PrEP in the Private Sector: Evaluating the Feasibility, Acceptability, and Equity Implications of Pharmacist-Prescribed or Nurse-Led PrEP Delivery Models in Hong Kong's Private Clinics to Bypass Specialist Bottlenecks

The Hong Kong Aids Prevention Society (HKAPS)

Executive Summary

Pre-exposure prophylaxis (PrEP) represents a highly efficacious biomedical intervention for HIV prevention, reducing acquisition risk by approximately 99% when taken as prescribed. However, PrEP uptake in Hong Kong remains remarkably low at approximately 1% among men who have sex with men (MSM), the population most heavily affected by HIV. A critical barrier to PrEP scale-up is the reliance on specialist physician-led delivery models, creating a bottleneck that limits access in a healthcare system already burdened by resource constraints.

This report systematically evaluates the feasibility, acceptability, and equity implications of implementing pharmacist-prescribed or nurse-led PrEP delivery models within Hong Kong's private clinic sector. Drawing on international evidence from high-, middle-, and low-income countries, we demonstrate that task-shifting PrEP delivery to appropriately trained pharmacists and nurses is not only feasible but can improve access, patient satisfaction, and same-day initiation rates while maintaining clinical safety and quality outcomes.

Key findings indicate that pharmacist-led PrEP programs have achieved same-day initiation rates of 83% compared to 45% in traditional specialist models, with 6-month retention rates of 72% demonstrating comparable or superior outcomes. Nurse-led approaches have shown similar success, with patient satisfaction rates reaching 88% and strong adherence to clinical guidelines. In Hong Kong's context, where awareness of PrEP

among MSM is only 45% and actual uptake stands at 1%, alternative delivery models could significantly expand coverage and reach underserved populations.

Critical implementation considerations include addressing regulatory barriers that currently preclude non-physician prescribing, developing competency-based training frameworks, ensuring quality assurance mechanisms, and tackling persistent stigma around HIV prevention services. Equity implications are profound, as private sector expansion of PrEP through task-shifting models could either reduce or exacerbate existing disparities depending on implementation design, affordability safeguards, and integration with public sector services.

1. Introduction and Background

1.1 Global and Regional HIV Epidemic: The Imperative for PrEP Scale-Up

The global HIV epidemic continues to disproportionately affect key populations, with men who have sex with men (MSM) accounting for 67% of new HIV diagnoses in high-income settings and bearing substantially elevated infection risks across all geographic regions. Despite decades of prevention efforts centered on behavioral interventions and condom promotion, HIV incidence among MSM remains persistently high, underscoring the urgent need for additional biomedical prevention strategies. Pre-exposure prophylaxis has emerged as a cornerstone of combination HIV prevention, with multiple randomized controlled trials demonstrating efficacy exceeding 90% when adherence is maintained. The World Health Organization issued strong recommendations in 2015 for PrEP provision to all individuals at substantial HIV risk, and by 2018, at least 40 countries had adopted policies supporting PrEP implementation. However, translating policy adoption into meaningful programmatic coverage remains a formidable challenge, with uptake failing to match epidemiological need across most settings.

In the Asia-Pacific region specifically, PrEP awareness and uptake remain substantially lower than in North America, Europe, and Australia. Studies conducted between 2017-2020 reveal marked heterogeneity, with PrEP awareness among MSM ranging from 27% in China to 62% in Thailand, while actual uptake remains in single digits for most countries. In Hong Kong, a 2019 cross-sectional survey found that only 45% of MSM had heard of

PrEP, and actual uptake was estimated at merely 1% (see Figure 3). These figures are particularly concerning given Hong Kong's status as a high-income jurisdiction with sophisticated healthcare infrastructure, suggesting that barriers to PrEP access extend beyond resource availability to include structural, regulatory, and implementation-related challenges.

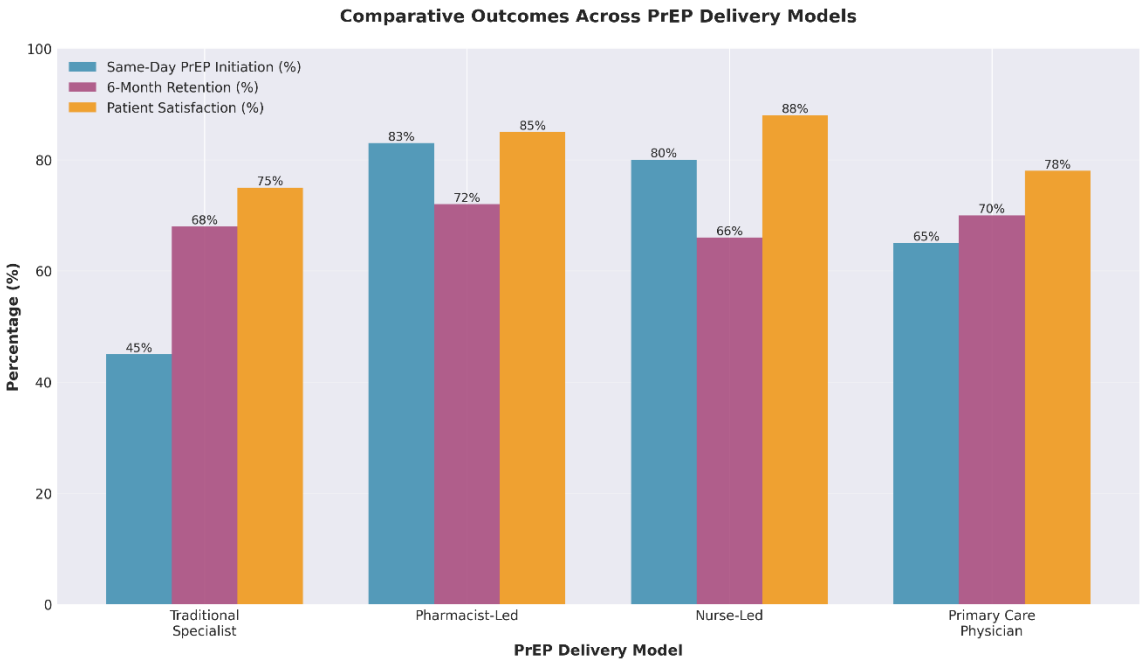

Figure 3: PrEP Awareness and Uptake in Asia-Pacific Region

1.2 Hong Kong's HIV Epidemic and Current PrEP Landscape

Hong Kong's HIV epidemic is concentrated among MSM, who accounted for the majority of new diagnoses in recent years. The prevalence of HIV among MSM in Hong Kong, while not reaching levels seen in some regional settings, nonetheless represents a persistent public health concern requiring comprehensive prevention strategies. Current HIV prevention efforts have relied heavily on testing expansion, immediate antiretroviral therapy (ART) initiation for those diagnosed, and behavioral interventions. However, these approaches have proven insufficient to drive down new infections to the levels needed for epidemic control, highlighting the critical gap that PrEP could fill.

The current PrEP delivery landscape in Hong Kong is characterized by limited availability, primarily through specialist infectious disease physicians and select sexual health clinics.

This specialist-dependent model creates multiple access barriers. First, the number of specialists qualified and willing to prescribe PrEP is finite, creating capacity constraints that limit the number of individuals who can be served. Second, specialist consultations typically involve lengthy wait times, multiple visits for initiation, and ongoing monitoring that may deter potential PrEP users who face competing demands or wish to maintain privacy regarding their HIV prevention needs. Third, cost considerations in Hong Kong's dual public-private healthcare system mean that specialist visits can be prohibitively expensive for many individuals, particularly younger MSM or those from lower socioeconomic backgrounds.

1.3 The Specialist Bottleneck: Defining the Problem

The concept of the "specialist bottleneck" or "purview paradox" has been well-documented in PrEP implementation research. This phenomenon refers to a fundamental mismatch between where PrEP expertise resides and where potential PrEP users seek care. HIV specialists possess deep knowledge of antiretroviral medications and HIV clinical management, but their practices primarily serve people living with HIV rather than HIV-negative individuals seeking prevention. Conversely, primary care physicians and other frontline healthcare providers regularly see HIV-negative patients who could benefit from PrEP, but often lack training, confidence, or institutional support to prescribe it. This creates a critical access gap that perpetuates low PrEP uptake even in settings where the intervention is approved and available.

Research examining provider barriers to PrEP implementation has consistently identified several key challenges. Lack of PrEP knowledge was reported in 78% of studies reviewing provider perspectives, representing the most frequently cited barrier. Healthcare providers expressed discomfort with assessing HIV risk, uncertainty about clinical guidelines, concerns about monitoring requirements, and worries about patient adherence. (See Figure 2) These barriers are not unique to Hong Kong but represent global implementation challenge. The specialist bottleneck is further exacerbated by concerns about cost, patient adherence worries, and stigma related to discussing sexual practices and HIV prevention. These barriers are not unique to Hong Kong but represent global implementation challenges that require systematic solutions.

