recruit patients. The incentives were paid either by capitation payment, fee-for-service payment, or pay-for-performance payment.
Canada	How is the healthcare system financed? The public financing of healthcare is funded by taxation. The public sector in Canada is responsible for about 70% of total health expenditures.	Public Health Agency of Canada's (PHAC) Centre for Chronic Disease Prevention (CCDP) launched a multi-sectoral partnership to **Promote Healthy Living and Prevent Chronic Disease Initiative** in 2013. • Who is the purchaser? The Canadian government. • What to purchase? Evidence-informed interventions that address common risk factors for chronic disease. • From whom to purchase? Both public and private organisations. • How to purchase? **Pay-for-performance model** has been implemented to improve programme accountability: payments are made when project milestones are reached. Performance are evaluated based on project outputs, such as visiting agreed number of locations, completing evaluation requirements (e.g., submitting all baseline data) or developing project resources.

Social health insurance systems

In social health insurance system, private healthcare providers are usually included in the health care delivery system. Therefore, their strategic purchasing methods usually evolve with the reform of their whole health financing system.

Japan: Tokutei-Kenshin, annual health check-up & management system

The healthcare financing system in Japan is based on the social health insurance model which consists of three major insurance systems: a health insurance scheme for government and company employees; a scheme for self-employed workers, farmers, retirees, and the unemployed; and a scheme for elderly adults aged 75 years or over. The majority of healthcare services in Japan are delivered by private clinics and hospitals. Nevertheless, the government has one of the most successful stories in purchasing healthcare services from the private sector. The government has not only exerted tight control over the price of medical services, but has also been promoting the delivery of certain cost-effective and preventive services by manipulating their prices. For instance, primary care is promoted through higher reimbursements, and some costlier services are reduced through lower reimbursements.

In Japan, however, because the medical institutions and patients have not been adequately motivated, there have been gaps in chronic disease management. To trigger national action in disease management, in April 2008, the Japanese government launched an annual health check-up programme (Tokutei-Kenshin) targeting metabolic syndrome; insurers are obliged to provide a check-up to all beneficiaries aged 40–74 years. Based on the evaluation results, participants are assigned to one of three risk groups, including “information provided group”, “motivation support group”, or the “aggressive support group”. Insurers need to provide different levels of health care instruction for individuals assigned to different groups. Initially, insurers will engage a health care provider company for outsourcing. After registration of the covered citizens, the health care provider will begin service. If providers do not produce adequate outcomes, insurers must pay a penalty as they must take overall responsibility.

China: Increasing health insurance benefits for chronic disease management in outpatient care

The basic public health insurance scheme in China covers over 95% of the population, but it has historically provided insurance mainly against catastrophic inpatient expenses. For outpatient expenses, including drugs, monthly reimbursements are capped at a relatively low rate. However, cost concerns among patients with chronic diseases can contribute to patients’ low adherence to treatment plans or lack of routine follow-up care, especially among patients with multiple chronic health problems. Reduced access to drugs is of particular concern if those drugs are cost-effective. Accordingly, the Chinese central government with its latest healthcare reform effort mandated an increase in health insurance benefits specifically for patients with chronic diseases at the outpatient level, seeking to encourage regular clinical visits and adherence to treatment plans and eventually to reduce catastrophic costs associated hospitalisations. Moreover, patients are encouraged to manage chronic diseases at primary care facilities. In urban China, community health centres (CHCs) are the main primary care facilities, of which a quarter are non-profit private providers. Unlike public CHCs which are subject to direct government control over staffing and budgets, private CHCs earn most of their revenues from service provision. Medicines and services provided by CHCs are mainly reimbursed by the social health insurance scheme under a fee-for-service payment model.

Table 2.3

Japan and China comparison

Country	Key Features of Health Financing System	Strategic Purchasing Policies & Frameworks
Japan	How is the healthcare system financed? Financed mainly through **SHI and taxation** Statutory Health Insurance System (SHIS) covers 98.3% of population; Public Social Assistance Program covers remaining 1.7%	**Purchasing for PHC and NCDs:** Since 2008, the Japanese government introduced the specific health check-up (*Tokutei kenshin*) to the population aged between 40 and 74 with the goal of promoting and preventing chronic diseases. Based on the check-up results, specific health guidance (*Tokutei hoken shidou*) is provided to those who are identified as having high risk of developing lifestyle-related diseases. • Who is the purchaser? All health insurers in Japan. • What to purchase? The health check-ups include a medical consultation which collects information including medical history and smoking habits, and examinations of a nationwide set of items. People with risks of developing lifestyle-related diseases are invited to undergo one of the two types of specific health guidance, either intensive health guidance (*sekkyokuteki shien*) or motivational health guidance (*doukizuke shien*). • From whom to purchase? Private healthcare providers. • How to purchase? **Fee-for-service schedules** are set by the national government and provides subsidies to local governments, insurers, and providers. Incentives under the Continuous Care Fees scheme are given to PHC GPs for coordinating care of patients with chronic diseases thus subsidising care for patients. Providers sometimes can choose to be paid on a per-case basis or on a monthly basis.
China	How is the healthcare system financed? Financed mainly through SHI Three public insurance programmes: 1. New Rural Cooperative Medical Scheme (NRCMS); 2. Urban Residents Basic Medical Insurance (URBMI); 3. Urban Employee Basic Medical Insurance (UEBMI) (In 2016, the urban resident and rural schemes merged to form the Urban Rural Resident Basic Medical Insurance (URRBMI) to improve administrative efficiency) These 3 major social health insurance schemes cover more than 95% of the population.	The Chinese government made great investment into establishing primary care system. **Managing diabetes and hypertension has been included as one of the main public health functions of primary care facilities**, i.e., community health stations and community health centres. In some areas, chronic disease patients are getting higher reimbursement for getting treatment in the primary care level rather than going to hospitals. • Who is the purchaser? The Chinese government and social medical insurers. • What to purchase? Screening and management of hypertension and diabetes. • From whom to purchase? Community healthcare facilities, i.e., community health stations and community health centres, which can be owned by either public or private providers. • How to purchase? Mainly paid by fee-for-service. Some areas have introduced capitation payment.

Market based health systems

The United States: Diabetes Prevention Program

The US is the only developed economy where the private sector plays the dominant role in healthcare financing and delivery, which largely makes it the most expensive and inequitable health-care system in the world. However, in terms of chronic disease lifestyle intervention, as exemplified by the Diabetes Prevention Program (DPP), the US has one of the earliest DPP which greatly contributes to the evidence and implementation of the DPP worldwide. After further development in the two decades since the programme was first launched in 2002, DPP in the US has been adapted for delivery in community settings using a lower-cost, group based lifestyle intervention in which participants have achieved significant reductions in weight, although usually less than those observed in the original DPP (Alva et al., 2017; Ely et al., 2017; Mudaliar et al., 2016). The DPP has been adapted to specific racial and ethnic groups who are more likely to be in need of treatment due to inequality in socioeconomic factors as well as in healthcare financing.

Table 2.4

The United States' market-based health system

Country	Key Features of Health Financing System	Strategic Purchasing Policies & Frameworks
The United States	How is the healthcare system financed? Financed significantly through **private health insurance** and public entitlements Multipayer system (public and private insurance + for-profit and nonprofit insurers and providers) Insurance is voluntary; Premiums are paid by the individual and/or employer. Social insurance mechanisms: **Medicare:** payroll tax shared by employees and employers; premiums; federal general tax revenue. **Medicaid:** Federal and state taxes. Individual, employee, group, or family purchase private company insurance. **CHIP:** Children's Health Insurance Program for children in low income families.	Lifestyle intervention programmes in the United States, like Diabetes Prevention Program (DPP), with intensive lifestyle intervention or pharmacotherapy have been widely adapted to specific racial and ethnic groups and implemented in varied settings. The expansion of Medicaid under the 2010 Affordable Care Act (ACA), laying a foundation for initiatives like the **Million Hearts Campaign** and the **Medicaid Incentives for Prevention of Chronic Diseases (MIPCD)** grant program. • Who is the purchaser? Medicaid insurers • What to purchase? Behavioural interventions, such as tobacco cessation and weight management, for prevention or better control of hypertension, lipid disorders, and diabetes. • From whom to purchase? **YMCA** or other community facilities • How to purchase? Fee-for-service or value-based payment.

Public-private mixed systems

Australia: Experiences in providing financial incentives for more coordinated, multidisciplinary chronic disease management in primary healthcare

In Australia, prioritising the prevention and management of chronic diseases in PHC has continually been on the national policy agenda over the past two decades (Cant & Foster, 2011). The country's national health insurance, or Medicare, has allowed for population-wide access to PHC, and policy reform over the years has created greater incentives to providers for making PHC more coordinated and patient-centred.

Medicare provides universal health insurance and is financed through general tax revenue and a government levy (Commonwealth Fund, 2020a). Both inpatient and outpatient care are funded through the Medicare Benefits Scheme (MBS). The MBS includes a schedule of subsidised Medicare services and over time has changed with respect to the country's changing health burden profile. In particular, the MBS has expanded over time to include incentives for healthcare providers to deliver more coordinated, multidisciplinary PHC with allied health professionals (Rural Health West & WAPHA, 2020).

Financial incentives to improve the quality of healthcare have been used both past and present in Australia. In 1999, the Enhanced Primary Care (EPC) programme allowed for GPs to receive incentives if providers conducted routine health assessments and developed tailored chronic disease management care plans for people aged 65 and over, or for Indigenous Australians aged 45 and over (Cant & Foster, 2011; Wilkinson et al., 2002). By 2004, the EPC expanded so that GPs could refer patients to private allied health professionals with all costs continuing to be subsidised by MBS (Mason, 2013). In 2013, these expanded services eventually became **the Medicare-Plus Chronic Disease Management services** and are aimed in enhancing chronic disease management among eligible recipients of services (Australian Government Department of Health, 2014).

Since 2019, the Australian Department of Health has provided financial incentives to GPs through the Practice Incentive Program (PIP). PIP supports GPs in enhancing continuity and capacity of care through eight types of incentives that each target a specific target population (Australian Institute of Health and Welfare, 2020). These incentives for target populations include after hours; eHealth; aged care access; Indigenous health; procedural GP; quality improvement; rural loading; and teaching (Rural Health West & WAPHA, 2020). Private practices that meet the PIP guidelines for providing team-based care are eligible to receive subsidies for continuing those services. Certain services include prioritisation of chronic disease management. For example, the **PIP Indigenous Health Initiative (IHI)** supports GPs in delivering routine chronic disease management to Aboriginal and/or Torres Strait Islander (ATSI) individuals aged 15 years and over (Rural Health West & WAPHA, 2020). Financial incentives are not standardised payments but are categorised based on the specific service offered, including one-off sign-on payments, registration payments for each new patient, and 2-tiered payments based on outcomes when health outcomes and quality of care are met (Rural Health West & WAPHA, 2020). Practices are required to meet the requirements of community sensitivity training for the specific PIP target population, including cultural awareness training for those who apply for the IHI PIP.

Through PIP, not only are healthcare providers incentivised to deliver more tailored, team-based care for chronic disease management, but target populations benefit from receiving affordable quality of care.

Malaysia: PeKa B40 Scheme

Malaysia's dual-track healthcare system is very similar to the United Kingdom's which offers UHC to all citizens and access to comprehensive services within an extensive network of Malaysian public health facilities. The public sector is the dominant provider of hospital-based secondary and tertiary care and finances approximately 50% of PHC. Malaysia, like many countries, has an aging population and thus is facing a gradual increase in total health expenditure. In order to offset costs from the pressured public healthcare system while maintaining high quality health service delivery for the population, Malaysia is actively engaging in greater strategic purchasing practices. The PeKa B40 scheme is one such example in recent times.

In April 2019, the Malaysian Ministry of Health (MOH) launched PeKa B40 as a national pilot healthcare screening and protection scheme to combat the increasing rate of chronic illnesses among those coming from the poorest 40% of households in Malaysia–known as the B40 group (Ministry of Health of Malaysia, 2018; The Star, 2019). The scheme, with a total government allocation of MYR 100 millions, entitles B40 individuals aged 50 and above to four benefits: health screenings, medical devices, incentives to fulfill entire cancer treatments, and transportation incentives. Recipients are eligible to receive up to MYR 20,000 for medical devices, a maximum of MYR 1,000 in phases for cancer treatment based on the stage, and up to MYR 1,000 in transportation incentives for each diagnosed disease and depending on the distance required to travel to healthcare facilities.

For health screenings, recipients may receive screening for chronic illnesses such as hypertension, diabetes, kidney-related diseases, cholesterol, and cancers at private or government clinics who have registered as a participating PeKa B40 clinic. In order to engage private clinics in PeKa B40, the MOH contracts directly with private GPs for their participation. The MOH states that PeKa B40 prices are economical relative to the health services offered, such as access to medical devices and lab tests, and that participating GPs are monitored and evaluated for their quality through the scheme (ProtectHealth, 2020). By June 2020, over 2,600 clinics (including 1,753 private and 887 government clinics) were participating in PeKa B40, and over 350,000 individuals had been screened for chronic illnesses, with nearly 43% of those screened having had at least one or more chronic illnesses detected (ProtectHealth, 2020).

One year since the launch of PeKa B40, the scheme has not yet reached its screening target; however, 40% of those screened were found to have one or more chronic illnesses, therefore allowing for greater patient education and empowerment on their health status (ProtectHealth, 2020). Although PeKa B40's nascency does not allow for more in-depth monitoring and evaluation reports as of yet, the scheme is a good start in the right direction for more active public-private engagement in the healthcare system that could play a key role to in optimising healthcare financing and service delivery in the long-run.

Singapore: Chronic Disease Management and the SingHealth DOT Programme

The Singaporean government funds nearly a quarter of all healthcare costs through taxes, with mandatory individual medical saving, employer-based health insurance and OOP comprising the rest of total health expenditure (Yeo et al, 2012). Singapore's multipayer, mixed healthcare financing system is buttressed by three national financing schemes, known as the 3Ms: Medishield Life (mandatory universal basic health insurance funded primarily from MediSave for all citizens and permanent residents to cover catastrophic expenses); MediSave [mandatory (individual) national medical savings scheme whereby personal and employer salary contributions among all working citizens and permanents residents are used to pay for hospital and outpatient services]; and MediFund (safety net for low-income individuals who cannot afford care through OOP, even with utilising MediSave) (Commonwealth Fund, 2020b; Ministry of Health of Singapore, n.d.-c). Healthcare services

and facilities are highly centralised, with several national organisations besides the Ministry of Health governing public health and medical services, and coordination with accredited private PHC facilities is now a priority of the healthcare system.

PHC is currently available at the 20 subsidised public polyclinics and more than 2,300 private GP clinics (Ministry of Health of Singapore, n.d.-b). Over the past decade, Singapore has made progress in strategic purchasing for PHC. In 2014, the Community Health Assist Scheme (CHAS) was expanded to allow Singaporeans to seek PHC at subsidised private GP clinics, with SGD 42 millions allocated in the first eight months of the scheme (Lim, 2017). Several programmes have been launched by the Ministry of Health to mobilise both public and private healthcare stakeholders and address chronic disease prevention and expand the capacity of GPs in PHC, including the Chronic Disease Management Programme and the development of Primary Care Networks (PCN). The Chronic Disease Management Programme is a systemwide framework that allows patients to use MediSave benefits to pay for the cost of chronic disease management, including for diabetes, hypertension, hyperlipidemia, and stroke (Wee et al., 2008). The PCNs scheme is a national programme connecting private GPs with a shared mission to improve holistic chronic disease care and management in PHC through private GP settings and with a multidisciplinary team of clinicians and allied health professionals (Commonwealth Fund, 2020b; Ministry of Health of Singapore, n.d.-a). As of 2018, the Ministry of Health has committed an annual budget of SGD 45 millions per year for the PCNs scheme (Ministry of Health of Singapore, 2018). Currently, there are 10 PCNs with more than 350 participating private clinics, and the MOH provides direct administrative, financial, and workforce capacity support to PCNs. Since 2015, studies have shown that PCNs can improve health outcomes among diabetic and hypertensive patients seeking care in private PHC facilities, and are worth allocating further financial investments into for sustaining equitable and effective PHC (Luo et al., 2018).

Innovative strategic purchasing of private healthcare to manage chronic diseases was also evident. The Singapore General Hospital (SingHealth) Delivering on Target (DOT) Programme is one such example. Singapore General Hospital is a tertiary hospital wholly owned by the government and a member of the SingHealth cluster of healthcare institutions (Singapore General Hospital, n.d.). In 2005, the SingHealth DOT Programme was launched with the objective of “right-siting”, or referring, patients with stable chronic conditions from Specialist Outpatient Clinics (SOCs) in public healthcare facilities to partner private GP clinics for ongoing treatment and management (SingHealth, n.d.). Right-siting patients was enabled through various patient incentives, including laboratory test vouchers and subsidised prescription drugs (Yeo et al., 2012). Other benefits include patients being matched with DOT GPs who are near patients’ homes, GP consultation charges capped at a maximum of SGD 28, fast track referrals back to SOCs as subsidised patients if specialist care is required for severe cases, subsidised medication with the option for delivery to patients’ preferred address, and continual follow-up with Right-Siting Officers who engage as the liaison between patients and healthcare providers (SingHealth, n.d.). Besides reducing long wait times for care, the DOT Programme also aims to reduce unnecessary utilisation of specialist resources and thus reduce costs while also providing greater community health and lifestyle outcomes.

Evaluation of the DOT Programme shows favorable outcomes over the past decades. In 2016, more than 85% of DOT patients remaining in the programme for more than one year were assessed to be highly satisfied with the support offered by right-siting officers in coordinating their care between SOCs and private GP clinics (Ho and Chew, 2016). There were also benefits to the public sector as they offloaded more of the care burden through right-siting. The average waiting time for subsidised patients to seek care at SGH Diabetes Centres was reduced from eight months to 28 days. Savings for public hospitals were projected to increase if right-siting capacity grows, leading to long-term reduction in total health expenditure, but savings on healthcare are still being evaluated from longitudinal data collected on the DOT Programme (Ho and Chew, 2016; Yeo et al, 2012).

Table 2.5

Australia, Malaysia, and Singapore comparison

Country	Key Features of Health Financing System	Strategic Purchasing Policies & Frameworks
Australia	How is the healthcare system financed? Mostly financed through **taxation**, and earmarked income tax (Medicare levy). Medicare levy is 2% of personal taxable income and other tax revenues. Medicare is the universal public health insurance programme. Public hospitals are primarily funded by the states, territories, and government. Government policies **encourage enrollment in private health insurance, including** age-adjusted, means-tested rebate for PHI premiums, tax penalties (the "Medicare Levy Surcharge") for higher-income earners who do not take out insurance, and premium surcharges for people who take out PHI after age 30.	Since 2004, **Medicare Chronic Disease Management programme** has offered Australian patients with chronic or complex diseases access to 13 allied health professions via private clinics on referral from their general practitioner – with costs subsidised by Medicare. • Who is the purchaser? The Australian government (Medicare). • What to purchase and from whom to purchase? Accredited allied health providers via private clinics. The allied health providers include: aboriginal health worker, audiology, chiropractic, diabetes educator, dietetics, exercise physiology, mental health worker (including social worker or mental health nurse), occupational therapy, osteopathy, physiotherapy, podiatry, psychology and speech pathology. • How to purchase? Fee-for-service
Malaysia	How is the healthcare system financed? Malaysia has combined government-funded public delivery of services with the parallel delivery of privately funded private services; a low level of government financing for health (2.2 percent of gross domestic product [GDP] in 2012); and reliance on a high share of financing from household out-of-pocket spending (35 percent of total expenditure on health). Mostly financed through **taxation**: direct taxes (60%) such as income taxes, and indirect taxes (40%) such as sales taxes.	**PeKa B40 Scheme**: Contracts private GPs to conduct NCD screenings (hypertension, diabetes, cancer) for low income residents aged 50+. Private clinics/GPs must sign up as a PeKa B40 clinic to participate. Patients can be referred back to public sector healthcare facilities if their case is severe. M&E still ongoing (scheme launched in spring 2019) Social Security Organization Health Screening Program (SOCSO HSP) Voucher programme is a government voucher programme offered to all SOCSO members who are **40 years age and above** for NCD screenings, such as for cardiovascular diseases, diabetes, and cancer. Receive voucher from your employer and redeem at **nearest private GP**. • Who is the purchaser? The Malaysian government. • What to purchase? There are mainly two types of services to purchase, health screening and medical equipment that are required in procedures/treatments. • From whom to purchase? Private or government clinics who have registered as a participating PeKa B40 clinic. In order to engage private clinics in PeKa B40, the MOH contracts directly with private GPs for their participation. • How to purchase? Fee-for-service

Country	Key Features of Health Financing System	Strategic Purchasing Policies & Frameworks
Singapore	How is the healthcare system financed? Multipayer health system known as 3Ms: MediShield Life (mandatory universal SHI) MediSave (national medical savings scheme to help cover OOP) MediFund (safety net scheme)	**The Singapore General Hospital (SGH) Delivering on Target (DOT)** Programme was launched in 2005 aims to actively support the right-siting of clinically stable patients from the SGH Diabetes Centre to private DOT GPs to reduce unnecessary utilisation of expensive specialist resources, and to reduce waiting times for the large numbers of diabetic patients with complications. • Who is the purchaser? The Singaporean government. • What to purchase? Subsidised drug delivery; diagnostic tests; allied healthcare; chronic disease management, e.g., lifestyle behavior modification, healthy eating, etc. • From whom to purchase? Private GPs (accounting for 80% of all GPs in Singapore) • How to purchase? Fee-for-service

2.2.2.2 EVALUATING THE PROGRAMMES FROM STRATEGIC PURCHASING FRAMEWORK

This section reviews the purchasing programmes/policies for chronic disease prevention and management in each jurisdiction according to the synthesised framework of strategic purchasing (Klasa et al., 2018). The framework consists of five components: population health, citizen empowerment, strengthening government stewardship and capacity, developing effective purchaser and provider organisations, and incorporating cost-effective contracting.

Population health

The framework incorporates population needs as a core element in strategic purchasing decisions. Identifying population health needs and incorporating them into strategic purchasing requests a strong public health infrastructure, availability or meaningful population-level data and information, and the analytic capacity to use them in forecasting future needs. Specifically, recent technological advances, such as the development of smart phone and wearable devices, electronic health platform, as well as the big data sciences, all largely enhances the availability and meaningful usage of population health data. Additionally, from the perspective of equity, whether and how to identify the many individuals that are most in need of healthcare services is also regarded as an important task of strategic purchasing within the population health component.

First, the analysed programmes invest in chronic disease prevention and/or management, aiming to meet the escalating healthcare demands due to chronic diseases. **From this perspective, all those programmes were addressing population health needs.** However, the inclusion criteria and the identification strategy vary across programmes based on the target population. Some programmes rely on the referral from existing health system to identify targeted population, i.e., the programmes in the United Kingdom, China, the United States, and Australia. Among these programmes, **how to incentivise the hospitals or GPs to identify and refer patients to join the chronic disease prevention and management programme is a key issue identified.** For example, in Singapore DOT programmes, it is reported that there is limited incentive for public hospitals with fixed allocated budgets to join the programme. Specifically, the United Kingdom's DPP programme, the United States' MIPCD Program, and Malaysia PeKA B40 gave special attention to low-income people who are more likely to have financial barriers in accessing care. For example, in the UK, providers will particularly target individuals living in resource-poor areas and/or from protected groups—Black, Asian, Minority Groups. However, the equity issues were not mentioned in other programmes.

Citizen empowerment

With the growing movement in patients empowerment internationally, the strategic purchasing framework advocates that government and purchasers should ensure that citizens' and patients' values, views, and choices are stressed. Citizens should actively participate in determining the benefit package, be involved in the purchasing process, and have access to their medical records. Empirical practices include citizens' participation in the management of health services, patient advocate groups influencing health policy decisions, national feedback surveys used to collect citizens' opinion for future improvement. Furthermore, an explicitly defined benefit package can increase purchasers' accountability by giving consumer coverage guarantees.

However, all the programmes described in the case studies performed poorly in citizen engagement. It is not apparent from the case reports that any jurisdiction has built in patient empowerment into their practices. This can lead to growing concern that those programmes may not have constant improvement incentive driven by the patients, and may not fully cover unmet needs or reach the people in most need. **As for the benefit package which can provide patients with more information about what they should expect from the programme, the description is rather general in some programmes.** For example, in China and Australia, the government only suggested the number of consultations patients should be given by the providers, without indicating how the services should be provided to improve effectiveness and quality of care. The United States's DPP is based on standardised DPP curriculum and the volume of activities have been well designed. The standardisation in these programmes does not allow for patient flexibility nor an opportunity to receive patient feedback for improvement. **All the programmes have performed well in enabling the choice of providers. However, limited guidance and information were given to the patients, which may limit informed choice by patients.**

Strengthening governance: government stewardship and capacity

To ensure objectives (i.e., service amount, quality, efficiency, equity, cost-containment) of programmes and/or policies have been met, governmental stewardship and capacity to monitor and audit providers are key components of a strategic purchasing system. Consequently, it requires the government to not only establish an integrated regulatory policy and framework, but also to have ample capacity to implement policies and enforce regulation.

Most of the programmes were initiated by governments with the objective of addressing challenges of chronic diseases. However, very few of those programmes have **strong regulatory framework with clearly defined monitoring mechanisms.**

Furthermore, the issues reported in those programmes reflect the **limited capacity of government to ensure the policies can be enacted effectively.** For example, the take-up rate is very low in the chronic disease screening programmes in Japan, China, and Malaysia. Many of those providers are from private sector. The poor engagement reported between government and private providers reflected the capacity of government to enforce accountability of the private sector.

Developing effective purchaser and provider organisations

A purchaser-provider split is the basic feature of any purchasing activity, either strategic or not. Therefore, effective and accountable purchasers and providers are essential elements of strategic purchasing according to the framework of strategic purchasing. First, the characteristics of purchasers vary across different health systems, either public, private, or quasi-public, which may further determine the autonomy and power in determining criteria and conditions for purchasing. Specifically, the competition among purchasers, which is usually among private or quasi-public purchasers, may incentivise their competence and accountability through consumers' choice. **However, in our view of purchasing for chronic disease prevention and management programmes the public sector is usually the single purchaser.**

Second, for providers, increasing competition has been critical not only to enhance the quality and efficiency of services, but also to foster greater agility in responding to policy mandates, contracting conditions, and payment mechanisms. This is supported from our observation that all the programmes reviewed have multiple providers. However, there is **very limited information about the inclusion criteria of providers, which raises questions on the competence of the providers.**

Third, those purchasing programmes, consisting of both providers and purchasers, are accountable to explain their actions and output and may be rewarded or punished for those actions and outputs. **The accountability mainly stipulates four sub-components: legal accountability, financial accountability, professional accountability, and political/public accountability.** The legal accountability indicates that the programme was accountable for auditing and preventing medical errors; The financial accountability ensures the appropriate use of funds, following the rules of equity, efficiency, and etc.; Professional accountability requires purchasers to monitor and regulate the rules, activity, and performance of providers; Political/public accountability means the purchasers and providers need to better represent public interest and respond to population health needs. **Increased transparency** is the key to ensure greater accountability of purchaser and providers from all four perspectives. **With the exception of the Japanese health check programme, all other programmes reviewed had websites to release related information.** However, the amount of information released vary across programmes. Specifically, the performance or effectiveness of those pgroammes was rarely reported.

Incorporating cost-effective contracting

Contracting is used as the core mechanism to strategically purchase healthcare. Volume and prices are the most often used tools to assist purchasers to establish a contract, with some countries incorporating conditions that promote quality of care or experiment with mechanisms to enhance cost-effectiveness. However, according to our observation, cost-effectiveness evaluation was rarely integrated into the contracting process of those health programmes. **Nevertheless, the programmes in the United Kingdom, Canada, the United States, and Singapore incorporate performance-based payment into their practice, which may increase the value of money invested in the programme.**

Table 2.6

Assessing global case studies on adherence to strategic purchasing elements

Elements of strategic purchasing	**The United Kingdom:** The NHS Diabetes Prevention Programme (DPP)	**Canada:** Promote Healthy Living and Preventing Chronic Disease Initiative	**Japan:** Health check-ups to prevent chronic diseases	**China:** Chronic Disease Management at Community Health Centres	**The United States:** Medicaid Incentives for Prevention of Chronic Diseases (MIPCD)	**Australia:** Medicare Chronic Disease Management programme	**Malaysia:** PeKA B40 Scheme	**Singapore:** The Singapore General Hospital (SGH) Delivering on Target (DOT) Programme
				Population Health				
Address Population Health Needs	People with pre-diabetes are identified through general practice (GP) patient registers and NHS Health Checks which are offered every 5 years for 40-74 years old. People living in deprived areas and protected groups – Black, Asian and Minority Ethnic Groups (BAME) are particularly targeted.	Various programmes. No clear overall definition of targeted groups.	For all beneficiaries aged 40-74 years.	Not clearly defined; Plan to build health management record for the patients of community health centres.	Patients recruited from primary care clinic system (participating clinics); low-income; with prediabetes or a history of gestational diabetes.	Patient diagnosed with a chronic or complex medical condition present for at least six months and have a GP Management Plan or a Team Care Arrangement (TCA) in place	Low income residents aged 50+ and above	Clinically stable patients from the SGH Diabetes Centre.
				Citizen Empowerment				
Assert Citizen's Views/Values	Not clear	Not clear	Not clear	Not clear	Not clear	Not clear	Not clear	Not clear
Clear Benefit Package	Clearly defined benefit package.	Government calls for various intervention projects without clear specifying service package.	Government required all insurers to provide annual check-up targeting metabolic syndrome and health guidance. But the requirement is quite general, without specifying the specific service item.	Government required the community health centres to provide at least four consultations each year and health guidance. However, the application of scientific evidence-based chronic disease prevention and control by community health professional is far from ideal.	The programme is based on standardised DPP curriculum, including 16 weekly one-hour sessions of various activities.	The benefit package is not clearly defined, it is only mentioned that each patient can make five consultations per year to the allied health providers, like diabetes educators.	The health screening services and medical equipment covered by the programme are clearly defined.	The DOT GP will develop a one-year patient management plan and send updates on the patient's health to the referring specialist for shared care follow-up.
Increase Citizen Choice	Four behaviour change provider organisation procured by NHS England. But for each local site, one provider was selected through a local competitive process, led by local commissioner/programme manager.	Multiple partnership projects involving public and private organisations.	Dependent on the insurance that patients are enrolled in; no requirement by the Government regarding citizen choice	Each citizen can register in only one community health centre for the chronic disease management service each year but can switch to new provider on a yearly basis.	The services are provided by YMCA and other community facilities.	Patients can make choice between various accredited allied health providers.	Almost 3,000 private clinics registered with PeKa B40 to provide subsidised health screening.	Private GPs that enrolled in the DOT programme

Elements of strategic purchasing	**The United Kingdom:** The NHS Diabetes Prevention Programme (DPP)	**Canada:** Promote Healthy Living and Preventing Chronic Disease Initiative	**Japan:** Health check-ups to prevent chronic diseases	**China:** Chronic Disease Management at Community Health Centres	**The United States:** Medicaid Incentives for Prevention of Chronic Diseases (MIPCD)	**Australia:** Medicare Chronic Disease Management programme	**Malaysia:** PeKA B40 Scheme	**Singapore:** The Singapore General Hospital (SGH) Delivering on Target (DOT) Programme
Strengthening Government Stewardship & Capacity								
Health Policy Shapes Purchasing Decisions	The National Health Service (NHS) Long Term Plan endorsed "more NHS action on prevention and health inequalities".	In the fall of 2011, Canada signed the Political Declaration of the High-level Meeting of the General Assembly on the Prevention and Control of Non-Communicable Diseases.	Not clear	Prevention and management of chronic diseases, especially through enhancing primary care services, has been on the top of China health reform agenda since 2009.	The 2010 Affordable Care Act (ACA) substantially emphasised the prevention of chronic disease by increasing insurance coverage for low-income individuals with diabetes and prediabetes, which lays a foundation for initiatives of those chronic disease prevention programmes.	Over the last two decades, through a range of policy initiatives, the Australian government has sought to improve prevention and management of chronic diseases by enhancing the capacity of the primary care sector to provide continuity of care with multidisciplinary input.	No system-level health policies or goals targeting on chronic disease prevention and management was identified.	There have been several key policy stages in Singapore's move towards more integrated care for patients with diabetes.
Integrated Regulatory Framework	Not clear	Not clear	Not clear	Not clear	Not clear	Not clear	Not clear	No regulating framework or evaluation report being identified.
Government Capacity and Credibility	Some implementation challenges were identified, including managing new providers, promoting awareness of services, recruiting patients, incentive payments, and mechanisms for sharing learning.	Challenges remain in the multi-sectoral partnership programmes, including defining what constitutes a partnership, managing their risks and benefits, assessing their structures, processes and outcomes, and improving their performance.	Although the Japanese government set a specific target of 65% for participation in the check-ups for NHI by fiscal year 2012, the actual nationwide rate was 33.7%.	There are large number of undianogised diabetes and hypertension patients, and the quality of management services is under concern.	Evidence shows that there is a widespread adoption of community-based DPP.	Poor liaison and linkages between GPs and allied health providers were reported, reflecting the limited government capacity to enforce provider accountability.	One year since the launch of PeKa B40, the scheme has not yet reached its screening target.	There is little incentive for public hospitals, with their fixed allocated budgets, to join the programme. Government noted that additional incentives are needed for hospitals.
Developing Effective Purchaser & Provider Organisations								
Purchaser Competence	Single purchaser, NHS England works as purchaser through commissioning.	Single purchaser, the Public Health Agency of Canada's (PHAC)	Multiple purchaser, social health insurers.	Single purchasers, local government	Single purchaser, Medicaid	Single purchaser, Medicare	Single purchaser, Ministry of Health	Third-party purchaser, SingHealth institutions commissioned by the Singapore General Hospital (SGH) Chronic Disease Management Office (CDMO)
Choice of Multiple Providers	Four providers in total, three private and one third sector. Each geographically-defined local site end up with a single service provider through a local competitive process. Consumers are not able to make a choice.	Various providers were invited, both public and private institutions.	Not clear	Large number of providers, either public or private, but with limited competition.	Local community facility contracted with the programme	15 accredited allied health providers, such as aboriginal health worker, audiology, chiropractic, diabetes educator, dietetics, exercise physiology, and etc.	3,000 private clinics registered with PeKa B40	Private GPs

Elements of strategic purchasing	**The United Kingdom:** The NHS Diabetes Prevention Programme (DPP)	**Canada:** Promote Healthy Living and Preventing Chronic Disease Initiative	**Japan:** Health check-ups to prevent chronic diseases	**China:** Chronic Disease Management at Community Health Centres	**The United States:** Medicaid Incentives for Prevention of Chronic Diseases (MIPCD)	**Australia:** Medicare Chronic Disease Management programme	**Malaysia:** PeKA B40 Scheme	**Singapore:** The Singapore General Hospital (SGH) Delivering on Target (DOT) Programme
Provider Competence & Autonomy	Not clear. But provider for each local site is selected through a local competition.	Not clear. Both public and private organisation can apply for the funds to conduct evidence-informed interventions that address common risk factors for chronic diseases.	Not clear	The quality of chronic disease management in community health centres/stations is under concern.	Not clear. Nonprofit community organisation, like YMCA.	Not clear	Not clear	Medical education programmes were provided to private GPs to enhance their awareness and knowledge in chronic disease management.
Clear & Coherent Accountability (Transparency)	Government website to release information.	Website and media release are available for the funded projects	Not clear	Limited public information regarding the public health services towards chronic disease prevention and management.	Information website and evaluation reports are available.	Information website is available but updated information or report is missing.	Information website is available but evaluation report and other related information to indicate accountability are missing.	Limited information released to the public.
Incorporating Cost-Effective Contracting								
Cost-effective Contracts	Not clear	Not clear	Not clear	Not clear	Cost-effectiveness analysis was conducted by researchers, but not clear whether the CEA results were used in the contracting.	Not clear	Not clear	Not clear
Performance-based Metrics & Payment Systems	Providers will receive a higher payment where they are able to retain people from BAME backgrounds, or from postcode areas associated with high deprivation	Pay-for-performance model, payments are made when project milestones are reached;	Insurers will be penalised economically if stated goals are not achieved.	Very limited application of performance-based payments.	Performance-based incentives were provided.	No performance-based payment.	No performance-based payment.	Private GPs are required to meet goals, including the number of patients enrolled and the performance measures.

2.3 CONCLUSION

Strategic purchasing in healthcare, when designed and implemented with specific goals for targeted populations and health issues, is shown to be an effective method to improve quality, access, and equity of care. In so doing, the entire health system performance can be improved and enable progress towards achieving UHC and promoting PHC.

Chapter 2 has uncovered examples of how strategic purchasing in healthcare is essential for improving the efficiency of healthcare services, effectiveness of timely and targeted quality of care, and equity of healthcare access. Certain jurisdictions, such as the United Kingdom, Thailand, and Singapore, have been actively practicing strategic purchasing specifically for PHC in the pursuit of reducing the national chronic disease burden. Lessons from the United Kingdom's well-established CCG network and Singapore's PCNs show that high-level policy must be instated at the national level to create a population wide foundation for strategic purchasing of PHC. Within those established networks, nuanced initiatives that serve local community chronic disease health needs, like the SingHealth DOT Programme, are the boots-on-the-ground changemakers in utilising strategically purchased healthcare services for the good of the larger community. Given the global trend from the past 30 years of PPP in healthcare financing for PHC, Hong Kong can benefit from optimising our own purchasing practices to become more strategic given the help of examples from other jurisdictions.

While others have many years' experience under their belt with strategic purchasing for chronic disease management, countries like Malaysia are in more recent times also noticing the systematic benefits. The PeKa B40 Scheme, while still in its infancy, has been shown to be an optimistic example for population wide screening and management of chronic diseases with active support from the private healthcare sector. With continuous monitoring and evaluation of the programme and possible adjustments to budgeting, PeKa B40 may be lined up to be an example for Hong Kong and other jurisdictions seeking to attain UHC.

Moving forward, Chapter 3 analyses the latest demand and supply situations in Hong Kong's healthcare system, identifies major stressors in the field, and explores its unique health financing transition in recent years. It also studies the development of strategic purchasing in Hong Kong's healthcare system and highlights gaps to tackle in devising respective schemes in Hong Kong.

3 Hong Kong's Financing Journey in Partnering with the Private Sector for Primary Care

This chapter delves into the unique contexts of Hong Kong and presents a situation analysis of our local health financing structure, challenges, and ongoing transitions in past decades. We will juxtapose our health financing development with overall health system goals through discussing whether former efforts have been effective in leading Hong Kong towards the achievement of a primary care-led system.

3.1 THE DEVELOPMENT OF HEALTH FINANCING POLICIES IN HONG KONG

As discussed in **Chapter 1**, health financing is a crucial building block of health systems and the key lever to facilitate progression towards achieving universal health coverage (UHC). Health accounts are generally able to systematically reflect priorities of care and the evolution of population healthcare needs through analysis of these health financing statistics, which can uncover both opportunities and risks in building a primary care-led integrated health system. In doing so, it is important not just to assess whether a system is sufficiently funded, but to also understand where the money is spent and whether the investment aligns with health system goals by examining its health financing practices.

3.1.1 AN OVERVIEW OF HONG KONG'S HEALTH FINANCING SYSTEM

Hong Kong has a hybrid public-private mixed health financing system, in which a tax-based public sector runs in parallel to a private sector by private financing from out-of-pocket payments, to employer provided benefits and private health insurance. Analogous to the overview of economic and health spending indicators we presented for jurisdictions with different financing schemes in Chapter 2, Hong Kong's economic and health spending indicators are presented in **Table 3.1**. The health expenditure in Hong Kong as a percentage of GDP is much lower compared to the health systems of many developed economies. Considering the many health system achievements, like having the longest life expectancy, Hong Kong has been ranked among the world's most efficient health systems. Given the ageing population accompanied by a shrinkage of the labour population, the Government's capacity to significantly increase health expenditures in response to intensifying healthcare demands has been brought into question and the sustainability of the health financing system has long been of concern.

Table 3.1

Key health expenditure indicators for Hong Kong (2019–2020)

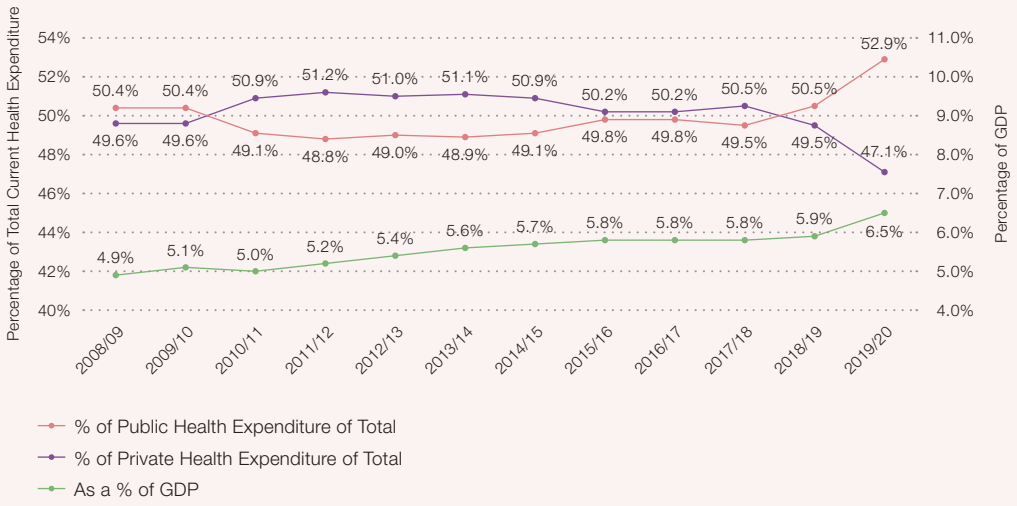
Population (million)	GNI per capita at current market prices (HKD)	Tax revenue (% GDP)	Current Health Expenditure (CHE) (HKD in million)	CHE out of GDP (%)	CHE per capita (HKD)	Government health expenditure (% govt. exp.)	Share of OOP in CHE (%)
7.5	398,044 (2019) 379,181 (2020)	10.77	181,190	6.5	24,135	14.4	29.6

Note: GNI per capita is according to the data released on 14 September, 2021, which may be subject to regular revision.
Sources: C&SD, 2021c; FHB, 2021a; HKSARG, 2021d

A general increasing trend of **current health expenditure as a percentage of GDP** could be observed from 2008 to 2020 from 4.9% to 6.5% indicative of increasing healthcare expenditure to cater for escalating healthcare demands **(Figure 3.1)**. Furthermore, the public and private healthcare sectors constituted similar shares of current health expenditure (CHE) for most of the past decade until 2019/2020 when a significant difference in the share of CHE between the two sectors could be observed (52.9% public and 47.1% private health expenditure), reflecting the policy initiatives in the use of public funds to encourage private sector utilisation.

Figure 3.1

Current health expenditure, HKSAR, 08/09–19/20



Source: FHB, 2021a

From the financing perspective, just over half (52.9%) of the CHE was from governmental sources (thus public spending) in 2019/20, while 16.3% was from insurance schemes. Notably, **household out-of-pocket payments (OOPs) constituted close to one-third (29.6%) of the 2019/20 CHE (Table 3.1 and Figure 3.1)**. This share of household OOP is higher than the WHO recommended 15%–20% threshold (WHO, 2010c).

Box 3.1

Out-of-pocket payments

What are out-of-pocket payments (OOP)s?

OOP is defined by the WHO as an individual's direct payments (household spending) to healthcare providers for any health services wherein any third-party payer reimbursement, such as insurance funds or government subsidy, do not cover the full cost of the services.

OOPs are composed of:

- Direct payments for uncovered or uninsured services
- Cost-sharing, including co-payments and deductibles
- Informal payments beyond prescriptions, such as informal payments to health staff

The higher the OOP spending, the greater the risk that people who are not protected against substantial payments, especially vulnerable populations such as those with limited financial capacity, will incur catastrophic spending that could deepen existing poverty, or even be forced to forgo care entirely. This leads to inequity in healthcare access because access is tied to one's ability to pay. Thus, share of OOPs in health systems is an important indicator of equity in healthcare access and is a marker of a country's progress towards UHC.

What can Governments do to reduce OOPs?

Towards UHC, common governmental approaches include a greater allocation of public revenue sharing to health, with an expansion of a prepaid funding pool to decrease OOP. Studies have identified various policies that have led to reductions in OOPs.

Main components of successful policy strategies internationally include:

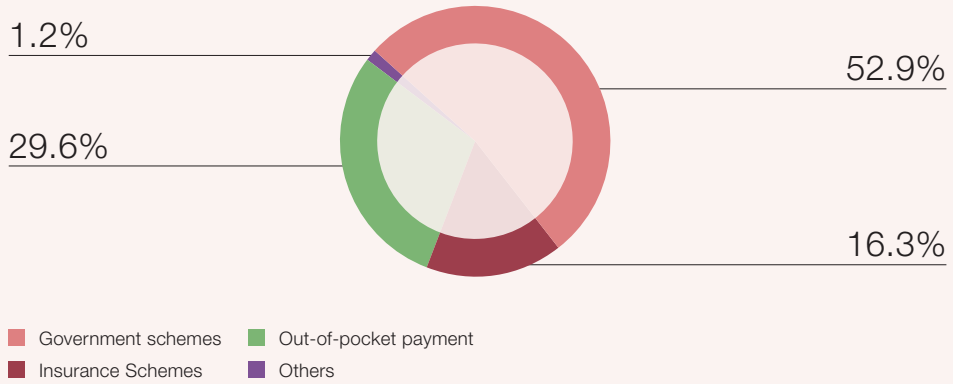
- Stewardship in implementing regulations through legislation, including cost-sharing maximums, and effective monitoring,
- Creating resources by investing in the health workforce and improving access to physical health facilities,
- Financing initiatives in purchasing and pooling, which includes insurance enrolment, and healthcare service redesign to enable better access,
- Delivering services, such as screening and treatment.

This demonstrates that governance and financing mechanisms are tools for Hong Kong to move towards UHC, so that quality health services are accessible financially and equitably.

Sources: Jalali et al., 2021; WHO & IBRD, 2020

Figure 3.2

Current health expenditure by financing schemes, 2019/20



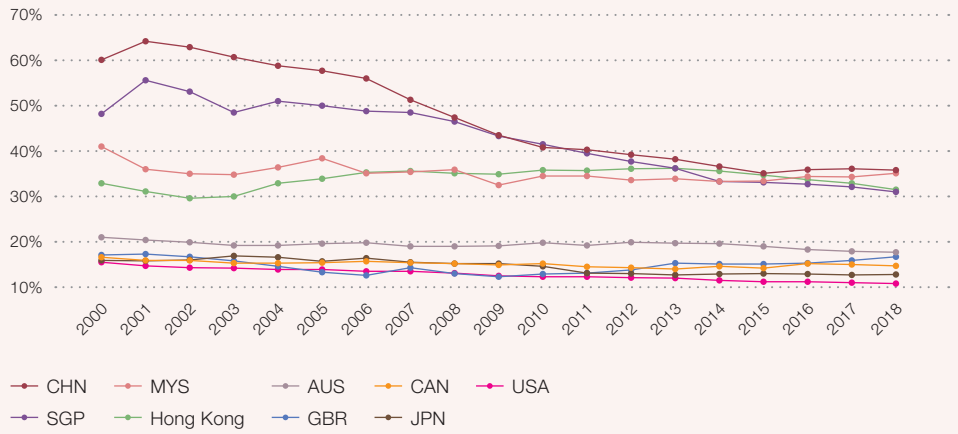
Source: FHB, 2021a

Cross-national evidence shows that levels of OOP spending is an important indicator of equity in healthcare access and is a marker of a country's progress towards UHC (Xu et al., 2003). Whilst China and Singapore have been attempting to reduce their OOP share of current health expenditure as a positive move towards attaining UHC, Hong Kong's OOP expenditure has increased by 2% from its lowest at 29.6% in 2002 to 31.6% in 2018 **(Figure 3.3).**

As the majority of the total OOP expenditure is from the spending on private outpatient care and medical goods (63.7% in 2019), the large OOP may not have the same impact on catastrophic payment which usually results from high OOP for specialist services and hospitalisation (Saksena et al., 2010). Nevertheless, OOPs is the main financing method of private out-patient care in Hong Kong, accounting for over half of its spending, which discourages usage among low-income people and leads to pro-rich inequity in access to primary care. It was reported that approximately 8.4% of a Hong Kong population did not seek medical care due to lack of financial means in 2017 (Wong et al., 2018). The lack of primary care may result in worse health outcomes and incur larger health spending in the future. Taken together, this high share of OOP spending is a signal that our health system's financial protection function may be inadequate and may impede progress towards achieving UHC.

Figure 3.3

Out-of-pocket share of current health expenditure, 2000–2018



Sources: FHB, 2021a; The World Bank, 2018

3.1.2 KEY HEALTH FINANCING REFORM CONSULTATIONS IN HONG KONG

Since as early as 1999, the Government has released a number of research and consultation papers on Hong Kong's health financing landscape, which identified key challenges to the health system and proposed health financing reforms to enhance health system sustainability **(Table 3.2)**. **It is apparent that the financial sustainability of Hong Kong's health system has been called into question for over two decades.**

Table 3.2 highlights key health financing reform papers published in the past two decades, in which much of the emphasis has been on financing options and the role of the private sector. The resulting recommendations centre around financing options involving both mandatory and voluntary contributions and purchasing private sector services in public-private partnership (PPP), allocating public resources more strategically, enabling development of better health insurance products, and increasing private sector transparency.

Table 3.2

Past recommendations on health financing reform in Hong Kong

Title	Health financing-related discussions
Improving Hong Kong's Health Care System—Why and For Whom, 1999 (The Harvard Team, 1999)	Observations: • The long-term financial sustainability of the current healthcare system is **highly questionable**, given a continuous rate of growth in public healthcare expenditure driven by an ageing population, increasing specialisation in medicine, and rising public expectations for quality health services. Recommendations: • Establish **Long Term Care Saving Accounts** (MEDISAGE), contributing towards individual long-term care insurance policy • Launch **Health Security Plan**, covering inpatient hospital services and specialist outpatient services for certain chronic diseases; to be jointly paid by employers and employees • Implement **Competitive Integrated Health Care**, in which the Hospital Authority (HA) is to be reorganised into 12 to 18 regional Health Integrated Systems (HISs) that can **contract with private GPs and specialists (or physician groups)** to provide a defined benefit package that will include preventive, primary, outpatient, and hospital care
Lifelong investment in Health–Consultation Document on Health Care Reform, 2001 (HWB, 2001)	Observations: • At present, public healthcare services are heavily subsidised by general revenue. As health care cost continues to grow against a background of an ageing population, advances in medical technology, and rising community aspirations, the need for major increases in the allocation of public revenue to healthcare shall be investigated. • Our future public healthcare system shall continue to be supported primarily by allocation from general revenue. To ensure long-term sustainability, we propose **targeting public subsidies towards areas of greatest needs**, supplemented by **affordable contributions and medical savings plans** by individuals in their working lives. Recommendations: • **Improve the public/private interface** through overcoming professional barriers by adopting common clinical protocols and sharing staff training and development programmes, developing computer-based Health Information Infrastructure, and developing new healthcare insurance policies with the medical insurance industry • Improve cost efficiency, by **reducing costs** and **revamping public fees structure** • Establish **Health Protection Accounts,** to be funded by mandatory contributions from the working population
A Study on Health Care Financing and Feasibility of a Medical Savings Scheme in Hong Kong, 2004 (HWB, 2004)	Observations: • To **address the financial sustainability** of the Hong Kong healthcare system, there is a need to continue with the **short-and medium-term measures** including the introduction of rigorous cost-containment measures in the public health care system, and continual review of the public healthcare fee structure to ensure that resources can be targeted at patients and services of the greatest needs. • Further studies will be needed to develop new financing options that will be sustainable in the long-term, and equitable and accessible to all members of the community. These options should address not only the appropriate mix of financing sources for Hong Kong, but also other issues like target subsidy, cost control measures, and **interface between public and private sectors.** Recommendations: • Introduce a medical savings scheme: however, it is important to examine carefully the role of a medical savings scheme. it is beneficial to **conduct further discussion with the private insurance industry** to explore the provision of new insurance products that could enhance the scheme's flexibility and attractiveness.

Title	Health financing-related discussions
Building a Healthy Tomorrow– Discussion Paper on the Future Service Delivery Model for our Health Care System, 2005 (HWFB, 2005)	Observations: • Challenges faced by the present system include: over-reliance on the heavily subsidised public healthcare system, an ageing population, tendency of early occurrence of chronic illnesses in the population advance in medical technology driving up costs of treatable medical conditions, and overstretched hospital services • It was generally recognised that the sustainability of Hong Kong's long-term healthcare is **an issue that needs to be addressed.** Recommendations: • **Purchase primary medical care service from the private sector** • **Develop the private primary medical care sector** • **Realign the roles of the public and private sectors** in developing our future healthcare model[1], through reviewing the fees and charges policy • Coordinate between public and private hospitals in the **procurement of drugs and equipment** (to help reduce cost for the private sector) • Improve private sector's transparency of fees and charges, enhance clinical governance, and **work with the insurance sector to bring about changes to insurance practices**
Your Health, Your Life: Healthcare Reform Consultation Document, 2008 (FHB, 2008b)	Observations: • Majority of the public recognised the need **to reform the current healthcare financing arrangement** • Many respondents supported the **direction of promoting PPP** in the provision of healthcare services • There was broad consensus in the community that the public healthcare system should continue to serve as a safety net offering healthcare protection for the population as a whole, not just the low-income and underprivileged groups. The direction of strengthening the safety net was thus broadly supported. Recommendations: • Preserve existing public healthcare as a safety net for all • Take forward financing reform through a step-by-step approach • Consider standardised and incentivised arrangements to facilitate access to better protection and choices in healthcare, with necessary flexibility to cater for the needs of the different age and/or income segments of the population • Be in line with the concept of **"money-follows-patient"**, ensuring sufficient protection to users for price transparency and cost-effectiveness

My Health My Choice: Healthcare Reform Second Stage, 2010 (FHB, 2010a)	Observations:
	• There was broad support for the direction of the healthcare reform to **enhance the long-term sustainability of the overall healthcare system,** namely for:
	  • Maintaining and strengthening the PHC system to provide equitable access to essential healthcare and to serve as a healthcare safety net,
	  • Complemented by reforming the **private health insurance and healthcare markets** with a view to providing value-for-money choices of health insurance and healthcare services with quality assurance and consumer protection.
	
	Recommendations:
	• **Take forward** the proposed **Health Protection Scheme (HPS)**[2] via
	  • Reviewing healthcare manpower strategy;
	  • Formulating supervisory framework for HPS;
	  • Facilitating healthcare service development such as developing essential infrastructure, enhancing the transparency and competition of private healthcare services in quality, and price; and
	  • Promoting packaged services and charging in **the private sector**.

Title	Health financing-related discussions
Voluntary Health Insurance Scheme Public Consultation, 2017 (FHB, 2017)	Observations: • There was **broad support for the concept and policy objectives of the Voluntary Health Insurance Scheme** (VHIS) in general. Many considered it a positive step towards redressing the imbalance of the public-private sectors and enhancing the long-term sustainability of the healthcare system as a whole. • There were divergent views over the proposed establishment of the **high-risk pool (HRP)** to **enable implementing the guaranteed acceptance with premium loading cap requirement.** While many supported the policy objective of establishing the HRP, a number of submissions expressed grave concern over its long-term sustainability. • Most agreed that success of the VHIS depended on strengthening the supporting infrastructure, including healthcare manpower supply and **private healthcare capacity**, as well as on measures to enhance the **price transparency of private healthcare services**. Recommendation: • VHIS will be taken forward with general support from the community.

Notes: [1] Public health care services shall focus on four target groups: acute and emergency care, low-income and underprivileged groups, illnesses that entail high cost, advanced technology and multidisciplinary professional team work, and training of healthcare professionals.

[2] The HPS is a standardised and regulated scheme of private health insurance based on voluntary participation incorporating various features for consumer protection and promoting packaged charging for transparency of healthcare services. Proposals for the HPS comprised (a) insurance features, (b) savings options, and (c) possible incentives (FHB, 2010a).

Identified strategic papers listed in **Table 3.2** also showcase recurring themes. First, **an increasing scope of collaboration between public and private sectors** and **a more strategic role of private healthcare services** were frequently highlighted as potential solutions for the increasing demand of healthcare services and the overstretched public sector. Second, there is a consistent emphasis on the urgency to **foster primary care** in all major strategic papers (2001, 2005, 2008). Discussions covered making **regular health checks available at an accessible price** (2005) and initiatives related to increasing financial subsidies for chronic disease patients, children, and the older population, as well as **receiving primary care from private sector providers** as an alternative to the existing public services (2008). Against the background of increasing healthcare demands coupled with the sustainability issue of public financing system, innovative ways of financing healthcare in our system considering health system sustainability needs to be discussed now more than ever before.

3.1.3 DEVELOPMENT OF THE HEALTH FINANCING POLICIES TO ENGAGE THE PRIVATE SECTOR

As presented in the last section, engaging the private sector to achieve health system goals has been on the top of the Government's policy agenda after several rounds of health reform discussions. There are three main policies implemented in the recent decade: **purchasing of private services through various public-private partnership (PPP) programmes, the regulation of private hospitals, and the introduction of the Voluntary Health Insurance Scheme (VHIS).**

PPPs–Public purchasing of private services

The main initiative of the Government in engaging the private sector is the introduction of various PPP programmes **(Box 3.2)**. PPPs in Hong Kong is a vehicle for purchasing private services by the Government. They are intended to enhance access to care, offer more choices of providers, and relieve stress on the public sector. More details of PPP programmes will be presented in the next section 3.1.4.

Box 3.2

PPP as defined in the "Your Health, Your Life" consultation document

PPP is defined by the Food and Health Bureau (FHB) as the "collaboration between the public and private sectors to provide healthcare infrastructure or services".

PPPs, as examples of purchasing in Hong Kong, were intended to engender the following benefits:

- Offer greater choice of services for individuals;
- Promote healthy competition and collaboration among healthcare providers;
- Make better use of resources in both the public and private sectors;
- Benchmark the efficiency and cost-effectiveness of healthcare services; and
- Facilitate cross-fertilisation of expertise and experience between medical professionals.

Source: FHB, 2008b

Regulation of private hospitals

Private inpatient care is an important complement to public ones, providing a choice for those who have the means. However, a local report documented transparency issues in the areas of pricing and quality, which lag behind comparable markets, such as Singapore, Australia, and the United Kingdom (Bupa, 2018). In October 2016, the Government together with the Hong Kong Private Hospitals Association launched a Pilot Programme for Enhancing Price Transparency of Private Hospitals (HKSARG, 2019c). The experience from the pilot scheme was incorporated in the Private Healthcare Facilities Ordinance (Cap. 633) gazetted in November 2018. The Ordinance stipulates price transparency measures which the licensees of private healthcare facilities (including private hospitals) have to comply with.

