Volume 4, No. 10 October 2025
p-ISSN 2980-4868 | e-ISSN 2980-4841
https://ajesh.ph/index.php/gp

Innovative Models for High-Cost Medicines: A Comparative Analysis Across the U.S., Indonesia, and Asia

Raymond R. Tjandrawinata
Universitas Katolik Indonesia Atma Jaya, Indonesia
Email: raytjan@yahoo.com

ABSTRACT:
Rising expenditures on high-cost, high-value medicines poses a major threat to the financial sustainability of healthcare systems worldwide. This paper presents a comparative analysis of innovative financing mechanisms designed to enhance affordability and equity. In the United States, subscription-based models ("Netflix models") for Hepatitis C DAAs have expanded access while capping budget exposure. Indonesia has relied on bulk procurement through its e-catalogue, formulary restrictions, and selective use of compulsory licensing to drive prices down, though access to novel therapies remains constrained. Japan and South Korea have institutionalized health technology assessment (HTA), dynamic price revision, and managed entry agreements to align prices with value. Thailand has employed government-use licenses to enable generic access to high-cost HIV and cancer medicines. India has combined compulsory licensing, aggressive price caps, and extensive production of generics and biosimilars to ensure affordability. China has leveraged national reimbursement drug list (NRDL) negotiations and volume-based procurement to achieve price reductions averaging 50–65% for new drugs. Across these cases, subscription models, advance purchase commitments, and regulatory strategies reflect different trade-offs between equity, innovation incentives, and fiscal sustainability. The findings highlight that while no single approach is universally optimal, each offers valuable lessons. Proactive financing models can unlock broad access where the health impact is clear, while strong regulatory negotiation can secure rapid affordability on a scale. Together, these approaches expand the global policy toolkit for ensuring timely and equitable access to life-saving therapies without compromising the viability of health systems.

Keywords: medicines, innovative models, high-cost medicines

INTRODUCTION

Health systems worldwide face mounting financial pressures from the rising cost of new medicines, especially breakthrough therapies that promise major health benefits at exorbitant prices (Vallano & Pontes, 2024). Global prescription drug spending was estimated at around $1.3 trillion in 2020, and "the high cost of prescription drugs threatens healthcare budgets and limits funding available for other areas in which public investment is needed" (Vincent Rajkumar, 2020). Specialty treatments such as curative antivirals for Hepatitis C, cancer immunotherapies, and biologic drugs often cost tens or hundreds of thousands of dollars per patient, straining both public payors and patients (Guzick, 2020; Roy, 2023). This creates a policy dilemma: how to ensure equitable access to life-saving innovations without bankrupting health financing schemes (Saltman, 2019). In response, payors have begun experimenting with new procurement and payment models—from subscription-based arrangements to advance purchase commitments—aiming to align prices with value and expand access (Lindström et al., 2024).

This article provides a comprehensive analysis of issue discussed, comparing experiences in the United States, Indonesia, and selected Asian countries (Japan, South Korea, Thailand, India, and China) (Yang & Greaney, 2017). It focuses on high-cost, high-value therapies (direct-acting antivirals for HCV, cancer treatments, immunotherapies, biologics), examining how different systems have tackled the affordability challenge (Grunwald, 2019).

(Tran & Zafar, 2018) explored the rising financial pressures that health systems face due to the increasing cost of prescription medicines, particularly breakthrough therapies such as cancer immunotherapies and biologic drugs. Their work provides a comprehensive look at the

global financial burden of new, high-cost therapies and the policy dilemmas they create (Elshiekh et al., 2025). However, this study mainly addresses the issue in terms of healthcare budgets and fails to investigate deeply alternative payment models or their real-world applications in specific countries, especially in lower- and middle-income settings like Indonesia. Another relevant study by Rajkumar (2020) highlights the financial strain caused by high prescription drug costs and the subsequent impact on healthcare budgets (Haque et al., 2021; McClellan et al., 2021). Rajkumar's research underscores the importance of exploring alternative procurement and payment models to align drug pricing with their value to health systems (Dhamija, 2025; Oluwole et al., 2024). While this research is important, it largely focuses on the broad economic implications without exploring the practical challenges of implementing such models in developing countries or assessing their impact on health equity and patient access, which remains underexplored.

The primary objective of this study is to assess the feasibility and implications of new procurement and payment models, such as subscription-based arrangements and advance purchase commitments, for high-cost, high-value therapies (Limnell, 2025; Willard, 2020). This study contributes to health policy by providing concrete recommendations for adapting these models to lower- and middle-income countries, ensuring broader access to essential therapies while maintaining financial viability in healthcare systems.

METHOD

This study employed a qualitative, multi-country comparative policy analysis using secondary data from peer-reviewed literature, policy documents, and WHO reports spanning from 2015 to 2025. The study utilized a thematic comparative synthesis approach to explore the efficacy, challenges, and implications of subscription models and APCs in the procurement of high-cost therapies. By examining the experiences of countries such as the U.S., Indonesia, and several Asian nations, the study identified key trends and insights into the implementation and scaling of these models. The study adopted a cross-source triangulation approach to validate the data, drawing on multiple sources including peer-reviewed academic articles, governmental policy documents, and international reports, thereby ensuring the robustness of the findings. While this research provided valuable insights into the practical application of innovative procurement models, it was limited by the availability and consistency of data across different countries, especially in low- and middle-income regions.

RESULTS AND DISCUSSION

Conceptual Background: Subscription Models and Advance Purchase Commitments

Subscription models and advance purchase commitments (APCs) are innovative pharmaceutical financing strategies that move away from traditional per-unit pricing toward proactive, upfront payments to expand access and incentivize innovation. In subscription models, payors pay a fixed fee for broad access to a therapy over a set period, creating budget certainty, guaranteeing manufacturers revenue, and reducing cost-based rationing—famously dubbed the "Netflix model" when applied to Hepatitis C antivirals, where flat fees enabled mass treatment at lower effective costs (Liu et al., 2020; Hohmeier et al., 2024; Cherla et al., 2020). APCs, by contrast, involve buyers guaranteeing in advance to purchase a certain volume of a product once developed, thus shifting risk to buyers while encouraging manufacturers to invest in R&D and production; notable examples include the Pneumococcal AMC, which pledged $1.5 billion for vaccines in low-income countries, and COVID-19 vaccine deals that accelerated access worldwide (Thornton et al., 2022; Ahmed, 2021; Legge & Kim, 2021). While subscriptions prioritize affordability and health system sustainability through predictable spending, APCs focus on innovation incentives and supply security, yet both aim

to align public health goals with industry incentives by paying upfront to secure long-term gains and more equitable access.