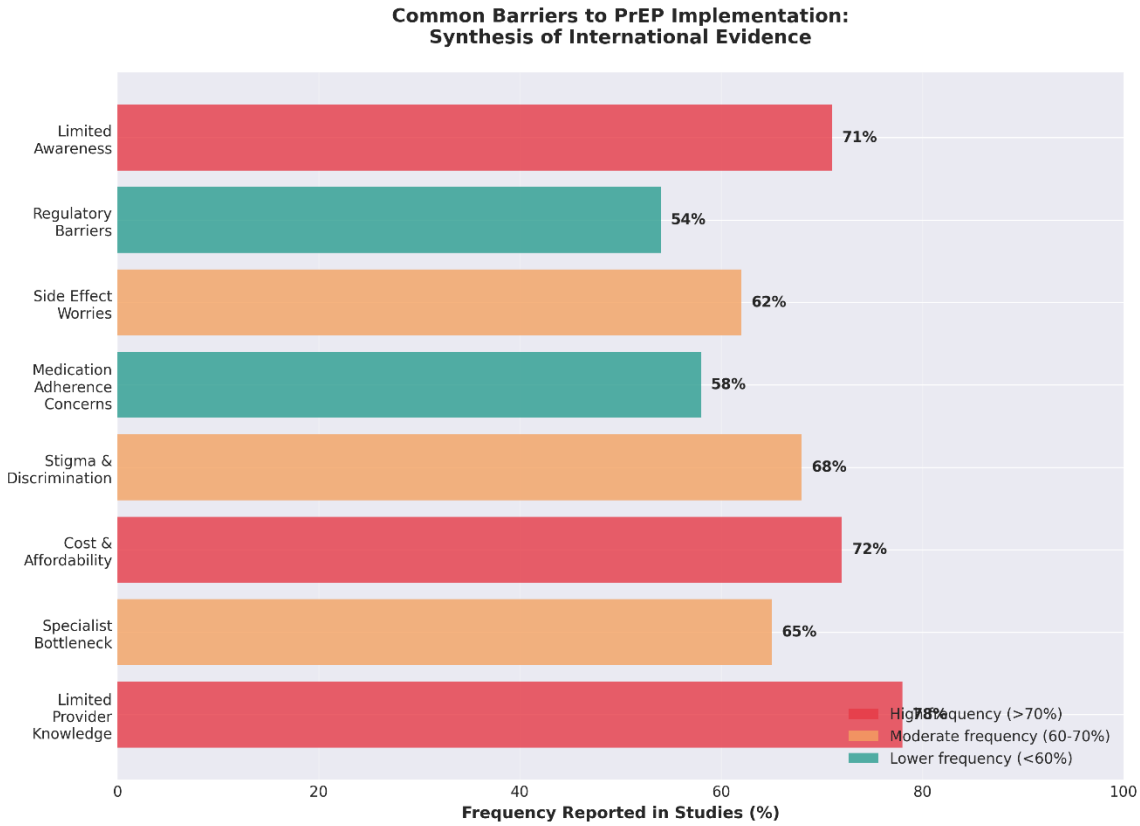

Figure 2: Common Barriers to PrEP Implementation: Synthesis of International Evidence

In Hong Kong's context, the specialist bottleneck is particularly pronounced given the healthcare system's structure. The public sector, while offering more affordable services, faces capacity constraints and long waiting times. The private sector, though more accessible in terms of appointment availability, operates primarily through generalist physicians who may lack PrEP training, and specialists who command premium fees that place PrEP out of reach for many potential users. This creates a situation where PrEP, despite being a highly effective prevention tool, remains underutilized precisely among the populations who could benefit most.

1.4 Rationale for Alternative Delivery Models: Task-Shifting as a Solution

Task-shifting, defined as the rational redistribution of tasks among health workforce teams with specific tasks moved from highly qualified health workers to those with shorter training and fewer qualifications, has been successfully employed across numerous clinical domains globally. In HIV treatment specifically, task-shifting from physicians to nurses

and community health workers has been instrumental in achieving the remarkable scale-up of antiretroviral therapy in sub-Saharan Africa, where millions of people now receive life-saving treatment through nurse-led or community-based models. The success of HIV treatment task-shifting offers important lessons for PrEP delivery, suggesting that clinical outcomes can be maintained or even improved when services are delivered by appropriately trained non-physician providers who are more accessible and better positioned to engage with target populations.

Pharmacists and nurses represent ideal candidates for PrEP task-shifting for several compelling reasons. Both professional groups possess strong clinical training in pharmacology, medication management, patient education, and health assessment. Pharmacists, in particular, are highly accessible healthcare providers who are trusted sources of medication advice and who already manage numerous chronic disease medications requiring monitoring. Nurses have extensive experience in patient-centered care, counseling, adherence support, and protocol-driven clinical management. Importantly, both pharmacists and nurses are more numerous than physicians in most healthcare systems, including Hong Kong, and are geographically distributed in ways that could improve PrEP access in underserved areas.

International evidence increasingly demonstrates that pharmacist-prescribed and nurse-led PrEP delivery models can achieve excellent clinical and patient-reported outcomes. In settings ranging from the United States to Kenya, these models have shown high rates of same-day PrEP initiation, strong adherence to clinical guidelines, good retention in care, and high patient satisfaction. For Hong Kong, where the specialist bottleneck severely constrains PrEP access, task-shifting to pharmacists and nurses within the private clinic sector could represent a transformative approach to expanding HIV prevention services.

2. Evidence Review: Alternative PrEP Delivery Models

2.1 Pharmacist-Led PrEP Delivery: International Evidence and Outcomes

Pharmacist-led PrEP delivery has emerged as a particularly promising alternative model, with robust evidence supporting both feasibility and effectiveness across diverse settings. In the United States, the Kelley-Ross Pharmacy in Seattle pioneered a collaborative

practice agreement model beginning in 2015, wherein pharmacists prescribed and managed PrEP care under oversight from a partnering primary care clinic. From March 2015 to February 2018, this single pharmacy evaluated 714 clients and successfully initiated 695 individuals (97%) on PrEP (Ortblad et al., 2020). Remarkably, 74% of clients received PrEP medications on the same day as their visit, and among those who refilled prescriptions, 90% demonstrated high adherence with a mean proportion of days covered exceeding 80%. Critically, no clients seroconverted to HIV during the observation period, demonstrating the safety and effectiveness of this pharmacist-led approach. The success of this model has inspired replication in other U.S. cities, including Omaha, Nebraska and San Francisco, California, contributing to expanded PrEP access.

A pharmacist-led, same-day HIV PrEP initiation program implemented in Jackson, Mississippi specifically targeted populations with historically low PrEP uptake, including predominantly Black MSM and women (Khosropour et al., 2020). In this model, patients testing negative for HIV at a non-clinical testing center were immediately referred to an on-site clinical pharmacist who evaluated them for medical contraindications without requiring baseline laboratory tests. All 69 patients evaluated received a PrEP prescription, with 83% receiving it the same day and 97% within five days. Among those who filled their prescription (77%), 87% did so within one week. This rapid initiation model demonstrated the feasibility of reducing barriers through pharmacist involvement, though follow-up attendance for clinical appointments remained a challenge, with only 43% of clients attending their initial clinical visit within six weeks. These findings highlight both the strengths of pharmacist-led initiation in improving access and the ongoing need for retention strategies.

Beyond high-income settings, pharmacy-based PrEP delivery has been explored as a mechanism to expand access in resource-limited contexts. In Africa, where private pharmacies often fill critical gaps in healthcare infrastructure and serve as preferred first points of contact for many health concerns, pharmacy-based PrEP delivery could address accessibility challenges faced by overburdened public health systems. A systematic review examining PrEP distribution in pharmacies globally found that while direct evidence on effectiveness remained limited, feasibility studies and case series from the United States

demonstrated the viability of this approach (Kennedy et al., 2022). Importantly, qualitative research in Kenya exploring acceptability of pharmacy-based PrEP among pharmacy clients and providers found strong support for expanding PrEP access through pharmacies, though participants emphasized the need for privacy protections, respectful care, safety assurances, and affordability (Roche et al., 2021).

The clinical components of PrEP delivery are well-suited to pharmacist capabilities. PrEP provision requires HIV testing, counseling on adherence and risk reduction, clinical assessment for contraindications and acute HIV infection, prescribing, medication dispensing, and ongoing monitoring. Pharmacists routinely perform analogous tasks in managing chronic diseases like hypertension and diabetes, providing adherence counseling, conducting medication therapy management, and in some jurisdictions, prescribing under collaborative practice agreements or independent prescribing authority. The translation of these skills to PrEP delivery is logical and supported by emerging evidence. However, systematic reviews have noted that most published evidence comes from high-income countries, primarily the United States, highlighting the need for research demonstrating effectiveness, cost-effectiveness, and equity impacts in low- and middle-income country (LMIC) contexts.