In addition to enhancing the price transparency of private healthcare facilities, the Government also encouraged private hospitals to provide more services at packaged charges. The prospective packaged payment has been widely accepted as a means to control the increasing expenditure of inpatient care in many health systems. At the time of writing, some private hospitals in Hong Kong offer a certain percentage of services at packaged charges according to the relevant Service Deeds.

Voluntary Health Insurance Scheme

After twenty years of debate since the “Health Security Plan” was first suggested by the Harvard Report in 1999, and since the “My Health My Choice” second-stage public consultation on healthcare reform in 2014, the **Voluntary Health Insurance Scheme** (VHIS) was finally launched on 1 April 2019. As an example of a more recent health financing reform effort, the VHIS offers government certification for hospital insurance products which meet criteria and key features specified **(Box 3.3)**. The number of insurance policies under the scheme reached **522,000** in its first year of implementation, roughly on track towards the Government’s estimate of one million purchases during the first two years of the scheme’s launch (Legislative Council of the HKSAR, 2021).

The effect of the scheme is yet to be evaluated due to its premature status. There are, however, noted limitations of the VHIS. As an example, the current design of VHIS excludes a “high-risk pool” and rejects applications of the older population aged above 80 years old, who are among the most vulnerable groups in our society that frequently necessitate care at our public hospitals, pointing to potential room for the expansion of coverage to include a wider scope of beneficiaries.

Importantly, it is not evident there will be a shift in demand from the over-stretched public healthcare sector to the private healthcare sector as VHIS members have the option of continuing to use public hospital services. In addition it does not cover non-hospital medical services (including outpatient services), and thus, does not incentivise beneficiaries to seek primary care services (FHB, 2021d). This stands in contrast with health system goals for a primary care-led health system through the promotion of primary care uptake to decrease demand for hospital are. At the time of writing, the Government is yet to announce any counter measures to resolve perceived limitations apart from the emphasis on garnering further social consensus (HKSARG, 2020c).

Box 3.3

Voluntary Health Insurance Scheme Fact Sheet

Launched: 1 April 2019

Objectives:

- Enhance the protection level of hospital insurance products
- Provide the public with an additional choice of using private healthcare services through hospital insurance
- Relieve the pressure on the public healthcare system in the long run

Products:

- Individual indemnity hospital insurance plans that are certified by FHB

Key Features of Certified Plans:

- Guaranteed renewal up to the age of 100 years
- No "lifetime benefit limit"
- Cooling-off period of 21 days
- Premium transparency

Subscription incentives: premium paid for a VHIS Policy is eligible for the tax deduction under the Inland Revenue Ordinance *(Cap.112)*

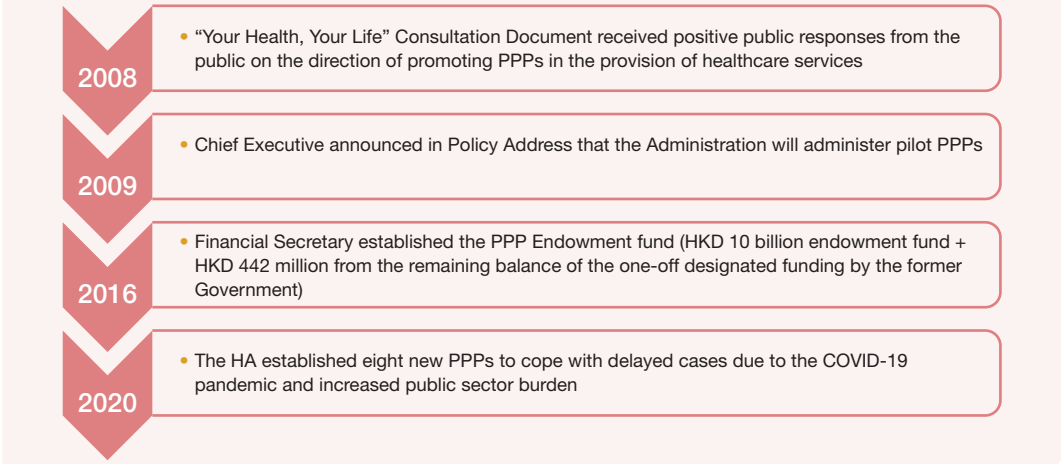
Source: FHB, 2021d

3.1.4 THE DEVELOPMENT OF PUBLIC-PRIVATE PARTNERSHIPS IN HONG KONG

The Government has been purchasing services from the private sector to decrease public-private segmentation, relieve the service burden on the public sector, and improve timelier access to healthcare services **(Table 3.3)**. To lay the context for existing purchasing initiatives in primary care, we first discuss the development of **public-private partnerships** (PPP) in Hong Kong.

Figure 3.4

Key milestones in PPP development in Hong Kong



The notion of promoting PPPs in the provision of healthcare services set out in the 2008 consultation on health financing received positive responses from the public. Whilst believing that PPPs could enhance the cost-effectiveness of health service delivery and shorten queues in the public healthcare sector, various concerns were raised, ranging from the need for proper monitoring and transparency under the PPP models, to the potential for PPPs to fuel unfair competition between public and private service providers (FHB, 2008b). Nevertheless, PPPs started to root itself in the healthcare sector of Hong Kong in the last decade.

In the 2008–2009 Policy Address, the Chief Executive announced that "to redress the serious imbalance in the provision of public and private healthcare services", a series of pilot measures to promote PPPs will be implemented. In particular, the Policy Address highlighted key directions of PPPs such as **purchasing primary care services and hospital services from the private sector** and **subsidising the public for preventive care provided by the private sector** (FHB, 2008b).

In subsequent years, various PPP programmes were gradually rolled out by the HA, the Department of Health (DH), and the Food and Health Bureau (FHB). These PPPs were focused mainly on purchasing services that have reached full capacity in public hospitals and in purchasing preventive care, such as **vaccination services from private providers and supporting our older population to access primary care services in the private sector**. In **2015/16**, the Financial Secretary of Hong Kong further pledged a fund for the HA to utilise investment returns for PPP initiatives **(Box 3.4)** (HKSARG, 2015).

Box 3.4

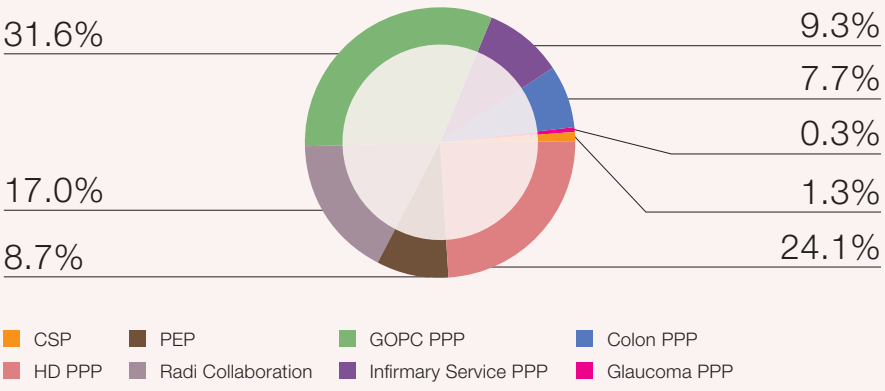
Hospital Authority's Public-Private Partnership (PPP) Endowment Fund

Launched: 31 March 2016

Value: HKD 10 billion endowment fund and additional HKD 442 million from the remaining balance of the one-off designated funding by the former Government. Investment yield in 2018/19 was 4.1%.

To further promote PPP programmes within the HA, HKD 10 billion was allocated to the HA as an endowment fund. With the initial funds placed with the Exchange Fund, investment returns will be utilised to (i) regularise and enhance ongoing clinical PPP programmes, and (ii) develop new clinical PPP programmes.

2020 Portfolio (in terms of expenditures):



For the full names of the abbreviated programmes, please refer to Table 3.3.

Source: FHB, 2020b

Before COVID-19, 15 active PPP programmes existed under FHB, HA and DH as well as other purchasers such as the Community Care Fund in Hong Kong (at the time of writing). Details of these PPP programmes are listed in **Table 3.3** and presented in accordance to a number of dimensions of the framework for purchasing.

Table 3.3

PPP portfolio in Hong Kong's health system

PPP	"What" to purchase	"From Whom" to purchase	"How" to purchase
Purchaser: Hospital Authority			
Cataract Surgeries Programme (CSP) 2008–present	Services • One pre-operative assessment • The Cataract Surgery (including one appropriate basic monofocal intraocular lens and all medical consumables) • Two post-operative checks	From whom to purchase • Any medical practitioner who is currently included in the Specialist Register in the specialty of ophthalmology	Fee-for-Service mechanism • **A fixed subsidy of HKD 5,000** • The agreed upon co-payment between the patient and the private ophthalmologist should **not be more than HKD 8,000**
General Outpatient Clinic Public Private Partnership Programme (GOPC PPP) 2014–present	Services • A maximum of 10 subsidised visits in a year for both chronic and episodic illnesses • Drugs for treating chronic conditions and episodic illnesses to be received directly from private doctors at their clinics • Investigation services (laboratory and x-ray services) provided by the HA as specified through private doctors' referral	From whom to purchase • Registered medical practitioners with the Medical Council of Hong Kong, under section 14 or 14A • Registered with the eHRSS and meets the standard of designated weekly operating durations at clinics	Fee-for-service mechanism • A **maximum total of HKD 3,510 per patient per year**, covering at most 10 consultations, including the **HA's GOPC Fee (presently HKD 50)** to be paid by patients to the participating service providers (PSPs) directly after each consultation
Haemodialysis Public-Private Partnership Programme (HD PPP) 2010–present	Services • Participating community haemodialysis centres will provide haemodialysis treatment in the community according to the available quota • Follow-up consultation, medication, and regular examination services will be provided by HA.	From whom to purchase • Community haemodialysis centres	Fee-for-service mechanism • Patients are required to pay the community haemodialysis centres a co-payment which **matches the HA gazette fees and charges** for its day procedure and treatment at Renal Clinic
Patient Empowerment Programme (PEP) 2010–present	Services • Disease specific knowledge • Self-efficacy enhancement and lifestyle modification, and follow-up calls within six months after programme completion	From whom to purchase • Non-governmental organisations (NGOs)	Contractual budget mechanism • Maximum service fee for each year is **HKD 1.5 million**. Bonus schemes apply

PPP	"What" to purchase	"From Whom" to purchase	"How" to purchase
Project on Enhancing Radiological Investigation Services through Collaboration with the Private Sector (Radi Collaboration) 2012–present	Services • Computed Tomography (CT) service • Magnetic Resonance Imaging (MRI) service • Results of investigation will be handled in HA hospitals for treatment plan formulation.	From whom to purchase • Private radiological service providers selected via tendering • Passed assessments from HA to have met prescribed requirements	Fee-for-service mechanism • Fully subsidised CT and MRI services
Colon Assessment Public-Private Partnership Programme (Colon PPP) 2016–present	Services • Tier A Service Package (clinical assessment, colonoscopy without removal of polyps, and post-procedural explanation and management) • Tier B Service Package (clinical assessment, colonoscopy with removal of polyps, and post-procedural explanation and management)	From whom to purchase • Registered Medical Practitioner within the meaning of the Medical Registration Ordinance (Cap. 161) who holds a valid practising certificate issued under the Ordinance • A registered specialist of Gastroenterology & Hepatology or a registered specialist of General Surgery within the meaning of the Ordinance "Specialist Register" • Participating in the Electronic Health Record Sharing System (eHRSS) and complying with the provisions relating to the eHRSS	Fee-for-service mechanism: • Subsidy from the HA: Tier A service package – **HKD 6,800** Tier B service package – **HKD 7,500** • Co-payment from participants between **HKD 1,000 to HKD 2,000**, depending on the additional fee charged by individual private specialist
Infirmary Service Public-Private Partnership Programme (Infirmary Service PPP) 2016–2021	Services • Healthcare services such as medical care, nursing care, and psychosocial care • Personal care services such as transferring, showering, and toileting • Residential care services	From whom to purchase • NGOs complying with the requirement for registration as a nursing home and with the Hospitals, Nursing Homes and Maternity Homes Registration Ordinance – Cap. 165 of the laws of Hong Kong	Contracting mechanism • Services users are only subject to pay the Professional Services Provider (PSP) the **same gazette fees and charges as charged by HA** for its General Infirmary Service.
Glaucoma PPP Programme (Glaucoma PPP) 2019–present	Services • Up to four subsidised consultations per year • Specified drugs for treating glaucoma conditions immediately from the PSPs at their clinics • Investigation services including up to one visual field (VF) test and one optical coherence tomography (OCT) scan per year to be provided by the PSP	From whom to purchase • Be included in the Specialist Register in the specialty of ophthalmology in accordance with Section 20K of the Medical Registration Ordinance • Participate in the Hong Kong Government's eHRSS	Fee-for-service mechanism • A maximum total of **HKD 5,350 per patient per year** which cover four subsidised consultations, one VF test and one OCT scan • Co-payment of HA SOPC fees by the patients (HKD 80 per attendance plus HKD 15 per drug item as per Gazette)

PPP	"What" to purchase	"From Whom" to purchase	"How" to purchase
Purchaser: Department of Health			
Vaccination Subsidy Scheme (VSS) 2009–present	Services • Seasonal influenza vaccination (SIV) • Pneumococcal vaccination	From whom to purchase • All medical practitioners registered with the Medical Council of Hong Kong who are in private practice and hold a valid annual practicing certificate	Fee-for-service mechanism • The subsidy level of seasonal influenza vaccine is **HKD 240 per dose** in 2020/21 • The subsidy level for pneumococcal vaccination ranges from **HKD 300 to HKD 760 per dose** in 2020/21 • For both vaccination services, the doctor may impose extra fees for services, including fees for booking, consultation fee, and other vaccine fees related to the vaccination
Seasonal Influenza Vaccination School Outreach 2018/19–present	Services • SIV for students including non-HK residents in primary schools and kindergartens (KGs), kindergarten-cum-child care centres (KG/CCCs), and childcare centres (CCCs) • Vaccines are supplied and procured by DH	From whom to purchase • All medical practitioners registered with the Medical Council of Hong Kong who are in private practice and hold a valid annual practicing certificate • Enrolled in VSS and the Primary Care Directory (PCD)	Fee-for-service mechanism • The provider reimbursement of any injection of vaccine is **HKD 100 per dose** in 2021/22
Residential Care Home Vaccination Programme (RVP) 1998–present	Services • SIV for residents and staff of Residential Care Homes for the Elderly (RCHE), Residential Care Home for persons with disabilities (RCHD), non-institutionalised persons with intellectual disability (PID) receiving services in designated institutions (DIs) serving PID, residents and staff of Residential Child Care Centres (RCCC) • Pneumococcal vaccination (PV): 23-valent pneumococcal polysaccharide vaccine (23vPPV) to all residents of RCHE and residents of age 65 years or above in RCHD who have never had a prior dose, and an extra dose of 13-valent pneumococcal conjugate vaccine (PCV13) to eligible residents • COVID-19 vaccination (CoronaVac) for RCHE residents and PIDs at DIs serving the PIDs	From whom to purchase • All medical practitioners registered with the Medical Council of Hong Kong who are in private practice and hold a valid annual practising certificate • Works in the private medical sector (including university and NGOs) • Enrolled and listed in the PCD	Fee-for-service mechanism • For SIV and PV: The provider reimbursement of any injection of vaccine is **HKD 100 per dose** in 2021/22 • For COVID vaccine: **HKD 130 per dose** of COVID-19 vaccine. An extra Vaccination Fee of **HKD 50 per dose** shall be paid for COVID-19 vaccination to an older individual who has reached or will reach the age of 60 years or above in the calendar year when the vaccination is administered

PPP	"What" to purchase	"From Whom" to purchase	"How" to purchase
Elderly Health Care Voucher Scheme (EHCVS) 2009–present	Services • **Private primary care** services	From whom to purchase • Medical practitioners, Chinese medicine practitioners, dentists, chiropractors, registered nurses and enrolled nurses, physiotherapists, occupational therapists, radiographers, medical laboratory technologists (the use of services provided by allied health professionals and laboratory test services is subject to the current referral arrangement) and optometrists (in Part I of the register)	Voucher mechanism • The annual voucher amount is **HKD 2,000**; accumulation limit is up to **HKD 8,000**. The face value of each voucher is **HKD 1**.
Outreach Dental Care Programme for the Elderly (ODCP) 2014–present	Services • On-site professional oral checkup and oral health care including preventive and curative dental treatments • On-site care training and oral health education activities for the elderly, their families, and caregivers	From whom to purchase • A non-profit-making entity and exempt from tax under Section 88 of the Inland Revenue Ordinance (Cap 112) • Operates at least one dental clinic for the public at the application closing date • Comply with requirements under Section 12 of the Dentists Registration Ordinance (Cap 156) at the application closing date	Contracting mechanism • Subvention to NGOs for operating outreach dental teams reached **HKD 52.5 millions** in 2020/21 • Interested institutions are invited to submit an application during regular open calls • Once a contract is granted, the PSP is expected to serve a period of three years
Colorectal Cancer Screening Programme (CRCSP) 2016–present	Services Primary Care Doctor (PCD) • Process enrollment • Assess medical fitness for screening • Issue collection tool for the Faecal Immunochemical Test (FIT) screening • Referral to colonoscopy examination upon FIT-positive result Colonoscopy Specialist (CS) • One pre-procedural consultation • Colonoscopy examination as a day case including conscious sedation and consumables for the removal of polyp • Post-procedural consultation(s) which is optional and will be required for explaining the colonoscopy examination result and subsequent management	From whom to purchase • Registered Medical Practitioner under Medical Registration Ordinance (Cap 161) • Registered specialist of Gastroenterology & Hepatology (S17) or registered specialist of General Surgery (S28) in the Specialist Register under that Ordinance as the CS • Valid annual practising certificate • Works in Private sector (including University and NGOs) • Has enrolled in eHRSS	Fee-for-service mechanism • With (**up to HKD 300 at the time of writing**) or without co-payment for consultations with PCD • The amount of government subsidy for the "Standard Package of Colonoscopy Service" is **HKD 8,500** if polyp(s) is removed and is **HKD 7,800** if no polyp(s) removal is needed • **Any co-payment charged by the CS is subject to a cap of HKD 1,000** for colonoscopy with and without polyp(s) removal

PPP	"What" to purchase	"From Whom" to purchase	"How" to purchase
Purchaser: Others			
Elderly Dental Assistance Programme 2012–present Purchaser: **Community Care Fund; whilst Hong Kong Dental Association being the implementing agent**	Services • Oral examination • Dentures and other related and necessary dental services (scaling and polishing, fillings, tooth extractions and X-ray examination) • Provision of accompanying service to the older population in need of support	From whom to purchase • NGOs running home-based services, home help, elderly centres, community centres and dental clinics • Community Care's dentists/dental clinics	Fee-for-service mechanism • A **maximum subsidy of HKD 14,700** for dental services for each beneficiary; **no co-payment** from participants • A referral fee of **HKD 50** per referral by NGOs • An accompanying service fee of **HKD 70 per hour** for applicants who are users of the home care/ home help services (if applicable)
Community Care Fund Pilot Scheme on Subsidised Cervical Cancer Screening and Preventive Education for Eligible Low-Income Women (CCF Pilot Scheme) 2017–present Purchaser: **Community Care Fund**	Services • Cervical smear services	Programme administer and coordinator • DH From whom to purchase • Applications are only accepted by non-profit-making institutions	Fee-for-service mechanism • HKD 78.61 millions is approved to fund the programme, though the disbursement amount as at 30 April 2020 was less than 1% (HKD 0.38 million). • Service charges for beneficiaries of Group 1 of Assistance is **free of charge**; service charges for beneficiaries of Group 2 of Assistance is **HKD 100**.

Sources: Chen et al., 2016; CHP, n.d., 2020a, 2020d, 2021a; Commission on Poverty of the HKSAR Government, 2019; DH, n.d.-b, n.d.-a, 2016; FHB, n.d.-a, 2019, 2020b; HA, 2016b, 2016a, 2018, 2021c, 2021i, 2021e, 2021d, 2021a, 2021g; HKSARG, 2017a, 2017b, 2019b, 2019a, 2020c, 2021c; Hong Kong Economic Times, 2020; Legislative Council of the HKSAR, 2021; Legislative Council Panel on Health Services, 2011, 2014, 2019, 2020; Legislative Council Panel on Home Affairs, 2020; Lian et al., 2019; Ming Pao, 2020; Ng, 2012; Wan et al., 2015; Wong et al., 2016

Since early 2020, the Coronavirus disease 2019 (COVID-19) pandemic has imposed unprecedented pressure on our public healthcare system. The HA suspended elective and non-essential services to make way for pandemic management and other urgent clinical services. To cover delayed treatments, the HA worked closely with the private healthcare sector to implement extended PPP programmes that involve diverting patients from public hospitals to private hospitals for treatments at current fees charged by public hospitals. This expansion applied to both existing PPP programmes and new service areas deemed necessary **(Table 3.4)**.

Table 3.4

Expanded and New PPP programmes launched during the COVID-19 pandemic

PPP	Planned Provisions, 2020–21
Colon PPP Surge Special	3,200 colonoscopies
Neonatal Phototherapy Service (NNJ)	160 patients
Radiation Therapy Service (RT)	105 patients
Cesarean Section Service (CS)	52 patients
Trauma Operative Service Collaboration Programme (Trauma Collaboration)	173 patients
Breast Cancer Operative Service Collaboration Programme (Breast Cancer Surgery Collaboration)	140 patients
Cystoscopy Collaboration Programme (Cystoscopy Collaboration)	724 patients
Oesophago-Gastro-Duodenoscopy Collaboration Programme (OGD Collaboration)	2,800 patients

Source: Legislative Council of the HKSAR, 2021

After the positive experience of launching pandemic-specific PPPs, the HA has reinforced PPPs through incorporating this direction in its Framework of Annual Plan 2021–22 as a strategy for optimising demand management **(Table 3.5)**. The new service target of all existing PPP programmes has increased from past years' provision, rendering PPPs as an important mechanism to be considered for long term development and sustainability of Hong Kong's health system.

Table 3.5

Strategic goal of reinforcing PPPs	
Action	**Target for 2021–22**
Provide additional patient choices through selected PPP programmes	Provide PPP programmes for patients by 1Q22, including • 750 cataract surgeries (↑ 15.4%)[1] • 336 haemodialysis places (↑ 9.5%)[1] • 50,730 Radi Collaboration (↑ 123.2%)[2] • 42,280 GOPC patient capacities (↑ 15%)[1] • 64 beds for infirmary service (↑ 19.8%)[1] • 1,800 colonoscopies (↑ 38.5%)[1] • 2,000 glaucoma patient capacities (↑ 53.8%)[1]
Continue new PPP programmes that were developed to divert a portion of public hospital patients to receive treatment at the private sector during COVID-19	Provide PPP programmes for patients by 1Q22, including • 277 case capacities for radiotherapy service • 120 case capacities for trauma operative service • 120 case capacities for breast cancer operative service

Notes: [1] Percentage increase is calculated based on 2020–21 planned provisions (Legislative Council of the HKSAR, 2021)
[2] Percentage increase is calculated based on 2019–20 actual provisions, because for Radi Collaboration, the 2019–20 actual provision is 22,728, whilst the 2020–21 planned provision is 49,200, meaning the planned provisions have more than doubled in 2020–21 from 2019–20 (Legislative Council of the Hong Kong SAR, 2021)
Source: HA, 2021a

3.2 PRIMARY HEALTHCARE FINANCING

PPPs as discussed in section 3.1 illustrate that the Government has acknowledged concerns over health system sustainability and is looking beyond relying on the public sector to improve population access to healthcare. As heavy focus continues to be placed upon primary healthcare (PHC) development in Hong Kong, how PHC is financed, whether Hong Kong's health financing organisation supports the promotion of primary care uptake, and the potential role for PPPs warrants further discussion. To improve access to affordable primary care services in a timely manner, Hong Kong would benefit from an assessment of its current investment in PHC. This section discusses both international and domestic practices in PHC spending, trends in PHC spending, strengths and limitations of these practices, and the implications of Hong Kong's public-private split in PHC contributions on the future development of health financing policies.

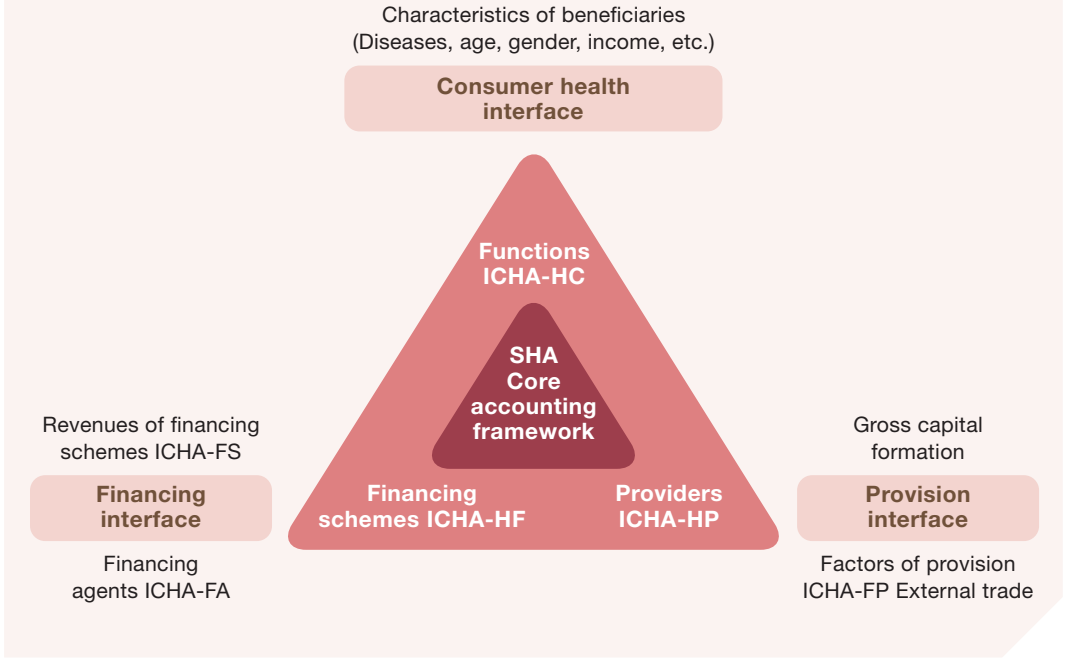
3.2.1 INTERNATIONAL STANDARDS IN TRACKING PHC SPENDING

The **System of Health Accounts (SHA)** is the result of a joint international effort to propose a framework for the systematic description of financial flows related to healthcare, first published in 2000 by the Organisation for Economic Co-operation and Development (OECD). The latest edition was released in 2017 (named **SHA 2011**) as a collaborative effort between the OECD, the European Union (EU), and the WHO. The SHA emphasised a tri-axial relationship between the following **(Figure 3.5)** (OECD et al., 2017):

- The classifications by the functions of healthcare (Functions ICHA-HC, types of healthcare goods and services to be consumed);
- The classifications by healthcare provision (Providers ICHA-HP, types of healthcare providers who deliver these goods and services); and
- The classifications by financing schemes (Financing schemes, ICHA-HF, how are these goods and services paid for).

Figure 3.5

The core and extended accounting framework of SHA 2011



Note: Adopted from A System of Health Accounts 2011: Revised Edition
Source: OECD, 2017

Subsequently, the WHO's 2019 Global Report, "Global Spending on Health: A World in Transition" presented the definition of PHC spending based on the **SHA 2011**. The categorisation, presented in **Box 3.5**, was developed in 2018 and for the first time, offered a framework on tracking **comparable PHC spending across jurisdictions**.

Box 3.5

Primary healthcare spending categories with specific codes from the SHA 2011

1. General outpatient and home-based consultation

- General outpatient curative care (HC.1.3.1)
- Dental outpatient curative care (HC.1.3.2)
- Curative outpatient care, not elsewhere classified (HC.1.3.nec)
- Home-based curative care (HC.1.4)
- Outpatient (HC.3.3) and home-based (HC.3.4) long-term health care

2. Preventive care (HC.6)

3. Part of "medical goods provided outside health care services", which is mostly comprised of medicine purchased outside of health facilities (e.g., pharmacies and markets) or paid separately from the consultation fee (80% of HC.5)

4. Part of health system administration and governance costs (80% of HC.7)

Source: WHO, 2019a

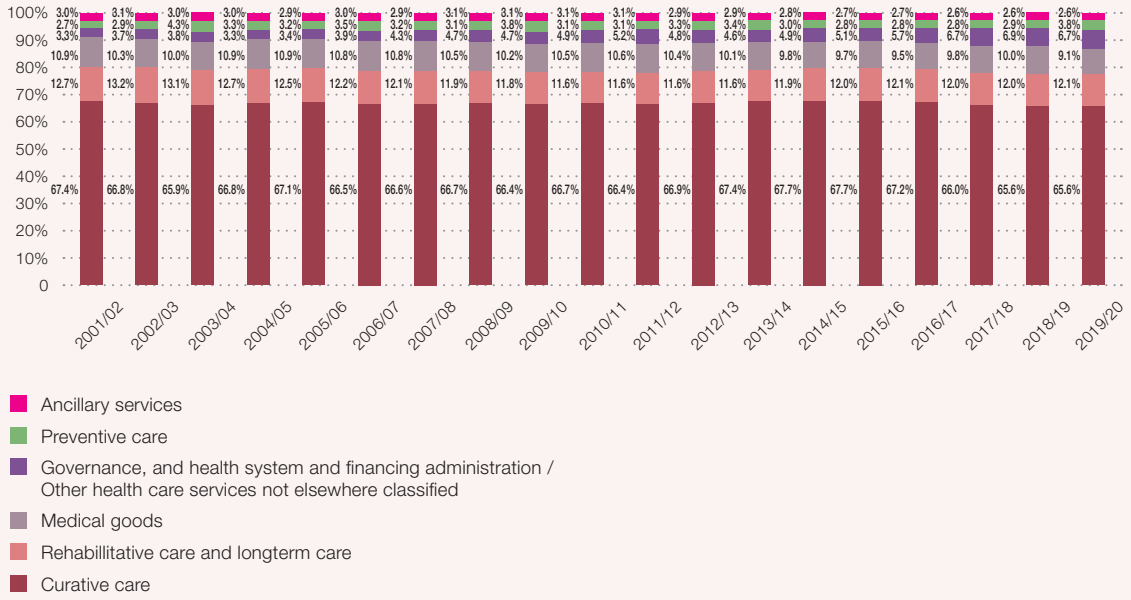
Notably, there is no set global standard for the percentage of health expenditure that a health system should be spending on PHC. Across 88 countries analysed in the 2019 WHO "Global Spending on Health" report, PHC spending ranged **from 33% to 88% of health spending**, with a global **54% average across 88 countries** (WHO, 2019). Part of the rationale for this drastic difference is in the varying availability of funds, historical context, and levels of development across health systems.

3.2.2 HOW MUCH DOES HONG KONG SPEND ON PHC?

The Food and Health Bureau set up the Hong Kong Domestic Health Account (DHA), which compiles data on governmental and non-governmental healthcare expenditure in Hong Kong with reference to the SHA 2011 guidelines (FHB, 2021a). Hong Kong's current healthcare expenditure **by healthcare function** is shown in **Figure 3.6**, in which Hong Kong's health expenditure on preventive care, a key aspect of PHC, has remained around 2 to 3% of the current health expenditure since 2000. Spending on preventive care, however, does not represent total PHC spending in Hong Kong. The way Hong Kong's healthcare expenditure is currently documented does not adopt the definition of PHC spending categories shown in **Box 3.5**, which makes it difficult to generate accurate estimations on PHC spending. Firstly, this method requires a breakdown of outpatient (HC.3.3) and home-based long-term care spending (HC.3.4) from total long-term care spending (HC.3), which is currently unavailable in the Hong Kong DHA. Secondly, the Hong Kong DHA does not currently break down curative care-related outpatient service expenditures along the division of general outpatient and specialist outpatient care, which is critical for estimating PHC spending based on the WHO 2019 definition (FHB, 2021a).

Figure 3.6

Hong Kong's current healthcare expenditure by healthcare function



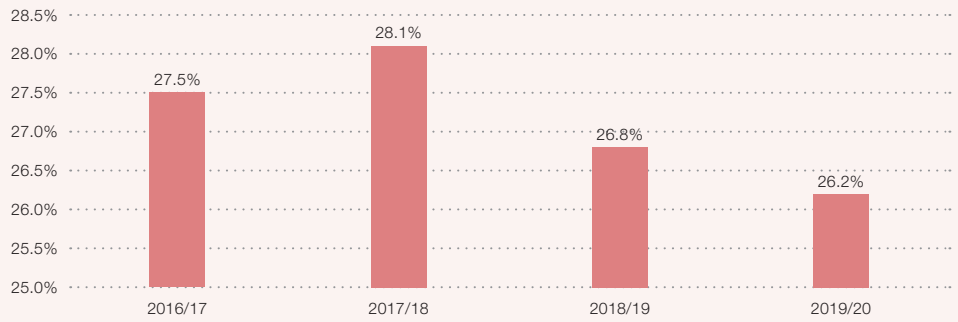
Source: FHB, 2021a

The Bauhinia Foundation Research Center (Bauhinia) estimated Hong Kong's PHC spending in their study report *Enhancing Hong Kong primary healthcare with additional resources and expanded channels* by simply summing up the entire expenditure for ambulatory healthcare providers (HCP.3) and preventive care providers (HCP.6) (Bauhinia, 2019). One significant pitfall of this simplified method is that the PHC spending estimate also includes **specialised outpatient curative care** (HCF.1.3.3), which consists of i) specialised outpatient care, and ii) ambulatory health care (HCP.3) and preventive care (HCP.6) and leads to an overestimation of PHC spending in Hong Kong. At the same time, this PHC spending estimate did not account for key items (e.g. medical goods provided outside health care services; health system administration and government costs) that, according to the WHO 2019 definition **(Box 3.5)**, should be considered in PHC spending estimations. The omission of these items could lead to an underestimation of PHC spending. **Figure 3.10** provides a visualisation of discrepancies between the WHO 2019 definition for PHC spending and the method adopted for estimating PHC spending by Bauhinia (Bauhinia, 2019; WHO, 2019).

Using the same methodology adopted by Bauhinia, we calculated Hong Kong's PHC expenditure over the last three years (2017/18, 2018/19, and 2019/20) using data extracted from the Hong Kong DHA. Findings show that the percentage of Hong Kong's PHC expenditure dropped slightly from 27.5% of the current health expenditure in 2016/17 to **26.2% in 2019/20, lower than the average expenditure of 54% across 88 countries**, as analysed in the 2019 WHO report (WHO, 2019). Meanwhile, the proportion of private PHC expenditure was estimated to be 66.2% of the total PHC expenditure in 2019/20, dropping from 75.1% in 2016/17 **(Figure 3.7 and Figure 3.8)**, **a higher percentage than that of various other OECD countries (Figure 3.9)** (Bauhinia, 2019).

Figure 3.7

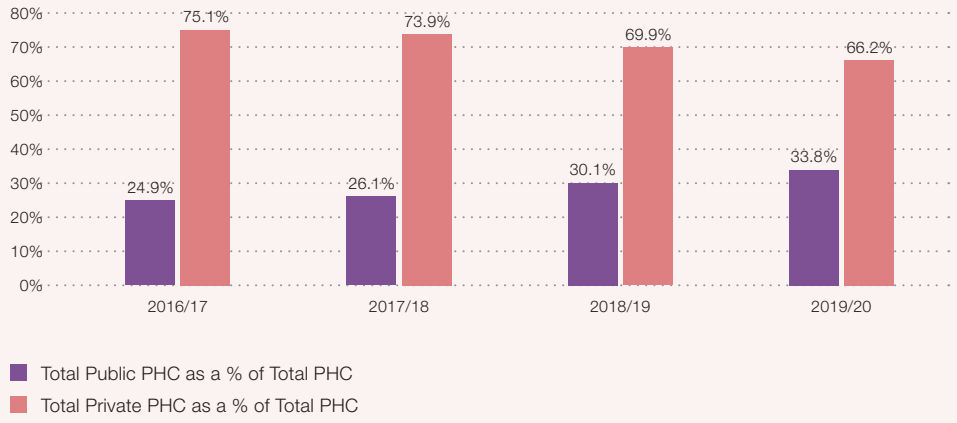
Hong Kong PHC expenditure as a percentage of current health expenditure from 2016/17 to 2019/20



Source: FHB, 2021a

Figure 3.8

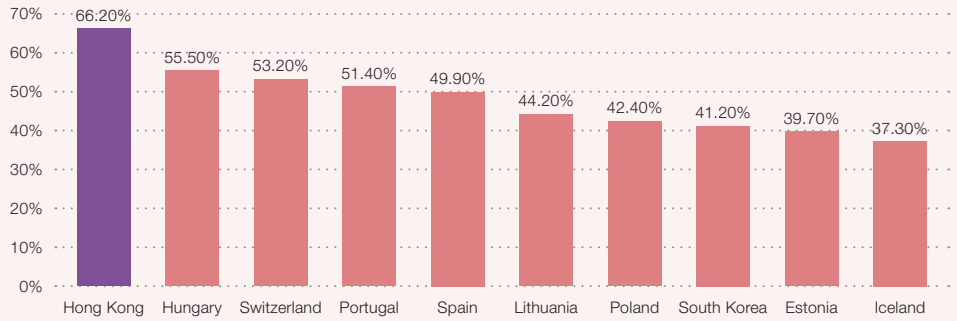
Hong Kong Public PHC expenditure and Private PHC expenditure between 2016/17 and 2019/20



Source: FHB, 2021a

Figure 3.9

Hong Kong Private PHC expenditure in 2019/20 compared to other OECD countries in 2016/17



Note: Hong Kong's private PHC expenditure in 2019/20 was selected because it is the latest available, whilst the latest available data of other OECD countries calculated using the Bauhinia method is only from 2016/17. Hong Kong's private PHC expenditure in 2016/17 is 75.1%, which is still higher than the other OECD countries presented in the same year.

Sources: Bauhinia, 2019; FHB, 2021a

Our observations also suggest that the Hong Kong DHA needs to reconsider presenting health expenditure data in a way that will facilitate **better tracking of our PHC expenditure** with reference to established international standards, such as the WHO 2019 definition on PHC spending **(Box 3.5)**. This will allow timely internal evaluation as well as external references to ensure that developments in Hong Kong are aligned with global trends towards improving primary care access.

Figure 3.10

Main discrepancies between WHO methodology and the Bauhinia methodology in calculating the PHC expenditure[1]

Health care function		Health care provider															
		HCP.1	HCP.2	HCP.3	HCP.3.1	HCP.3.2	HCP.3.3	HCP.3.4	HCP.3.5	HCP.4	HCP.5	HCP.6	HCP.7	HCP.7.1	HCP.7.2	HCP.7.3	HCP.7.9	HCP.8 & HCP.9
		Hospitals	Residential long-term care facilities	Providers of ambulatory health care	Medical practices	Dental practices	Other health care practitioners	Ambulatory health care centres	Providers of home health care services	Providers of ancillary services	Retailers and other providers of medical goods	Providers of preventive care	Providers of health care system administration and financing	Government health administration agencies	Social health insurance agencies	Private health insurance administration agencies	Other administration agencies	Rest of the economy/ Rest of the world
HCF.1	Curative care																	
HCF.1.1	Inpatient curative care																	
HCF.1.1.1	Inpatient curative care (excluding psychiatric care)																	
HCF.1.1.2	Inpatient psychiatric curative care																	
HCF.1.2	Day curative care																	
HCF.1.3	Outpatient curative care																	
HCF.1.3.1	General outpatient curative care																	
HCF.1.3.2	Dental outpatient curative care																	
HCF.1.3.3	Specialised outpatient curative care																	
HCF.1.3.3.1	Specialised outpatient curative care (excluding accident and emergency)																	
HCF.1.3.3.2	Accident and emergency																	
HCF.1.4	Home-based curative care																	
HCF.2	Rehabilitative care																	
HCF.2.1	Inpatient rehabilitative care																	
HCF.2.2	Day rehabilitative care																	
HCF.2.3	Outpatient rehabilitative care																	
HCF.2.4	Home-based rehabilitative care																	
HCF.3	Long-term care (health)																	
HCF.3.1	Inpatient long-term care (health)																	
HCF.3.2	Day long-term care (health)																	
HCF.3.3	Outpatient long-term care (health)																	
HCF.3.4	Home-based long-term care (health)																	
HCF.4	Ancillary services																	
HCF.5	Medical goods [2]																	
HCF.6	Preventive care																	
HCF.7	Governance, and health system and financing administration [2]																	
HCF.9	Other health care services not elsewhere classified																	

Notes: [1] Bauhinia approach; WHO approach

[2] In the WHO approach, only 80% of Medical Goods expenditure (HC.5) and 80% of Governance, and health system and financing administration expenditure (HC.7) are taken into account when calculating the PHC expenditure, as stated in Box 3.5

Sources: Bauhinia, 2019; WHO, 2019a

3.3 PUBLIC PRIVATE PARTNERSHIPS TO IMPROVE PRIMARY CARE ACCESSIBILITY

With less than 30% of total health expenditure spent on PHC of which close to 70% of Hong Kong's PHC spending is in the private sector (with a significant portion from OOP household payments) that remains unaffordable to the lower income population, Hong Kong needs to consider how to make primary care more accessible in progressing towards a primary care-led health system. This entails either "making" (creating services strategically in the public sector) more affordable primary care services accessible in the public sector, or otherwise "purchasing" primary care services in the private sector using public funds and making such services available at a lower price. In addition to planning for increasing primary care service provision in our already overburdened public healthcare sector that dedicates much of its capacity to secondary and tertiary levels of care, as discussed in previous health financing reform documents **(Table 3.2)**, ways to better leverage the capacity of the private sector should be considered. To achieve this, **the Government should consider evaluating and adjusting the allocation of existing resources and purchasing and payment mechanisms for improved accessibility to affordable primary care** so that the population particularly those with chronic diseases are provided with need services.

As discussed in section 3.1, the government's recent health reform policies, including various PPPs, have concentrated on promoting primary care services through engaging the private sector. **Table 3.6** lists primary care services funded by the Government in 2019/20. The expenditure breakdown by services reveal that a large proportion of financial resources have been recently directed towards "purchasing" services in the GOPC-PPP Programme and Elderly Health Care Voucher Scheme (EHCVS), which currently accounts for about 17.2% of the total public expenditure on primary care.

Table 3.6

Primary care services funded by the Government, 2019/20

Service Providers	Service Scopes	2019–20 actual expenditures (HKD million)	Total Share (%)[1]
Hospital Authority	General Outpatient Attendance	3,256.8	**21.1** (87.2)
	Family Medicine Specialist Clinic Attendance	393.8	**2.6%** (10.6)
	GOPC-PPP	82.5	**0.5** (2.2)
Department of Health	Disease Prevention	7,180.7	**46.6** (61.7)
	Health Promotion	415.2	**2.7** (3.6)
	Curative Care	1,134.3	**7.4** (9.8)
	Rehabilitation	150.9	**1.0** (1.3)
	Elderly Health Care Voucher Scheme (PPP)	2,569.7	**16.7** (22.1)
	Vaccination Reimbursement	181.1	**1.2** (1.6)
Food and Health Bureau	District Health Centre	43.6	**0.3** (100)
Total public expenditure on primary care		15,408.5	**100**

Note: [1] Figures in bracket represent the share within the same service providers
Sources: PricewaterhouseCoopers, 2020; HKSARG, 2021a

3.3.1 AN ANALYSIS OF PRIMARY CARE PPPS IN HONG KONG

Public purchasing for private healthcare can be implemented in two main modes: **supply-side financing** and **demand-side financing** **(Table 3.7)**. We provide a Hong Kong case study for each financing mode in the context of enhancing primary care provision below.

Table 3.7

Distinguishing characteristics of supply-side and demand-side financing

	Supply-side	Demand-side
Objectives	Motivate change in health providers to improve individuals' access to health services	Stimulate individuals' (particularly under-served people) demand for health services to increase utilisation of and access to under-utilised services
Beneficiary	Provider	Patient
Tools	Incentives and payment guarantees to providers, such as capitation payment, fee-for-service, performance-based payment, and referral vouchers	Financial subsidies and incentives to individuals, such as vouchers and cash transfers

Sources: Bowser et al., 2016; The World Bank, 2004

3.3.1.1 SUPPLY-SIDE FINANCING CASE STUDY: THE GENERAL OUTPATIENT CLINIC PUBLIC PRIVATE PARTNERSHIP PROGRAMME (GOPC-PPP)

Focusing on the provision of primary care services through private sector family doctors, the GOPC-PPP was first launched in three pilot districts (Kwun Tong, Wong Tai Sin and Tuen Mun) in Hong Kong. The service now covers all 18 districts. Key features of the GOPC-PPP are introduced in **Box 3.6**.

Box 3.6

General Outpatient Clinic Public Private Partnership Programme (GOPC-PPP) Fact Sheet

Launched: Mid-2014

Objectives:

(a) Provide choice to patients for receiving primary care service from the private sector in their community;

(b) Enhance patient access to primary care service;

(c) Promote the family doctor concept;

(d) Help HA manage demand for general/specialist outpatient service; and

(e) Foster the development of the territory-wide Electronic Health Record Sharing System (eHRSS).

Eligibility:

Patients fulfilling pre-defined clinical criteria (with hypertension and/or diabetes mellitus (DM), with or without hyperlipidemia, and are deemed clinically stable) and programme requirements. Patients who have been attending HA GOPC for at least 12 months will be invited to join the programme to receive primary care service from the private sector.

Services for each person:

(a) Up to 10 subsidised consultations each year (at the same GOPC price of HKD 50 per visit), including medical consultations for both chronic and episodic illness;

(b) Drugs for treating their chronic conditions and episodic illnesses from the private doctors at their clinics immediately after each consultation; and

(c) Relevant laboratory and x-ray services provided by HA upon referral by the participating private doctors.

Incentives for provider:

Participating private doctors receive a maximum total payment of HKD 3,510 per patient per year (on a reimbursement basis), which includes the GOPC fee of HKD 50 per consultation paid by patients

Key progress:

- The Programme has now been implemented in all 18 districts of Hong Kong, and nearly 600 private doctors have participated in the Programme.
- More than 40,000 patients have participated in the programme, and more than 680,000 consultations were provided as of the end of June 2021.
- An interim review was undertaken by the HA in 2016.
- A Co-Care service model is introduced in the third quarter of 2021 in which eligibility to this programme is expanded to patients at selected HA SOPCs with stable clinical conditions.

Sources: HA, 2021b, 2021c; HKSARG, 2021c

Overall, the GOPC-PPP has received positive feedback from medical professional bodies, patients, private doctors, and the community partners. The patient satisfaction rate was reported to be 90% in a patient survey in 2017 (Legislative Council Panel on Health Services, 2018b). However, an interim review by the HA published in 2016 pointed out that the drug list was insufficient to address the clinical conditions associated with Diabetes Melltius (DM) and hypertension. The interim review also found that the GOPC-PPP increased the administrative workload of participating service providers, which could have disincentivised participation. Stakeholders engaged by the OHKF research team also identified additional workload and unattractive financial incentives as barriers to private sector participation, particularly as the compensation offered is not perceived to balance out the extra workload **(**see **Chapter 4.1)**.

Separately, an external review journal article published in 2021 from the Hong Kong Polytechnic University discussed some limitations of the GOPC-PPP programme as follows (Lau & Fong, 2021):

- Lack of integrated care to support holistic needs of DM and hypertension patients and patients with more than one chronic disease
- Patients must pay additional out-of-pocket expenses for items not covered in the programme, including medications
- Lack of quality standardisation of private providers

In moving forward, the identified challenges highlighted in relation to the GOPC-PPP scheme highlights the need for various areas of improvement that should be considered, including the need for redesigning for integration of services for chronic diseases management, reviewing the incentives to motivate participation of suitably trained doctors, and the quality assurance mechanisms.

3.3.1.2 DEMAND SIDE FINANCING CASE STUDY: THE ELDERLY HEALTH CARE VOUCHER SCHEME

Launched as a pilot in 2009 and regularised in 2014 as a recurrent programme, the EHCVS adopted the concept of "money follows the patient" to allow eligible Hong Kong individuals aged 65 or above to choose private primary care that best suits their health needs, including preventive care, with an annual voucher amount of HKD 2,000 (FHB, n.d.-a). Key features of the EHCVS are introduced in **Box 3.7**.

Box 3.7

The Elderly Health Care Voucher Scheme (EHCVS) Fact Sheet

Launched: 1 January 2009 as a pilot and became recurrent in 2014

Objectives: To promote the family doctor concept and enhance primary care service access for the elderly by providing financial incentives to choose private sector services, including preventive care, that best suit their health needs

Eligibility:

As of 1 July 2017, the age of eligibility is 65 years and above

Services covered:

- Private primary care, including preventative care
- Optometry services (with a cap of HKD 2,000 every two years)

Key progress:

- The annual voucher amount was raised from HKD 250 to HKD 500 in 2012, then to HKD 1,000 in 2013, and finally to HKD 2,000 in 2014.
- In 2018 and 2019, each person was provided an additional voucher amount of HKD 1,000 on a one-off basis.

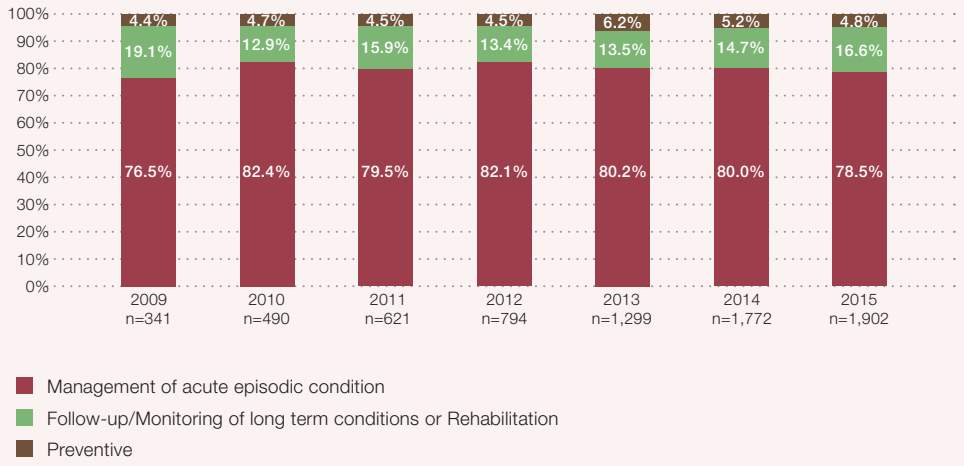
Source: FHB, n.d.-a

Despite an impressive ever-use rate of 98% of all eligible individuals in 2020, the actual voucher claim patterns suggest usage that do not align with initial goals to share health demand between the public and private sectors (HKSARG, 2021b). Although the EHCVS seeks to promote the older population's use of preventive primary care, such services are underutilised amongst voucher users. DH released a review report in which synthesised information from various sources, including studies conducted in collaboration with The Jockey Club School of Public Health and Primary Care of the Chinese University of Hong Kong (CUHK-JCSPHPC) to assess the knowledge and attitudes of elderly persons and healthcare professionals on the EHCVS, and the impact of voucher usage on primary healthcare services for elderly persons. The results demonstrated that whilst 42% of EHCVS users had visited enrolled healthcare service providers (EHCPs) for preventive healthcare services in 2019, a greater portion of elders (68%) used vouchers for managing acute episodic conditions rather than preventive care (42%) (FHB, 2019). There is also no evidence of significant behavourial change from public to private primary care service usage amongst voucher users (Yeoh et al., 2020). On the other hand, the cost for the Government in providing primary care services is HKD 3.1 billion in year 2018/19 for the whole population, as compared with the total voucher amount claimed (for elderly population aged 70 or above) at HKD 2.8 billion in 2018. Effectively, the public investments in primary care has increased by 90% with the voucher programme, but without significant changes to end-users' behaviours. **Box 3.8** further illustrates major findings from the EHCVS review report.

Studies on the EHCVS affirm the long-standing belief that concerted efforts from the Government and the healthcare sector in Hong Kong are needed to further cultivate a culture of primary care and its preventive benefits. Also, a designated voucher for preventive care services would help to enhance the uptake for early disease detection and management.

Figure 3.11

Percentage of elders using Elderly Health Care Vouchers who had made at least one visit by principal reason for visit, 2009–2015



Note: Figures do not add up to 100% as the elders can seek services from more than one category of service in a year
Sources: FHB, 2019; HKSARG, 2020c

Box 3.8

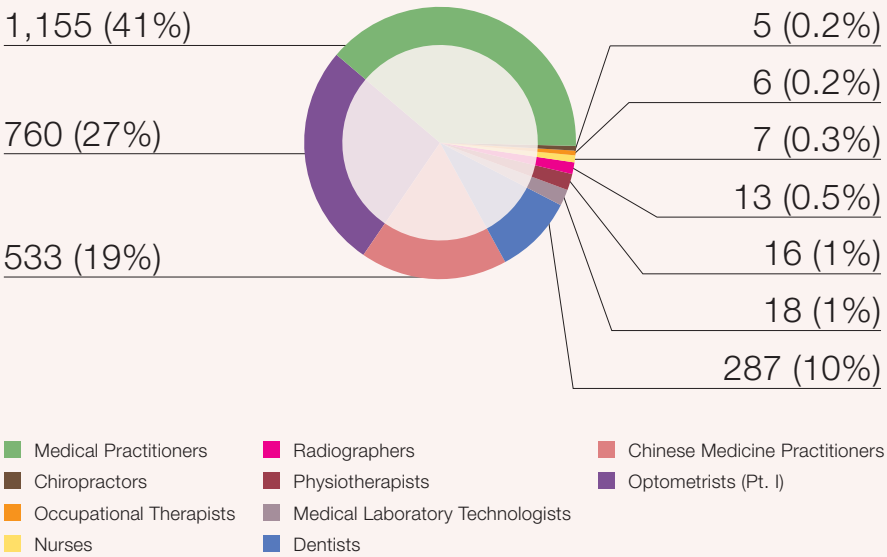
Highlights from the Report on the review of the EHCVS

Key policy issues in the design of the EHCVS

Voucher usage is biased towards managing acute episodic conditions
A recent response from the FHB at the Legislative Council revealed that the scheme has yet to effectively mobilise the older population toward using services in line with the PHC Reference Framework. Furthermore, the scheme has not increased their awareness of preventive care and healthy living. More efforts would therefore be in place to enhance health promotion.

Uneven claims for private healthcare professional service types
Some patients were unaware of the wide range and broad service scope of primary care, as found in focus group studies amongst healthcare professionals. This has caused an imbalanced distribution of voucher utilisation skewing towards medical practitioners (41%), optometrists (27%), Chinese Medicine Practitioners (19%) and dentists (10%). Allied health services such as occupational therapy and physiotherapy are underutilised, despite their close linkage to holistic primary care.

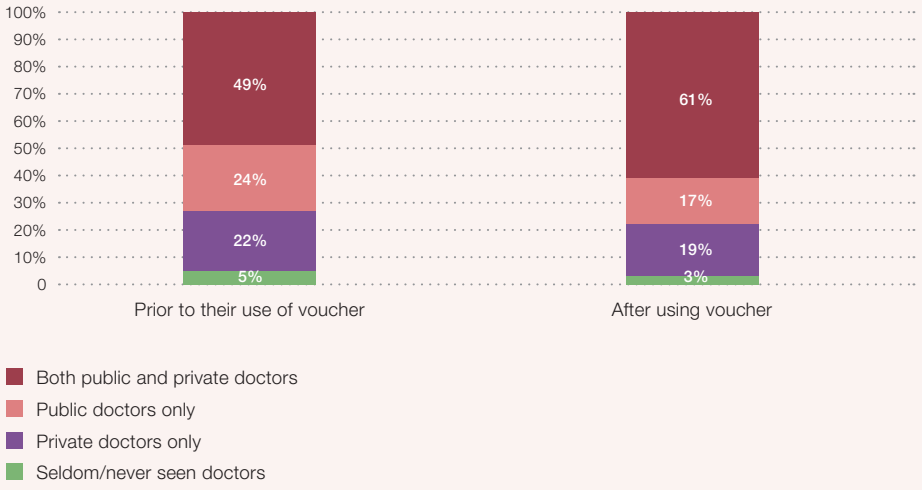
Distribution of voucher amount claimed (in HKD million) by types of healthcare services in Hong Kong, 2018



Ambiguous results on shifting demands from public to private sectors

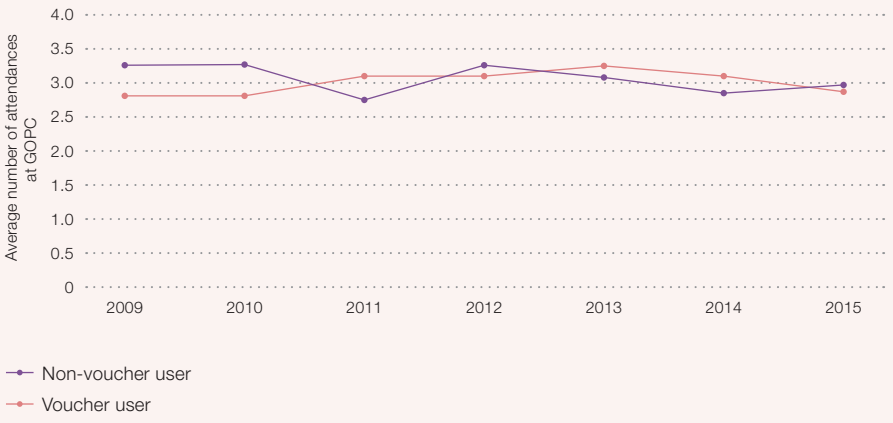
The older population's tendency to consult either private or public doctors has declined, but dual utilisation of both public and private sectors has increased from 49% to 61% amongst voucher users.

Did you usually consult public doctors or private doctors or both for general illness? (n=905)



The average attendances at the HA GOPCs between those who used vouchers for private sector medical consultation and those who have not used vouchers were not significantly different, suggesting that there seems to be no apparent relief of the pressure in the public sector as a result of the EHCVS.

Average attendances at GOPC for those who used vouchers for private Western medical consultation (voucher users) and those who did not (non-voucher users), from 2009 to 2015 (N=551)



Sources: FHB, 2019; Yeoh et al., 2020

3.3.2 EVALUATING HONG KONG'S EFFORTS IN PPP PROGRAMMES

The development of PPPs in Hong Kong using publicly funded, privately-provided service models have generally been in response to demand pressures. **Table 3.3** reveals that service provision of current programmes spans a broad range from primary care, elderly care, and health promotion to general surgery, cancer treatment and screening. The programmes are largely disease-oriented and some focus on disease prevention. It is not evident that design of these PPPs are consistent with the concept of strategic purchasing that seeks to maximise health system objectives in meeting population health needs and through improvements and performance of healthcare providers. Analogous to the review of international practices in Chapter 2, this section reviews the PPPs in Hong Kong according to the synthesised framework of strategic purchasing which consists of five components: addressing population health, ensuring citizen and patient empowerment within the health system, strengthening governance through efficient stewardship and capacity to ensure accountability, developing effective purchaser and provider organisations, and incorporating cost-effective contracting (Klasa et al., 2018).