United States Case Study: Subscription Model for Hepatitis C and Beyond

In the United States, innovative payment models are being tested to address the challenge of breakthrough drugs that are highly effective but budget-busting. A landmark example is the Louisiana Medicaid "subscription model" for Hepatitis C treatment, launched in 2019 and often dubbed the "Netflix model." Hepatitis C (HCV) provided an ideal test case: highly curative direct-acting antivirals (DAAs) became available in 2014 with >95% cure rates, but initial prices around $80,000 per course led most state Medicaid programs to severely restrict access (Marshall et al., 2024). By 2018, fewer than 3% of Medicaid enrollees with HCV were being treated, despite the drugs' curative potential. Louisiana's response was to negotiate a subscription-based contract to lift the treatment rationing (Kapadia et al., 2023). In July 2019, Louisiana Medicaid and the state corrections department entered a five-year agreement with Asegua Therapeutics (Gilead's subsidiary) for unlimited access to the DAA sofosbuvir/velpatasvir (Epclusa) (Auty et al., 2022). Under this model, Louisiana pays the drugmaker a fixed annual amount up to a cap (approximately $35 million per year, equal to what the state spent on HCV drugs in 2018) – once that cap is reached, any additional prescriptions are provided at no extra cost (fully rebated) for the rest of the year. In exchange, the chosen drug (generic Epclusa) became the preferred formulary option, and the manufacturer agreed to support outreach efforts to identify and treat patients (Auty et al., 2022). Essentially, Louisiana secured a volume-unlimited license to cure HCV among its Medicaid and incarcerated populations while capping its total spend at the pre-negotiated level. The policy design required federal approval – Louisiana obtained a Medicaid State Plan Amendment to implement supplemental rebates in this fashion.. Notably, the state leveraged competition: multiple companies were invited to bid, and Asegua's offer (backed by an authorized generic) won, yielding an effective price per treatment projected as low as ~$5,000 if all eligible patients are treated (far below previous costs) (Manolis, 2017).

Implementing Louisiana's HCV subscription model faced several operational challenges, including screening large numbers of infected individuals, expanding provider capacity, and ensuring patient adherence. To address this, the state launched an elimination campaign that expanded screening, provider training, and public awareness. Early outcomes were highly promising: prescription fill rates increased by more than 500% in the first year, and by 2023 over 11,000 patients had been treated. Within four years, 67% of all HCV patients in the state received treatment, projected to reach 78% by year five, with HCV-related mortality declining by 11–13%. Crucially, these results were achieved without exceeding the budget cap, as every additional patient after the fixed payment was effectively treated at no extra cost, showing how the subscription approach can dramatically reduce cost per cure while expanding access.

Louisiana's experience has since become a reference point for innovative drug financing. It inspired other states, such as Washington and Michigan, to implement similar subscription programs, and even led to a federal proposal in 2023 for a national HCV elimination initiative. There are also discussions about extending the "Netflix model" to other high-cost conditions like HIV prevention. Compared with outcomes-based contracts used for some cancer and gene therapies, which remain limited by data and logistical hurdles, Louisiana's subscription model represents a more transformative approach by directly reducing unit costs through volume leverage. The U.S. case demonstrates that subscription models can expand access and control spending when supported by competitive markets, regulatory flexibility, and clear public health goals—highlighting their potential as a viable policy tool for high-cost therapies where unmet needs are both significant and finite.

Indonesia Case Study: BPJS Kesehatan, Bulk Procurement, and Local Strategies

Context – JKN and BPJS Kesehatan. Indonesia operates one of the world's largest national health insurance schemes, known as *Jaminan Kesehatan Nasional* (JKN), managed by BPJS Kesehatan. As of 2023, JKN covers approximately 90% of Indonesia's 270 million people, providing a relatively comprehensive benefit package including many essential medicines. Managing pharmaceutical costs in this single-payer-like system is a massive undertaking, complicated by Indonesia's mixed healthcare delivery and the need to serve a huge and geographically dispersed population. High-cost therapies pose a significant challenge to BPJS, whose budget has been strained by rising claims for chronic diseases and expensive hospital treatments (e.g. cancer chemotherapy ranks among the top expenditures). Indonesia has thus far relied on a combination of formularies, centralized procurement, and generic medicines policy to keep drug costs sustainable. While not a "subscription model" per se, Indonesia's approach emphasizes volume-based pricing and pooled procurement, leveraging the scale of JKN to negotiate lower prices. There are also important examples of compulsory licensing and local production being used to address affordability of patented drugs in the past.

Formulary and e-Katalog procurement. Indonesia maintains a National Formulary (Fornas) that lists drugs covered under JKN. Inclusion in the formulary often requires a product to be cost-effective or available as a generic; many ultra-expensive new therapies are not (yet) included due to budget impact concerns. For drugs that are covered, the government uses an electronic catalog procurement system (e-Katalog) to aggregate demand and secure low prices. Since 2014, the LKPP e-Katalog platform has listed hundreds of pharmaceuticals with pre-negotiated unit prices, available for purchase by all public hospitals and clinics without separate tender. This system increases transparency and effectively creates a bulk purchasing arrangement – manufacturers compete to be listed in the e-Katalog at a given price, in exchange for access to the nationwide market. Public providers then buy at these fixed prices. The result has been significantly lower drug prices for many generics and essential meds under JKN. One study found that after JKN's launch and the e-catalogue implementation, procurement prices for medicines dropped substantially, reflecting the bargaining power of the national insurer (prices of some drugs decreased by 20–30% or more). The logic is volume-based purchasing: by committing the large volume of the Indonesian market to whichever suppliers offer the best price, the government can achieve economies of scale. Indeed, e-Katalog has been described as a rapid route to large sales volumes for companies – but only if they agree to the government's price criteria. For example, if multiple manufacturers produce a generic cancer drug, they bid and the lowest price gets listed, driving down costs across the system. This approach is somewhat analogous to pooled procurement internationally, and while it's not a subscription (no lump-sum upfront), it harnesses bulk-buying power to keep prices of high-use drugs in check. However, when it comes to patented, single-supplier drugs (like novel biologics), Indonesia's leverage is limited. In those cases, alternative strategies have been used to improve affordability, as discussed below.

Volume-based pricing and past initiatives (Vaccines, TB, HIV). Indonesia has a history of leveraging public sector capacity and international partnerships to procure high-cost therapies for priority diseases. For instance, for vaccines, Indonesia's state-owned manufacturer Bio Farma produces many vaccines (for domestic use and export) at affordable prices, ensuring that routine immunizations are inexpensive. During the COVID-19 pandemic, the government made advance purchase agreements with manufacturers (and participated in COVAX) to secure vaccine supply – effectively a form of APC, where payments were made to guarantee doses for the population. In tuberculosis (TB), Indonesia has benefitted from the Global Drug Facility for access to subsidized drugs, and negotiated price reductions for newer TB drugs. For example, when bedaquiline (a new TB drug) was introduced at high cost, global

partnerships (USAID, Stop TB Partnership) enabled a price cut (from ~$900 to ~$340 for a six-month course) to low-income countries, including Indonesia. In HIV, Indonesia similarly leveraged generic competition and international pressure to lower drug prices. Notably, the government issued "government use" compulsory licenses on key antiretroviral (ARV) medicines in the 2000s. In 2004, Indonesia bypassed patents on lamivudine and nevirapine, and in 2007 on efavirenz and others, allowing local production/import of generics for its public HIV program. Again in 2012, a decree authorized generic versions of seven patented HIV/AIDS and Hepatitis B drugs (including tenofovir, lopinavir/ritonavir, and others). These actions drastically cut ARV prices and expanded treatment. For example, by the late 2010s, first-line ARV combination pills were available through government procurement at under $10–15 per patient per month, whereas previously prices were several times higher. One advocacy-driven analysis in 2019 revealed that Indonesia had been paying about 4× the international generic price for a common HIV combination (tenofovir/lamivudine/efavirenz) when buying from local companies; after public pressure, BPJS revised its procurement price 48% lower (to Rp 210,000 or ~$15 per bottle), yielding an annual savings sufficient to treat 45,000 additional patients. This underscores how policy tools like price controls, negotiation, and compulsory licensing have been used to make essential therapies affordable for the national program – lessons highly relevant to cancer and immunotherapy drugs today.