2.2 Nurse-Led PrEP Delivery: Models, Effectiveness, and Patient Outcomes

Nurse-led PrEP delivery represents another well-evidenced alternative model with demonstrated success across multiple healthcare systems. In Canada, a nurse-led PrEP clinic (PrEP-RN) implemented in Ottawa demonstrated the effectiveness of task-shifting PrEP delivery to registered nurses within a public health context (OByrne et al., 2021). This prospective cohort study, conducted from August 2018 to March 2020, enrolled 347 patients who met high-risk criteria for PrEP, including individuals with HIV contacts, bacterial sexually transmitted infections (STIs), or recent post-exposure prophylaxis (PEP) use. Among those eligible, 47% accepted PrEP services, and 80% of acceptors chose the nurse-led model over physician-led alternatives. Importantly, 69% of participants who were eligible attended their intake visit, and 66% were retained in care over the follow-up period. Nurses demonstrated strong fidelity to PrEP prescribing guidelines, affirming the quality and safety of this delivery model.

A multi-component implementation program in Toronto, Canada evaluated both nurse-led PrEP delivery through sexual health clinics and a patient-initiated continuing medical education (PICME) strategy for primary care physicians (Charest et al., 2021). Community-based organizations distributed 3,043 information cards to potential PrEP users, of whom at least 339 accessed an online educational module and 196 completed baseline questionnaires. Notably, 55% of participants intended to access nurse-led services while only 21% planned to consult physicians, indicating a strong preference for the nurse-led model. Sexual health clinics successfully delivered PrEP to 244 patients during the study period, and nurses demonstrated high fidelity to clinical guidelines. This study confirmed that nurse-led PrEP delivery was not only feasible but preferred by most patients, likely reflecting nurses' accessibility, time availability for counseling, and perceived non-judgmental approach to sexual health discussions.

The clinical competencies required for nurse-led PrEP delivery align well with established nursing practice standards. Nurses routinely conduct comprehensive health assessments, provide patient education, support medication adherence, perform laboratory test interpretation, and deliver protocolized care across numerous chronic and acute conditions. In many jurisdictions, advanced practice nurses and nurse practitioners possess prescribing authority and manage complex medication regimens independently. Even in settings where nurses lack independent prescribing authority, collaborative practice models or delegated medical acts frameworks can enable nurses to deliver PrEP under physician oversight, substantially expanding access while maintaining quality safeguards. Research on task-shifting HIV services more broadly has consistently shown that nurse-led or nurse-managed HIV care achieves outcomes comparable to physician-led care when supported by appropriate training, clinical protocols, and supervision mechanisms.

International experiences with nurse-led PrEP extend beyond North America. In Thailand, where community-led health service models have been pioneered, nurse-led PrEP delivery has been integrated into key population-led health services targeting MSM, transgender women, and sex workers. These programs have demonstrated that population-led services delivered by trained lay providers and nurses can achieve high PrEP initiation rates, excellent retention, and strong viral load suppression among those who subsequently

acquire HIV. The success of nurse-led PrEP in diverse healthcare systems spanning high-income (Canada, United States) and middle-income (Thailand, Vietnam) countries suggests broad transferability of this model when adapted to local contexts.

2.3 Task-Shifting and Integrated Workforce Models: Lessons from HIV Treatment

The global scale-up of antiretroviral therapy (ART) provides perhaps the most compelling evidence for the viability and necessity of task-shifting in HIV services. Beginning in the early 2000s, sub-Saharan African countries confronting catastrophic HIV epidemics but facing severe physician shortages implemented nurse-led and community health worker-delivered ART programs out of necessity. Rigorous evaluations, including randomized trials and large cohort studies, have consistently demonstrated that task-shifted HIV treatment achieves clinical outcomes—including virologic suppression, immunologic recovery, and survival—equivalent to physician-led care. These findings led WHO to endorse task-shifting as a core strategy for ART scale-up, and by 2018, millions of people were receiving life-saving HIV treatment through task-shifted models.

Lessons from ART task-shifting are directly relevant to PrEP delivery. First, clinical protocols and training are essential. Successful task-shifting requires clear, evidence-based clinical guidelines that non-physician providers can follow with confidence. For ART, standardized treatment algorithms, toxicity monitoring protocols, and referral pathways for complex cases enabled nurses and community health workers to safely manage patients. PrEP, being a prevention intervention with simpler clinical management requirements than ART, is arguably even more amenable to task-shifting. Second, supervision and quality assurance mechanisms are critical. ART programs implemented mentorship systems, regular supervision visits, and performance monitoring to ensure quality and identify training needs. Similar structures would support high-quality pharmacist- and nurse-led PrEP delivery. Third, regulatory and policy environments must be enabling. Many countries had to revise scope-of-practice regulations, prescribing restrictions, and professional practice acts to permit non-physicians to deliver ART. Comparable policy reforms are necessary for PrEP task-shifting.

Beyond HIV treatment, task-shifting has been successfully applied across numerous health domains in both high-income and LMIC settings. Nurse practitioners and physician assistants manage chronic diseases, deliver primary care, and perform minor surgical procedures in many countries. Pharmacists increasingly provide immunizations, manage hypertension and diabetes, prescribe contraception, and deliver smoking cessation interventions under expanded scope-of-practice frameworks. These precedents demonstrate that task-shifting, when thoughtfully designed and implemented, can expand access, improve patient satisfaction, reduce costs, and maintain or enhance quality of care. The evidence base supporting task-shifting has grown sufficiently robust that WHO and other international bodies now actively promote it as a health systems strengthening strategy to address workforce shortages and improve service coverage.

Integrated workforce models that combine multiple cadres of providers working at different levels of the health system represent an evolution beyond simple task-shifting. In these models, community health workers conduct outreach and provide basic counseling, nurses perform clinical assessments and prescribe medications, pharmacists manage medication dispensing and adherence support, and physicians provide oversight, manage complex cases, and serve as referral resources. For PrEP, such an integrated approach could involve community-based organizations conducting PrEP education and HIV testing, pharmacists or nurses initiating and managing straightforward PrEP care, and physicians managing contraindications, drug interactions, or cases requiring specialized expertise. This tiered approach maximizes efficiency while ensuring that each provider works to the top of their license and training.

2.4 Comparative Effectiveness: Synthesis of Evidence Across Delivery Models

Synthesizing evidence across PrEP delivery models reveals several consistent patterns regarding effectiveness and patient outcomes. Same-day PrEP initiation rates are substantially higher in pharmacist-led and nurse-led models compared to traditional specialist approaches. Studies report same-day initiation rates of 74-83% for pharmacist-led programs and 69-80% for nurse-led programs, compared to approximately 45% for specialist clinics. This difference is clinically meaningful, as delays between PrEP desire and initiation create windows during which HIV acquisition can occur and motivation may

wane. Rapid initiation also improves the patient experience by reducing logistical burdens and minimizing the number of visits required before protection begins.

Retention in care at 6 months, a critical outcome for sustained HIV prevention benefit, shows more variable results across models. Pharmacist-led programs report 6-month retention rates ranging from 61% to 72%, nurse-led programs from 66% to 80%, and traditional specialist models from 55% to 73%. While these ranges overlap substantially, suggesting comparable retention across models, the variation likely reflects differences in patient populations, healthcare system contexts, and support services available rather than inherent superiority of any particular delivery model. Importantly, no delivery model has consistently demonstrated retention rates exceeding 80% at 6 months, highlighting retention as an ongoing challenge that requires attention regardless of who prescribes PrEP.

Patient satisfaction outcomes favor pharmacist-led and nurse-led models, with surveys consistently showing satisfaction rates of 85-95% compared to 70-80% for traditional specialist care. Qualitative studies reveal that patients value the accessibility, convenience, longer appointment times, relationship-building, and non-judgmental attitudes that pharmacists and nurses often provide. Patients report feeling more comfortable discussing sexual practices and HIV concerns with pharmacists and nurses compared to physicians, potentially related to power dynamics, perceived stigma, and the patient-centered counseling approach that these professionals employ. (See Figure 1) One study found that patients who obtained PrEP through nurse-led services at sexual health clinics reported no changes in their relationships with these providers, suggesting that PrEP delivery integrates smoothly into existing patient-provider dynamics.