Population health

Identifying population health needs and incorporating them into the purchasing process is a core element in strategic purchasing decisions. However, in existing PPPs, there does not appear to be a **planning framework for analysing population health needs** to guide the design and development of PPPs, which will increase the health system's ability to tackle changing health needs in the medium-to-long term. Most PPPs are designed to fill existing and foreseeable service gaps in light of growing service demand, targeted at individual patients and specific diseases, but not populations.

With more than 40,000 participants as of June 2021, the GOPC-PPP is an encouraging effort to address the escalating burden of chronic disease through enhancing primary care provision by diverting primary care service load from the public into the private sector. However, the service scope is limited to only patients, with hypertension and/or DM, with or without hyperlipidemia deemed clinically stable, already using HA services. The restrictive eligibility requirements are inadequate to meet PHC needs of the entire population.

At the same time, the EHCVS presents citizens aged 65 years and above with an additional choice to use subsidised primary care services in the private sector (HKSARG, 2020c). However, the vouchers have been mainly utilised for acute episodic care and not for chronic disease management and have encouraged dual utilisation of both public and private care. There are also no similar schemes designed for populations from other age groups that will incentivise primary care uptake, and in particular, none for younger age groups wherein chronic health conditions are deemed to be more preventable and early detection allows for more timely intervention.

Citizen empowerment

Citizen empowerment is achieved through ensuring that **patients' views and values are asserted, purchaser accountability is enforced, and that citizen choice is increased** (Klasa et al., 2018). The strategic purchasing framework advocates that government and purchasers should ensure that citizens' and patients' values, views, and choices are accounted for. To do so, citizens should be allowed input on their benefit package, their choice of provider, and ability to hold purchasers and providers accountable for services offered.

While Hong Kong PPPs provide patients with an extensive choice of service providers, the level of citizen participation in determining the benefits of PPP programmes is limited. In

Hong Kong, complaint mechanisms are generally in place for professional misconduct, particularly in the public sector. Purchasers' accountability is limited due to limited citizen participation in designing and making purchasing decisions in PPP programmes and inadequate quality management of private providers. To strengthen citizen and patient empowerment, purchasers' accountability should be strengthened.

Regarding beneficiary choice, the two primary care PPP programmes have divergent characteristics on patient choice that indirectly impact the patient health outcomes, behaviours and ability to manage their health conditions. For the GOPC-PPP, barriers for private doctor participation such as additional workload and unattractive financial incentives could in turn limit patients' choices of primary care service providers they could seek care from in the private sector. On the other hand, the EHCVS enables patients to use services from a broad spectrum of healthcare providers, from medical practitioners, Chinese medicine practitioners, to optometrists. While citizens enjoy having the choice to choose from a wide array of primary care service providers, without enough guidance and information, the lack of targeted and clear benefit package design of the EHCVS has manifested into misuse of voucher credit for products and services beyond the intended scope of private sector primary care provision. For example, a previous review found that EHCVS participants mostly used the voucher for managing acute episodic conditions (HKSARG, 2020c). Feedback from beneficiaries was that the voucher amount was not adequate for chronic disease management and participants were not familiar with the range of preventive service available. This reflects the lack of consideration for the most relevant needs of citizens for preventive care and chronic disease management that could have been solicited from a citizen-participatory design process.

Strengthen government stewardship & capacity

To build an effective strategic purchasing system, the **regulation and monitoring of purchasers and providers to ensure that they are meeting health objectives** is the key. To achieve these goals, health systems adopt an **integrated and centralised framework** that builds upon explicit contractual terms, and ensures enough government credibility to enact and enforce change should further current purchasing arrangements be insufficient for achieving health goals.

There does not appear to be a defined regulatory framework with predefined monitoring mechanisms of PPPs in Hong Kong. As a result, the role delineation between purchasers and providers remains without a regulatory framework which defines the roles of different purchasers and the obligations of providers (contractual enforcement could be problematic).

Furthermore, government evaluation of PPPs are not transparent given that the latest publicly accessible reports are relatively dated. Amongst analysed PPPs, evaluations published by academic institutions applying a structured evaluation framework are the HD PPP study conducted by the University of Hong Kong between 2014-2016, the Elderly Health Care Voucher Scheme review conducted by The Jockey Club School of Public Health and Primary Care, the Chinese University of Hong Kong (CUHK-JCSPHPC) in 2020, the only other independent review of HA's PPP programmes was conducted by the Audit Commission and released in 2012. Recommendations of this independent review are summarised in **Box 3.9**. Authors of the HD PPP Study highlighted that the need for a formal, independent and rigorous evaluation for the programme to reach its desired goals on patient care, supporting the importance of regular evaluation (Chen et al., 2016).

Given Hong Kong's fragmented and pluralistic health system, and the large proportion of private financing for PHC, the Government's current capacity to monitor the performance of primary care PPP providers is foreseeably limited and must be enhanced in a regulatory framework.

Developing effective purchaser & provider organisations

Within a strategic purchasing framework, continuous shifts in needs, demands, funding priorities, treatment options, medicines, and individual and provider behaviours need to be anticipated. This necessitates strategic purchasing agencies to respond to changing contexts and dynamics of the health system promptly and appropriately to **manage the alignment and dynamics of various changing factors** (WHO, 2017b). Accountability and greater transparency are important for both purchaser and provider; therefore, expectations for each participating stakeholder and health system goals should be made explicit. However, stakeholders and a review of PPP programmes have reported unclear standardisation of the private sector services with services in the public sector (Lau & Fong, 2021).

Box 3.9

Audit Review on Hospital Authority's public-private partnership programmes

Released: 28 March 2012

Selected recommendations:

- Devise a mechanism to assess the overall development of PPP programmes and consolidate experience
- Monitor the patients and healthcare providers' take-up and drop-out rates while taking follow-up actions
- Establish a fee-setting framework, thoroughly test market sensitivity and improve the cost-effectiveness of PPP programmes
- Improve risk management with private service providers and step up the monitoring of service delivery
- Further promote the use of electronic records and platforms to enhance cross-sectoral collaboration
- FHB to stipulate detailed terms for conducting independent evaluation on PPP programmes in good time
- HA and FHB to develop more holistic performance indicators instead of being solely output-driven

Source: Audit Commission of the HKSARG, 2012

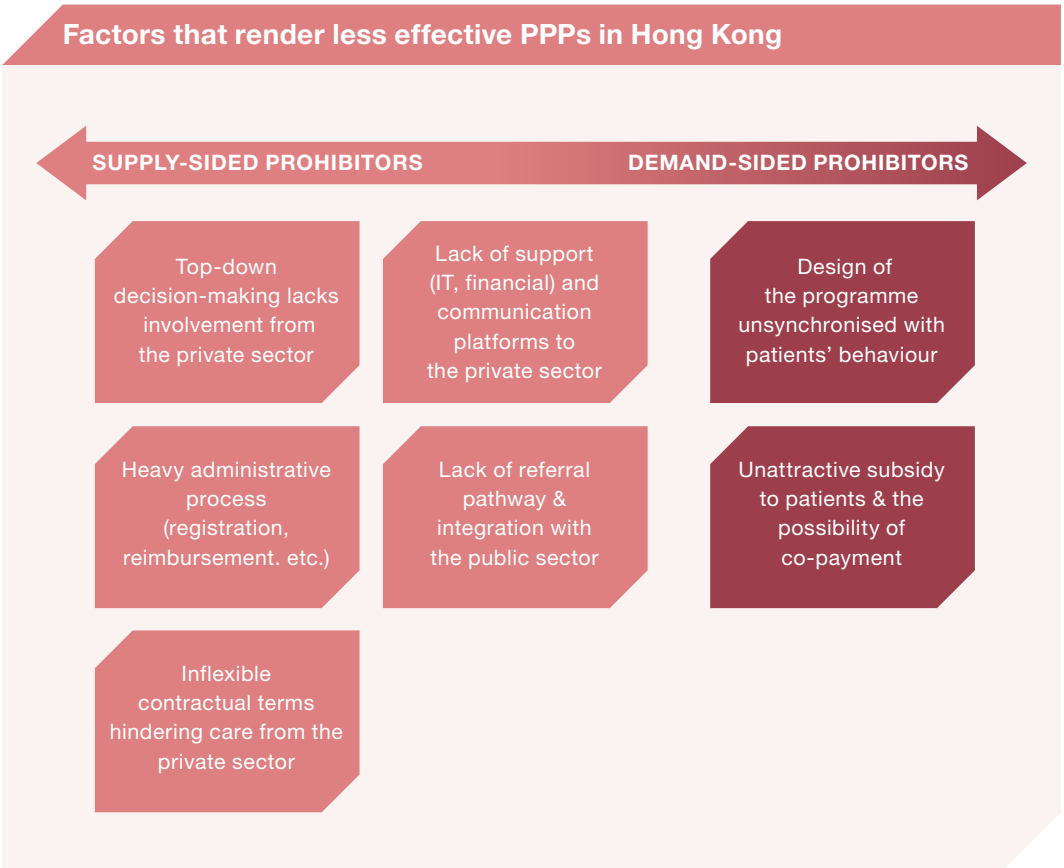
Incorporating cost-effective contracting

Policy clarity and **definition of the contracting** process (in other words, the payment system and financing mechanism between purchasers and providers) is a key component of strategic purchasing (Klasa et al., 2018). An ideal contract will have terms and criteria, as well as measurements of its effectiveness, that are based on evidence, premised on the availability of a health system's data on health status, health needs of its populations, and the efficiency of existing health programmes and service models. Provider payment systems must align with benefit package design, and due consideration should be given to the **transfer of risk** from the purchaser to service providers and communication to both parties, as well as patients (Nachtnebel et al., 2015). Risk-sharing mechanisms are not explicit and the Director of Audit pointed out the need to improve risk management.

While there is no clear definition of "good contracting" within Hong Kong's existing PPP practice, a number of **supply-side and demand-side factors** have not been strategically addressed to promote PPP participation from providers and users. This contributes to a lower participation of providers than intended. **Figure 3.12** summarises how various supply-side prohibitors such as heavy administrative processes, and demand-side factors such as unattractive subsidies for patients, contribute to less effective PPPs. In general, the two primary care PPPs experienced similar barriers to participation, in particular, unattractive provider incentives and restricted drug coverage for the GOPC-PPP programme (Wong et al., 2015).

Figure 3.12

Factors that render less effective PPPs in Hong Kong



In sum, we conclude that Hong Kong's current PPP programmes do not meet the definitions of strategic purchasing due to the aforementioned pitfalls. As discussed in **Chapter 2**, effective strategic purchasing programmes entail multidimensional policy issues from governance, information system support, benefit design, payment means, alignment and dynamic management. In light of these key enablers, the refinement of existing PPPs and development of new PPPs should strive to meet these criteria. In particular, in exploring the introduction of PPPs to promote primary care uptake, the Government should draw up a cohesive and evidence-based policy framework for using PPPs that is coupled with consistent follow-up and review mechanisms to ensure that PPPs are in line with WHO strategic purchasing principles.

3.4 CONCLUSION

With the private sector contributing to most of the PHC spending, our analysis indicates that Hong Kong's public sector is not investing in PHC sufficiently or strategically. Given Hong Kong's ageing population, it is of great urgency that the local health system moves beyond reliance on the already overburdened public sector in the provision of primary care services. Instead, our government has been committed to engaging the private sector with PPPs as one of the main actions, and has invested a large amount of the government budget comparable to spending on public healthcare services. However, the development of PPPs in Hong Kong is largely fragmented and short-sighted, with barriers acting to hinder patient and provider participation that need to be overcome in future PPP plans. There is a need to consider strategically purchasing primary care services to better allocate existing resources without relying on a drastic increase in current health expenditures.

Based on the review of recent developments in health financing policies and lessons learnt from existing initiatives to improve the sustainability of Hong Kong's health system, we present a proposal in **Chapter 4** that utilises strategic purchasing principles to move Hong Kong closer to a primary care-led health system. Specifically, we propose a scheme that aims to encourage the screening and management of prevalent chronic conditions (specifically hypertension, hyperglycaemia (diabetes), and hyperlipidaemia, collectively termed HDH). This proposal stands in line with latest Government directions to shift the health system toward a prevention-based orientation.

4 Applying Strategic Purchasing to Chronic Disease Screening and Management

The previous chapters have established strategic purchasing as an effective health financing lever that facilitates progress towards achieving universal health coverage. In Hong Kong where the health system is making important strides forward in primary healthcare (PHC) development, strategic purchasing can be applied to better leverage existing resources for improving primary care accessibility continuity, affordability, and uptake in advancing to a fit-for-purpose health system. In particular, the characteristic segmentation between public and private sectors means that strategic purchasing can be applied to better leverage private sector capacity for it to play a complementary role in achieving health system goals. In this chapter, **we assess the feasibility of applying strategic purchasing as a governance tool propel PHC development in Hong Kong.**

An important aspect of PHC is the role in early detection of disease enabling timely quality care to delay disease progression, and allows for earlier disease management to prevent complications that may reduce hospital care burden and costs in the long-run **(Box 4.1)**. While government-initiated population screening programmes currently exist, such as the Colorectal Cancer Screening Programme and the Community Care Fund Pilot Scheme on Subsidised Cervical Cancer Screening and Preventive Education for Eligible Low-Income Women, these programmes are primarily cancer-focused with suboptimal uptake rates, and are generally not designed to detect prevalent chronic conditions, such as high blood pressure, high blood glucose, and high blood lipid levels.

Box 4.1

Disease screening and its benefits

Screening is a key mechanism for controlling and stymying the burgeoning chronic disease burden. Screening typically is a means of **detecting disease at earlier stages, providing patients more time to delay or even prevent its onset, and opening more options to patients for treatment and management of their condition** (Lee et al., 2016). Management of chronic disease may aid in preventing the escalation of symptoms, thereby reducing the likelihood of requiring more invasive medical procedures to maintain a steady level of health. Thus, health system planners must proactively improve its prevention and management efforts for building long-term health to stem the manifestation and growth of chronic diseases.

Screening can provide long-term economic savings and health benefits (Kaczorowski et al., 2011; Strong et al., 2016; Zelen & Feinleib, 1969). By delaying the development of multi-morbidities and complications associated with chronic diseases, the direct costs of hospital utilisation, accident and emergency (A&E) visits, and out-of-pocket payments (OOPs) can be reduced (Sambamoorthi et al., 2015). In fact, several studies have demonstrated a positive relationship between health expenditure and instances of multi-morbidity due to chronic disease interaction. For instance, the cost of care skyrockets due to the increase in usage of polypharmacy (multiple medications) in which adverse drug events can render significant costs to the health system (Lehnert et al., 2011).

To fill this gap, we first recommended that the Government consider a subsidy scheme for population screening and management of chronic diseases in our 2016 report *An Investment for the Celebration of Aging*. Taking into account the Government's more recent efforts in promoting PHC and drawing reference from international strategic purchasing practices, we further develop the recommendation to propose **a Chronic Disease Screening Voucher and Management Scheme (CDSVMS, addressed as "Scheme" thereafter) targeted at the population aged 45 years and above.** Targeted conditions for screening include Hong Kong's three most prevalent chronic diseases, namely diabetes (DM), hypertension and hyperlipidaemia (collectively termed "HDH"). Proposals of chronic disease management care pathways will also be explored.

We conducted multiple studies to assess the potential of applying strategic purchasing to Hong Kong's health system and the feasibility of the Scheme. We interviewed **key stakeholders**, including healthcare service providers, patient group representatives and policymakers to collect their views **(Chapter 4.1)**. We also garnered **citizens' perspectives** by conducting a population-based telephone survey **(Chapter 4.2)**. Furthermore, we conducted a simplified **Budget Impact Analysis (BIA)** on the Scheme as an illustration of the potential impact that implementing strategic purchasing could have on healthcare spending in Hong Kong **(Chapter 4.3)**. Work presented in this chapter was completed with support from the Public Policy Research Funding Scheme of the Policy Innovation and Co-ordination Office (PICO) in the HKSAR Government (Project number: **2020.A4.068.20B**).

4.1. THE VOICES OF LOCAL HEALTHCARE EXPERTS

The unique perspectives of key stakeholders in Hong Kong's health system are important in identifying the key challenges and feasible ways forward for a health system transformation. In view of this, OHKF and the Centre for Health Systems and Policy Research of The Jockey Club School of Public Health and Primary Care, Faculty of Medicine, the Chinese University of Hong Kong (CUHK-JCSPHPC) conducted a series of in-person interviews with key stakeholders in the local health system to better grasp the most urgent and pertinent issues in Hong Kong's health system, and in particular, their views on our strategic purchasing proposal, including their attitude and perception towards the proposal, the availability of resources, considerations for successful implementation, and the potential impact of the proposal. The interviewees came from an expansive range of decision-making roles and positions, including policymakers, government officials, front-line service providers from both public and private sectors, leaders from non-governmental organisations (NGOs), corporate players from the insurance sector, patient group representatives, and academics with medical and social expertise **(Table 4.1)**. Discussions mainly revolved around five critical themes: health system fragmentation, health financing, PHC development, strategic purchasing, and the proposed Scheme as a principal recommendation of this policy report **(Table 4.2)**.

4.1.1 THE INTERVIEWEES

A total of 27 key stakeholders took part in interviews that were jointly completed by OHKF and CUHK-JCSPHPC between April and August 2020. The stakeholders consisted of 15 key stakeholders from 13 institutions **(Table 4.1)** and 12 PHC service providers in solo or group practices at NGOs, the District Health Centre (DHC), general out-patient clinics (GOPCs) of the Hospital Authority (HA) and private medical institutions. All interviews were recorded and transcribed verbatim in their conducted languages (and translated where necessary) by independent contractors. Two primary researchers and two assistant researchers were involved in coding and conducting a thematisation of the transcripts involving cross-checking and discussion. The interviews strictly followed standards under the ethical approval of the Survey and Behavioural Research Ethics Committee of the CUHK (Reference number: SBRE-19-117), and verbal/written consent was sought from all interviewees.

Table 4.1

Affiliations of institutional stakeholders engaged in this research, 2020

Key stakeholders	ASIA INSURANCE
	AXA HONG KONG AND MACAU
	CUHK MEDICAL CENTRE LIMITED
	HEALTH IN ACTION
	HONG KONG ACADEMY OF MEDICINE
	HONG KONG COLLEGE OF FAMILY PHYSICIANS
	HOSPITAL AUTHORITY
	KWAI TSING DISTRICT HEALTH CENTRE
	KWAI TSING SAFE COMMUNITY & HEALTHY CITY ASSOCIATION
	LEGISLATIVE COUNCIL OF THE HKSAR
	THE CHINESE UNIVERSITY OF HONG KONG
	THE HONG KONG ACADEMY OF NURSING LIMITED
	THE UNIVERSITY OF HONG KONG

4.1.2 INSIGHTS BY THEME

Table 4.2

Themes extracted from the key stakeholder interviews

Theme 1. Reviewing health system fragmentation	
Subtheme 1.1	Our public healthcare system is overburdened.
Subtheme 1.2	The role of the private sector is yet to be fully leveraged.
Subtheme 1.3	There is a need for means to bridge the fragmentation in Hong Kong's health system.
Theme 2. Propelling primary healthcare development	
Subtheme 2.1	Developing primary healthcare is important in alleviating our overburdened health system.
Subtheme 2.2	The Government has a key role in further advancing primary healthcare development.
Subtheme 2.3	A multi-pronged approach to advance primary healthcare development is recommended.
Theme 3. Improving existing health financing mechanisms	
Subtheme 3.1	The way our health system is financed needs to be better organised to alleviate burden on the public sector and maximise health system performance.
Subtheme 3.2	The opaque pricing of private healthcare services is a challenge to improving health financing mechanisms.
Subtheme 3.3	Strategies to improve mechanisms within existing health financing system
Theme 4. Investing in strategic purchasing as a health financing lever	
Subtheme 4.1	Successful strategic purchasing requires comprehensive policy and regulation.
Subtheme 4.2	Planning, engagement, and well-planned logistics are keys to success.
Subtheme 4.3	Potential limitations of Public-Private Partnerships (PPPs) should be addressed.
Theme 5. Meticulous planning is necessary for effective implementation of the Scheme	
Subtheme 5.1	A long-term vision is needed for the design of vouchers as a health financing tool.
Subtheme 5.2	A chronic disease screening voucher will be useful for promoting primary healthcare.
Subtheme 5.3	Management plans after screening need to be well-designed to achieve a desirable impact.

Theme 1. Reviewing health system fragmentation

Subtheme 1.1 – Our public healthcare system is overburdened. The pluralistic health system in Hong Kong has failed to balance resources between the public and private healthcare sectors. The public sector, albeit with similar physician numbers to the private sector, is burdened with a much heavier load of inpatient care and other administrative tasks.

Stakeholders' voices

Problems of the public system include too much constraint, too much hard work, too bureaucratic.

Private service provider

We all know roughly only about half of the doctors in Hong Kong are serving the Hospital Authority, which looks after 90% of all the patients. This is unhealthy; this is not good enough.

Professional body representative

Adding to the overburdened public sector are the **unfavourable health-seeking behaviours of Hong Kong citizens**. Inaction in early manifestations of sickness increases the costs and resources required to treat health problems at later stages. The preference of specialists over generalists is also believed to drive up avoidable healthcare demand in public hospitals.

Stakeholders' voices

Hong Kong people tend to wait until really late, when their problems are really bad, and then they go to find solutions.

NGO representative

The system is skewed towards the specialist setting of the health system. No matter in the community, private or public settings, specialist doctors are always dominant.

NGO representative

Hong Kong people always prefer specialists. If they cannot afford the services provided by private specialists, they would go to the public sector. They are not content with the care of generalists in private clinics.

Patient group representative

Inadequate education on primary care for both citizens and professionals, and the importance of early health-seeking were cited as contributors to the behaviours observed. Interviewees highlighted the imminent need to improve health literacy in the population.

Stakeholders' voices

> This is a big issue, and you can't have a quick fix for it (PHC development), because it is not just the service provision itself, it is concerning... people's mindset [to push PHC development]. Not only the mindset of the Hong Kong citizens, but also the mindset of all professionals. So, it is a very difficult situation, and it takes time to change them.
>
> *NGO representative*

> Hong Kong people have not grown accustomed to family doctors, and it is hard to force them to have one immediately. This problem can only be resolved with further education about our healthcare system.
>
> *Patient group representative*

Subtheme 1.2 – The role of the private sector is yet to be fully leveraged. With roughly half of the total number of doctors in Hong Kong, the private sector has much to offer if its resources were to be more strategically allocated. Yet, stakeholders mentioned and criticised restrictions on the flow of both patients and physicians between the public and private sectors, which they deemed as the major causes of resource duplication. They **called for the removal of these barriers to enhance the role of private institutions in healthcare delivery.**

Stakeholders' voices

> It really, I think, requires a very fundamental change of mindset of thinking the two systems as separate. I think we need to reconsider the two as part of the same system... and rethink how we can channel resources and patients and services to the other parts of the system, and at the same time how we can actually link them (the public and the private sector) together.
>
> *Academic*

> I think the solution is either to give the Hospital Authority more money, which is difficult, or try to engage the private sector a bit better.
>
> *Professional body representative*

> The Government should allow patient flow between the public and private sectors. The clear separation between the two systems prohibits public hospitals from taking care of private patients and vice versa.
>
> *Academic*

Comprehensive regulations are in place in the public sector to protect patient safety and enhance efficiency. These measures, however, are less prominent in the private sector. The practice of private physicians is mainly under the supervision of the **Medical Council of Hong Kong (MCHK)** and the **Department of Health (DH)** under physicians' affiliated institutions according to the newly passed *Cap. 633 Private Healthcare Facilities Ordinance* **(Box 4.2)** which started in January 2021. This legislation has already been criticised for its lack of regulation on broader areas such as pharmacies and it has been resisted by professionals in the private healthcare sector. Regulation in the private sector will be a key issue to address in order to implement the Scheme successfully.

Stakeholders' voices

We have a lot of so-called supervision, regulation, monitoring systems, audit systems in the public sector, but we never have those in private hospitals or in private practices. They are just governed by the professional Councils and then it (the governance) is very [regressive].

NGO representative

Hong Kong's private doctors essentially are very powerful, and they will resist all kinds of regulation, both from the insurance company or the Government.

Academic

The Department of Health will start to regulate private hospitals, day surgery centres and clinics step-by-step starting January 2021. However, they will just regulate the structural component. They are not going beyond that to other areas such as drug sales and distribution, information and data privacy, etc. The Government should also think about how to coordinate its regulatory actions.

Academic

Box 4.2

Brief summary of *Cap. 633 Private Healthcare Facilities Ordinance*

Background:

- Enacted into Law in November 2018
- Provides a new regulatory regime for private healthcare facilities (PHFs) with registered medical practitioners and/or dentist practice

Key licensing requirements:

- Appointing a Chief Medical Executive
- Complying with the requirements of the Ordinance, Conditions of Licence and Code of Practice issued by the Director of Health
- Implementing a Complaints Management System
- Adopting measures on price transparency as follows:

	Hospital	Day Procedure Centre	Clinic
Provision of Fee Schedules / Price Information	✓	✓	✓
Provision of Budget Estimate	✓	–	–
Disclosure of Historical Bill Sizes Statistics	✓	–	–

Source: DH, 2019

Subtheme 1.3 – There is a need for means to bridge the fragmentation in Hong Kong's health system. The problem of fragmentation in our health system was highlighted in our report *Fit for Purpose: A Health System for the 21st Century* (OHKF, 2018). In this series of interviews, our stakeholders provided a myriad of solutions to the aforementioned problems, amongst which the adoption of **an integrated multidisciplinary approach** has been repeatedly emphasised. These disciplines are not limited to healthcare or social professions such as nurses, allied health professionals and social workers. An integrated approach may involve parties within the greater sphere of patient care, such as pharmaceutical companies, insurance providers, and patient groups.

Stakeholders' voices

The Government should inject money into the Hospital Authority with a clear intention for hiring more social workers and health promoters into all hospitals' patient resource centres. Not doctors, not nurses, not physiotherapists, but social workers.

Academic

Any idea suggested by any single stakeholder, be it hospitals, clinics, or pharmaceuticals, will not work. They need to cooperate with pharmaceuticals and insurance providers.

Private service provider

Our stakeholders also identified information sharing as a crucial step in linking fragmented parts of the system. The Hospital Authority, with its enormous yearly patient flow, can provide invaluable data for private and research institutions. However, gaps remain in our current system and **the Electronic Health Record Sharing System (eHRSS) could be further leveraged to promote system integration.**

Stakeholders' voices

Whenever information is entered, it's not logged in real-time. That means once a healthcare person entered the information, it would have to wait a few days before it's updated in the system. Many issues exist in the eHRSS system, hindering communications between public and private sectors.

Professional body representative

Theoretically, the Hospital Authority stores massive amounts of data. Their data most accurately reflects reality as almost everyone utilises public services.

NGO representative

Theme 2. Propelling primary healthcare development

Subtheme 2.1 – Developing primary healthcare is important in alleviating our overburdened health system. The healthcare burden due to non-communicable diseases is burgeoning against the backdrop of a city home to a rapidly ageing population. These diseases entail serious complications, hence the need for frequent care in hospitals and clinics. In order to relieve the anticipated healthcare demand as expressed by stakeholders, Hong Kong should **take upstream approaches such as implementing prevention-oriented policies within a PHC framework.**

Stakeholders' voices

The elderly [suffering from non-communicable diseases] will take up more hospital beds and push up patient numbers. They are admitted frequently too.

Patient group representative

Chronic illness is still the most important... One in ten people are diabetic, one in four adults [are] hypertensive, one in three [have] high cholesterol... This is a growing time bomb. By 2025, one in four people will be more than the age of 65. I mean, these are such cliched data that everybody's talking about already. With increasing elderly population, these percentages will increase.

Private service provider

I think we (stakeholders collectively) really need to address the age-related issues that are happening in the community. I think we are looking at possibly 16% to 18% of population in the community who are already over 65. So, I think in 10 years or more, maybe we're looking at [an increase to] 35%. So that's a substantial amount of workload to the healthcare system.

Professional body representative

Multidisciplinary teams of medical and social professionals have an edge over physicians in solo practice in providing primary care. These primary care professionals provide components of healthcare that are not provided by a specialist doctor, such as rehabilitation and lifestyle modification important for individuals with multi-morbidities. Furthermore, the vision of an **integrated, holistic, patient-centred approach in primary care** stands in stark contrast with the fragmented and overly specialist-oriented system in Hong Kong. Interviewees mapped out visions of blueprint of a healthier, primary care-led system in Hong Kong, often drawing from international examples such as the health system in Toronto (Canada).

Stakeholders' voices

The most important services provided by the DHC are really the allied health services. The occupational therapists, the physiotherapists, the dietitians- which are very difficult for a solo private doctor to have access to and too expensive for the patients to visit on their own. We're talking about diabetes mellitus. They need a lot of [supporting] services.

Academic

The Hospital Authority cannot, is not, and will not be able to provide a generalist-led health promotion, health awareness and health screening process. So alternative systems must be established. In Toronto, Ontario, hubs of clinics [have been set up] at local levels. [It] would be a very desirable option [for Hong Kong to follow]. They have a comprehensive team of staff with targets of health promotion as well. Diet, exercise, and lifestyle are so fundamentally important. Mental health is also greatly neglected [in Hong Kong].

Academic

Subtheme 2.2 – The Government has a key role in further advancing primary healthcare development. Nearly all interviewees agreed on the importance and effectiveness of promoting PHC, yet its development has not progressed in past years. **The lack of central coordination of service providers in the private and public sectors** was cited by stakeholders as a contributor to widespread confusion and overlapping of efforts between the two sectors, slowing down the progression of PHC development in Hong Kong.

Stakeholders' voices

It's quite slow. I think because we do not have very good visions on what we want to do with primary care, especially with the public/private sector working together, so there has not been very good development. I think many things are unclear, [like] what is the role of the Government and what is the role of the private sectors, so there's a lot of hesitations to involve the private sector.

Academic

Another problem is that primary care is now controlled by private physicians instead of the Government.

Academic

The development is really slow, because the Government did not provide a centralised system, nor good coordinating policies.

NGO representative

Our interviewees highlighted the importance for a centralised governmental plan, or an official organisation which could lead PHC development in Hong Kong. Yet, Hospital Authority, the main health service provider in Hong Kong, was deemed unsuitable to take on this role due to fundamental differences in mandates and guiding principles from that of PHC. Primary care, our stakeholders pointed out, would not be prioritised under the current structure of HA which focuses on the provision of secondary and tertiary care. The idea of establishing a **Primary Care Authority**, as suggested in the 1990 report *Health for all, the way ahead: report of the Working Party on Primary Health Care* (for further details, please refer to **section 3.2.2**) was brought up by our stakeholders, in hopes of better coordinating primary care in the region. This suggestion, however, was not universally aligned—some academics worried about **further bureaucratisation of healthcare** in Hong Kong if a new agency was added within the current intricate structure.

Stakeholders' voices

The focus of the Hospital Authority should be hospitals and the primary care should have its own governing body... Primary care will not be the priority of the Hospital Authority no matter what, because there are so many different specialties and primary health is just one of them. Primary care would never be respected within the Authority. There will always be limitations, because that's not the mandate of Hospital Authority to improve primary care...

Academic

We need to establish a Primary Care Authority or Office instead of simply employing a few outsiders with no understanding of primary care. There will be a serious problem if primary care development was led by people without proper understanding, knowledge and concept.

NGO representative

This Primary Care Authority will be chaired by famous giants in family medicine or the broader medical field—this will just lead to more bureaucracy and rigidity in the system.

Academic

Subtheme 2.3 – A multi-pronged approach to advance primary healthcare development is recommended. Key stakeholders repeatedly pointed out the urgent need for a paradigm shift in our system: from a disease-centred medical care model to a primary care-based, person-centred framework by enhancing the role of allied health and social care professionals. Besides providing tailor-made treatment and management for individual patients, primary care workers should also focus on providing services that cater to **local district-based demographics and specific needs.** Some key stakeholders considered the recent Government's initiative of building DHCs in all 18 districts in Hong Kong a good example of a district-based healthcare model.

Stakeholders' voices

But if people cannot afford to see a private psychiatrist, what do they do? They engage themselves in smoking, drinking and drug use, because that's the easiest, most affordable way to deal with mental health issues. And therefore, I would strongly advocate for a person-centred approach that you (OHKF) have proposed… Really person-centred, not disease-centred.

Academic

One of the strategies I always share with my colleagues in the DHC is that we should know we are the ones who have the best knowledge of the service provision in the district. So that when the citizens come to the Centre, and register as our members, we can help them to navigate through all this.

NGO representative

But even if there are many family doctors, that does not translate into a good preventive policy or service. Our (primary care providers) transdisciplinary team of social workers, nurses, pharmacists, dietitians, and physiotherapists can handle a lot of these early care services and [prevent people from] a late stage of presentation. We can promote health literacy, letting people understand how they can prevent diseases. Then we have early identification strategy so that they (patients) can have an early intervention of disease management.

NGO representative

Current efforts directed at primary care provision should be stepped up to advance PHC development in Hong Kong. Comparable salaries between non-specialists and family medicine specialists, and the lengthy specialist training process, were noted to have hindered the popularisation of the family medicine specialty in Hong Kong. To prepare for the upcoming surge in cases of chronic diseases, stakeholders opined that **additional training in primary care provision in the form of short courses should be offered for all physicians practising in the health system** in Hong Kong regardless of their specialist status. The importance of **raising public awareness of disease prevention** through social media channels was also highlighted by interviewees.

Stakeholders' voices

[General practitioners] may not be familiar with the management of certain diseases if they rarely encounter these problems in the past. They should be more equipped with knowledge about management of diabetes and hypertension to ensure the quality of care is up to standard. Hopefully, they can adopt the local guidelines, released by the Government to manage these chronic diseases in local context; and they can fulfil the voluntary-based Continuing Medical Education (CME) scheme.

Public service provider

I would definitely agree that no matter what background they (private physicians, regardless of attainment of specialty qualification) are from previously, as long as they are in the community, they will certainly see at least a certain percentage of patients who are having primary care problems, family medicine problems, and chronic diseases. I'm sure they will come across this. So, it will be a great benefit for the patients attending these private doctors if they (private physicians) would have a certain degree of knowledge in terms of managing day-to-day issues of primary care.

Professional body representative

You (OHKF) have to see how to disseminate this thing (preventive services), but mainly the public needs to understand the importance of prevention as well. This is where the media comes in. You can do radio programs, TV, and so on. You need all these things to happen together. For example, you want to push some Government policies and influence the Government—you're gonna raise awareness among the public of what you're talking about.

Academic

Theme 3. Improving existing health financing mechanisms

Subtheme 3.1 – The way our health system is financed needs to be better organised to alleviate burden on the public sector and maximise health system performance. Multiple stakeholders felt that by positioning HA as a safety net for Hong Kong citizens, the low-cost and high-quality services offered in the public sector effectively **disincentivises use of private healthcare.** Intensifying the problem is the public's **fear of missing out**—the public is likely to seek public hospital-based service even for minor problems that could be solved in ambulatory (outpatient) settings, which creates a bigger burden on the public hospital system.

Stakeholders' voices

In the public sector, you can see now with the deflecting of money, the financing is a problem, so the quality of care and efficiency are running down.

Policymaker

Just imagine if there is a place in the world that this health service is cheap, fast, and of good quality. It will only end up in [misuse]. Every person will go there for the most minor problems.

Private service provider

I remember that the Hospital Authority was spending 15% of the Government's total expenditure more than a decade ago. That figure has now risen to about 18%, meaning that this current model does not work [because the problems remain despite more resources allocated to the health system].

Professional body representative

The public system now serves as a safety net. Its usage will keep rising because of its cheap price and high quality. Only the rich and those with good insurance coverage will use the services provided by private hospitals.

Professional body representative

But then, everybody looks at it as a resource, governmental resource–I want a bit of the resource.

Academic

Some preliminary ideas were raised to more effectively organise and utilise resources to maximise health system performance, including **co-payment of public healthcare services and distribution of resources in a more targeted way.** Citing international examples in the United Kingdom (UK) and Canada, some stakeholders advocated for a partial sharing of fiscal responsibility by patients in the public sector.

Stakeholders' voices

> In our GOPCs, the drugs are still free. But if you think about it, for most patients with chronic disease, they probably can afford their chronic medications. It's really not that expensive except for a few of the newer drugs. And all over the world, [the] majority of the people except the elderly pay too. They pay for the drugs even in the National Health Service (NHS) in the UK. People pay for their own drugs. In Canada, people pay for their own drugs even though they've got a universal health insurance system.
>
> *Academic*

> The general public has to get used to the co-payment system. Otherwise, it will be even harder to change people's [payment habits] if the Government bears all the costs.
>
> *Professional body representative*

> Now with this governmental system, just giving everybody more money doesn't work. Targeted distribution is fine–to give more help to the few who are really poor, and to give less help to the people who are not so poor.
>
> *Academic*

Subtheme 3.2 – The opaque pricing of private healthcare services is a challenge to improving health financing mechanisms. The private sector in Hong Kong is almost **completely autonomous to set their own pricing rules.** As mentioned in **Theme 1**, the new *Cap. 633 Private Healthcare Facilities Ordinance* **(Box 4.2)** is thought to provide insufficient regulation. Pricing structures are often opaque and patients are charged for hidden fees without prior notice, thereby increasing the difficulty of providing comprehensive Government subsidies for private sector services.

Stakeholders' voices

How would the Government know how much private practitioners would charge…? Even if the Government gives them money, there's no regulation and so the general practitioner (GP) can always charge more… How do the patients negotiate for proper fees? Never. It will be fairer if the private sector has transparency of the charges and all that.

Academic

Healthcare costs in the private sector create a huge burden for most Hong Kong citizens. Worse still, the costs are not transparent and often unknown.

Private service provider

A suggested reason for the low uptake of medical insurance in Hong Kong is the **mismatch between insurance products and consumer expectations.** Stakeholders raised concerns towards insurance providers for their lack of vision and general unwillingness to increase coverage, quoting the Voluntary Health Insurance Scheme (VHIS) launched by the Government, which has been characterised by the absence of a high-risk pool, expensive premiums, and narrow service coverage. Nonetheless, certain insurance providers view this as a deadlock situation where they are forced to set **high premiums due to lack of transparency in services charges.**

Stakeholders' voices

Even if they (the patients) have joined certain insurance schemes, the coverage is usually unclear. Yet, they cannot afford high-end products with broader coverage.

Private service provider

What is it about Hong Kong insurance companies—a lot of products, a rip-off—everybody knows that.

Academic

Stakeholders' voices

Insurance companies are unable to broaden the coverage for insurance products due to the lack of transparency in medical pricing. Transparent prices, if provided, can be reflected in a lowered and more accurate premium, creating a win-win situation.

Private service provider

The [Voluntary Health Insurance] Scheme is complicated and very expensive, with some terms not being covered.

Policymaker

Subtheme 3.3 – Strategies to improve mechanisms within existing health financing system. Citing the unhealthy competition between insurance providers and private doctors, some stakeholders called for further development of the insurance sector in Hong Kong. An acknowledged attempt was the recent development of **fixed-price medical packages**, now available in certain private hospitals. Apart from resolving conflicts and reducing tensions between insurance providers and private doctors, this example also resolves the problem of the lack of transparency of private services. More efforts, however, are required to further promote such practice.

Stakeholders' voices

Everybody wants to pay for health insurance if it really helps, and if you reduce the premium, they will buy it. The elderly [have] a lot of purchasing power, and so there are marketing opportunities, but the insurance providers are pushing people away.

Academic

Insurance providers now compete for profit with private doctors, creating tension and little trust.

Academic

Instead of competing for profit with the doctors, we (insurance providers) are going to collaborate with them. We start by rolling out medical packages—supporting each other to increase the pricing transparency.

Private service provider

Stakeholders discussed the role of an important, but often overlooked key stakeholder in healthcare financing—the pharmaceutical industry. Drug costs have a significant contribution to healthcare expenditures, yet massive discrepancies in prices appear between different forms of drug purchases: between generic and patented drugs, and newly researched and older drugs. HA utilises practices of bulk purchase to acquire medications at lower costs, but such mechanisms are generally unavailable for private service providers. Given the important role played by pharmaceuticals, various stakeholders, especially those offering private services, emphasised the **importance of involving the pharmaceutical industry in health financing discussions.**

Stakeholders' voices

When we (different stakeholders collectively) talk about health financing and related issues, the Government, HA, and others always intentionally or unintentionally leave out the pharmaceuticals.

Private service provider

All drugs approved by the Food and Drug Administration (FDA) are expensive because of the extensive research involved. For diabetic and hypertensive drugs, there should be negotiations of prices with the pharmaceuticals.

Private service provider

Theme 4. Investing in strategic purchasing as a health financing lever

Subtheme 4.1 – Successful strategic purchasing requires comprehensive policy and regulation. Stakeholders showed a **supportive attitude towards PPPs and the idea of applying strategic purchasing** to **fill in service gaps in the public sector**, such as the long wait-times for ophthalmologists or accessibility issues of healthcare services during a public health crisis. In particular, the UK was quoted for drastically shortening the waiting list for specific procedures through leveraging PPPs.

Stakeholders' voices

[The optometrists and ophthalmologists] will find a lot of visual acuity problems like presbyopia, myopia [in voucher users], which require [these patients to wear] glasses. Now if you (the Government) don't provide the voucher for the population, they won't go because all these treatments are costly to them, especially if they have not purchased any insurance. If you give it (the subsidy), at least they get checked. That's why I think it (the Scheme) is really good, and it really meets an unmet need, particularly for vision care.

Academic

Stakeholders' voices

> PPP programmes have been set up in the United Kingdom to reduce waiting times for certain public healthcare services. The private sector has been encouraged to invest in building capacity to reduce the waiting times. This allows the private sector to respond to inadequacies in the public sector.
>
> *Academic*

Our stakeholders, however, pinpointed that the current political landscape in Hong Kong and various obstacles in the course of implementing a new voucher scheme will complicate the process of applying strategic purchasing. Stakeholders pointed out that political momentum for significant policy reform is often hard to gain or maintain throughout an extended period. To succeed under these limitations, the Government should modify the proposed Scheme based on healthcare demand. At the same time, the Government should **invest in and design a vision for future development,** including **support for future initiatives in terms of promotion, research, and regulation,** rather than roll out fragmented policies. The Government should give clear directions on important topics such as payment and liability, beyond ensuring smooth execution and fulfilment of intended objectives. Efforts must be made for public education and promotion within the community so that the public has a higher buy-in rate.

Stakeholders' voices

> If you (the Government) don't have a targeted policy, you're not going to get anywhere. I thought that [setting up a policy] was a really big improvement already. Because when you have a policy, people can start working on strategic purchasing. The Government can then convince people step-by-step, by doing focus groups where people say, "Wow this is great, I wish we had more". Through these documentation and research, the Government can build up evidence to support the continued effort of implementation.
>
> *Academic*

> Strategic purchasing might be the only goal they (the Government) can achieve under the current political reality—the Government needs to be aware of this. Nonetheless, they need to set out clear priorities, a long-term direction, and identify gaps in the implementation. Be it public-private partnerships or voucher schemes, they need to remember the gaps in any of these projects and have a vision to resolve them later.
>
> *Academic*

Subtheme 4.2 – Planning, engagement and well-planned logistics are keys to success. Despite the widely acknowledged necessity of strategic purchasing and PPPs, our interviewees identified **a low level of enthusiasm among doctors towards existing PPPs**, due to cumbersome computer systems, heavy logistic work, and insufficient reimbursement rates. Since the cost of private services was perceived to be kept at a minimum level under PPPs, providing more financial incentives for private practitioners was mentioned as a lever to increase private sector participation given the profit-driven nature of the private sector. Additionally, given that physicians typically join the General Outpatient Clinic Public-Private Partnership Programme (GOPC-PPP) within their solo practice, the Government should look to simplifying current administrative systems to increase the number of doctors participating in the programme.

Stakeholders' voices

The private sector now operates in a "fee for services" model, so financial incentives are very important.

Academic

The consultation fees are exempted now—we (private service providers) just charge the patients with the drug costs, and use generic drugs as much as possible to minimise costs for patients.

Private service provider

Doctors now can only log in with sets of passwords, their log-in ID, by plugging in their own ID cards, or using access codes. It gets inconvenient when they have to do it several times…The small [reimbursement] sum of HKD 200—including medications—is unattractive to some doctors… If the patients present with other complaints like a common cold or a cough aside from hypertension, the doctors will need to manage it and give medications without any extra consultation charges…

Private service provider

The Government needs to think about the mindset that how the private sector is running. For the majority of the privately practicing doctors, they don't want complicated cases… they want simple transactions. If you are a GP, you want patients to come and go. It is fast, straightforward and easy to build relations. For a complicated case, you need more time, you need more resources, the patient may eventually go back to public sector, too. [Therefore, incentives should be provided to the doctors to increase their uptake.]

NGO representative

Applying strategic purchasing to PPPs will not work without the support of patients. Our stakeholders suggested that **a multi-faceted strategy targeting different population groups can promote this new financing method on multiple fronts.** Some suggested promoting PPPs through both traditional media and social media to reach diverse age groups, while patient group representatives suggested targeting current patients receiving treatment in public hospitals to offer first-hand testimony for promoting strategic purchasing programmes. Others focused on motivating private doctors to recruit their own patients into PPP initiatives.

Stakeholders' voices

I think another important point is that there should be a group of advocates who have used the network practitioners provided in the PPPs, as well as having very good experience and results out of that.

NGO representative

You (OHKF) can do radio programmes, TV, and so on. You need all these things to happen together. For example, you want to push some governmental policies and influence the Government—you need to then raise awareness among the public of what you are talking about.

Academic

The Government must do more publicity—they can ask their network of private doctors to promote the PPP to their patients. These patients might have come in for another disease, but if they fall inside the target group, the doctors can ask if they want to join this programme as well. The Government needs to empower the private physicians, so they can recruit other patients in their clinics.

Public service provider

Key stakeholders were concerned about differences in services provided by the public and private sectors. The Government needs to **coordinate all healthcare service providers in Hong Kong to ensure that consistent standards of screening and treatment are provided for patients.** Stakeholders proposed outsourcing simpler procedures in future PPPs from the public to the private sector in order to facilitate better patient-doctor relationships.

Stakeholders' voices

Doctors have to adhere to evidence-based guidelines and protocols when giving treatments in the Hospital Authority, but some private physicians switch between ultra-expensive medications every two weeks, and their side effects will undermine patients' quality of life.

Academic

Apart from the Hospital Authority, there are also other service providers offering different chronic disease screening and management programmes in the market. It is therefore hard for any single organisation, if not the Government, to coordinate and organise these services holistically.

Public service provider

Subtheme 4.3 – Potential limitations of PPPs should be addressed. While agreeing with the general direction of promoting public and private sector integration with strategic purchasing, various stakeholders questioned **PPPs' long-term effectiveness due to the limited scope of current programmes.** Although wide gaps remain between the public and private sectors, such as imbalanced utilisation patterns and disjointed service standards, stakeholders acknowledged PPP as an interim solution especially during peak seasons or emergency situations, such as the COVID-19 pandemic.

Stakeholders' voices

In short term, I think it PPPs is a good idea, [but] I think it doesn't really solve the fundamental problem. People would still want to maintain their feet in the public system, because they worry that they will be excluded.

Academic

PPP in the context of primary care has limited resources and can only [provide] a finite amount of coverage. What happens beyond this?

Academic

PPPs are especially useful… Paying for services contracted to the private sector is a short-term solution to the current problem.

Patient group representative

While PPPs are intended to bridge the public and private sectors, interviewees are worried that PPPs may backfire and instead **intensify the fragmentation of care** when there is already inadequate coordination and communication between the two sectors. A few problems were identified, including that many existing PPPs in Hong Kong focus on specialist services, which could contribute to the imbalance of care towards specialist care.

Stakeholders' voices

There is actually no direct flow of patients between the two (public and private sectors), or no direct, convenient way of using the services between the two sectors.

Academic

I think it's (the concept of PPP) much more complicated. The Hospital Authority also provides complication screening programmes for diabetes, hypertension, mild cognitive impairment, as well as occupational therapy, physiotherapy, etc. If you're going to fragment them and put some parts into the private sector, will that cause challenges to the patients? Would they have issues of coordinating? Who's going to coordinate? I think you're (the Government) creating more problems.

Academic

There are long waiting times for people requiring joint replacement surgeries [in Hong Kong], but I haven't seen any successful PPPs in reducing the waiting time because it is too expensive... The current PPP is not quite working because we have focused primarily on specialist service in designing the programmes.

Professional body representative

Although the Elderly Health Care Voucher Scheme (EHCVS) is considered as convenient to use, the model of which is adopted to the proposed Scheme, criticisms towards the EHCVS were raised. Its limitations in attracting the elderly to take up preventive care and health promotion, together with its role in further fragmentation of care due to the doctor-shopping phenomenon, led some interviewees to dismiss the EHCVS as ineffective. The Government should be aware of **the lack in specificity of this programme**, particularly the services targeted, and improve the design of similar schemes in the future.

Stakeholders' voices

The EHCVS actually encourages doctor shopping. It's the same thing here if we launch another voucher scheme, and the same problem may repeat.

Academic

I can see that the current use of health vouchers will be wasted if we are only looking at the health vouchers for treatment of minor aliments instead of health promotion.

Policymaker

Most EHCVS users spend the vouchers on episodic illnesses like common cold and cough, or for getting new pairs of glasses. These are not serving the intended purposes.

Professional body representative

Theme 5. Meticulous planning is necessary for effective implementation of the Scheme

Subtheme 5.1 – A long-term vision is needed for the design of vouchers as a health financing tool. Drawing on previous experiences from the EHCVS, apart from designing the vouchers to be convenient to use, stakeholders overwhelmingly agreed on the **necessity of identifying certain target populations when designing voucher schemes.** Some interviewees opined that age would be a proper selection criterion, but others felt the need to further narrow the criteria down to demographic groups where high prevalence of chronic illnesses is observed.

Stakeholders' voices

You (the Government) will have to think of ways to identify this group of working class—the "[living] from hand to mouth" group… people above 45 who are in cleaner jobs, working long hours, construction site workers...

Academic

It's not quite possible to provide it (voucher) to everyone. At this point, possibly the priority should be absolutely clear. It (voucher) should not be for anybody just above the age of 45, because only people who have the luxury, time and health consciousness will consume this, rather than those in need.

Academic

Stakeholders' voices

In the current voucher system, patients can consult GPs, traditional Chinese medicine practitioners, physiotherapists etc. However, the system is not working because the Government only gives a general coverage of services for the citizens, but no target problem in focus.

Academic

I think it (EHCVS) is a useful supplement to the public, especially for the target population...

Professional body representative

Should we be more specific and target people with pre-existing chronic diseases?

Professional body representative

The Government should learn from experiences gained from the implementation of the EHCVS and respond in time to various foreseeable situations. **Regulations** need to be in place to better guide patients on the purpose of the vouchers and active efforts should be made to encourage patients to proactively improve their health beyond the vouchers' scope.

Stakeholders' voices

If you (the Government) decide to give out vouchers, you really need regulations. You really need to know how they (citizens) can spend it, such that they can be directed [to designated services and service providers].

Academic

These kinds of vouchers might help, but as I have mentioned before, we (the Government) have to be very careful because we are sending a message that people should be responsible for their health, but we also send a message: that it all depends on whether the Government will give subsidies or not.

NGO representative

Some interviewees worried that the design of a chronic disease screening voucher and scheme for subsequent management might be disease-centred and contradict the health-centred model in the desired primary care-led system. Stakeholders suggested that the Government should **carefully define the services to be covered by the vouchers** to ensure that they are used in preventive services rather than solely disease treatment.

Stakeholders' voices

The difficulty of issuing a chronic disease voucher is the definition of chronic disease. And the overall problem, as you have mentioned in the report (OHKF, 2018), is about services being segmented, fragmented, too disease-oriented, and so forth... If you (the Government) focus on chronic disease assessment, screening, early identification, it might also be disease-oriented instead of health-oriented.

Academic

You (patients) can have impaired function without diseases, and this is still going to make you disabled, right? You (the Government) could detect these things before they become disabled... You can't just target NCDs (non-communicable diseases)... You have to target both (NCDs and geriatric syndromes).

Academic

The goal is to shift the start of care from the time when they are already sick to when they are still healthy; to shift the whole timeframe earlier.

Private service provider

Regarding the scope of the Scheme, there were diverse opinions among stakeholders. Some agreed with the **HDH (hypertension-diabetes-hyperlipidaemia) approach**, citing its high prevalence in Hong Kong, while others suggested expanding the diagnostic tests to uric acid, osteoporosis, and other health indicators, such as obesity. A few insisted on the need to include Body Mass Index (BMI) measurements in the Scheme, which they regarded to be a highly important indicator for risk factor for chronic diseases. However, stakeholders who supported the HDH approach were also opposed to the expansion of the screening scope due to feasibility concerns.

Stakeholders' voices

These schemes need to be simple, clear and easy to understand, so just the HDH screening should suffice. Too many other tests will complicate the picture, and people may lose their focus.

Private service provider

Obesity is important too because it is a risk factor for HDH too. If obesity is ignored, the problem cannot be completely unveiled.

Public service provider

Subtheme 5.2 – A chronic disease screening voucher will be useful for promoting primary care. Stakeholders were generally receptive towards the Scheme for encouraging preventive care in the general public. The Scheme was regarded to be likely useful in addressing the underdiagnoses of HDH in the population. Aside from early identification of diseases, risk assessments could be performed to prevent future complications. Many stakeholders believed these essential elements of primary care could also be achieved with the implementation of the Scheme. This will eventually save healthcare costs as it reduces avoidable hospital admission in the long run.

Stakeholders' voices

There are many hidden cases of chronic diseases in the community—roughly 50% of chronic diseases patients are unidentified. If we can have early screening and intervention, we could prevent the progression of these diseases and the emergence of complicated conditions. This will benefit both patients and our health system.

Private service provider

It is highly beneficial for the middle-aged to undergo check-ups regularly to prevent diseases.

NGO representative

This is one main truth and I strongly believe it—for that sort of public-private programmes in primary and secondary prevention of disease, I really feel that this is an area that we can really work on.

Professional body representative

Some interviewees opined that the screening programme could **foster the development of family medicine** and **introduce Hong Kong citizens to the concept of having a family doctor.** Family doctors were thought to have a unique position in initiating and following up on behavioural changes in patients. Yet, some stakeholders pointed to potential barriers that could impact the effectiveness of the Scheme, such as socioeconomic and psychological factors, as well as the population's long-standing tendency to consult specialists. Some opined that the **healthcare vouchers alone would be inadequate to alter the behaviours and health-seeking patterns** of Hong Kong citizens.

Stakeholders' voices

Health-seeking behaviour does not change easily—besides doctors' advice, there are a lot of factors influencing patients' behaviour, including their psychological status, social and financial considerations, and the opinions of people around them.

Private service provider

If there is no financial support for the newly diagnosed patients with hypertension or hyperlipidaemia, naturally they will ask to be referred back to the public system.

Private service provider

The family doctor concept has been promoted for a long time. Yet, the public does not buy into the concept and prefers doctor shopping. More health screening programmes will encourage public buy-in as patients will get used to having a family doctor to take care of their health when they visit the same [family] doctor for screening and chronic disease management.

Private service provider

People in Hong Kong are not satisfied with being looked after by a generalist, whom they expected to be specialists.

Policymaker

Subtheme 5.3 – Management plans after screening need to be well-designed to achieve a desirable impact. The Government should **listen to patients' voices and take potential chronic disease complications into consideration upon designing follow-up management plans.** In terms of the management scheme, the Government should factor in the **costs incurred for more invasive procedures**, as well as the possibility of patients presenting **multiple medical conditions beyond the scope of HDH.** Stakeholders anticipated negative responses from the population if not all treatment costs arising from the screened conditions are borne by the Government.

Stakeholders' voices

Can you (physicians joining the Scheme) really see a patient just for the designated chronic disease and ignore the other symptoms or requests, and charge for other things that the patient requests? And if you are a patient, will you actually do that? You will separate yourself into different diseases?

Academic

"Don't worry, your condition is minor, very stable." Do they (patients) accept this kind of explanation after you have provided a screening for them? They might think about themselves having some sort of disorders already.

Policymaker

The Government needs to think what the subsidy can cover [for disease management]—from medications, blood tests to management of chronic diseases. Some complication screenings are also necessary. Diabetes is especially complicated. The Government needs to think twice about the extent of subsidy, and plans for the management we cannot cover. For example, for screening on diabetes complication, where can patients check for retinopathy?

Public service provider

If the reimbursement of disease management in the private sector is insufficient, some screened patients may return to the public clinics for further treatment. There were therefore concerns that **screening may increase the number of patients visiting the public sector for primary care-level management,** rather than diverting towards the private sector; this backflow of patients may worsen the healthcare burden within the public sector. Related problems, such as resource duplication and "doctor shopping" behaviour, may be re-introduced.

Stakeholders' voices

Unfortunately, the maintenance of chronic diseases actually takes a toll [on the public system] for citizens who are not able to afford [care in private sector], as they would return to the public system after screening.

Professional body representative

The supply of our public primary care services can never satisfy the demand, so a significant portion of patients will remain in GOPCs despite of the diversion of some to the private sector. Thus, the number of consultations in GOPCs will not be reduced greatly.

Public service provider

When the newly diagnosed diabetic, hypertensive patients choose to go to the public system, they will create a heavier burden for the GOPCs or Specialist Out-patient Clinics (SOPCs).

Private service provider

4.1.3 SUMMARY

The interviewed key stakeholders agreed that Hong Kong's health system remains fragmented and recognised the importance of PHC development for alleviating our currently overburdened system. Identifying the Government to have a key role in coordinating service providers in the public and private sectors, stakeholders generally held the view that the private sector could be better leveraged to achieve overall health system goals. Also in terms of improving the coordination of service provision, some suggested establishing a Primary Care Authority to better organise PHC development.

While acknowledging the potential for PPPs as a lever for propelling PHC development, stakeholders pointed to the need for **better planning of such programmes to improve uptake and sustainability.** This includes consideration for overcoming existing barriers such as untransparent pricing of private healthcare services that requires putting in place sophisticated regulations to increase price transparency and ensure consistent service quality. Stakeholders also stressed on the importance of involving stakeholders from different sectors in programme design and implementation. In particular, in addition to health service providers, the insurance and pharmaceutical industries should be engaged, particularly in transforming health financing mechanisms that aim to improve citizens' access to health services.

Our proposed Scheme was considered useful in propelling PHC development in Hong Kong, especially in promoting preventive care, early detection, and the family doctor concept. Stakeholders raised key implementation considerations, including the coverage of chronic diseases, the identification of a target population, and the necessity of follow-up management after screening. They also highlighted that the successful implementation of the Scheme requires buy-in from private health service providers and the general public. It is therefore imperative to incentivise both parties to partake in the Scheme.