High-cost therapies and current challenges. Despite these measures, Indonesia faces difficulties integrating the latest high-cost medicines (e.g. advanced biologics for cancer, or novel gene therapies) into JKN. Many such therapies remain excluded from the national formulary or restricted due to cost. For example, trastuzumab (a biologic for HER2+ breast cancer) was initially very expensive in Indonesia; only after a biosimilar by a local manufacturer (with technology transfer) became available did the price drop and access improve. In 2017, Indonesian regulators fast-tracked approval of generic sofosbuvir and daclatasvir (HCV DAAs) through state-owned enterprise Kimia Farma, and stakeholders pushed to get these DAAs covered by BPJS. Doctors and patient groups urged the government to list sofosbuvir+daclatasvir in the formulary so that Hepatitis C treatment would be "tanggung oleh JKN" (borne by the national insurance) and accessible to thousands of patients. The Ministry of Health did add these DAAs to the formulary around 2017–2018, negotiating prices for generic supply. As a result, by 2019 Indonesia was treating HCV with generics at a fraction of the original brand cost (though overall numbers treated remained modest, partly due to limited diagnosis). This pattern – wait for a generic or pursue a license to enable one – has been Indonesia's main approach for high-cost drugs: delay or avoid paying monopoly prices by fostering competition. The downside is that patients may wait years for access (until patents expire or deals are struck).

Indonesia has not yet attempted a Louisiana-style subscription or an advance market commitment for domestic needs in a formal sense. However, elements of those models are visible: the national insurer does effectively guarantee large volume uptake for any drug it lists (similar to a purchase commitment), and there have been discussions on novel financing for treatments like curing hepatitis C or expanding cancer care. One proposal floated by local experts is to have BPJS negotiate price-volume agreements with pharma companies for expensive drugs – e.g. agreeing to treat a certain number of patients at a discounted price, with the company perhaps offering additional quantities for free beyond a threshold (which is conceptually analogous to a subscription cap). So far, such arrangements have been ad-hoc. In some cases, manufacturers have provided patient assistance programs (free extra vials after a certain number purchased, etc.) to support BPJS – a form of managed entry agreement albeit not systematically reported.

In summary, Indonesia's experience emphasizes centralized bargaining and generics as the primary means to handle high-cost therapies. The e-Katalog system has institutionalized

volume-based procurement and driven down the cost of many drugs in the JKN formulary. For patented medicines critical to public health (HIV, hepatitis, certain cancers), Indonesia has shown willingness to use compulsory licensing and government-mediated price cuts to improve affordability. These measures require political will and have occasionally drawn pushback (e.g. trade pressures after the ARV licenses), but they underscore a commitment to equitable access. The trade-off is potential concerns about how such aggressive price interventions impact pharmaceutical innovation or relationships with industry. Compared to the U.S., where innovative pricing models operate within a market-driven context, Indonesia's approach is more regulatory and system-wide. As Indonesia's burden of cancer and chronic disease grows, the pressure to find sustainable financing for therapies like immunotherapies or new biologics will increase. The lessons from past vaccine, TB, and HIV initiatives suggest that pooled purchasing, local production, and international collaboration will likely be part of the solution – possibly complemented by newer ideas like outcome-based reimbursement or subscription deals if feasible within Indonesia's legal framework. The next section will place Indonesia's strategies in context by examining how other Asian countries have tackled similar challenges with high-cost drugs.

Comparative Perspectives: Approaches in Other Asian Countries

To broaden the analysis, we examine how several Asian health systems – Japan, South Korea, Thailand, India, and China – have innovated (or differed) in pharmaceutical pricing and procurement for costly therapies. Each country has unique policy tools shaped by its health system structure, economic considerations, and legal latitude. These cases range from advanced economies employing health technology assessment and price regulation (Japan, South Korea) to middle-income countries using compulsory licensing or aggressive generic substitution (Thailand, India), and a hybrid approach in China that mixes market competition with state negotiation. Below is a summary of each:

Japan: Cost-Effectiveness Thresholds and Dynamic Price Revision

Japan has a universal health insurance system with strict national control over drug prices. Historically, Japan's National Health Insurance (NHI) list prices were revised every two years to reflect the actual market prices being paid by hospitals and pharmacies – a practice that systematically drives prices down over time. (In fact, since 2018 Japan moved toward annual price revisions for many drugs to capture savings from generics or volume changes more quickly.) This periodic re-pricing means that if a drug's sales surge or if discounts in the market increase, the government will cut the official price accordingly to keep expenditures in check. On top of this, Japan in 2019 formally implemented a health technology assessment (HTA) process focused on cost-effectiveness. New high-cost drugs are subject to cost-effectiveness evaluation after launch, and their reimbursement price can be adjusted based on the rsults. Japan introduced a stepwise cost-effectiveness threshold: currently around ¥5 million per QALY (approximately US$35,000–$45,000) is considered an acceptable cost/QALY. If a drug's incremental cost-effectiveness ratio (ICER) exceeds that, price reductions are triggered on a sliding scale. For example, an ICER between ¥5–7.5 million/QALY might lead to a moderate price cut; if ICER is extremely high (≥¥10 million/QALY), the drug could lose up to 90% of any price premium it initially received and about 50% of its allowed profit margin in the NHI price. In effect, Japan uses HTA to claw back prices to more reasonable levels post-launch, rather than deny coverage. All drugs that undergo this process remain on the market, but their prices are reduced to reflect value. Japan is the first country to institute such mandatory repricing using explicit ICER thresholds in a binary fashion.

Additionally, Japan has stringent rules for annual price cuts if actual sales far exceed initial projections (so-called market expansion re-pricing). A famous example was the cancer

immunotherapy nivolumab (Opdivo): after its use broadened and sales boomed, Japan cut its price by 50% in 2017 and further thereafter, to recalibrate spending. The cost-effectiveness framework, introduced full-scale in April 2019, further institutionalized this approach. If a drug is selected for assessment (criteria include high budget impact or high launch price premium), companies must submit pharmacoeconomic data, and within ~15 months a committee reviews and decides a price adjustment. The policy rationale is to ensure value for money and prevent overspending on drugs that provide marginal benefits. Japan's system also has price-match formulas (new drugs' prices are set by referencing similar existing drugs or cost-plus formulas, with innovation premiums awarded only if the drug offers significant improvement). Those premiums, as noted, can later be reduced if the HTA deems the price too high per QALY.