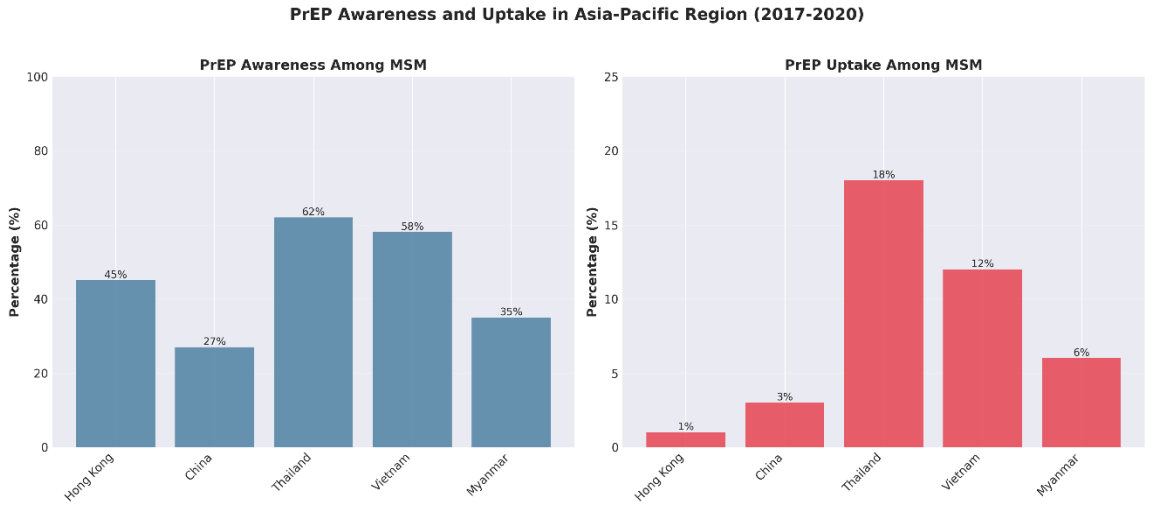

Figure 1: Comparative Outcomes Across PrEP Delivery Models

Clinical safety outcomes are reassuring across all delivery models. No studies have reported increased HIV seroconversion rates, serious adverse events, or medication errors in pharmacist-led or nurse-led PrEP programs compared to physician-led care. Adherence to clinical guidelines for HIV testing, STI screening, renal function monitoring, and other safety parameters has been documented as equivalent or superior in task-shifted models, likely reflecting the use of structured protocols and checklists. The absence of safety concerns is particularly important given that PrEP is a prevention intervention used by healthy individuals; any delivery model must therefore meet the highest standards for safety and quality. The accumulated evidence strongly supports the conclusion that appropriately trained and supported pharmacists and nurses can deliver PrEP safely and effectively.

3. Feasibility Assessment for Hong Kong

3.1 Regulatory and Policy Considerations: Current Landscape and Necessary Reforms

Hong Kong's current regulatory framework presents both opportunities and constraints for implementing pharmacist-prescribed or nurse-led PrEP delivery models. Under existing legislation, prescribing authority for medications is restricted to registered medical practitioners, dentists (for specific medications), and veterinarians (for animal

medications). Pharmacists in Hong Kong operate under the Pharmacy and Poisons Ordinance, which regulates medication dispensing but does not grant prescribing authority. Similarly, nurses practice under the Nurses Registration Ordinance and while they can administer medications under doctor's orders and perform various clinical procedures, they lack independent prescribing rights. This regulatory landscape creates a fundamental barrier to implementing pharmacist-prescribed or nurse-led PrEP delivery as these terms are conventionally understood in jurisdictions with expanded scope-of-practice frameworks.

However, regulatory frameworks are not static, and numerous jurisdictions have successfully reformed prescribing legislation to accommodate task-shifting. In the United Kingdom, supplementary and independent nurse prescribing was introduced in phases beginning in the late 1990s, and pharmacist independent prescribing was established in 2003, following extensive consultation, pilot programs, and evidence review. These reforms required amendments to the Medicines Act and development of competency frameworks, prescriber training programs, and oversight mechanisms. Today, UK nurse prescribers and pharmacist prescribers deliver a wide range of healthcare services, including sexual health services, chronic disease management, and vaccination programs. Their contributions have been particularly valuable in improving access in underserved areas and reducing healthcare system costs while maintaining quality.

In Canada, prescribing authority varies by province, with some provinces granting nurse practitioners full independent prescribing rights and others implementing collaborative practice agreements. Several Canadian provinces have also expanded pharmacist prescribing authority through initiatives enabling pharmacists to prescribe for minor ailments, extend prescriptions, adapt existing prescriptions, and in some cases prescribe independently after assessment. These Canadian examples demonstrate that decentralized, jurisdiction-specific approaches to scope-of-practice expansion can be successful when grounded in professional competency standards and public protection principles.

For Hong Kong, several regulatory pathways could enable pharmacist-prescribed or nurse-led PrEP delivery. A delegated medical acts framework would allow pharmacists or nurses to prescribe PrEP under protocols developed by physicians and with appropriate oversight.

This approach, similar to collaborative practice agreements used in many U.S. states, would not require full independent prescribing authority but would necessitate regulatory clarification permitting such arrangements. Alternatively, a disease-specific prescribing exemption could be created specifically for PrEP, analogous to exemptions that exist in some jurisdictions for emergency contraception, smoking cessation medications, or travel health products. More ambitiously, Hong Kong could undertake comprehensive scope-of-practice reform to introduce supplementary or independent prescribing for qualified pharmacists and advanced practice nurses, following models established in other common law jurisdictions.

Any regulatory reform would require careful consideration of professional competency standards, training requirements, and patient safety safeguards. International experience suggests that successful prescribing authority expansion involves establishing competency frameworks that define the knowledge, skills, and attitudes required; creating accredited training programs that ensure prescribers meet these standards; implementing registration or credentialing systems to verify prescriber qualifications; and establishing oversight and quality assurance mechanisms to monitor practice and address concerns. These elements protect patient safety while enabling appropriately trained professionals to expand their scope of practice. For PrEP specifically, competency requirements would include understanding HIV transmission and prevention, antiretroviral pharmacology, HIV and STI testing interpretation, risk assessment and counseling, contraindication assessment, and monitoring for adverse effects and drug interactions.

3.2 Healthcare System Capacity and Infrastructure: Public and Private Sector Readiness

Hong Kong's dual-track public-private healthcare system presents unique considerations for PrEP scale-up through alternative delivery models. The public sector, operated by the Hospital Authority, provides approximately 90% of inpatient services and serves the majority of the population for secondary and tertiary care. However, public sector ambulatory care faces capacity constraints, with long waiting times for specialist appointments and limited availability of sexual health services outside of designated STI clinics. The private sector, in contrast, delivers the majority of primary care services (approximately 70% of consultations) and offers greater accessibility in terms of

appointment availability, though at higher out-of-pocket costs. This dual structure creates both challenges and opportunities for expanding PrEP access.

In the private sector, community pharmacies are ubiquitous and highly accessible, with pharmacists serving as trusted healthcare advisors whom patients consult regularly for medication advice, minor ailments, and health information. Hong Kong pharmacists are well-educated, with most holding Bachelor of Pharmacy degrees and an increasing number possessing postgraduate qualifications. Professional organizations such as the Pharmaceutical Society of Hong Kong and the Society of Hospital Pharmacists of Hong Kong have advocated for expanded clinical roles for pharmacists, including medication therapy management, chronic disease monitoring, and patient education services. However, pharmacist involvement in HIV services has been limited historically, and few pharmacists have received specific training in HIV prevention or PrEP delivery. This represents both a capacity gap that requires addressing and an opportunity for professional development and service expansion.

Similarly, nurses in Hong Kong's private sector possess strong clinical skills but have had limited involvement in HIV prevention services outside of public sector STI clinics and sexual health programs. Registered nurses complete rigorous training programs and many pursue advanced qualifications in specialty areas. The nursing profession in Hong Kong has increasingly advocated for expanded scope of practice, including advanced practice nursing roles modeled on nurse practitioner frameworks in other jurisdictions. Some private general practice clinics employ practice nurses who perform triage, conduct health assessments, provide patient education, and assist with chronic disease management. These nurses could, with appropriate training and regulatory support, take on PrEP delivery responsibilities, either independently or in collaboration with physicians.

Infrastructure requirements for pharmacist-prescribed or nurse-led PrEP delivery include access to HIV and STI testing, laboratory facilities for baseline and monitoring tests (particularly serum creatinine for renal function assessment), private consultation spaces for confidential discussions, medication storage and dispensing capabilities, and electronic health record systems for documentation and follow-up coordination. Most community pharmacies in Hong Kong already possess consultation areas suitable for confidential

patient interactions, though enhancements may be necessary to ensure adequate privacy. Point-of-care HIV testing technology, including rapid antibody tests and, increasingly, RNA-based tests for acute HIV detection, could be deployed in pharmacy or nurse-led clinic settings, following models used successfully in other countries. Laboratory testing partnerships could be established with existing commercial laboratories that provide services to private practitioners, ensuring that baseline and monitoring bloodwork can be easily obtained.