4.2 A POPULATION-BASED SURVEY ON THE KNOWLEDGE, ATTITUDE, AND PERCEPTION OF CHRONIC DISEASE SCREENING AND MANAGEMENT

To complement the key stakeholder interviews presented in **Chapter 4.1**, this chapter will delve into an analysis of a telephone survey that was conducted to better understand the knowledge, attitudes, and perceptions of Hong Kong's citizens towards chronic disease screening and management. Respondents' viewpoints and past behaviours will help **inform the design of a prospective screening voucher and management scheme, named the Chronic Disease Screening Voucher and Management Scheme** (CDSVMS, also addressed as the "Scheme") for hypertension, hyperglycaemia (diabetes), and hyperlipidaemia (collectively termed HDH). Findings will inform the design of the Scheme assessed in the economic model presented in Chapter 4.3 and will guide recommendations put forward in Chapter 5 to propel primary healthcare (PHC) development in Hong Kong through strategic purchasing.

4.2.1 IMPROVING UPON THE ELDERLY HEALTH CARE VOUCHER SCHEME FOR THE PROPOSED SCHEME DESIGN

A core component of the Scheme is the adoption of healthcare vouchers for prompting primary care uptake and development. However, healthcare vouchers, as a demand-side lever to promote desirable behaviour, are far from novel in Hong Kong. A key example is the Elderly Health Care Voucher Scheme (EHCVS) launched in 2009—a dedicated effort by the Government to empower our older population (aged ≥ 65 years) to utilise primary care services in the private sector with an annual voucher amount that currently stands at HKD 2,000 (see **Chapter 3**). Although the EHCVS achieved an impressive ever-utilisation rate of 98% by 2020, the success of the EHCVS in incentivising the older population to use primary care services (in particular, preventive care services) in the private sector in order to reduce the public sector burden has been less than ideal (HKSARG, 2021b; Yam et al., 2019).

Various evaluation studies of the EHCVS showed that the overall design and the lack of specificity of the EHCVS are core areas for improvement **(Box 4.3)**. Therefore, along with the findings from the interview with key stakeholders **(Chapter 4.1)**, it is important that the Scheme clearly defines the service scope. In line with the concepts of strategic purchasing centred on the purchasing of specified services, the Scheme should align with **a more well-defined structure that targets specific healthcare services, notably preventive care, and chronic disease management** (Yam et al., 2019; Yeoh et al., 2020).

The lessons learned from the implementation of the **EHCVS formed an important cornerstone of question-setting** for our telephone survey, which sought to identify **improvements to be made for enhancing the effectiveness of similar schemes.** For instance, in designing a more effective voucher Scheme, clearly defining the **scope of services** to be offered and identifying the accessible price, also known as **willingness-to-pay (WTP)**, based on prospective users' healthcare needs are imperative to bridging the gap between intention to use health services and actual uptake **(Box 4.4)**.

Box 4.3

Key findings from evaluation studies of the EHCVS

There is increased utilisation of private sector services, but purchased services were generally **more associated with acute care rather than disease prevention or chronic disease management** (Yam et al., 2019).

There is **an unintended increase in dual utilisation of public and private healthcare services,** indicating the likelihood that service duplication remains, which would greatly challenge overall health system performance and sustainability (Yam et al., 2019).

Non-targeted services of the EHCVS, inadequate knowledge about the EHCVS, higher cost, and low trust towards private healthcare services compared to public services were key contributors to the observed underutilisation of vouchers for disease prevention and management, and for the failure to reallocate care demand from the public to private sector (Lai et al., 2018).

Box 4.4

Rationale of measuring willingness-to-pay (WTP) of prospective participants of the Scheme

While the Scheme intends to fully subsidise the cost of screening for all eligible patients, chronic disease management could incur costs through co-payment by scheme subscribers. Currently, a follow-up consultation for chronic disease patients with stable conditions at the Hospital Authority (HA) General Out-patient Clinics (GOPCs) costs HKD 50. In comparison, the private sector does not currently offer sufficient price transparency nor standardised price points across all providers. As such, **estimating prospective users' WTP for each consultation to manage chronic conditions is imperative in designing a voucher scheme that encourages public uptake.** While we acknowledge that assessing the maximum WTP per respondent may be insufficient in capturing the affordability of pricing, especially given that willingness may not equate to financial capacity, a WTP range will help voucher designers and policymakers best structure payment schemes.

4.2.2 FACTORING IN ACCESSIBILITY AS A KEY CONSIDERATION TO ENGAGE IN REGULAR SCREENING AND MANAGEMENT OF CHRONIC CONDITIONS

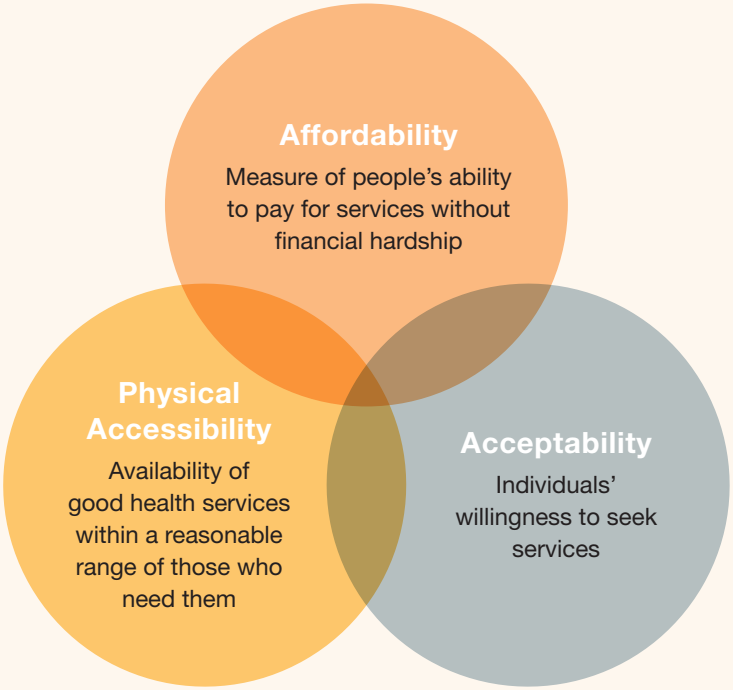
Ever more presently, health system sustainability is being threatened by rising demand and disproportionate resource allocation. In **Chapter 1**, we discussed that health financing systems have set universal health coverage (UHC) as a main policy priority. In parallel, **universal access**, which encompasses physical accessibility, financial affordability, and acceptability, must also exist to facilitate progress towards UHC (Evans et al., 2013). **We believe that the Scheme will be successful if implemented with the necessary factors for universal access, and ultimately UHC, in mind.**

"Universal access", as defined by the World Health Organisation (WHO), is comprised of three interlinked dimensions **(Figure 4.1)**:

- **Physical accessibility**, which relates to the availability of quality health services within reach of individuals in relation to service organisation and delivery;
- **Financial affordability**, which is based upon an individual's ability to afford services, including both direct and indirect costs to patients;
- **Acceptability**, which captures individuals' willingness to seek and receive services (Evans et al., 2013).

Figure 4.1

WHO's definition of "universal access"



Source: Evans et al., 2013

4.2.3 AIMS OF THE STUDY

Given that further **understanding of the needs, wants, and preferences of potential end-users are essential to the design of the Scheme,** we carried out a population-based survey with the following aims:

1. First, identify end-users' perspectives towards screening, health service utilisation preferences in terms of private and public sector utilisation, and views towards the Scheme.
2. Second, using the three dimensions of universal access in **Figure 4.1**, assess respondents' perspectives towards the Scheme and the factors that may impact their choice of provider for screening and management services, and uptake of the Scheme.
3. Third, derive key considerations for the design and implementation of the Scheme. On a larger level, the study's findings seek to help policymakers and health system planners design and implement purchasing programmes that promote universal access to appropriate services and achieve a high level of public uptake.

4.2.4 SURVEY METHODOLOGY

Population-based telephone survey

We conducted a population-based telephone survey to evaluate the Hong Kong general public's perspectives towards chronic disease screening and management. Data on the target population's socio-demographic status, health status, and current health-seeking attitudes and behaviours was also collected **(Appendix A)**.

We commissioned the Centre for Health Behaviours Research of The Jockey Club School of Public Health and Primary Care at The Chinese University of Hong Kong to conduct the telephone survey, which was implemented between 27 July 2020 and 30 August 2020. The study gathered data from 2,044 respondents.

All respondents were (1) aged ≥ 18 years, (2) had a Hong Kong-based phone number, and (3) were present in Hong Kong at the time of the survey administration. We used a combined representative sampling followed by random sampling methodology to reflect Hong Kong's population structure with 1,200 respondents (around 59% of interviewees) aged ≥ 45 years and 844 respondents (around 41% of interviewees) aged 18 to 44 years. The telephone survey was conducted via a random sampling method wherein a computer randomiser generated phone numbers to select individuals for the survey.

Analysis methodology

To create a more comprehensive perspective of the results from the public polling, we conducted various statistical analyses of the data set. Analyses include descriptive analyses, comparison of groups using Chi-squared tests, independent samples t-test, and ANOVA analyses. We also conducted age-stratified analyses between those aged ≥ 45 years and < 45 to identify age-specific characteristics pertaining to preventive health behaviour. We considered a p-value of less than 0.05 to be statistically significant. Figures may not add up to 100% due to rounding.

4.2.5 CHARACTERISTICS OF RESPONDENTS

The characteristics of respondents, including sociodemographic factors, personal medical history of chronic diseases, and family history of chronic diseases, are presented in **Table 4.3, Table 4.4**. Overall, our study sample consisted of more female respondents (68.4%). Most respondents were aged ≥ 65 years (37.2%), followed by respondents aged 35–44 years (22.9%) and 55–64 years (15.6%). Furthermore, most respondents had attained at least a secondary level education (70.1%), were employed (32.6%) or retired (31.9%), and were not recipients of the Comprehensive Social Security Assistance (CSSA) (96.9%) (Question ECON; Question CSSA). Most respondents had a monthly household income ranging from HKD 10,000 to HKD 19,999 (31.0%) and HKD 20,000 to HKD 29,999 (23.4%) (Question INCOME).

In terms of health status, 39.8% of the respondents had a chronic health condition while 45.8% had an immediate family member (parents, siblings, children) diagnosed with a chronic health condition (Question 6a; Question 15). **More than half of the surveyed population claim to engage in regular health screening** (at intervals of two years, or shorter) using the measures of blood pressure, blood sugar, and cholesterol (Question 2i/ii/iii) **(Table 4.4)**.

Table 4.3

Sociodemographic characteristics of study respondents (n=2,044)

Sociodemographic characteristics	n (%)[1]
Age, years	
18–24	175 (8.6)
25–34	201 (9.8)
35–44	468 (22.9)
45–54	120 (5.9)
55–64	319 (15.6)
≥65	761 (37.2)
Gender	
Male	646 (31.6)
Female	1,398 (68.4)
Educational level	
Primary or below	560 (27.4)
Secondary	870 (42.6)
Tertiary or above	563 (27.5)
Refused to answer	51 (2.5)
Job status	
Employed: Full-time or part-time	667 (32.6)
Retired	652 (31.9)
Housewife	524 (25.6)
Student	131 (6.4)
Unemployed	53 (2.6)
Refused to answer	17 (0.8)
Financial capacity	**n (%)[1]**
Monthly household income (HKD)	
<10,000	40 (6.0)
10,000–19,999	207 (31.0)
20,000–29,999	156 (23.4)
30,000–59,999	89 (13.3)
≥60,000	26 (3.9)
Unstable Income	14 (2.1)
Refused to answer	135 (20.2)
No response recorded[2]	1,377
Recipient of CSSA	
Yes	55 (2.7)
No	1,981 (96.9)
Refused to answer	8 (0.4)
Purchase of health insurance	
Yes, Voluntary Health Insurance Scheme (VHIS)	4 (0.2)
Yes, private health insurance	615 (30.1)
Both VHIS and private health insurance	10 (0.5)
No	1,288 (63.0)
Don't know / No opinions	1 (0.0)
Refused to answer	126 (6.2)

Insurance coverage by employer	
Yes	380 (18.6)
No	236 (11.5)
Not applicable (no employer)	1,365 (66.8)
Don't know / No opinions	5 (0.2)
Refused to answer	58 (2.8)
Perceived preparedness for unanticipated medical expenses	
More than sufficient	11 (0.5)
Sufficient	335 (16.4)
Just enough	371 (18.2)
Insufficient	637 (31.2)
Very insufficient	180 (8.8)
Don't know / No opinions	469 (22.9)
Refused to answer	41 (2.0)
Health Status	**n (%)[1]**
Prior HDH diagnosis	
Yes	813 (39.8)
No	1,220 (59.7)
Don't know / No opinions	8 (0.4)
Refused to answer	3 (0.1)
Family history of hypertension, diabetes, lipid disorders or stroke	
Yes	937 (45.8)
No	976 (47.7)
Don't know / No opinions	119 (5.8)
Refused to answer	12 (0.6)

Notes: [1] Percentages may not add up to the totals due to rounding; percentages expressed as valid percent
[2] Answered "Retired", "Housewife", "Student", "Unemployed" or "Refused to answer" for "Job status"

4.2.6 MAJOR FINDINGS

Table 4.4

Overview of respondents' health utilisation patterns and willingness to participate in the Scheme

Actual healthcare utilisation behaviours	n (%)
Engages in regular screening for HDH (n=2,044)	
Yes, every 6 months	26.1 (29.0; 25.1; 24.3)[1]
Participants aged < 45 Years	3.9 (3.8; 3.9)[2]
Participants aged ≥ 45 Years	41.8 (46.6; 40.1; 38.6)
Yes, every year	28.2 (26.0; 29.5; 29.2)
Participants aged < 45 Years	21.6 (21.6; 21.3)
Participants aged ≥ 45 Years	32.9 (29.2; 35.0; 34.7)
Yes, every 2 years	5.3 (5.3, 5.4, 5.3)
Participants aged < 45 Years	5.9 (6.0; 5.7)
Participants aged ≥ 45 Years	4.9 (4.8; 5.0; 5.0)
Yes, every 3 years	1.6 (1.6; 1.6; 1.6)
Participants aged < 45 Years	3.1 (3.1; 3.1)
Participants aged ≥ 45 Years	0.5 (0.5; 0.5; 0.5)
Irregularly	5.6 (6.1; 5.6; 5.2)
Participants aged < 45 Years	8.3 (7.6; 6.9)
Participants aged ≥ 45 Years	4.3 (4.6; 4.3; 4.0)
None	32.7 (31.9; 32.6; 33.6)
Participants aged < 45 Years	57.2 (57.9; 58.9)
Participants aged ≥ 45 Years	14.9 (14.1; 14.8; 15.8)
Don't know	0.4 (0.1; 0.2; 0.9)
Participants aged < 45 Years	0.0 (0.0; 0.2)
Participants aged ≥ 45 Years	0.7 (0.3; 0.3: 1.4)
Screenings mainly in (n=1,237; for those diagnosed with HDH)	
Public	788 (63.7)
Private	378 (30.6)
Both public and private	66 (5.3)
None / No opinions	3 (0.2)
Refused to answer	2 (0.2)
Regular follow-up for chronic disease (n=813; for those diagnosed with HDH)	
Yes	811 (99.8)
No	2 (0.2)
Follow-up mainly in (n=813; for those diagnosed with HDH)	
Public	723 (88.9)
Private	57 (7.0)
Through an HA PPP programme	11 (1.4)
Both public and private	20 (2.5)
None	2 (0.2)

Participation in the Scheme	n (%)
Willingness to participate in the Scheme (n=1,233; for those without prior HDH diagnosis)	
Yes	928 (75.3)
No	231 (18.7)
Don't know / No opinions	74 (6.0)
Participation frequency (n=928; of those willing to participate)	
Once every 6 months	94 (10.1)
Once every 1–2 years	705 (76.0)
Once every 3 years or more	35 (3.8)
Irregularly	9 (1.0)
According to professional advice	60 (6.5)
Don't know / No opinions	25 (2.7)
Preferred sector for follow-up (n=1120; of those willing to participate)	
Public	302 (27.0)
Private	413 (36.9)
No preference	342 (30.5)
Will not attend follow-up	11 (1.0)
Don't know / No opinions	52 (4.6)

Notes: [1] Data is presented as "average %" (% regular screening for hypertension; % regular screening for diabetes; % regular screening for hyperlipidaemia)
[2] Data is presented as "% regular screening for hypertension (% regular screening for diabetes; % regular screening for hyperlipidaemia)" as only hypertension screening guidelines recommends regular screening for those < 45 years (FHB, 2021b)
[3] HA: Hospital Authority; PPP: Public-Private Partnership

Prevalence of chronic conditions is higher in older age group

Roughly 92.0% of chronic health conditions was observed amongst respondents aged ≥ 45 years, whereas 8% of chronic conditions were observed in respondents aged 18–44 years (Question 6a). This centralisation of chronic conditions amongst the middle and older age groups (≥ 45 years) suggests the importance of this age group regularly accessing primary care services, specifically screening and disease management.

Older individuals participate more in regular screening

Respondents' participation in screening behaviours increased with age. In particular, amongst respondents **aged 45 years and older, the average proportion of individuals who regularly participated in screening** (categorised as screening at intervals of 3 years or shorter) for blood pressure, blood sugar, or blood lipids was **80.1%**, with regular screening proportions of 81.1%, 80.6%, and 78.8%, respectively (FHB, 2018).

However, when this group of participants aged 45 and older is further stratified into the age groups of 45–54, 55–64, and 65+ years, we find that older participants are increasingly more likely to engage in regular screening. In the study conducted by Huang et al. (2021) using the same survey participants as this study, but focusing principally on those aged 45 and above, findings indicated increasing likelihood of participation in screening with age (these findings are also presented in the attendant PICO report). This finding holds true for screening for at least one factor within HDH, for at least two factors, and for all three factors (see **Table 4.5**) (Huang et al., 2021). Additionally, the **screening percentage for hypertension amongst those under age 45 was only 34.5%** (only regular hypertension screening is recommended for those under age 45) (Question 2). Given the disparity in screening behaviour across age, it is critical to target individuals in the 45–54 years or younger age range and to explore respondents' underlying rationales for behaviour in order to boost willingness to engage in all recommended screenings. In particular, findings highlight the need to boost screening for hypertension amongst individuals under the age of 45.

Table 4.5

Factors associated with not screening for at least one factor

Univariate Analysis		n	%	COR	95% CI		Sig.
Age	45–54	120	40.8	Reference			
	55–64	316	27.5	0.550	0.355	0.855	0.008
	65 or above	747	11.6	0.191	0.125	0.293	< 0.001

Factors associated with not screening for at least two factors

Univariate Analysis		n	%	COR	95% CI		Sig.
Age	45–54	120	40.8	Reference			
	55–64	316	28.5	0.577	0.372	0.894	0.014
	65 or above	747	11.9	0.196	0.128	0.300	< 0.001

Factors associated with not screening for all three factors

Univariate Analysis		n	%	COR	95% CI		Sig.
Age	45–54	120	43.3	Reference			
	55–64	316	30.4	0.571	0.370	0.880	0.011
	65 or above	747	13	0.195	0.128	0.297	< 0.001

Note: Table 4.5 is adapted from Huang et al., 2021
Source: Huang et al., 2021

Mismatch between knowledge and actual screening behaviours

Respondents' perceptions of preventive services such as screening for blood pressure, sugar, and lipid levels were overwhelmingly positive, with approximately 98.0% of respondents agreeing that screening will help with early identification and management of chronic diseases (Question 1). Yet, despite the high percentage of respondents who agreed with the notion that screening is beneficial, we also noted that the actual level of screening behaviour is comparably low. In relation to those who are recommended to complete HDH screenings on a regular basis, only an **average of 80.1% of respondents (for those aged ≥ 45 years) reported having engaged in regular screening** (of intervals equalling three years or shorter with reference to Food and Health Bureau (FHB) recommendations) **for blood pressure, blood glucose, and blood lipid** (Question 2i, 2ii, 2iii) (FHB, 2018).

As the actual level of **participation in regular screening falls below the level of agreement with the perceived benefits of screening,** this finding shows that knowledge does not necessarily translate into behaviour. The aforementioned discrepancy is indicative of the multiple factors contributing to irregular screening behaviours. This leads us to analyse the Scheme's level of acceptability and perceived screening need amongst potential end-users.

Actual health screening behaviours is attributed to individual perception of need and availability

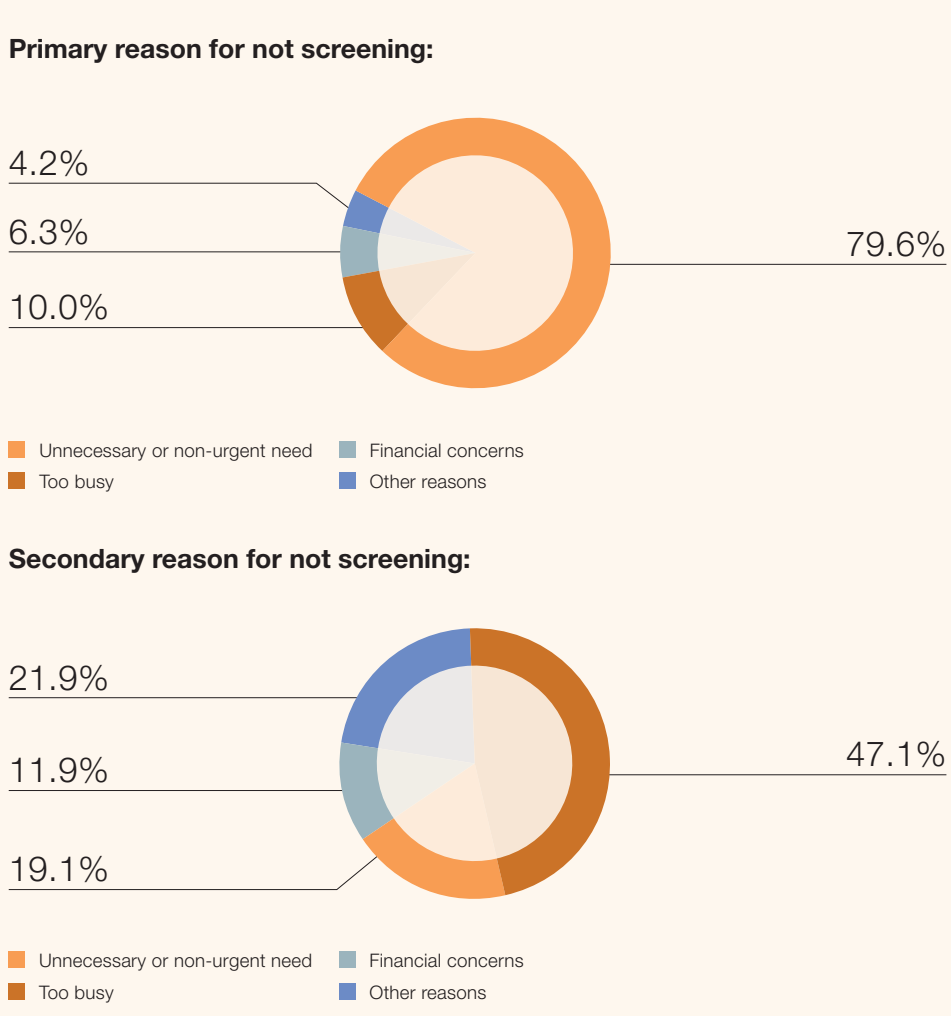
Results show that specific **motivators for screening** (of blood pressure, blood sugar, or blood lipid levels), namely **early disease detection or respondents' physical health conditions,** affect one's participation in screening, with negligible differences across age groups **(Figure 4.2)**. Of the respondents who regularly participated in screening,

53.8% of respondents attributed their primary reason to their physical health condition, while 47.6% attributed their secondary reason to early disease prevention (Question 4). When stratified by age (< 45 and ≥ 45 years), motivations for screening do not differ significantly.

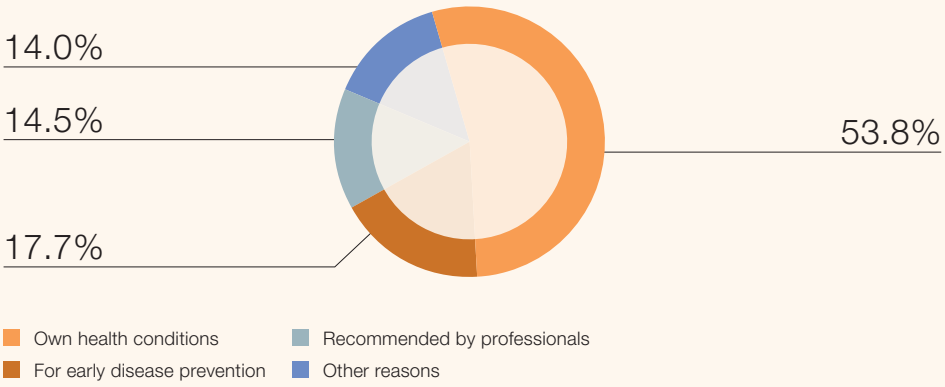
Conversely, respondents who did not regularly participate in screening overwhelmingly listed **perceptions of unnecessary or non-urgent need** (79.6%) as well as **being too busy** (47.1%) as their primary and secondary reasons, respectively, for not screening (Question 2b). Notably, of the respondents amongst the middle-to-older age group (≥ 45 years) who did not regularly screen, 87.1% of respondents attributed their primary or secondary reason to perceptions of non-urgency, while 33.0% attributed their primary or secondary reason to being too busy (Question 2b). Perceptions of non-urgency are further heightened as top reasons for not screening amongst younger respondents (< 45 years). **97.1% of younger respondents attributed one of their top two reasons to perceptions of non-urgency, while 51.1% attributed their other reason to being too busy** (Question 2b). Therefore, perceptions of non-urgency alongside concerns with busyness may inhibit health-seeking behaviour.

Figure 4.2

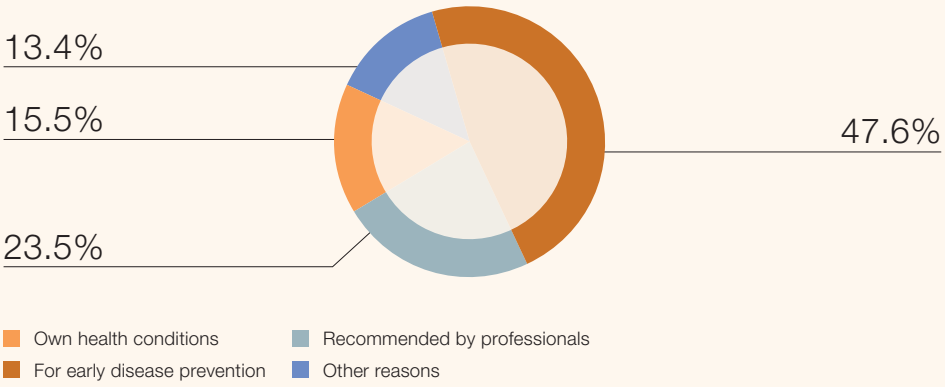
Primary and secondary reasons for engaging regularly (or not) in health screening



Primary reason for screening:



Secondary reason for screening:



Deviation between preferences and actual healthcare utilisation patterns

There is no majority preference for follow-up care in the public or private sector upon participation in the Scheme, with over 60% of respondents expressing either preference for or indifference to receiving follow-up care in the private sector. Specifically, **36.9% of respondents would prefer to receive follow-up care from private service providers,** while 30.5% exhibited no strong preference for care from either service provider type (Question 10a) **(Table 4.4 and Figure 4.3c)**.

Despite respondents' ambivalent preference of service provider type for chronic disease management services upon participation in the Scheme, the actual utilisation patterns for screening and management demonstrate a **strong tendency for public sector service usage—particularly amongst chronic disease patients and individuals aged 45 years or above.** For example, 63.7% of respondents who regularly participated in screening frequented public service providers (including HA hospitals, GOPCs or Specialist Out-patient Clinics (SOPCs), Department of Health (DH) clinics, etc.) (Question 3). Utilisation of the public sector is higher amongst people with chronic disease, as 88.9% of respondents diagnosed with chronic health conditions reported that they sought public service providers for management of elevated levels of blood pressure, heart diseases, stroke, and diabetes (Question 6b). Separately, a significant positive association was observed between age group and past selection of service provider type for chronic disease management, particularly amongst individuals aged 45 years or

above (p≤0.001) (Question 6b) **(Appendix F)**. 56.0% of respondents aged 45–54, 81.2% of respondents aged 55–64, and 92.6% of respondents aged ≥ 65 years selected public service providers for previous management of chronic health conditions (Question 6b) **(Appendix F)**. This illustrates an **increased utilisation of public services with older age,** which is consistent with the service usage patterns of EHCVS users (Lai et al., 2018).

Figure 4.3a

Sector for screening tests in previous year

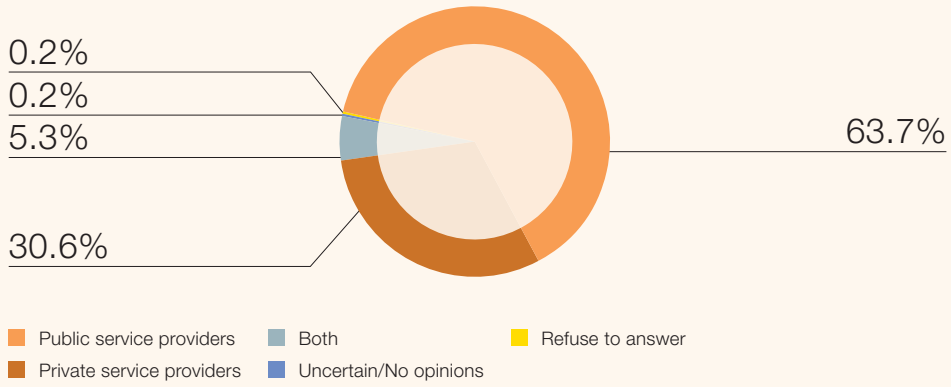
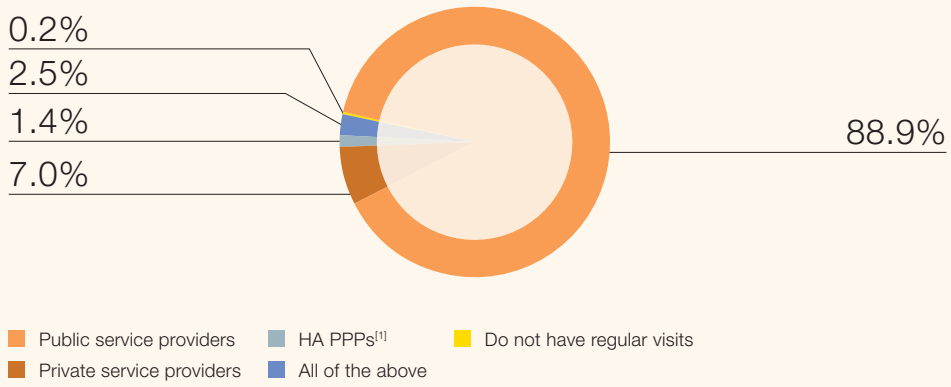


Figure 4.3b

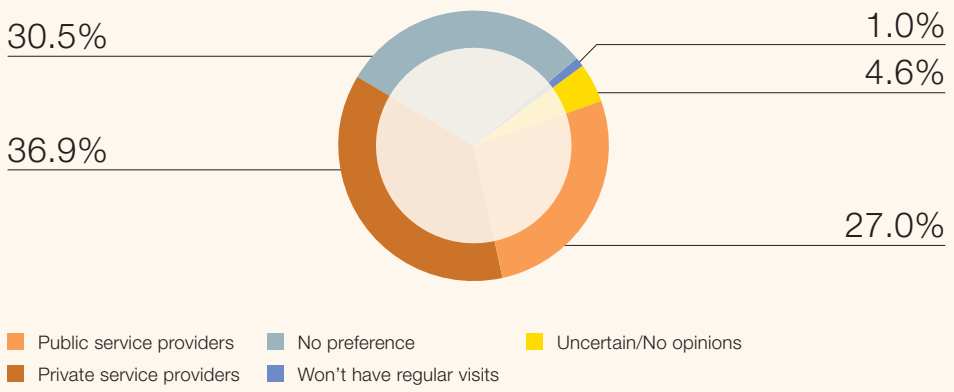
Sector for chronic disease management in the past



Note: [1] HA public-private partnerships (PPPs), namely to visit private clinics sponsored by the Government

Figure 4.3c

Preferred sector for future chronic disease management consultations



Factors influencing willingness to participate in the Scheme

75.3% of respondents without a prior diagnosis expressed willingness to participate in the Scheme (Question 8). Given that many factors determine actual participation in the Scheme and adherence to the recommended frequency of screening, we used the WHO framework on universal access to construct and understand the factors that may promote or inhibit participation in the Scheme. The accessibility, financial affordability, and acceptability of the Scheme are assessed as follows.

i. Physical accessibility

In analysing the facilitators to participation, we found that physical convenience is critical. Of the respondents who were asked about their willingness to participate in the Scheme and who provided at least one motivation for participating, **67.5% reported geographical convenience as either their primary or secondary reason to participate** (Question 5). Similarly, of the respondents who provided at least one motivation for seeking care for disease management, **56.9% reported the convenience of location as either their primary or secondary reason for choice of service provider type** (Question 11a). This highlights the importance of ensuring the physical accessibility of service providers who will participate in the Scheme.

ii. Financial affordability

Beyond physical convenience, respondents are motivated by a reasonable price level for screening and management services. Our survey revealed that respondents are price sensitive to healthcare services, given that **66.0% of respondents factor the price of services in their decision to engage in regular screening** (Question 5). In the event of having a diagnosis of a chronic condition, **58.3% of respondents attributed reasonable service pricing as their primary or secondary consideration** in decisions on sector for follow-up care to manage their conditions (Question 11a).

Respondents' **preferred sector for chronic disease management** upon participation in the Scheme (private or public service provider) is associated with **income, insurance coverage, and financial preparedness** to afford unanticipated medical expenses. Analyses show that respondents' prior sector preferences were significantly associated with financial preparedness for unexpected medical expenses, for both chronic disease management ($p<0.001$) and episodic illness consultation ($p<0.001$) (Questions 10a, 18; 14, 18) **(Appendix E, I)**. In particular, respondents who answered that they were **"insufficient" or "severely insufficient"** in being able to afford unanticipated medical expenses **were more likely to use the public sector** for screening and management (Questions 10a, 18; 14, 18) **(Appendix E, I)**. Additionally, individuals **without any form of insurance were more likely to have chosen public services** in the event of a chronic condition diagnosis or for episodic illness consultations ($p<0.001$) (Questions 14, 17) **(Appendix H)**. These findings highlight the necessity of pricing private sector services against an individual's economic accessibility and affordability in order to influence actual service utilisation patterns.

Regarding the WTP, our survey results reveal that **the maximum amount most respondents (56.2%) were willing to pay for management of their chronic conditions ranges from HKD 51 to HKD 200 per consultation.** Approximately one-third (31.5%) of all respondents were willing to pay a higher price range of HKD 101 to HKD 200 per consultation (Question 11b) **(Table 4.6)**. The FHB recommends four to ten consultations every year for individuals with stable conditions of HDH (FHB, 2020). Therefore, depending on the number of consultations per year, our survey respondents are willing to pay up to from HKD 204 for four consultations to HKD 2,000 for ten consultations annually for managing their chronic conditions, which encompasses and surpasses the benchmark price for GOPC appointments of HKD 200 to HKD 500 annually.

Table 4.6

Maximum willingness-to-pay amount for chronic disease management per consultation

Maximum amount (HKD)	n (%)
1–50	115 (17.8)
51–100	160 (24.7)
101–200	204 (31.5)
201–500	122 (18.9)
501 or above	34 (5.3)
Uncertain / No opinions	12 (1.9)

We found that monthly household income was associated with an individual's WTP level ($p<0.05$ for all tests), suggesting that being **low-income is more likely to be associated with lower WTP ranges for chronic disease management** (Questions 11b, INCOME) **(Appendix G)**. This suggests that in the design of the Scheme, income as well as other financial capacity indicators associated with income, such as medical insurance coverage and financial preparedness against unanticipated medical expenses, should be considered **(Table 4.6)**.

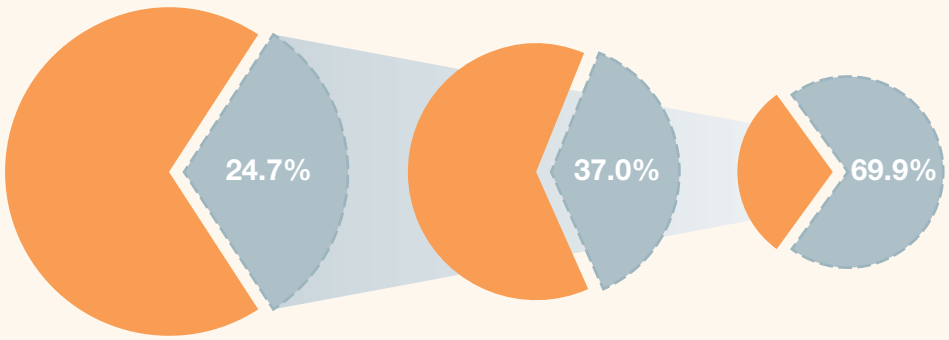
iii. Acceptability

The third dimension of accessibility revolves around the acceptability of healthcare services. In the context of Hong Kong's health system, we predict limited acceptability of the Scheme through two measures: the low level of participation in regular screening and the low actual utilisation of private sector services. Regarding the former, there remains **a gap between respondents' awareness** of the importance of prevention through routine health screenings and their **actual behaviour.**

Our data shows that unnecessary or non-urgent need is the main reason for reluctance to join the Scheme, despite providing the knowledge of the dangers of late disease detection. In fact, of the 24.7% of respondents who reported being unsure or unwilling to participate in the Scheme (Question 8), 37.0% were not willing to change their decision even when informed that undetected and untreated HDH could result in an array of chronic health diseases (Question 8b). Upon inquiring about their reluctance to participate, **69.9% of respondents whose unwillingness persisted and provided at least one reason attributed their primary or secondary reason to unnecessary or non-urgent need** (Question 8c) **(Figure 4.4)**.

Figure 4.4

Breakdown of respondents by willingness to join the Scheme, persisted stance, and reasons for not joining



We also found that health education may be key to influencing health-seeking behaviours. Amongst respondents, only a low proportion of respondents (≤5%) were able to correctly identify that elevated levels of blood pressure, sugar and lipid levels will put an individual at higher risk for other chronic diseases such as heart diseases, stroke, retinopathy, neuropathy, and nephropathy (Question 7). However, **after receiving further information on the dangers of undetected and untreated HDH, 46.2%** of the respondents who initially were not willing to participate in the Scheme **shifted their opinions to being in favour of participating** (Question 8b). This decision shift highlights the facilitative effect of health literacy, which can be improved by creating a fuller picture of the benefits of screening as well as the adverse consequences of not screening, through which individuals can gain health knowledge and turn knowledge into action **(Box 4.5)**.

We found that medical professionals can also play an important role in fostering health behavioural change. 45.8% of respondents who provided at least one rationale for joining the Scheme stated that their primary or secondary reason for participating in screening services was **due to recommendations by close medical professionals** (Question 8d).

Box 4.5

What is "health literacy"?

Though the definition and understanding of **health literacy** is constantly evolving, the WHO maintains that it refers broadly to **the ability of individuals to "gain access to, understand and use information in ways which promote and maintain good health"** (Nutbeam & Kickbusch, 1998). In recent years, the definition has expanded to include the **government and health system's role in facilitating health literacy** through the provision of clear, accurate, appropriate, and accessible information for all people **(Figure 4.5)** (WHO, 2021b).

Figure 4.5

Definition of "health literacy"

In Hong Kong, there are two prominent policy documents that explicitly refer to health literacy as a target of public health interventions. The first is *Towards 2025: Strategy and Action Plan to Prevent and Control Non-communicable Diseases in Hong Kong*, published by the Centre for Health Promotion (CHP) in 2008 that sought to promote healthy lifestyles through increasing health literacy, especially in relation to reducing alcohol-related harm. Subsequently, in 2010, FHB published a report entitled *Primary Care Development in Hong Kong: Strategy Document*, featuring health literacy as a key measure to promote person-centred care and patient empowerment. However, the lack of a populational health literacy assessment in Hong Kong points to the need to further health literacy development, with a goal of promoting public knowledge of and actual utilisation of primary care.

Source: Australian Commission on Safety and Quality in Health Care, 2015

4.2.5 DISCUSSION ON IMPLICATIONS OF STUDY FINDINGS ON THE SCHEME

Among the survey participants, individuals below the age of 45 years had the lowest regular screening percentages across all HDH factors despite hypertension screening being recommended for this age group. Participants within the age group of 45–54 years also had lower screening percentages relative to their older counterparts within the age groups of 55–64 and ≥ 65 years. Notably, individuals between the ages of 45–54 were less likely to screen for one or more HDH factors, indicating possible unmet health needs and barriers that they face in relation to screening access. As such, focusing efforts on increasing access to preventive health services is of crucial importance for improving the health and well-being of this age group.

A majority of respondents without a prior diagnosis for HDH indicated willingness to participate in the Scheme. From the survey, we learned that while respondents use more public sector services over the private sector at the time of the study, there is no strong majority preference for care in either public or private sector upon future participation in the Scheme. This suggests that the sector in which prospective voucher users will access screening and management of diseases will be unlikely to impact uptake of the Scheme.

We found that the top reasons for not engaging in regular screening are non-urgency and busyness. Therefore, **the Scheme should take into consideration the need to remove barriers to accessibility** of screening services (for example, ensuring geographical convenience and accessible price point) so that individuals, particularly those already knowledgeable in the benefits associated with screening but are unable to prioritise preventive health behaviours, can more easily act upon their beliefs to engage in early prevention.

Upon examining the three dimensions of universal access with respect to the Scheme, the study also revealed that:

1. Physical Accessibility—Locality of services is critical to participation in screening and management of chronic conditions

   Locality and physical convenience of service provision has been identified as key considerations for chronic disease screening and management. As shown by a survey conducted by the DH, as of 2016, the private sector hosts approximately 500 private day procedure centres and roughly 5,000 clinics (Legislative Council, 2017; HA, 2020). This multitude far outweighs the 73 GOPCs in the public sector, suggesting that there is potential for **establishing an expansive network of service providers in the private sector** that improves physical accessibility to patients seeking chronic disease screening and management services. Given that the private sector has an expansive distribution of service outlets in primary care, respondents' slight preference towards private sector service provision or no general preference suggests **the potential of the Scheme to further leverage on the private sector's capacity.**

2. Financial affordability—Pricing of health checks is a key determinant of service uptake in the private sector

   Respondents cited pricing as a key consideration when engaging in health screening and management of chronic conditions. The high costs of the private sector may inhibit new patients without insurance or who feel financially unprepared from partaking in the proposed Scheme.

   Survey results suggest that a variety of factors may impact patients' WTP for the Scheme and their financial capability to participate, including three main factors: monthly household income, medical insurance status, and financial preparedness, measured by the sufficiency of funds for unanticipated medical events. The Scheme should consider **varied co-payment prices against financial capacities of individuals** that adjust for these three factors that influence economic accessibility for individuals with a low level of monthly household income, who are under-insured, and are financially unprepared for unanticipated medical spending.

   In addition, while the most commonly chosen WTP range is between HKD 51 and HKD 200, there remains great variability within and also outside of this range. One should not be overly reliant on interpreting WTP when determining price structures, as these price points are insufficient for capturing the affordability (economic accessibility) of the Scheme. Therefore, we **suggest tailoring the payment scheme for management services to the individual patient,** using factors such as **income level.** Furthermore, to successfully boost the uptake of the Scheme, **the Government should consider stratifying the population based on the criteria identified above** and **set out specific co-payment amounts for each stratified population.**

3. Acceptability—Promoting health literacy may boost uptake of the Scheme

   Results indicate that segments of the public require additional efforts to boost health literacy, including those who are aware of the benefits and/or risks of health screening yet do not engage in regular screening. Fostering public education with specific focus on prevention should target increasing the awareness of the consequences of undetected and untreated HDH, with an aim of increasing the sense of urgency and perceived need for disease prevention and early detection. Specifically, we found that general practitioners and family doctors are likely in entrusted positions to enhance health literacy and follow-up on behavioural changes amongst our target population. This observation is in synergy with propositions made in **Chapter 4.1**, wherein private doctors are in a key position to identify and empower patients to partake in screening and expand the concept of family doctors to all Hong Kong citizens. As a means of increasing the willingness to join the Scheme and increasing the acceptability of health-promoting services, we suggest **leveraging on medical professionals to increase population health literacy,** particularly in disease prevention and self-management.

Through effective patient-doctor communication, doctors can address patient inquiries and misunderstandings associated with health services to boost patient confidence, uptake rates, and continuity of care (WHO, 2015). The role of doctors should expand from provision of health services to include participation in the broader conversation around health promotion, working to impart health-related information, and fostering change in patients' preventive behaviours. Therefore, in designing the Scheme, **due consideration should be given to the role of doctors in informing and guiding patients to seek primary care services by providing doctors with training on primary care regardless of their specialities.**

Limitations

While our findings from the population-based survey are based on a representative sample of the Hong Kong general public, we acknowledge that there may be limitations in our research scope. Since 39.8% of the respondents had a chronic health condition in our survey, which is higher than the prevalence of having at least one chronic health condition in the general population (31.1% of the overall population had chronic conditions in 2019), the generalisability of our findings must be taken with caution (C&SD, 2019). Additionally, the willingness to participate was only reported by respondents without a prior HDH diagnosis. However, this does not account for the individuals who may later qualify for the management component of the Scheme and hence, may underestimate the actual willingness to participate for the entire Scheme, outside of the screening voucher component. Furthermore, our willingness-to-pay ranges were not set at equal intervals nor can they offer a more specific price point that patients may be willing to accept. As such, the WTP may not fully capture the variation in financial affordability to patients and the general public. More detailed assessments may be of benefit in identifying willingness to participate in the Scheme and financial affordability to users.

4.3 THE FINANCIAL IMPACT OF A SCHEME TO PROMOTE DIABETES MELLITUS SCREENING AND MANAGEMENT

Beyond gaining perspectives from key stakeholders and the public, it is critical to further explore the financial feasibility of implementing **the Chronic Disease Screening Voucher and Management Scheme** (CDSVMS, also addressed as the "Scheme") to be designed. With a view towards understanding potential costs and using only diabetes mellitus as a proxy for the implementation of the Scheme, we conducted an economic analysis of possible forms of the Scheme over a 30-year time horizon with the target audience—individuals between the age of 45–54 at the beginning of the projected time horizon. We present findings from a Budget Impact Analysis (BIA) that would provide health system planners and policymakers with a clearer view of the investment needed in implementing this large-scale screening programme and would additionally showcase the cost-benefits to the health system and budget if implemented.

4.3.1 DIABETES DISEASE PROFILE AND LITERATURE REVIEW

Diabetes mellitus (DM) is a serious chronic condition that occurs either when the pancreas is unable to produce enough insulin (a hormone that regulates blood sugar or glucose), categorised as **Type 1 diabetes**, or when the body is unable to effectively use the insulin it produces, categorised as **Type 2 diabetes**. DM has become an important area of global discourse due to its rising prevalence, associated health complications, and economic impact.

Box 4.6

Defining “diabetes” and “prediabetes”

What is “diabetes mellitus”?

Diabetes mellitus (DM) is a chronic disease, which occurs when the pancreas does not produce enough hormone insulin, or when the body cannot effectively use the insulin it produces. This leads to an increased concentration of glucose in the blood, clinically referred to as hyperglycaemia. There are three major types of DM: Type 1 diabetes, Type 2 diabetes, and gestational diabetes. **Type 2 diabetes is the most prevalent form of diabetes amongst Hong Kong adults.**

What is “prediabetes”?

Prediabetes is a largely asymptomatic condition in patients at risk of progressing to a diagnosis of diabetes if the condition is not detected and addressed in a timely manner. It is characterised by blood sugar level that is higher than normal but **not within the diabetic range**, clinically referred to as intermediate hyperglycaemia. Individuals that fall within the prediabetic range can either have **impaired fasting glucose** or **impaired glucose tolerance**.

In 2003, the World Health Organization (WHO) and International Diabetes Federation (IDF) met to propose screening as a possible solution to the growing burden of DM globally, with projections at the time showing that DM prevalence will double to 350 million people between the years 2003 and 2030 (WHO, 2003). This estimated prevalence was surpassed in 2014, when the global burden of DM **nearly quadrupled with an estimated 422 millions adults living with DM compared to 108 millions in 1980**, with the highest DM prevalence observed in China.

As a conclusion, in 2003, the two organisations drew a case for DM screening in countries with increasing prevalence, outlining the considerations relevant to the development of a screening policy **(Figure 4.6)**. In cases, such as Hong Kong’s health system, where there is capacity to screen and where prevalence of chronic conditions is growing, there is a strong argument towards strengthening the screening capacity of the health system.

Box 4.7

Diabetes: A global trend

China's skyrocketing diabetes prevalence stands out from similar economies. The prevalence has risen by an order of magnitude from < 1% in 1980, to 9.7% in 2007, to 11.6% in 2010, with rates expected to increase further due to half the country's population meeting the American Diabetes Association's criteria for prediabetes. On the contrary, studies from the United States, the United Kingdom, Denmark, and Korea indicate that their incidence rates have largely stabilised.

Age and economic development may be linked to the increasing prevalence of diabetes in China. Consequently, Hong Kong may be suggestive of such trends towards an expansion of the prevalence of DM and subsequent stabilisation, given its significant Chinese population.

This finding does not stand alone. A study conducted between 1997 and 2008 featuring 230,503 United States adults found that Asian Americans were more likely to develop Type 2 Diabetes relative to their White counterparts, despite having a lower BMI on average. In fact, Asian-Americans were found to be 30–50% more likely to develop DM in comparison.

Sources: Lee et al., 2011; Quan et al., 2017

Figure 4.6

Considerations for screening policy development

	TO SCREEN ⟷	NOT TO SCREEN
Epidemiological consideration	Clear evidence that screening is beneficial High prevalence or undiagnosed type 2 diabetes High prevalence or cardiovascular disease (CVD) risk and other complications amongst people with type 2 diabetes	Clear evidence that screening is harmful Low prevalence or undiagnosed type 2 diabetes Low prevalence amongst people with type 2 diabetes
Considerations of health system capacity	High capacity of health care system for screening High capacity of the health care system for effective clinical management of those who screen positive High capacity of the health care system for supporting the psycho-social effects of screening High capacity of the health care system to implement prevention strategies in individuals at high risk of the future development of diabetes even those who screen negative on that occasion	Low capacity of health care system for screening Low capacity of the health care system for effective clinical management of those who screen positive Low capacity of the health care system for supporting the psycho-social effects of screening Low capacity of the health care system to implement these prevention strategies
Economic considerations	Low cost of early detection Low cost of clinical management	High cost of early detection High cost of clinical management

Note: Figure is adopted from (WHO, 2003)
Source: WHO, 2003

Of note, diagnostic criteria for DM varies globally due to variances in epidemiology and demographic trends of health systems. Such diagnostic differences can impact the case definitions of DM and the health system's recognition of the severity of disease **(Appendix J)**. This analysis follows diagnostic criteria guidelines as stipulated in the latest Hong Kong Reference Framework for Diabetes Care for Adults in Primary Care Settings **(Appendix K)**.

4.3.2 DIABETES AND CARE EVALUATION IN HONG KONG

Hong Kong has observed a large impact from **disease complications** and **economic costs** to the city's public healthcare system due to the rising prevalence of DM (HealthyHK, 2021). To understand whether there is scope for **targeted DM screening and possible expansion of screening services to a larger proportion of the population**, we first assess the i) disease burden; and ii) economic burden of DM in Hong Kong.

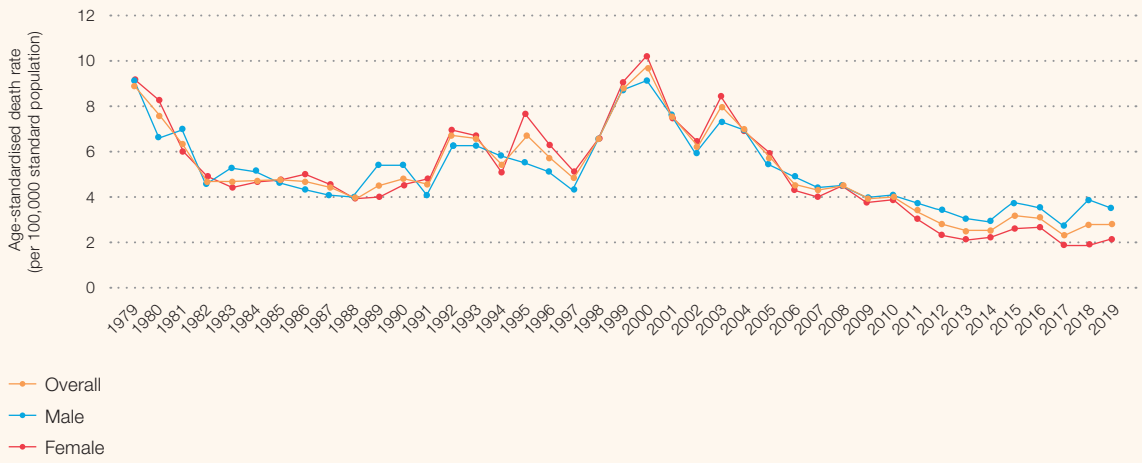
i. Disease profile of diabetes in Hong Kong

In recent years, the burden of DM has grown significantly in Hong Kong. In the *2003/04 Population Health Survey (PHS)* published by the Centre for Health Protection (CHP), 3.8% of people aged 15 and above reported that they had doctor-diagnosed DM; by 2014/15, a decade later, this value rose to 5.5%, nearly doubling within 10 years (CHP, 2017). A study by Quan et al. (2017) also revealed **a high average prevalence of prediabetes of 8.9%**[1] between 2006 and 2014 amongst all age and sex groups in Hong Kong.

In addition to the growing burden of DM, CHP identified DM as a major cause of morbidity and mortality. In 2019, 14,898 inpatient discharges and deaths were related to DM, accounting for 0.7% of all inpatient discharges and deaths (HealthyHK, 2021). Combined with the deaths as a direct cause of DM, these figures have resulted in DM being the 10th leading cause of death in Hong Kong (CHP, 2021b; HealthyHK, 2021). From the early 1980s to 2000, the age-standardised death rate for DM showed a general increasing trend, but promisingly, a decreasing trend from 2001 onwards **(Figure 4.7)**. The observed decline in deaths from the 1990s onwards may be explained by **more timely and effective pathways of treatment and management of diagnosed patients** (CHP, 2020b).

Figure 4.7

Age-standardised death rate due to diabetes mellitus, 1979–2019



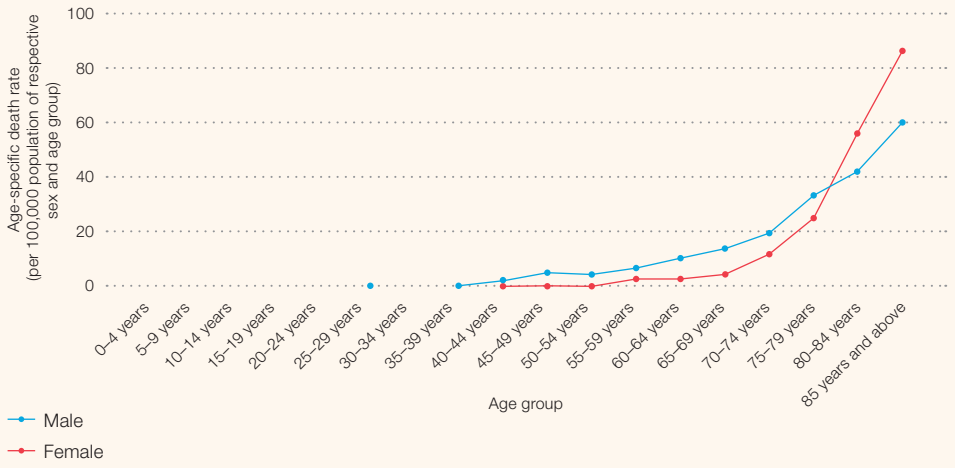
Source: HealthyHK, 2021

[1] Quan et al (2017) defined prediabetes using ADA 2015 guidelines

Furthermore, in 2018, the age-specific death rates due to DM increased markedly after age 70 **(Figure 4.8)**. This concentration of risk in the older age groups makes the case for **increasing population screening, treatment, and management at earlier stages to prevent or further delay DM onset and downstream complications.**

Figure 4.8

Age-specific death rate due to diabetes mellitus, 2019



Source: HealthyHK, 2021

In combination, the growing burden of DM and the increasing mortality of this disease suggest that the disease burden of DM accounts for a significant increment in morbidity, premature mortality, and ultimately, healthcare expenditure.

ii. Estimated economic burden of diabetes in Hong Kong

Estimating the economic burden of DM remains a critical component of understanding the true toll of DM. However, this remains a challenging task due to the nature of DM, which encompasses a wide range of co-morbidities and impacts on other health-related risk factors. The present study references the *Cadenza study* (2009), which remains one of the most comprehensive studies on the trends and economic burden of DM in Hong Kong. The *Cadenza* study defines the cost for DM in two parts, with **direct costs** encompassing medical costs such as **hospitalisation, doctor consultations, and medication**, and the **indirect costs** including costs associated with **disability, loss of economic activity, and premature mortality.**

The *Cadenza study* **estimated the attributable medical cost to DM in the public sector,** in particular for: inpatient care (bed days), General Out-Patient Clinics (GOPCs), Specialist Out-Patient Clinics (SOPCs), and Accident & Emergency Department (A&E). Firstly, the **attributable medical costs of DM in the public sector for people aged 65 and above was approximately HKD 1.4 billion** in the year 2006, which includes direct costs such as inpatient care in public hospitals and costs of doctor consultations (HKJC, 2009). The study also estimated that **the number of people aged 65 and above who had DM was approximately 0.11 million in 2004**, marking an increase of 23.3% from 0.09 million in 2000 (HKJC, 2009). The increase of 23% in number of patients aged 65 and over with DM is especially concerning due to the scope and the high cost per patient, which was valued at roughly HKD 11,915 amongst those 65 and over. Finally, the study further projected future attributable medical costs to DM in the public sector for those aged 65 and above in 2036. Based on previous estimates and 2006 prices, **the study estimated attributable medical costs at HKD 3.5 billion in 2036, projecting an increase of 163% in costs compared with that in 2006.**

However, the *Cadenza study* has cited the above calculations as a conservative estimate of costs, despite the projected increase in years to come (HKJC, 2009). In view of the growing disease and economic burden of DM in Hong Kong and its public healthcare system as detailed by the *Cadenza study*, it is critical to identify and evaluate the availability of effective prevention and management for DM in Hong Kong. This study will expand upon the findings of the *Cadenza study* to assess the financial impact of screening over a prospective 30-year time horizon.

iii. The cost-effectiveness of DM prevention and management in Hong Kong

Over the past two decades, there have been several studies evaluating different interventions for DM care in Hong Kong. At the forefront of such clinical practices has been the **Risk Assessment and Management Programme for Diabetes Mellitus** (RAMP-DM). In 2009, the Hospital Authority (HA) launched the territory-wide programme as an effort to improve the quality of care provided to patients receiving DM care in all 73 public primary care clinics at the HA's GOPCs (Chan et al., 2019). Patients with DM attending GOPCs were invited at random to enrol in RAMP-DM.