The Japanese approach has yielded a more sustainable spending trajectory despite the proliferation of pricey therapies. For instance, when Japan first applied cost-effectiveness reviews in a pilot, one expensive heart failure drug had its price cut by 80% after analysis showed a very high ICER, whereas other drugs with lower ICERs saw smaller or no cuts. Routine price surveys have kept generic drug prices to a low level (generics see a sharp price drop on NHI list as soon as they penetrate the market). The trade-off is that manufacturers sometimes voice concerns that Japan's frequent price cuts and stringent value thresholds may make it a less attractive market for innovation (if profits are squeezed too much). Indeed, companies face the risk of losing a large portion of revenue within a couple years of launch if their drug is priced high. However, Japan balances this with mechanisms like "orphan drug" status incentives and special premiums (e.g. Sakigake designation for breakthrough therapies) to reward important innovations. Overall, Japan exemplifies an advanced economy using regulatory pricing (including cost-effectiveness-based price adjustment) as an alternative to novel payment models. The policy ensures high-cost drugs are covered by insurance (promoting access) but at price levels aligned with clinical benefit, and the government continually revises prices to reflect real-world conditions and value.

South Korea: HTA and Managed Entry (Risk-Sharing) Agreements

South Korea also has a national health insurance system (single payer) and employs rigorous pharmacoeconomic evaluation for new drug coverage. Since 2007, any new drug seeking reimbursement must undergo a cost-effectiveness assessment by HIRA (Health Insurance Review and Assessment Service), unless it's exempted (e.g. for rare diseases or pediatric cancers where a "no alternative" waiver might apply). HIRA's Drug Review Committee compares the new drug's incremental benefit and cost to established thresholds or to existing therapies. If a drug is deemed not cost-effective at the proposed price, Korea can refuse listing – unless a special arrangement is made. In 2013, to facilitate access to expensive but important drugs (especially oncology and orphan drugs), South Korea introduced Risk-Sharing Agreements (RSAs). Under an RSA (a type of managed entry agreement), the manufacturer and NHIS (National Health Insurance Service) agree on conditions such as: a price discount or rebate if usage exceeds a certain amount, refunds if the drug doesn't meet outcome targets, or a cost cap beyond which the company bears the expense. These agreements allow coverage of high-cost drugs that otherwise might fail the cost-effectiveness test, by limiting the insurer's financial risk or improving the value proposition. Initially, RSAs in Korea were limited to drugs for cancer and rare diseases with no alternatives. For example, a new leukemia drug might be listed with the condition that the manufacturer provides a 20% rebate on all sales or pays for any treatment beyond the first 3 months for a patient. This lowers the effective cost. Studies indicate that South Korea's RSAs significantly expanded patient access to new therapies and reduced out-of-pocket costs. As of 2018, dozens of drugs (mostly oncology) were under RSA coverage in Korea, with mechanisms like utilization-cap agreements and performance-linked refunds.

Pricing in Korea is ultimately set through negotiation between HIRA/NHIS and the company, after the pharmacoeconomic evaluation. If a drug demonstrates clear clinical superiority, it may get a higher price (often referencing prices abroad but adjusted for Korea's budget). If it's similar to existing drugs, a reference pricing or average price method is used. An interesting feature is Korea's two-track system: drugs that fail cost-effectiveness can sometimes go through a separate "weighted benefit" pathway or waiver if they treat serious diseases – often invoking an RSA as a condition for listing. In recent years, Korea has also implemented price-volume agreements (if sales exceed a forecast, price is cut) and periodic price cuts for older drugs.

Example: Nivolumab (Opdivo) and pembrolizumab (Keytruda), costly immunotherapies, were listed in Korea's insurance under RSAs that include outcome-based refund provisions – the insurer pays for a set number of cycles; if the patient needs more or doesn't respond, the manufacturer bears some cost. Such schemes helped resolve uncertainty about the value. By 2021, Korea reported that RSA-covered drugs had rapidly grown and greatly improved timeliness of access for cancer patients, compared to earlier years when negotiations could stall access for long periods.

The South Korean approach thus combines HTA-driven pricing (to ensure value for money) with flexible managed entry agreements to handle uncertainty and high prices. The policy rationale is to split the risk: the insurer only fully pays if the drug works and if budget impact stays reasonable; the manufacturer gets market access but might have to rebate or refund depending on outcomes or sales. This approach aligns with global trends in managed entry schemes. The challenge is administrative complexity – monitoring outcomes and usage to enforce RSA terms requires good data infrastructure. HIRA, fortunately, has a claims database to utilize for this purpose. The broader impact has been positive: more drugs available to patients with some financial safeguard. However, Korean authorities are mindful of the budget – in late 2022, they proposed further reforms to increase cost-effectiveness threshold transparency and possibly share RSA costs across stakeholders.

In summary, South Korea exemplifies a system where formal HTA meets pragmatic negotiation. It hasn't needed a subscription model (as the single-payer system can negotiate nation-wide prices anyway), but it pioneered conditional reimbursement contracts in Asia. By doing so, it achieved a balance: innovative drugs (like cutting-edge oncology meds) are included in coverage, but often under special pricing deals that protect the health budget and encourage manufacturers to price responsibly or prove real-world benefit.

Thailand: Universal Coverage and Compulsory Licensing for Access

Thailand's Universal Coverage Scheme (UCS), which covers the bulk of the population, has taken a bold stance at times to ensure affordability of high-cost medicines. Thailand uses a National List of Essential Medicines (NLEM) and typically only reimburses drugs on this list for UCS patients. The NLEM inclusion process considers cost-effectiveness via the Health Intervention and Technology Assessment Program (HITAP) – effectively Thailand's HTA body. Thus, like Japan and Korea, Thailand uses economic evaluation to decide which new therapies to cover under public insurance. However, Thailand stands out for its assertive use of compulsory licensing (government use licenses) as a procurement strategy when faced with unaffordable patented drugs. In the late 2000s, Thailand's Ministry of Public Health issued a series of government use licenses to override patents on several crucial medications in order to import or locally produce generics at lower cost. This occurred under the legal flexibilities allowed by WTO/TRIPS for public non-commercial use.

Notable cases: In 2006–2007, Thailand issued compulsory licenses for the AIDS drugs efavirenz (Merck) and lopinavir/ritonavir (Abbott), as well as the cardiovascular drug clopidogrel (Plavix by Sanofi) – each time after price negotiations with the patentees failed to

yield affordable prices. By importing generic efavirenz from India, Thailand slashed the cost by more than half and was able to expand HIV treatment to thousands more patients. Then, in January 2008, just before a change in government, Thailand's health minister Dr. Mongkol Na Songkhla approved licenses on four high-cost cancer drugs. These were letrozole, docetaxel, erlotinib, and imatinib – treatments for breast cancer, lung cancer, and leukemia that were far too expensive for the UCS to provide widely. At the time, for instance, imatinib (Gleevec) for leukemia was extremely costly; the license allowed generic versions (or imports via the Government Pharmaceutical Organization) to supply patients at a fraction of the cost. The government cited public health needs: cancer had become the leading cause of death in Thailand, and "the government says it cannot afford patented drugs for its national health scheme, which covers 80% of its 63 million people.". In issuing the licenses, Thai authorities did attempt last-minute price talks with manufacturers, but when discounts were not satisfactory, they proceeded with the compulsory lincences. The impact was substantial price reductions (e.g. generic letrozole and docetaxel came at a small fraction of the original price), enabling the UCS to start offering these cancer medicines to patients who previously had no access. One analysis showed that after licensing, the cost per patient of letrozole dropped so much that treating early-stage breast cancer with it became feasible in the system, whereas before it was effectively out of reach.

