Funding models, and economic and societal impact of pharmacy-based vaccination

Findings from FIP reports and literature

2025

Colophon

International Pharmaceutical Federation (FIP)
Andries Bickerweg 5
2517 JP The Hague
The Netherlands
www.fip.org

Authors:
Ms Nisa Masyitah, Data and Intelligence Manager (GPO)
Ms Farah Aqqad, Data and Intelligence Lead (GPO)

Contributors:
Ms Grace Oluwakemi Adebayo, Project and Data Support Coordinator (GPO)
Dr Diala Koudmani, Data Indicators Manager (GPO)
Dr Aysu Selçuk, Development Goals Lead (GPO)

Editor:
Dr Catherine Duggan, FIP Chief Executive Officer (CEO)

Recommended citation
International Pharmaceutical Federation (FIP). Funding models, and economic and societal impact of pharmacy-based vaccination: Findings from FIP reports and literature. The Hague: International Pharmaceutical Federation; 2025.

Cover image
@ Ca-ssis | istockphoto.com

Contents

Acknowledgement

This report is supported by unrestricted funding from Pfizer.

Foreword

Vaccination has long been recognised as one of the most cost-effective public health interventions, offering protection against infectious diseases while simultaneously reducing healthcare expenditures and supporting economic resilience.[1, 2] Despite these benefits, vaccine-preventable diseases (VPDs) continue to impose a significant global burden, exacerbating health inequities, straining healthcare systems, and leading to productivity losses across various sectors.[3-5]

The role of pharmacists in public health has evolved significantly, with increasing recognition of their capacity to provide critical vaccination services. Traditionally, pharmacists were involved in vaccine distribution, storage, and education,[6] but regulatory changes in many countries have expanded their role to include direct vaccine administration, improving accessibility to the public. Beyond administration, pharmacists also contribute by raising awareness, addressing vaccine hesitancy, ensuring proper vaccine storage, and reporting adverse events.[7, 8]

Studies show that the integration of pharmacy-based vaccination (PBV) into healthcare systems has led to improved vaccine accessibility and uptake, particularly among underserved populations.[8-11] As healthcare systems seek sustainable strategies to expand vaccination coverage, understanding the funding mechanisms and the broader economic and societal impact of PBV is essential. A well-structured funding model is critical to ensuring equitable access, financial sustainability, and effective long-term integration of PBV services.

Recognising the need to further support and expand pharmacists' role in vaccination, the FIP Council took a significant step in September 2023 by adopting a Statement of policy on the role of pharmacy in life-course vaccination. This policy statement outlines key calls to action and recommendations for stakeholders to maximise pharmacists' contributions to vaccine awareness, confidence and uptake, thereby strengthening vaccination strategies worldwide.

In 2024, FIP launched the "Think Health, Think Pharmacy" campaign. This global initiative aims to raise awareness of pharmacies as pivotal points for primary healthcare provision and to advocate for universal recognition of the pharmacy profession's unique role in enhancing public health outcomes. A core message of this campaign is that when individuals consider their health needs, they should naturally think of pharmacy as a primary resource. This perspective extends to vaccination services, reinforcing the idea that **when you think about vaccination, you think pharmacy**.

This report presents an analysis of funding models that support and sustain PBV services across various countries. Beyond funding mechanisms, it highlights the economic and societal impact of these services, including direct cost savings, such as reduced hospitalisations and lower healthcare costs, and indirect cost savings, such as improving productivity and maintaining functional ability in aging populations. The report also addresses broader societal benefits of vaccination, including improved public health equity and increased vaccine accessibility in underserved areas. Additionally, the report summarises the challenges pharmacists face in securing sustainable funding models and provides case studies showcasing different remuneration and reimbursement approaches.

We hope this report serves as a valuable resource for FIP members, policymakers and healthcare professionals seeking to advocate for stronger vaccination programmes and sustainable funding models that fully leverage pharmacists' contributions to vaccination.

Forward with Pharmacy, Forward with FIP.

Paul Sinclair
President
International Pharmaceutical Federation

Executive summary

Vaccination is a cornerstone of public health, delivering far-reaching benefits that extend well beyond disease prevention. It enhances health equity, protects vulnerable populations, reduces healthcare system strain, and drives societal progress by improving productivity and life expectancy. PBV services are a powerful extension of this impact, offering accessible, trusted, and efficient points of care—particularly for underserved communities.

As pharmacists increasingly serve as vaccinators, educators, and public health advocates, their role in strengthening immunisation efforts has become critical. PBV services improve vaccine coverage through extended hours, walk-in access, and widespread community presence. They also help address vaccine hesitancy and support life-course immunisation, including maternal and adolescent health needs. Pharmacists' involvement contributes to stronger public health infrastructure by enhancing vaccine equity and closing access gaps in rural or marginalised areas.

This report draws on data from the 2024 FIP global vaccination surveillance survey, literature reviews, and international case studies. Figure 1 summarises the structure and key themes of the report. It presents five core areas that guide the report's narrative and analysis. The report begins by establishing the broader societal value of vaccination, including its role in improving health equity, education, and community trust. It then explores the different health system types and examines trends of the four main PBV funding models adopted across countries: public reimbursement, private insurance, out-of-pocket payments, and pharmacy-funded services. The report next identifies barriers to sustainable implementation, such as regulatory challenges, workforce constraints, and limited financial support. This is followed by an overview of procurement strategies essential to ensuring timely and equitable vaccine supply. The next section highlights the economic impact of PBV, drawing on global evidence to demonstrate its cost-effectiveness and return on investment.

To complement this analysis, the final section presents a selection of country case studies from FIP member organisations to showcase diverse national approaches to PBV. Each case highlights:

- Legislative frameworks
- Funding models
- Economic and public health impacts
- Lesson learned from implementation.

Countries featured:

- Australia
- Canada
- Costa Rica
- Portugal
- South Africa
- UK (England, Scotland, Wales, Northern Ireland)
- USA.

These components provide an overview of the enablers, barriers, and opportunities for scaling up pharmacist-led vaccination services globally.

Figure 1. The overall structure and key themes of the report

1 Introduction and objectives

1.1 Background

Vaccination is recognised as one of the most effective and cost-efficient public health interventions for preventing infectious diseases. It has contributed to reducing mortality and morbidity associated with preventable infections, with an estimated 51.5 million deaths projected to be prevented between 2021 and 2030.[12] However, despite these successes, vaccine-preventable diseases (VPDs) continue to pose significant challenges, particularly in underserved populations where access to vaccination services remains limited.

Recognising its importance, international organisations, governments, and relevant stakeholders continue to develop strategies to enhance vaccine accessibility and coverage. A key initiative in this regard is the Immunization Agenda 2030 (IA2030), which was endorsed by the 73rd World Health Assembly in August 2020. IA2030 presents a global roadmap with the vision of ensuring that individuals of all ages, regardless of their geographic location, fully benefit from vaccines to maintain good health and well-being.[13] It focuses on reducing mortality and morbidity from vaccine-preventable diseases (VPD), increasing equitable access to vaccination, and bolstering vaccination strategies in primary health care.[13]

Over the past decade, the role of community pharmacists in vaccination has evolved significantly, with many countries integrating PBV services into their healthcare systems. Pharmacists serve as educators, facilitators, and vaccinators,[7] thereby expanding access to vaccination, especially for individuals with time constraints and mobility limitations. They perform essential functions such as raising public awareness about vaccines, addressing vaccine hesitancy, ensuring proper vaccine storage, reporting adverse events, and directly administering vaccines.[7, 8] This integration has been associated with increased immunisation uptake, particularly for influenza vaccines.[14]

Studies show that pharmacies offer unique advantages, including convenience, extended operating hours, and accessibility, which make them essential vaccination sites—particularly for individuals facing logistical or mobility barriers.[8-11] A study conducted in Poland revealed that 85.3% of respondents found pharmacies more accessible than outpatient clinics, while 61% considered PBV to be less time-consuming than at outpatient clinics.[15] Similar findings from Switzerland indicate that respondents prefer pharmacies for vaccination due to ease of access, trust in pharmacists, and flexible scheduling.[16] Additionally, modelling studies have shown that incorporating pharmacies as vaccination sites can result in substantial cost savings, ranging from USD 4.1 to USD 11.5 billion (EUR 3.77 to EUR 10.58 billion), depending on factors such as epidemic severity and vaccination rates.[17]

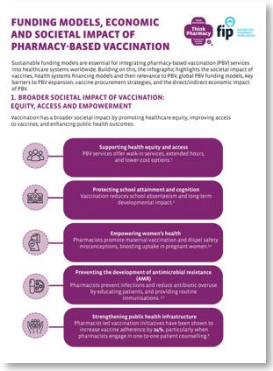
Despite these advancements, challenges remain in fully integrating PBV services, with financial constraints being a major challenge among them. A national survey on pharmacy-based immunisation services in the USA identified key challenges faced by pharmacists and patients. Among patient-related barriers, the most frequently cited issues included lack of insurance coverage for vaccines and financial constraints preventing individuals from receiving vaccinations. On the organisational and environmental front, concerns related to financial losses from expired vaccines, inadequate reimbursement for vaccine administration, and the high upfront costs of purchasing vaccines were highlighted as moderate to major obstacles. The administrative burden of insurance billing, insufficient reimbursement for vaccine procurement, difficulties in tracking multi-dose vaccines, and complications in accessing vaccination registries, were also noted as barriers to vaccination services.[18] Addressing these challenges to improve vaccine uptake and coverage, as well as reduce the burden of vaccine-preventable diseases is essential.

Recognising the need to support and expand pharmacists' roles in vaccination, FIP has developed a wealth of resources accessible through its disease prevention microsite here. Key resources include:

1. The FIP Policy Statement on the role of pharmacy in life-course vaccination (adopted in September 2023), which outlines key actions and recommendations to optimise pharmacists' role in vaccination.[19]
2. The FIP report: "Pharmacy-based vaccination: Recent developments, success stories, and implementation challenges," which highlights 17 case studies from FIP member organisations showcasing successful pharmacy-based immunisation programmes.[20]

3. The FIP intelligence report: "Leveraging pharmacy to deliver life-course vaccination" (2016-2024), which provides a comprehensive analysis of trends, barriers, and progress in PBV.[21]

Building on these efforts, this report explores the financial sustainability of PBV services. It examines funding mechanisms, economic benefits, and reimbursement models across different countries, offering insights into how various healthcare systems integrate and support pharmacist-led vaccination. The report also presents case studies showcasing effective financing strategies, highlighting the role of policy, government incentives, and private-sector engagement in sustaining PBV.



An infographic visually highlights the key messages and findings, offering a concise overview of the report's core themes, funding models, and insights from global case studies. It can be accessed here.

1.2 Objectives

By examining various funding models that sustain PBV services and the impact of vaccination on the population, the report seeks to support members, policymakers, and other relevant stakeholders to design effective and sustainable strategies for expanding pharmacists' role in vaccination. The objectives of this report are as follows:

1. To highlight the broader societal impact of vaccination, including its role in promoting healthcare equity, reducing disparities in vaccine access, and enhancing public health outcomes.
2. To explore the national health system structures and financing models around the world and their relevance to PBV.
3. To analyse and compare funding models for PBV services across countries and regions.
4. To identify financial and operational challenges hindering the expansion of PBV, including funding gaps and regulatory barriers.
5. To explore the procurement strategies to ensure timely, reliable and adequate supply of vaccines.
6. To assess the economic impact of PBV, including direct cost savings (e.g., reduced hospitalisations) and indirect benefits (e.g., workforce productivity and healthcare system efficiency).
7. To showcase global case studies focussed on models of reimbursement and remuneration, and best practices in funding and sustaining PBV.

2 Methodology

2.1 Data collation and analysis

This report synthesises findings from surveys, literature reviews, and case studies, providing a comprehensive assessment of funding mechanisms for PBV, as well as their economic and societal impact. It aims to identify sustainable financing models and best practices from various country case studies to inform future implementation and expansion efforts. To achieve this, this report relies on three key sources of data, as shown in Figure 2.

1. **Surveys**

   FIP surveys were conducted in 2016,[22] 2019,[23] and 2024[21] to assess the evolving role of pharmacists in vaccination, with data gathered from FIP member organisations. These surveys tracked trends over time, focusing on key themes such as vaccine administration and prescribing authority, education and training to equip the pharmacy workforce for vaccination services, and barriers to implementation and expansion. One of the main objectives of this report is the analysis of funding models, one of the themes examined in the surveys.

2. **Literature reviews**

   A structured literature review was conducted to complement the survey findings, particularly in assessing the economic and societal impact of PBV. This includes:

   1. Broader public health and societal benefits of vaccination, such as improved vaccine access and equity.
   2. The influence of national health system financing models on PBV implementation, including how system structure (i.e., Beveridge, Bismarck, National Health Insurance, Out-of-Pocket, and Hybrid) affects PBV reimbursement and service integration.
   3. Challenges in securing sustainable funding for PBV services.
   4. Vaccine procurement strategies and mechanisms, such as centralised, decentralised and pool procurement, and how they impact the affordability and accessibility of vaccine supply in community pharmacy settings.
   5. Direct and indirect cost savings, such as reductions in hospitalisations and improvements in workforce productivity.

   The literature review draws from peer-reviewed journal articles, government reports, and publications from international organisations and NGOs. The search terms included, but were not limited to, remuneration, economic impact, societal impact, direct and indirect cost savings, and PBV funding models.

   The literature review helped to identify successful financial models, highlight common challenges, and assess the wider economic and health system benefits of integrating PBV into national vaccination programmes.

3. **Case studies**

   To gain practical insights into different PBV financing structures, seven case studies were received from FIP member organisations.

   These case studies, provided by Australia, Canada, Costa Rica, Portugal, South Africa, the UK, and the USA, examine:

   - How PBV services are funded in each country.
   - The impact of different financing models on accessibility and uptake.
   - Lessons learned from implementing and sustaining PBV programmes.

The case studies provide examples of how financial mechanisms influence service delivery and long-term sustainability. These case studies are presented in Chapter 9, with the case study template available in Appendix 1.