The general goal of care for patients with DM is to prevent DM-related complications. Therefore, the RAMP-DM care model sets itself apart from the "usual care" protocol by incorporating **risk assessment criteria for risk level stratification**, which is used to administer tailored care plans with risk-appropriate intervention and education by a team of multi-disciplinary healthcare professionals (for more details of the two care protocols, see **Table 4.7**).

Participants are stratified into four groups, namely "very high risk", "high-risk", "medium risk", or "low risk", from which care plans are developed according to a standardised risk-stratified guide. Traditionally, patients deemed low-risk will continue receiving usual GOPC care, while medium-risk patients are provided with additional intervention by an advanced practice nurse (APN) (Fung et al., 2012). High-and very high-risk patients are provided with additional interventions by an APN and an associate consultant who specialises in family medicine.

Table 4.7

Comparison of RAMP-DM care and usual care protocols

	RAMP-DM care	Usual care
Management	Nurses are engaged as RAMP-DM care managers and provide: • Review of screening results • Individualised DM education • Lifestyle advice (e.g., exercise, diet, smoking and drinking) • Explanation of the cardiovascular risk level The patient's disease profile is recorded and available to a **multi-disciplinary healthcare team** including doctors, nurses, and other allied health professionals	Managed by **GOPC doctors** based on the Hong Kong reference framework for DM care in primary care which includes: • Lifestyle modification (e.g., diet, exercise, smoking cessation) • Glucose control and monitoring • Drug treatment (if HbA1c[1] ≥ 7% after lifestyle modification) • Routine follow-up visits every three months

Key feature	Initial risk assessment to stratify participants into different disease severity level groups:
	• Physical examination
	• Laboratory testing
	• Eye and foot assessment
	• Drug adherence
	• Lifestyle assessment
	• Diabetic complications
		No performance of any risk assessment and stratification such as RAMP-DM care; however, patients have access to:
		• Additional assessments and referrals to allied health professionals (if necessary, at doctor's discretion):
		  • Physical examination
		  • Laboratory testing
		  • Other allied health services

Note: [1] HbA1c (glycated haemoglobin) is a blood test used to monitor blood sugar levels
Sources: Fung et al., 2012; Wan et al., 2018; FHB, 2018

Since its inception, RAMP-DM has undergone multiple evaluations of its efforts. Amongst the leading papers published on RAMP-DM care, two of the latest studies (2018) have reviewed the clinical and cost-effectiveness of the two treatment and management protocols, namely "RAMP care" versus "usual care". The studies have shown **high clinical effectiveness and cost-effectiveness of the multidisciplinary RAMP-DM** for primary care patients with Type 2 DM compared to usual primary care over a period of five years (Jiao et al., 2018; Wan et al., 2018).

In the study on clinical effectiveness, researchers found that RAMP-DM care resulted in an overall reduction of disease complications related to DM from 43.6% (usual care group) to 23.2% (Wan et al., 2018). The findings are consistent with previous studies that observed a reduction in DM-related complications such as cardiovascular complications (6.69% in the usual care group to 4.39% in the RAMP-DM group), heart failure (1.37% to 0.79%), and all-cause mortality (6.07% to 2.22%) over a median follow-up period of 36 months between control group and RAMP-DM patients (Jiao et al., 2015).

Even more promisingly, the cost-effectiveness analysis (CEA) comparing the two care protocols revealed that **RAMP-DM care was substantially more cost-effective than usual care.** The cost reduction was driven by **more effective preventive interventions at earlier stages of disease** and more **timely holistic treatment**. The estimated cost for RAMP-DM care was far less than usual care, costing the health system approximately HKD 19,137 per patient annually compared to an estimated HKD 30,515 for usual care (Jiao et al., 2018). The economic analyses also revealed that while initial investment of RAMP-DM care is higher than usual care by HKD 1,225 per patient, the upfront cost is offset by the reduction in health service utilisation and subsequently, reduction in costs for hospitalisation associated with DM-related complications (Jiao et al., 2018).

The available studies on the effectiveness and benefits of RAMP-DM reiterate the importance of taking up a multifaceted approach to reduce the overall incidence of diabetic complications, hospitalisations, and premature mortality. In particular, these studies illustrate both clinical and cost effectiveness, which builds the case for earlier diagnosis and effective management of DM. The history and development of RAMP-DM are further explored in **Appendix L**.

Table 4.8

Overview of studies evaluating intervention strategies for diabetic care

Title	Overview of Study & Key Findings
From Hong Kong Diabetes Register (HKDR) to Joint Asia Diabetes Evaluation (JADE) Program to Risk Assessment and Management Programme–Diabetes Mellitus (RAMP-DM) for Data–Driven Actions (Chan et al., 2019)	(a) Historical practice of gathering structured data-related to DM care in Hong Kong highlights the importance of **technological integration** in prediction of clinical outcomes, reducing clinic inertia, and empowering self-management; (b) Generation of **big data** on DM care enabled the identification of patients' unmet needs and evaluation of intervention strategies to periodically inform integrated DM care programmes supported by data-driven action; (c) **RAMP-DM** care is a proven example that combines UHC, public-private partnership (PPP), and data-driven integrated care, and benefits 0.4 million people in Hong Kong with DM.
Five-Year Effectiveness of the Multidisciplinary RAMP-DM on Diabetes-Related Complications and Health Service Uses-A Population-Based and Propensity-Matched Cohort Study (Wan et al., 2018)	Clinical effectiveness of RAMP care vs. usual care (a) **RAMP-DM** care can substantially reduce the risk of disease complications from 43.6% (usual care group) to 23.2% and delay disease progression; (b) Highlights the importance of **optimal early intervention** in DM patients which can be achieved through RAMP care.
Five-Year Cost-effectiveness of the Multidisciplinary Risk Assessment and Management Programme–Diabetes Mellitus (RAMP-DM) (Jiao et al., 2018)	Cost-effectiveness of RAMP care vs. usual care (a) Estimated cost of health care utilisation for RAMP-DM care is substantially less than usual care, resulting in a net saving of USD 7,451 (HKD 58,118); (b) Economic analyses revealed that while initial investment of RAMP-DM care is higher than usual care by USD 157 (HKD 1,225), the upfront cost is offset by the reduction of overall health service utilisation, especially through cost saved with the reduction of DM-related complications; (c) **RAMP-DM** is therefore a cost-saving intervention in the management of DM to reduce disease complication.

Title	Overview of Study & Key Findings
Evolution of Diabetes Care in Hong Kong: From the HKDR to JADE-PEARL Program to RAMP and PEP Program (Ng et al., 2018)	(a) Demonstrates evidence in support of incorporating **multi-component in the programme design** for improving DM care in Hong Kong; (b) Highlights elements such as a team-based integrated care approach, information technological, and patient empowerment programs to substantially improve care provision and reduce incidence of diabetic complications, hospitalisation, and mortality; (c) Calls for the strengthening of financing schemes through the adoption of PPP to provide integrated care as a feasible and cost-effective solution.
Annual direct medical costs associated with diabetes-related complications in the event year and in subsequent years in Hong Kong (Jiao et al., 2017)	(a) Estimated the direct medical costs associated with DM-related complications and observed a wide variation in estimated costs across major diabetic-related complications; (b) Formulated a cost prediction model to enable economic evaluation of DM management programmes; (c) Insightful for the cost-effectiveness analysis (CEA) for RAMP-DM care study (e.g., Jiao et al., 2018) to estimate cost-saved in reduction of DM associated complications.
Effectiveness of the multidisciplinary RAMP-DM for diabetic microvascular complications: A population-based cohort study (Jiao et al., 2016)	(a) Assessed resultant development of three subtypes of diabetic microvascular complications over three years follow-up in DM patients compared to those receiving regular primary care; (b) Patients receiving RAMP-DM intervention were associated with a reduction in microvascular complications except in neuropathy over a three-year follow-up period.
Long-term effects of the multidisciplinary RAMP-DM: A population-based cohort study (Jiao et al., 2015)	(a) Assessed risks of cardiovascular complications and all-cause mortality in diabetic patients; (b) Patients receiving RAMP-DM care by a multidisciplinary team observed a reduction in occurrence of coronary heart disease (CHD), stroke, heart failure, total cardiovascular disease, and all-cause mortality; (c) RAMP-DM intervention therefore is effective in the reduction of cardiovascular complications and all-cause mortality over three years follow-up.
Evaluation of the quality of care of multidisciplinary risk factor assessment and management programme for diabetic patients (Fung et al., 2012)	(a) Highlights the importance of a **multi-disciplinary team approach** to DM care; (b) Forms the empirical basis for RAMP-DM care to be led by a multi-disciplinary team; (c) Calls for studies to evaluate the effectiveness of RAMP-DM care.

4.3.3 THE CASE FOR SCREENING AND MANAGEMENT OF DM IN HONG KONG

In considering the growing burden of DM, with rapidly increasing prevalence, decreasing age of onset, and projected growth in disease and economic burden, there is a **strong case for developing a comprehensive screening and management programme to identify individuals at risk of and already with DM, and to provide timely intervention.** More specifically, screening and management efforts must be tailored to: i) identify and prevent patients with no DM from progressing into prediabetes cases; ii) prevent prediabetes cases from progressing into DM cases; and iii) reduce and/or delay DM-related disease complications, including mortality. Similar to previously published care protocols, these combined efforts aim to prevent and/or delay DM diagnoses and subsequent DM-related complications so that patients may enjoy a greater number of healthy years and reduce high spending on health service utilisation (Fung et al., 2012).

Our study seeks to inform the design of the Chronic Disease Screening Voucher and Management Scheme by using a **thirty-year prospective screening and management programme for DM as a proxy,** for those aged 45 to 54 years, based on recommendations from Food and Health Bureau's guidelines (2018) on DM. We address this pilot scheme as the "Scheme" in this chapter. In the Scheme, enrolled individuals will receive DM screening and/or management within the private sector, with patients requiring more complex secondary and tertiary care (e.g. inpatient care) being referred back to the public sector for care and treatment. More details on the clinical definition, screening, diagnostic tests, and management guidelines are presented in **Appendix M**.

On an ongoing continuum and as part of the project funded under the Public Policy Research Funding Scheme of the Policy Innovation and Co-ordination Office (PICO) in the HKSARG (Project number: **2020.A4.068.20B**), a Cost-Effectiveness Analysis (CEA) model for each of the three prevalent chronic conditions in Hong Kong, namely DM, hypertension, and hyperlipidemia, has been conducted to understand the cost-effectiveness of screening. Data and findings from the CEA suggest that population-wide screening, namely for those between the ages of 45–64 years, is a cost-effective measure for improving population health through life-years and complication treatment saved. Hence, we believe that additional analysis needs to be conducted to complement findings from the CEA to better inform public opinion and policy efforts.

Here, we estimate the financial impact of the Scheme on Hong Kong's health system spending on DM care through a **Budget Impact Analysis (BIA) using Hong Kong and relevant international data** to generate more robust evidence on projected expenditure and savings. The BIA will have important implications on the potential implementation of the Scheme in Hong Kong, and in particular, will offer insight into how such programmes may impact the financial budget in the short- and long-term.

4.3.4 METHODOLOGY

Parallel to previously published studies on RAMP-DM care in Hong Kong, our BIA will focus on direct costs to the health system related to cost of hospitalisation, GOPC visits, SOPC visits, allied health clinic visits, and A&E department visits across the public and private sectors (Jiao et al., 2017).

Target screening population and epidemiological data

The Scheme aims to **screen all individuals between the ages of 45–54 years for DM and prediabetes.** To estimate the prevalence of DM and prediabetes amongst the target population to screen, we retrieved population data and disease epidemiological data based on age stratification from the latest 2014/15 PHS from the CHP (CHP, 2017).

Inclusion criteria

The Scheme will be inclusive of all individuals between the ages of 45 and 54 years in the first year of implementation and who are eligible to receive public healthcare services at the Government-subsidised price point (e.g. Hong Kong Permanent Residents and HK identity card (HKID) holders). Individuals who have previously received a positive diagnosis for DM will be included in the model to account for those who may wish to receive an additional series of screening tests to confirm their diagnosis and/or to partake in the additional management components of the Scheme. Within the Scheme projection, we did not distinguish between individuals with prior diagnoses and individuals with DM but without prior diagnoses. The model will project **the costs and savings of those who qualify at the start of the study and track the spending of this demographic group over a time horizon of 30 years.**

Exclusion criteria

The Scheme excludes those aged 55 years and over, as well as those under the age of 45 at the start of the study period. While research shows that older adults (individuals aged ≥ 65) are faced with an increased prevalence of DM relative to a younger population (individuals aged 18–64), the Scheme will exclude individuals **aged 55 years and over at the start of the programme** due to two principal reasons: a) to capture the benefits of the Scheme at an age (i.e., 45 years of age) that is underserved in prevention programmes, which can generate a better understanding of the economic and health benefit of promoting earlier interventions for chronic diseases; b) to avoid insufficient reliable data on DM for those aged 85 years and above (Wong et al., 2017).

Within our projection model parameters, we expect that our target demographic will reach the ages of 75–84 years at the end of the 30-year time horizon. While existing programmes may have already captured segments of this population and will provide similar services, our model intends to show a long-term and population-wide spending projection for 30 years of regular screening and management for DM. As such, the target age range being 45–54 at the start of the study period allows for an extended duration capturing this specific age period during which there are high risks for developing DM-related complications.

Economic projection model assumptions and parameters

For the purposes of modelling, we delineate three principal themes of assumptions:

i) The prevalence of DM and prediabetes within the Scheme's participants:

   We assume that there is a homogeneous prevalence of diabetes, prediabetes, and complications amongst the Scheme's participants.

   We assume that all individuals within the target age range will take part in each of the prescribed interventions and will not withdraw from the programme once they enrol.

ii) The onset of complications due to DM:

   We assume that complication onset is homogenous throughout the target population and principally influenced by years of DM history.

iii) The follow-up treatment provided to the Scheme's participants:

   We assume that all participants diagnosed with DM will receive care within either the public or private sector moving forward and that any differences in prices billed to patients for services between the sectors are negligible.

In building these assumptions into the economic projections model, we aim to define the parameters through which we expect future savings and benefits to both patients and the health system **(Appendix N)**.

i. BIA parameters

To assess the impact of the Scheme in different variations, the BIA was conducted using three scenarios: a baseline scenario modelling expected expenditures assuming that the health system maintains its status quo and no population-wide programmes for screening or risk management are implemented **(Base Scenario)**; a modified scenario showcasing expected expenditures if a screening and basic follow-up care programme is implemented **(Scenario 1)**; a third scenario projecting expenditures if a screening programme is implemented in conjunction with a comprehensive management programme (RAMP-DM) **(Scenario 2)** **(Table 4.9)**.

We calculated our costs and cost-savings using a 30-year horizon with a closed prospective cohort, wherein individuals maintain participation within the Scheme, except in the event of death, throughout the time horizon.

Parameters for the model include the prevalence of the different stages of DM, flow parameters to simulate progression and regression of illness, rates of complications and expected costs, mortality rates and costs, and costs due to screening and intervention (see **Box 4.8** for definitions). The shifts in each of the above listed rates are explored in greater detail in **Appendix O**.

All costs are expressed as before discounting, per the guidelines presented in the 2012 Task Force for International Society for Pharmacoeconomics and Outcomes Research Health Sciences Policy Council to determine new best practices for BIAs (Sullivan et al., 2014).

Box 4.8

Definitions of terms

Progression: describes the development of the disease towards worsening conditions (e.g., from "healthy" to prediabetes, to diabetes)

Regression: describes the reversal of the disease development from having prediabetes towards normoglycaemia (e.g., from prediabetes to "healthy")

Remission: describes the reversal of the disease development from diabetes to prediabetes

Diagnostic state: each diagnosable state of disease (e.g., "healthy"/ no diabetes, prediabetes, diabetes)

Table 4.9

Summary of modelling differences between the three scenarios

	Base Scenario	Scenario 1	Scenario 2
Progression of disease	Individuals may progress from being healthy, towards prediabetes, towards DM with no complications, towards DM with complications	Individuals may progress from being healthy, towards prediabetes, towards DM with no complications, towards DM with complications	Individuals may progress from being healthy, towards prediabetes, towards DM with no complications, towards DM with complications
Progression rate	Based on progression of disease **without intervention**	Based on progression of disease **with intervention**	Based on progression of disease **with intervention**
Remission towards health	Individuals may regress from prediabetes to normoglycaemia (healthy, without DM)	Individuals may **remit from DM towards prediabetes, and subsequently regress from prediabetes** to normoglycaemia	Individuals may **remit from DM toward prediabetes, and subsequently regress from prediabetes** to normoglycaemia
Mortality rates	Mortality accounts for all-cause mortality, DM-related deaths, and prediabetes-related deaths	Mortality accounts for all-cause mortality, DM-related deaths, and prediabetes-related deaths	Mortality accounts for all-cause mortality, DM-related deaths, and prediabetes-related deaths Mortality due to DM is based on **RAMP figures**
Complications costs	Costs determined based on years of DM history	Costs determined based on years of DM history	Costs determined based on years of DM history and **RAMP-adjusted costs**
Additional costs		Additional subsidy cost for management services	Additional subsidy cost for management services

Additional information on the three Scenarios can be found in **Appendix O**.

ii. Scenario analyses

We conducted a series of scenario analyses to explore the possible benefit-cost range of different key parameter values if the Scheme were to be implemented. The set of scenario analyses conducted includes:

1) **Scenario analysis 1:** varying remission rates within Scenarios 1 and 2 to explore the impact of remission on cost-benefits
2) **Scenario analysis 2:** varying the cost of screening to assess the likelihood of cost impact
3) **Scenario analysis 3:** assessing costs and savings of different complication rates and costs per patients with DM complications
4) **Scenario analysis 4:** differing the administrative and running costs of RAMP-DM programme
5) **Scenario analysis 5:** adding a management cost for prediabetes patients to stymie their disease progression
6) **Scenario analysis 6:** comparing the impact of a screening programme against a Base Scenario with existing RAMP-DM
7) **Scenario analysis 7:** assessing the impact of the Scheme on costs and savings if the target population takes up the Scheme in a naturalistic manner, rather than all at once.

4.3.5 RESULTS

i. Parameters used in the model

To determine the overall cost and benefit of a large-scale population-wide DM screening programme, we first investigated the prevalence of DM in the target screening population. The screening voucher Scheme will specifically target individuals between and inclusive of the ages 45 and 54 years, regardless of existing prior DM diagnosis. The prevalence estimation was based on the CHP's 2014/15 PHS, specifically, on the table entitled "Prevalence of diabetes mellitus amongst persons aged 15 to 84 by age group".

Based on the Department of Health data on DM prevalence, we identified three main values for the population age demographic between years 45 and 54. While the data on prevalence is based on figures presented in the PHS 2014/15 and may therefore be insufficiently representative of the current population health trends, this data source remains the most up-to-date population-wide survey regarding DM **(Table 4.10)**. The data used are as follows:

Table 4.10

Prevalence of Diabetes Mellitus and Prediabetes

Parameters	Value
Prevalence of prediabetes (IFG)	1.24%
Prevalence of DM with prior diagnosis	2.46%
Prevalence of DM without history of diagnosis	4.86%

Using an average of the growth in prevalence of prediabetes in the data provided by Quan and colleagues to substitute for the cumulative incidence proportion of prediabetes, **we calculated that the growth in incidence of prediabetes per year would be 0.99%** (Quan et al., 2017).

To calculate the progression rate from prediabetes to DM, we used the resultant data from Okada, Tsushita et al.'s 2017 Japan Ningen Dock study to explore the variation in impact of prediabetes management and lifestyle modification on prediabetic patients (Okada et al., 2017). Okada and colleagues' study faced a four-year timeline and compared the cumulative incidence of DM progression from prediabetes in two groups, the Ningen Dock study group that received guidance on lifestyle modification, and a control group without comprehensive guidance. The researchers found that the **cumulative incidence of DM progression in the study group was 11.2%** (95% CI, 10.7–11.7%), **compared to a cumulative incidence in the control group of 14.9%** (95% CI, 14.2–15.6%). We do not account for the progression of prediabetes to DM in patients within the first year given that the prevalence of different diagnostic states is already set in the 2014/15 PHS. After, our model assumes that individuals will begin developing DM as early as the second year at an incidence interval of 2.8% (per annum incidence derived from 11.2% cumulative incidence every four years). Separately, we expect an annual cumulative incidence of DM progressing from pre-diabetes as 3.73% for the Base Scenario (per annum incidence derived from 14.9% cumulative incidence every four years).

The parameters used in the BIA are as follows **(Table 4.11)** (calculations can be found in **Appendix P**):

Table 4.11

Parameters list for model assumptions

Parameters	Value
Starting points	
Prediabetes prevalence as at 2022	1.24%
Already have diagnosis before 2022	2.46%
Diabetic but without diagnosis before 2022	4.86%
Flow parameters	
Incidence of prediabetes from no diagnosis	0.99%
Base Case: Incidence of new DM cases from prediabetes cases	3.73%
Scenario 1 & 2: Incidence of new DM cases from prediabetes cases	2.80%
Regression rate from prediabetes to normoglycaemia	2.82%
Scenario 1 & 2: Remission rate from DM to prediabetes	7.00%
Assumed complication rate multiplier of 20+ years of DM history	150%

Parameters	Value
Complication rates and costs	
Base Case & Scenario 1:	
Complication rate (usual care)	6.20%
Complication cost per patient (usual care)	HKD 106,523.39
Cost per “healthy” patient, aged 45–54 (usual care)	HKD 5,705.28
Cost per “healthy” patient, aged 55–64 (usual care)	HKD 9,293.30
Cost per “healthy” patient, aged 65–74 (usual care)	HKD 15,137.81
Scenario 2:	
Complication rate (RAMP)	3.81%
Complication cost per patient (RAMP)	HKD 123,363.56
Cost per “healthy” patient, aged 45–54 (RAMP)	HKD 5,950.20
Cost per “healthy” patient, aged 55–64 (RAMP)	HKD 9,538.22
Cost per “healthy” patient, aged 65–74 (RAMP)	HKD 15,382.73
Cost of intervention for diagnosed DM patients (Scenario 1, 2)	HKD 3,486.00
Screening	
Scenario 1 & 2: screening cost per head	HKD 200
Screening interval (per year)	
Prediabetes screening interval	1
Low-risk (no DM) screening interval	1/3
High-risk (no DM) screening interval	1
Risk level prevalence	
Low-risk (no DM) aged 45–54	58.80%
Low risk (no DM) aged 55–64	56.50%
Low-risk (no DM) aged 65–74	52.70%
Mortality rates	
Overall mortality rate for aged 45–54	0.21%
Overall mortality rate for aged 55–64	0.46%
Overall mortality rate for aged 65–74	1.09%
Base Case & Scenario 1:	
Mortality rate specific to DM for aged 45–54	0.85%
Mortality rate specific to DM for aged 55–64	1.86%
Mortality rate specific to DM for aged 65–74	4.27%
Scenario 2:	
Mortality rate specific to DM for aged 45–54 (RAMP care)	0.32%
Mortality rate specific to DM for aged 55–64 (RAMP care)	0.69%
Mortality rate specific to DM for aged 65–74 (RAMP care)	1.59%
Mortality rate specific to prediabetes for aged 45–54	0.50%
Mortality rate specific to prediabetes for aged 55–64	0.60%
Mortality rate specific to prediabetes for aged 65–74	0.70%

ii. Cost calculations per scenario

Base Scenario

After accounting for the progression of patients' DM conditions and regression towards normoglycaemia (i.e., the state of a having a normal blood glucose level), the flow of patients between different disease groups reveals a trend towards growing DM and prediabetes populations over the 30 years **(Figure 4.9) (Table 4.12)**.

Figure 4.9

Diagnostic category shifts in base scenario

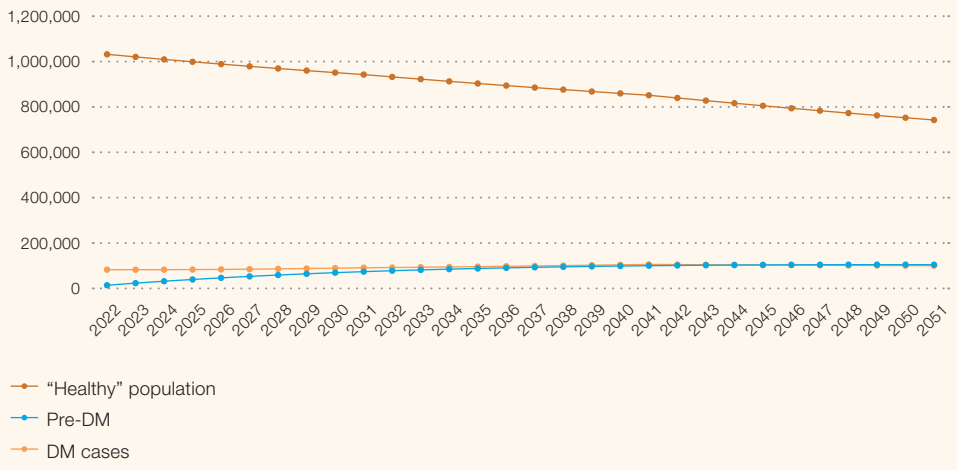


Table 4.12

Number of individuals at each diagnostic state per five-year intervals (Base Scenario)

	2022	2026	2031	2036	2041	2046	2051
"Healthy" population	1,031,809	988,714	942,572	894,077	851,438	794,100	742,352
Pre-diabetes population	13,992	46,562	73,960	90,597	100,115	104,140	104,553
DM population	82,599	83,811	91,024	97,498	105,815	102,543	100,319

The mortality rate for each diagnostic group remains consistent within each ten-year period, between 2022–2031, 2032–2041, and 2042–2051 **(Table 4.13)**. There are notable jumps in mortality in 2032 and 2042 due to participants in the target age demographic entering the next age brackets of 55–64 years and 65–74 years, respectively.

Table 4.13

Total DM-related mortality and average DM-related mortality per year over 10-year intervals (Base Scenario)

	2022–2031	2032–2041	2042–2051
Total DM-related Mortality	6,508	18,021	43,978
Average DM-related Mortality Per Year	651	1,802	4,398

Of note, the costs associated with complications and mortality grow significantly within the 30-year horizon of the model due to the growing burden of DM cases and mortality.

Consequently, **the total costs for the care and management of DM over a 30-year time span is projected to total HKD 45.35 billion.** The average yearly costs of care are expected to reach approximately HKD 1.51 billion.

Total cost of DM care (Base Scenario) = [Complications care] + [Care for patients without complications]

Scenario 1

In modelling the implementation of a DM screening programme, we first projected the likely progression of the target population through each diagnostic state assuming that the entire target population partook in the screening programme. The results of this projection showed that relative to the demographic trends in Base Scenario, the size of the "healthy" population would be larger at the end of the 30-year time horizon, and the size of the prediabetes population would increase significantly in comparison, while the size of the DM population would decrease **(Figure 4.10) (Table 4.14)**. The principal rationale for this shift in demographic trends is the inclusion of the remission from DM toward prediabetes, wherein the screening programme is expected to diagnose DM and offer timely intervention to aid in controlling and managing patients' conditions.

Figure 4.10

Diagnostic category shifts in scenario 1

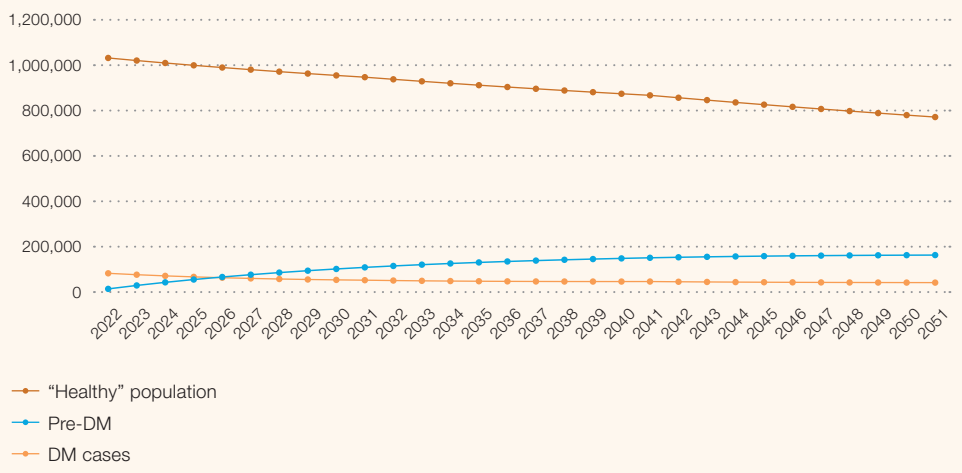


Table 4.14

Number of individuals at each diagnostic state per five-year intervals (Scenario 1)

	2022	2026	2031	2036	2041	2046	2051
"Healthy" population	1,031,809	989,631	947,101	903,765	867,155	816,363	771,369
Prediabetes population	13,992	66,380	108,803	134,833	151,022	159,604	162,967
DM population	82,599	63,198	52,321	47,129	46,361	42,876	41,631

Consequently, under Scenario 1 where all individuals in the target age demographic undergo screening, the cost of complications (including the cost of additional intervention subsidies to diagnosed patients) decreases relative to the Base Scenario **(Figure 4.12b)**. In particular, the cost of complications for individuals is markedly lower in Scenario 1. This lower cost is the result of fewer patients with DM after the implementation of screening and basic lifestyle modification.

Within Scenario 1, after the implementation and adoption of the screening programme, we project that there will be cost savings to the health system compared to having no screening (Base Scenario). In particular, our BIA forecasts a **total spending of HKD 31.36 billion over the 30-year horizon**. This translates to a **30.84% savings in costs relative to the Base Scenario (Table 4.16)**. The projected savings over the 30-year period amount to HKD 13.98 billion.

Total cost of DM care (Scenario 1) = [Screening cost] + [Intervention cost] + [Complications care] + [Care for patients without complications]

Scenario 2

Relative to Scenario 1, there are more individuals in the prediabetes and DM population at the end of the 30-year horizon despite similar rates of change for disease progression and remission **(Figure 4.11) (Table 4.15)**. This result is due to a lower mortality rate specific to DM, thus allowing more individuals to progress through the different diagnostic states of DM.

Figure 4.11

Diagnostic category shifts in Scenario 2

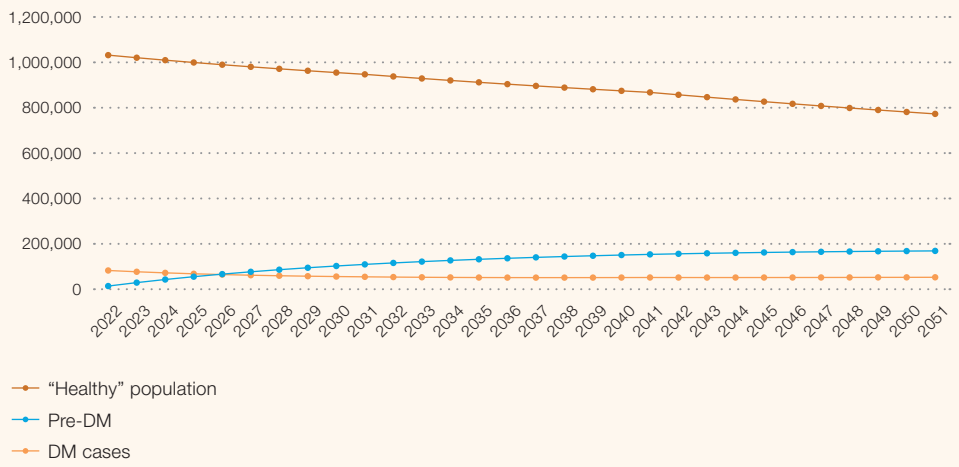


Table 4.15

Number of individuals at each diagnostic state per five-year intervals (Scenario 2)

	2022	2026	2031	2036	2041	2046	2051
"Healthy" population	1,031,809	989,634	947,154	903,951	867,597	817,209	772,835
Prediabetes population	13,992	66,541	109,499	136,332	153,576	163,627	168,939
DM population	82,599	64,618	54,671	51,298	51,714	51,686	52,588

In assessing the cost calculations stemming from implementing a screening and attendant RAMP-DM Scheme (Scenario 2), our projections show that the gross annual costs closely mirror that of only implementing a screening programme (Scenario 1). The final total spending on the screening and risk management Scheme shows that spending is expected to surpass the total expenditures on a screening-only programme. When comparing only the cost of complications to Scenario 1, our model projects an annual expenditure surpassing HKD 1 billion within the last ten years of the time horizon. Additionally, Scenario 1 shows a decrease in complication and treatment costs towards the end of the time horizon, whereas expenditures increase in Scenario 2 towards the end of the time horizon.

Concerning spending in Scenario 2, we note a **total projected cost of HKD 32.85 billions with a 27.57% savings in costs relative to the Base Scenario (Table 4.16)**. Overall, these savings translate to a total of HKD 12.50 billions over the course of the 30-year horizon.

Total cost of diabetes care (Scenario 2) = [Screening cost] + [Intervention cost] + [RAMP cost] + [Complications care] + [Care for patients without complications]

Table 4.16

Comparison of total costs and savings in each scenario over 30-year horizon

(HKD million)	Base Scenario	Scenario 1	Scenario 2
Costs over 30 years	45,346.76	31,362.88	32,845.33
Savings over 30 years		13,983.87	12,501.43
% Savings		**30.84%**	**27.57%**

The majority of costs in the Base Scenario are due to the costs of treating complications. We find that when the health system incorporates screening and RAMP-DM into diabetes care, we can significantly lower costs to the health system, especially in relation to complications (a comparison of costs over a 5-year horizon can be found in **Appendix Q**).

Table 4.17

Comparison of costs over a 30-year horizon

(HKD million)	Base Scenario	Scenario 1	Scenario 2
Screening Cost	N/a	4,198.75	4,212.60
Intervention Costs	N/a	5,121.21	5,705.31
Complication Costs	45,346.76	22,042.92	22,927.42
Total Costs	45,346.76	31,362.88	32,845.33
DM-related Mortality	83,029	54,287	35,891
Total Premature Mortality	**181,176**	**152,434**	**134,038**

Note: Premature mortality is defined as the sum of deaths related to diabetes, deaths related to prediabetes, and deaths due to all-cause mortality as defined by the C&SD.

Although expenditures may suggest that the most cost-efficient option is to screen only, we observe that the screening and management programme outweighs the costs with its health outcomes **(Figure 4.12a and 4.12b)**. Notably, we observe that under the construct of the BIA model, we project **the implementation of screening and management services to prevent approximately 47,138 mortalities relative to the Base Scenario (Table 4.18)**. In comparison, **implementing only a screening programme would prevent approximately 28,742 mortalities, a 39% decrease in prevented mortality** relative to a full Scheme implementation.

The cost to prevent one mortality in Scenario 2 is lower than that in Scenario 1, contributing to the relatively higher cost-effectiveness of Scenario 2. We note that when only implementing a screening programme, the cost to prevent one mortality equates HKD 1,091,191 within a thirty year time horizon **(Table 4.18)**. However, when we factor in an **additional management component in addition to screening, the cost to prevent one mortality becomes HKD 696,795.** Therefore, despite an additional 3% spending over the course of 30 years, when a screening and management Scheme is enacted in full, the health system will reap significant benefits via a greater number of prevented mortalities and a lower per capita spending to prevent DM-related mortality. In sum, the health system achieves greater benefits when investing fully in a chronic disease screening voucher and management Scheme.

Table 4.18

Comparison of mortality in each scenario over 30-year timeline

	Base Scenario	Scenario 1	Scenario 2
Mortality–DM	68,507	32,525	13,757
Mortality–Prediabetes	14,521	21,762	22,133
Total prevented mortality		**28,742**	**47,138**
Cost to prevent one mortality		**HKD 1,091,190.59**	**HKD 696,794.93**

Figure 4.12a

Comparison of annual gross costs over 30-year horizon in each scenario

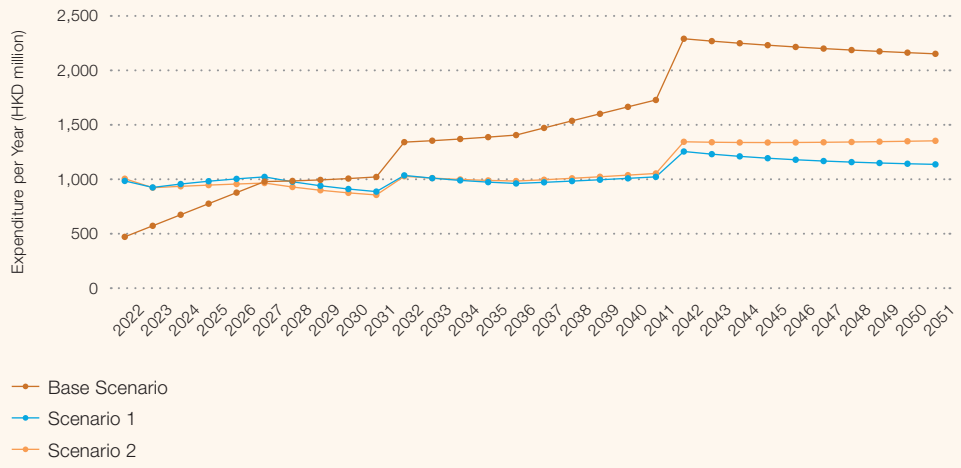
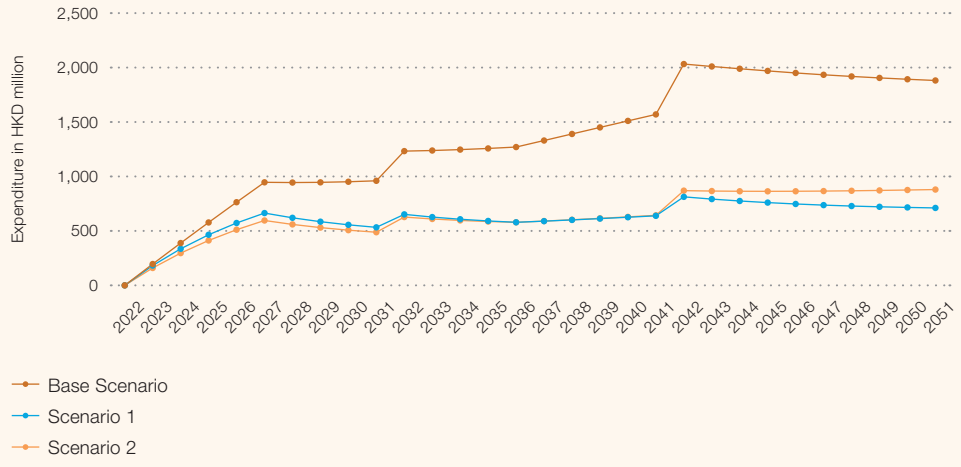


Figure 4.12b

Annual cost of complications (in those with diagnosed DM) across all three scenarios



iii. Scenario Analyses

To better assess and understand the possible range in which parameter values may vary from those used within the model in order to achieve cost-savings and prevent premature mortalities, we conducted various scenario analyses on drivers of the model. The findings are summarised in the table below and in **Appendix R**.

Table 4.19

Scenario analysis findings

Parameter of interest	Analysis results	Implications on policy
Remission rate from DM toward prediabetes (Scenario analysis 1)	To attain net-neutral cost-savings for the full screening and management Scheme, remission rates must surpass 2.9%.	It is vital that patients with DM follow lifestyle modification guidance to achieve DM remission. If the remission rate is too low, there may not be cost-savings to the health system.
Cost of DM screening (Scenario analysis 2)	If the cost of screening is raised to match the cost of attendance at a GOPC (HKD 445), the savings for the Scheme decreases from 27.57% to 16.19%. There will be no accrued savings if screening costs surpass HKD 780 per person.	The Government and purchasing authority should work towards a lower cost of screening within the private sector to ensure long-term savings.
Complication rates and costs (Scenario analysis 3)	• If the effects of the RAMP management Scheme are muted and rates of complication development increase, the likely cost-savings will decrease. • Conversely, if complication development rates increase for all patients between the Base Scenario and Scenario 2, there is likely to be greater savings. • At varying complication rates and costs per patients, we achieve different cost-savings, with net-neutral savings at 7.0% complication rate and HKD 200,000 per patient cost.	Providers should prioritise the prevention and delaying of complication-onset to reduce hospital inpatient care spending.
Cost of implementing RAMP (Scenario analysis 4)	If the cost of RAMP increases from HKD 244 to HKD 1,500, there are still likely to be cost-savings to the health system.	For the Scheme implementation, there is greater flexibility in adjusting the cost of RAMP to better incentivise participation.
Adding prediabetes management options (Scenario analysis 5)	There remain cost savings over 20%, even when there are additional prediabetes management options.	The Government and purchasing authorities may consider a more holistic Scheme to aid in stronger primary care uptake.
Comparing impact to Base Scenario with existing RAMP-DM but without screening (Scenario analysis 6)	Total spending in our base case is lower if no population-wide screening voucher were implemented but all diagnosed patients received RAMP-DM. This results in lower savings and fewer prevented mortalities.	The Government and purchasing authorities should implementing a screening voucher to gain more benefits from early detection and management of DM.
Varying uptake rates of Scheme participation (Scenario analysis 7)	Total spending decreases when the participation rate matches the EHCVS ever-use rate due to increases in mortality count. Nonetheless, the cost to prevent one mortality increases, suggesting that low initial participation makes the Scheme less cost-efficient.	The Government and purchasing authorities should more strongly promote the Scheme and work to increase participation in order to reduce negative effects of insufficient screening and management services.

4.3.6 DISCUSSION

This chapter presents the findings from an economic impact analysis of executing the Scheme for DM for 30 years, following a target population of individuals aged 45–54 years at the start of the implementation period. The BIA structure used in this Chapter follows a 30-year time horizon, rather than a shorter period of 5 years, as recommended in the latest BIA best practices guidelines, in order to capture the full impact of the Scheme as a population health intervention (Sullivan et al., 2014).

Implementing a population-wide screening voucher and management Scheme for DM will be cost-saving and reduce preventable mortalities. The Government should therefore consider adopting a chronic disease screening voucher and management Scheme to fully attain the financial and demographic benefits described in the BIA model. The proposed programme would further Hong Kong's efforts in **promoting the family doctor and basic medicine model wherein patients sustain a routine source of care from a primary care provider and the health system transitions to a model of care that is less hospital-centric** (FHB, 2008b).

We conclude that implementing the Scheme for individuals aged 45–54 years **will result in long-term cost-savings.** Our BIA shows that there are three major benefits of implementing a comprehensive Scheme encompassing prevention, early screening, treatment, and management **(Table 4.20)**. Firstly, we note that in implementing such a Scheme, there are likely to be notable savings to the health system due to fewer DM cases and subsequently, fewer patients experiencing complications. Secondly, the BIA projects that there will likely be an additional population demographic benefit of implementing the Scheme due to a high number of prevented mortality. Thirdly, both percentage savings from Scenario 1 and Scenario 2 indicate that **implementing some form of the CDSVMS would result in a saving of approximately one-third of direct healthcare spending, relative to if there had been no screening Scheme at all.**

Table 4.20

Results of BIA showing savings and prevented mortalities

	(HKD million)	Base Scenario	Scenario 1	Scenario 2
Costs and Savings	Costs over 30 years	45,346.76	31,362.88	32,845.33
	Savings over 30 years		13,983.87	12,501.43
	% Savings		**30.84%**	**27.57%**
Mortality	Mortality–DM	68,507	32,525	13,757
	Mortality–Prediabetes	14,521	21,762	22,133
	Total prevented mortality		**28,742**	**47,138**
	Cost to prevent one mortality (HKD)		**1,091,190.59**	**696,794.93**

While both iterations of the Scheme suggest cost-savings under the parameters of the BIA model, we acknowledge that in absolute values, it would appear more financially responsible to implement only a screening voucher due to its higher cost-savings compared to a full screening and management Scheme. However, cost-savings as an absolute value is not fully indicative of the cost-efficiency of the Scheme iterations. The benefits of the full Scheme, as encapsulated by Scenario 2, can be shown by i) the number of prevented mortalities from DM, and ii) the cost to prevent one mortality.

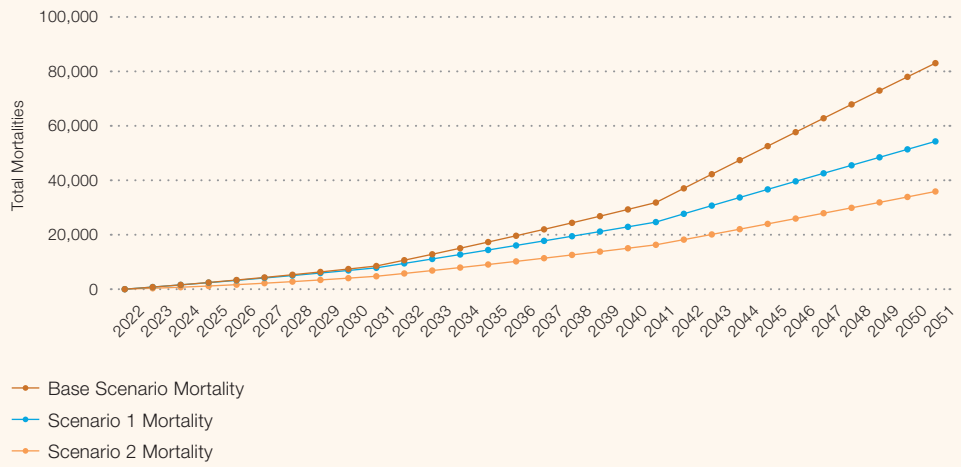
When considering i) the number of prevented mortalities, Scenario 2 observed larger decreases in total mortality of individuals due to DM than Scenario 1. The model projects that **implementing a screening-only voucher Scheme would prevent 28,742 total mortalities** due to DM and prediabetes. **When both the screening voucher and management Scheme are implemented, the model projects that 47,138 total mortalities will be prevented** **(Figure 4.13)**. Overall, there are more prevented mortalities in Scenario 2 than in Scenario 1.

When considering ii) the cost to prevent one mortality, our analyses show that Scenario 2 projects a lower cost to prevent one mortality than Scenario 1. In Scenario 1, the model projects the cost to prevent one mortality in the event of implementing **only a screening voucher** to be **HKD 1,091,190.59**. In comparison, our model projects that the cost to prevent one mortality should a **screening voucher and management Scheme** be implemented is **HKD 696,794.93**, showcasing a **36.1% decrease in spending per mortality** relative to Scenario 1. In short, the **approximately 3% extra spending over the course of a 30-year timeline will prevent an extra 20,000 mortalities.** Hence, while implementing a screening only voucher Scheme may incur less spending in the long-term, we consider it more financially reasonable to implement a screening voucher and management scheme to utilise spending more efficiently.

Furthermore, these projected figures only account for direct spending to the health system through hospitalisations, medication, and consultations with doctors. However, **our model cannot fully account for the indirect benefits** that are likely to be accrued from the implementation of the Scheme. For instance, we project that implementing the Scheme in full would result in prevented mortalities from individuals with DM. While we must account for their continued healthcare spending, we cannot account for their later economic contributions through continued employment, participation in the community, or role in supporting their families as a result of prevented mortality. Similarly, in the case of the Base Scenario of the status quo, we cannot fully account for the economic impact on patients' families and communities if they develop severe complications that take away from their ability to contribute economically nor the financial impact on family members who experience the loss of a loved one. As such, we maintain that while our projections showcase the likely financial impact on the health system, **we have likely underestimated the actual economic and interpersonal benefits to patients, their communities, and the larger Hong Kong primary healthcare ecosystem.**

Figure 4.13

Total mortality to date in each scenario



High initial costs of Scheme implementation relative to cost projections

While the model projects significant savings in the long run, we also acknowledge that within the current model projections, both modeled scenarios of the Scheme will result in higher initial costs of programme implementation **(Figure 4.12a, Figure 4.12b, and Figure 4.14)**. We maintain that cost-savings are most likely to be accrued after an extended period within the Scheme. Available literature on the risk of complications and duration of DM indicates that patients are more at risk of complication development after 10 to 20 years of DM duration, regardless of age of DM onset (Song & Hardisty, 2009). As such, the expenditure level relative to the cost-saving level during the early years of the Scheme implementation cannot sufficiently capture the true benefit to the health system and patients.

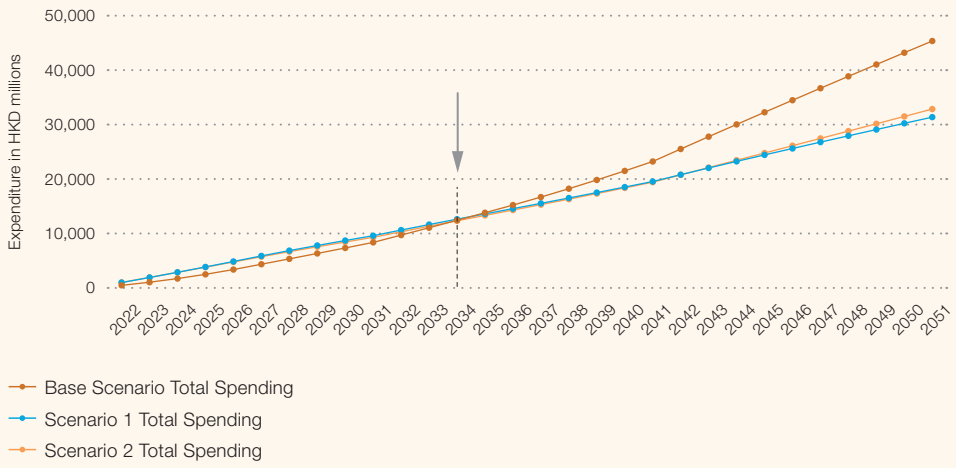
Most notably, we find that if the full Scheme were to be implemented, we would see greater spending within the first five years (with the expected costs for screening and management in year five alone totalling HKD 4.765 billions), relative to our Base Scenario of not implementing the Scheme (with expected costs in year five totalling HKD 3.371 billions, a 29.3% decrease in spending relative to implementation). The bump in expected costs may be disincentivising for policymakers in the short-term. However, as discussed previously, greater savings are likely to be accrued in later years of implementation.

While these costs meaningfully drive the total expenditure for the Scheme in the initial years of programme implementation, we are also cognizant that these costs encompass critical components of the Scheme, which includes the financial incentive for participation—the annual intervention subsidy of HKD 3,486 per patient and participation subsidy for providers. The subsidy is intended to incentivise patients to proactively seek healthcare services to better maintain their health and prevent deterioration of their conditions. We expect that during the actual implementation of the Scheme, the expenditure on the intervention subsidy (valued at HKD 3,486/patient) will overlap with spending on treatment and management of DM for individuals without complications (valued at HKD 5,950/patient for patients between the ages of 45–54 years; subsequently valued at HKD 9,538/patient and HKD 15,383 for ages 55–64 and ages 65–74, respectively). While the intervention subsidy is intended to allow patients to access a wider variety of services not exclusively limited to healthcare provision, it remains likely that patients may want to utilise these funds for healthcare purposes, which may subsequently overlap with the treatment and management costs that the Government can expect to spend on an annual basis. As such, health system spending on the Scheme is likely to be lower than projected in the model.

Furthermore, we may expect that during the initial years of the Scheme's implementation, many patients may be found with DM and underlying symptoms that have yet to be treated in a sustained manner. To this end, we can expect that costs may be initially high to enrol these patients into treatment and management Schemes, and therefore deviate from the projected spending levels in the BIA. Nonetheless, as these patients are eased into the Scheme, their costs can be expected to plateau as they learn to better manage their diagnosis and stave off worsening symptoms. The initial increase in expenditures due to patients with complications joining the Scheme is not seen within our projections, given the nature of our cost figures being representative of average expenditures over a five-year period, and thereby "smoothing" the possible outliers in healthcare expenditures.

Figure 4.14

Total expenditure per scenario to date



Introducing management efforts to prediabetic patients will result in benefits to patients and the health system

Our model cannot fully capture the full scale of economic, health, and individual benefits that would be accrued by the implementation of the Scheme. The model maintains a conservative estimate of the benefits gained by patients and the health system while simultaneously over-estimating the costs demanded in implementation. This is especially notable in the Scheme's additional management efforts for individuals diagnosed with prediabetes.

Recent research has explored the prediabetes diagnostic state for its possible cost implications within the short- and long-term. Patients with prediabetes or with no DM diagnosis may help prevent future costs when they improve their baseline state of health and are prevented from likely comorbidities.

According to a consensus by the American College of Endocrinology and the American Association of Clinical Endocrinologists released in 2008, prediabetes alone can raise the short-term absolute risk of DM by 3- to 10-fold (Garber et al., 2008). Patients with prediabetes are already at risk of complication development, with evidence showing associations between pre-diabetes and early forms of nephropathy, chronic kidney disease, small fibre neuropathy, diabetic retinopathy, and increased risk of macrovascular disease (Garber et al., 2008; Tabák et al., 2012). As such, addressing pre-diabetic patients may be crucial in preventing future complications of DM, such as related microvascular disease and CVD (Chiasson et al., 2003; DREAM Trial Investigators, 2008; Ghody et al., 2015; Ratner et al., 2005).

Literature also shows that regression toward normo-glycaemia is beneficial for both patients and the health system. Incorporating prediabetic management would likely contribute to lower costs to the health system, including GOPC-based care costs and complications costs, with the impact of interventions potentially leading to effects lasting up to 20 years after the time of intervention (Kerrison et al., 2017; Nah et al., 2019; Perreault et al., 2012; Zhuo et al., 2014).

Proposal to attain more accurate screening results

The most notable instance of change in prevention is in relation to screening services. Recommendations for DM screening within the *Hong Kong Reference Framework for Diabetes* currently entail using either a HbA1c test or a FPG test to conduct screening for DM (PHO, 2018). Individuals who do not meet the threshold for not having DM will receive additional screening services to confirm their diagnosis.

Our model and screening methodology instead employ a more aggressive approach to obtain a diagnosis. We propose that to ensure accuracy of diagnosis for modelling purposes, screening should consist of two rounds of testing, with each round consisting of different tests to ensure a higher likelihood of providing a correct diagnosis. In the first round, we propose that all eligible individuals should receive both the HbA1c test and FPG test. Individuals who do not meet the threshold for either DM or prediabetes can be diagnosed as "healthy without DM" and will not require a second round of testing. Individuals who fall into the prediabetic range of either HbA1c and FPG tests will retake the HbA1c and FPG tests in addition to an OGTT test. Individuals who initially fall into the diabetic range will retake the HbA1c and FPG tests to confirm their DM diagnosis. In doing so, we hope to minimise the false negative rate of these tests, which would provide an incorrect "healthy" diagnosis, and to minimise the false positive rate, which would provide an incorrect DM diagnosis.

While this screening mechanism veers away from the screening guidelines, this protocol more closely aligns with the services available in the private sector for DM screening. During an initial assessment of the DM screening services in the private sector, we found that many clinics offered DM tests in various combinations, rather than individual tests. In particular, given that patients may not have the luxury of visiting clinics in high frequency to conduct different DM testing and given that a blood sample is required for both the HbA1c and FPG tests, conducting both tests simultaneously as a "first-round" screening is more efficient and ensures more accurate results **(Appendix S)**.

Cost of screening is premised on assumptions about market behaviour and economies of scale

Our modelling approach for the overall cost of screening also presumes shifts in costs to the health system upon implementation on a population-scale. Currently, we assume an average total cost of screening per individual to be HKD 200 per screening event, indicating that regardless of the combination of tests that a patient receives, the average cost per patient per screening will be approximately HKD 200. We note that such a low average total cost may currently fall below the average cost of screening in the private sector, where the median price for screening services involving FPG, HbA1c, and OGTT is approximately HKD 400–650 per patient.

Nonetheless, in considering that the health system will play a central role in organising the screening efforts to ensure a high quality standard, it is not improbable that conducting population-wide screening may allow the health system to achieve economies of scale, thus lowering the cost of screening for all. Such reductions in cost are not unprecedented in the health system, most notably with the reduction of costs for COVID-19 testing during the last quarter of 2020, when the Government launched four community testing centres (HKSARG, 2020a). This example of cost reduction is indicative of the lower costs achievable through the centralisation and mass implementation of services by the Government and health system.

The modelling mechanisms additionally acknowledge that individuals without DM will face different screening needs and receive varied recommendations for rescreening. The current dearth of data relating to the percentage of individuals deemed high-risk for DM creates a gap in our ability to fully forecast screening costs to the health system. To work around this data gap, we instead used data pertaining to physical activity during a normal week, taking the average percentage of individuals in each age group who reported having engaged in moderate or vigorous physical exercise. We used this value as a proxy for individuals at low-risk for DM due to their healthy lifestyle habits that would form a significant component of the recommendations for those at high-risk. Individuals categorised as low-risk will receive screening services every three years, or as recommended by their doctors, while high-risk individuals and individuals with prediabetes will receive screening services on an annual basis (FHB, 2018).

Factors that may impact costs to the health system

To counter potential concerns surrounding data, we additionally conducted various univariate and multivariate scenario analyses to assess the impact of different parameter values on the cost-savings and health benefits of conducting the Scheme. We conclude that variations in parameter values will shift the expected percentage cost-savings, and in certain instances, the total prevented mortality. Nonetheless, we still find that most variations result in positive cost-savings and health benefits to the health system.

i) Remission rates

Given that DM remission research is relatively novel in Asia, and especially in Hong Kong, we assessed the impact of alternative remission rates on cost-savings based on the literature. We found that a remission rate of 2.0%, based on a population using only DM support and education, would result in net negative savings, adding an additional HKD 3.819 billion to the health system spending over a 30-year horizon for the Scheme (Gregg et al., 2012). Nonetheless, even if the health system expects to increase its spending by 8.42% over a 30-year time horizon, our model still projects a total of 42,633 prevented premature mortalities. Hence, when only considering the direct costs to the health system, we may expect higher costs to the health system if a lower remission rate is achieved. Nonetheless, in considering the demographic benefits of implementing the Scheme, our model still projects a high number of prevented mortalities.

ii) Cost of screening

In addition, we also assessed the cost impact of a higher total cost of screening per individual, under the possibility that the Government is unable to significantly lower the screening cost. We found that a screening cost of approximately HKD 780 will lead to no cost-savings in the Scheme implementation, while an increase in screening cost from the current HKD 200 to HKD 445, the cost to the health system for a GOPC attendance, will result in only a 16.19% cost-saving percentage over the time horizon. We acknowledge that the screening cost can drive the final cost-savings of the programme, hence pointing to **the critical importance of the role of the Government and health system planners in achieving lower cost screening services.** We believe that it is possible to do so if population-wide screening were to take place, as the increase in screening demand could enable the health system to achieve economies of scale.

iii) Cost of implementation

Within the realm of RAMP-DM implementation, we also acknowledge that the costs of implementation in the public sector may be lower than costs in the private sector. Therefore, we also assessed the impact of increasing RAMP-DM administrative and implementation costs. The current model supposes a cost of HKD 244 per patient per year, derived from the most recent cost-effectiveness study of RAMP-DM, which results in a final cost-savings percentage of 27.57% (Jiao et al., 2018). When this cost per patient is increased to HKD 500, the percentage of cost-savings decreases to 26.61%; at HKD 1,000/patient, the percentage falls to 24.74%; and at HKD 1,500/patient, the percentage becomes 22.87%. This suggests that while the cost of RAMP-DM implementation may impact the final percentage cost-savings, it does not appear to be a significant driver of the results. Therefore, **the Government has more leeway in adjusting the price of RAMP administration to incentivise more private sector participation.**

iv) Costs of care for prediabetic patients

Finally, our model projects that the size of the population with prediabetes will grow significantly if screening and management for DM were widely implemented. Under the current *Hong Kong Reference Framework for Diabetes Care guide*, individuals with prediabetes do not receive care or management for their prediabetes beyond more regular DM rescreening. However, given that prediabetes is a high-risk state for DM, we also explored the impact on cost should an additional management component for prediabetes be added. To do so, we factored an additional HKD 350, or the average cost of one doctor visit per the GOPC-PPP subsidy, for each patient with prediabetes. We found that cost-savings would be reduced to 24.73%. While this marks a decrease in the expected cost-savings of the Scheme, it is possible that this addition may further **reduce the rate of transition from prediabetes towards DM**, and therefore, **the Government should consider subsidising prediabetes management services within the Scheme.**

Limitations

Our model does not include initial set-up costs for the Scheme for DM or the RAMP-DM Scheme within the private sector. We acknowledge this limitation in the projection and recognise that the cost projections may therefore be insufficiently representative of the cost in the initial years of implementation. However, insufficient data on private sector participation in PPPs of this capacity renders it difficult to estimate set-up costs. As such, we recommend that **the Government complete an assessment of private sector doctor, nurse, and allied health professional capacity to partake in the Scheme.** Additional Government incentives for private sector participation may add additional uncertainty to our projections.