Thailand's actions drew international controversy – pharma companies and some governments (e.g. the U.S.) protested, and Abbott notably retaliated by withdrawing some pending drug registrations in Thailand (though it later reversed some decisions). Nevertheless, Thailand held its ground, arguing these measures were legal and moral to save lives. Civil society and evidence played a big role: HITAP provided evidence on disease burden and cost, and patient groups pressed for access. Over time, some of the targeted companies negotiated settlements or offered deeper price cuts to avoid future licenses. By demonstrating willingness to use compulsory licensing, Thailand strengthened its bargaining position.

Aside from licensing, Thailand also established a strong generic drug production capacity in its Government Pharmaceutical Organization (GPO), which has made ARVs, oncology drugs, and biosimilars for the Thai market at lower cost. The UCS's benefit design, combined with the NLEM, effectively concentrates demand, somewhat similar to Indonesia's e-catalog: if a drug is on the NLEM, the government will procure it in bulk for public hospitals. Thailand also has engaged in pooled procurement for certain high-cost items (for example, joint procurement of drugs for rare diseases in collaboration with other government schemes to get volume discounts).

In recent years, Thailand's focus has shifted more to price negotiations and HTA rather than frequent use of compulsory licensing, but the legacy remains. The government use license policy created significant savings and allowed Thailand to rapidly scale up HIV treatment and improve cancer drug access in the late 2000s. For instance, the number of Thai HIV patients on ARVs jumped and AIDS mortality declined, partly thanks to affordable generics. On the cancer front, more patients could receive therapies like imatinib for leukemia, improving outcomes. The trade-off, as always, is potential chilling effects on pharmaceutical investment or diplomatic friction. But Thailand's example showed that for middle-income countries with constrained budgets, compulsory licensing is a potent tool to obtain high-cost drugs at marginal cost, essentially an extreme form of price control that forces a form of advance market commitment to generics (the government commits to buy generics, bypassing the patent monopoly).

In summary, Thailand's approach to high-cost therapies under the UCS has been characterized by firm cost containment and a willingness to prioritize public health over patent exclusivity when necessary. It uses HTA to decide what to cover, and if an important drug isn't affordable, it has not shied away from invoking TRIPS flexibilities to procure it cheaply (the

"government use" licenses). Alongside that, the country has cultivated local manufacturing and generally emphasizes generics. This stands in contrast to subscription models – rather than pay the patent holder a lump sum for unlimited access, Thailand opted in several cases to pay generic producers to get unlimited access, by nullifying the patent barrier. The outcome is similar (broad access at lower total cost), though the method is legally and politically more confrontational. Thailand's experience raises important issues for scaling such measures and their sustainability, which we will revisit in the discussion.

India: Generic Manufacturing, Price Controls, and Selective Licensing

India is known as the "pharmacy of the developing world" due to its huge generic pharmaceutical industry. For domestic patients, this translates into widespread availability of generic medicines at relatively low prices – a cornerstone of India's strategy for affordability. The vast majority of medications used in India's health system (especially in the public sector) are generics, often produced by Indian companies at a fraction of the cost of the original brands. For high-cost therapies, India has leaned on compulsory licensing, patent challenges, and direct price regulation to improve access, while also leveraging its manufacturing might to produce biosimilars and generics of expensive biologics as soon as legally possible.

A famous example highlighting India's approach is the case of sorafenib (Nexavar), a tyrosine-kinase inhibitor for liver and kidney cancer. In 2012, India's patent office granted the country's first-ever compulsory license to an Indian generic firm (Natco Pharma) to produce sorafenib, which was patented and sold by Bayer at the time. The justification was that Bayer's price – about ₹280,000 per month (US$5,600) – was unaffordable and that the reasonable requirements of the public were not being met. The license allowed Natco to sell sorafenib at ₹8,800 per month (roughly $165), a 97% price reduction. Bayer's drug reached fewer than 200 patients in India in 2011 due to cost, whereas an estimated 30,000 patients could benefit from it. The compulsory license massively expanded access – Natco's generic (and others that followed) brought the treatment within reach of many more patients. Bayer fought the decision in court, but Indian authorities and later courts upheld it, emphasizing that patents cannot be used to deny life-saving treatment in contexts where patients cannot afford it. This set a precedent: India signaled it would use compulsory licensing in cases of exorbitant pricing for critical drugs, aligning with its pro-access stance in trade and health policy.

Beyond compulsory licenses (which have been infrequent – sorafenib remains one of the only high-profile cases, with others considered but not granted), India relies heavily on price control regulations. The National Pharmaceutical Pricing Authority (NPPA) fixes ceiling prices for essential medicines under the Drug Price Control Order (DPCO). While historically this covered mostly older essential drugs, in recent years India has extended price caps or margin caps to some expensive drugs as well. For example, in 2017–2019 NPPA took measures to curb prices of cardiac stents and knee implants (medical devices) and then turned to cancer drugs. In 2019, NPPA invoked an emergency provision to cap trade margins on 42 anti-cancer drugs, leading to price drops of up to 85% for certain brands. The government highlighted that cancer had caused catastrophic spending for many families, and "affordability of cancer medicines is the most important determinant for equitable cancer care". By capping the markup to 30%, it forced companies to slash exorbitant retail prices. According to official data, this trade margin rationalization resulted in 105 cancer drug brands reducing prices, with 17 brands dropping by more than 70% and many others by 50% or more. For instance, a biosimilar trastuzumab manufactured in India might have been sold at ₹50,000 per vial but was reduced to ~₹12,000 (around $150) per vial by NPPA's action. These kinds of price interventions have saved Indian patients and insurers (where insurance applies) hundreds of crores of rupees and expanded the usage of these drugs. The Indian government openly views price controls as a legitimate tool to fulfill the right to health, even if it means industry profits are curbed.

India's generic production also means that when patents expire (or when patents are weak or successfully challenged), domestic companies quickly bring much cheaper versions to market. For example, India has been a hub for biosimilars – affordable versions of biologic therapies like rituximab, trastuzumab, adalimumab, etc., have been developed by Indian firms often at a fraction of the original price. These biosimilars are used in India and exported to other emerging markets. Consequently, some expensive cancer or autoimmune biologics that remain high-priced in the West are available in India at significantly lower cost due to local competition. Even so, some newer therapies (especially gene therapies or very novel classes) remain out of reach for many Indians – either not marketed or only available to the wealthy via private import.

In terms of innovative procurement models akin to subscription or APC, India has not needed a "Netflix model" in the same way, because the government's approach is typically to mandate a low price or source a generic rather than pay the originator a lump sum. India's government drug supply for public hospitals (especially in states with free medicine schemes) can resemble volume procurement: states issue tenders for large quantities of generics and get low per-unit prices. At the national level, there is a program of Jan Aushadhi Kendras (cheap generic pharmacies) to ensure availability of low-cost generics across the country. For vaccines and public health commodities, India has engaged in advance purchase agreements (for instance, the government prepays domestic manufacturers for routine vaccines or for COVID-19 vaccines as it did in 2021) – a form of APC to secure supply. One could argue that India's massive public sector demand and preference for generics creates an "advance market" for any company willing to supply at low cost, which is why so many generic firms thrive.