Figure 2. Data collection process for this report

The data collated from surveys, literature reviews, and case studies were analysed to identify key trends, patterns, and insights into the impact of PBV on economic and societal outcomes. Survey data were examined to highlight various funding models for PBV services across countries. The literature review was assessed thematically to understand the direct and indirect cost-savings, as well as the broader societal impact of vaccination. Case studies were gathered to explore different funding methods and their influence on service accessibility and sustainability.

3 Broader societal impact of vaccines

This section explores the wider social benefits of vaccination (see Figure 3), including its impact on equity, education, antimicrobial resistance, maternal health, life expectancy, women's health, and healthcare infrastructure.[24]

Figure 3. Broader societal impact of vaccination

1. Supporting equity of healthcare

Vaccination is one of the most cost-effective and equitable health interventions, ensuring protection for all individuals regardless of gender, socioeconomic status, or geographic location. [25] According to the Immunization Agenda 2030,[13] universal vaccination coverage is key to reducing health disparities and achieving universal health coverage (UHC).[26]

PBV impact on equity:

- Pharmacies are widely distributed across both urban and rural areas, making vaccines more accessible.[27, 28]
- Pharmacist-led vaccination programmes enhance vaccine uptake among low-income and medically disadvantaged populations by improving accessibility and reducing disparities.[10]
- PBV services decrease logistical barriers by offering walk-in services and extended hours.[10]

The expansion of vaccine coverage could improve the equity value of vaccines. For example, increasing pneumococcal vaccine coverage to all adults over 50 (rather than just high-risk individuals and those over 65) could reduce racial disparities in disease burden. An expanded recommendation, combined with an effective delivery system, could enhance health outcomes and economic benefits.[29]

2. Protecting student attainment and cognition

Vaccination prevents childhood infectious diseases, reducing school absenteeism and long-term developmental impact.[24] Infectious diseases like measles and Haemophilus influenza can lead to neurological complications, affecting cognitive function and educational attainment.[25, 30] Community pharmacies are very convenient for parents as they do not require appointments and have longer working hours than other health institutions. One study cited that 97% of parents feel confident about pharmacists providing influenza vaccinations to their children.[31] In another study, parents also declared that they would vaccinate their children against HPV at the pharmacy.[32]

Key benefits of childhood vaccination:

- Reduces school absenteeism by preventing vaccine-preventable diseases.[33]
- Improves cognitive and physical development by reducing disease-related impairments.[30]
- Pharmacies provide convenient, appointment-free vaccination services, reducing parental burden.[10]

3. Preventing the development of antimicrobial resistance (AMR)

Vaccines can mitigate the risk of antimicrobial resistance by reducing antibiotic overuse and the development of AMR.[1] Many vaccine-preventable diseases, such as pneumococcal infections and influenza, often lead to unnecessary antibiotic prescriptions, accelerating AMR.

Studies demonstrate that after the introduction of the conjugate pneumococcal vaccine for infants in the USA, infections caused by penicillin-resistant strains declined by 57% and multi-drug-resistant strains by 59%.[34]

Pharmacists contribute to AMR mitigation by:

- Increasing vaccination rates,[35] reducing the need for antibiotic treatments.
- Educating patients on the role of vaccines in reducing antibiotic resistance.[36]
- Providing routine adult vaccinations (e.g., influenza, pneumococcal, and pertussis vaccines) that prevent secondary bacterial infections requiring antibiotics.[37, 38]

One of the major outcomes of the vaccines is the prevention of death through avoiding infectious diseases. Vaccines prevent approximately 6 million deaths each year from vaccine-preventable diseases.[39] For example, older adults are at increased risk of mortality and morbidity from infectious diseases and influenza, where pneumococcal, herpes zoster, and pertussis vaccines can protect from these infections.[40] The reduction of pneumonia in older adults can also reduce the rates of hospital admissions and the subsequent associated risks of death from cardiac failure.[41] Based on a study including a longitudinal logistic regression model to estimate the impact of pharmacy-based immunisation services, it has been shown that pharmacy-based immunisation services can increase the likelihood of immunisation, particularly among high-risk populations such as older adults.[42]

4. Empowering women's health

Maternal vaccination plays a critical role in protecting both pregnant women and their newborns. In addition to providing direct maternal benefit, vaccines such as influenza, tetanus, diphtheria, and pertussis (Tdap) provide passive immunity to newborns, reducing neonatal mortality.[43]

Rubella vaccines indirectly protect pregnant women against an infection that can cause miscarriage, stillbirth and severe birth defects in the baby.[25] Studies have shown that women find pharmacy-administered maternal and HPV vaccinations convenient, accessible, and effective for protecting maternal and neonatal health.[44, 45] Pharmacists are beneficial for promoting maternal vaccinations and addressing misconceptions about vaccine safety to increase vaccination rates among pregnant women.[44-46]

Examples of maternal vaccine benefits:

- Rubella vaccine prevents congenital rubella syndrome, reducing birth defects.[43]
- Influenza vaccination during pregnancy lowers neonatal complications and preterm birth risks.[47]
- HPV vaccination reduces cervical cancer incidence, safeguarding reproductive health.[48]

5. Strengthening public health infrastructure

Vaccination programmes contribute to long-term improvements in healthcare systems, supporting disease surveillance, outbreak preparedness, and health education initiatives. Pharmacists play a vital role in public health infrastructure, delivering vaccinations while promoting health education and combating vaccine hesitancy.[1, 49]

Pharmacist-led vaccination initiatives have been shown to increase vaccine adherence by 24%, particularly when pharmacists engage in one-to-one patient counselling.[22]

Public health benefits of PBV programmes:

- Supports national vaccination goals by improving vaccine coverage.[50]
- Increases public confidence in vaccines through pharmacist-led counselling.[51]
- Reduces the burden on healthcare facilities by decentralising vaccine administration.[52]

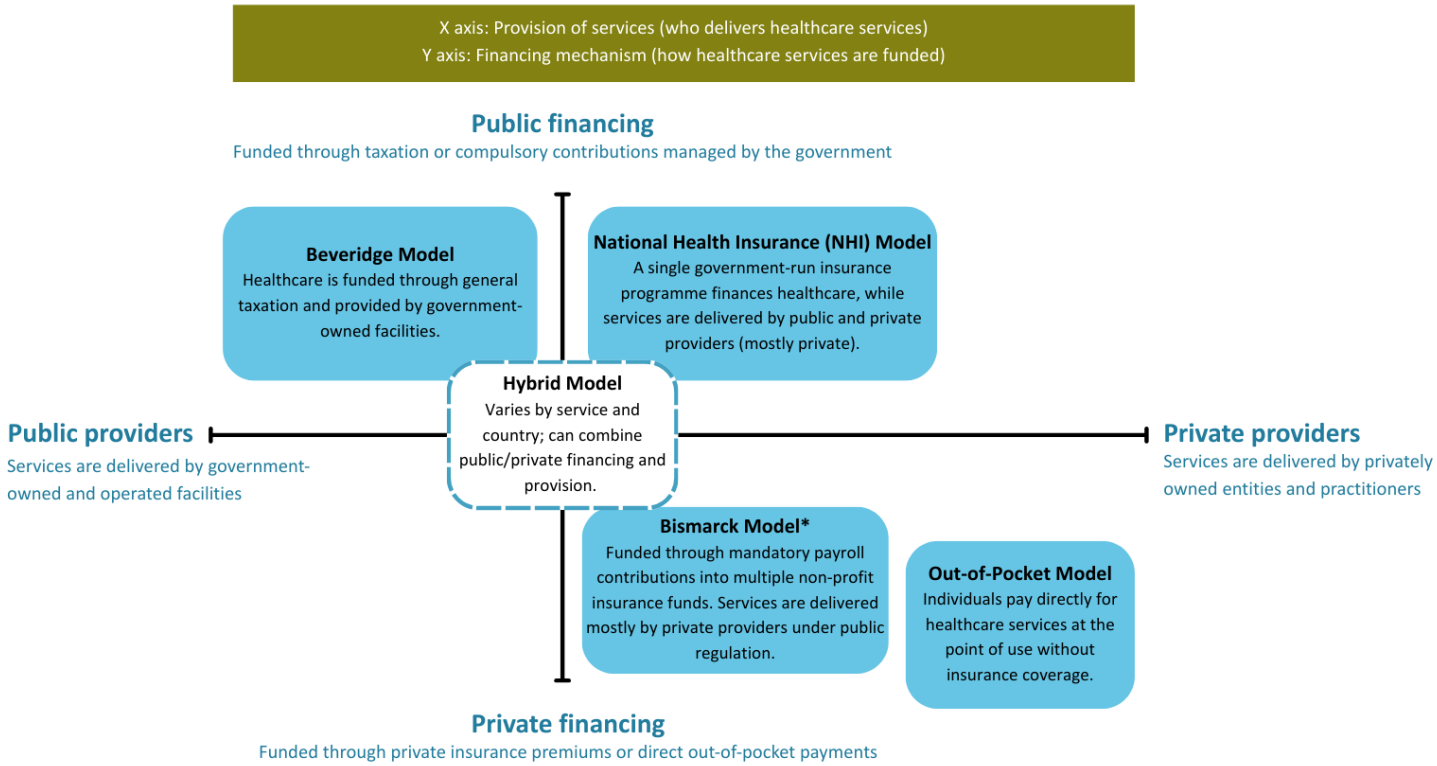
Recognising the societal impact of vaccines underscores the importance of sustained investment in immunisation services. To contextualise this investment, the next chapter presents an overview of global health financing models, assessing how different health systems influence the integration and sustainability of PBV.

4 Models of health system financing and their relevance to PBV

4.1 Overview of healthcare financing models

Financing healthcare is a core function of health systems that can enable progress towards universal health coverage by improving effective service coverage and financial protection. Today, millions of people do not access services due to the cost.[53]

Healthcare systems and how they are financed have evolved over time, influenced by historical and socioeconomic contexts. Figure 4 provides a visual framework categorising these models based on who funds healthcare (public vs. private financing) and who provides these services (public vs. private providers). This 2x2 matrix illustrates how different financing and provision arrangements give rise to distinct system types, such as the Beveridge, Bismarck, National Health Insurance (NHI), and Out-of-Pocket models. A hybrid category is also included to reflect the reality that many countries combine elements from multiple models. Table 1 complements the figure by summarising the characteristics of each model.



*Some systems, such as Bismarck, involve private insurance funds but are mandatory and publicly regulated.

Figure 4. Overview of healthcare system models: Provision and financing structures[54, 55]

1. **Beveridge model[54, 55]**

The Beveridge model is named after the social reformer, William Henry Beveridge, who designed the National Health Service in the UK. It was first implemented in the UK with the creation of the National Health Service (NHS) in 1946, following the recommendations of the 1942 Beveridge Report.[56] In this model, healthcare is funded and provided by the government through direct income on tax deductions. Healthcare services are largely delivered by government-funded facilities and are provided free at the point of use to all citizens.

This model, often referred to as the “tax-based national health service”, is currently implemented in countries such as the UK, Spain, Cuba, New Zealand and Nordic countries. While it ensures universal access to care, it also faces challenges, including long waiting times for treatment and limited tax revenue generation—particularly in nations with aging populations such as in Asia, where a significant proportion of citizens are retired and no longer contributing to the tax base.

PBV implication: Pharmacists administering vaccinations are typically reimbursed directly by governments and health programmes.

2. Bismarck model[54, 55, 57]

Developed by Otto von Bismarck in 19th-century Germany, the Bismarck model is based on mandatory social health insurance. Contributions are made by both employers and employees through payroll deductions, which are pooled into non-profit insurance funds (also known as "sickness funds"). Healthcare delivery is typically carried out by private providers, but the system is closely regulated by the government to ensure efficiency, equity, and coverage.

Countries operating under the Bismarck model include Germany, France, Belgium, and Japan. This system is praised for its high-quality service delivery and comprehensive coverage, though it can be administratively complex due to the presence of multiple insurers.

PBV implication: Pharmacist-administered vaccinations are reimbursed by insurance funds, contingent upon insurer policies. PBV accessibility depends heavily on regulatory frameworks and fund negotiations, which may create variability in service availability.

3. National Health Insurance (NHI) model[54, 55]

The National Health Insurance model incorporates elements of both the Beveridge and Bismarck models. It features a single-payer structure—typically a government-run insurance programme—funded by taxation or compulsory premiums. Service delivery is provided by a combination of public and private entities. This model offers universal healthcare access and aims to balance equity with operational flexibility.

Examples of NHI model countries include Canada, South Korea, and Taiwan. While administrative costs are generally low, the model can face challenges related to wait times and the exclusion of certain services (e.g., dental, optical care) from public coverage.

PBV implication: Pharmacies are reimbursed directly by the government or public insurance scheme, enabling widespread participation in vaccination programmes. This ensures consistent funding for pharmacist-delivered vaccines and supports broader immunisation goals.

4. Out-of-Pocket model[54, 55]

In the Out-of-Pocket model, individuals pay directly for healthcare services at the time of care without substantial government or insurance coverage. Historically, this model was adopted in many countries before the introduction of universal health coverage and remains common in low-income settings where health systems lack the infrastructure or resources for structured financing.

This model is common in rural or underserved areas of countries, such as rural areas in India, parts of Africa, and parts of South America. It creates significant financial barriers to healthcare, often resulting in delayed care-seeking, catastrophic health expenditures, and poor health outcomes.

PBV implication: PBV services are limited and primarily available on a fee-for-service basis, restricting access to those who can afford them. Pharmacists may not be formally integrated into national immunisation efforts.

5. Hybrid models

Many countries employ a mix of the above models to cater to their specific socio-economic contexts. For example, the USA features a combination of employer-sponsored insurance (Bismarck), government programmes such as Medicare and Medicaid (NHI), and a portion of the population relying on out-of-pocket payments.

PBV implication: The availability and structure of PBV services depend on insurance coverage specifics, regulatory frameworks, and public-private collaboration. Pharmacies may be reimbursed through multiple channels, leading to inconsistencies in access.