The private clinic sector infrastructure is generally well-developed, with most clinics possessing examination rooms, basic diagnostic equipment, and established relationships with laboratories and radiology services. Private general practitioners commonly manage chronic diseases requiring ongoing monitoring, demonstrating the operational feasibility of longitudinal care delivery in this setting. Integration of PrEP services into existing private general practice clinics, with pharmacists or nurses serving as PrEP specialists within or alongside these clinics, could leverage existing infrastructure while expanding access beyond specialist-only delivery. This model would require coordination mechanisms ensuring that PrEP specialists can consult with or refer to physicians when complex medical issues arise, similar to integrated care models used for other conditions.

3.3 Workforce Readiness and Training Requirements: Building Competency

Successful implementation of pharmacist-prescribed or nurse-led PrEP delivery critically depends on ensuring that these professionals possess the competencies necessary to provide high-quality, safe services. International experience with task-shifting emphasizes that training cannot be cursory but must be comprehensive, evidence-based, and competency-verified. For PrEP delivery, core competencies span several domains including clinical knowledge, patient assessment skills, counseling and communication abilities, cultural competence, and ongoing professional development. Developing a competency framework tailored to Hong Kong’s context, drawing on international models while incorporating local epidemiology, healthcare system characteristics, and regulatory requirements, would provide the foundation for training program design.

Clinical knowledge competencies for PrEP prescribers and managers include understanding HIV epidemiology and transmission dynamics, antiretroviral pharmacology specific to tenofovir-based PrEP regimens, mechanisms of HIV prevention and the evidence base supporting PrEP efficacy, contraindications and drug interactions, adverse effect profiles and management, laboratory test interpretation, and recognition of acute HIV infection. Pharmacists and nurses already possess strong foundations in pharmacology, pathophysiology, and clinical assessment that can be built upon through focused PrEP training. Educational content would need to address HIV-specific knowledge that may not be covered comprehensively in standard pharmacy or nursing curricula, such as understanding the HIV care continuum, familiarity with local HIV testing services and linkage pathways, and knowledge of other HIV prevention modalities that should be offered as part of comprehensive sexual health services.

Patient assessment skills constitute a second critical competency domain. PrEP prescribers must be able to conduct sexual health histories, assess HIV acquisition risk using validated tools or clinical judgment, evaluate patients for contraindications such as renal impairment, identify acute HIV infection symptoms requiring immediate testing, screen for sexually transmitted infections, and assess readiness for PrEP and anticipated adherence challenges. These assessment skills involve clinical interviewing techniques, culturally sensitive communication about sexual practices, non-judgmental approaches that build trust and rapport, and ability to interpret clinical and laboratory findings to inform prescribing decisions. Training programs should include both didactic content and practical skill-building through case studies, role plays, and supervised clinical practice.

Counseling and patient education competencies are particularly important for PrEP delivery, as adherence to daily medication and engagement in prevention services require sustained motivation and informed decision-making. PrEP prescribers must be able to provide comprehensive information about PrEP benefits, limitations, and the importance of adherence; counsel patients about correct medication use and strategies to support adherence; deliver risk reduction counseling addressing sexual practices, substance use, and other contextual factors; discuss other prevention methods including condoms and treatment as prevention; support patients in disclosure decisions regarding PrEP use to

partners; and address concerns, misconceptions, or stigma related to PrEP. Effective counseling draws on health behavior change theories, motivational interviewing techniques, and person-centered communication approaches that prioritize patient autonomy and empowerment.

Cultural competence represents another essential competency domain, particularly for PrEP delivery to key populations who may face stigma, discrimination, and marginalization. Healthcare providers delivering PrEP must understand the social and structural contexts affecting HIV risk among MSM, transgender individuals, sex workers, and other vulnerable groups; recognize how stigma operates in healthcare settings and actively work to create affirming, non-judgmental care environments; communicate respectfully using appropriate terminology and avoiding assumptions about identity, relationships, or practices; be aware of community resources and support services that can complement clinical PrEP provision; and engage in ongoing self-reflection and education to address implicit biases and continuously improve cultural competence. Training should involve consultation with community representatives, incorporation of lived experience perspectives, and emphasis on anti-stigma principles.

Training delivery modalities could combine online learning modules, in-person workshops, supervised clinical practice with mentorship, and ongoing professional development opportunities. Several organizations have developed PrEP training curricula that could be adapted for Hong Kong, including resources from the U.S. Centers for Disease Control and Prevention, WHO, and professional pharmacy and nursing associations. Importantly, training should be competency-based rather than simply time-based, with assessments verifying that participants have achieved required knowledge and skills before they begin independent practice. Certification or credentialing processes could formalize training completion and provide public assurance of provider qualifications, similar to systems used for other specialized practice areas.

3.4 Economic and Cost Considerations: Pricing, Affordability, and Sustainability

Economic considerations profoundly influence the feasibility and equity of PrEP delivery model implementation. In Hong Kong’s largely user-pay private healthcare sector, PrEP

costs encompass medication expenses, clinical consultation fees, laboratory testing costs, and ancillary services such as STI treatment when needed. Tenofovir-based PrEP medication costs have decreased substantially since generic formulations became available, but still represent a significant expense, particularly for daily long-term use. A cost-effectiveness analysis of PrEP among MSM in Thailand, a middle-income setting with relevance to Hong Kong, found that PrEP delivered to high-risk MSM had an incremental cost-effectiveness ratio of USD $4,836 per disability-adjusted life year (DALY) averted, which was deemed cost-effective using Thailand's cost-effectiveness threshold (Suraratdecha et al., 2018). However, these analyses often assume that medication costs remain relatively low and that delivery systems are efficient.

Pharmacist-prescribed or nurse-led PrEP delivery could potentially reduce overall PrEP program costs through several mechanisms. First, pharmacist and nurse consultation fees are typically lower than specialist physician fees, making PrEP initiation and follow-up more affordable for patients paying out-of-pocket. In settings where pharmacists or nurses can initiate PrEP on the same day without requiring separate physician appointments, patients save both time and consultation costs. Second, the greater accessibility of pharmacists and nurses may reduce opportunity costs for patients, who can obtain services conveniently near their homes or workplaces without extensive travel or time off work. Third, if task-shifting enables more patients to access PrEP and adhere to care, the downstream benefits of HIV prevention accrue to both individuals (avoiding infection and its consequences) and society (reduced transmission and healthcare expenditures for HIV treatment).

However, economic benefits of task-shifting are not automatic and depend critically on implementation design. If pharmacist-prescribed or nurse-led PrEP is offered exclusively in private clinics charging market rates without affordability safeguards, cost barriers may remain prohibitive for many potential users, limiting uptake and perpetuating inequities. International evidence on PrEP uptake consistently identifies cost as a major barrier, with studies reporting that the majority of potential users express concerns about affordability and many indicating they would not use PrEP if required to pay market rates. In Hong Kong specifically, surveys of MSM found that willingness to use PrEP at market price was

low (Cao et al., 2020), with many respondents indicating they could afford only minimal monthly expenditures for prevention services. This suggests that PrEP scale-up, regardless of delivery model, requires addressing affordability through subsidies, insurance coverage, or tiered pricing schemes.

Financing mechanisms for pharmacist-prescribed or nurse-led PrEP could include several approaches. Public-private partnerships could involve government subsidies for PrEP medication dispensed through private sector pharmacies or clinics, similar to drug subsidy programs that exist for other health conditions. Pharmaceutical patient assistance programs, as offered by some manufacturers, could provide PrEP at reduced or no cost to eligible individuals based on income criteria. Health insurance coverage, whether through private insurers or public schemes, could include PrEP as a covered preventive service, reducing out-of-pocket costs for insured individuals. Social franchising models, successfully used for sexual and reproductive health services in many LMIC settings, could standardize quality while providing branded services at accessible price points through negotiated procurement and economies of scale.

Sustainability considerations extend beyond initial implementation to long-term financial viability. For private pharmacies and clinics to invest in PrEP service provision, there must be a viable business case that covers training costs, time investment in patient counseling, and administrative requirements for monitoring and reporting. If reimbursement rates for PrEP services are set too low, providers may be unwilling to offer services, limiting availability. Conversely, if market rates are not regulated, affordability problems will persist. Finding the appropriate balance requires careful economic modeling, consultation with stakeholders, and potentially phased implementation with evaluation of cost structures and sustainability. International experiences with private sector engagement in HIV services offer lessons; for example, social franchising of HIV testing and treatment services in sub-Saharan Africa has shown that private providers can deliver quality services at accessible prices when supported by appropriate financing mechanisms and quality assurance systems.

4. Acceptability and Stakeholder Perspectives

4.1 Patient and Community Acceptability: Preferences, Concerns, and Engagement

Patient and community acceptability of pharmacist-prescribed or nurse-led PrEP delivery is a critical determinant of implementation success. Evidence from multiple settings indicates generally high acceptability, though with important nuances and conditional factors that require attention. In the Toronto PrEP implementation study, 55% of potential users indicated preference for nurse-led services compared to 21% preferring physician consultation, suggesting that many individuals actively prefer non-physician providers for PrEP care (Charest et al., 2021). Qualitative studies exploring these preferences reveal several drivers. Patients perceive nurses and pharmacists as more accessible, easier to schedule appointments with, and having more time to spend in consultation compared to busy physicians. The approachability and non-judgmental communication style that many nurses and pharmacists employ is valued, particularly for discussions about sexual health and HIV prevention that some patients find uncomfortable with physicians.