In summary, India's route to high-cost drug access is dominated by genericization and price regulation. The philosophy is that competition and government fiat should drive prices down to marginal cost, rather than the government paying high prices even in alternative payment models. The benefits are clear in terms of cost saved and patients treated – e.g., tens of thousands of additional cancer patients treated after price caps, thousands of HIV and hepatitis patients on therapy due to cheap generics, etc. The limitations are that for truly novel, patented drugs where India cannot easily invoke a license or where local manufacturing is not immediate, access can lag (patients must rely on compassionate programs or wait years until a generic is possible). However, India's stance has also pressured pharma companies to offer better prices or voluntary licenses for the Indian market sooner. For example, newer hepatitis C DAAs were voluntarily licensed by Gilead to Indian generic firms early on, partly because of India's patent strictness and generic competition – resulting in generic sofosbuvir being available in India at <$400 per cure by 2015 (compared to $84,000 in the U.S.). This enabled India's national hepatitis C program to start in 2018 with affordable drug costs.

Overall, India demonstrates a maximalist use of generics and regulatory power to address high-cost therapies, in contrast to creating new payment models with originators. It reflects India's position as a global champion of generic medicines and medicine access.

China: National Negotiation, Bulk Procurement, and Pilots in Value-Based Pricing

China has rapidly emerged as a huge pharmaceutical market and has undertaken sweeping reforms in the past decade to manage drug costs while improving access. Two signature strategies define China's approach: annual national price negotiations for new drugs (NRDL updates) and the "Volume-Based Procurement (VBP)" program for off-patent drugs. Together, these have led to dramatic price reductions for many therapies – with oncology and other high-cost drugs coming down in price via negotiation, and common generics seeing massive cuts via bulk tendering. Additionally, China has begun incorporating health technology assessment concepts and even piloting outcome-based payments in limited cases, signalling a move toward more value-based pricing.

China has transformed drug pricing and access through the National Reimbursement Drug List (NRDL) negotiations, which since 2016 have required companies to offer steep discounts in exchange for inclusion in basic insurance. Average price cuts range from 50–65%, with some drugs reduced by over 70%, leading to major improvements in access to innovative therapies such as targeted cancer drugs and hepatitis C antivirals. For example, the inclusion of trastuzumab and other cancer drugs after price reductions resulted in a surge in utilization, making lifesaving treatments affordable for millions. Between 2016 and 2021, innovative drug prices fell by at least 44% on average, and in some cases to the lowest levels globally. These dynamic forces even multinational firms to cut prices drastically, since exclusion from the NRDL would mean limited sales. The process incorporates pharmacoeconomic data and implicit cost-effectiveness thresholds, aligning prices more closely with clinical value and national affordability.

Complementing NRDL negotiations, China's Volume-Based Procurement (VBP) program has aggressively cut generic drug prices through centralized bulk tenders, with reductions averaging 52% and often reaching 80–90% compared to branded versions. By driving prices closer to manufacturing costs and freeing fiscal space, VBP has enabled greater investment in innovative but costly therapies. In parallel, China is piloting value-based models such as outcome-based risk-sharing agreements, installment payment plans for gene therapies, and bundled cancer care payments. A national HTA center now supports evidence-based pricing decisions, moving the system toward international best practices. Together, these reforms—NRDL negotiations, VBP, and early value-based pilots—have reshaped China's pharmaceutical market by expanding patient access, reducing out-of-pocket costs, and positioning the country as a global leader in large-scale drug affordability strategies.

In summary, China's strategy is characterized by aggressive negotiation and leveraging its huge market size. It has effectively created a yearly "price bargaining tournament" that forces drug companies to compete on price for inclusion – analogous to an advance purchase commitment in that China is saying: "We will buy large volumes (and guarantee nationwide reimbursement) if you give us a low price." The success rates for negotiation are high (e.g. >80% of drugs in recent rounds eventually agreed to terms) (Wu, 2023), indicating companies are willing to cut prices to gain access. Meanwhile, the VBP ensures the health system isn't overpaying for older drugs, thereby freeing funds for new therapies. Together, these policies have markedly improved affordability: oncology drug spending per patient has fallen and utilization has widened. The obvious trade-off is the impact on pharma revenues – but given China's importance, most companies have adapted by using a "low margin, high volume" model for China. For purely domestic innovation, the government balances rewards vs. cost by sometimes providing R&D subsidies to local firms even as it negotiates their prices down.

China has not explicitly done a "subscription model" for any drug yet, but it did consider one for antibiotics (to stimulate new antibiotic development by paying companies an annual fee irrespective of volume, as the UK has piloted). As of 2025, that remains under study. Instead, China's focus is on driving prices to value-based levels through negotiation and using bulk purchasing to eliminate inefficiencies. This is effectively an alternative route to the same goal: ensuring broad patient access at sustainable cost. The Chinese example illustrates that even without formal subscription models, a state can use its monopsony power (single buyer power) to achieve many of the same ends – the NRDL negotiations guarantee manufacturers a large patient pool (like a market commitment) but only at a price that the payer finds acceptable.

Discussion: Policy Trade-offs, Preconditions, and Scalability

The comparative cases above reveal a spectrum of mechanisms – from paying for unlimited access via subscriptions to demanding price reductions via negotiation or licensing. Each approach carries specific trade-offs and prerequisites. In this discussion, we synthesize

key insights: What do subscription models vs. other strategies mean for payors and manufacturers? What institutional conditions are needed to implement these models? Can they be scaled or transferred to other settings? And what risks attend their implementation?

Trade-offs and Incentives: Subscription models (like the U.S. HCV example) offer a win-win on volume – patients get treated without delay, and the payor's total spend is capped/predictable. The manufacturer, in turn, gets a lump-sum revenue and potentially treats a much larger population (albeit at a lower unit price), which can be acceptable if the alternative was very limited sales due to rationing. The trade-off is that the payor might pay for unused "capacity" if fewer patients come forward than expected, or if a cure effectively exhausts the patient pool before the contract period ends. For instance, if Louisiana had failed to find enough HCV patients, it still would have paid the fixed fee (in effect overpaying per treatment) – this places a premium on robust epidemiological data and outreach. Conversely, for the manufacturer, the risk is an underestimation of volume: if vastly more patients utilize the drug than anticipated, the effective price per patient for the manufacturer drops low, potentially hurting profits (hence contracts may include volume caps or renegotiation triggers) (Baryakova et al., 2023). Thus, both sides assume some risk. Advance purchase commitments, similarly, commit funds up-front – beneficial in guaranteeing supply or innovation, but risky if the product disappoints or if demand shifts. For example, APCs for vaccines can lead to surplus or sunk costs if fewer doses are needed or if a funded candidate fails; yet they can also expedite product availability (as seen with COVID-19 vaccines).

In contrast, price-cutting strategies (negotiation, compulsory licensing, price caps) shift value towards the payor and patient at the expense of the manufacturer's margin. The clear gain is immediate affordability and potentially fiscal sustainability – more patients treated within the same budget (Burn & Casak, 2022). The trade-off here is potential impact on innovation incentives and industry behavior. Pharmaceutical companies argue that drastic price reductions (especially imposed ones like in India or Thailand) could deter R&D investment for those markets or lead to fewer new therapies being launched there (Donato et al., 2022). However, the evidence is mixed: companies still seek entry into large markets like China and India even with lower prices, due to volume and ethical pressure. There's also a geopolitical trade-off: use of compulsory licenses can invite trade disputes or diplomatic pressures (Thailand experienced USTR watch-listing, India faced legal challenges by Bayer, etc.). Policymakers must weigh the short-term public health benefit against potential long-term relationship costs with innovators. Some mitigate this by using CL sparingly or as a negotiating threat rather than routine tool (wenjuan & Zhao, 2023).