Table 1. Summary of health financing models: Funding sources, service provision and country examples

Model	Primary funding	Provision	Country examples[55, 57-59]
Beveridge model *Tax-funded model* *National health service (NHS) model*	General taxation	Healthcare services are primarily provided by government-owned facilities; many healthcare professionals are government employees	UK (different variations in each of the four countries), Spain, Cuba, New Zealand, Nordic countries
Bismarck model *Social health insurance (SHI)* *Statutory health iInsurance* *Multi-payer insurance system*	Funded through mandatory payroll contributions from both employers and employees Insurance operates through multiple non-profit insurance funds or "sickness funds"	Services are delivered by a mix of public and private providers (mostly private, publicly regulated)	Germany, France, Belgium, Japan
National Health Insurance (NHI) *Single-payer system* *Public insurance with private providers*	General taxation or mandatory insurance premiums A single, government-run insurance programme covers all residents	Services are provided by a mix of public and private providers (mostly private)	Canada, Taiwan, South Korea
Out-of-Pocket model *Fee-for-service model*	Individuals pay directly for healthcare services at the time of use	Services are typically provided by private providers	Rural areas in India, parts of Africa, parts of South America, other LMICs.
Hybrid model *Mixed financing model* *Multi-tier health system*	Combines elements from various models, including taxation, social insurance, private insurance, and out-of-pocket payments May include multiple insurance schemes catering to different population segments	Services are provided by a mix of public and private providers	USA, China

Figure 5 categorises global health coverage models into four key types, based on the extent of population coverage and the structure of financing and service provision. It distinguishes between universal and non-universal systems. This figure has been adopted from the World Economic Forum webpage.[55]

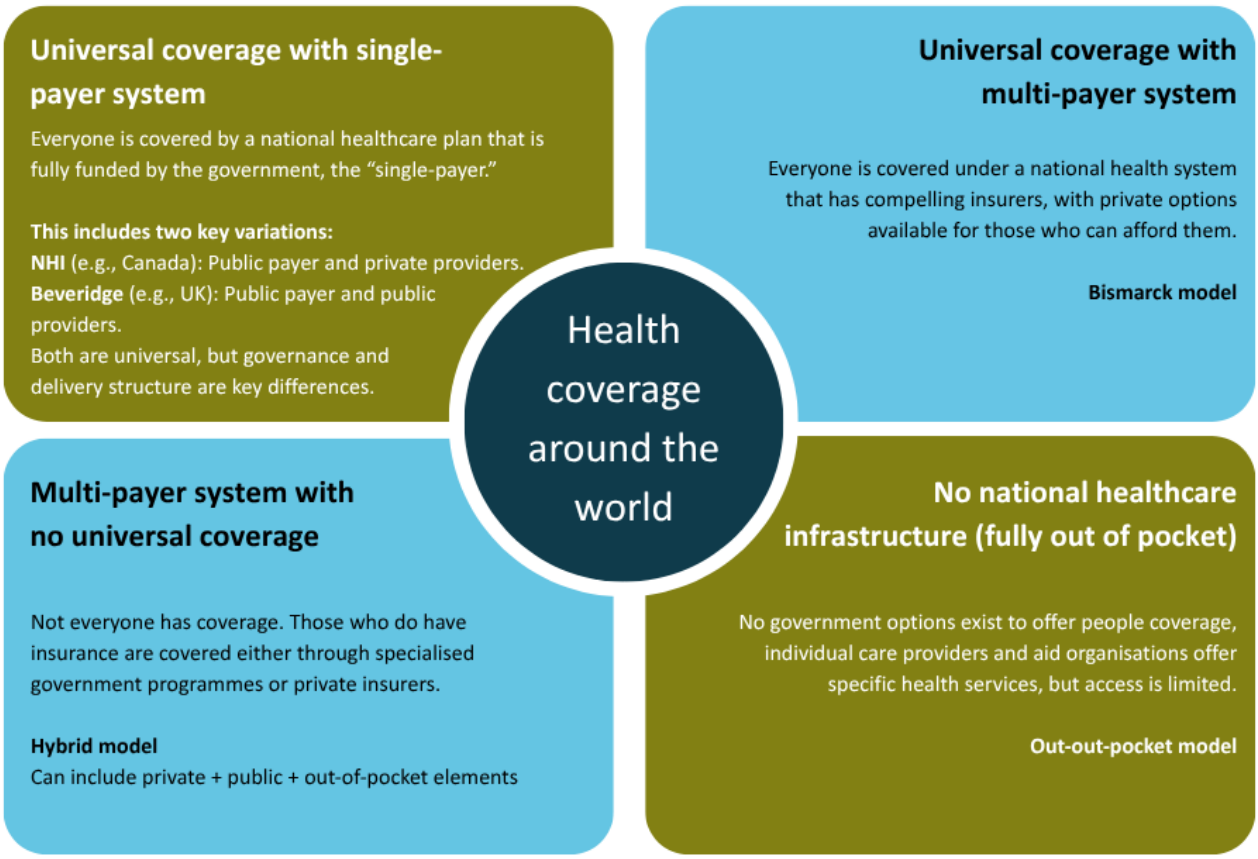


Figure 5. Comparative health coverage models: From universal to out-of-pocket[55]

Globally, there is considerable variation between public and private health financing in high-income countries (HICs) and low- and middle-income countries (LMICs). While most countries operate hybrid systems, the dominant model in place influences how healthcare is financed, delivered, and accessed across different socioeconomic contexts.

1. **High-income countries (HICs)**

HICs predominantly adopt Beveridge, Bismarck, or National Health Insurance models, with government financing accounting for a large proportion of the total health expenditure.[60] Government financing dominates and PBV is publicly funded or covered by insurers.

Country examples:

- Canada: A National Health Insurance system is adopted in Canada, where the health system is primarily funded through general taxation by provincial, territorial, and federal governments. About 70% of health care spending is publicly funded,[61] covering essential services such as hospitals and physician care. Canada's PBV services are governed by provincial and territorial legislation.
- Germany: The healthcare system is funded through a mix of public and private insurance (Social Health Insurance). Approximately 77% of the population is covered by statutory health insurance, which is funded through payroll taxes, while 23% have private health insurance.[62] Pharmacists are reimbursed for vaccines (e.g., influenza) administered in pharmacies.

2. Low- and middle-income countries (LMICs)

Conversely, low- and middle-income countries (LMICs) often rely on out-of-pocket payments and donor aid due to limited tax revenue, weak insurance coverage, and inadequate government investment.[60] In the poorest settings, out-of-pocket expenditure constitutes the largest share of healthcare financing, contributing to financial hardship and barriers to accessing essential services.[63]

Country examples:

- Nigeria: Out-of-pocket model dominates, where patients pay for their healthcare out of their own pockets. This often leads to financial barriers to accessing healthcare, particularly for poor households. [64]
- India: A mixed approach is adopted, with the healthcare system funded by public and private sectors. Large populations often bear high out-of-pocket healthcare expenditures,[59] especially those living in rural areas. Several vaccines are provided free in the public sector, while they are paid out-of-pocket in private pharmacies.

4.2 PBV across financing models

As illustrated in the previous section, PBV varies depending on national health financing mechanisms. Effective and widespread PBV implementation typically occurs when:

- Vaccines are publicly or privately reimbursed.
- Pharmacists are recognised and compensated adequately for vaccine administration.
- Patient out-of-pocket costs are minimised.

In tax-based systems (e.g., the UK), PBV is highly integrated into public immunisation programmes. Insurance-based systems (e.g., Germany) are increasingly permitting pharmacists to administer vaccines, compensated through insurance schemes. Single-payer systems (e.g., Canada) have successfully integrated pharmacists into vaccination programmes, while mixed systems (e.g., the USA) rely on private sector participation and insurance reimbursements.

Table 2 illustrates the variations of PBV across financing models. Understanding these health financing models is essential to developing sustainable, equitable, and effective PBV strategies.

Table 2. PBV across financing models

Financing model	Who pays for PBV?	PBV accessibility
Beveridge	Government	High
Bismarck	Insurance funds	Medium to high
NHI	Public insurer	High (varies by region)
Out-of-Pocket	Patient	Low (access based on ability to pay)
Hybrid	Varies (government + private + out-of-pocket)	Mixed, often inequitable

5 Funding models for PBV services

5.1 Global overview of funding models for PBV

PBV is increasingly recognised as a key component of public health strategies worldwide. The integration of pharmacies as vaccination sites has improved vaccine accessibility and uptake, particularly in underserved populations. However, the sustainability of these services depends heavily on the underlying funding mechanisms, which vary widely across countries. A well-structured funding model is essential to ensure **equitable access, financial sustainability, and effective long-term integration** of PBV services into healthcare systems.

This analysis focuses specifically on how PBV is funded. Drawing from FIP intelligence surveys,[21, 23] four distinct financing mechanisms are used, based on who ultimately pays for the service:

1. **Public reimbursement:** Vaccination costs, including administration fees, are covered by the government or a national health insurance scheme.
2. **Private reimbursement:** Private insurers or healthcare systems reimburse vaccination services, either partially or fully, as part of their coverage plans.
3. **Out-of-pocket payments:** Patients pay the full cost of the vaccine and its administration at the point of service, without reimbursement.
4. **Pharmacy-funded (free of charge):** Pharmacies offer vaccines at no cost to patients, absorbing the associated costs themselves.

Figure 6 presents an overview of funding models for PBV services across various countries, as derived from the latest FIP intelligence report in 2024.[21] Among the 37 countries analysed:

- The most common funding model is out-of-pocket payments, which is reported in **21 countries.**
- The second most common model, observed in **13 countries**, involves reimbursement by public (state-run) health systems or insurers.
- A smaller **number of countries (10)** provide vaccines free of charge, funded by the pharmacy.
- Finally, **nine countries** report that private health systems or insurers reimburse vaccination services.

The data from the 2024 FIP intelligence report reveals that, among the 37 countries analysed, a majority (21 countries) rely on out-of-pocket payments for PBV. This finding is concerning because extensive literature indicates that high levels of out-of-pocket costs are directly associated with lower vaccine uptake and increased inequities in access—particularly among vulnerable and low-income populations.[65] Several studies have shown that when individuals are required to pay directly for vaccines, financial barriers can deter timely vaccination, especially in settings where economic disparities are pronounced. For example, research from BMC Public Health suggests that the convenience and accessibility of PBV is only fully realised when cost barriers are minimised.[38]

By contrast, public reimbursement mechanisms—as seen in 13 countries—have been linked to higher vaccination rates by removing the direct cost burden on patients. This model aligns with evidence from countries such as Canada and parts of Europe, where robust public funding for pharmacy services has contributed to improved vaccine coverage and reduced health disparities.[38]

The fact that only ten countries offer free pharmacy-funded vaccinations and nine rely on private insurance reimbursement suggests that, overall, there is a relatively low integration of funding mechanisms that promote universal access. Evidence shows that sustainable funding models—whether through public insurance, mixed public-private reimbursement, or pharmacy-funded schemes—are critical for the long-term integration of PBV services into national healthcare systems.[27]

The choice of funding model for PBV services influences vaccination uptake and public health outcomes. For instance, the U.S. Vaccines for Children (VFC) programme, which covers vaccine costs for eligible children, has

prevented approximately 1.1 million deaths and saved USD 2.7 trillion (EUR 2.48 trillion) in societal costs over three decades.[66]

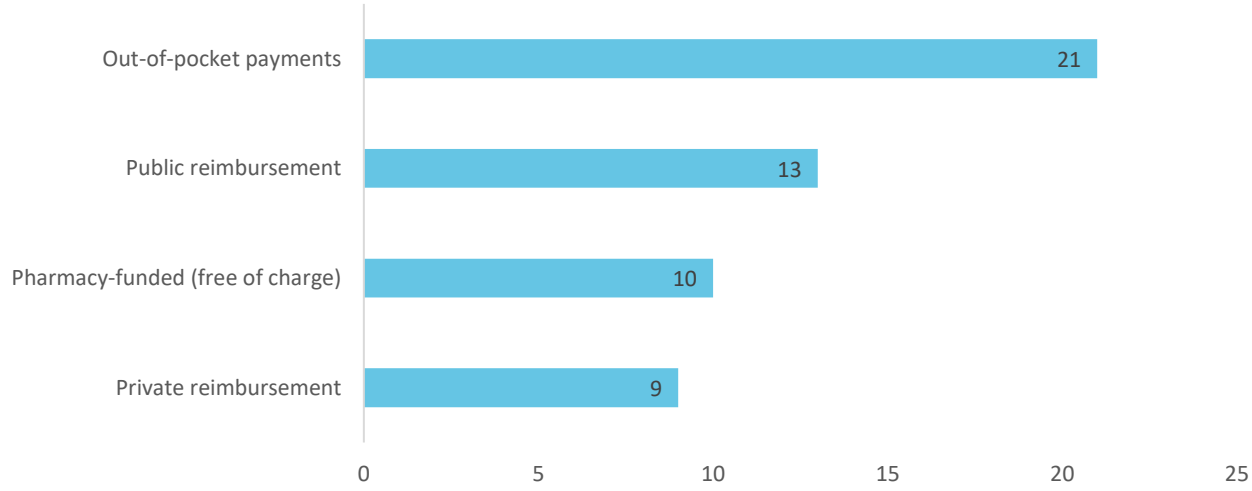


Figure 6. Funding models for PBV across countries (n=37)

A hybrid approach for PBV funding has been adopted in some countries. Argentina and the UK, for example, use a combination of public reimbursement, private insurance, and out-of-pocket payments. Denmark differentiates funding mechanisms by vaccine type, with some covered by the public health system and others paid for by customers. The list of countries and their funding models for PBV can be seen in Table 3. Countries with various funding models for PBV services

Table 3. Countries with various funding models for PBV services

Model	Countries and territories	Overview
Public reimbursement	Argentina, Australia, Belgium, Canada, Denmark, France, Germany, the UK, Iceland, Ireland, Italy, Norway, and the USA.	In these nations, the cost of vaccinations administered in pharmacies is covered by government-funded health systems or public insurance schemes. This approach minimises direct costs to patients, thereby promoting higher vaccination rates and ensuring equitable access.
Private reimbursement	Argentina, Germany, the UK, Portugal, South Africa, Switzerland, Tunisia, the USA, and Yemen.	Private insurance companies reimburse the costs of vaccinations. While this can alleviate out-of-pocket expenses for insured individuals, those without adequate insurance coverage may face financial barriers, potentially leading to disparities in vaccine uptake.
Out-of-pocket payments	Argentina, Australia, Bangladesh, Brazil, Cape Verde, Denmark, Ghana, the UK, Ireland, Italy, Jordan, Namibia, Nepal, Norway, Philippines, Portugal, Romania, Sierra Leone, Switzerland, Tunisia, and Yemen.	In these countries, individuals bear the full cost of vaccinations at pharmacies. This model can deter people from getting vaccinated, especially in low-income populations, thereby hindering public health efforts to achieve widespread vaccination.
Pharmacy-funded (free of charge)	Algeria, Cameroon, Costa Rica, Croatia, Israel, Lebanon, Nigeria, Paraguay, Romania, and South Sudan.	Pharmacies in these regions absorb the costs of vaccinations, offering them free of charge to patients. While this enhances accessibility, the financial sustainability of such a model depends on the pharmacies' capacity to bear these costs without external support.