The BIA model utilises the most timely and relevant data within the parameters and relies on available literature on the progression of DM to model the expected costs and impact of the Scheme. Nonetheless, given that the model attempts to capture epidemiological changes over a 30-year horizon with no stochasticity (i.e., we do not account for randomness of event occurrence), we acknowledge that certain values are likely to be insufficiently representative of the target demographic and the larger Hong Kong population.

4.3.7 CONCLUSION

Our BIA findings suggest that implementing a chronic disease screening voucher and management Scheme for DM in Hong Kong contributes to reduced health system expenditures in the long-term, and additionally helps to reduce preventable mortalities attributable to chronic diseases. The Government should consider the adoption of a screening voucher and management scheme for chronic conditions, such as DM, and further explore the potential for inclusion of other chronic conditions, such as hypertension and hyperlipidaemia. Greater cost-savings and benefits to the health of the target population are more likely to be accrued if strategic policies are directed towards prevention and management in early stages of disease prognosis.

5 Moving Forward: Strategically Purchasing to Enable Health for All

"Today's health services are not fit for 21st century challenges.
Approximately half the world's population lacks access to essential health care.
Where health care is accessible, it is often fragmented and of poor quality.
The *Framework on integrated people-centred health services* is a call for a fundamental shift
in the way health services are **funded**, **managed**, and **delivered**.
It supports countries' **progress towards universal health coverage**
by shifting away from health systems designed around *diseases* and *health institutions*
towards health systems designed for *people*." (WHO, 2021c)

5.1 STRATEGIC PURCHASING SHOULD BE LEVERAGED FOR HONG KONG'S HEALTH SYSTEM TO BECOME FIT-FOR-PURPOSE

In the face of a rapidly ageing population, a new normal in Hong Kong continues to reveal a growing burden of chronic diseases, increasing healthcare costs, and concerns over health system sustainability. While the Government has committed to transform Hong Kong's treatment-oriented health system into one that is prevention-focused and has further positioned primary healthcare development as a top health policy priority, the supply of healthcare services in Hong Kong continues to be characterised by the segmentation of the public and private sectors and fragmented service delivery contributed by underlying financing mechanisms. The current organisation of health service provision does not adequately meet emerging population healthcare demands and heavily contributes towards the biased pattern of behaviour toward overreliance on hospital-centric care particularly in the more affordable public sector, resulting in health system inefficiencies and continued fragmentation of our health system. The current organisation also obstructs the realisation of the World Health Organization (WHO) **"health for all"** goal which necessitates the interaction of political will, health sector cooperation, community participation, and supporting technology to improve health to a level that enables all people to lead socially rewarding and economically productive lives. Evidently, Hong Kong's health system is yet to be fit-for-purpose.

5.1.1 ACHIEVING A FIT-FOR-PURPOSE HEALTH SYSTEM IN HONG KONG

For Hong Kong's health system to become fit-for-purpose, we identified in our prior health policy paper *Fit for Purpose: A Health System for the 21st Century* a critical goal of transforming our current system into a "primary care-led, integrated, person-centred health system". This will pivot our system away from the current emphasis on hospital-based, specialist, episodic care towards care in the community that is continuous and person-centred and is integrated across the different levels of care, coordinated between specialities and providers, and interfaced with social care. This will also provide the system infrastructure to meet the holistic needs of individuals and transform the healthcare delivery system into one that aspires to provide "Health for All" and enhance the effectiveness and efficiency of the health system. This transformation will require an evaluation of the current gaps in provision of the different service types and the mechanisms for how these could be better provided and/or bridged both within and between the public and private sectors. The delineation of a strategic role for the private sector in the design of a better integrated system in our segmented public and private healthcare system will be crucial. Leadership in governance will be of essence and must engage with a shared vision that is supported by strategic goals to enable policies, and strategic purchasing. Governance structures should also commission mechanisms and enhance workforce planning to ensure appropriate education and professional development required for the right mix and competencies of healthcare professionals.

Strategic purchasing will be a key lever for the system to be fit-for-purpose. Strategic purchasing and commissioning will enable resources to be allocated to where they could be better utilised to meet system goals and population needs, and achieve recalibration of the public-private mix while simultaneously improving effectiveness and efficiency of the healthcare delivery system. It is fundamental for the mechanisms of strategic purchasing to be an integral function of health system governance, aligned with system strategic goals and examined at all three levels of the health system: macro- (health system), meso- (purchaser-provider healthcare delivery), and micro- (person journey of healthcare delivery) levels.

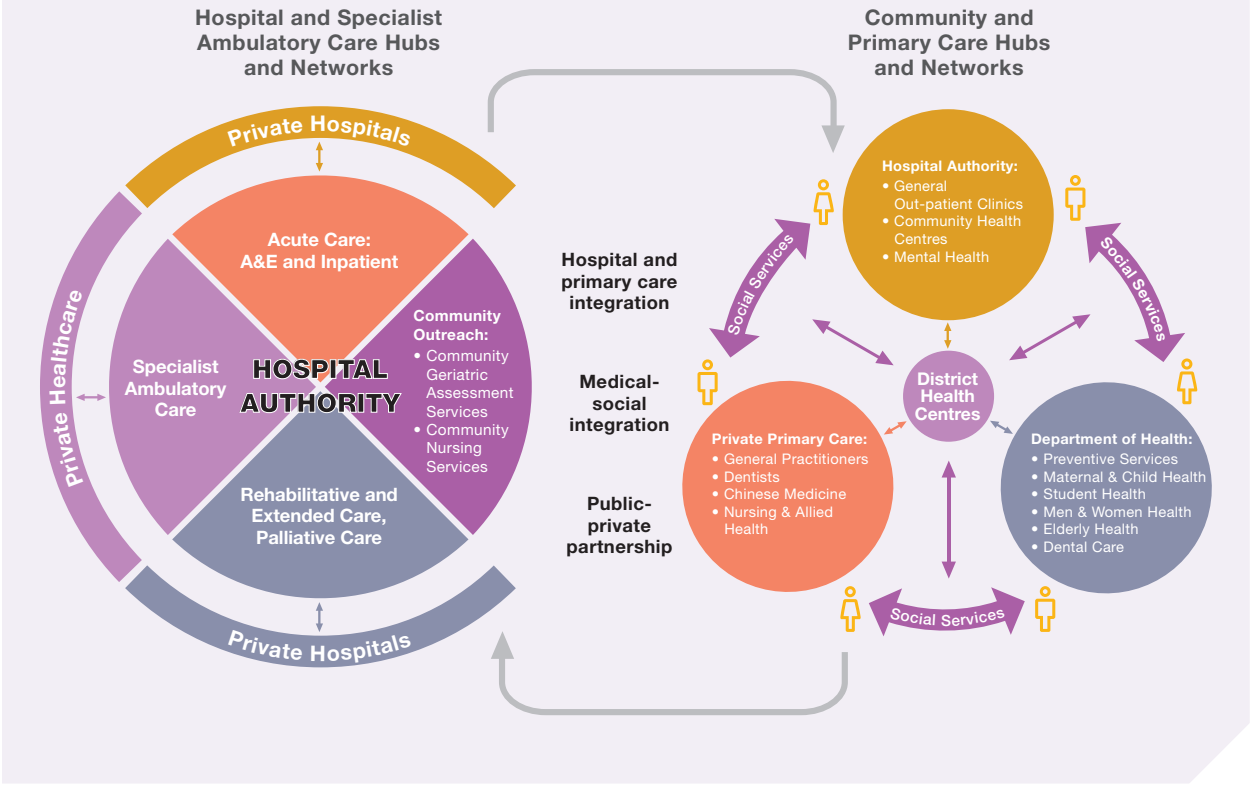
5.1.2 A PRIMARY CARE-LED INTEGRATED CARE SYSTEM

Recognising that conventional care models are no longer sufficient to address burgeoning healthcare needs globally, the WHO has called for a "fundamental paradigm shift in the way health services are funded, managed and delivered" to achieve further gains in health outcomes (WHO, 2015b). In response, Our Hong Kong Foundation's 2018 report *Fit for Purpose: A Health System for the 21st Century* advocated for the reorientation of Hong Kong's health system from being hospital-centric and treatment-focused to **integrated and primary care-led** to be fit for purpose. In particular, we recommended accelerating the pace of primary healthcare (PHC) development which is acknowledged by the WHO as a critical milestone in progression towards universal health coverage (UHC), an orientation for health systems to enable access to needed healthcare for all individuals regardless of individual capacity to afford care **(**see **Chapter 1)** (WHO, 2017b, 2019b). In Hong Kong's context, primary care is a crucial component of integrated care.

Our report reiterated the importance of primary care provision that is comprehensive, coordinated, continuous, accessible, and connected with hospital and specialist care in an **integrated service delivery system** enabled by a multidisciplinary team of primary healthcare professionals. Under an integrated care model, prevention, treatment and rehabilitation are provided by multidisciplinary teams under the primary and community care hubs which also connect individuals to the social care they need **(Figure 5.1)**. The teams build links between stakeholders to ensure the best use of resources available and provide continuity of high-quality holistic care across the fissures of service provision. These linkages form networks between public and private service providers, and also medical and social sectors. Providers of specialist and hospital care will also be linked with each other and also with primary care providers. The integrated care model will promote integration between medical services providers like primary care doctors and allied health professionals, and community services providers like non-governmental organisation workers, forming a sustainable continuation of healthcare services.

Figure 5.1

Conceptual Model of Integrated Health Services in Hong Kong



Source: OHKF, 2018

5.1.3 THE FINANCING LEVER AND PUBLIC-PRIVATE PARTNERSHIPS

Financing is a crucial lever for the reorientation of a primary care-led integrated care system. There are different financing and payment tools developed, including capitation, performance-based payment schemes, provider incentives and mechanisms to hold providers accountable. With reference to the experiences of different countries, capitation has been reported to be a better performance payment method. Capitation can be used as a cross-district resource allocation tool, and it enables payments to individuals and groups, for example to primary care networks (PCNs). Capitation funding in healthcare can contribute to a shift from mainly general practitioners (GPs) to a larger range of health service providers to deliver primary care services (Cumming, 2011).

While the role of the private sector in health systems has been debated, there is a consensus that the private sector can and should play an integral role in moving heath systems towards UHC (Harding, 2009). This will enable a system to use health resources more efficiently and effectively, provide integrated, continuous, and coordinated health services, promote access to needed care for all population groups, and provide financial risk protection. Purchasing in Hong Kong has been conducted through public-private partnerships (PPP) mechanisms. PPPs were developed to encourage collaboration and knowledge-sharing between the public and private sectors, and to provide greater efficiency and access to healthcare. Using **PPPs as a purchasing instrument** has been expected to enhance the complementary role of the private sector and help to overcome the challenges of system segmentation. Nonetheless, our research also demonstrated that **the design, implementation and financing practices of healthcare PPPs generally veer on the passive side of the purchasing continuum** (WHO, 2000). PPPs are

well-intended but are often narrow in scope in terms of participant eligibility, and unambitious in provider enrolment and long-term service targets. Hence, despite efforts to position PPPs as a means of enhancing accessibility to health services in a timelier manner, existing PPPs have generally been reactive in efforts to bandage over cracks in our health system, without consideration of the longer-term structural changes necessary to enhance system efficiency and sustainability. Existing PPPs could thus be better positioned within a strategic approach in the vision to meet health system goals. In conjunction with the recommendations presented in our 2018 health policy paper and assessment of primary care services in both public and private sectors, this report is prefaced on the conviction that the role of PPPs should be incorporated under a framework for strategic purchasing, which will enable a better assessment of the gaps in integrated care which should be addressed by harnessing the capacity of the private sector where most of Hong Kong's primary care is currently provided.

5.1.4 STRATEGIC PURCHASING FOR A PRIMARY CARE-LED INTEGRATED CARE SYSTEM

In the spirit of promoting equity such that health progress is made available to everyone through better management of available resources, our 2018 health policy paper also highlighted the importance of **strategic resource allocation and the use of health financing as a lever to propel primary healthcare development** to achieve health system goals. We presented strategic purchasing as an important lever in health service planning that will contribute to bettering health service quality and system efficiency while enhancing equity in the allocation of resources that will be distributed to meet the most pressing demands. Strategic purchasing makes use of available data to inform the type and mix of services that should be purchased to meet population health needs and the system goal of a primary care led person centred integrated care system. Doing so necessitates an ongoing thorough assessment of population needs including the identification of needs that are unmet. Also necessary is the discernment of service delivery gaps and mechanisms devised for how they could be better provided or bridged, consideration of payment methods and assessment of provider performance. Strategic purchasing can be carried out through either commissioning or contracting, and the usage of multiple payment methods. Importantly, careful planning and implementation of purchasing programmes that apply strategic purchasing will **facilitate system integration**, wherein the links between primary care in the community, hospital and specialist care, between medical and social care, as well as interfacing public and private sectors—may be strengthened. We therefore position strategic purchasing as an important component and essential implementation tool for strategic planning that needs to be applied in Hong Kong to achieve defined system objectives, including that of providing **person-centred, integrated care for people throughout the life course beginning from primary care in community settings.**

What does strategic purchasing entail?

To enable a health system application of strategic purchasing in Hong Kong with PPPs as the purchasing instrument, we conducted our study based on two guiding frameworks for strategic purchasing: the first outlines the key decisions that must be made in the strategic purchasing process **(Figure 5.2)**; the second involves five main elements used in conceptual policy deliberations that must be considered for the implementation of strategic purchasing **(Figure 5.3) (Chapter 2)**.

Figure 5.2

Sources: WHO, 2000; Yeoh, 2020

The first system framework captures key decision steps in the policy formulation process in the strategic purchasing of health programmes and services. The six key steps include: **i) whether to provide or purchase, ii) who to purchase, iii) for whom to purchase, iv) what to purchase, v) from whom to purchase, and vi) how to purchase** (WHO, 2000, 2017b, 2019b). This process is summarised as follows:

- First, the Government should decide whether it would provide health services themselves or purchase the services from other provider organisations.
- Second, the Government should identify an appropriate purchaser that is equipped to focus on the type and level of health services of interest and define its role in the health system (see Element 3 in Section 5.3 for further discussion).
- Third, when designing a strategic purchasing-oriented programme, the purchaser should identify a target group in need of the programme's services would benefit from the purchasing programme.
- Fourth, the Government should assess what service gaps exist in the current health system and which health goals may be met through the services purchased.
- Fifth, the purchaser should carefully select service providers based on their capacity, availability, and accessibility, and the appropriateness of the services they provide relative to the population health goals set out by the Government.
- Sixth, to draw participation in the purchasing programme, the purchaser should utilise demand-side and supply-side instruments, contractual terms and agreements, and provider payment mechanisms that effectively incentivise patients and providers to meet health goals.

Figure 5.3

Framework 2:
Five main elements used in conceptual policy deliberations that must be considered for the implementation of strategic purchasing

Source: Klasa et al., 2018

The second framework further elaborates on key policy themes that need to be considered to optimise the outcomes of applying a strategic purchasing process. First mentioned in **Chapter 2** and later used as an evaluation framework of PPPs in **Chapter 3** of this report, these elements represent a synthesis of theoretical models and definitions of strategic purchasing and references to policy themes that are critical for implementation as reflected in the WHO's Strategic Purchasing framework (Klasa et al., 2018; WHO, 2017b). These elements include: i) **Population Health**; ii) **Citizen Empowerment;** iii) **Strengthening Government Stewardship and Capacity**; iv) **Developing Effective Purchaser and Provider Organisations**; and v) **Incorporating Cost-effective Contracting** (see **Chapter 2**).

While these frameworks may appear to suggest singular decisions throughout the implementation of strategic purchasing, in actuality, such decisions are iterative. Strategic purchasing occurs as a process that requires continuous revisiting of these steps and considerations. Our recommendations for the Government to adopt the proposed programme for chronic disease screening and management based on strategic purchasing practices are presented in the following section will highlight the iterative nature of these policy considerations.

Strategic purchasing for primary care

Leveraging the commitment of the Government in improving population health outcomes through advancing PHC development and the opportunities to be presented by the Primary Healthcare Blueprint, this report explored the role of strategic purchasing in accelerating PHC development in Hong Kong. The Government has positioned **primary care as a top priority on the health policy agenda, both as a sustainability factor and as a health improvement effort.** A local study showed that every HKD 1 invested into homecare for community-dwelling older populations would result in savings ranging from HKD 9 to HKD 69 from acute care (Leung, 2019). Investments in primary care can incur cost-savings, and there is a need to decrease the service demand for hospital and specialist care from the morbidity of chronic disease. A population screening programme for chronic disease followed by chronic disease management is thus well-positioned to be a logical choice for purchase. How such services can be efficiently and effectively delivered within community settings should be also considered.

Strategic purchasing is not only a purchasing approach, but also an important policy lever that facilitates integrated care. To showcase the potential of strategic purchasing in the Hong Kong context, this report investigated the application of strategic purchasing towards primary care services that align with system-wide efforts to tackle a key population health challenge, namely the growing burden of chronic conditions. Specifically, we illustrate how strategic purchasing could be applied to screening for chronic disease to enable early management to prevent morbidity in the private sector. Our research identified the need to improve efforts in "buying" primary care services as an integrated product in partnerships between the public and private sectors. Our demonstration will provide insights in future programmes of strategic purchasing which tackle key health system gaps and address health system inefficiencies.

5.2 HONG KONG SHOULD INTRODUCE A CHRONIC DISEASE SCREENING VOUCHER AND MANAGEMENT SCHEME TO ENHANCE PRIMARY CARE ACCESSIBILITY

We investigated the potential to apply strategic purchasing with PPPs as a purchasing instrument in promoting primary care utilisation and access, as an initial step for health system transformation in Hong Kong. In particular, given the urgent need for Hong Kong's health system to address the growing burden of chronic disease that in many cases are preventable and necessitate continuous management, we assessed the feasibility of introducing a **Chronic Disease Screening Voucher and Management Scheme** (CDSVMS, also addressed as "Scheme") to incentivise citizens to engage in early detection and intervention of prevalent chronic diseases. Importantly, we intend for the Scheme to alleviate pressure on public hospitals, curb healthcare costs associated with chronic disease complications, and leverage private sector capacity to increase primary care accessibility and coverage. In practice, the Scheme will offer a **voucher that fully subsidises screening for three targeted chronic conditions—hypertension, hyperlipidaemia, hyperglycaemia** (collectively termed "HDH", hypertension-diabetes-hyperlipidaemia) coupled with follow-up management plans in the private sector. We reference international examples of national-level strategic purchasing strategies for chronic disease screening and management services **(Chapter 2)** and existing efforts to encourage primary care uptake in Hong Kong to inform the design of the Scheme, summarised in **Box 5.1** in accordance with Framework 1 **(Figure 5.2)**.

Box 5.1

Summary of who, for whom, what, from whom, and how of strategic purchasing demonstrated by the Chronic Disease Screening Voucher and Management Scheme

Who to purchase?	The Government should identify a purchaser responsible for the provision of primary care in Hong Kong
For whom to purchase?	Adults between the ages of 45–54 at the beginning of the Scheme
What to purchase and from whom?	• HDH Screening, re-screening, and follow-up management services in the private sector, administered by primary care service providers, including allied health professionals and family doctors. Re-screening should be purchased at intervals calibrated for individuals without HDH. • Chronic Disease Management for adults diagnosed with conditions co-morbid with HDH in the private sector. • Follow-up consultations with family doctors on lifestyle modification for users who are not diagnosed with HDH and referral to re-screening.
How to purchase?	Demand-side instrument: fully subsidised voucher updated annually. Supply-side instrument: performance-based payment to providers for management services, with financial flexibility for co-payment determined by the purchaser.

5.2.1 RESEARCH FINDINGS THAT INFORM THE DESIGN OF THE CHRONIC DISEASE SCREENING VOUCHER AND MANAGEMENT SCHEME

Three separate studies were conducted to explore the perceived applicability of strategic purchasing to Hong Kong's health system and feasibility of the proposed Scheme. We garnered insights from key stakeholders of Hong Kong's health system, surveyed members of the general public, and conducted an economic analysis to better understand financial implications of the proposed Scheme. These research efforts to determine the design of the Scheme **aim to build a model for ways in which other programmes may be designed and implemented in the context of strategic purchasing.** The collective insights gained from these studies have important implications for the implementation of the proposed Scheme to enhance primary care uptake in the general population and for strategic purchasing in Hong Kong, and are summarised as follows.

The voices of key stakeholders

Key stakeholders acknowledged the importance of primary care development for alleviating the demands on the overburdened health system and agreed that health system fragmentation poses a problem for addressing the growing healthcare demand. In particular, stakeholders expressed that the Government ought to play a role in bridging the public and private sectors and that the capacity within the private sector could be better leveraged to achieve overall health system goals. Stakeholders welcomed our proposed Scheme that was deemed beneficial in propelling primary healthcare development in Hong Kong, particularly in promoting preventive care, early detection, and continuous chronic disease management.

Nonetheless, stakeholders cautioned that the successful implementation of the Scheme would be contingent on buy-in from both private sector providers and the general public, thereby requiring sufficient incentives for both parties to join. Furthermore, stakeholders elaborated on the need for health system planners and the purchaser to enable the sustainability of the Scheme through overcoming existing barriers present in the health system. Specifically, the untransparent pricing of services, limited regulation, and concerns over inconsistent service quality across the public and private sectors must be addressed.

Stakeholders further highlighted that a PPP-oriented Scheme would require the collaboration and input of various sectors and industries, particularly in the design and implementation of the Scheme. Notably, stakeholders suggested that the purchaser should engage with the insurance and pharmaceutical industries to better plan health financing mechanisms to improve access to health services.

Findings are detailed in **Chapter 4.1**.

The voices of the general public

Using a telephone survey, we assessed the likely public reception of the Scheme upon implementation and identified design considerations to ensure successful implementation. To understand the ways in which the Scheme's design can best facilitate progression towards UHC, we applied WHO's core concept of universal access in analysis that considers the key dimensions of physical accessibility, financial affordability, and acceptability.

Key findings demonstrate a mismatch between respondents' *preference* in service sector (public/private) for seeking care and *actual* utilisation patterns. A majority of respondents reported utilisation of public sector services to obtain preventive and disease management services. Nonetheless, respondents generally did not indicate a strong preference for continuing their use of public sector services; on the contrary, the majority of respondents indicated either a preference for the private sector or no preference at all. This suggests the feasibility of promoting private sector usage through the Scheme.

Additionally, survey results indicated that a variety of socio-economic factors impacted respondents' past health-seeking behaviours when i) choosing whether to engage in preventive services, ii) deciding between the public and private sectors for care, and iii) expressing their willingness-to-pay (WTP) range for the Scheme. In particular, three factors associated with past health-seeking behaviour were identified: monthly household income, medical insurance coverage, and perceptions of financial preparedness. Most respondents reported their WTP range for chronic disease management as HKD 51–200. We also found that monthly household income was positively associated with respondents' WTP range, with lower monthly income being correlated with a lower willingness-to-pay range. Similarly, individuals without insurance coverage were more likely to choose public sector services over private sector care, thus highlighting the importance of considering the financial barriers of this group in the payment structure of the Scheme. These factors should be taken into consideration in ensuring that all residents, irrespective of financial status are empowered to access the Scheme.

Finally, survey findings suggested that the Scheme should remove barriers to accessibility of screening services, ranging from issues of geographical convenience, flexibility in attaining services (targeting busyness), and limited health literacy (targeting non-urgency). Findings also suggested that health literacy is a promising target for intervention in order to increase the willingness to participate in preventive behaviours. Respondents welcomed the advice of medical professionals and indicated willingness to change their stance toward being willing to take up screening and management if they have received advice in favour of doing so. To that end, the role of primary care providers can be enhanced to improve population health literacy and ultimately increase the public's participation in preventive behaviours.

Findings are detailed in **Chapter 4.2**.

Economic analysis

Our economic model projects, as a proxy measure, that if we were to fully implement the Scheme for only diabetes over the course of 30 years for individuals aged 45 to 54 years of age at the start of the scheme, the health system would spend approximately 28% less on direct healthcare expenses, compared to if no such scheme were implemented. Additionally, we found that participation in the Scheme is projected to prevent over 47,000 premature mortalities over the course of 30 years. Comparing the benefits of a screening-only programme, the combined benefits of implementing the Scheme outweigh the additional marginal financial gains derived from implementing a screening voucher-only programme.

A comparison of costs from our projections shows that the health system may expect a higher level of expenditure during the first decade of implementation relative to projected spending in the later years given that the costs of chronic condition management does not change during the 30 years. Savings therefore are concentrated in later years of the Scheme wherein patients are more likely to develop complications that require costly hospital-based care services had they not received timely management services.

Findings are detailed in **Chapter 4.3**.

5.2.2 DETAILS OF THE PROPOSED CHRONIC DISEASE SCREENING VOUCHER AND MANAGEMENT SCHEME

The Scheme is designed to leverage public funds and private sector service provision to overcome system segmentation in making primary care services more accessible and affordable to Hong Kong citizens. Designed to meet the most immediate needs of our rapidly ageing population based on lessons learned from existing PPP schemes, and in particular, the Elderly Health Care Voucher Scheme (EHCVS), the Scheme aims to promote the uptake of specific primary care services and shift care burden from the largely hospital service-centric public sector to the private sector.

The Chronic Disease Screening Voucher and Management Scheme

1. We recommend that the Scheme consists of **two principal components: chronic disease screening voucher and a disease management scheme.**

   Global research and our economic analysis indicate that screening coupled with coordinated management for chronic diseases, such as through the Hospital Authority Risk Assessment and Management Programme (RAMP) for Diabetes Mellitus, can lead to better health outcomes on a population scale and cost-savings for the Government. Therefore, we suggest that the **Scheme should include both a screening voucher and a disease management scheme** to encourage early detection and chronic disease care continuity. The screening voucher is constructed in the vein of a demand-side instrument to incentivise screening, while the chronic disease management programme which contracts private services is set up as a supply-side instrument. Disease management services, in particular, are offered through a supply-side incentive as opposed to a healthcare voucher in order to **accommodate the varying needs of each patient that is potentially complex in nature and to offer sufficient flexibility in care access.**

1.1 With the objective of promoting detection earlier on in the life course, a **chronic disease screening voucher for HDH screening** should target individuals **aged 45 to 54 years, the point at which chronic disease prevalence increases significantly, at the start of the scheme.** Further consideration in design of the Scheme could be given to whether participating citizens have already been diagnosed with HDH and whether patients are already on treatment or not under care. Also, a certain element of flexibility could be considered on how participants will be phased into the Scheme, particularly for chronic disease management based on factors including the gradual build-up of capacity for service provision, the subsidy to be provided for which groups and the corresponding recurrent resources being secured.

1.2 To facilitate access and incentivise participation in screening, we recommend that the Scheme **fully subsidises all screening services**, including future rescreening.

2. In continuing the conceptualisation of a continuous healthcare service delivery model, we envision a seamless merging of the demand-side voucher scheme and the supply-side management programme. Adhering to our goal of identifying high-risk individuals to prevent and/or delay the onset of chronic conditions and prevent the development of complications (such as neuropathy, eyesight-threatening retinopathy, and limb amputation for DM) that may require the use of inpatient care services, we further recommend differentiating the treatment and re-screening plans for patients identified to have different risk levels. Also with reference to the "Hong Kong Reference Framework for Diabetes Care for Adults in Primary Care Settings" and "Hong Kong Reference Framework for Hypertension Care for Adults in Primary Care Settings" (Task Force on Conceptual Model and Preventive Protocols et al., 2013), we recommend the following follow-up screening, treatment and management protocol **(Figure 5.4)**.

2.1 As a first step of entry into the Scheme, participants will undergo screening for HDH. Scheme participants will be categorised by diagnosis and will receive disease management and prevention services that are tailored to their diagnostic needs. This is especially crucial for individuals deemed "high risk" for HDH, as they are most likely to progress toward diagnosis of a chronic condition.

2.2 Patients diagnosed as **presently without HDH** are recommended to receive **care in the private sector** for **regular screening services** and further lifestyle guidance and advice. We recommend that the Government consider subsidising one follow-up consultation with the same private sector medical practitioner, the cost of which is included in our economic analysis. They should also be referred for **regular re-screening preferably with the same private sector medical practitioner** at intervals that are suited to their health condition.

2.3 Patients diagnosed as **"high risk" for future HDH** (including those with an early form of HDH, such as *prediabetes*, and those without prediabetes but are *at high risk of developing an early form of HDH*) are recommended to attend a follow-up consultation with the same private sector medical practitioner. They should also be referred for **regular re-screening** with the same private sector medical practitioner at intervals that are suited to their health condition.

3 Among patients who have been diagnosed with HDH, we recommend **the use of the RAMP risk-level assessment** so that a personalised care plan can be formulated and the purchaser may determine the care subsidisation for conditions co-morbid with HDH.

3.1 Patients **diagnosed with HDH** should be further **assessed for risk of future complications** and worsening of their condition within the private sector.

3.1.1 Patients with **low- to medium-risk of future complications** should continue to **receive monitoring and disease management services** in the private sector with the same family doctor who conducted their screening.

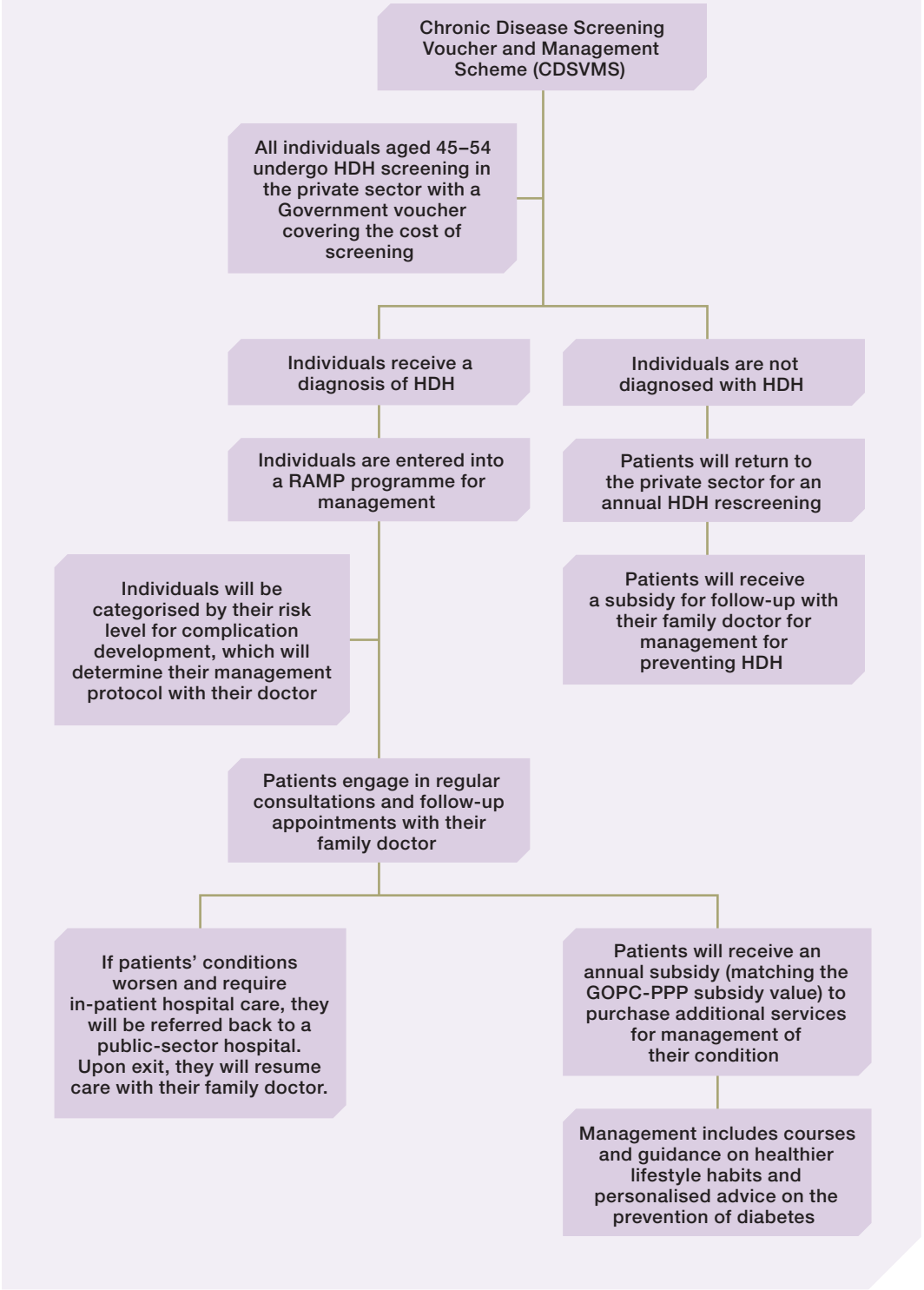
3.1.2 Patients with **high- to very high-risk** of future complications should similarly be **monitored in the private sector** with the same family doctor who conducted their screening and transferred to **public sector hospitals should clinical management be problematic and complications arise** requiring specialist referrals and/or immediate inpatient care. Such an arrangement may contribute to a stronger risk-sharing incentive for private sector doctors to participate in the Scheme.

3.1.3 Patients with **conditions co-morbid with hypertension, DM, and hyperlipidaemia** should additionally receive **follow-up care for their comorbidities with the private sector doctor who is providing management for their HDH.** Within our economic projections in **Chapter 4.3**, we accounted for the cost of co-morbid complications under the context of fully subsidising all services pertinent to managing the health and well-being of diagnosed patients, and still found cost-saving impacts of the Scheme, suggesting that allocating funds to cover co-morbid conditions will be cost-efficient. Furthermore, learning lessons from existing PPPs such as the GOPC-PPP, the Government should consider that the scope of drugs issued by Hospital Authority (HA) include conditions co-morbid with HDH.

4 **There will potentially be patients who do not screen positive for HDH but are considered by the primary care provider to necessitate follow-up care for other health conditions.** The Government should have in place a clinical protocol to cater for the needs of these individuals, such as arranging for referral to existing care programmes relevant to their conditions.

Figure 5.4

Patient service flow in the Scheme with reference to the Primary Healthcare Office "Hong Kong Reference Framework for Diabetes Care for Adults in Primary Care Settings"



Source: PHO, 2018

5 Patients with HDH and/or conditions co-morbid with HDH may require the use of medication as part of their management regime. Within the Scheme, we propose that the Government and purchaser consider the **provision of medication for management with either generic medications (such as those available for patients in the public sector) or brand-name medication from private sector doctors.** For the latter option, we implore the Government and purchaser to consider **offering subsidies or employ a co-payment option to ensure financial affordability** of the medication.

5.1 We acknowledge that many patients who have traditionally relied on HA services may prefer the lower pricing of medications available in the HA; vice versa, patients visiting private sector doctors may prefer the use of brand-name drugs. To incentivise patients to remain in the private sector for continuous chronic disease management that includes prescription of medications, we propose that both options should be available for patients within the Scheme.

5.2 Our economic projections **(Chapter 4.3)** accounted for the cost of medications when calculating the cost of disease management and showed that even when medication is fully subsidised by the Government, there are likely to be cost savings to the health system, thereby increasing the feasibility of offering subsidies for medication purchase.

5.3 THE GOVERNMENT MUST CONSIDER KEY POLICY DIMENSIONS TO ENSURE EFFECTIVE APPLICATION OF STRATEGIC PURCHASING

In moving our health system towards one that is fit-for-purpose, in addition to implementing the Scheme as a specific example of applying strategic purchasing to purchasing primary care, we additionally propose that further efforts be made to strengthen the strategic vision of this Scheme. In keeping with the synthesised elements of the various strategic purchasing definitions **(Figure 5.3)** (Klasa et al., 2018), we recommend that additional policy dimensions be considered to complement strategic purchasing efforts as listed below:

Element 1:
Population health, as indicated by information sharing systems

To ensure that policy decisions related to the Scheme are based upon the latest population health data and information on past provider and purchaser performance, it is critical to ensure that information sharing systems are in place.

1. First recommended in our 2018 report, there is a need to invest in 21st century information architecture, which is essential for facilitating continuity of care as patients navigate across different care settings, such as between public and private sectors. We recommend that the Government **further leverage and strengthen existing infrastructure**, such as the **Electronic Health Record Sharing System (eHRSS)** to better link patients with various providers. At the same time, leveraging the eHRSS allows policymakers to more systematically track population health needs, as regular population needs assessments are necessary to ensure that policies fill existing gaps in the system.

a. **Patient data could be linked to payment mechanisms** while ensuring that sufficient rights are offered to private sector practitioners to access and update patient data.

b. Policies should be in place to **ensure patient privacy, data protection and integrity**, safeguarding data against manipulation.

2. Hong Kong must engage in rigorous monitoring and assessment of its current investment in primary healthcare to ensure that the purchasing of services is strategic and cost-effective. To integrate data into purchasing decisions, we suggest that the Government systematise and regularise the tracking of **Hong Kong's primary healthcare expenditure using international measurement standards. This could be done by fully adopting the System of Health Accounts (SHA)**, a joint classification proposed by the OECD, the European Union, and the WHO.

   a. This will allow a better estimate of primary healthcare spending in accordance to the 2019 WHO PHC spending definition that considers: i) general outpatient and home-based consultations; ii) preventive care; iii) parts of medical goods provided outside health care services; and iv) parts of health system administration and governance costs **(**see **Box 3.5** in **Chapter 3)** (WHO, 2019a). The SHA segregates health spending by source of financing, financing schemes, types of health care goods, services consumed, and the health care providers who deliver the services. This tracking methodology will allow for timely internal evaluation against external references to ensure local developments are aligned with both global trends, namely with WHO's suggested primary healthcare spending, and local aims **(**outlined in **Chapter 3)**. Furthermore, systematic tracking will aid in strategic, evidence-based policymaking by helping to achieve budgetary flexibility according to population health needs.

Element 2: Citizen empowerment, as indicated by transparent benefit packages

Citizens and participants of the Scheme are best served when they are aware of the different benefits and pricing available to them through the Scheme and if they are provided with recourse for holding both purchasers and providers accountable for full provision of services. As demonstrated by the telephone polling exercise described in **Chapter 4.2**, citizen empowerment must involve the voices of all beneficiaries, including those who are least likely to be fully served by the current range of health services available.

The set up and recurrent costs of the proposed Scheme will be substantial and will need to be secured. Against this background, since screening programmes are more likely to be successful if no co-payment mechanism is involved, the purchaser of the Scheme is recommended to fully pay for screening services. We put forth suggestions for the pricing mechanism for chronic disease management services that includes **consideration for medications in the private sector to ensure that users are financially empowered to access the Scheme.**

1. Depending on users' willingness-to-pay, **the Government may consider fully subsidising further consultations for the management of HDH in the private sector.** Alternatively, **the Government can consider the implementation of a co-payment scheme** to lessen the Government's financial burden toward the Scheme while also ensuring financial affordability for financially vulnerable populations.

Our economic projections presented in **Chapter 4.3** were constructed on the premise that the health system would fully subsidise all follow-up management services in the private sector, as well as inpatient care in the public sector. Our initial model showcased that even if the health system took on full financial responsibility for the health of citizens, there would still be significant savings accrued from early detection and management of chronic conditions.

Results from our public polling survey in **Chapter 4.2** indicate that most individuals would be receptive to a service fee ranging between HKD 51–200 per visit to a private sector provider for management. Therefore, the Scheme should have flexibility to a range of patient-facing payment responsibilities, particularly for financially vulnerable individuals. It is incumbent upon the Government to determine a pay scale for individuals experiencing financial difficulties and to ensure that such patients are financially capable of maintaining a continuum of care with the private sector family doctor of choice.

With reference to co-payment schedules in voucher schemes under the Social Welfare Department, the Government could create a co-payment schedule based on the Median Monthly Domestic Household Income (MMDHI) released by the Census and Statistics Department within the latest quarter at the time of the Scheme and annually revise these figures in accordance to the Composite Consumer Price Index (SWD, 2021). In line with UHC goals, the Government should study the design of co-payment schemes, if applicable, to ensure **financial protection** of all individuals participating in the Scheme, especially for the close to 870,000 people with incomes below 60% of the MMDHI, a statistic based on the Hong Kong Poverty Situation Report (C&SD, 2020b).

2. The Government and purchaser should consider compiling **a list of essential medications for the care and management of HDH and common co-morbidities.** Furthermore, the Government and purchaser should actively **involve patients and community members** when developing the inclusion list and payment method for these drugs, paying attention to prospective users' financial capacity, to ensure that both parties' needs are being met during the Scheme's implementation.

3. Ensuring that citizens' perspectives can be accounted for when determining the benefits package is also a crucial element of strategic purchasing. Therefore, the Government may consider **conducting public polling on a regular basis to better understand the needs and wants of the public.** Regularising efforts to better grasp the public's perceptions, attitudes, and behaviours toward health services will promote citizen empowerment by providing a platform for citizens to reflect their experiences with programmes and express their views and values.

4. We recommend that citizens be further empowered in being informed about their health and care options, which can be facilitated by improving the accessibility and user experience of the eHRSS and the newly introduced eHealth App, and enhancing the education of its features to ensure patients' enrolment and best use of the eHealth App to view their health records and record their health status. Mirroring our 2018 report recommendations, positioning the patient as an **"integrator of services"** and ensuring their **access to and ownership of their health records** are important to enable person-centred care.

Element 3:
Strengthen government stewardship & capacity, as indicated by strong governance

Strong governance is the cornerstone of successful strategic purchasing. The ability to centralise policies in favour of systemic decision-making by a purchaser will prove critical in the credibility of the Government and Scheme and to reduce potential fragmentation of an already fragmented healthcare service structure. The role of the purchaser and the Government in enforcing fair rules, incentives, and sanctions as tools to facilitate programme implementation must be strengthened.

1. To centralise the provision of primary care services and to ensure that the Scheme is effectively implemented, the Government needs to ensure clear role delineation for the responsibility of purchasing and payment of services.

    a. The current major service provider of preventive primary care is the Department of Health (DH), while the Hospital Authority (HA) provides primary care through General Out-patient Clinics and Family Medicine Specialist Clinics. As separate departments, the current provision of primary care is fragmented. Therefore, it is important that the Government **names a central purchaser, organiser and implementor** of the Scheme and other programmes that involves purchasing health services to **avoid intensifying the fragmentation of primary care provision.**

2. The Government should set clear functions for the identified purchaser; including consideration of the following:

    a. Set **well-communicated guidelines and standards** to ensure consistency of care between public and private sectors, together with **defined care protocols** that will help to overcome professional barriers between the two sectors.

    b. **Draft standard treatment guidelines and care protocols** that cover individual needs that are outside of conventional service scopes and benefit package designs, particularly among patients facing multi-morbidities.

    c. Set clear definitions to **prevent potential implementation challenges** such as induced moral hazard, a phenomenon wherein healthcare professionals may ask Scheme participants to pay “additional charges” on top of the subsidised amount, and provide unnecessary health services to the benefit of health service providers, leading to unwarranted price inflation (Yeoh et al., 2020).

    d. **Ensure coordination between existing and future public-private partnership schemes,** in order to prevent further fragmentation of the health system (WHO, 2017b).

    e. Put in place accountability arrangements to align and steer purchasers within the system towards common health system goals (WHO, 2017b). **The purchaser should establish feedback loops** to receive and respond to complaints or feedback and conduct systematic evaluation regularly.

    f. **Regularise the release of public reports** on the expenditures and performance of existing PPP programmes and the Scheme upon its implementation. Such reports will play an important role in determining the budget required for the improvement of existing PPP programmes and implementation of the Scheme, which are subject to yearly change in government expenditure.

3. As the number of patients requiring additional expenses and the healthcare needs of the target population changes in the future, **yearly budgetary flexibility must be ensured to account for the large-scale funding potentially incurred to continue the operation of the Scheme in full.** The Government and purchaser should ensure that funding for the Scheme is based upon population health needs and adjusted to fulfil the healthcare service demand on an annual basis.

4. Given that an **integrated regulatory policy framework to monitor programmes** is key to developing effective strategic purchasing practice, the Government should consider the development of an integrated regulatory framework of purchasers and providers of primary care services that should include the identification and specification of the roles of different sector actors, monitoring targets for PPPs, and enforcement of fair rules, incentives, and sanctions for all participating providers.

Element 4: Developing effective purchaser & provider organisations, as indicated by ensuring alignment of stakeholders, and building and sustaining partnerships

As part of a strategic purchasing effort, the Scheme should attempt to align the interests, demands, and products of each stakeholder to improve organisational congruence—the extent to which organisational arrangements minimise service duplication or fragmentation. The Scheme must also ensure that the existing health system has the capacity to cater to programme participants' needs so that it is accountable for delivering quality services. As an example of how to develop organisations that are congruent and accountable, **Chapter 4.1** modelled a stakeholder interview methodology that would aid in eliciting the views of key stakeholders and in identifying places where the fit between policy objectives and organisations in the health system should be improved.

1. The Government should **assess the capacity and capability of the healthcare system to match new service demands generated by the introduction of the Scheme.**

    a. The Government and purchaser must consider methods to ensure sufficient private sector capacity for implementation of the Scheme to meet the health needs of the target population. While screening capacity is likely less problematic, the complex nature of chronic disease management necessitating follow-up possibly by a team of more than a single primary care doctor may pose additional demands on system capacity. Assessment of capacity may be achieved through a **rigorous pre-implementation assessment of private sector capacity** together with factors that affect participation in the Scheme. Such consideration will inform the funding arrangements related to reimbursement levels and incentives for participation. In addition, particularly where multiple healthcare professionals are involved in care, clear and well-designed care guidelines and clinical management protocols need to be in place. Referral protocols between specialists and primary care providers are also necessary for integration of care and coordination between providers.

    b. Consideration should be made to promote primary care training for all healthcare personnel. New training programmes and career structures could be considered.

c. Primary care professionals—in both public and private sectors—must be equipped to educate the public on the importance of engaging in regular preventive behaviours and to work towards increasing population health literacy, which our study identified as a determinant of willingness to screen.

d. In accordance with our previous recommendation to recruit allied health professionals to conduct the risk assessments using current RAMP protocols and to provide further patient-specific management advice, the Government should consider enhancing allied health professional training and incentives for their participation and review the existing supply of allied health professionals.

e. The Government and purchaser should strengthen efforts toward increasing accountability between purchasers, providers, and patients to ensure that health system and population health goals are met. To do so, the responsibilities and roles of each stakeholder should be made explicit and disseminated widely.

2. To ensure health system alignment towards shared health system goals and a visionary primary care-led reorientation, the Government should ensure that the Scheme is well-integrated with and supplements ongoing primary care initiatives such as the EHCVS and services provided by District Health Centres (DHC), and that it will facilitate the establishment of a solid primary healthcare ecosystem for Hong Kong together with other ongoing initiatives.

   a. The EHCVS can reference to the design of the Scheme that promotes uptake of targeted primary care services. For instance, the Government can consider allocating a portion of the subsidy offered in the EHCVS to fund specified screening services and also explore contracting mechanisms with private sector primary care service providers for the provision of subsidised chronic disease management. Furthermore, the purchaser could consider making efforts towards aligning the Scheme with the EHCVS, whereby individuals participating in the Scheme can continue to receive similar services upon reaching the age of eligibility for the EHCVS (65 years and above), and thus be part of both programmes. While the target populations for both programmes do not overlap, it is necessary **to ensure the continuity in access** across the life course.

   b. The setting up of DHCs is a major initiative for PHC development in Hong Kong, hence the manner in which DHC services can be leveraged to complement implementation of the Scheme should be studied and defined. For example, chronic disease risk assessment and management is within the service profile of DHCs, although risk assessment, diagnosis and management services remain fragmented between DHCs and network service providers. This discourages continuity in primary care that necessitates patient affiliation with a primary care doctor. In contrast, the proposed Scheme **encourages continuity in primary care where screening, diagnosis and management is overseen by the same primary care physician in the private sector.** With preventive care being a key element of DHCs' service profile, **leveraging the role of DHCs for the provision of upstream preventive care should be considered by the Government.** As an example, the purchaser can set up a collaborative agreement with DHCs wherein DHCs focus on preventive services that serve to prevent or delay the onset of diabetes among populations that are not diagnosed with HDH, especially those at a high risk of HDH development. In alignment with recommendations presented in our 2018 report, we recommend that as a "primary care hub", DHCs should strive to fully leverage their networks to join the Scheme as providers of lifestyle modification guidance and other patient empowerment activities.

3. To build and sustain partnerships with key players in the health system, the purchaser should promote **cross-departmental and multi-sectoral collaboration beyond public and private sectors in health programmes** (Chu et al., 2019). Specifically, the design of the Scheme should address intricate **stakeholder dynamics** between key actors that include the Government, development partners, providers (capacity and willingness to engage) and users (preferences, beliefs, awareness) (Nachtnebel et al., 2015; Wong et al., 2015).

    a. The Government and the purchaser should **engage with industry stakeholders,** such as from the **pharmaceutical industry** and **insurance industry,** to garner perspectives of how to improve population health and meet the growing health demand, as showcased in **Chapter 4.1**. Consideration should be given to the current practices of both industries, as insurance companies have begun incorporating prevalent chronic disease management into insurance products. Additionally, pharmaceutical companies have different guidelines and prices when supplying drugs to doctors in private sector, which has created challenges for increasing the uptake of PPP programmes by private service providers. Thus, exchanging experiences with and gaining insights from commercial entities will broaden the Government's perspective on how to incentivise private sector usage among the public and the participation of private service providers in the Scheme.

    b. The Government should consult with private sector providers to ensure that they are offered a role in defining the benefit package, payment mechanisms, and actively engage them in provider reforms that potentially promote the achievement of high service quality.

    c. To increase purchaser and provider transparency, and also allowing patients to make informed decisions on their choice of medication purchase, **the Government and the purchaser should work with the private sector to publicise and disseminate the costs of drugs available in both the public and private sectors.**

Element 5:
Incorporating cost-effective contracting, as indicated by well-implemented payment systems

The payment systems incorporated into the Scheme will be critical for incentivising the participation of different providers while allowing for accountability mechanisms to be prioritised by purchasers. The economic analysis completed in **Chapter 4.3** and serves as a reference tool for better understanding the financial impact of the Scheme upon implementation, the cost-drivers and required cost inputs to ensure that the Scheme is cost-effective in the long-run, which should be a recurrent practice for any prospective programme that seeks to apply strategic purchasing in Hong Kong.

1. To ensure equivalent standard and quality for chronic disease management in the private and public sectors, we propose that the Government **set up and implement a management Scheme for HDH in the private sector that is modelled off the Risk Assessment Management Programme (RAMP)** for newly diagnosed HDH patients currently implemented in the public sector so that an HDH-positive patient can receive continuous and affordable care. We also recommend that the Government and purchaser **develop common clinical protocols** and **share staff training and development programmes** between the public and private sectors.

    a. As doing so requires managing alignment between public and private sector service provision, we recommend that the Government and purchaser ensure that the parallel RAMP protocol is specific to the services available in the private sector. The Government and purchaser should define the standard protocols required in the new RAMP schemes and ensure that there is alignment on treatment options for patients on conditions co-morbid with HDH.

    b. The **private sector providers should be responsible for the care and management of patients with HDH.** Nonetheless, the Government and purchaser are recommended to explicitly **define the risk-sharing mechanisms between the private and public sectors.** For instance, patients should be able to attend their RAMP programme in the private sector as they need, but if their conditions worsen and they require acute hospital inpatient services, patients should be referred to public hospitals. This sharing of risk perceivably helps to incentivise private sector providers to partake in the Scheme and simultaneously help manage the increasing healthcare demand on the public sector.

2. The Government and purchasing authority should **hold all contracted providers to a determined quality standard** to ensure that all patients receive similar care, regardless of sector of service provision. The attainment of the care standard should be a central **determining factor of contract renewal and participation eligibility in the scheme.** Specifically, the Government may consider the implementation of a provider performance-based payment model to ensure that service provision is optimised for best outcomes of patients participating in the Scheme. The performance-based payment may employ a set of quality standard criteria that providers must meet and surpass.

3. As it is important to assess whether the Scheme's contracting terms and criteria are evidence-based, **regular evaluations should seek to incorporate population-level health data into analyses of the Scheme's cost-efficiency and cost-effectiveness.**

4. The Government and purchaser should work towards **streamlining administrative requirements** and preventing any increases in administrative workload of private sector providers, which have been identified as a disincentive for private family physician participation in the GOPC-PPP **(Chapter 3)**.

5. To ensure that payment to providers is sufficiently attractive and streamlined to sustain their participation in the scheme, the Government should **create and disseminate clear guidelines and information on their payment mechanism to providers, including the reimbursement rate for specific services**, and ensure that mechanisms are in place for the **smooth transfer of payment upon the provision of services.** As an example, the following price and reimbursement principles should be referenced to:

    a. Regarding the population-wide screening initiative for HDH, screening services should be fully subsidised for all patients **to cover the cost of services,** subject to change by demand volume. The Government and purchaser should attempt to **lower the standard pricing for screening given the higher volume of demand once the Scheme is implemented on a population-wide level**, thus allowing the health system to achieve economies of scale.

    b. To conduct the follow-up management necessary for maintaining the health of patients, we recommend that the Government clearly define its **payment scheme for the care of co-morbid conditions and conditions beyond HDH.** In particular, to adequately share risk between the public and private sectors, the Government and the purchaser could offer an **age-specific and evidence-based annual subsidy to conduct follow-up consultations and provide management** for patients' HDH. The reimbursement rate may change depending on healthcare needs of patients.

    c. To better promote the holistic care and management of health conditions, the **Government could offer an additional annual subsidy that at least matches the GOPC-PPP subsidy value** (set at HKD 3,500 at the time of writing) **to all patients diagnosed with HDH** to access services that may improve their health, such as appointments with dietitians, physical therapists, and exercise-related services, so that patients facing financial barriers will not be excluded. The Government and the purchaser should **specify which services are accessible with the subsidy** and provide clear guidelines for the access thereof.

    d. Regarding the **risk-assessment for diagnosed HDH conditions**, the Government and the purchaser could recruit **allied health professionals to conduct the risk assessments using current RAMP protocols and to provide further patient-specific management advice.** We propose that the Government consider a standard reimbursement rate for all patients (with the rate set to HKD 250 within the economic analysis in **Chapter 4.3**), subject to future change.

5.4 STRATEGIC PURCHASING SHOULD BE INCORPORATED INTO THE GOVERNANCE OF HEALTH SYSTEMS TO MAKE THEM FIT-FOR-PURPOSE

The concept of strategic purchasing is applicable beyond simply facilitating the design of specific healthcare programmes, and can act as a critical policy lever for health system transformation toward becoming primary care-led, integrated, person-centred, and ultimately, fit-for-purpose. Systems transformation can only be achieved by the essential health system governance functions of i) formulating strategic goals and the corresponding policies and plans required; ii) generating the intelligence to inform decision making; iii) choosing and implementing the policy instruments for the strategic plans; iv) creating mechanisms to ensure accountability; and v) ensuring structures and processes for collaboration (WHO, 2014).

Despite the substantial investments and plethora of policies and programmes, including PPPs, for engaging the private sector in providing primary care and preventive care, Hong Kong's health system remains highly fragmented, with the public sector under increasing pressure to meet escalating demands arising from an increasing prevalence of chronic diseases. An integrated, primary care-led, person-centred health system is the only way to successfully manage chronic disease and address the challenge of chronic disease in health systems. The Government's strategic goals are to improve primary care, recalibrate the public-private sectors, and relieve pressure on the public system. **"Integrated patient care"**, which has been omitted in these stated goals, is crucial towards informing the appropriate recalibration to meet population health needs and decrease demands on the public sector. Achieving this is fundamental to optimising the resources allocated and invested in healthcare towards generating returns on population health. Integrated healthcare aims to enable timely access to a full spectrum of preventive, curative, rehabilitative, and palliative care needed and appropriate for the individual across primary, specialist secondary and tertiary levels of care, settings and types of care, as well as between and within the public and private sectors. This will minimise unnecessary duplication of healthcare and bridge gaps in provision and care. Hence, a key policy lever for the system transformation is the **instrument of strategic purchasing.**

The decisions in strategic purchasing for health systems need to be considered in the context of the interconnected objectives and goals, together with accountability mechanisms at all three levels of the health system: governance, healthcare delivery purchaser-provider system, and person journey of healthcare delivery (WHO, 2012). Furthermore, health systems strategic purchasing comprises four key integrated components, governance, policy parameters to guide strategic purchasing decisions for purchasing agents, collaboration, and oversight and accountability mechanisms **(Figure 5.5)**.