Institutional Preconditions: Implementing innovative models demands certain institutional capacities and legal frameworks:

a. For Subscription/APC models: A payor needs a good grasp of disease epidemiology and utilization projections (to size the contract appropriately), and the budget flexibility to make large up-front commitments. The U.S. Medicaid program had to secure CMS approval for supplemental rebates and navigate "best price" rules – an institutional barrier that needed workaround (Williams et al., 2025). In many countries, multi-year contracts require political stability and trust that future governments will honor payments. There is also a need for procurement competence – structuring contracts with clear terms on volume, outcomes, and escape clauses. Louisiana's experience benefited from strong support of the governor and collaboration between health departments and Medicaid to execute the deal (Herd et al., 2023). Not every system has that alignment. Advance purchase deals (like AMCs) often require a consortium of funders or donors and robust legal frameworks to manage contingent commitments (for example, Gavi's AMC was backed by legally binding pledges from multiple governments and organizations). Essentially, the precondition is a

high level of coordination and financial commitment upfront, which can be challenging for low-resource settings without external support.

b. For HTA and managed entry: Countries like Japan and South Korea illustrate that having institutionalized HTA agencies and data infrastructure is key. You need the capability to assess cost-effectiveness, negotiate based on those assessments, and monitor outcomes for risk-sharing. This means having skilled health economists, reliable clinical data, and sometimes patient registries. South Korea's HIRA, for instance, collects detailed utilization data that allow it to verify RSA rebate conditions. Where such capacity is lacking, implementing outcome-based agreements could fail (e.g., if outcomes aren't tracked, the deal can't be settled fairly).
c. For price negotiations and CL: A government must have the regulatory authority and political will to stand up to industry pressure. China's negotiation success is predicated on the government's strong role and the unified insurance system that can say no to a drug unless price is acceptable. In fragmented systems, negotiating leverage is weaker. For compulsory licensing, the legal precondition is that TRIPS flexibilities are encoded in national law (India, Thailand, Indonesia all have provisions for government use licensing, enabling swift action) (Ward et al., 2025). There's also a need for a supply alternative – either domestic manufacturers or import sources ready to provide the generic product under license. In Thailand, the GPO and Indian suppliers were able to deliver quality generics for ARVs and cancer drugs once licenses were issued; without that, a license would be just paper. Thus, a robust generic industry (or access to one) is a precondition for successfully leveraging CL to actually obtain drugs.

Scalability and Feasibility: Can these models be scaled or transplanted? Some can: the subscription model for HCV is already being considered for national scaling in the U.S., and conceptually it could be applied in other countries or disease areas (e.g., Australia essentially did a national Hep C subscription – treating ~60,000 patients in 5 years for a capped budget). Middle-income countries might consider a subscription or APC for diseases where generics are not an option and public health payoff is huge – for instance, a group of countries could collectively do an APC with a company for a lower price on a new gene therapy for a prevalent genetic disorder, in exchange for volume commitment. The challenge is financial – pooling and sustaining funding – and governance if multiple countries collaborate. Scaling RSAs and HTA-driven pricing is largely a matter of building technical capacity; many upper-middle-income countries are now establishing HTA units to guide reimbursement (Thailand's HITAP has even helped build HTA in neighboring countries). Risk-sharing agreements are increasingly common wherever payors are sophisticated (e.g., China may adopt them soon, Eastern European countries have them).

Price negotiation strategies (like China's NRDL approach) are very scalable – any large public purchaser can attempt this, though success depends on market size leverage. Smaller countries might need to form purchasing coalitions to get similar clout. The joint negotiation by the EU for COVID-19 vaccines is one example of pooling for leverage. For generics procurement, pooled tenders (like those done by Gulf states collectively, or the Pan-American Health Organization's Revolving Fund for vaccines) demonstrate scalability beyond one country.

Risks and Mitigation: Each model carries implementation risks that need addressing:

a. Subscription/APC: Risk of overpayment or underutilization – mitigated by good data and perhaps contract clauses (for instance, Louisiana's contract was five years; if a cure for HCV had become obsolete due to a new breakthrough, the state might be stuck for a time – but at least it wasn't an eternal commitment). There's also moral hazard: if a payor prepays for unlimited use, providers might over-treat or not prioritize appropriate patients (Engstrom et al, 2023). Louisiana dealt with this by removing barriers but still encouraging

proper clinical guidelines (e.g. focusing on high fibrosis patients first) . In an APC for R&D, risk is paying and the product failing – mitigated by milestones or pulling funding if certain benchmarks aren't met, or diversifying (sponsoring multiple candidates as in some vaccine AMCs).

b. Managed entry (RSAs): Risk of administrative burden and confidentiality. These deals are complex to administer and often kept secret (which can reduce transparency). Ensuring that outcomes data are credible is a challenge – if a drug doesn't "work," who decides and how? To mitigate this, clear outcome definitions and independent auditing may be needed. Another risk is that RSA can be a bandaid to avoid tough decisions: one might ask, if a drug needs an RSA, perhaps its price is just too high? However, they do buy time and patient access while data mature.
c. Compulsory licensing/Price controls: Risk of industry backlash – mitigated by adhering to international rules (to avoid legal sanction) and by communicating that it's a measure of last resort. Also, risk of quality or supply issues if relying on alternative suppliers – this calls for strong regulatory oversight to ensure generics are of high quality. For example, when Thailand imported Indian generics, they had to ensure those were WHO prequalified or approved by a stringent regulator.
d. Negotiation and HTA: Risk that manufacturers decline to offer acceptable price, leaving patients with no access (a stalemate). This happened occasionally in China – a few cancer drugs weren't listed because the company wouldn't cut price enough. Patients then either pay out-of-pocket or wait. Over time, most companies came around in China due to market pressure. To mitigate this, payors might need to show flexibility or offer volume sweeteners. HTA also faces the risk of political pushback – if a highly publicized new drug is deemed not cost-effective and denied, there can be public outcry. Systems must have robust communication to explain decisions, or be willing to negotiate special deals (like an RSA) to permit coverage. Japan's approach of adjusting price rather than denying coverage is one way to handle this.

Equity and Sustainability: A crucial dimension is how these models impact health equity and system sustainability. Subscription models and APCs generally promote equity – by removing cost as a barrier, all eligible patients can get treatment (e.g., curing prisoners and Medicaid patients in Louisiana without copay). Compulsory licenses and generics likewise improve equity by making drugs affordable in public sector or via cheap pharmacies (as in India's case where generic ARVs allowed free HIV treatment to hundreds of thousands). Risk-sharing agreements and HTA ensure that limited resources are spent where they yield the most health benefit, arguably an equity-positive move (maximizing health gains per dollar helps more patients in need overall).