However, acceptability is often conditional on assurances regarding service quality, provider competence, safety, privacy, and respectfulness. In the Kenyan study examining pharmacy-based PrEP acceptability, participants strongly supported the concept but emphasized that their acceptance depended on confidence that pharmacy providers were properly trained, that services would be delivered privately and respectfully, that medications would be genuine and safe, and that costs would be affordable (Roche et al., 2021). These findings underscore that acceptability cannot be assumed but must be earned through demonstrating commitment to quality, competence, and patient-centered care. For Hong Kong, where awareness of alternative PrEP delivery models is likely low given the current specialist-only landscape, education and community engagement will be essential to build understanding, address concerns, and foster acceptance.

Community engagement should begin early in program planning and continue throughout implementation. Involving representatives from key populations most affected by HIV, including MSM community organizations, sexual health advocates, people living with HIV, and other stakeholders, ensures that program design reflects community priorities,

addresses real-world barriers, and incorporates cultural competence from the outset. Engagement strategies could include community forums to present proposals and gather feedback, advisory committees with community representation providing ongoing input, partnership with community-based organizations in service delivery and referral, and co-design processes wherein community members actively participate in developing program elements. These approaches align with principles of community-based participatory research and have been shown to improve intervention acceptability, uptake, and sustainability.

Specific concerns that communities may raise about pharmacist-prescribed or nurse-led PrEP delivery should be anticipated and addressed proactively. Concerns about provider competence can be addressed by clearly communicating training requirements, certification processes, and quality assurance mechanisms. Concerns about privacy and confidentiality, particularly salient for individuals who may not be "out" about their sexual orientation or HIV risk, require robust privacy protections, physical consultation spaces that ensure confidentiality, and clear policies on health information handling. Concerns about stigma and discrimination necessitate anti-stigma training for all staff, visible commitments to non-discrimination and LGBTQ+ affirmation, and accountability mechanisms for addressing complaints. Addressing these concerns transparently and effectively will be essential to building the trust necessary for community acceptance.

4.2 Healthcare Provider Perspectives: Attitudes, Readiness, and Professional Considerations

Healthcare provider perspectives on pharmacist-prescribed or nurse-led PrEP delivery encompass both professional and practical dimensions. Research examining provider attitudes has identified mixed views. Many pharmacists and nurses express enthusiasm about expanded roles in HIV prevention, viewing PrEP delivery as an opportunity to contribute meaningfully to public health, utilize their clinical skills more fully, and enhance professional standing. Surveys of pharmacists in the United States found that most supported offering PrEP services and believed pharmacists could deliver high-quality PrEP care. Similarly, nurses involved in sexual health services expressed strong interest in providing PrEP and confidence in their ability to do so effectively. These positive attitudes

are encouraging and suggest latent provider readiness that could be mobilized through appropriate enabling mechanisms.

However, provider perspectives also reveal important concerns and barriers. Knowledge gaps about PrEP represent a primary concern; studies consistently show that many pharmacists and nurses lack detailed knowledge about PrEP indications, prescribing guidelines, monitoring requirements, and management of adverse effects. In one survey, fewer than 20% of healthcare providers who were not HIV specialists reported feeling adequately prepared to prescribe PrEP. This knowledge deficit, while addressable through training, represents a real barrier that must be overcome through comprehensive education programs. Providers also express concerns about their legal liability when prescribing PrEP, particularly in jurisdictions where scope-of-practice boundaries are ambiguous or where task-shifting arrangements lack clear regulatory frameworks. These liability concerns can be mitigated through explicit legal protections, professional indemnity insurance coverage, and clear collaborative practice agreements that delineate responsibilities.

Professional identity considerations also influence provider perspectives. Some pharmacists and nurses worry that expanding into prescribing roles may generate conflict with physicians or be perceived as encroaching on medical practice. These interprofessional tensions, documented in research on task-shifting across various health domains, require careful navigation through stakeholder engagement, clear communication about the public health rationale for task-shifting, and collaborative implementation approaches that position pharmacists and nurses as complementing rather than replacing physician services. Importantly, studies examining physician attitudes toward pharmacist and nurse prescribing have found increasing acceptance over time, particularly when physicians recognize that task-shifting addresses unmet needs and reduces their own workload in areas where demand exceeds capacity.

4.3 Interprofessional Collaboration and Integration with Existing Services

Successful implementation of pharmacist-prescribed or nurse-led PrEP delivery requires strong interprofessional collaboration and thoughtful integration with existing healthcare services. The specialist bottleneck that currently constrains PrEP access will not be solved

simply by shifting all responsibility to pharmacists and nurses; rather, an integrated model wherein different providers work at the top of their competencies, with clear communication channels, referral pathways, and mutual respect, offers the optimal approach. Specialists in infectious diseases and sexual health should continue to serve as expert resources for complex cases, provide training and mentorship to pharmacists and nurses delivering PrEP, contribute to guideline development and quality assurance, and receive referrals for patients with complications or special circumstances requiring specialized expertise.

Primary care physicians have an important role in the PrEP care continuum, even when initial prescribing is task-shifted to pharmacists or nurses. Many patients maintain ongoing relationships with primary care providers who manage their overall health and chronic conditions. PrEP services can be integrated into comprehensive primary care through collaborative arrangements where pharmacists or nurses embedded in or partnered with primary care clinics handle PrEP-specific activities while communicating with physicians about their patients' PrEP use. This ensures continuity of care, facilitates management of drug interactions with other medications, and enables holistic approaches to health promotion. The patient-initiated continuing medical education (PICME) approach implemented in Toronto demonstrates one model for engaging primary care physicians in PrEP delivery through patient-driven education and empowerment (Charest et al., 2021).

Sexual health and HIV testing services represent natural integration points for PrEP delivery. In many jurisdictions, sexual health clinics serve as key venues for PrEP provision because they already attract populations at HIV risk, offer STI testing and treatment, provide HIV testing, and employ staff with expertise in sexual health counseling. Integrating pharmacist-prescribed or nurse-led PrEP into these existing services leverages established infrastructure and patient flows. Community-based organizations working in HIV prevention and serving key populations can serve as crucial partners in PrEP education, peer navigation, adherence support, and linkage to clinical services. The successful key population-led health services model in Thailand illustrates the power of community engagement in PrEP scale-up, achieving high uptake and retention through culturally

competent, stigma-free services delivered by trained community members working in collaboration with nurses and physicians (Vannakit et al., 2020).

4.4 Addressing Stigma, Confidentiality, and Trust: Essential Elements for Acceptability

Stigma remains one of the most pervasive barriers to PrEP uptake across all delivery models and populations. HIV-related stigma, stigma associated with sexual orientation and sexual practices, stigma related to taking medications for HIV prevention (which some perceive as suggesting "risky" behavior), and anticipated healthcare provider judgment all deter individuals from seeking PrEP. Research among MSM in Hong Kong and other Asian settings has documented high levels of stigma and discrimination related to sexual orientation, HIV status, and PrEP use (Wei & Raymond, 2018). Addressing stigma requires multi-level interventions including healthcare provider training in cultural competence and non-judgmental communication, public education campaigns to normalize PrEP as a responsible prevention choice, policy-level anti-discrimination protections, and creating visibly affirming healthcare environments that signal safety and welcome to all individuals regardless of sexual orientation, gender identity, or HIV risk.

Confidentiality concerns are particularly salient for PrEP users who may face serious consequences if their sexual practices, HIV risk, or PrEP use become known to family members, employers, or social networks. In Hong Kong's close-knit society where privacy may be challenging to maintain, robust confidentiality safeguards are essential. Pharmacist-prescribed or nurse-led PrEP services must implement clear policies on health information privacy, ensure that consultations occur in private spaces away from public areas, train all staff in confidentiality obligations, use discreet medication packaging and labeling, and provide options for anonymous or pseudonymous service access where legally permissible. Digital health records, while valuable for continuity of care and monitoring, must include strong security protections and access controls to prevent unauthorized disclosure.

Building trust between healthcare providers and communities most affected by HIV is foundational to PrEP acceptability and uptake. Trust is earned through consistent demonstration of competence, respect, confidentiality, and genuine commitment to serving

patients' needs without judgment. Community-led organizations and peer navigators can play vital bridging roles, vouching for providers who have demonstrated trustworthiness and facilitating connections between potential PrEP users and services. Long-term engagement, responsive listening to community concerns, and accountability when problems arise all contribute to trust-building. For pharmacist-prescribed or nurse-led PrEP delivery to succeed in Hong Kong, establishing trust within MSM and other key population communities will be as important as clinical competence and regulatory enablement.