Figure 5.5

Health system strategic purchasing: the application of strategic purchasing across macro-, meso- and micro- levels of the health system

Macro-level: Health system strategic purchasing

Governance

- Assessment of population health needs and equitable access to integrated care
- Healthcare delivery evaluation
- Policy instrument choice
- Make or buy
- Strategic resource allocation to commissioners and purchasing agents

Policy parameters

- Health system objective & policy goals
- Who to purchase
- From whom to purchase
- Contracting/ commissioning
- Policy guidance and authorisation for purchasers on purchasing decisions

Collaboration

- Engagement/ Participation/ Communication
- Feedback and timely response
- Credibility/trust

Oversight & Accountability

- Selective contracting
- Licensing and accreditation
- Monitoring and evaluation
- Reviewing and auditing

Meso-level: Healthcare delivery purchaser-provider system

Purchasing, Commissioning and Provider System

- Roles, authority, and obligations of purchasers, commissioners, and providers
- Engagement with governance to align functions
- Structure for communication and collaboration with health and community stakeholders

Integration of health services

- Mix, types, settings, and providers of care
- Networking of services and agreements on resource deployment
- Bridging mechanisms and structures for care transitions

Systems for coordination

- Care pathways
- Clinical protocols
- Multidisciplinary engagement
- Clustering of primary and specialist services for vertical integration
- Networking of service types for horizontal integration

Monitoring for results

- Review of process
- Monitoring and evaluation of access, safety, quality assurance, and audit systems
- Patient complaints, redress, and feedback systems
- Patient satisfaction and reported outcomes surveys

Micro-level: Person journey of healthcare delivery

Integrated care

- Timely access to preventive, curative, rehabilitative, palliative and social care
- Multidisciplinary engaged teams
- Clinical protocols
- Service navigation systems
- Provider transition review
- Affordability and equitable access to care

Person centredness

- Redesign of care process around patients
- Protocols for engagement in decisions
- Culture for care to be appropriate to the needs and preferences of each person
- Performance incentives for person centredness

Holistic care

- Monitoring of care processes
- Assessing access, affordability and continuity of care
- Review of patient journey and experience
- Evaluating interventions for co-production of health

Source: WHO, 2012

5.4.1 Health system strategic purchasing

5.4.1.1 Governance

At the macro-level, the role of strategic purchasing is to act as a financing lever in governance and leadership of the overarching health system functions. A key governance function is the formulation of strategic goals, which are generated by a strategic planning process that should be anchored by the health systems objective of transforming to a primary care-led, integrated, person-centred system. The strategic planning process should be informed by a **population health needs assessment** in conjunction with an **evaluation of the healthcare delivery system, population health care access, equity, and affordability.** The evaluation involves identifying gaps in healthcare service types and mix in the public and private provider systems. How these gaps may be bridged within and between public and private providers to meet the population health needs should also be considered. An assessment of the capacity and capabilities of the public and private sectors and their potential for development will inform the delineation of a strategic role of the private sector in the transformed system. This decision will have implications on whether the Government should "make" (commission) the services in the public sector or "buy" (purchase) from private providers. Information systems are required to capture data that is then analysed to provide intelligence to inform the policy formulation process and in decision-making for setting strategic goals and priorities.

The goals, objectives, and priorities emanating from the strategic planning process will inform purchasing decisions of the types and configurations of healthcare that need to be purchased equitably for which population groups and from whom, in the integrated healthcare delivery system in order to enable the formulation of strategic plans. To enable the implementation of strategic plans, programmes, and purchasing, appropriate policy instruments will need to be designed, including creating resources, regulations, and necessary legal instruments. Decisions of who to purchase will depend on the governance structure, purchasing capacity, and operations. Co-ordination of principal purchasing agents, commissioned providers, and purchasing agents is critical for cost-effective resource allocation. Coordination requires governance of the health system to have the capacity and mechanism to strategically allocate resources to these organisations to avoid unnecessary duplication of resources and to optimise their impact in integrating healthcare. Structures to enable collaboration between the agents will also be necessary for better alignment of their roles.

5.4.1.2 Policy parameters

Different levels of commissioning or purchasing will be operational at all levels of the health system, although they may not be recognised as such and this needs to be re-examined in the context of strategic goals. An initial step is to analyse the authority delegated to budget holders for allocation of resources and the accountability in the effect of the disbursement on outputs and outcomes. Policy parameters will need to be defined for purchasing agents for service mix and types, and for configuration arrangements of public-private provision needed to bridge the gaps in healthcare delivery to enable integrated care. Policy guidance and authorisation will also be needed for decisions on what, from whom, and how to purchase, as well as the choice of demand- and supply- side purchasing instruments and payment mechanisms together with any affordable co-payments that may be levied. The Government should also support innovations in payment methods that encourage people-centredness, improve patient experience, and increase value in care. As an example, NHS introduced personal health budgets (PHBs) which provide money for patients to purchase personalised care. This gives disabled people and people with long-term conditions more choice, control and flexibility over their healthcare to support their health and well-being needs (NHS, 2014). Deliberations and agreements with stakeholders will generate better understanding of responsibilities and expectations on performance and facilitate collaboration.

5.4.1.3 Collaboration

Transformation of an integrated health system is exceedingly complex and challenging, and calls for a shared vision and collaboration of the multitude of stakeholders, in the public and private healthcare sectors, business and civil society. Structures and mechanisms for engagement, participation and communications at every stage of the policy formulation, decision and implementation will enable rich inputs, clarify misconceptions, and address unrecognised barriers and problems. This would engender not only the buy-in needed for collaboration but more robust policies and implementation fidelity. Feedback and timely responses and formative evaluation of policy and programme implementation would build credibility and trust.

5.4.1.4 Oversight and accountability

A system for oversight and accountability for the decisions made by purchasing agents will need to be created. Accountability structures and mechanisms, rules and proceeding will ensure purchasing agents are exercising their delegated authority judiciously and fulfil this responsibility effectively.

A framework for monitoring of the functions, review of progress, evaluation of performance and objectives, and information systems will be needed to capture the data on inputs, access, coverage, continuity and quality. Patient feedback, redress systems, patient satisfaction and reported outcomes surveys are features of person centredness and is an integral component of accountability.

5.4.2 Healthcare delivery purchaser-provider system

The meso-level refers to health service delivery and provider organisation. At this level, strategic purchasing will be focused on the types, range and mix of care for the defined community which is responsive to changing community healthcare needs. Establishing structures for coordination between purchasing agents and between commissioning organisations, and purchasing agents will enable better alignment of roles and functions. This level also puts focus on the mechanisms for engagement, coordination, and management of local actors, service providers and health workers. Decisions of what to purchase and from whom to purchase need to consider how the services types and providers can be linked with the networks of providers and services types in the integrated system.

A system for coordination will need to be specified in the contracts used in purchasing and should cover operational, communications and information mechanisms, clinical protocols and pathways for integrated care.

The purchaser will need to decide how to purchase and which instruments should be used for the type or sets of healthcare that should be purchased. The payment methods will have to be devised to incentivise performance and coordination, and should be more effective when a combination of the available instruments of case-based, capitation, performance-based, pay-for-coordination and bundled-payment are used. Close monitoring of the effects will enable timely adjustments and needed changes. The roles of the providers will have to be defined and the service-mix and types needed to bridge the gaps for integrated healthcare delivery determined. The relationship and mechanisms for coordination and communications in the network of service providers need to be clarified. Channels for engagement between purchaser and provider must be established.

Contractual obligations of providers, performance monitoring and audits should be centred on timely access of patients to multidisciplinary care and experienced seamlessly in a coordinative system of integrated provider organisations. This should include care pathways to integrate care across provider transactions and patient feedback and redress systems and survey instrument for patient satisfaction and patient-reported outcomes.

5.4.3 Person journey of healthcare delivery

The micro-level relates to the person healthcare journey during a life course including encounters with multiple disciplines of healthcare professionals from different specialties in different settings. Encounters are also at different levels of health services attended by a multitude of providers in public and private sectors managed in their unique organisation cultures and defined by provider policies. The final product of strategic purchasing is what matters at the interaction of patient care delivery with the person and how the model of patient care can be redesigned to centre on the individual and to enable a seamless journey in care delivery over a life-course in preventive, curative, rehabilitative, palliative and social care provided by multidisciplinary team of health professions. Purchasing should also assess the inputs, processes outputs and outcomes of patientcare delivery. Inputs required include facilities, equipment, medical products, information, healthcare professionals, supporting staff and healthcare services. Processes for person-centredness include responsiveness to individuals' specific needs and preferences, and participation as an equal partner in the coproduction of health. Also important are mechanisms to navigate patients in this complex and constantly evolving system of care delivery and in the transitions of care.

What should be purchased in addition to this holistic-person centred care are the bridging and coordinating mechanisms required for vertical integration in the transitions (transitions of care within and between primary, secondary and tertiary levels of care) and horizontal (between different types and specialties of care, between social and medical care, and in the transitions to and from the community) integration. How to purchase should consider the goal of holistic care over a life course and for this temporal integration of care to consider capitation payment and personal budget allocations. Performance incentives for person centredness should also be built into contracts and agreements. Monitoring and evaluation tools should include assessment of responsiveness, equitable access, appropriateness, affordability and continuity surveys of patient experience, satisfaction and patient reported outcomes, in addition to patient complaints and redress procedures. Patient safety and quality and clinical audits are complements to the other mechanisms.

Ultimately the integrated journey of holistic care of individuals across the life course is of essence. Strategic purchasing needs to incorporate a bottom-up perspective to link the three levels of governance–provider–delivery. Adequate linkages will ensure the purchaser is getting the product paid for and that service provision does not require extraneous payments by patients. This arrangement thus allows the health system to avoid pitfalls of the principal agent theory that warns against providers maximising profits at the expense of patients.

In conclusion, beyond facilitating the design of specific healthcare programmes, we put forward that strategic purchasing serves as a critical policy lever for health system transformation to achieve a person-centred, integrated care system. Our framework illustrates how the decisions in strategic purchasing should be considered in the context of the interconnected objectives and goals at all three levels of the health system, including macro- (health system), meso- (healthcare delivery), and micro- (person journey of healthcare care delivery) levels to achieve better integration across preventive, curative, rehabilitative, palliative and social care provided by multidisciplinary teams. The Government needs to consider the adoption of health system strategic purchasing in tackling key health system gaps and combatting health system inefficiencies to achieve an integrated care system—which is fit-for-purpose.

5.5 CONCLUSION

Primary healthcare development in Hong Kong has been incremental but is now gaining momentum. In our 2018 research report *Fit for Purpose: A Health System in the 21st Century*, we highlighted that "**strategically purchasing services**, **allocating resources appropriately** and **utilising purchasing and payment mechanisms** can enable coordination and integration between service providers." The present report elaborates on strategic purchasing and showcases how this health financing tool can be a lever to propel PHC development in Hong Kong's pluralistic health system. We have demonstrated how the strategic allocation of resources, particularly through **strategic purchasing in PPPs, can potentially contribute to promoting primary care uptake, improve the health of the population and generate cost savings for the health system.** Specifically, we have evaluated the feasibility of the proposed **Chronic Disease Screening Voucher and Management Scheme that will enhance accessibility of chronic disease screening and management**, incentivise the uptake of primary care services in a targeted manner, and leverage private sector capacity to complement the public sector. The Scheme applied WHO health financing principles and strategic purchasing criteria in its design for prevention and early intervention of HDH in an increasingly high-risk but currently underserved population (targeted age group: 45 to 54 years). The Scheme is particularly novel against a backdrop of a myriad of PPPs in Hong Kong, and has a potential for large-scale impact in propelling the development of primary healthcare development in Hong Kong in the following ways:

1) Targeted design with a primary strong focus on prevention

Many existing PPP programmes have predefined eligibility patient criteria within clinical protocols in the HA, rendering the scope of beneficiaries limited. The Scheme targets an underserved younger population among whom the prevalence of chronic diseases has been rising, with the aim to promote chronic disease prevention earlier on in the life course. The Scheme provides chronic disease screening services for **all eligible individuals within the targeted age group, regardless of prior diagnosis or risk factors.** On that note, further studies will need to be conducted to estimate the take up rate of the target population, and beyond that, research the disease profile of newly detected patients for a more precise allocation of resources required to operate and sustain the Scheme. Beyond the initial screening process for diagnosis, we also recommended that the Government fund access to regular screening services for individuals without a DM diagnosis, operationalising preventive healthcare among the wider public and not putting financially vulnerable populations at risk of delaying care. Further studies are needed for more precise projections of natural disease progression as well as on the proposed model of care that has largely been based on the Hospital Authority RAMP for supplementary interventions that may be warranted.

2) Hybrid purchasing model drawing upon experience from existing PPP programmes and the strategic purchasing ideals

The recommendations provided for the design and implementation considerations of the Scheme are based on lessons drawn from existing primary care PPP programmes such as the EHCVS and the GOPC-PPP. They are also based on strategic purchasing criteria, which seeks to address many factors that affect the successful application thereof to Hong Kong's unique health system from the level of governance to benefit package design, considering the need for adequate incentivisation and coverage of co-morbid conditions. There are currently no PPP programmes designed as a hybrid of supply-side and demand-side instruments, each best suited for the two components of the proposal for a screening voucher and chronic disease management to change and optimise healthcare utilisation patterns. To that effect, the Scheme provides a visionary approach to tackling holistic and continuity in the provision of care. The Scheme also advocates that co-morbidities be managed and subsidised within the scope of its service provision, and highlights key design considerations that i) the purchaser should reduce potential dual utilisation of public and private sectors among the Scheme's voucher users through regulation and ii) ensure the ease of access to affordable primary care services for underserved and disadvantaged populations. Further studies need to be undertaken to explore varying scenarios of costs, their sources, and payment mechanisms to optimise financial sustainability of the system. Key stakeholders including patients should be engaged throughout the finalisation of the design of the proposed Scheme that should be piloted and evaluated when considered for scaling up.

3) In line with latest Government policy agenda and initiatives in primary healthcare development

It would be important for the Government to consider how the introduction of the said Scheme will complement the existing programmes, particularly existing primary care initiatives, PPPs and the District Health Centres (DHC), to examine how they may be synchronised and integrated to avoid duplication of resources which create health system inefficiency. As an example, at of the time of writing, two District Health Centres have commenced services. The Scheme will maximise its population impact through disease detection and downstream continuous management services, in conjunction with DHCs' positioning for the provision of upstream HDH prevention across all districts. DHCs could also serve as a hub for coordination of the programme.

4) Strategic purchasing as a system level instrument for the transformation to a primary care-led integrated person-centred health system

Despite the efforts made by the Government to improve the provision of primary care and well-integrated care, existing policies and programmes are often immediate interventions and not positioned to be long-term solutions to address major problems. Our report not only introduces the strategic purchasing perspective for the design of a PPP programme, but also recommends and describes how the Government should **incorporate strategic purchasing in health system governance functions and how it can be a critical lever to transform our health system to be fit-for-purpose.** From the system level, strategic purchasing can inform a broad range of interconnected government decisions, at the three macro, meso and micro levels. Strategic purchasing decisions of whom to purchase, who to purchase, and how to purchase can be informed from assessment of population health needs, identification of gaps in healthcare service types, assessment of the capacity and capabilities of the public and private sectors. Strategic purchasing will **enable resources to be allocated to where they could be better utilised to meet system goals and population needs**, ensure medical and social care system to develop in ways which are sustainable by fostering **closer integration, and healthcare development of primary, secondary and tertiary care coupled with better coordination with social care.**

Leveraging the achievements of the current Administration in PHC development and in anticipation of the city's Primary Healthcare Blueprint to be presented for public consultation in the upcoming months (at the time of writing), this policy paper has demonstrated the accessibility and affordability of primary care can be enhanced through strategically reorienting our health financing purchasing and commissioning mechanisms to deliver holistic, person-centred, and integrated care. Our aspiration is our research will pave the way for discussion surrounding a whole health system approach to maximising health system performance using the strategic purchasing lever. At stake is not simply a matter of the number of options that patients have for access to care, but rather a matter of whether patients can realistically attain timely, accessible, appropriate and quality care, without financial hardship over a life course, which lies at the heart of the WHO's universal health coverage goals. This policy paper demonstrates that population health goals may be achieved by strategically investing in and purchasing of health services, enabling Hong Kong's health system to become fit-for-purpose, and in effect, take a major step towards **health for all.**

Appendix

CHAPTER 4.2

APPENDIX A: PUBLIC POLLING SURVEY QUESTIONNAIRE

使用醫療券用作慢性疾病篩查和管理的意見調查

Opinions on Using Vouchers for Chronic Diseases' Screening & Management

「喂，你好，我哋係中文大學賽馬會公共衞生及基層醫療學院打嚟嘅，我哋做緊一個有關香港市民對使用醫療券用作慢性疾病篩查和管理醫療券嘅意見調查，你提供的所有資料，只作研究用途，會保密處理。希望你可以花少少時間回答一啲簡短嘅問題，請問可唔可以呢？」【需時3、4分鐘】

We are calling from the CUHK-JCSPHPC and conducting a survey about the opinions of Hong Kong citizens on using vouchers for chronic diseases' screening & management. All your information provided will be kept confidentially. We hope that you can spend a few moments to answer our brief questionnaire, are you interested?

受訪者性別GENDER

【以下資料由訪問員填寫】The surveyor will fill in the following information:

【如未能確定受訪者性別，追問：「對唔住，我聽得唔係好清楚，請問你係男士係女士呢？」】

If the surveyor cannot ascertain the individual's gender, please ask: I apologise, I could not hear clearly, what gender do you identify with?

- ◯ 1. 男 Male
- ◯ 2. 女 Female

年齡AGE

「請問你屬於以下邊個年齡組別呢？」【讀出1-6】[1]

What is your age range? [1]

- ◯ 1. 18–24歲 18–24 age range
- ◯ 2. 25–34歲 25–34 age range
- ◯ 3. 35–44歲 35–44 age range
- ◯ 4. 45–54歲 45–54 age range
- ◯ 5. 55–64歲 55–64 age range
- ◯ 6. 65歲或以上 65 years or above
- ◯ 9. 拒絕回答 Refuse to answer

Note: Questions with [1] notation indicate that responses purposefully skipped chronological ordering to indicate variation in response types.

第一部分：有關健康檢查服務的使用習慣
Session 1: About utilisation habits on health checking services

Q1 「你同意接受健康檢查有助及早發現慢性疾病，令病情盡早受到控制嗎？係非常同意、同意、不同意，定係非常不同意呢？」[1]

（慢性疾病定義：又稱為「長期病患」或「非傳染病」，病程一般會維持較長的時間和進展也會比較緩慢，當中以高血壓、膽固醇過高、糖尿病、心臟病、癌症、中風及關節炎等最為普遍。）

Do you agree that health checks will help early identification of chronic diseases, and hence the disease progression could be under control earlier? [1]

(Definition of chronic diseases: also known as “long-term diseases” or “non-communicable diseases”. Disease progression will last for a longer time frame in a slower manner. Most common ones among which are High Blood Pressure, High Cholesterol, Diabetes, Heart Diseases, Cancer, Stroke & Osteoarthritis.)

- ◯ 1. 十分同意 Strongly Agree
- ◯ 2. 同意 Agree
- ◯ 3. 不同意 Disagree
- ◯ 4. 非常不同意 Strongly Disagree
- ◯ 8. 不知道／無意見 Uncertain/No Opinions
- ◯ 9. 拒絕回答 Refuse to Answer

Q2 「你有無定期進行以下健康檢查？係半年、一年、兩年、三年一次、不定時、定係無？」【讀出i-iii；逐項回答】[1]

Have you regularly completed the following health checks? Half a year, annually, biennially, triennially, irregularly or none? [1]

i. 血壓檢查(N=1000) Blood Pressure Check	◯ 1	◯ 2	◯ 3	◯ 4	◯ 5	◯ 6	◯ 8	◯ 9
ii. 血糖檢查 (N=1000) Blood Glucose Check	◯ 1	◯ 2	◯ 3	◯ 4	◯ 5	◯ 6	◯ 8	◯ 9
iii. 血脂檢查 (N=1000) Blood Lipid Check	◯ 1	◯ 2	◯ 3	◯ 4	◯ 5	◯ 6	◯ 8	◯ 9

1. 半年 Half a year
2. 一年 Annually
3. 兩年 Biennially
4. 三年 Triennially
5. 不定時 Irregularly
6. 沒有 None
8. 不知道／無意見 Uncertain/No Opinions
9. 拒絕回答 Refuse to Answer

i. – iii 任何一項有回答(5)不定時或(6)沒有【追問Q2b】
If any of the answers is 5 or 6 [Follow up on Q2b]
其餘【跳問Q3】 Others [Jump to Q3]
8. 不知道/無意見【跳問Q6a】Uncertain/No Opinions [Jump to Q6a]
9. 拒絕回答【跳問Q6a】Refuse to Answer [Jump to Q6a]

Note: Questions with [1] notation indicate that responses purposefully skipped chronological ordering to indicate variation in response types.

Q2b 「你認為以下邊方面係你無定時檢查血壓／血糖／血脂嘅主要原因呢？其次呢？」【讀出1-6】【跳問Q6a】

Amongst the followings, what are your primary and secondary reasons for not checking your blood pressure, blood sugar, blood lipid regularly? [Jump to Q6a]

- ◯ 1. 自身沒有需要或不逼切
  Unnecessary or non-urgent need of health checks
- ◯ 2. 認為血壓、血糖和血脂檢查沒有作用
  Checks on blood pressure, blood glucose and blood lipid are useless
- ◯ 3. 自身太忙 Too busy
- ◯ 4. 財政考慮 Financial concerns
- ◯ 5. 擔心篩查後或帶來的有關疾病管理
  Worried of the disease management potentially brought by screening
- ◯ 6. 唔知邊度有得做檢查 Uncertain of where one can receive health checks
- ◯ 7. 其他(請註明) Others
- ◯ 8. 唔知道／好難講 Uncertain/Hard to say
- ◯ 9. 拒絕回答 Refuse to answer

Q3 「過去一年，你較多於公營或是私營醫療機構進行血糖、血脂或血壓的檢查？【讀出1-3】[1]

In the past year, did you have your checks on blood sugar/lipid/pressure more frequently in public or private institutions? [1]

- ◯ 1. 公營醫療(包括公立醫院、醫管局普通科或專科門診、衞生署診所等)
  Public service providers (including public hospitals, HA's general or specialist clinics, DH clinics, etc)
- ◯ 2. 私營醫療(包括私家診所、醫院或保險等)
  Private service providers (including private clinics, hospitals or insurance providers)
- ◯ 3. 兩者都有 Both
- ◯ 8. 不知道／無意見 Uncertain/No Opinions
- ◯ 9. 拒絕回答 Refuse to answer

Note: Questions with [1] notation indicate that responses purposefully skipped chronological ordering to indicate variation in response types.

Q4 「你認為以下邊方面係驅使你進行有關血壓、血糖和血脂檢查的主要因素呢？其次呢?」【讀出1-6 受訪者需選出首要和次要因素】

Amongst the followings, what are the primary and secondary drivers for you to do checks on blood pressure/sugar/lipid?

- ◯ 1. 自身身體狀況 Own health conditions
- ◯ 2. 及早預防疾病 For early disease prevention
- ◯ 3. 專業人士建議 Recommended by professionals
- ◯ 4. 親朋好友介紹 Recommended by relatives and friends
- ◯ 5. 長遠減少醫療開支 To reduce financial burden in the long run
- ◯ 6. 保險提供 Included in the insurance plan
- ◯ 7. 其他(請註明) Others
- ◯ 8. 唔知道／無意見 Uncertain/No opinions
- ◯ 9. 拒絕回答 Refuse to answer

Q5 「你認為以下邊方面最會影響你實際參與血壓、血糖和血脂檢查計劃的主要考慮因素呢？其次呢?」【讀出1-5 受訪者需選出首要和次要因素】[1]

Amongst the followings, what are the primary and secondary factors for you to actually participate in checks on blood pressure/sugar/lipid? [1]

- ◯ 1. 檢查地點 Locations of health checks
- ◯ 2. 檢查價錢 Price of health checks
- ◯ 3. 檢查時段 Time of health checks
- ◯ 4. 檢查服務提供者 Service providers of health checks
- ◯ 5. 檢查後的支援 Post-health-check support
- ◯ 7. 其他(請註明)【續問Q6】Others [Continue on Q6]
- ◯ 8. 唔知道／無意見【續問Q6】Uncertain/No opinions [Continue on Q6]
- ◯ 9. 拒絕回答【續問Q6】Refuse to answer [Continue on Q6]

Q6a 「你有冇患上高血壓、心臟病、中風、糖尿病？」[1]

Do you have high blood pressure, heart diseases, stroke, or diabetes? [1]

- ◯ 1. 有【追問Q6b】Yes [Jump to Q6b]
- ◯ 2. 冇【續問Q7】No [Continue on Q7]
- ◯ 8. 不知道／無意見【續問Q7】Uncertain/No Options [Continue on Q7]
- ◯ 9. 拒絕回答【續問Q7】Refuse to answer [Continue on Q7]

Note: Questions with [1] notation indicate that responses purposefully skipped chronological ordering to indicate variation in response types.

Q6b 「過去你較多於公營或是私營醫療機構，為高血壓、心臟病、中風或糖尿病作定期覆診？(不包括只取藥而沒見醫生，或牙醫服務。)」【讀出1-4】[1]

Would you often have your checks on high blood pressure/heart diseases/stroke/diabetes in public or private institutions (excluding prescription without consultation, nor dental services)? [1]

- ◯ 1. 公營醫療機構(包括公立醫院、醫管局門診、衞生署診所等)【跳問Q12a】
  Public service providers (including public hospitals, HA's general or specialist clinics, DH clinics, etc.) [Jump to Q12a]
- ◯ 2. 私營醫療機構(包括私家醫生、私家醫院等)【跳問Q12a】
  Private service providers (including private clinics or hospitals) [Jump to Q12a]
- ◯ 3. 醫管局公私營協作計劃，則由政府資助到私家診所覆診【跳問Q12a】
  HA PPPs, namely to visit private clinics which are sponsored by the Government [Jump to Q12a]
- ◯ 4. 以上皆有 All of the above
- ◯ 5. 沒有定期覆診 Do not have regular visits
- ◯ 7. 其他(請註明) Others
- ◯ 8. 不知道／無意見 Uncertain/No Opinions
- ◯ 9. 拒絕回答 Refuse to answer

Q7 「你知道高血壓、高血糖同高血脂會有更大傾向患上以下邊啲健康問題呢？可選多於一項。」【讀出i-iii；逐項回答；可選多項】

Do you know what health issues of the followings will high blood pressure/sugar/lipid more likely to have? Accept multiple selections

i. 高血壓 High blood pressure	◯ 1	◯ 2	◯ 3	◯ 4	◯ 5	◯ 6	◯ 7	◯ 8	◯ 9
ii. 高血糖 High blood sugar	◯ 1	◯ 2	◯ 3	◯ 4	◯ 5	◯ 6	◯ 7	◯ 8	◯ 9
iii. 高血脂 High blood lipid	◯ 1	◯ 2	◯ 3	◯ 4	◯ 5	◯ 6	◯ 7	◯ 8	◯ 9

1. 冠心病(亦則冠狀動脈閉塞引起的心臟病)
   Heart diseases
2. 中風(腦部血管「阻塞」或「爆裂」，令腦組織不能得到充份的養料和氧氣而壞死)
   Stroke
3. 視網膜病變，會影響視力
   Retinopathy
4. 神經病變(神經系統疾病，會出現感覺、如對痛覺及溫度的感覺變差)
   Neuropathy
5. 腎病變，(使腎臟功能損傷)
   Nephropathy
6. 以上皆是
   All of the above
7. 以上皆不是
   None of the above
8. 不知道／無意見
   Uncertain/No opinions
9. 拒絕回答
   Refuse to answer

Note: Questions with [1] notation indicate that responses purposefully skipped chronological ordering to indicate variation in response types.

第二部分
Session 2

「以下問題牽涉一個虛擬的醫療券計劃，由政府推出，以鼓勵港人免費到私營醫療機構，如私家診所和體檢中心等，進行有關高血壓、心臟病、中風、或糖尿病的慢性疾病篩查，內容為血壓、血糖和血脂的檢測。現時此等服務之市場參考價格約為每次約500-2000港元，政府建議18歲以上市民每1-2年進行檢查一次。」

The following questions concern a proposal of a health voucher scheme. It will be launched by the Government to encourage Hong Kong citizens to take chronic disease screenings related to high blood pressure, heart diseases, stroke and diabetes at private health service providers (private clinics, screening centres, etc) free-of-charge. The screening will comprise of checks on blood pressure, blood sugar and blood lipid level. The current market price of similar services is around HKD 500–2,000 each. The Government has recommended citizens aged above 18 to have these checks every 1 or 2 years.

Q8 「你認為你會唔會參與以上計劃呢？」[1]
Will you participate in this scheme? [1]

- ◯ 1. 會【跳問Q9】Yes [Jump to Q9]
- ◯ 2. 不會【續問Q8b】No [Continue on Q8b]
- ◯ 8. 唔知道／無意見【跳問Q8b】Uncertain/No opinions [Continue on Q8b]
- ◯ 9. 拒絕回答【跳問Q8b】Refuse to answer [Continue on Q8b]

Q8b 「如果你知道持續嘅高血壓、高血糖同高血脂會較容易引致冠心病、中風、視網膜病變、神經病變或腎病變嘅健康問題，咁又會唔會提升你定期檢查血壓、血糖同血脂嘅動機呢？如果1分代表『絕對唔會』，至6分代表『絕對會』，1至6分，你會俾幾多分呢」？
If you are now informed that continuous high blood pressure/sugar/lipid will easily cause heart diseases, stroke, retinopathy, neuropathy and nephropathy, will your motivation for regular checks on these indicators increase, along a 1 (absolutely not) to 6 (absolutely yes) scale?

- ◯ 1. 1分（絕對唔會提升）【續問Q8c】1 (Absolutely not) [Continue on Q8c]
- ◯ 2. 2分（唔提升）【續問Q8c】2 (No) [Continue on Q8c]
- ◯ 3. 3分（沒大提升）【續問Q8c】3 (Probably not) [Continue on Q8c]
- ◯ 4. 4分（少許提升）【跳問Q8d】4 (Slightly increase) [Jump to Q8d]
- ◯ 5. 5分（會提升）【跳問Q8d】5 (Increase) [Jump to Q8d]
- ◯ 6. 6分（絕對會提升）【跳問Q8d】6 (Absolutely yes) [Jump to Q8d]
- ◯ 7. 普通／一半半【跳問Q8d】Half-half [Jump to Q8d]
- ◯ 8. 唔知道／好難講【跳問Q8d】Uncertain/Hard to say [Jump to Q8d]
- ◯ 9. 拒絕回答【跳問Q8d】Refuse to answer [Jump to Q8d]

Note: Questions with [1] notation indicate that responses purposefully skipped chronological ordering to indicate variation in response types.

Q8c 「你認為以下邊方面係你唔願意參與此計劃服務嘅主要原因呢？其次呢？」【跳問Q13】

Amongst the followings, what are your primary and secondary reasons of your reluctance to participate in this scheme? [Jump to Q13]

- ◯ 1. 自身沒有需要 Unnecessary or non-urgent need of health checks
- ◯ 2. 認為血壓、血糖和血脂檢查沒有作用
  Checks on blood pressure, blood glucose and blood lipid are useless
- ◯ 3. 對私營服務提供者質素有疑慮
  Concerns on private service providers
- ◯ 4. 已有參類似檢查血壓、血糖和血脂
  Already participated in similar checks on blood pressure/sugar/lipid
- ◯ 5. 擔心篩查後或帶來的有關疾病管理
  Worried of the disease management potentially brought by screening
- ◯ 6. 檢查方法(如：抽血)會令你感到害怕
  Scared of the way of screening (e.g., blood taking)
- ◯ 7. 其他(請註明) Others
- ◯ 8. 唔知道／好難講 Uncertain/Hard to say
- ◯ 9. 拒絕回答 Refuse to answer

Q8d 「你認為以下邊方面係你決定會唔會參與此計劃服務嘅主要原因呢？其次呢？」【跳問Q10a】[1]

Amongst the followings, what are your primary and secondary reasons to participate in this scheme? [Jump to Q10a] [1]

- ◯ 1. 自身身體情況 Physical health
- ◯ 2. 有否空餘時間 Whether one has free time
- ◯ 3. 檢查地點 Locations of the screening
- ◯ 4. 檢查所需時間 Required time of the screening
- ◯ 5. 自身熟悉的醫護人士建議 Recommended by close medical professionals
- ◯ 7. 其他(請註明) Others
- ◯ 8. 唔知道／好難講 Uncertain/No opinions
- ◯ 9. 拒絕回答 Refuse to answer

Note: Questions with [1] notation indicate that responses purposefully skipped chronological ordering to indicate variation in response types.

Q9 「衞生署建議成年人每一至兩年量度血壓[1]、血糖和血脂。在虛擬醫療券計劃下，你又願意幾頻密地接受依啲免費的健康檢查呢？」【讀出1-5】[1]

The Department of Health suggested adults to check blood pressure, sugar and lipid every 1 or 2 years. Under this proposal of healthcare voucher scheme, how frequently are you willing to take these health checks? [1]

- ◯ 1. 半年一次 Half a year
- ◯ 2. 一至兩年一次 Once every 1 or 2 years
- ◯ 3. 三年或以上 Triennially
- ◯ 4. 不定期 Irregularly
- ◯ 5. 跟從自身熟悉的醫護人員建議 Follow recommendations of close medical professionals
- ◯ 7. 其他(請註明) Others
- ◯ 8. 唔知道／無意見 Uncertain/No Opinions
- ◯ 9. 拒絕回答 Refuse to Answer

Q10a 「如果進行檢查後確診高血壓、心臟病、中風、或糖尿病，你會較傾向喺邊度作定期覆診呢？」【讀出1-4】[1]

If you are diagnosed with high blood pressure, heart disease, stroke or diabetes after the screening, where do you tend to seek regular visits for diseases management? [1]

- ◯ 1. 公營醫療機構(包括公立醫院、醫管局門診、衞生署診所等)【跳問Q11a】
  Public service providers (including public hospitals, HA's general or specialist clinics, DHclinics, etc)
  [Jump to Q11a]
- ◯ 2. 私營醫療機構(包括私家醫生、私家醫院等)【跳問Q11a】
  Private service providers (including private clinics, hospitals or insurance providers)
  [Jump to Q11a]
- ◯ 3. 無所謂【跳問Q11a】Both [Jump to Q11a]
- ◯ 4. 不會刻意覆診【跳問Q12】Won't have regular visits [Jump to Q12]
- ◯ 7. 其他(請註明)【跳問Q11a】Others [Jump to Q11a]
- ◯ 8. 不知道／無意見【跳問Q11a】Uncertain/No Opinions [Jump to Q11a]
- ◯ 9. 拒絕回答【跳問Q11a】Refuse to answer [Jump to Q11a]

Note: Questions with [1] notation indicate that responses purposefully skipped chronological ordering to indicate variation in response types.

Q11a「你認為以下邊方面係你選擇定期覆診服務者的主要考慮因素呢？其次呢?」【讀出1-6】

Amongst the following, what are your primary and secondary considerations for choosing a service provider for regular consultations?

- ◯ 1. 價錢合理【追問Q11b】Reasonable prices [Follow up on Q11b]
- ◯ 2. 覆診地點方便【跳問Q13】Convenient location for consultations [Jump to Q13]
- ◯ 3. 覆診所需時間合理【跳問Q13】Reasonable amount of time needed [Jump to Q13]
- ◯ 4. 同服務提供者能建立關係【跳問Q13】
  Being able to establish relationship with the service provider [Jump to Q13]
- ◯ 5. 自身熟悉的醫護人員轉介【跳問Q13】
  Recommended by close medical professionals [Jump to Q13]
- ◯ 6. 服務提供者的口碑【跳問Q13】Reputation of the service provider [Jump to Q13]
- ◯ 7. 其他【註明】【跳問Q13】Others [Jump to Q13]
- ◯ 8. 唔知道／好難講【跳問Q13】Uncertain/Hard to say [Jump to Q13]
- ◯ 9. 拒絕回答【跳問Q13】Refuse to answer [Jump to Q13]

Q11b「醫管局每一次的普通科門診收費為50港元，私營服務者則數百元不等。若高血壓、高血脂和高血糖的情況穩定，一年約需覆診4至10次。對每一次管理慢性疾病的定期覆診，你願意負擔的最高費用係幾多？」【讀出1-5】[1]

Each consultation at the Hospital Authority's general outpatient clinic costs HKD 50, and around a few hundred dollars at private service providers. Around 4 to 10 consultations are needed every year for stable conditions of high blood pressure, high blood lipid and high blood sugar. For each consultation to manage chronic diseases, what is the maximum amount you are willing to pay? [1]

- ◯ 1. 1–50港元 HKD 1–HKD 50【跳問Q13】[Jump to Q13]
- ◯ 2. 51–100港元 HKD 51–HKD 100【跳問Q13】[Jump to Q13]
- ◯ 3. 101–200港元 HKD 101–HKD 200【跳問Q13】[Jump to Q13]
- ◯ 4. 201–500港元 HKD 201–HKD 500【跳問Q13】[Jump to Q13]
- ◯ 5. 501港元以上 Above HKD 501【跳問Q13】[Jump to Q13]
- ◯ 8. 唔知道／無意見【跳問Q13】Uncertain/No opinions
- ◯ 9. 拒絕回答【跳問Q13】Refuse to answer

Note: Questions with [1] notation indicate that responses purposefully skipped chronological ordering to indicate variation in response types.

Q12 「你認為以下邊方面係你唔願意就高血壓、心臟病、中風、或糖尿病的慢性疾病定期覆診嘅主要原因呢？其次呢？」【讀出1-5，受訪者需選出首要和次要因素】[1]

Amongst the followings, what are the primary and secondary reasons of your reluctance to seek regular consultation to manage high blood pressure, heart disease, stroke, or diabetes? [1]

- ◯ 1. 自行管理身體已足夠【跳問Q13】 It's sufficient to do self-management [Jump to Q13]
- ◯ 2. 自身太忙【跳問Q13】Too busy [Jump to Q13]
- ◯ 3. 不知道該去哪兒覆診【跳問Q13】Uncertain of where to seek regular consultation [Jump to Q13]
- ◯ 4. 財政考慮【追問Q12b】Financial concerns [Follow up on Q12b]
- ◯ 5. 唔想定期見醫生【跳問Q13】Unwilling to see doctors regularly [Jump to Q13]
- ◯ 7. 其他(請註明)【跳問Q13】Others [Jump to Q13]
- ◯ 8. 唔知道／好難講【跳問Q13】Uncertain/Hard to say [Jump to Q13]
- ◯ 9. 拒絕回答【跳問Q13】Refuse to answer [Jump to Q13]

Q12b 「管理慢性疾病的定期覆診之市場參考價格約為數百元不等。若高血壓、高血脂和高血糖的情況穩定，一年約需覆診4至10次 。你認為政府最少對每一次覆診要提供幾多財政資助，你先會考慮到私營醫療服務者作定期覆診呢？」【讀出1-7】[1]

The private market price of each consultation to manage chronic diseases is around a few hundred dollars. Around 4 to 10 consultations are needed every year for stable conditions of high blood pressure, high blood lipid and high blood sugar. In your opinion, what is the minimum amount of subsidy offered by the Government to motivate you to seek care from private service providers? [1]

- ◯ 1. 1–50港元【跳問Q13】 HKD 1–50 [Jump to Q13]
- ◯ 2. 51–100港元【跳問Q13】HKD 51–100 [Jump to Q13]
- ◯ 3. 101–200港元【跳問Q13】HKD101–200 [Jump to Q13]
- ◯ 4. 201–500港元【跳問Q13】HKD 201–500 [Jump to Q13]
- ◯ 5. 501港元以上【跳問Q13】HKD 501 or above [Jump to Q13]
- ◯ 6. 無論多少亦不會覆診【跳問Q13】 Won't have regular visits regardless of the amount [Jump to Q13]
- ◯ 8. 唔知道／無意見【跳問Q13】Uncertain/No Opinions [Jump to Q13]
- ◯ 9. 拒絕回答【跳問Q13】Refuse to answer [Jump to Q13]

Note: Questions with [1] notation indicate that responses purposefully skipped chronological ordering to indicate variation in response types.

Q13 「你有冇需要長期服用藥物或定期覆診呢(例如患上高血壓、心臟病、中風、癌症、慢性呼吸道疾病、糖尿病等)？」[1]

Are you on long-term medication or regular consultation schedule (say diagnosed with high blood pressure, heart disease, stroke, cancer, chronic diseases, diabetes)? [1]

- ◯ 1. 有需要 Yes
- ◯ 2. 冇需要 No
- ◯ 8. 不知道／無意見 Uncertain/No opinions
- ◯ 9. 拒絕回答 Refuse to answer

Q14 「過去你較多於公營或是私營醫療機構，作普通科問診？(通常針對偶發症疾病、如傷風、感冒等，不包括只取藥而沒見醫生，或牙醫服務。)」【讀出1-3】[1]

Would you visit public or private healthcare institutions for general consultation (usually to address episodic diseases like cold or flu; excluding prescription without consultation, nor dental services)? [1]

- ◯ 1. 公營醫療(包括公立醫院、醫管局普通科或專科門診、衞生署診所等)
  Public service providers (including public hospitals, HA's general or specialist clinics, DH clinics, etc.)
- ◯ 2. 私營醫療(包括私家醫生、私家醫院等)
  Private service providers (including private clinics or hospitals)
- ◯ 3. 兩者相約 Similar frequency to both of the above
- ◯ 8. 不知道／無意見 Uncertain/No Opinions
- ◯ 9. 拒絕回答 Refuse to answer

Q15 「你的直屬家庭成員(父母，兄弟姊妹，子女)患有高血壓、心臟病、中風、或糖尿病？嗎？」[1]

Is any of your immediate family members (parents, siblings, children) diagnosed with high blood pressure, heart disease, stroke, or diabetes? [1]

- ◯ 1. 有 Yes
- ◯ 2. 沒有 No
- ◯ 8. 不知道／無意見 Uncertain/No opinions
- ◯ 9. 拒絕回答 Refuse to answer

Note: Questions with [1] notation indicate that responses purposefully skipped chronological ordering to indicate variation in response types.

Q16 「你的僱主有提供醫療保險嗎？」[1]

Does your employer offer medical insurance? [1]

- ◯ 1. 有 Yes
- ◯ 2. 沒有 No
- ◯ 3. 有購買政府的自願醫療保險和私人醫療保險
  I have purchased both government's VHIS and private medical insurance
- ◯ 4. 沒有購買任何保險 I have not purchased any insurance
- ◯ 8. 不知道／無意見 Uncertain/No opinions
- ◯ 9. 拒絕回答 Refuse to answer

Q17 「你有購買醫療保險嗎？」[1]

Have you purchased any medical insurance? [1]

- ◯ 1. 有購買政府的自願醫療保險 VHIS
- ◯ 2. 有購買私人醫療保險 Private insurance
- ◯ 3. 有購買政府的自願醫療保險和私人醫療保險 Both VHIS and private insurance
- ◯ 4. 沒有購買任何保險 No insurance
- ◯ 8. 不知道／無意見 Uncertain/No opinions
- ◯ 9. 拒絕回答 Refuse to answer

Q18 「你認為你有足夠的金錢負擔突發的醫療開支嗎？係足夠有餘、足夠、剛好，不足夠、定係非常不足夠呢？」[1]

Do you think you have sufficient money to afford unanticipated medical expenses? [1]

- ◯ 1. 足夠有餘 Absolutely sufficient
- ◯ 2. 足夠 Sufficient
- ◯ 3. 剛好 Just about
- ◯ 4. 不足夠 Insufficient
- ◯ 5. 非常不足夠 Severely insufficient
- ◯ 8. 不知道／無意見 Uncertain/No opinions
- ◯ 9. 拒絕回答 Refuse to answer

Note: Questions with [1] notation indicate that responses purposefully skipped chronological ordering to indicate variation in response types.

EDU

「請問你嘅教育程度去到邊呢？」【讀出1-6】[1]

What is your education level? [1]

- ◯ 1. 無受教育或幼稚園 No prior education received/Kindergarten
- ◯ 2. 小學 Primary school level
- ◯ 3. 初中(中一至中三) Form 1 to 3
- ◯ 4. 高中(中四至中七) Form 4 to 6
- ◯ 5. 大專非學士(包括文憑／副學士／ IVE等)
  Tertiary non-bachelor degrees (including diploma, associated degree, IVE, etc.)
- ◯ 6. 大專學士或以上(包括大學學士／碩士／博士等)
  Tertiary bachelor degree or above (including bachelor, master, doctoral)
- ◯ 9. 拒絕回答 Refuse to answer

ECON

「請問你嘅就業情況係？」【讀出1-5】[1]

What is your employment status? [1]

- ◯ 1. 在職人士(包括全職或兼職) Employed (Full-time/part-time)
- ◯ 2. 退休人士(包括不會再找工作) Retired (not seeking further employment)
- ◯ 3. 家庭主婦(包括曾工作但已退休，不會再找工作)
  Housewives (including retired without intention to seek further employment)
- ◯ 4. 學生 Students
- ◯ 5. 失業／待業 Unemployed
- ◯ 8. 不知道／無意見 Uncertain/No opinions
- ◯ 9. 拒絕回答 Refuse to answer

Note: Questions with [1] notation indicate that responses purposefully skipped chronological ordering to indicate variation in response types.

【此題只問在職受訪者】Only for respondents who are current employed

INCOME

「請問你個人每個月嘅收入大約有幾多呢？」【讀出1-5】[1]

How much is your monthly salary? [1]

- ◯ 1. 一萬以下 HKD <10,000
- ◯ 2. 一萬至二萬以下 HKD 10,000–19,999
- ◯ 3. 二萬至三萬以下 HKD 20,000–29,999
- ◯ 4. 三萬至六萬以下 HKD 30,000–59,999
- ◯ 5. 六萬或以上 HKD ≥ 60,000
- ◯ 8. 收入不定 Irregular income
- ◯ 9. 拒絕回答 Refuse to answer

CSSA

「請問你有領取綜緩嗎？」[1]

Are you a CSSA recipient? [1]

- ◯ 1. 有 Yes
- ◯ 2. 沒有 No
- ◯ 8. 不知道／無意見 Uncertain/No Opinions
- ◯ 9. 拒絕回答 Refuse to Answer

Appendices B, C, D, E, F, G, H, and I can be accessed by scanning the QR code below:

Note: Questions with [1] notation indicate that responses purposefully skipped chronological ordering to indicate variation in response types.

CHAPTER 4.3

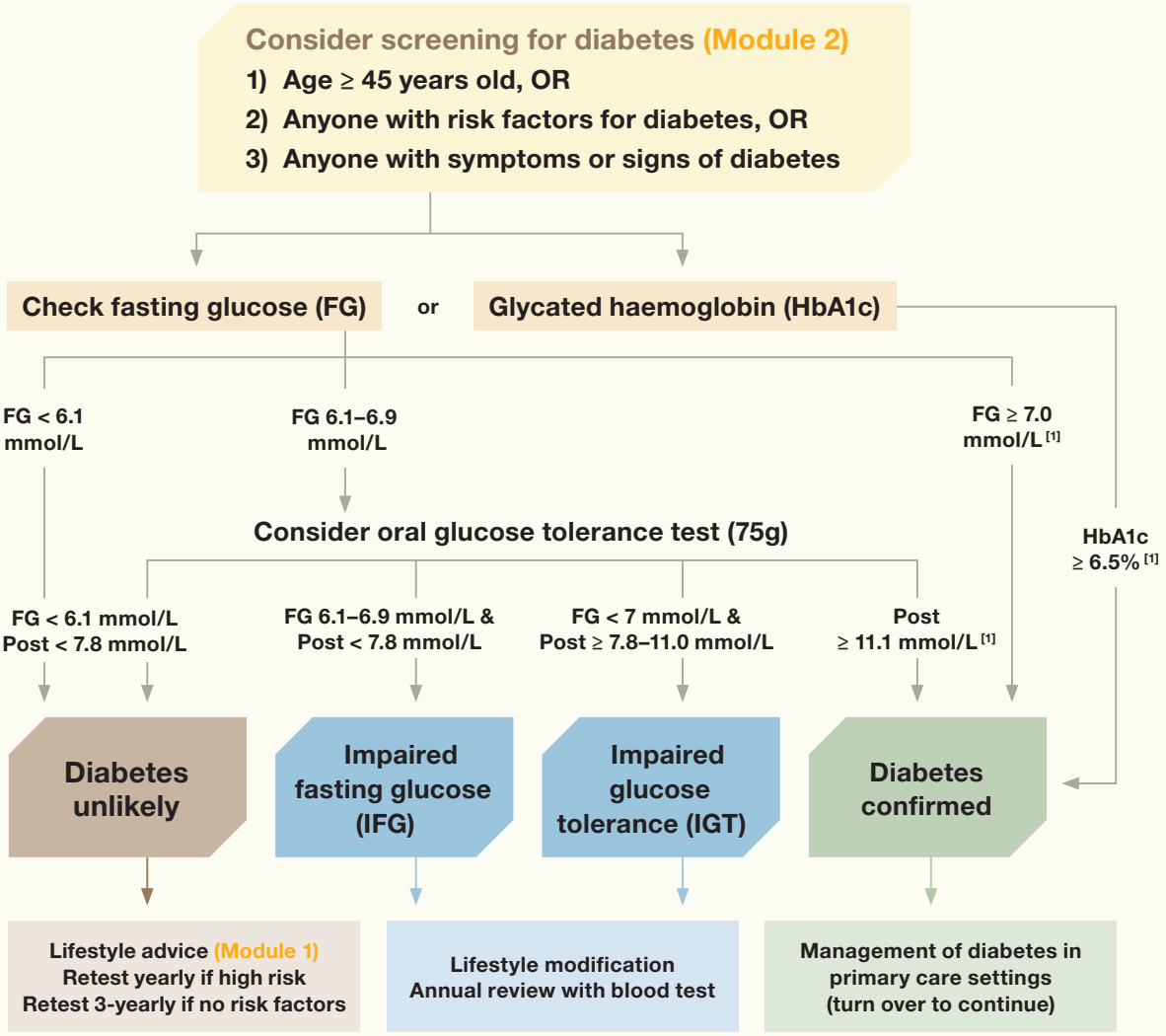
APPENDIX J: DIFFERENCES IN CLINICAL DIAGNOSIS AND REQUIREMENT OF DIABETES

Prevention and treatment of diabetes entail policies and protocols that differ internationally due to variances in epidemiology and demographic trends of health systems. Such variances have implications on **severity of disease** and **case definitions** among populations. Internationally, different professional health organisations such as the WHO, American Diabetes Association (ADA), and Diabetes UK have similar guidelines as to which tests to use for diagnosis and which referential systems of the different blood test result levels to adopt for grading the disease severity of diabetes.

However, there are **small but important differences** on the range of diagnostic criteria adopted by different institutions which have substantial implications on the number of individuals detected with pre-diabetes and/or diabetes. For example, in comparing the ADA criteria to the WHO criteria, we observe that the former has broader requirements for the diagnosis of diabetes, with FPG concentrations of **5.6–6.9 mmol/L** or HbA1c of 39–47 mmol/mol **(5.7–6.4%)**, whereas WHO and the International Expert Committee recommend an FPG cut off **6.0–6.9 mmol/L** and HbA1c of 42–47 mmol/mol **(6.0–6.4%)**. There is no "one-size-fits-all" mantra as macro-contexts and healthcare challenges differ across jurisdictions. Consequently, a variation of clinical cut-offs can be observed in international practice, where a lower cut-off of 6.3% for HbA1c is recommended in Malaysia and a higher cut-off of 6.7% is recommended in New Zealand. While in Singapore, the use of HbA1c for diagnosis of diabetes is not recommended altogether (Lim et al., 2018).

APPENDIX K: SCREENING AND DIAGNOSIS OF DIABETES MELLITUS IN PRIMARY CARE SETTINGS

Management of Diabetes Mellitus (DM) in Primary Care Settings



Risk factors for diabetes (Module 2)

- Age ≥ 45 years old
- Family history (first-degree relatives) of diabetes
- Overweight or obesity
- Previous impaired glucose tolerance (IFG) or impaired fasting glucose (IGT)
- Abdominal circumference: ≥ 80cm in females, ≥ 90cm in males
- Hypertension (HT) (blood pressure (BP) ≥ 140/90 mmHg)
- Metabolic syndrome
- Clinical cardiovascular diseases (e.g. coronary heart disease, stroke, peripheral vascular disease)
- Presence of other cardiovascular risk factors
- Women with history of gestational diabetes or big baby
- Polycystic ovarian syndrome
- Long term systemic steroid therapy

Management of Diabetes Mellitus (DM) in Primary Care Settings (continued)

Management strategy

- Promote *lifestyle modification*, e.g. diet (Module 3), exercise (Module 4) and smoking cessation
- Check *HbA1c half yearly* or more frequently if necessary (Module 5) and arrange regular follow up
- Measure BP every visit. Start *ACEI / ARB* for patients with HT (BP ≥ 130/80 mmHg) (Module 7), microalbuminuria or proteinuria (Module 9)
- Consider *statin* if lifestyle modification fails to achieve target LDL-C < 2.6 mmol/L (Module 8)
- Consider *referral* if indicated (Core Document 8.1)

^HbA1c goal (Module 5)

Individualised, balancing benefits and risks

- General: < 7%
- Young and fit: ≤ 6.5%
- Frail elderly, severe hypoglycaemic episodes or advanced disease:
  Less stringent goal

HbA1c ≥ 7%^ after lifestyle modification

Step 1: Mono-therapy

- Use Metformin as monotherapy (Module 6)
- Consider sulphonylurea if:
  - Metformin not tolerated or contraindicated
  - Rapid response desired for hyperglycaemic symptoms

HbA1c still ≥ 7%^ despite monotherapy

Step 2: Dual therapy

Add **Sulphonylurea** when blood glucose control remains inadequate on metformin (Module 6)

Consider adding **pioglitazone**, **DPP4** inhibitor or **SGLT2 inhibitor** instead of sulphonylurea if:

- Significant risk of hypoglycaemia
- Intolerant of or contraindicated to sulphonylurea

HbA1c ≥ 7.5%^ despite adjustment / addition of blood glucose lowering drugs

Step 3: Triple therapy or insulin based

- Consider **insulin** (Appendix of Module 6)
- Add **Pioglitazone, DPP4 inhibitor** or **SGLT2** inhibitor when insulin is unacceptable or inappropriate
- Add **GLP-1 agonist** if BMI ≥ 35kg/m2 and weight loss would benefit comorbidities

Annual assessment and complication screening (Core Document 8.3)

- Glycaemic control
  - HbA1c
  - Compliance / diabetes knowledge
- Co-existing cardiovascular risk factors
  - Obesity (BMI / waist circumference)
  - Smoking / alcohol
  - HT (BP)
  - Dyslipidaemia (lipid profile)
- Complications
  - Nephropathy (serum creatinine / random spot urine albumin: creatinine ratio) (Module 9)
  - Retinopathy (Module 10)
  - Foot (foot pulse / foot ulcer /neuropathy) (Module 11)
- Medication review, dietary assessment

Note: [1] Values in diabetic range in 2 occasions in asymptomatic subjects for diagnosis
Source: Extracted from the Hong Kong Reference Framework for Diabetes Care for Adults in Primary Care Settings, available at www.fhb.gov.hk/pho

APPENDIX L: HISTORY OF RAMP-DM AND JADE

The defining key feature of the RAMP-DM care is the risk stratification feature made possible by the Joint Asia Diabetes Evaluation (JADE) study. One of the defining points of diabetes care in Hong Kong dates back to 1995 when the Hong Kong Data Register (HKDR) was formulated. Through the eventual linkage of the data-rich registry to the territory-wide electronic medical records, the JADE programme was established in 2007 and later adapted in 2009 to form the now well-established RAMP-DM care in publicly funded primary care clinics.

More specifically, the JADE programme features a comprehensive risk engine, while the basis of the web-based JADE portal incorporates HKDR-derived data from patients receiving secondary or tertiary care and risk algorithms. The insights gathered from the HKDR enabled the current risk stratification of patients in the RAMP programme based on risk factor combination and complications. Moreover, in-built risk equation also integrates patient's clinical data to predict five-year disease trajectory of major events across CHD, stroke, end-stage renal disease and all-cause mortality (Fung et al., 2012; Wan et al., 2018).

In reviewing the historical context of the development of diabetes care in Hong Kong, two studies have aptly captured the evolution of the varying data-driven diabetes care models (Chan et al., 2019; Ng et al., 2018). The latest study by Chan and colleagues (2019) provides an overview and highlights the importance of data-driven care to unveil insight into clinical outcomes, identify unmet needs of patients and most importantly evaluate the effectiveness of different intervention strategies for diabetes care in Hong Kong. In a similar study by Ng and colleagues (2018), evidence in support of benefits of the multi-components that formulate diabetes management care in Hong Kong were discussed.

Reference to a multi-disciplinary team-based integrated approach coupled with information technology and patient empowerment programmes were key to improving diabetes care in Hong Kong. As a mechanism to bolster patient empowerment and treatment adherence, the **issuance of a personalised report for patients has led to improved patient and health professional communication.** The resultant goal was to encourage patients to optimise treatment targets through lifestyle and medication modification. In moving forward, the study called for strengthening financing Schemes through PPP as a potential option with establishment of community-based integrated care centres as a feasible and cost-effective solution for Hong Kong.

Figure 1

Evolution and implementation of diabetes care programmes in Hong Kong

1995: HKDR, CUHK-PWH

- Annual or bi-annual nurse-coordinated structured assessment for all patients with diabetes referred to the Prince of Wales Hospital (PWH), the CUHK teaching hospital
- Provided nurse-coordinated post-assessment classes for patient education and empowerment, nurse review clinics, and care triage
- Documentation of risk factors, comorbidities, family history, medication use, and self-management
- Data were used to establish the HKDR while PhD/MPhil health care students run disease management programmes
- Launching of the first Diploma Course in Diabetes Management and Education and Master Course in Endocrinology, Diabetes and Metabolism

2000: HA diabetes risk assessment programme

- HA adopted and incorporated the HKDR structured data collection form into the EMR
- Created career paths for diabetes nurses with provision of training
- Set up 18 hospital-based diabetes centres that provided nurse review clinics, insulin initiation classes, and patient support groups
- Data were used by administrators to benchmark performance with regular feedback to frontline operators to improve care

2007: JADE

- HKDR protocol was digitalised to establish a web-based platform for structured data collection
- Automated risk categorisation using validated risk engine
- Triage of patient care based on risk levels
- Issuance of personalised reports with individualised decision support to both doctors and patients

2007: PPP

- Used public-private partnerships (PPP) to make community-based integrated diabetes care more accessible and affordable
- Used university-affiliated, self-funded, nurse-coordinated diabetes centre to provide assessment and education with yearly telephone reminders to ensure car continuation
- Provided alternative option to reduce service demand in the public care setting aimed at enhancing diabetes care in the private sector

2009: PEARL

- **P**eer support, **E**mpowerment, **A**nd **R**emote Communication **L**inked by information technology Programme
- Trained patients with type 2 diabetes and stable glycaemic control to be peer supporters
- Four 8-h workshops of tutorials, case sharing, reflections, role-playing, and games, focusing on diabetes self-management
- Patients participating in both JADE and PEARL Programmes showed reduced hospitalisation rates

2009: RAMP-DM (primary care)

- HA adopted the JADE model for structured assessment in all publicly funded primary care clinics
- Earlier screening of risk factors and complications with enhanced use of organ-protective medications
- Increased attainment of ABC treatment goals, reduced micro-/macrovascular complications and health services utilisation

2010: PEP (primary care)

- Complement the RAMP-DM Programme to improve self-management
- Six sessions delivered by trained nurses and social workers, coordinated by nongovernmental organisations
- Generic components: diet and exercise, behaviour modification, psychosocial support
- Diabetes-specific components: education on medications, self-management of hypo-/hyperglycaemia
- Improved treatment adherence, reduced micro-/macrovascular complications and death rates

Source: Chan et al., 2019

APPENDIX M: CLINICAL DEFINITION AND DIAGNOSTIC TESTS

The prospective diabetes screening and management programme shall follow the guidelines in the latest *Hong Kong Reference Framework for Diabetes Care for Adults in Primary Care Settings* **(Appendix C)**. In particular, the guidelines stipulate that considerations for diabetes screening follow three general rules of thumb, namely any individual i) age 45 years old and above; or ii) with risk factors for DM, such as family history or obesity; or iii) with symptoms or signs of DM should be screened (FHB, 2020). Under this framework, **clinical definition and diagnostic requirements** are detailed for hyperglycaemia, including the three tests, namely fasting plasma glucose (FPG); glycated haemoglobin (HbA1c); and oral glucose tolerance test (OGTT) **(**see **Box 1)**. **Table 1** illustrates the respective diagnostic cut-offs for detecting DM or pre-diabetes which adopt the same clinical ranges as the WHO criteria.