Ensuring sustainability in pharmaceutical financing requires balancing affordability with incentives for future innovation, as overly strict price controls risk discouraging R&D, while models like subscriptions and advance purchase commitments (APCs) offer a middle ground by guaranteeing companies predictable returns at prices that enable broad access. Examples such as Louisiana's HCV subscription and Gavi's pneumococcal AMC show that well-structured deals can both expand treatment and stimulate innovation. These models are now being explored for antibiotics, gene therapies, and chronic illness drugs, with variations like outcome-based payments or pooled regional funds to improve feasibility. However, while price controls are simpler to administer, subscription and managed entry agreements demand greater administrative capacity, meaning countries must carefully assess their resources when adopting such approaches.

CONCLUSION

The analysis found that addressing high drug prices requires tailored, context-specific strategies rather than a one-size-fits-all approach. Subscription models and advance purchase commitments (APCs) provide proactive financing by paying upfront to expand access and encourage innovation, while Asian methods such as price negotiation, health technology assessment (HTA), compulsory licensing, and fostering generic competition promote affordability and equity. Both frameworks can enhance sustainability—subscriptions stabilize budgets and HTA ensures value-based spending, while price controls safeguard public funds—though careful design is vital to prevent waste or unintended barriers to access. Future research should examine how hybrid "smart procurement" models, integrating evidence-based policy, sustainable financing, and strategic negotiation, can be adapted for diverse economic settings to optimize the balance between equity, innovation, and long-term system sustainability.

REFERENCES

Ahmed, M. (2021). Innovative Vaccine and Immunization Funding: Advance Market Commitments. In: Innovative Humanitarian Financing. Palgrave Studies in Impact Finance. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-83209-4_3

Baryakova, T. H., Pogostin, B. H., Langer, R., & McHugh, K. J. (2023). Overcoming barriers to patient adherence: The case for developing innovative drug delivery systems. Nature Reviews Drug Discovery, 22, 387–409. https://doi.org/10.1038/s41573-023-00738-4

Burns, L.R., Cassak, D. (2022). The GPO Chronicle, Part I: 1910–2000—The Players, Market Structure, and Market Conduct. In: The Healthcare Value Chain. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-031-10739-9_4

Donato, A. A., Pita, J. R., & Batel-Marques, F. (2022). Classification of pharmaceutical policy measures during the Portuguese financial crisis. Inquiry: The Journal of Health Care Organization, Provision, and Financing, 59, 00469580221093171. https://doi.org/10.1177/00469580221093171

Kapadia, S. N., Zhang, H., Gonzalez, C. J., Sen, B., Franco, R., Hutchings, K., Wethington, E., Talal, A., Lloyd, A., Dharia, A., Wells, M., Bao, Y., & Shapiro, M. F. (2023). Hepatitis C treatment initiation among US Medicaid enrollees. JAMA Network Open, 6(8), e2327326. https://doi.org/10.1001/jamanetworkopen.2023.27326

CGD. (2005). What is an advance market commitment? Center for Global Development. https://www.cgdev.org/blog/what-advance-market-commitment

Cherla, A., Howard, N., & Mossialos, E. (2021). The 'Netflix plus model': Can subscription financing improve access to medicines in low- and middle-income countries? Health Economics, Policy and Law, 16(2), 113–123. https://doi.org/10.1017/S1744133120000031

Engstrom, N. F., Venook, T., Engstrom, D. F., & Saltzman, S. (2023). Plaintiffs and attorneys in multidistrict litigation: Strengths, deficits, and paths forward (Stanford Law School Working Paper). https://doi.org/10.2139/ssrn.4477266

Herd, P., Hoynes, H., Michener, J., & Moynihan, D. (2023). Introduction: Administrative burden as a mechanism of inequality in policy implementation. RSF: The Russell Sage Foundation Journal of the Social Sciences, 9(4), 1–30. https://doi.org/10.7758/RSF.2023.9.4.01

Hohmeier, K. C., Baker, P., & Lobo, E. (2024). Permissionless innovation in the pharmacy business model: The case for the membership pharmacy model. JAPhA Practice Innovations, 1(2), 100007. https://doi.org/10.1016/j.japhpi.2023.100007

Kapadia, S. N., Zhang, H., Gonzalez, C. J., Sen, B., Franco, R., Hutchings, K., Wethington, E., Talal, A., Lloyd, A., Dharia, A., Wells, M., Bao, Y., & Shapiro, M. F. (2023). Hepatitis C treatment initiation among US Medicaid enrollees. JAMA Network Open, 6(8), e2327326. https://doi.org/10.1001/jamanetworkopen.2023.27326

Lashitew, A. A., Narayan, S., Rosca, E., & others. (2022). Creating social value for the 'base of the pyramid': An integrative review and research agenda. Journal of Business Ethics, 178, 445–466. https://doi.org/10.1007/s10551-020-04710-2

Legge, D. G., & Kim, S. (2021). Equitable Access to COVID-19 Vaccines: Cooperation around Research and Production Capacity Is Critical. Journal for Peace and Nuclear Disarmament, 4(sup1), 73–134. https://doi.org/10.1080/25751654.2021.1906591

Liu, H. H., Mulcahy, A. W., & Rose, A. J. (2020, May). Subscription models for prescription drugs: The motivation, potential, and limitations of a new payment model [Perspective]. RAND Corporation. https://www.rand.org/pubs/perspectives/PEA308-1.html

Manolis, A. S. (2017). Transcatheter aortic valve implantation economics: A grisly reality. Annals of Cardiothoracic Surgery, 6(5), 516–523. https://doi.org/10.21037/acs.2017.07.02

Rajkumar, S. V. (2020). The high cost of prescription drugs: Causes and solutions. Blood Cancer Journal, 10, 71. https://doi.org/10.1038/s41408-020-0338-x

Thornton, I., Wilson, P., & Gandhi, G. (2022). "No regrets" purchasing in a pandemic: Making the most of advance purchase agreements. Global Health, 18, 62. https://doi.org/10.1186/s12992-022-00851-3

Vallano, A., & Pontes, C. (2024). Escalating costs of innovative medicines: Perspective and proposals. Frontiers in Public Health, 12, 1449707. https://doi.org/10.3389/fpubh.2024.1449707

Warda, Z., Simmons, R., Fraser, H., Trickey, A., Kesten, J., Gibson, A., et al. (2025). Impact and cost-effectiveness of scaling up HCV testing and treatment strategies for achieving HCV elimination among people who inject drugs in England: A mathematical modelling study. The Lancet Public Health, 10, 1176. https://doi.org/10.1016/S2468-2667(24)00323-3

Wenjuan, S., & Zhao, K. (2023). Balancing fiscal expenditure competition and long-term innovation investment: Exploring trade-offs and policy implications for local governments. PLOS ONE, 18(11), e0293158. https://doi.org/10.1371/journal.pone.0293158

Williams, D., Zima, S. C., & Miller, B. J. (2025). Reforming drug price regulation: Using tools that work. Inquiry: The Journal of Health Care Organization, Provision, and Financing, 62, 00469580251335844. https://doi.org/10.1177/00469580251335844

Wu, C. (2023). Decoding US–China strategic competition: Comparative leverages and issue selection. The Chinese Journal of International Politics, 16(1), 31–60. https://doi.org/10.1093/cjip/poad001