5. Equity Implications and Access Considerations

5.1 Private Sector Expansion and Equity: Potential Benefits and Risks

Expanding PrEP delivery through pharmacist-prescribed or nurse-led models in Hong Kong's private sector holds significant potential to improve equity by reducing the specialist bottleneck and increasing geographic accessibility. However, private sector expansion also carries risks of exacerbating existing disparities if affordability, service quality, and inclusivity are not proactively addressed. The dual nature of Hong Kong's healthcare system, wherein the public sector provides subsidized services but faces capacity constraints while the private sector offers accessibility but at market prices, creates inherent equity tensions that PrEP implementation must navigate carefully.

Potential equity benefits of private sector pharmacist-prescribed or nurse-led PrEP delivery include improved geographic accessibility, as pharmacies and private clinics are widely distributed across Hong Kong including in areas underserved by specialist services. Greater convenience and flexibility in appointment scheduling reduce opportunity costs and logistical barriers that disproportionately affect working individuals, those with caregiving responsibilities, and people with less workplace flexibility. The lower stigma and increased comfort that some individuals report with pharmacists and nurses compared to physicians may particularly benefit those who have experienced discrimination in healthcare settings or who feel intimidated by specialist medical environments. Faster initiation times and reduced waiting periods mean that individuals at highest immediate risk can access protection more quickly.

However, significant equity risks accompany private sector expansion. If pharmacist-prescribed or nurse-led PrEP is offered exclusively through private clinics at unsubsidized prices, cost barriers will prevent access for low-income individuals, unemployed persons, migrants, students, and others with limited financial resources. Research consistently demonstrates that PrEP disparities are most pronounced among racial and ethnic minorities, people with lower socioeconomic status, and those lacking health insurance. In Hong Kong, where income inequality is substantial and not all residents have health insurance coverage, cost-based exclusion could mean that PrEP remains accessible primarily to affluent populations while those at highest HIV risk due to structural vulnerabilities remain unprotected. This would represent a profound equity failure, undermining the public health rationale for PrEP scale-up.

Geographic equity considerations extend beyond simple availability to include the distribution of quality services and culturally competent providers. If PrEP services cluster in affluent areas or cater primarily to certain demographic groups, geographic equity will suffer. Ensuring that pharmacist-prescribed or nurse-led PrEP is available across diverse neighborhoods, including working-class areas, districts with high concentrations of migrant workers, and locations accessible to populations facing geographic isolation, requires intentional planning and potentially targeted incentives or requirements. Quality equity—ensuring that all PrEP services meet high standards regardless of where they are delivered or who delivers them—demands robust quality assurance systems, standardized training, clear clinical protocols, and monitoring mechanisms.

5.2 Reaching Key Populations and Vulnerable Groups: Targeted Strategies

Men who have sex with men represent the population group in Hong Kong most heavily affected by HIV and with greatest need for PrEP, yet they also face significant barriers to accessing healthcare services due to stigma, discrimination, and fear of disclosure. Pharmacist-prescribed or nurse-led PrEP delivery could improve access for MSM through several mechanisms. The greater anonymity and perceived lower judgment in pharmacy settings may reduce barriers for MSM who are not “out” or who prefer to access health services discreetly. Community-based organizations serving MSM could partner with specific pharmacies or nurse-led clinics to create designated PrEP-friendly services where

staff are trained in cultural competence and MSM-specific health issues. Peer navigator programs could accompany MSM to appointments, provide adherence support, and help navigate healthcare systems, bridging trust gaps between communities and providers.

Other key populations including transgender women, sex workers, and people who inject drugs face compounded vulnerabilities related to HIV risk and healthcare access barriers. Transgender women experience high rates of HIV globally and face profound stigma and discrimination in healthcare settings. PrEP delivery models must be explicitly inclusive of transgender women, with providers trained in transgender health competencies, use of correct names and pronouns, understanding of hormone therapy interactions with PrEP, and awareness of the specific HIV risk contexts that transgender women navigate. Sex workers, whether working in commercial establishments, independently, or in informal settings, often face criminalization, stigma, and violence that impede healthcare access. Harm reduction-oriented PrEP services delivered through trusted community organizations or health services specifically designed for sex workers are more likely to reach this population than mainstream healthcare channels.

Migrants and ethnic minorities represent populations that may experience language barriers, cultural barriers, immigration status-related fears, and unfamiliarity with Hong Kong's healthcare system. PrEP services aiming to reach these populations must offer language-accessible information and services, culturally tailored health education, trusted community liaison workers, and explicit assurances regarding confidentiality and non-discrimination regardless of immigration status. Young people, particularly young MSM, face age-specific barriers including limited financial resources, dependence on family members who may be unaware of their sexual orientation, limited health literacy, and concerns about parental notification. Youth-friendly PrEP services with attention to these developmental and social contexts are necessary to reach this high-priority group.

5.3 Affordability and Financial Access: Subsidies, Insurance, and Pricing Strategies

Addressing PrEP affordability is central to achieving equity in access. Multiple financing strategies, potentially implemented in combination, could improve financial accessibility. Government subsidies for PrEP medication, whether provided as direct subsidies to users

meeting eligibility criteria or as reimbursements to pharmacies and clinics providing PrEP at reduced costs, represent a proven approach used in many countries. Such subsidies could be means-tested, targeting individuals with lower incomes, or could be universal, providing PrEP free or at nominal cost to all who meet clinical eligibility criteria. Thailand's experience with PrEP coverage under its Universal Coverage Scheme demonstrates that public financing of PrEP is feasible even in middle-income settings when prioritized as a public health investment.

Insurance coverage expansion, whether through mandatory inclusion of PrEP as a covered preventive service in private health insurance plans or through expanded coverage under government employee insurance schemes, could reduce out-of-pocket costs for insured individuals. However, relying solely on insurance coverage would leave uninsured individuals without financial access, necessitating parallel strategies for this population. Tiered pricing schemes, wherein wealthier individuals pay market rates while lower-income individuals access reduced-price or free PrEP, balance cost recovery with equity goals. Social franchising models could standardize pricing at affordable levels across participating pharmacies and clinics through bulk medication procurement, negotiated service fees, and quality assurance, as successfully demonstrated for sexual and reproductive health services in many settings.

Pharmaceutical manufacturers have implemented patient assistance programs in some countries, providing PrEP medications free or at greatly reduced cost to eligible individuals who meet income criteria and lack insurance coverage. Engaging manufacturers operating in Hong Kong to establish similar programs could expand access, though such programs should be viewed as complementary to rather than substitutes for systemic financing solutions. Price transparency and regulation of private sector PrEP pricing may be necessary to prevent excessive pricing that would exclude many potential users. Clear public information about where to access affordable PrEP, eligibility criteria for subsidies or assistance programs, and patient navigation support to help individuals understand and access financial assistance are essential operational components of an equitable PrEP program.

5.4 Integration with Public Sector Services: Complementarity and Coordination

An equitable approach to pharmacist-prescribed or nurse-led PrEP delivery in Hong Kong's private sector requires thoughtful integration and coordination with public sector services rather than creating parallel systems that risk fragmenting care and exacerbating inequities. The public sector, through Hospital Authority sexual health clinics and other venues, should continue and expand PrEP provision as a safety net ensuring that individuals unable to access or afford private sector services have alternatives. Strengthening public sector PrEP delivery through task-shifting to nurses within public clinics, extended hours, and enhanced community outreach would complement private sector expansion and provide choice to potential users regarding where they prefer to access services.

Coordination mechanisms between public and private PrEP services could include shared clinical guidelines and protocols ensuring consistency in care quality, referral pathways enabling patients to move between sectors as their circumstances or preferences change, integrated monitoring and surveillance systems tracking PrEP coverage and outcomes across both sectors, and joint training and quality assurance activities that build a unified PrEP workforce. Public-private partnerships specifically designed to extend PrEP access, such as government contracting with private pharmacies and clinics to provide subsidized PrEP under agreed quality standards, could leverage private sector accessibility while using public financing to ensure affordability and equity.

Information systems that enable patients to have portable health records, allowing PrEP monitoring data to transfer between providers and sectors, would support continuity of care while respecting patient choice in where to access services. However, such systems must incorporate strong privacy protections given the sensitive nature of PrEP-related information and the serious consequences that unauthorized disclosure could have for individuals. Community education about the full range of PrEP access options, both public and private, empowers individuals to make informed choices based on their preferences, circumstances, and values rather than accessing services based solely on awareness of limited options.