Box 1

Types of tests for diagnosis of diabetes mellitus

Types of tests for diabetes mellitus

Glycated haemoglobin test (HbA1c) measures a non-fasting blood sugar level and provides the average blood sugar level for the past two or three months. The result reflects the percentage of blood sugar attached to haemoglobin (oxygen carrying protein in red blood cells).

Fasting plasma glucose test (FPG) requires fasting overnight and measures the fasting blood sugar level.

Oral glucose tolerance test (OGTT) requires fasting overnight and measures the fasting blood sugar level. Afterwards, ingestion of a sugary liquid is required, and blood sugar levels are tested for the next two hours.

Table 1

Reference Frameworks for Diabetes Classifications

	Hong Kong Reference Framework for Diabetes Care (2018)	WHO Classification of Diabetes Mellitus (2019)
Pre-diabetes *Impaired Fasting Glucose*	• FG 6.1–6.9mmol/L • OGTT<7.8mmol/L	• FG 6.1–6.9mmol/L • OGTT<7.8mmol/L
Pre-diabetes *Impaired Glucose Tolerance*	• FG<7.0 mmol/L • OGTT≥7.8 and 11.0 mmol/L	• FG<7.0 mmol/L • OGTT≥7.8 and 11.0 mmol/L
Diabetes *Hyperglycaemia*	• **Fasting plasma glucose**≥7.0 mmol/L • **Glycated haemoglobin**≥6.5% • **Oral glucose tolerance test** ≥11.1mmol/l	• **Fasting plasma glucose**≥7.0 mmol/L • **Glycated haemoglobin**≥6.5% • **Oral glucose tolerance test** ≥11.1mmol/l

Source: FHB, 2018

Test procedural combination and test result grouping

The Hong Kong Reference Framework for Diabetes Care for Adults in Primary Care Settings (2018) suggests that either FPG *or* HbA1c tests can be sufficient with added OGTT for diagnosis of DM (PHO, 2018). Internationally, protocols for DM diagnoses recommend using combinations of the three above tests. However, due to inherent differences in the respective tests, there has been substantial debate over the preference of each. For example, while the OGTT is a diagnostic test, it is also more costly and time-consuming and therefore is **not recommended in the first round of screening.** To be most definitive, the **OGTT should be performed to offer an actual clinical diagnosis of diabetes.**

FPG and HbA1c are therefore the recommended candidates for the first round of screening. The HbA1c test is the most common screening test due to its low cost and ease of administration, given that it can be stored at ambient temperatures and administered at any time of the day without requiring fasting random blood samples (Lim et al., 2018). However, the HbA1c test's measurement can be affected by a variety of genetic, haematologic and illness-related factors (FHB, 2018; Gallagher et al., 2009). Alternatively, the FPG test can be administered through measurement of fasting blood glucose levels and therefore difficult to achieve on a mass population screening level. Furthermore, due to conflicting evidence internationally on the test performance of FPG and HbA1c, there remains conflict over the use of only one of the two tests alone to assess pre-diabetes or DM diagnosis **(Appendix R)**. (Barry et al., 2017)

In view of this, our prospective screening programme proposes aligning with the recommendation stipulated under the Hong Kong Reference Framework for Diabetes Care for Adults in Primary Care Settings (2018) with the added component of combining the FPG and HbA1c tests. In combining the FPG and HbA1c tests, we propose that we may partly overcome the associated inaccuracies within each screening test. Additionally, we may be able to better estimate the cost to improve diagnosis accuracy and provide the necessary treatment protocols to patients.

Therefore, the screening programme shall **consist of at least one round of screening: with one mandatory round of combined FPG & HbA1c tests, followed by either a repeat of both or both tests in addition to OGTT** if patients fall into the thresholds for either DM or prediabetes. All calculations for the economic projection model will therefore follow the current FHB protocol for prediabetes or DM diagnosis with the additional component of combining FPG + HbA1c tests.

After administrating either combinations of the diagnostic tests, three diagnostic outcome scenarios are possible, namely that the individual is 1) unlikely to have diabetes (healthy); 2) falls under the pre-diabetic range (prediabetes) and has either impaired fasting glucose (IFG) or impaired glucose tolerance (IGT); or 3) has diabetes mellitus (DM).

Table 2

Testing results and diagnoses

Round 1 Test Results	Round 2 Test Results	Diagnostic State
HbA1c<6.5%, FPG<6.1 mmol/L	N/a	Diabetes Unlikely
HbA1c<6.5%, FPG 6.1-6.9 mmol/L	FPG<6.1 mmol/L, OGTT Post<7.8 mmol/L	Diabetes Unlikely
	FPG 6.1-6.9 mmol/L, OGTT Post <7.8 mmol/L	Impaired Fasting Glucose (Prediabetes)
	FPG<7 mmol/L, OGTT Post>=7.8–11.0 mmol/L	Impaired Glucose Tolerance (Prediabetes)
	OGTT Post>=11.1 mmol/L	Diabetes Confirmed
HbA1c<6.5%, FPG>=7.0 mmol/L	HbA1c<6.5%, FPG>=7.0 mmol/L;	Diabetes Confirmed
HbA1c>=6.5%, FPG any value	HbA1c>=6.5%, FPG any value;	Diabetes Confirmed

APPENDIX N: ASSUMPTIONS LIST USED IN CREATING ECONOMIC PROJECT MODEL

1. The modelling approach follows a similar structure between the three tabs/scenarios. There are three main scenarios as follows:
    a. **Base Scenario:** The Base Scenario will model the costs of diabetes treatment over a thirty-year horizon, assuming that no population-wide programmes for screening or risk management are implemented to establish a baseline against which the impact of the programmes could be measured.
    b. **Scenario 1:** Scenario 1 projects the costs and hence, savings over the same period if a screening programme were implemented and adopted by the target population over the said time horizon.
    c. **Scenario 2:** Based on Scenario 1, Scenario 2 will model the costs and hence, savings if a Risk and Assessment Management Programme—Diabetes Mellitus (RAMP-DM) programme was implemented in conjunction with the screening programme.
2. The model will use a **30-year horizon**, beginning in 2022 and ending in 2051.
3. The target age demographic is those between **45–54 years of age at the start of the programme**. The model will utilise a closed prospective cohort, with the only "exit" from the model being observed deaths. Based on population projection models, there will be a total of **1.128 million individuals in the age group in year 2022**.

Disease Prevalence & Incidence:

4. There is homogenous prevalence within each subdivided category of DM and all complications, regardless of age, gender, predispositions/risk-factors etc.
    a. Data is from 2014/15 Population Health Survey (CHP) based on a randomised sample collected in 2013;
    b. Data provides:
        i. Prevalence of Diabetes (DM) from individuals with prior diagnosis **(2.5%)**
        ii. Prevalence of DM from individuals without history of DM (sans diagnosis) **(4.9%)**
        iii. Prevalence of prediabetes (IFG/GT) **(1.2%)**
5. The model will utilise a series of "flow" parameters, measuring the shifts in population health within each scenario:
    a. The cumulative incidence of prediabetes from a "healthy" population is **0.99%** (Quan et al., 2016);
    b. Within the Base Scenario, the cumulative incidence of diabetes from a population with pre-diabetes is **3.73%**, based on the Japan Ningen Dock study (Okada et al., 2017);
    c. The prevalence of diabetes for Scenarios 1 and 2 will increase by an annual cumulative incidence of **2.80%** (Okada et al., 2017);
    d. The model will also account for regression in all three scenarios from prediabetes back to "healthy", using a cumulative incidence of **2.82%** (Paprott, 2018);
    e. The model will also account for remission in Scenarios 1 and 2 from diabetes back to pre-diabetes, using a cumulative incidence of **7.0%** (Ried-Larsen, 2019).

Modelling:

6. Screening services are assumed to take place in the private sector and subsidised with vouchers covering the total cost of screening. The voucher and the total cost of screening, encompassing between one to two rounds of (FPG & HbA1c) tests and/or (FPG & HbA1c & OGTT) tests, will amount to **HKD 200/person/year**.
    a. All individuals in the target age range will go through the screening process to be accounted for and to receive a diagnosis within Scenarios 1 and 2. All individuals that are not diagnosed with diabetes will engage in regular rescreening, with intervals dependent on risk level.
7. Complications are assumed to be homogeneous:
    a. Patients with 1–5 years of diabetes history are assumed to have no complications. Patients with 6–19 years of diabetes history are faced with a set complications rate. Patients with 20+ years of diabetes history experience an average multiplier on their complications rate of 1.5x.
8. Total costs for the health system will comprise of the cost of treatment for complications (including screening costs and costs of DM intervention for Scenario 1 and 2).
    a. Patients with one or more complications will have an annual average cost of treatment for complications (see below).
    b. Patients without complications will incur a standard average annual fee (see below).
9. **Base Scenario:** No Screening and Guideline treatment
    a. Refers to the current treatment and diagnosis pathway for diabetic patients. Patients may be screened for diabetes during the course of their usual healthcare services.
    b. Costs include:
        i. Average yearly cost of standard care for DM management without complications is **HKD 5.7k/person**. This figure progresses to **HKD 9.3k/person** in years 2032–2041, and **HKD 15.1k/person** in years 2041–2051.
        ii. Cost of healthcare services to treat a patient with one or more complications is **HKD 106.5k/person/year**.
        iii. The cumulative incidence of complications is **6.20%** within a diabetic population.
    c. Patients find out about their DM status through opportunistic screening (after development of complications due to DM or co-morbid conditions with DM)
        i. No proactive screening for DM
        ii. Regardless of diagnosis, patients will not incur costs to the health system until they have diabetes, at which point they will incur HKD 5.7k/person/year to the health system. If they have one or more complications, they will incur HKD 106.5/person/year.
    d. Patients will be exposed to different mortality rates at different age demographics. For the first ten years, the mortality rate is 0.85% and increases to 1.86% for the second 10 years of the time horizon, and finally to 4.27% for the last ten years.
        i. Patients will also be exposed to different mortality rates due to comorbidity with pre-diabetes. The mortality rate is 0.50% for the first ten years at ages 45–54, and then 0.75% for the next ten years at ages 55–64.

10. **Scenario 1:** screening for patients for pre-diabetes and diabetes
    a. Refers to the current treatment protocol in the HA for all complications. Patients will be screened on an annual basis, unless they have already been diagnosed with diabetes. Additional efforts to monitor diabetic patients' biochemical levels (FPG, HbA1c) will not be separately accounted for.
    b. Costs include:
        i. Average yearly cost of standard care for DM management without complications is **HKD 5.7k/person**. This figure progresses to **HKD 9.3k/person** in years 2032–2041, and **HKD 15.1k/person** in years 2041–2051.
        ii. Patients diagnosed with diabetes without complications are provided with an annual **HKD 3,486/person** subsidy to purchase additional services to manage their diagnosis, matching the subsidy provided for GOPC PPP.
        iii. Cost of healthcare services to treat a patient with one or more complications is **HKD 106.5k/person/year**. This cost includes the costs of monitoring and testing for FPG and HbA1c.
        iv. The cumulative incidence of complications is **6.20%** within a diabetic population.
    c. Patients with diabetes may remit back to having pre-diabetes at a rate of 7.0% cumulative incidence.
        i. Remission cases will also be distributed homogeneously among individuals with diabetes, with exception to the first year of diabetes history wherein individuals will not experience mortality or remission.
    d. Patients will be exposed to different mortality rates at different age demographics. For the first ten years, the mortality rate is 0.85% and increases to 1.86% for the second 10 years of the time horizon, and finally to 4.27% for the last ten years.
    e. Patients who are not diagnosed with diabetes will undergo regular rescreening.
        i. Patients with pre-diabetes will conduct an annual rescreening, given their higher risk of developing diabetes.
        ii. Patients deemed "low-risk" will conduct an annual rescreening once every three years. The prevalence of low risk is determined as an average of individuals in each age range who engage in moderate to vigorous physical activity during the week, as per PHS 2014/15 data. For 45–54 year old patients, the prevalence is **58.8%**, for 55–64, it is **56.5%**, and for 65–74, it is **52.7%**.
        iii. Patients deemed "high-risk" will conduct annual rescreening. These are individuals who do not engage in regular physical activity.

11. **Scenario 2:** screening for patients for pre-diabetes and diabetes, with further RAMP protocol implementation

    a. Patients will be screened on an annual basis, unless they have already been diagnosed with diabetes. If they are diagnosed with diabetes, patients will be placed in a RAMP programme that is located in the private sector.

    b. Costs include:

        i. Average yearly cost of standard care for DM management without complications is **HKD 5.9k/person**, which includes the cost of running the RAMP programme. This figure progresses to **HKD 9.5k/person** in years 2032–2041, and **HKD 15.4k/person** in years 2041–2051.

        ii. Patients diagnosed with diabetes without complications are provided with an annual **HKD 3,486/person** subsidy to purchase additional services to manage their diagnosis, matching the subsidy provided for GOPC PPP.

        iii. Cost of healthcare services to treat a patient with one or more complications is **HKD 123.4k/person/year**, which includes the cost of running the RAMP programme.

        iv. The cumulative incidence of complications is **3.81%** within a diabetic population.

    c. Patients with diabetes may remit back to having prediabetes at a rate of 7.0% cumulative incidence.

        i. Remission cases will also be distributed homogeneously among individuals with diabetes, with exception to the first year of diabetes history wherein individuals will not experience either mortality or remission.

    d. Patients will be exposed to different mortality rates at different age demographics. For the first ten years, the mortality rate is **0.32%** and increases to **0.69%** for the years 2032–2041, and **1.59%** for years 2042–2051.

Table 3

Modelling assumptions

		Base Scenario (Usual care)	Scenario 1 (Screening & Basic Management)	Scenario 2 (Screening & RAMP-DM)
Target population	Age	45–54	45–54	45–54
	Condition	No systemic means of screening. DM identified through complication onset from diabetes.	Identified through screening	Identified through screening
Guideline treatment	What is included	HA/public sector services for complications	HA/public sector services for complications	HA/public sector services for complications
		Recommendations for annual screening based on risk factors	Recommendations for annual screening based on risk factors	Recommendations for annual screening based on risk factors
Proposed additional treatment		N/A	Screening services in the private sector	Screening services in the private sector
		N/A		RAMP-DM programme or equivalent in the private sector
		N/A	Additional GOPC PPP subsidy to access care services	Additional GOPC PPP subsidy to access care services
Costs	Moderate – Severe Complications	Hospital-based care (HKD 106.5k/ person)	Hospital-based care, unless services can be covered in the private sector (HKD 106.5k/ person)	Hospital-based care, unless services can be covered in the private sector with RAMP (HKD 123.4k/person)
	Low–No Complications	Hospital care, GOPC, SOPC (at HKD 5.7k/person for age 45–54)	• Hospital care/GOPC/ SOPC (at HKD 5.7k/ person) • HKD 3,500/year for additional care services	• RAMP services in the private sector (HKD 5.9k/person for age 45–54) • HKD 3,500/year for additional care services
	Proposed Treatments	N/A	Screening Additional management service fee	Screening RAMP care Additional management service fee

APPENDIX O: DESCRIPTION OF SCENARIO DIFFERENCES

Base Scenario

To model the demographic changes in the target population, the Base Scenario measures the flow of DM through progression from a "healthy" population (e.g., a patient without pre-diabetes or DM), to a population with pre-diabetes, to a population with DM, as well as regression from pre-diabetes to no DM. Within the Base Scenario, we do not account for the remission from DM to pre-diabetes due to a lack of intervention for DM patients that would result in improvement of condition. Mortality was accounted for in all three disease states using mortality rates due to comorbidity with DM and the latest available mortality rates for the age group of 45–54 years. Mortality rates for all-cause mortality (as defined by the Census and Statistics Department of the Department of Health), DM-related deaths, and pre-diabetes-related deaths were adjusted for each relevant age group category, namely from age range 45–54 years to 55–64 years, and finally to 65–74 years.

The healthcare costs in the Base Scenario were derived from the cost of an average patient with one or more complications and the costs for a diabetic patient without complications. The risk of complications for patients with DM is dependent on the years of DM history. Both cost values were derived from previously published literature on DM patients in Hong Kong (Jiao et al., 2017, 2018).

Scenario 1

The model differs in demographic changes in Base Scenario by additionally introducing a flow parameter showcasing remission from DM toward pre-DM. As a point of convergence from the Base Scenario, the incidence of new DM cases progressing from pre-diabetes cases was lowered to reflect the implementation of an intervention protocol. Mortality rates were kept consistent between Base Scenario and Scenario 1.

The healthcare costs in Scenario 1 were based on a similar methodology to the Base Scenario. Additional expenditures to the healthcare costs in Scenario 1 include the cost of screening and cost of basic intervention for individuals diagnosed with DM. Based on guidance from the *Hong Kong Reference Framework for Diabetes*, only individuals diagnosed with pre-diabetes and who are deemed "high-risk", defined as those who do not engage in vigorous or moderate physical exercise, require annual rescreening for DM after the first year.

Within the model and Scheme framework, all individuals diagnosed with DM will receive an annual subsidy of HKD 3,486, equivalent to the cost of an annual General Outpatient Clinic-Public-Private Partnership (GOPC-PPP) subsidy in 2021, to access additional healthcare services for DM management. Such services extend beyond basic follow-up care, such as medication, consultations, and screenings for complications, and are geared towards empowering facilitating improved health (such as visits with dietitians, allied health professionals, physical trainers, etc.).

Using the healthcare costs calculations, we also determined the cost to prevent one mortality based on projections of the number of mortalities that would result in Scenario 1. This calculation will help to elicit the cost-effectiveness of the proposed Scheme.

Scenario 2

Scenario 2 uses similar parameters to model demographic changes as Scenario 1. Mortality counts for Scenario 2 were adjusted for mortality due to diabetic complications and complications co-morbid with DM within the RAMP-DM programme, with the general all-cause mortality stock remaining consistent to Base Scenario.

The methodology for calculating the healthcare costs in Scenario 2 are consistent to the methodology used for Scenario 1. Due to the additional implementation of RAMP-DM in Scenario 2, the costs of complications and rate of complications were further adjusted to account for the cost of implementing RAMP-DM.

While we aimed to use data that most accurately represents that population health of Hong Kong, we were limited by data availability. To address gaps in data availability, we conducted a semi-systematic literature review and explored relevant available literature for possible data. The main data gaps that were filled in our model encompassed:

- The transitional probability of progression from a state of no diabetes (termed “no DM”) to pre-diabetes (termed “prediabetes”);
- The transitional probability of progression from prediabetes to DM;
- The regression rate from pre-diabetes to no DM and remission rate from DM to pre-DM; and
- The transitional probability and cost of progression from a state of DM without complications to DM with complications.

APPENDIX P: CALCULATIONS OF PARAMETERS

Table 4

Calculations for parameter values

Parameters	Value	Reference	Calculations Involved
Starting points			
Pre-diabetes prevalence as at 2022	1.24%	(CHP, 2017, 2018, 2020c)	
Already have diagnosis before 2022	2.46%	(CHP, 2017, 2018, 2020c)	
Diabetic but without diagnosis before 2022	4.86%	(CHP, 2017, 2018, 2020c)	
Flows parameters			
Incidence of pre-diabetes from no diagnosis	0.99%	(Quan et al., 2017)	Average rate of change in prevalence of diabetes
Base Case-Incidence of new DM cases from pre-diabetes cases	3.73%	(Okada et al., 2017)	
Scenario 1 and 2-Incidence of new DM cases from pre-diabetes cases	2.80%	(Okada et al., 2017)	
Regression rate from pre-diabetes to normoglycaemia	2.82%	(Paprott et al., 2018)	Regression of 33.6% over 12 years from the pre-diabetic population
Scenario 1 and 2-Remission rate from diabetes to pre-diabetes	7.00%	(Ried- Larsen et al., 2019)	
Assumed complication rate multiplier of 20Y+	150%	(Song & Hardisty, 2009)	There is no consistent/aggregate value for multiplier of complication rates. For Macrovascular complications after 20 years, the adjustment factor ranges from 1.06 to 1.75. For Microvascular complications, the factor ranges from 1.37 to 1.90. The average adjustment factor is 1.49, or 150%.
Complications rates and costs			
Base Case and Scenario 1			
Complications rate (usual care)	6.20%	(Jiao et al., 2018)	
Complications cost per patient (usual care)	HKD 106,523.39	(Jiao et al., 2018)	[USD 19,561 * 7.8 HKD/USD * 1/5 years]*[N=8,570]/[2,455 Observed complication events]
Cost per “healthy” patient, aged 45–54 (usual care)	HKD 5,705.28	(Jiao et al., 2017)	[exp(9.381) * 1.05(50–65)]
Cost per “healthy” patient, aged 55–64 (usual care)	HKD 9,293.30	(Jiao et al., 2017)	
Cost per “healthy” patient, aged 65–74 (usual care)	HKD 15,137.81	(Jiao et al., 2017)	
Scenario 2			
Complications rate (RAMP)	3.81%	(Jiao et al., 2018)	
Complications cost per patient (RAMP)	HKD 123,363.56	(Jiao et al., 2018)	[USD 12,110 * HKD/USD 7.8 / 5 years]*[N=8,570]/[1,315 Observed complication events]
Cost of RAMP	HKD 244.92	(Jiao et al., 2018)	
Cost per “healthy” patient, aged 45–54 (RAMP)	HKD 5,950.20	(Jiao et al., 2017, 2018)	usual_cost + [USD 157 * HKD/USD 7.8 * 1/5years]
Cost per “healthy” patient, aged 55–64 (RAMP)	HKD 9,538.22	(Jiao et al., 2017, 2018)	
Cost per “healthy” patient, aged 65–74 (RAMP)	HKD 15,382.73	(Jiao et al., 2017, 2018)	
Cost of intervention for diagnosed DM patients	HKD 3,486.00	(HA, 2021f)	

Parameters	Value	Reference	Calculations Involved
Screening			
Scenario 1 and 2-screening cost per head	HKD 200.00		
Screening interval (/year)			
Pre-diabetes screening interval	1	(PHO, 2018)	
Low-risk screening interval	1/3	(PHO, 2018)	
High-risk screening interval	1	(PHO, 2018)	
Risk level prevalence			
Low-risk, aged 45–54	58.80%	(CHP, 2017)	[average of # of individuals between 45–54 who engage in moderate and vigorous physical activity in a week]
Low risk, aged 55–64	56.50%	(CHP, 2017)	
Low-risk, aged 65–74	52.70%	(CHP, 2017)	
Mortality rates			
Overall mortality rate for aged 45–54	0.21%	(CHP, 2021c)	(death rate for men + death rate for women)/100,000 / adjust by factor of 2
Overall mortality rate for aged 55–64	0.46%	(CHP, 2021c)	(death rate for men + death rate for women)/100,000 / adjust by factor of 2
Overall mortality rate for aged 65–74	1.09%	(CHP, 2021c)	(death rate for men + death rate for women)/100,000 / adjust by factor of 3
Base Case and Scenario 1			
Mortality rate specific to DM for aged 45–54	0.85%	(Jiao et al., 2018)	[21.35% all cause mortality / 5 years / 5 adjusted by factor of 5]
Mortality rate specific to DM for aged 55–64	1.86%	(Jiao et al., 2018)	[21.35% all cause mortality / 5 years / 2.3 adjusted by factor of 2.3]
Mortality rate specific to DM for aged 65–74	4.27%	(Jiao et al., 2018)	
Scenario 2			
Mortality rate specific to DM for aged 45–54 (RAMP care)	0.32%	(Jiao et al., 2018)	[7.96% all cause mortality / 5 years / 5 adjusted by factor of 5]
Mortality rate specific to DM for aged 55–64 (RAMP care)	0.69%	(Jiao et al., 2018)	[7.96% all cause mortality / 5 years / 2.3 adjusted by factor of 2.3]
Mortality rate specific to DM for aged 65–74 (RAMP care)	1.59%	(Jiao et al., 2018)	
Mortality rate specific to Pre-diabetes for aged 45–54	0.50%	Working assumptions. Rough “middle ground” between overall mortality and DM patient mortality.	
Mortality rate specific to Pre-diabetes for aged 55–64	0.60%	Working assumptions. Rough “middle ground” between overall mortality and DM patient mortality.	
Mortality rate specific to Pre-diabetes for aged 65–74	0.70%	Working assumptions. Rough “middle ground” between overall mortality and DM patient mortality.	

APPENDIX Q: Variation in costs and mortality within a 5-year horizon

Table 5

5-year Horizon

(HKD million)	Base Scenario	Scenario 1	Scenario 2
Screening cost	N/A	753.10	753.16
Intervention costs	N/A	1,228.66	1,252.53
Complication costs	3,371.30	2,869.94	2,759.84
Total costs	3,371.30	4,851.70	4,765.53
DM-related mortality	3,365	3,245	1,660
Total premature mortality	9,312	9,191	7,607

Note: Premature mortality is defined as the sum of deaths related to diabetes, deaths related to prediabetes, and deaths due to all-cause mortality as defined by the Census and Statistics Department, HKSAR.

APPENDIX R: SCENARIO ANALYSIS RESULTS

Scenario analysis 1: Variation in remission rates

The model employs a remission variable of 7% to indicate rate of remission from diabetes towards prediabetes after intervention–namely screening and participation in a risk assessment and diabetes management programme (Ried- Larsen et al., 2019). Nonetheless, literature shows that remission is also associated with intensive lifestyle intervention and bariatric surgery, which may not overlap with the treatment and management path that the CDSVMS patients take (Gregg et al., 2012; Ried- Larsen et al., 2019; Sjöström et al., 2009). To assess the possible cost impact of different remission rates, we conducted scenario analyses using remission rates of 2.0%, representing the remission rate for patients with diabetes who only receive diabetes support and education in a different study (Gregg et al., 2012). With a lowered remission rate of 2.0%, the model projects greater spending after the implementation of a screening programme, with net negative savings **(Table 6)**. However, our model still projects a high total prevented mortality in both Scenario 1 and Scenario 2 relative to the Base Scenario. This indicates that while spending may increase with a projected additional HKD 3.819 billion over thirty-years, the number of prevented mortality remains high. For a net neutral cost-savings in Scenario 1, the remission rate will need to reach approximately 2.1%. Similarly, for a net neutral cost-savings in Scenario 2, the remission rate will need to surpass approximately 2.9%, thus providing a better sense of the "buffer" available to achieve cost-savings.

Table 6

Costs and mortality changes after variation in remission rates (2.0%)

	Base Scenario	Scenario 1	Scenario 2
Costs over 30 years (HKD million)	45,346.76	45,719.41	49,165.84
Savings over 30 years (HKD million)		-372.65	-3,819.08
% Savings		**-0.82%**	**-8.42%**
Mortality–DM	68,507	50,775	22,193
Mortality–PreDM	14,521	18,016	18,202
Total prevented mortality		**14,237**	**42,633**

Scenario analysis 2: Cost of screening

The current cost projections utilise a screening cost of HKD 200 per patient, assuming that this fee will be inclusive of all necessary tests to receive a diagnosis. This screening cost is based on the assumption that population-wide mass screening will allow the Government and relevant authorities to more efficiently engage in testing and achieve economies of scale wherein screening services can be provided at a lower cost. However, to assess costs of the Scheme if a higher economy of scale is not attained, we conducted a scenario analysis using a screening cost of HKD 445, based on the cost for non-eligible patients to the HA for an attendance at a general outpatient clinic, as this figure is likely closer to the actual cost to the health system. The results indicate that the final percentage cost savings decreases from 30.84% in Scenario 1 to 19.50% after the adjustment in cost savings. Similarly, the percentage cost savings in Scenario 2 decreases from 27.57% to 16.19% **(Table 7)**. While we still observe cost savings when the cost of screening is increased to match the cost of general outpatient care, we may still note that higher screening costs lead to lower cost savings. If all other parameters are consistent, a screening cost of approximately HKD 780 will lead to no cost savings in Scenario 2 (screening and RAMP-DM), while a screening cost of approximately HKD 860 will lead to no cost-savings in Scenario 1 (screening only).

Table 7

Shifts in costs and savings due to increased screening costs

(HKD million)	Base Scenario	Scenario 1	Scenario 2
Costs over 30 years	45,346.76	36,506.35	38,005.76
Savings over 30 years		8,840.41	7,341.00
% Savings		**19.50%**	**16.19%**

Table Shifts in costs and savings due to increased screening costs

Scenario analysis 3: Complication rates and costs per patient

The complication rate used in the model is derived from a five-year cost effectiveness study on the implementation of RAMP-DM in Hong Kong (F. F. Jiao et al., 2018). Given that these figures directly correlate to the Hong Kong general population, these figures are likely to be the most relevant to the target demographic. However, as the figures presented in the research article are not age-stratified, we cannot approximate figures that are more closely targeted to each age demographic. As such, we conducted various scenario analyses to assess the cost impact of different complication rates in each of the three scenarios. Firstly, we assessed the impact on cost if the complication rates between all three scenarios were set to the higher complication rate of 6.20%, which assumes that everyone, regardless of RAMP-DM participation, faces the same risk for complication development. This shift principally affects the cost-savings in Scenario 2, wherein the percentage cost savings decrease significantly from 27.57% to 19.37% **(Table 8)**.

Table 8

Shifts in costs and savings due to higher complication rates in Scenario 2

(HKD million)	Base Scenario	Scenario 1	Scenario 2
Costs over 30 years	45,346.76	31,362.88	36,561.48
Savings over 30 years		13,983.87	8,785.28
% Savings		**30.84%**	**19.37%**

Separately, in conjunction with the five-year cost effectiveness study on the implementation of RAMP-DM, there was also a parallel five-year effectiveness study on the impact of RAMP-DM in relation to the development of complications (Wan et al., 2018). While the two studies use similar research cohorts, there were notable differences in results. Namely, the Wan et al. study found that the cumulative incidence of complications in the control 'usual care' group was 43.6% (n = 26,718 usual care patients); additionally, the cumulative incidence of complications in the RAMP-DM group was 23.2% (n = 26,718 RAMP-DM care patients) (Wan et al., 2018). Using these figures in place of the figures derived from the cost-effectiveness study by Jiao et al., we substituted the rate of complication development for Base Scenario and Scenario 1 of 6.20% with a new complication rate of 8.72% (derived from 43.6% divided over 5 years for an annual cumulative incidence rate) and similarly substituted the complication rate in Scenario 2 with a new rate of 4.64% (derived from 23.2%, split over 5 years) from the prior 3.81%. We can observe from **Table 9** that substituting these figures does not change the conclusion that the implementing a screening voucher and management Scheme would be ultimately cost-saving. On top of the expected cost-savings, we note that there are higher cost-savings in both Scenario 1 and Scenario 2 relative to the results derived from the original parameters, with the cost-savings from Scenario 2 surpassing the cost-savings in Scenario 1. This is a likely consequence of the higher complication rates, which helps to further elicit the benefits of the screening and RAMP-DM Scheme.

Table 9

Shifts in costs and savings due to different complication rates

(HKD million)	Base Scenario	Scenario 1	Scenario 2
Costs over 30 years	51,766.97	34,284.67	34,133.84
Savings over 30 years		17,482.31	17,633.13
% Savings		**33.77%**	**34.06%**

Scenario analysis 3b: Multivariate scenario analysis of complication rates and costs per patient

In conjunction with the univariate scenario analyses of the complication rates, we also simultaneously conducted multivariate scenario analyses of complication rates and costs of complications per each patient with one or more complications. While data and figures from the Wan et al. and Jiao et al. research papers on RAMP-DM implementation in Hong Kong are the most up-to-date research articles on the costs of healthcare utilisation and of disease progression within usual Hospital Authority services and RAMP-DM services, we also acknowledge that there may be more recent and updated figures on diabetes care that are not publicly available (Jiao et al., 2018; Wan et al., 2018). In lieu of substituting international figures or data from publicly available research prior to the Wan et al. and Jiao et al. articles, we conducted a multivariate scenario analysis to approximate potential impact to the percentage cost savings within the full screening and management Scheme (Scenario 2). For the rate of complication development, we selected a range of 2.0% to 10.0% with incremental increases of 1.0%; for cost per patient with one or more complications, we selected a range of HKD 20,000 to HKD 200,000 at increments of HKD 20,000 **(Table 10)**. The lower range more closely approximates the average cost per diabetes patient from the Jiao et al. study on cost effectiveness (Jiao et al., 2018). We believe that these ranges will allow us to reach sufficient saturation of possible combinations. The possible percentages of cost-savings in Scenario 2 are presented in the following table **(Table 10)**.

Table 10

Changes in percent of cost-savings in Scenario 2 due to complication rates and costs of complications per patient

Cost per patient with one or more complications (HKD) \ Complication rates	2.0%	3.0%	4.0%	5.0%	6.0%	7.0%	8.0%	9.0%	10.0%
20,000	40.2%	40.0%	39.7%	39.5%	39.3%	39.0%	38.8%	38.6%	38.3%
40,000	38.9%	38.1%	37.2%	36.4%	35.5%	34.7%	33.8%	33.0%	32.1%
60,000	37.7%	36.2%	34.8%	33.3%	31.8%	30.4%	28.9%	27.4%	26.0%
80,000	36.5%	34.4%	32.3%	30.2%	28.1%	26.0%	23.9%	21.8%	19.8%
100,000	35.2%	32.5%	29.8%	27.1%	24.4%	21.7%	19.0%	16.3%	13.6%
120,000	34.0%	30.7%	27.3%	24.0%	20.7%	17.4%	14.0%	10.7%	7.4%
140,000	32.8%	28.8%	24.9%	20.9%	17.0%	13.0%	9.1%	5.1%	1.2%
160,000	31.5%	27.0%	22.4%	17.8%	13.3%	8.7%	4.1%	-0.4%	-5.0%
180,000	30.3%	25.1%	19.9%	14.7%	9.5%	4.4%	-0.8%	-6.0%	-11.2%
200,000	29.0%	23.2%	17.4%	11.6%	5.8%	0.0%	-5.8%	-11.6%	-17.4%

Using our projected cost-savings percentage for Scenario 2 as our base (marked brown borders), we then assessed combinations of rates and costs that would lead to higher cost-savings percentages (highlighted in green), combinations that would result in percentages between 27.0% and 28.0% that match our current projections (highlighted in yellow), combinations that would result in lower percentages (no highlights), and combinations that would result in net-zero or negative benefits (highlighted in red). Under our current model mechanics, we found that many combinations of complication rates and costs may still lead to higher cost-savings percentages, with costs per patients of HKD 60,000 or lower per year leading to higher cost-savings up to complication rates of 9.0%. Additionally, we find that the health system is projected to reach a net-zero cost-savings if the rate for complication development reaches 7.0%, with a cost per patient with complications of HKD 200,000, both of which far surpass the figures proposed in research. These figures are promising to the health system, as they suggest that the implementation of screening and management for diabetes is likely to be beneficial in direct budgetary terms, even when excluding indirect benefits to patients.

Scenario analysis 4: RAMP-DM costs

Within the current model mechanics, the cost of implementing the management Scheme on a population-wide basis is derived from the five-year cost effectiveness study of RAMP-DM, using an annual cost of HKD 244.92 per patient, regardless of age and level of risk (F. F. Jiao et al., 2018). Understandably, while this cost per patient may be reasonable when implemented with a smaller subset of the population with diabetes, an annual spending of less than HKD 300 may not be sufficient when factoring in the additional costs, for example due to implementation in the private sector, such as additional staffing, technology, and administrative costs. To assess the cost impact of a higher cost of implementation in the private sector, we conducted scenario analyses using annual costs of HKD 500, HKD 1,000, and HKD 1,500. We observe that the cost-savings in Scenario 2 decrease as the cost of RAMP-DM implementation increases. Nonetheless, even at a RAMP-DM implementation cost of HKD 1,500 per patient per year, the cost-savings percentage remains above 20% relative to the Base Scenario **(Table 11)**.

Table 11

Shifts in costs and savings in Scenario 2 due to different costs for RAMP-DM implementation

(HKD million)	Current cost: HKD 244	RAMP cost: HKD 500	RAMP cost: HKD 1,000	RAMP cost: HKD 1,500
Costs over 30 years	32,845.33	33,278.19	34,126.68	34,975.17
Savings over 30 years	12,501.43	12,068.57	11,220.08	10,371.59
% Savings	**27.57%**	**26.61%**	**24.74%**	**22.87%**

Scenario analysis 5: Prediabetes management costs

The latest *Hong Kong Reference Framework for Diabetes Care in Adults* does not provide in-depth guidance for the care and management of prediabetes in patients, and hence, the original model does not account for any extra care protocols for prediabetes within the Base Scenario and only additionally accounts for annual rescreening costs (Primary Healthcare Office, 2018). Nonetheless, between the demographic figures in Base Scenario **(Table 4.12)**, Scenario 1 **(Table 4.14)**, and Scenario 2 **(Table 4.15)**, the size of the population with prediabetes grows significantly from 104,553 individuals by 2051 in the Base Scenario to 162,967 in Scenario 1 and 168,939 in Scenario 2. These figures represent an increase of 56% and 62%, respectively. Given that the size of the prediabetes population directly impacts the size of the population with diabetes and that the Reference Framework also suggest taking measures, such as routine exercise and annual rescreening, to prevent progression toward diabetes, the Government may consider adding an additional management component for individuals with prediabetes. In addition to annual rescreening for diabetes wherein patients may be able to receive additional care resources, an additional scenario analysis was built to account for one extra routine medical visit to incentivize patients with prediabetes to better manage their condition. This is represented as an additional HKD 350 (the average cost of one visit according to the GOPC PPP subsidy) for each patient with prediabetes in both Scenario 1 and Scenario 2 **(Table 12)**. We note that the cost-savings percentage remains above 20% even in Scenario 2, suggesting that the additional benefit to prediabetic patients would still lead to cost savings to the health system, even prior to the indirect and direct benefits that may be accrued from providing additional care for prediabetes.

Table 12

Shifts in cost and savings due to prediabetes management costs

(HKD million)	Base Scenario	Scenario 1	Scenario 2
Costs over 30 years	45,346.76	32,630.13	34,134.16
Savings over 30 years		12,716.63	11,212.60
% Savings		**28.04%**	**24.73%**

Scenario analysis 6: Base Case with existing RAMP-DM

The model construction of the BIA supposes a current scenario wherein patients diagnosed with diabetes are able to receive management services from the public sector but are expected to control this management process unilaterally. Nonetheless, this may not be reflective of the current scope of the RAMP-DM programme. In the Hospital Authority Convention 2021, the average annual head-count of participants in RAMP-DM was cited as approximately 200,000 patients (Ko, 2021). Given that this represents a significant portion of the total number of individuals with diabetes based on the 2014/15 Population Health Survey, it is also critical to assess the financial impact of applying a Scheme that utilises a screening voucher and RAMP-DM to a base case that assumes enrolment in RAMP-DM for all diagnosed diabetes patients (CHP, 2017).

Table 13

Shifts in cost and savings due to a base case with RAMP-DM

	Base Scenario (with RAMP-DM)	Scenario 2
Costs over 30 years (HKD million)	43,178.64	32,845.33
Savings over 30 years (HKD million)		10,333.31
% Savings		**23.93%**
Mortality–DM	49,508	13,757
Mortality–PreDM	14,470	22,133
Total Prevented Mortality		**28,088**
Cost to prevent one mortality (HKD)		**1,169,386.25**

The figures above assume that the proportion of individuals in our target age range that are aware of their diabetes diagnosis is consistent with the reported proportions in the 2014/15 Population Health Survey by age range and that these individuals are concurrently enrolled in RAMP-DM. We find that the cost-saving percentages and total prevented mortalities decrease relative to our original findings, signifying that more wide-spread participation in RAMP-DM may decrease the savings incurred from the Scheme. Nonetheless, we continue to find savings due to the early detection of DM in our target audience within the Scheme implementation, which showcases the necessity of early intervention. We thus recommend that the Government prioritise both screening and sustained management in the care of chronic conditions.

Scenario analysis 7: Varying uptake rates of Scheme participation

The original model was designed with the assumption that all individuals in the target population of Hong Kong individuals aged 45–54 years will equally participate in the intervention in question. Thus, the original Base Scenario suggests that no population-wide screening or management programme is available and thus, the full target population is assumed to not partake in screening or more intensive management. Conversely, the original Scenario 2 suggests that all individuals in the target population partake in both screening and the recommended RAMP-DM programme. However, data from existing PPPs suggest that when new interventions are implemented, there is a gradual uptake of the intervention rather than full participation within the first year of implementation.

To model this gradual uptake of the proposed Scheme in Scenario 2, we used the ever-use rates from the first ten years of the Elderly Health Care Voucher Scheme (EHCVS), adjusting for the shift in eligibility and assuming that the participation rate plateaus after the initial ten years of Scheme implementation (FHB, 2019).

Table 14

Shifts in savings and mortality after varying uptake rate of Scheme

		Scenario 2 (All in)	Varying Uptake
Costs and Savings	Costs over 30 years	HKD 32,845.33	HKD 32,267.43
	Savings over 30 years	HKD 12,501.43	HKD 13,079.33
	% Savings	**27.57%**	**28.84%**
Mortality	Mortality–DM	13,757	19,862
	Mortality–PreDM	22,133	21,140
	Total Prevented Mortality	**47,138**	**42,026**
	Cost to prevent one mortality	**HKD 696,794.93**	**HKD 767,798.33**

We find that when we model the participation in the Scheme off the ever-use rates of the EHCVS, our cost-savings marginally surpasses the cost-savings of full participation in Scenario 2 though the total prevented mortality is lower, thus causing a higher cost to prevent one mortality. Despite the relatively higher direct costs of implementation, these figures do not yet account for the indirect benefits to the health system or to patients. This finding showcases the necessity of promoting the Scheme for higher uptake in the initial years in order to reduce the number of preventable mortalities moving forward.

APPENDIX S: SCREENING TEST PERFORMANCE AND ACCURACY CONCERNS

The administration of either FPG or HbA1c is the recommended protocol as the first line for screening tests in Hong Kong. Yet, more recent evidence suggests there are accuracy concerns relating to HbA1c as well as FPG (Barry et al., 2017; Heianza et al., 2011). The implications of inaccurate testing are two-fold: i) screening may result in an incorrect diagnosis (false positive) and intervention is offered to those that do not require it; or ii) screening may result in no diagnosis and timely intervention may not be offered to those in need (false negative). It is therefore imperative that available screening tests attain high sensitivity (measures probability of true positives) and specificity (measure probability of true negatives) to reduce the number of false positives and false negatives.

In a leading study by Barry and colleagues (2017), a systematic review and meta-analysis of empirical studies evaluating accuracy of tests for identification of pre-diabetes was presented. The study reviewed **148 international publications** and **extracted data from 46 papers** (inclusive of studies with WHO and ADA criteria) specifically to construct the diagnostic accuracy for a meta-analysis and presented findings on sensitivity and specificity for FBG and HbA1c tests. One of the key principal findings concluded that the diagnostic accuracy of tests used to detect pre-diabetes in screening programme is low, specifically that HbA1c is neither sensitive 0.47 (95% CI; 0.37 to 0.58) nor specific 0.81 (95% confidence interval 0.74 to 0.86); while FPG is specific 0.95 (95% confidence interval 0.93 to 0.97) but not sensitive 0.24 (95% confidence interval 0.17 to 0.32) (Barry et al., 2017). In sum, the findings illustrate that **both tests are low in sensitivity** rendering **a higher number of false negatives**, therefore screened individuals are at greater risk of being falsely reassured and not given timely intervention. In terms of specificity however, FPG should perform better while HbAc1 may lead to a high number of false positives, therefore the chance of being misdiagnosed and given intervention is a higher probability for the latter test.

The Hong Kong Reference Framework for Diabetes Care for Adults in Primary Care Settings suggests that either FPG or HbA1c tests can be sufficient in the two rounds of screening test. While no screening test is 100% accurate, there is **no universal evidence as to which test is the most accurate** including the trade-offs between accuracy, costs and feasibility. In view of this, our prospective screening programme confronts this challenge by aligning with the recommendation stipulated under our local guidelines with the added component of combining FPG+HbA1c tests. Therefore, the screening programme **consists of two rounds of screening, with at least one round of combined FPG+HbA1c tests, followed by either a repeat of both, or both tests in addition to OGTT.**

In the case of Hong Kong, we recommend the added component of combining FPG+HbA1c tests as a feasible alternative to **partly overcome the associated inaccuracies presented within each screening test.** For example, taking the case of an asymptomatic individual that receives an abnormal value for fasting plasma glucose or HbA1c value, a repeat of either test is required. However, in the case of an individual that does not present an abnormal value, the performance of screening test based on FPG and HbA1c results together versus on the basis of a single FPG or Hba1c value alone should perform better. Therefore, presented with the challenge of a low sensitivity (many false negatives) observed in both tests, the approach to combine the two tests is a method to reduce the inaccuracies associated with a case in which false negative may arise.

Furthermore, the combination the two tests together is not an unconventional practise and has been in international literature and observed in local practice. For example, in a study by Lim and colleagues (2018) that assessed test performance of HbA1c and FPG among Chinese, Malay and Indian residents in Singapore recommended the combination of HbA1c and FPG would improve identification of individuals with DM and pre-diabetes. A separate study by Heianza and colleagues (2011) that systematically assessed the incidence of diabetes in a longitudinal cohort study in Japan observed that combining the two tests could detect more individuals in need of timely intervention.

Glossary: Key Terms

Ambulatory Care Sensitive Conditions (ACSC)	Ambulatory care sensitive conditions (ACSC) are examples of acute, chronic, or vaccine-preventable conditions for which hospitalisations are preventable if appropriate and effective primary healthcare-based services were delivered. (WHO Regional Office for Europe, 2016)
Budget impact analysis (BIA)	Budget-impact analysis estimates the population resource use and cost for the mix of interventions and condition-related outcomes expected for a healthcare budget holder over a given period after the introduction of the new intervention, compared to that without the intervention, which results in an estimation of the resource and budget impact of the intervention. (Mauskopf & Earnshaw, 2017)
Citizen empowerment	Citizen empowerment is one of the five elements of strategic purchasing based on a synthesised framework. It is achieved through ensuring that patients' views and values are asserted, purchaser accountability is enforced, and that citizen choice is increased. To do so, citizens should be allowed input on their benefit package, their choice of provider, and ability to hold purchasers and providers accountable for services offered. (Klasa et al., 2018)
Current health expenditure	Current health expenditure refers to the final consumption of health goods and services by households, government, and non-profit institutions. (OECD et al., 2017)
Developing effective purchaser and provider organisations	Developing Effective Purchaser & Provider Organisations is one of the five elements of strategic purchasing based on a synthesised framework. It describes that successful implementation of strategic purchasing is dependent upon well organised, autonomous, transparent purchasers and providers who uphold a high degree of accountability to stakeholders. (Klasa et al., 2018)
District Health Centre (DHC)	District Health Centres (DHCs) are health centres that operate through a district-based medical-social collaboration and public-private partnership model in Hong Kong, with an aim to expand to seven districts in June 2022. They provide services in health promotion, health assessment, chronic disease management, and community rehabilitation. They seek to form a service network across all that better coordinates care for residents at the community level. (HKSARG, 2018b)
Domestic Health Account (DHA)	Also known as the national health account in Hong Kong, the Domestic Health Account (DHA) describe the totality of health care expenditure flows in both the public and private sectors. Hong Kong's DHA has adopted the International Classification of Health Accounts (ICHA) asset out in A System of Health Accounts (SHA) 2011. (FHB, 2021a)
Elderly Health Care Voucher Scheme (EHCVS)	The Elderly Health Care Voucher Scheme (EHCVS) was launched by the Department of Health in 2009 and was normalised in 2014. It adopted the concept of "money follows the patient" to allow eligible Hong Kong elders aged 65 or above to choose private healthcare services that best suit their health needs, including preventive care, with an annual voucher amount of HKD 2,000. (FHB, n.d.-a)
Fee-for-service (FFS)	Fee-for-service is a supply-side financing mechanism in which healthcare providers are paid a fix payment for each service performed. While it facilitates access to care, it also has the potential to contribute to over-provision of unnecessary care. (USDHHS, n.d.)

General Outpatient Clinic Public-Private Partnership Programme (GOPC-PPP)	The General Outpatient Clinic Public-Private Partnership Programme (GOPC-PPP) is a primary care public-private partnership programme launched by the Hospital Authority in 2014 and now covers all 18 districts in Hong Kong. Its primary aims include incentivising patients who are eligible based on pre-defined clinical criteria (with hypertension and/or diabetes), with or without hyperlipidemia and are deemed clinically stable) to see private sector services, and promoting the family doctor concept. The programme subsidises up to ten consultations per year and associated drugs. (HA, 2021e)
Incorporating cost-effective contracting	Incorporating cost-effective contracting is one of the five elements of strategic purchasing based on a synthesised framework. It entails that governments and health systems define the contracting process (in other words, the payment system and financing mechanism between purchasers and providers) for strategic purchasing, including measuring the impact of the contract on population health, adequate incentivisation of providers through performance-based financing, and risk-sharing between purchaser and provider. (Klasa et al., 2018)
Out-of-pocket payments (OOPs)	Out-of-pocket payments (OOPs) is defined by the WHO as an individual's direct payments (household spending) to healthcare providers for any health services where any third-party payer reimbursement, such as insurance funds or government subsidy, do not cover the full cost of the services. (WHO & IBRD, 2020)
Population health	Population health is one of the five elements of strategic purchasing based on a synthesised strategic purchasing framework. It suggests that purchasing decisions, should be influenced by routine information sharing of population health needs and provider performance. (Klasa et al., 2018; WHO, 2017b)
Primary care	Primary care is the first point of care for individuals, including preventive, diagnostic, and curative services. Primary care is only one of the components of primary healthcare. (OHKF, 2018)
Primary healthcare (PHC)	Primary healthcare (PHC) is a healthcare service field necessary for equitable healthcare system development, defined by the WHO has having the three inter-related components: primary care and essential public health functions, multisectoral policy and action, and empowered people and communities. PHC has a low implementation cost and includes a very comprehensive scope of services, thus positioned as a meaningful investment to address populational health more holistically. (WHO & UNICEF, 2018)
Public-private partnership (PPP)	PPP is defined as "*an agreement between the government and one or more private partners (which may include the operators and the financers) according to which the private partners deliver the service in such a manner that the service delivery objectives of the government are aligned with the profit objectives of the private partners and where the effectiveness of the alignment depends on a sufficient transfer of risk to the private partners.*" While optimally a PPP will serve as a strategic purchasing instrument, a PPP may or may not apply strategic purchasing. (OECD, 2008)
Risk Assessment and Management Programme for Diabetes Mellitus (RAMP-DM)	Risk Assessment and Management Programme for Diabetes Mellitus (RAMP-DM) is a territory-wide programme launched by the Hospital Authority to improve the quality of care for primary care patients with diabetes mellitus (DM) receiving care in the GOPCs. All enrolled patients undergo a comprehensive risk assessment and screening for diabetes-related complications, and tailored care plans with risk-appropriate intervention and education by a team of multi-disciplinary healthcare professionals are delivered. (Fung et al., 2012; Wan et al., 2018)

Strategic purchasing	Strategic purchasing is also known as “active purchasing”, an iterative process in which funding and legal entitlements to health services are guided by the score and quality of services and the performance of providers, based on the health needs of the population at large. The strategic purchasing process entails five core decisions to be made for implementation, including “what services to buy”, “who to buy the targeted services”, “for whom to buy services”, “from whom to purchase services,” and “how to purchase”. (WHO, 2000)
Strengthening government stewardship and capacity	Strengthening government stewardship and capacity is one of the five elements of strategic purchasing based on a synthesised framework. Governance entails the clear delineation of roles as purchaser, provider, and beneficiaries. It is recommended that governments incorporate health policies into purchasing decisions, invest in an integrated and centralised framework that builds upon explicit contractual terms, and ensures enough government credibility to enact and enforce change. (Klasa et al., 2018; WHO, 2017b)
System of Health Accounts (SHA)	The System of Health Accounts (SHA) is the result of a joint international effort to propose a framework for the systematic description of financial flows related to healthcare. Its core accounting framework emphasises the tri-axial relationship between the classifications by the functions of healthcare (types of healthcare goods and services to be consumed), by healthcare provision (types of healthcare providers who deliver these goods and services), and by financing schemes (how are these goods and services paid for). (OECD et al., 2017)
Universal health coverage (UHC)	UHC is defined by the WHO as “all people [having] access to the health services they need, when and where they need them, without financial hardship.” To attain UHC, a health coverage mechanism must cover more people (population axis), offer more comprehensive services (services axis), and extend coverage to more people (financial protection). (WHO, n.d.)
Voluntary Health Insurance Scheme (VHIS)	The Voluntary Health Insurance Scheme (VHIS) is a policy initiative launched in April 2019 by the Food and Health Bureau to regulate indemnity hospital insurance plans offered to individuals in an effort to shift demand from the public healthcare sector to the private sector. Insurance companies and consumers participate in the scheme voluntarily. (FHB, 2021d)
Willingness-to-pay (WTP)	Willingness-to-pay (WTP) refers to individuals’ willingness to spend money out-of-pocket for a programme or intervention. (Culyer, 2014)

List Of Abbreviations

A&E	Accident and Emergency
ACSC	Ambulatory Care Sensitive Conditions
APN	Advanced Practice Nurse
BIA	Budget Impact Analysis
BMI	Body Mass Index
C&SD	Census and Statistic Department of the HKSAR Government
CCF	Community Care Fund
CCGs	Clinical Commissioning Groups
CDSVMS	Chronic Disease Screening Voucher and Management Scheme (Scheme)
CEA	Cost-Effectiveness Analysis
CHAS	Community Health Assist Scheme
CHD	Coronary Heart Disease
CHE	Current Health Expenditure
CHP	Centre for Health Protection of the HKSAR Government
CVD	Cardiovascular Disease
DH	Department of Health of the HKSAR Government
DHA	Domestic Health Account
DHC	District Health Centre
DM	Diabetes Mellitus
DOT	Delivering on Target
DPP	Diabetes Prevention Programme
DRG	Diagnosis Related Group
EHCVS	Elderly Health Care Voucher Scheme
eHR	Electronic Health Record
eHRSS	Electronic Health Record Sharing System
FFS	Fee-for-service
FHB	Food and Health Bureau of the HKSAR Government
GDP	Gross Domestic Product
GOPC	General Out-patient Clinic
GP	General Practitioner
GMF	Global Monitoring Framework
GNI	Gross National Income
HA	Hospital Authority of the HKSAR Government
HbA1c	Hemoglobin A1c
HCF	Health Care Function
HCP	Health Care Provider
HDH	Hypertension-Diabetes-Hyperlipidemia
HKD	Hong Kong Dollar

HKDR	Hong Kong Diabetes Register
HPS	Health Protection Scheme
HRP	High-Risk Pool
HWB	Health and Welfare Bureau of the HKSAR Government
HWFB	Health, Welfare and Food Bureau of the HKSAR Government
IDF	International Diabetes Federation
JADE	Joint Asia Diabetes Evaluation
MBS	Medicare Benefits Scheme
MCH	Maternal and Child Health
MCHK	The Medical Council of Hong Kong
MMDHI	Median Monthly Domestic Household Income
NCD	Non-Communicable Disease
NGO	Non-governmental Organisations
NHS	National Health Service
OECD	The Organisation for Economic Co-operation and Development
OOP	Out-of-Pocket, alternatively Out-of-Pocket Payments
PBF	Performance-based Financing
PCN	Primary Care Networks
PFP	Pay-for-Performance
PHC	Primary Healthcare
PHO	Primary Healthcare Office, Food and Health Bureau
PICO	Policy Innovation and Co-ordination Office of the HKSAR Government
PPP	Public-Private Partnership
RAMP	Risk Assessment and Management Programme
RAMP-DM	Risk Assessment and Management Programme for Diabetes Mellitus
RCHE	Residential Care Home for the Elderly
SHA	System of Health Accounts
SHI	Social Health Insurance
SOPC	Specialist Out-patient Clinics
SWD	Social Welfare Department of the HKSAR Government
UCS	Universal Coverage Scheme
UHC	Universal Health Coverage
UN	The United Nations
USD	United States Dollar
WHO	The World Health Organization
WTP	Willingness-to-Pay
VHIS	Voluntary Health Insurance Scheme
VSS	Vaccination Subsidy Scheme

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LEAD AUTHORS

Professor Yeoh Eng-kiong, GBS, OBE, JP

Professor of Public Health

Director, Centre for Health Systems and Policy Research, The Jockey Club School of Public Health and Primary Care, Faculty of Medicine, The Chinese University of Hong Kong

Lead Advisor in Health Policy Research and Member of Research Council, Our Hong Kong Foundation

Dr Stephen Wong

OHKF Senior Vice President and Executive Director of Public Policy Institute

Dr Pamela Tin

Head of Healthcare and Social Development, Our Hong Kong Foundation

Dr Wu Yushan April

Postdoctoral Fellow, Centre for Health Systems and Policy Research, The Jockey Club School of Public Health and Primary Care, Faculty of Medicine, The Chinese University of Hong Kong

CONTRIBUTING AUTHORS (listed in alphabetical order by surname)

Shereen Ayub

Dicky Chow

Assistant Researcher,
Our Hong Kong Foundation

Queenie Li

Danting Liu

Assistant Researcher,
Our Hong Kong Foundation

Emily Ching Ma

Assistant Researcher,
Our Hong Kong Foundation

Maira Qamar

Assistant Researcher,
Our Hong Kong Foundation

Nan Xia

Assistant Researcher,
Our Hong Kong Foundation

Valerie Fung

Research Associate, Centre for Health Systems and Policy Research, The Jockey Club School of Public Health and Primary Care, Faculty of Medicine, The Chinese University of Hong Kong

Dr Huang Junjie Jason

Postdoctoral Fellow, The Jockey Club School of Public Health and Primary Care, Faculty of Medicine, The Chinese University of Hong Kong

Dr Huo Zhaohua Bob

Postdoctoral Fellow, The Jockey Club School of Public Health and Primary Care, Faculty of Medicine, The Chinese University of Hong Kong

Terence Lau

Consultant, Centre for Health Systems and Policy Research, The Jockey Club School of Public Health and Primary Care, Faculty of Medicine, The Chinese University of Hong Kong

Lin Jiaer

PhD student, The Jockey Club School of Public Health and Primary Care, Faculty of Medicine, The Chinese University of Hong Kong

Professor Martin Wong

Professor, The Jockey Club School of Public Health and Primary Care, Faculty of Medicine, The Chinese University of Hong Kong

Dr Carrie HK Yam

Scientific Officer, Centre for Health Systems and Policy Research, The Jockey Club School of Public Health and Primary Care, Faculty of Medicine, The Chinese University of Hong Kong

Professor Benjamin Yip

Assistant Professor, The Jockey Club School of Public Health and Primary Care, Faculty of Medicine, The Chinese University of Hong Kong

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