The out-of-pocket payment is a widely adopted funding model across all WHO regions. Public reimbursement is the most common model for funding PBVs in Europe (nine countries), reflecting strong governmental support for PBVs. Countries such as Belgium, France, and Germany have integrated these services into their national health systems, ensuring minimal direct costs to patients and promoting higher vaccination rates. Figure 7 illustrates the funding models for PBV across regions (n=37).

The Americas present a heterogeneous landscape in funding models. This variability indicates differing healthcare infrastructures and policies across the continent. In the USA, a combination of public programmes (e.g., Medicare and Medicaid) and private insurance plans cover vaccination costs, though coverage can vary by state and insurance provider. Canada's approach varies by province, with some offering publicly funded pharmacy vaccinations and others relying on private insurance or out-of-pocket payments. Latin American countries like Argentina employ hybrid models, combining public reimbursement, private insurance, and direct payments by individuals, reflecting diverse economic conditions and healthcare structures.[38]

In many African nations, PBV services are limited, and funding predominantly comes from out-of-pocket payments. This reliance poses significant barriers to vaccine accessibility, especially in low-income populations. Initiatives like New Incentives have sought to address these challenges by providing conditional cash transfers (CCTs) to caregivers in Nigeria, encouraging infant vaccination and mitigating financial obstacles.[67]

The funding models in the Eastern Mediterranean, Southeast Asia and the Western Pacific regions are diverse. High-income countries such as Australia and Japan often have public reimbursement systems that cover PBV, ensuring broad access. Conversely, in lower-income countries, out-of-pocket payments are more common, limiting vaccine uptake due to financial constraints.

The variability in economic conditions and healthcare infrastructures across the region results in differing levels of access to PBV services. Regions with predominant public reimbursement systems tend to achieve higher vaccination rates and more equitable access. In contrast, reliance on out-of-pocket payments can hinder vaccine uptake, particularly among vulnerable populations. Addressing these disparities requires tailored strategies that consider regional contexts, such as enhancing public funding, incentivising private insurance coverage, and implementing innovative programmes to reduce financial barriers to vaccination.

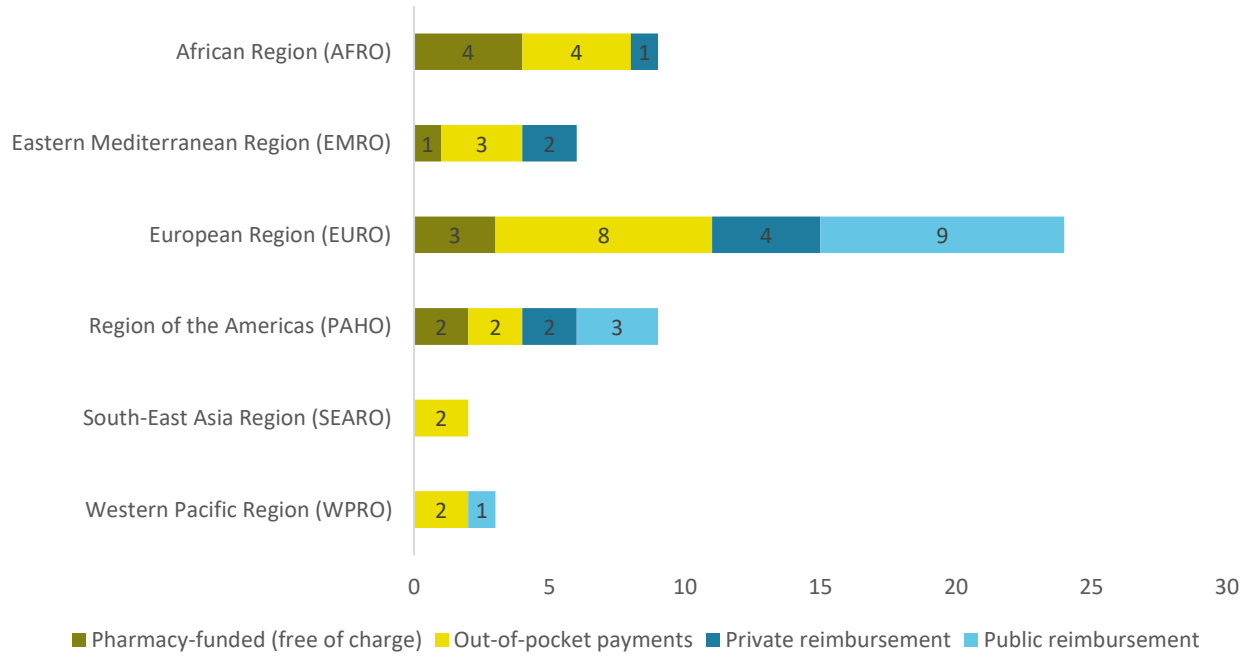


Figure 7. Funding models for PBV across regions (n=37)

5.2 The adoption of PBV funding models across countries

As illustrated in the previous section, funding models for PBV vary across countries due to differences in healthcare systems. Chapter 9 Case studies submitted by FIP member organisations. This chapter summarises key findings from these case studies.

In Australia, Canada, Portugal, and the UK, government funding (public reimbursement) plays a major role, with pharmacies reimbursed through national immunisation programmes or integrated into public vaccination efforts. In contrast, the USA and South Africa rely more on private insurance and out-of-pocket payments, with limited public funding and complex reimbursement systems. In other countries, such as Costa Rica, pharmacists primarily distribute and monitor vaccines rather than administer them, and PBV is entirely private, with no established reimbursement mechanisms. Even in countries with established public reimbursement, variations persist—particularly in Canada, where provincial differences lead to variations in vaccine accessibility.

Private reimbursement models are common across seven countries (Australia, Canada, Costa Rica, Portugal, South Africa, the UK, and the USA) but differ in scope. In some countries, private insurers cover vaccine costs, as seen in the UK, Canada, and the USA. In contrast, PBV is largely an out-of-pocket expense in Costa Rica and South Africa. Australia and Portugal provide limited private insurance coverage, though policies often exclude pharmacist-led vaccinations. Additionally, reimbursement rates for PBV vary widely. In Canada, public reimbursement ranges from CAD 7 to 13 (EUR 4.48 to 8.31) per dose, while in Portugal, pharmacies receive EUR 3 per vaccine administered under public programmes. In the USA and South Africa, reimbursement rates fluctuate based on insurer agreements and state regulations.

Building on the broader overview of funding approaches from the case studies, the examples below showcase how some PBV funding models have developed over time:[68]

- **South Africa:** Since 2020, their scope of PBV has expanded to include a wider range of vaccines, supported through public funding, insurance, private-public partnerships, and out-of-pocket payments. During the COVID-19 pandemic, pharmacists administered 24% of all vaccinations nationally, underscoring both their central role in public health and the potential of multi-faceted funding approaches to sustain vaccination services.[68]

- **Portugal**: Pharmacies have been authorised to vaccinate since 2007, initially under a reimbursement model where patients paid for vaccines and pharmacists received partial government compensation. Over time, partnerships with the National Health Service (NHS) enabled direct reimbursement for selected groups, with the NHS directly covering the cost of both the vaccine and its administration. Despite a temporary shift back to GP-led vaccine delivery during COVID-19, the long-term trend reflects increasing integration of PBV into the national immunisation programmes.[68]

- **Ireland**: Initially in 2011, influenza vaccinations offered in pharmacies were predominantly funded through private payments. By 2012, public funding was introduced for medical cardholders over 65 and at-risk groups. The scope of public coverage expanded during the COVID-19 pandemic, and by 2022, flu and COVID-19 vaccines were publicly funded for the entire population in pharmacies.[68]

6 Barriers to achieving sustainable funding mechanisms for PBV

Pharmacists play an essential role in vaccination delivery by providing convenient, cost-effective, and trusted vaccination services. However, despite their proven contributions to public health, sustainable funding for PBV remains a challenge in many countries. [69]

Unlike physician-administered vaccination, which is often integrated into national immunisation programmes, PBV frequently lacks standardised financial support from governments or national programmes. The absence of structured funding models limits pharmacists' ability to expand vaccination services, affecting service availability and accessibility. This section explores the financial, regulatory, and systemic barriers hindering the sustainable funding of PBV and identifies key areas for policy reform.

6.1 Lack of standardised reimbursement and funding models

Sustainable funding for PBV is highly dependent on national healthcare financing structures, which vary significantly across countries. While some nations, such as Australia and Canada, have integrated pharmacist-administered vaccination into public health systems,[69] others still rely on out-of-pocket payments or limited private insurance coverage. This inconsistency in reimbursement policies leads to disparities in vaccine accessibility, particularly among low-income populations.[69,70] In the USA, reimbursement rates for vaccine administration by pharmacists vary significantly across states, with some states not allowing pharmacies to obtain reimbursement for certain vaccines, thereby limiting patient access.[69, 70]

In many countries, pharmacists administering vaccines receive little to no financial compensation from governments or insurance providers, making it difficult to sustain PBV as a viable service.[71, 72] Unlike physicians, who often receive reimbursement through national health systems, pharmacists face uncertain funding mechanisms, high operational costs, and limited financial incentives to continue offering vaccinations. In countries with established pharmacist-administered vaccines, such as Brazil, South Africa, and Ireland, pharmacists receive lower compensation than physicians, limiting their full participation in vaccination efforts.

In Poland, Tunisia and Costa Rica, where pharmacist-administered vaccines are limited, inadequate or absent, reimbursement makes these services financially unviable. In Greece, pharmacists play a key role in influenza vaccination but receive payment only for scheduling appointments, not for administering vaccines, posing a barrier to the financial sustainability of these services.[73] In the United Arab Emirates, pharmacist-administered vaccination depends largely on private insurance payments, contributing to disparities in access and affordability.

Key challenges include:

- Limited cost-sharing mechanisms: Patients often bear out-of-pocket costs due to the lack of government subsidies.[72]
- Variability in insurance coverage: Reimbursement models differ between public and private payers, leading to inconsistencies in compensation.[69, 70]
- Administrative burden: Complex billing processes and eligibility restrictions further deter pharmacies from expanding PBV services.

6.2 Budget constraints and competing healthcare priorities

Public health budgets are often constrained, requiring governments to prioritise funding for hospital-based care, physician services, and other primary healthcare interventions.[69, 71, 72] Despite evidence showing that PBV reduces healthcare costs by preventing vaccine-preventable diseases (VPDs), funding is often diverted to competing

priorities. This creates an environment where pharmacists struggle to secure financial support, even when PBV is proven to be cost-effective.

In some countries, government hesitancy to invest in PBV stems from the perception that physician-led vaccination programmes are sufficient to meet national immunisation goals.[69, 71, 72] However, regions with physician shortages have demonstrated that expanding PBV enhances vaccine accessibility and overall vaccination rates.

Policy reforms are needed to recognise PBV as a complementary, rather than competing, vaccination model and ensure that budget allocations reflect its long-term public health benefits.

6.3 Physician resistance and scope of practice limitation

The expansion of pharmacists' roles in vaccination services sometimes encounters resistance from other healthcare professionals, particularly physicians. In some settings, physicians view pharmacist-administered vaccinations as a threat to their own revenue streams, leading to resistance to integrating PBV into national immunisation programmes. Additionally, in some regions, legal and regulatory frameworks limit the scope of pharmacy practice, restricting pharmacists' ability to administer vaccines. For example, a study highlighted that a lack of support from physicians and costs associated with additional training were significant barriers to pharmacists' involvement in vaccine administration.[74]

Ensuring the sustainability of PBV requires a reliable, timely and adequate vaccine supply. The next chapter addresses this critical area by examining vaccine procurement strategies that influence equitable vaccine availability and access.

7 Procurement strategies to ensure timely and adequate supply of vaccines

Vaccine procurement generally occurs in two main phases. First, health authorities identify demand and requirements, specify legal and technical criteria, and issue invitations for bids or proposals. Second, they manage vaccine deliveries, monitor quality and safety, and evaluate performance.[75] This iterative process engages multiple stakeholders[75]—from government bodies to private insurers, individual patients, and international donors—all of whom influence vaccine access and financing.

7.1 Stakeholders in vaccine procurement

- Public sector: In many high-income settings (e.g., parts of Europe), national or regional health authorities fund and purchase vaccines through open tenders.[76] During pandemics, governments often centralise these efforts to streamline supply and ensure equitable distribution.[77]
- Insurance providers: In private markets, insurers reimburse vaccines listed within their benefit packages, though the level of coverage can vary widely by region and insurer.[78]
- Individuals: Where government or insurance coverage is limited, people may pay directly for recommended or optional vaccines (e.g., travel vaccines). Out-of-pocket costs can pose barriers to uptake, particularly in lower-income populations.[79]
- Donor organisations: In many low- and middle-income countries, global health partners (e.g., UNICEF, Gavi, PAHO) subsidise vaccine procurement and use pooled procurement or contracting strategies to reduce costs and improve supply stability.[80]

7.2 Main procurement strategies

Procurement strategies play a critical role in immunisation efforts, as they directly influence the reliability and sustainability of vaccine supply. According to the World Health Organization (WHO), the following are the main strategies for procuring vaccines (see Figure 8):[81]

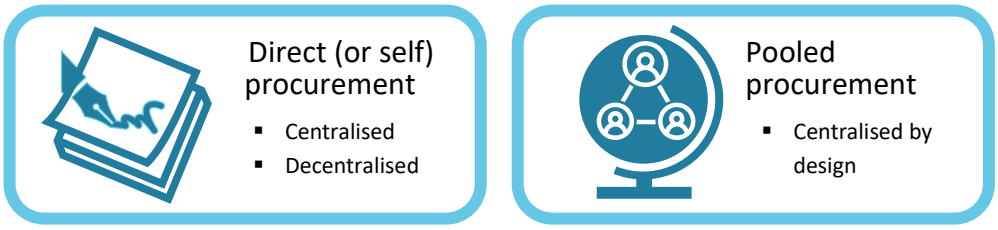


Figure 8. Vaccine procurement strategies according to the WHO

1. **Direct (self) procurement**

In this approach, countries independently manage the procurement of vaccines through open tenders or direct negotiations with manufacturers. It can involve:[75, 81]

- Competitive bidding: Public tenders inviting multiple suppliers to submit bids.
- Request for quotations: Informal process of soliciting offers without sealed bidding.
- Sole-source procurement: Direct purchase from a single supplier, usually for niche vaccines or during emergencies.