6. Implementation Framework and Recommendations

6.1 Phased Implementation Approach: Piloting, Evaluation, and Scale-Up

Implementing pharmacist-prescribed or nurse-led PrEP delivery in Hong Kong's private sector should follow a phased approach that allows for piloting, evaluation, learning, and adaptive refinement before full-scale rollout. An initial pilot phase involving a limited number of carefully selected pharmacies and private clinics would test operational feasibility, identify implementation challenges, refine training and support systems, and generate early evidence on outcomes. Selection criteria for pilot sites should consider geographic diversity, existing relationships with key population communities, demonstrated commitment to inclusive care, and willingness to participate in rigorous evaluation. Engaging 5-10 pilot sites for an initial 12-18 month period would provide sufficient experience to assess feasibility while remaining manageable in scope.

During the pilot phase, intensive support including hands-on training, mentorship from experienced PrEP providers, regular supervision and consultation, and technical assistance with systems development would maximize success and learning. Rigorous evaluation should employ mixed methods, combining quantitative metrics such as number of individuals screened, PrEP initiations, retention rates, adverse events, and HIV seroconversions with qualitative data on patient satisfaction, provider experiences, barriers encountered, and facilitators identified. Community advisory boards including representatives from target populations should provide ongoing input into pilot implementation and evaluation, ensuring that community perspectives inform adaptations and refinements.

Following pilot evaluation, findings should be synthesized and used to refine the implementation model, update training curricula, strengthen quality assurance mechanisms, and address identified gaps. A staged scale-up phase would gradually expand the number of participating pharmacies and clinics, prioritizing geographic areas with limited current PrEP access and populations facing greatest barriers. Scale-up should be accompanied by continued monitoring and evaluation, recognizing that challenges may differ at scale compared to pilot implementation. Long-term sustainability planning, including securing

stable financing, institutionalizing training and quality assurance systems, and integrating PrEP delivery into routine pharmacy and nursing practice, should occur throughout implementation phases.

6.2 Quality Assurance and Monitoring: Ensuring Excellence and Safety

Robust quality assurance mechanisms are essential to maintain high standards of care, ensure patient safety, build public and professional confidence, and identify areas requiring improvement. Quality assurance for pharmacist-prescribed or nurse-led PrEP delivery should encompass structural elements (provider credentials, training, physical infrastructure), process elements (adherence to clinical protocols, patient communication quality, documentation completeness), and outcome elements (clinical safety, retention in care, patient satisfaction, HIV prevention effectiveness). A quality framework specific to PrEP service delivery should be developed, drawing on international clinical guidelines and adapted to Hong Kong's context.

Provider credentialing and registration systems would verify that pharmacists and nurses delivering PrEP have completed required training, maintain current competency, and meet professional practice standards. Periodic recredentialing could ensure ongoing competency through continuing education requirements and practice audits. Clinical audits, conducted through review of medical records and patient encounters, would assess adherence to PrEP prescribing protocols, completeness of risk assessments, appropriateness of laboratory monitoring, and quality of patient counseling and documentation. Audits should be conducted regularly, with findings used for quality improvement rather than primarily punitive purposes, though serious quality deficiencies requiring corrective action or service suspension should be addressed.

Patient feedback mechanisms, including satisfaction surveys, complaint procedures, and opportunities for patients to report concerns or adverse experiences, provide crucial perspectives on quality from those most directly affected. Mystery shopper approaches, wherein trained evaluators pose as potential PrEP users to assess service quality, can identify issues such as stigmatizing treatment, confidentiality breaches, or inadequate counseling that might not be captured through other monitoring methods. Outcome

monitoring through a PrEP registry or surveillance system would track HIV seroconversions among PrEP users, adverse events, retention in care, and other population-level outcomes, providing early warning of safety issues and enabling evaluation of program effectiveness.

6.3 Policy and Regulatory Recommendations: Enabling Environment for Implementation

Successful implementation of pharmacist-prescribed or nurse-led PrEP delivery requires an enabling policy and regulatory environment. Key policy recommendations include amending prescribing regulations to permit pharmacists and advanced practice nurses to prescribe PrEP through delegated medical acts frameworks, disease-specific prescribing exemptions, or expanded scope-of-practice provisions. Legislation should clearly define the conditions under which non-physician prescribing is permitted, training and competency requirements, supervision or collaboration arrangements, and liability protections. Regulatory reforms should be developed through consultative processes involving professional bodies, healthcare providers, community representatives, legal experts, and health authorities to ensure broad stakeholder support and address concerns.

Professional practice guidelines and clinical protocols specific to pharmacist-prescribed and nurse-led PrEP delivery should be developed by authoritative bodies such as the Hong Kong Advisory Council on AIDS, professional pharmacy and nursing associations, and specialists in HIV medicine. These guidelines would provide clinical algorithms, decision support tools, documentation templates, and quality standards that support consistent, evidence-based practice. Incorporation of PrEP competencies into pharmacy and nursing curricula at the pre-service level would prepare future graduates for PrEP delivery roles, while continuing education accreditation for PrEP training programs ensures quality and accessibility of in-service training.

Financing policies addressing PrEP medication subsidies, insurance coverage mandates, and reimbursement rates for pharmacist and nurse PrEP services are essential to ensure affordability and provider participation. Explicit anti-discrimination policies protecting individuals seeking PrEP from discrimination based on sexual orientation, gender identity, HIV status, or other characteristics, coupled with enforcement mechanisms and

accountability, would create safer healthcare environments. Public health surveillance and monitoring systems should be established or adapted to track PrEP coverage, retention, HIV incidence among PrEP users and non-users, and health equity outcomes, providing data to inform program refinement and resource allocation.

6.4 Research Agenda: Addressing Knowledge Gaps

Despite growing evidence supporting pharmacist-prescribed and nurse-led PrEP delivery, important knowledge gaps remain that Hong Kong-specific research could address. Implementation science studies examining facilitators and barriers to PrEP task-shifting in Hong Kong's specific healthcare context, optimal training and supervision models for local pharmacist and nurse workforces, and strategies to promote interprofessional collaboration would generate actionable insights. Economic evaluations of pharmacist-prescribed or nurse-led PrEP delivery compared to specialist models, including comprehensive cost-effectiveness analyses incorporating healthcare system costs, patient costs, and health outcomes, would inform financing decisions and sustainability planning.

Health equity research examining PrEP uptake, retention, and outcomes across socioeconomic groups, geographic areas, age groups, and key populations would identify equity gaps requiring targeted interventions. Studies exploring patient preferences and decision-making regarding PrEP access modalities, factors influencing choice between public and private sector services, and experiences of stigma and discrimination in different healthcare settings would inform patient-centered service design. Behavioral research on PrEP adherence patterns, factors supporting persistence, and optimal adherence support interventions tailored to Hong Kong populations would enhance prevention effectiveness. Long-term follow-up studies tracking HIV incidence in populations with access to pharmacist-prescribed or nurse-led PrEP compared to areas without such access would provide rigorous effectiveness evidence.

7. Conclusion

Pre-exposure prophylaxis represents a transformative HIV prevention tool that, when combined with other interventions, could significantly advance progress toward ending the HIV epidemic. However, PrEP's potential can only be realized if people who could benefit

from it can actually access it. In Hong Kong, the current specialist-dependent delivery model creates a bottleneck that severely constrains access, resulting in remarkably low PrEP uptake despite moderate awareness and pressing epidemiological need among MSM and other key populations. Pharmacist-prescribed and nurse-led PrEP delivery models offer evidence-based solutions to this access challenge, with international experience demonstrating feasibility, safety, effectiveness, and patient acceptability across diverse settings (Charest et al., 2021).

For Hong Kong, implementing these alternative delivery models through the private clinic sector could substantially expand PrEP access, reduce wait times, improve geographic coverage, and enhance patient choice. However, realizing these benefits requires addressing multiple implementation prerequisites including regulatory reforms to enable non-physician prescribing, comprehensive training programs to build provider competency, robust quality assurance systems to ensure safety and effectiveness, and financing mechanisms to ensure affordability and equity. The equity implications of private sector expansion are profound and double-edged—offering potential to reduce disparities through improved accessibility while risking exacerbation of inequities if affordability and inclusivity are not proactively ensured.

A thoughtful, phased implementation approach that begins with carefully designed pilots, incorporates rigorous evaluation, engages communities meaningfully throughout, and adapts based on evidence and experience offers the greatest likelihood of success. Integration and coordination between private sector pharmacist-prescribed or nurse-led PrEP services and public sector provision, rather than fragmented parallel systems, would optimize equity and efficiency. Strong political will, adequate resource allocation, collaborative stakeholder engagement, and sustained commitment to health equity principles are essential enabling conditions. International evidence provides grounds for optimism that pharmacist-prescribed and nurse-led PrEP delivery can contribute meaningfully to HIV prevention in Hong Kong, but translating this potential into reality requires deliberate action, thoughtful planning, and unwavering commitment to ensuring that all individuals who could benefit from PrEP, regardless of income, geography, or social position, can access this life-saving prevention intervention.

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