This strategy allows for tailored purchasing but may be challenging for countries with limited negotiating power or procurement expertise. WHO offers technical assistance to strengthen procurement systems, particularly in low- and middle-income countries (LMICs).[81] Furthermore, it can be further categorised based on how procurement are distributed within a country:

a. **Centralised public procurement:**

   Often used by national governments, especially in tax-funded or single-payer systems, this strategy uses bulk purchasing to secure vaccines at scale for national immunisation programmes. It reduces transaction costs and allows for quality control but may limit flexibility at local levels.

b. **Decentralised procurement:**

   Procurement responsibilities are delegated to sub-national entities, healthcare providers, or individual pharmacies. While this allows for responsiveness to local needs, it may result in fragmented pricing, inconsistent supply chains, and challenges in ensuring product quality.

2. **Pooled (centralised) procurement:** Collaboration of multiple countries that form a single purchasing entity to procure vaccines collectively. This mechanism can vary in scope, from the exchange of supplier and pricing information to the coordination of joint tenders and the establishment of shared contracts with manufacturers.[75]

   Regional or global pooled procurement mechanisms consolidate demand from multiple countries to leverage better pricing and supply conditions. Notable examples include:

   - PAHO Revolving Fund: Centralised contracting on behalf of member states in the Americas.[82, 83]
   - UNICEF Supply Division: Procures WHO-prequalified vaccines for nearly 100 countries, often using donor funds (e.g., via Gavi).[84, 85, 86]
   - Joint procurement in Europe: Regional collaborations (e.g., Nordic Forum, Baltic Initiative) enhance negotiating capacity and coordination.[87]

The summary of health systems adopted across countries and how vaccines are procured for PBV services is shown in Table 4.

Table 4. Summary of health systems and procurement strategies that influence PBV services

Health system model (example countries)	Vaccine procurement & funding	PBV services
Beveridge model *Tax-funded model* *National health service (NHS) model* **(e.g., UK, Nordic countries)**	Vaccines are financed by government as part of the national immunisation programme. Centralised procurement (national tenders/contracts) secures vaccine supply for the whole population. No charges to patients for recommended vaccines.[76]	Community pharmacies serve as designated vaccination sites for programmes such as flu and COVID-19.[21] Pharmacists are reimbursed by the health system for each vaccination (cost of vaccine and administration fee). For example, NHS England pays pharmacies for flu vaccines administered to eligible individuals.[88]
Bismarck model *Social health insurance (SHI)* *Statutory health insurance* *Multi-payer insurance system* **(e.g. Germany, France, Japan)**	Vaccines are included in benefits of statutory insurance. Funding comes from insurance premiums (with government subsidies for some). Procurement can be central or joint; many vaccines are purchased by public health agencies or via collective insurance fund tenders. In some cases, individual providers (e.g., physicians) purchase vaccines and are reimbursed by insurers.[76]	Pharmacists have recently been authorised to vaccinate (e.g., flu vaccines in pharmacies in France and Germany).[21] In these systems, pharmacies bill the insurance fund for administering recommended vaccines, with no out-of-pocket cost to patients.[20]
National Health Insurance (NHI) *Single-payer system* *Public insurance with private providers* **(e.g., Canada, South Korea, Taiwan)**	National (or provincial) health authorities finance vaccines on formulary. Procurement is generally centralised at a provincial or national level, using bulk purchasing to supply providers. Vaccines on the national schedule are paid by the public insurer and provided free to residents.[76]	PBV is authorised in some of these systems (varies by country/province).[21] Where allowed, it is typically integrated into the publicly funded scheme. For example, Canadian provinces authorise pharmacists to administer flu and COVID-19 vaccines, with the provincial health plan reimbursing pharmacies per dose administered (see Chapter 9).
Hybrid model *Mixed financing model* *Multi-tier health system* **(e.g., USA)**	Vaccine financing is split; government funds cover vaccines for certain groups (e.g., the Vaccines for Children programme covers ~50% of children, providing free vaccines to eligible children). Most others obtain vaccines through private healthcare providers with costs paid by their insurance plans. Procurement is decentralised—private sector buyers (including large pharmacy chains) purchase vaccines at market prices, while public agencies purchase at negotiated discount rates for programmes.[89, 90]	Pharmacies are authorised to administer vaccines. They purchase vaccines from wholesalers and administer to customers. For insured individuals, the pharmacy bills the insurer (public or private) for the service. Medicare also pays pharmacies for vaccine administration to seniors. Uninsured individuals may pay out-of-pocket at pharmacies. Many pharmacies are enrolled providers for public programmes such as Medicaid, enabling them to vaccinate eligible low-income children.[90]
Low-income & donor-supported (e.g., sub-Saharan African countries, parts of South Asia)	Childhood vaccines are typically provided through national immunisation programmes supported by GAVI and UNICEF. Funding is heavily donor-driven with some government co-finance. Procurement is centralised through UNICEF's Supply Division or via regional pools (e.g., PAHO Revolving Fund). Vaccines are delivered free at government clinics in line with EPI (Expanded Programme on Immunization). Adult vaccination programmes are minimal or non-existent due to resource constraints.[85]	Pharmacists are not yet routinely integrated into public immunisation efforts. In urban areas, pharmacies might offer select vaccines on a private, fee-for-service basis. In low-income settings, the absence of formal funding for PBV reduces uptake—aligning with the statistic that only ~11% of low-income countries offer any PBV services. The focus remains on strengthening public clinics, though interest in leveraging pharmacies is growing.[23]

8 The economic impact of PBV

8.1 The growing impact of vaccine-preventable diseases (VPDs)

Vaccination has long been recognised as one of the most cost-effective public health interventions, offering protection against infectious diseases while simultaneously reducing healthcare expenditures and supporting economic resilience.[1, 2] Despite these benefits, VPDs continue to impose a significant global burden, exacerbating health inequities, straining healthcare systems, and leading to productivity losses across industries.[3-5]

VPDs, including seasonal influenza, pneumococcal disease, pertussis, and herpes zoster, significantly impact public health and economic stability.[3-5] As per the WHO, seasonal influenza alone is responsible for up to 650,000 annual deaths globally and causes 3–5 million severe cases each year.[91] The economic burden is equally staggering (see Figure 9)—influenza-related hospitalisations, lost productivity, and medical visits cost the USA an estimated USD 11.2 billion (EUR 10.28 billion) annually.[17] In the European Union, failure to meet influenza vaccination targets results in healthcare costs ranging from EUR 190 million to EUR 226 million per year.[11]

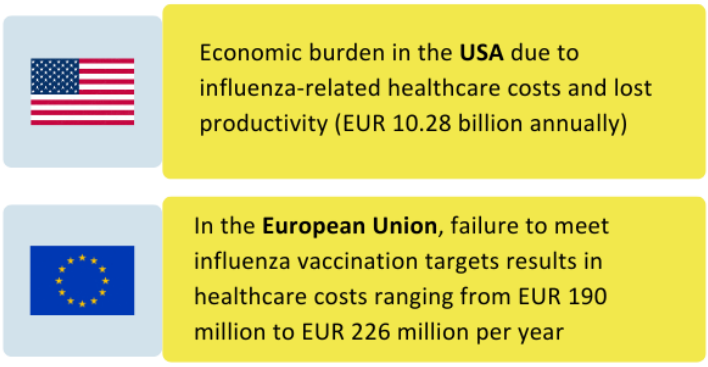


Figure 9. The economic burden of influenza-related healthcare costs

Beyond influenza, other VPDs pose serious risks, particularly for older adults and individuals with chronic conditions.[3, 4] Adults over 65 years account for nearly 90% of flu-related hospitalisations and deaths.[5] Pneumococcal disease, pertussis, and herpes zoster (shingles) continue to cause severe health complications, leading to increased hospital admissions and long-term medical costs.[3, 4] According to the International Federation of Pharmaceutical Manufacturers & Associations (IFPMA), the economic repercussions of vaccine-preventable diseases extend far beyond direct healthcare expenditures. For instance, the H1N1 pandemic led to an estimated global GDP loss of USD 2.8 trillion (EUR 2.57 trillion), underscoring the profound macroeconomic impact of inadequate immunisation efforts.[92]

Seasonal influenza alone accounts for approximately 91 million cases annually, leading to 159 million missed workdays and billions in lost productivity.[93] In Canada, influenza-related hospitalisations exceed CAD 1 billion (EUR 638.47 million) per year, while the global economic burden of VPDs runs into the hundreds of billions of dollars annually.[94]

As global life expectancy rises, so too does the prevalence of chronic conditions that heighten the risks associated with VPDs.[95-98] The World Health Organization (WHO) has emphasised that while life expectancy has increased, health span—the number of years lived in good health—has not kept pace.[95] This has led to an increase in chronic conditions such as cardiovascular disease, diabetes, and chronic respiratory illnesses, all of which heighten the risks associated with VPDs, leading to increased hospitalisations and higher healthcare costs.

8.2 The economic case for investing in vaccination

The International Longevity Centre UK (ILC-UK) and the World Health Summit Report (IFPMA) emphasise that vaccination is not only a public health intervention but also a driver of economic stability, workforce resilience, and

healthcare sustainability.[92, 93] The economic burden of failing to prevent VPDs is considerable. The Office of Health Economics (OHE) has estimated that for **every euro invested in immunisation, societies receive up to 19 times the return in healthcare savings, reduced absenteeism, and improved quality of life.**[98] A 2016 study also found that **for every dollar invested in vaccination in the world's 94 lowest-income countries, USD 16 (EUR 14.81) are expected to be saved in healthcare costs, lost wages, and lost productivity (see Figure 10).**[99]

Figure 10. Investment in vaccination in the world's 94 lowest-income countries

Economic analyses of flu vaccination in England, Canada, and Switzerland indicate that optimising vaccine delivery through pharmacies could yield significant healthcare cost savings by preventing outbreaks and reducing hospital strain.[93, 98, 100]

The financial impact of VPDs can be measured in both **direct healthcare costs** (hospital stays, medical consultations, emergency care) and **indirect economic losses** (workforce absenteeism, decreased labour market participation, premature mortality).[93]

For example:

- In the **European Union**, achieving influenza vaccination targets could save between EUR 190 million and EUR 226 million annually in healthcare-related costs.[11]
- In **Canada**, influenza-related hospitalisations alone cost the healthcare system over CAD 1 billion (EUR 638.47 million) per year, with additional indirect costs due to lost wages and productivity.[101]
- In the **USA**, broadening influenza vaccine coverage could prevent up to 16 million cases annually, leading to USD 1.9 billion (EUR 1.7 billion) in direct healthcare savings and substantial reductions in productivity losses.[17]
- In **England**, pharmacies administer 35% of adult NHS influenza vaccinations. A study by the Office of Health Economics suggests that vaccination for flu in pharmacies is more utilised in deprived areas.[102] If this proportion were applied to the adult NHS shingles and pneumococcal vaccination programmes, it could increase uptake, reduce inequalities, and save over 400,000 GP practice appointments annually, freeing 80,000 hours, mainly for practice nurses.[102] This would allow GPs and nurses to focus on childhood vaccination and other priority services while reducing reliance on locum staff during peak demand.[102]

However, the impact of vaccines extends far beyond seasonal influenza. Immunisation against pneumococcal disease, pertussis, herpes zoster, and COVID-19 has demonstrated similar cost-saving effects, reducing disease incidence and alleviating pressure on hospital systems.[5, 11, 27, 103, 104] Pharmacist-led vaccination programmes offer a cost-effective, high-impact solution to improve vaccine accessibility and uptake, particularly among hard-to-reach populations.[11, 101, 105]

8.3 Direct cost savings from PBV

8.3.1 Strengthening immunisation strategies through PBV

Expanding the role of community pharmacies in vaccine administration has been identified as a key strategy to improve vaccination rates, particularly among underserved populations. Pharmacists provide convenient, widely accessible vaccination services, often with extended hours and no requirement for prior appointments, making them an effective complement to traditional vaccination settings.

Evidence from multiple countries underscores the benefits of pharmacy-led vaccination programmes:

- **Canada**: Pharmacist-administered vaccination programmes increased influenza immunisation rates by 3%, with pharmacies administering 765,000 flu shots annually, saving the healthcare system CAD 763,158 (EUR 487,261) per year in direct costs.[101]
- **European Union:**
    - Countries integrating pharmacists into vaccination programmes have seen higher vaccination rates and healthcare savings of up to EUR 1.59 billion annually.[11]
    - Pharmacist-administered flu vaccines could generate EUR 39.45 million in annual savings from reduced primary care visits.[11]
- **Switzerland**: Pharmacist-administered flu vaccines led to CHF 143,021 (EUR 148,930) in net savings per 100,000 people due to reduced hospitalisations and medical consultations.[100]
- **France, Germany, and the UK:** Integrating pharmacists into influenza vaccination programmes could result in EUR 1.59 billion in annual savings, mainly by preventing hospitalisations and reducing primary care visits.[11]
- **USA:** Pharmacies administer over 50 million flu vaccinations annually, accounting for nearly one-third of all adult influenza vaccinations.[106] During the COVID-19 pandemic, pharmacies in the USA administered 304.7 million vaccine doses, demonstrating their capacity to support large-scale immunisation efforts.[28]

8.3.2 Pharmacists as key vaccination providers

The role of pharmacists in public health has evolved significantly, with increasing recognition of their capacity to provide critical vaccination services (see Figure 11). Traditionally, pharmacists were involved in vaccine distribution and education, but regulatory changes in many countries have enabled them to administer vaccines directly, making vaccination more accessible to the public.

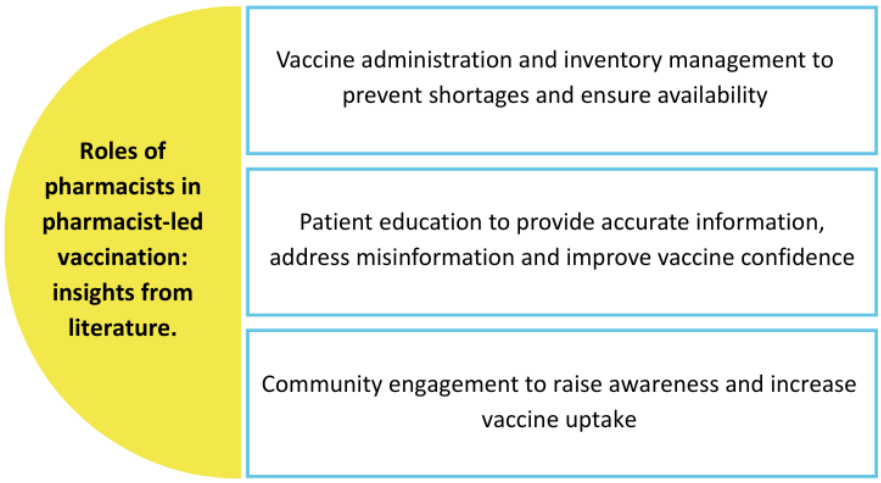


Figure 11. Roles of pharmacists in pharmacist-led vaccination

A growing body of evidence highlights the effectiveness of pharmacist-led vaccination programmes in enhancing vaccine uptake and addressing healthcare disparities. A systematic review by Isenor & Bowles (2018)[105] found that pharmacist-led vaccination initiatives significantly increased vaccination rates, particularly when pharmacists assumed roles beyond direct administration. Their meta-analysis of 36 studies demonstrated that when pharmacists acted as educators and facilitators, vaccination rates increased nearly threefold. This underscores the impact of pharmacists not only in administering vaccines but also in educating the public, facilitating vaccine delivery, and supporting vaccination campaigns.

Similarly, a systematic review and meta-analysis by Rahim et al. (2023)[107] provided further evidence of pharmacists' contributions to immunisation. Analysing 19 studies across different healthcare settings, the review found that pharmacist interventions improved immunisation rates by up to 51% compared to usual care (pooled RR = 1.51; 95% CI: 1.28–1.77). The strongest improvements were observed in interventions where pharmacists took on advocacy roles, including patient education, community engagement, and vaccine inventory management (RR = 2.09; 95% CI: 1.42–3.07). Even in cases where pharmacists primarily acted as direct vaccine administrators, a modest but statistically significant improvement in vaccine uptake was observed (RR = 1.03; 95% CI: 1.00–1.21).

These findings are reinforced by global data, demonstrating that PBV programmes are effective in diverse healthcare systems. Countries that have incorporated pharmacists into their vaccination strategies—such as Canada, the USA, Australia, and several European nations—have reported higher vaccine uptake, increased accessibility, and cost savings due to fewer hospitalisations and reduced healthcare utilisation.

Beyond increasing vaccine coverage, pharmacists play a critical role in reducing vaccine hesitancy. As trusted healthcare professionals, pharmacists provide evidence-based information, address vaccine-related concerns, and facilitate informed decision-making.[103] The MOTIVATE study[108] found that pharmacist-led vaccine education interventions were not only more effective in increasing vaccine trust and acceptance but also more cost-effective than peer-led interventions, with an average cost of USD 34.72 (EUR 31.87) per participant compared to USD 81.51 (EUR 74.83) for alternative programmes.

8.3.3 Mechanisms of cost savings in pharmacist-led vaccination

This section outlines the mechanisms through which PBV reduces healthcare expenditures and presents evidence from global case studies demonstrating these economic benefits (see Figure 12). Pharmacist-led vaccination programmes reduce direct healthcare costs through three primary mechanisms:

1. **Reduced** hospitalisations and emergency visits

Expanding vaccine access through community pharmacies has been associated with lower hospitalisation rates, reducing the burden on hospitals and intensive care units.

- Canada: A 3% increase in pharmacy-based flu vaccination coverage led to CAD 717,000 (EUR 457,854) in reduced flu-related hospital costs.[101]
- Switzerland: Pharmacist-led flu vaccines prevented 17.6 primary care visits, 0.33 hospitalisations, and 1.1 hospital days per 100,000 people per season, yielding CHF 143,021 (EUR 148.959) in economic savings.[100]
- USA: Including pharmacies in flu vaccination strategies prevented 11.9 million influenza cases per epidemic, saving over USD 1 billion (EUR 918.15 million) in hospitalisation costs.[17]

2. **Fewer** medical consultations and outpatient visits

Pharmacist-led vaccination programmes reduce physician workload, lowering demand for primary care consultations and emergency room visits.

- Canada: Ontario's pharmacist-administered flu vaccination programme saved CAD 763,158 (EUR 487.375) per year by reducing physician visits.[101]
- EU: Pharmacist-led vaccination could play a critical role in reaching EU coverage targets for at-risk groups. Achieving full coverage could save up to EUR 39.45 million in reduced primary care visits across five major EU countries.[11]

- USA: Pharmacy-based flu vaccinations lower flu-related outpatient visits by 24%, reducing healthcare expenditures.[5]

3. **Lower** treatment costs and medication use

By preventing infections, pharmacist-led vaccination programmes reduce the need for costly treatments, including antibiotics, antiviral medications, and intensive care interventions.

- Antibiotic usage reduction: Pharmacist-led flu vaccines have decreased antibiotic prescriptions, supporting antimicrobial stewardship efforts.[11]
- USA impact: Expanding pharmacy-led vaccination saved over USD 3.5 million (EUR 3.21 million) from avoided hospitalisations, reducing the need for intensive care and antiviral treatments.[106]
- Canada: Integrating pharmacists into vaccination strategies lowered prescription medication use for flu-related complications, further driving healthcare savings.[104]

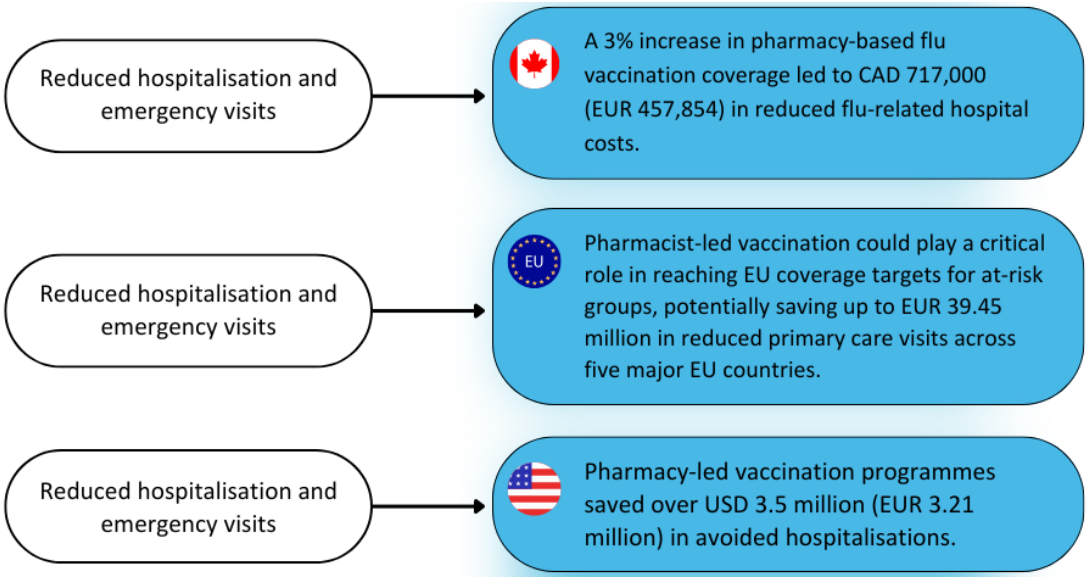


Figure 12. Evidence from global case studies demonstrating the economic impact of PBV

Across diverse healthcare settings, PBV programmes have consistently demonstrated cost-effectiveness and public health benefits. Key trends emerging from global case studies are summarised below:

1. Significant healthcare cost savings: PBV programmes reduce hospitalisations, emergency visits, and physician consultations, saving millions in healthcare costs.
2. Increased vaccine accessibility: Pharmacists offer convenient, community-based vaccination services, reaching populations that may not access traditional healthcare settings.
3. Higher vaccine coverage rates: Pharmacists improve vaccination uptake, particularly among underserved and working-age populations.
4. Public health resilience: PBV programmes provide a scalable, cost-effective solution for managing disease outbreaks and reducing the burden of vaccine-preventable diseases.

8.4 Indirect cost savings from PBV

PBV programmes yield indirect cost savings by mitigating economic burdens associated with productivity losses, including absenteeism, presenteeism, caregiver burden and disruptions caused by disease outbreaks. These savings originate from a healthier workforce, reduced medical leave and alleviated pressure on healthcare systems.[66, 109]

For instance, Bartsch et al.[17] calculated that pharmacist-led flu vaccination in the USA could prevent up to 16 million cases per year, saving the economy USD 69.5 billion (EUR 63.89 billion) in productivity losses. Notably, PBV enhances indirect savings by increasing access to vaccines, leading to higher vaccine uptake and fewer disease outbreaks. This increased vaccination coverage reduces disease transmission, minimising both the frequency and severity of outbreaks,[1] thereby promoting economic stability and reducing the burden on healthcare systems.[1]

8.4.1 Productivity losses

Indirect savings through reduced productivity losses include:

1. **Reduced absenteeism and presenteeism**

Absenteeism refers to missed workdays due to illness, while presenteeism describes decreased productivity (e.g., reduced focus and efficiency) when employees work despite being ill.[110] PBV reduces these indirect costs by preventing time lost to illness and medical appointments.[110]

Several studies demonstrate the effectiveness of vaccination in reducing absenteeism and presenteeism:

- Poland: The SARS-CoV-2 vaccination programme lowered absenteeism and presenteeism among healthcare workers. Those vaccinated with three doses had the fewest missed workdays (2.00 ± 6.75), while the unvaccinated group had the highest (5.32 ± 16.24).[110]
- Canada: Increased PBV reduced flu incidence, thereby decreasing absenteeism by USD 3.4 million (EUR 3.14 million).[101]
- Italy: Raising influenza vaccination coverage among healthcare workers from 30% to 70% over five years averted 23,213 influenza cases, reducing productivity losses by EUR 4.48 million and boosting tax revenues by EUR 327,159.[111]

The ILC-UK report "Lost Time: Productivity and the Flu" found that flu-related absenteeism led to 159 million missed workdays among 50–64-year-olds in 2018 alone. These findings align with broader health strategies in Europe, where proactive measures have saved USD 646 million (EUR 593 million) in welfare gains, illustrating how preventive strategies across sectors stabilise economies.[112]

2. **Improved productivity through disease prevention**

Vaccination programmes, including PBV, enhance workforce efficiency by preventing long-term disability and premature mortality, thereby reducing productivity losses associated with VPDs. For example, the Global Self-Care Federation's report highlights that policy-driven preventive health strategies, including vaccination programmes, could boost productivity gains by 25%.[112] This highlights the multiplier effect of vaccination programmes when integrated into broader public health frameworks like self-care initiatives that promote accessible interventions like PBV.

Studies have shown that vaccination programmes can reduce productivity losses associated with illness and premature death:

- Iran:[113] Indirect costs accounted for 62% of the total costs for COVID-19 patients, primarily due to lost productivity. On average, patients missed 27.31 workdays, while their family caregivers missed an additional 15.74 days. Productivity losses from missed workdays made up 88% of total indirect costs, emphasising the significant economic impact of VPDs.
- An economic analysis of influenza vaccination[93] found that vaccination averted GBP 28.9 million (EUR 34.39 million) in sick day costs and GBP 269.7 million (EUR 320.9 million) in productivity losses from premature mortality in England.

3. **Maintaining functional ability in ageing populations**

PBV improves access and coverage, especially for ageing populations, by offering convenient locations, extended hours, and walk-in services. This accessibility helps overcome barriers such as transportation and scheduling, ensuring timely protection and better health outcomes. For instance, administering influenza vaccination in adults

over 65 years reduced hospitalisation rate by 40%,[114] alleviating pressure on healthcare systems and translating into indirect cost savings by preventing lost workdays for caregivers and lowering broader societal costs associated with long-term care and medical expenditures.

The pandemic has disproportionately affected older adults, leading to higher rates of morbidity and mortality in this population. Vaccination has proven effective in preventing severe illness and hospitalisations among the elderly, thereby underscoring the importance of vaccination programmes for this vulnerable group.[115] Furthermore, COVID-19 survivors, particularly older adults, may experience long-term health complications, including cardiovascular issues, emphasising the need for preventive measures like vaccination to mitigate these risks. [116]

4. **Societal perspective on productivity losses**

From a societal perspective, productivity losses represent a critical factor in assessing the cost-effectiveness of vaccination programmes. By preventing absenteeism, reducing mortality, and minimising workforce disruptions, vaccination helps offset programme costs, ultimately enhancing its economic value.[101]

Studies have demonstrated that vaccination programmes generate substantial savings in productivity losses, reinforcing their role as a cost-effective public health intervention.[17]

For example, utilising pharmacies as vaccination sites during an influenza epidemic improved accessibility, increasing vaccination coverage to 33.7% compared to 23.8% when only traditional locations were used.[17] This strategy reduces work absences, averting up to 16.5 million symptomatic influenza cases while offering overall economic stability by averting productivity losses ranging from USD 4.2 billion to USD 65.5 billion (EUR 3.87 billion to EUR 60.41 billion) and providing overall societal savings of USD 5.2 billion to USD 67.3 billion (EUR 4.79 billion to EUR 62.04 billion).[17]

8.4.2 The role of vaccines in reducing the burden of non-communicable disease (NCD)

Non-communicable diseases (NCDs) such as cardiovascular disease (CVD), chronic obstructive pulmonary disease (COPD), and cancer remain leading causes of morbidity and mortality worldwide.[117] While vaccines are traditionally associated with preventing infectious diseases, emerging evidence highlights their critical role in mitigating NCD-related complications.[118]

Vaccination not only reduces the direct burden of infections but also helps prevent infection-triggered exacerbations of chronic conditions.[118] Respiratory infections, for example, increase the risk of cardiovascular events and severe complications in COPD patients. However, certain vaccines, such as the human papillomavirus (HPV) vaccine, play a direct role in preventing NCDs like cervical cancer.[118, 119]

Given the accessibility of pharmacists, they are uniquely positioned to improve vaccine uptake among high-risk populations with NCDs. PBV models have been instrumental in closing vaccination gaps, particularly for older adults and individuals with chronic illnesses who frequently interact with pharmacists for medication management.[19]

The following section outlines the strong connection between vaccination and NCD prevention based on current literature.

1. **Influenza vaccines and cardiovascular (CV) risk reduction**

Seasonal influenza vaccination plays a critical role in reducing the risk of CV events, particularly among individuals with pre-existing heart conditions. Several studies indicate that flu vaccination lowers hospitalisation rates, healthcare costs, and mortality associated with cardiovascular disease (CVD). PBV services amplify these benefits by increasing vaccine uptake through convenience (e.g., extended hours and no-appointment options), accessibility (e.g., widespread locations), and pharmacist-patient interactions that build trust and address vaccine hesitancy, ensuring more individuals receive timely protection.[22, 105]

- A meta-analysis of six randomised controlled trials (RCTs)[120] found that flu vaccination reduced composite CV events by 34%, with a 56% reduction in cardiovascular mortality among patients who had recently experienced acute coronary syndrome (ACS).

- A self-controlled case series study in England (2008–2019) of 193,900 individuals found a significant reduction in first-time CV events following flu vaccination[121]
- A cross-sectional study of 89,999 patients in the USA found a significant association between laboratory-confirmed influenza infection and CV events.[122] The study suggested that increasing influenza vaccination rates could lead to a substantial decline in CV incidents, further supporting the vaccine's role in protecting heart health. [122]
- A nationwide cohort study in Denmark showed that receiving an annual flu vaccine reduced cardiovascular mortality by 18%, with greater protection for individuals who had received multiple flu vaccines over the years.[123]

2. Pneumococcal vaccines and CVD prevention

Similar to influenza vaccination, pneumococcal vaccination has been shown to reduce complications from CVD. Recent studies highlight its potential in different age groups and individuals with underlying health conditions:

- A large retrospective study conducted in Hong Kong showed that receiving sequential pneumococcal vaccination (PCV13 followed by PPSV23) reduced the risk of CVD by 25.[124]
- A systematic review and meta-analysis concluded that pneumococcal vaccination could offer substantial cardiovascular benefits, particularly in reducing all-cause mortality and myocardial infarction (MI) risk among older adults.[125,126]
- Despite the demonstrated benefits of vaccination, pneumococcal vaccine uptake remains low among individuals with CVD. A cross-sectional study in Australia[127] found that 68% of participants had received an influenza vaccine in the past year, while only 37% and 20% had received pneumococcal and zoster vaccines, respectively.

Barriers such as limited awareness, cost concerns, and logistical challenges (e.g., transportation or appointment scheduling) hinder vaccine uptake.[128] Pharmacies can address these by offering convenient, walk-in vaccination services at accessible locations, reducing out-of-pocket costs through subsidised programmes, and leveraging pharmacist-patient interactions to educate and encourage vaccination, particularly among high-risk CVD patients.

3. HPV vaccines and cervical cancer

Cervical cancer accounts for significant morbidity and mortality worldwide, being the third leading cancer among women yearly.[129] Human papillomavirus (HPV) vaccine is a proven tool for preventing cervical cancer, yet vaccination rates remain suboptimal in many countries.

- A national HPV vaccination programme in England (which is also implemented in Wales) prevented 687 cases of cervical cancer and 23,192 cases of grade 3 cervical intraepithelial neoplasia.[119]
- A Swedish study found that quadrivalent HPV vaccination was associated with a lower risk of invasive cervical cancer, and the reduction in the incidence was more pronounced among women vaccinated at a younger age.[130] This shows the efficacy of these vaccines in protecting against HPV infection and neoplasm.[131]

4. Pneumococcal and influenza vaccination in chronic obstructive pulmonary disease (COPD)

Chronic obstructive pulmonary disease (COPD) is a leading cause of morbidity and mortality, with frequent exacerbations leading to hospitalisations and long-term complications.[132] Many of these exacerbations are triggered by respiratory infections, making vaccination a key preventive strategy.[133]

The Global Initiative for Chronic Obstructive Lung Disease (GOLD) recommends several vaccines for COPD patients, including influenza vaccine, pneumococcal vaccine, COVID-19, tetanus, diphtheria, zoster, and pertussis vaccine.[134]

Despite these recommendations, vaccination rates among COPD patients remain low due to a lack of awareness, logistical barriers, and access issues.

9 Case studies

The following case studies explore the PBV landscape in Australia, Canada, Costa Rica, Portugal, South Africa, the UK (England, Scotland, Wales, and the Northern Ireland), and the USA. These case studies highlight key aspects such as legislative frameworks, funding models, economic and public health impacts, and lessons learned from PBV implementation.

9.1 Australia

Country/Territory:	Australia
Member organisation's name in English:	Pharmaceutical Society of Australia

Section A: Legislative framework for funding PBV

In Australia, PBV operates under both national and state-level regulations, with funding provided through public programmes such as the National Immunisation Program (NIP) and the COVID-19 Vaccination in Community Pharmacy (CVCP) Program. Pharmacies may also offer privately paid vaccinations, with administration fees determined by the provider.

The following funding programmes are available to support the delivery and uptake of vaccination through Australia's community pharmacies:

- **National Immunisation Program (NIP)**: The NIP provides vaccine providers, including community pharmacies, with vaccines listed in this national formulary at no charge for administration to eligible individuals. The NIP includes infant and childhood vaccination schedules (currently out-of-scope for most community pharmacists except for catch-up vaccination for children under 5 years), adolescent vaccination, and adult vaccination (including older persons).
  Vaccines included on the NIP include hepatitis B, DTPa, polio, Haemophilus influenzae type b (Hib), rotavirus, pneumococcal, meningococcal B, influenza, meningococcal ACWY, MMR (measles, mumps, and rubella), hepatitis A, HPV, shingles (herpes zoster) and RSV. Each vaccine has specific eligibility criteria.
- **COVID-19 Vaccination in Community Pharmacy (CVCP) Program:** This government programme distributes COVID-19 vaccines to participating pharmacies at nil charge for administration to any eligible person. Pharmacies are paid a fee for each vaccine administered. Currently, CVCP has adult and paediatric versions of the Pfizer COVID-19 vaccine available. Novovax, Moderna and AstraZeneca COVID-19 vaccines have previously formed part of this programme.

Some state-specific vaccination programmes also exist:

- **State-funded vaccine schedules**: Some state-funded vaccination programmes provide vaccines at no cost to PBV providers (on request) to administer to eligible individuals. Examples include MMR (Victoria, NSW) and hepatitis A (NSW) etc. At this time, no remuneration for the administration of these vaccines is available (exception: see free-flu programmes below), and PBV providers are able to charge patients a private fee.
- **Responses to emerging public health threats:** Some state programmes exist which stand-up PBV providers as part of campaigns to protect at-risk individuals against emerging public health threats such

as mPox (smallpox vaccine) and Japanese encephalitis. These programmes are currently available in both NSW and Victoria. No reimbursement for administration fees is available.

- **Free-flu programmes:** In 2022, most states ran 'free flu vax' programmes in an effort to increase influenza vaccine uptake in a year in which there were strong concerns about the severity of the circulating strain and hospital capacity. Some jurisdictions have continued to fund this on a year-by-year basis, with Queensland and Western Australia offering the programme in both PBV providers and general practice in 2025.

Private administration fees are an individual business decision for a pharmacy. The fees set should cover the cost of providing the service (e.g., human resources, consumables, recording systems, advertising and marketing, utilities, storage), consistent with the business' pricing policy and consideration of market rates.

It is difficult to provide definitive descriptions of market rates, particularly as the components of a private fee often include the vaccine and a professional fee. However, 'administration only' fees of between AUD 15 (EUR 8.72) and AUD 40 (EUR 23.24) have been observed, usually dependent on the complexity of the vaccination event, local market rates, and individual business and professional service delivery costs.

Section B: Overview of PBV in Australia

When was PBV introduced?

The first PBV programme commenced in Queensland in 2014 for influenza vaccination. Since this time, the range of vaccines, eligible age groups, and funding arrangements have changed dramatically.

What types of vaccines are pharmacists authorised to administer?

Authority varies between jurisdiction and an individual pharmacist's scope of practice. A comprehensive list of vaccines that pharmacists are legally authorised to administer, broken down state-by-state, can be found on the Pharmaceutical Society of Australia's website.

Section C: Funding model for PBV services

Who funds PBV?

The PBV in Australia is funded through both public and private payment models:

- Public reimbursement: Pharmacists or pharmacies are reimbursed through Commonwealth Government and state/territory government health systems or insurers.
- Private payment: Some vaccinations are not reimbursed, and patients pay out-of-pocket.

The following describes funding arrangements for the PBV programmes:

- **NIP (vaccine):** Funded by the Australian Government's Department of Health and Aged Care. The distribution of vaccines is managed by state and territory health departments.
- **CVCP (vaccine and administration fee):** Funded by the Australian Government's Department of Health and Aged Care, with payments administered by the Pharmacy Programs Administrator.
- **State health programmes (vaccine):** Vaccines are provided free of charge to the pharmacy. Private vaccine administration fees are charged by the PBV provider (to the patient), as reimbursement for this is not available.
- **NIPVIP (administration fee):** Funded by the Australian Government's Department of Health and Aged Care, with payments administered by the Pharmacy Programs Administrator.
- **'Free flu' programmes** (vaccine and administration fee): Time-limited vaccination campaign programmes which are funded and administered by some state governments (Queensland and

Western Australia in 2025). In these cases, the government has set fees paid to pharmacies for the provision and administration of private-market influenza vaccines.

- **Other vaccines:** Privately funded by individuals.

Additional insights on reimbursement:

Jurisdictional variation of PBV reimbursement
The introduction of NIPVIP for the administration of NIP-funded vaccines has largely standardised reimbursement. Some of the jurisdictional variations for reimbursement have been addressed above (see '*Free flu' programmes*).

Private insurance
Private health insurers may reimburse limited expenses for private prescription items (including any vaccine) up to an annual cap, which can include vaccines. However, this generally doesn't recognise pharmacist-initiated vaccines or cover administration fees and is, therefore, probably out-of-scope of this case study of PBV.

How are reimbursement rates determined, and do they differ based on vaccine type, administration setting, or patient demographics?

CVCP provides reimbursement for the administration of a COVID-19 vaccine in any setting a pharmacist is lawfully able to administer at. When linked to a community pharmacy, in most jurisdictions, this includes vaccination within and outside of the pharmacy (e.g., residential aged care facility, outreach service to a patient's home).

CVCP also includes a flag fall payment of AUD 127.30 (EUR 73.96) when a COVID-19 vaccination service is delivered to patients and workers in a residential aged care facility, residential disability facility, or a patient's place of residence if the patient is house-bound and unable to visit a primary care vaccination site. Pharmacies receive the same flag fall payment per site visit, regardless of how many vaccinations are completed at the site. This is in addition to any other fees payable.

The fee payable to the PBV provider varies depending on the rurality of the community pharmacy, which is currently:

- Metropolitan (MM1*): AUD 28.35 (EUR 16.47)
- Regional, rural and remote (MM2-7*): AUD 31.60 (EUR 18.36)

NIPVIP provides reimbursement for NIP vaccines administered:

- To individuals aged 5 years or over; and
- Within the community pharmacy or in a residential aged care or residential disability care setting.

No flag fall is claimable for off-site vaccination under NIPVIP.

The NIPVIP reimbursement fee is fixed at AUD 19.32 (EUR 11.23) for all vaccines administered under this programme.

* MM refers to the Modified Monash Model, a measure of rurality and remoteness. It is used in Australia in health funding models to address inequitable access to a range of health services.

Are pharmacists reimbursed at the same rate as doctors or nurses? If not, what are the key differences in compensation structures?

There is no set fee a general practitioner or nurse receives for the administration of a vaccine. Generally, reimbursement in general practices (medical centres) for the administration of a vaccine would be covered by Medicare Benefits Schedule (MBS) fees.

The NIPVIP fee was introduced at the same rate as an MBS Level A consultation AUD 19.60 (EUR 11.39) (with a general practitioner) in 2024. However, this does not necessarily mean there is payment parity:

- Where the administration of a vaccine is more complex, an MBS Level B consultation fee (6–20 minute consultation) can be claimed by a general practitioner and reimbursed at AUD 42.85 (EUR 24.90).
- General practitioners are able to charge a fee higher than the MBS scheduled fee (gap fee), whereas pharmacists who claim an NIPVIP fee are unable to charge an additional fee. Pharmacists are also required under the NIPVIP programme rules to offer NIPVIP-funded administration fees for every NIP vaccine administered and cannot selectively choose to charge private fees for higher-complexity vaccination events.

Reimbursement for the assessment of suitability and administration of COVID-19 vaccines remains separate from other vaccination funding programmes.

There are other models of vaccination delivery in Australia which exist under different funding models:

- **Workplace vaccination programmes for influenza**: These are privately funded by a person's employer and would consist of payment of an agreed amount to the provider, who would provide both an immuniser (historically a nurse) and the influenza vaccines.
- **School immunisation programmes**: These run under various models in different jurisdictions, which may include a private provider or be delivered by state health department nurses.
- **Public health clinics (e.g., maternity clinic in a public health unit, sexual health service, etc.)**: The service would be delivered using vaccines supplied or procured from the state health department and administered as part of the clinic's regular service by salaried personnel.

What are the main barriers pharmacists face in reimbursement (e.g., administrative delays, regulatory restrictions)?

Existing reimbursement systems are generally timely and relatively straightforward to navigate. Clinical software facilitates reporting required to make accurate and timely claims for NIPVIP and CVCP reimbursement.

Inconsistency in regulation leads to the following barriers to pharmacist reimbursement:

- Uncertainty on what vaccines can be lawfully initiated and administered.
- Lack of national uniformity for patients and pharmacists as vaccine types that can be initiated by pharmacists vary across jurisdictions due to state or territory government policy decisions.
- Only funding the administration of a vaccine rather than an assessment of suitability. This discourages pharmacists from undertaking longer, more in-depth assessments of a patient's health needs and vaccine eligibility.
- Inability to claim reimbursement for administration of vaccines lawfully administered to persons under 5 years of age (e.g., influenza vaccines in Queensland).

Section D: Economic and public health impact

Evidence on the economic and public health impact of PBV in Australia

PSA is not aware of specific studies which assess the cost-effectiveness of PBV in Australia.

It is difficult to identify the quantitative impact of PBV on healthcare expenditure, hospitalisation or productivity. Such an evaluation would be complex and require substantial funding in order to evaluate.

Qualitatively, it appears that PBV has modestly increased the total number of people who seek protection against influenza each year. Significantly, PBV provides surge capacity in vaccination campaigns at short notice, which is critical for increasing vaccination rates when there is time-limited motivation or necessity to be vaccinated. This has been invaluable for short-notice COVID-19, meningococcal, JEV and mPox campaigns.

PBV is also able to increase engagement with some parts of the community, which has limited, If any, interaction with other vaccination providers.

It is difficult to identify the quantitative impact of PBV on vaccination uptake, particularly given substantial disruption events such as the COVID-19 pandemic and funding changes in recent years. Data shows that ~25% of all influenza vaccines are administered in PBV programmes, which has increased from about ~15% in 2021.

While PBV has grown in recent years, total vaccination rates in adults and children have somewhat declined. This has been largely attributed to post-COVID-19 pandemic vaccination fatigue and increasing anti-vaccination sentiment in the Australian community. These lower vaccination rates have been associated with an increase in measles outbreaks in the past two years (Australia was generally considered not to have endemic measles transmission) and increased pertussis outbreaks.

Section E: Key enablers

What factors have contributed to the success of PBV in Australia?

The success of PBV in Australia is multifactorial and involves the contribution of a range of stakeholders, key opinion leaders, and the engagement of the profession and the general public. Key enablers have included:

- **Advocacy by peak health organisations, including the Pharmaceutical Society of Australia:** Sustained advocacy work over more than a decade has been needed to advance PBV in Australia. This included advocacy to support the initial QPIP trial, followed by years of championing to expand the scope of PBV to more vaccines, more age cohorts, more locations, and within an equitable funding model. PSA's support has extended to thousands of interactions with health ministers, public servants, consultation submissions, social media, member communications, and key-opinion leaders at conferences and mainstream media over this time. This messaging has been supported by other pharmacy stakeholders and consumer groups.
- **Pharmacist training offered by peak health organisations, including the Pharmaceutical Society of Australia:** All pharmacists who authorise and administer vaccines must be assessed as competent by a trainer in an accredited face-to-face workshop and meet a range of compliance obligations. The capability of the Pharmacy Guild of Australia and PSA to train and credential large numbers of pharmacists in vaccination has been essential to ensure there are enough pharmacist immunisers to meet consumer demand and ensure PBV reaches critical mass.
- **Practice support by peak health organisations, including the Pharmaceutical Society of Australia:** PSA has supported a range of practice support activities for PBV, including:
    - Developing and maintaining the professional guidance document, ***Practice Guidelines for Pharmacist Providing Immunisation Services***, which describes the minimum expectations of pharmacist immunisers.
    - ***Member briefings (webinars)*** on major vaccine recommendation changes (e.g., annual ATAGI statement on seasonal influenza) and changes to funding arrangements.
    - ***Communication of major vaccination advice*** to pharmacists through member bulletins and social media posts.
    - ***Pharmacist-to-pharmacist advice line*** where PSA members can call a pharmacist with a query regarding vaccination.
    - ***Immunisation resource hub*** hosted on the PSA website, which collates key Information and resources for pharmacists. need.
- **Growing confidence In PBV by regulators and the Australian community**: Australian pharmacists now routinely administer over 2 million influenza vaccines annually and have administered nearly 13 million COVID-19 vaccines (August 2021 to March 2025). The convenience, surge capacity, low

error rate, and capability of pharmacist immunisers have provided confidence to regulators and the Australian community that PBV is safe and cost-effective.

- **Normalisation of PBV within existing vaccination initiatives**: Extension of the NIP and COVID-19 vaccine programmes to PBV providers has been critical in normalising PBV. Prior to the availability of NIP vaccines in community pharmacies, the uptake of PBV was often limited in scope. The addition of NIPVIP, which in many ways mirrors reimbursement of consultation fees in other practice settings, is accelerating the uptake of NIP vaccines through PBV.

Section F: Lessons learned

What key insights can other countries learn from Australia's PBV experience, and what policy recommendations would you suggest for countries considering PBV implementation?

Key insights from Australia's experience:

- There is strong trust in pharmacists in Australia, and this has now extended to trust in PBV. This has been achieved through incremental and effective policy changes, which have progressively grown the role of PBV in Australia.
- Jurisdictional variation has added substantial complexity to the implementation of PBV in Australia. Chiu et al. 2022 have suggested some approaches which could help reduce this level of variation.
- Initial funding models in Australia were private-patient payment for influenza vaccination. This helped demonstrate an effective model of PBV in Australia when governments were considering the provision of funding and/or access to NIP vaccines.
- The quality accreditation programme for community pharmacies in Australia includes an audit of pharmacy cold chain management. This helped provide initial confidence in the management of the cold chain for PBV.
- Patel et al. 2024 provide valuable commentary on some of the challenges in implementation and lessons for other countries, in particular regarding recording systems and the need for transparency and completeness of data to inform effective evaluation and policy decisions.
- Surge capability to support public health crises, such as COVID-19 vaccination and mPox, is critical for health departments looking to respond to rapidly emerging health needs.

Policy recommendations for countries considering PBV implementation:

- Seek incremental implementation and build evidence and confidence in PBV over time.
- Offer solutions to health regulators and policy teams to achieve their goals and targets.
- Regulatory changes require ongoing, in-depth engagement of peak bodies, such as national member organisations, with political and regulatory decision-makers over a long time. This will also require ongoing and deep engagement with, and support to, the pharmacist workforce to upskill and build professional capacity.

9.2 Canada

Country/Territory:	Canada
Member organisation	Neighbourhood Pharmacy Association of Canada (Non-FIP member)

Section A: Legislative framework for funding PBV

Canada's PBV services operate under a provincial legislative framework, with funding governed by health ministries. Coverage varies—some provinces fully fund PBV through public programmes, while others require private insurance or out-of-pocket payments. Pharmacists' scope of practice also differs by province, affecting eligibility, vaccine types, and remuneration models.

Canada's PBV services are governed by provincial and territorial legislation, leading to variations in funding models and pharmacists' scope of practice. Each province's Ministry of Health determines which vaccines pharmacists can administer, whether they are publicly funded, and the reimbursement model.

Funding models:

- **Publicly funded vaccines:** All provinces cover pharmacist-administered influenza vaccines, and most now reimburse pharmacists for COVID-19 vaccines. Some provinces (e.g., Alberta, British Columbia, Ontario) also fund additional vaccines such as pneumococcal, shingles, and HPV for eligible populations.
- **Private payment and insurance:** Vaccines not included in public programmes must be paid out-of-pocket or covered by private insurance, leading to disparities in access. Some provinces limit pharmacist reimbursement to specific vaccines, restricting the range of services available.

Recent policy changes:

- Ontario expanded pharmacists' authority in 2023 to include RSV vaccines, aligning with other provinces offering broader immunisation scope.
- Quebec (2020) authorised pharmacists to administer vaccines for the first time, following legislative changes in Bill 31.
- Reimbursement rates vary, with some provinces increasing pharmacy fees for COVID-19 and expanding pharmacist prescribing authority to reduce access barriers.

Overall, legislative changes have enhanced PBV access, but funding discrepancies persist across Canada.

Section B: Overview of PBV in Canada

When was PBV introduced?

PBV was introduced in 2007 (See reference).

What types of vaccines are pharmacists authorised to administer?

The list of vaccinations that can be administered by pharmacists is extensive. The list varies from province to province. A strong Canadian example is the province of Ontario where, as of July 2023, pharmacists are authorised to administer a wide range of vaccines and medications by injection. They can provide vaccines for influenza (for individuals aged two and older), COVID-19 (for those six months and older), hepatitis A and B, herpes zoster (shingles), human papillomavirus (HPV), meningococcal disease, pneumococcal disease, respiratory syncytial virus (RSV), Tdap booster, rabies, typhoid, varicella (chickenpox), yellow fever,

Haemophilus influenzae type b (Hib), Japanese encephalitis, and Bacille Calmette-Guérin (BCG). In addition to vaccines, pharmacists are now permitted to administer injectable medications for treatment purposes, including those for osteoporosis (such as denosumab), diabetes (such as insulin and GLP-1 receptor agonists), rheumatoid arthritis (such as biologics), and asthma (such as biologics for severe asthma).

Section C: Funding model for PBV services

Who funds PBV?

Pharmacists or pharmacies are reimbursed through public health systems or private insurers. Importantly, each province has its own budget for funding pharmacy. Therefore, publicly funded vaccines such as flu or COVID-19 immunisations, are funded by the province.

Additional insights on the funding model for PBV

Remuneration structures are set provincially and can differ in both fee amount and which vaccines are included. Most provinces pay a flat fee per publicly funded dose. The fee ranges from approximately CAD 7 (EUR 4.48) to CAD 13 (EUR 8.31) for a flu shot, depending on the province. For example, Ontario reimburses pharmacists CAD 8.50 (EUR 5.43) per flu immunisation. During the COVID-19 rollout, many provinces temporarily boosted pharmacist vaccination fees (Ontario paid CAD 13 (EUR 8.31) per COVID-19 shot, and some provinces added supplements for pandemic-related costs). Provinces also differ in which vaccines come with a pharmacist billing code; for example, Manitoba allows pharmacists to administer a set of five publicly funded vaccines (such as influenza, pneumococcal, tetanus/diphtheria, etc.), but if a patient is eligible for another publicly funded vaccine not in that set, the pharmacist cannot bill for it and must refer the patient to public health. In contrast, Ontario and Saskatchewan permit pharmacists to give any vaccine the patient is eligible for elsewhere and simply advise that it is publicly available through other providers. If the patient still opts for pharmacy convenience, the pharmacist can administer and charge for it privately.

Private insurance plays a secondary but important role. Core vaccines for seniors, children, or high-risk groups are funded by government. Many working-age adults seek vaccines like shingles (if outside the free age range), HPV or travel vaccines which require payment. In these scenarios, private drug plans often cover the cost of the vaccine itself (if it is on the plan's formulary) and sometimes cover pharmacist injection fees (which may be covered under health spending accounts or as a paramedical service). For instance, an adult who needs a travel vaccine (not publicly provided) might request their pharmacy to purchase and administer it, and then submit a claim to their insurance for both the vaccine and the administration fee as "medical expenses."

How are remuneration rates determined, and do they differ based on vaccine type, administration setting, or patient demographics?

Remuneration rates for pharmacists are typically negotiated or set by the provincial government (Ministry of Health or public health authority) in consultation with pharmacy associations. The fee per injection may consider factors such as time required, training, and administrative overheads. Generally, the fee is the same for any given publicly funded vaccine in a province; however, there are exceptions. For example, Ontario pays CAD 13 (EUR 8.31) for COVID-19, which is higher than its standard flu fee of around CAD 8.50 (EUR 5.43). Differences by patient demographics are not common; instead, eligibility for public payment is what matters (e.g., an eligible senior's pneumonia vaccine triggers a pharmacy fee from government, whereas a non-eligible adult paying privately would result in no government fee).

There may also be distinctions in prescribing authority. In Alberta, pharmacists with independent prescribing authorisation can both prescribe and inject a vaccine in one visit and be paid for the administration, whereas in a province without pharmacist prescribing, the patient might need a doctor's prescription for certain vaccines (introducing an extra step but not changing the pharmacy's administration fee).

Are pharmacists reimbursed at the same rate as doctors or nurses? If not, what are the key differences in compensation structures?

Pharmacists are generally reimbursed at a lower rate than physicians for administering vaccines, but their cost per vaccination is often comparable or lower due to efficiency and accessibility. Physicians typically bill provincial health insurance for an office visit or procedure fee, which can be around CAD 13 (EUR 8.31) per flu shot in Ontario.

Pharmacists receive a set administration fee per publicly funded vaccine, usually ranging between CAD 7 (EUR 4.48) and CAD 13 (EUR 8.31), depending on the province. Despite slightly lower per-shot fees, pharmacist-led vaccination programmes are cost-effective, with studies showing similar or lower overall costs per vaccine delivered compared to physician-led programmes.

What are the main challenges in the funding model (e.g., administrative burdens, funding gaps, reimbursement delays)?

Administrative burden and coordination

Pharmacists must manage vaccine inventory (often supplied by public health for publicly funded vaccines) and navigate documentation requirements to get reimbursed, which can be time-consuming. For example, pharmacies in BC must order public vaccine stock from local health units and document each dose by lot number to reconcile inventory.

Funding gaps exist for certain patient groups or vaccines. If a vaccine is recommended but not publicly covered for a given patient, pharmacists face the choice of turning the patient away or charging them, which can create inequity. Some provinces (like Manitoba) restrict pharmacists from providing privately paid vaccines that are available for free elsewhere, which, while intended to ensure patients use free programmes, can inconvenience patients and result in missed opportunities (e.g., if public clinics are hard to reach).

Reimbursement delays and paperwork

Pharmacies must submit claims (through provincial billing systems or insurance) and occasionally face rejections or late payments if data are incomplete.

Inadequate remuneration

Pharmacy organisations in Canada have argued that the fees for vaccination sometimes do not fully cover the operational costs (staff time, supplies, cold chain maintenance, post-shot monitoring for adverse reactions, etc.). For instance, during COVID-19, Ontario's pharmacy fee was among the lowest in Canada, prompting calls for a temporary increase to account for personal protective equipment and additional workload. Low margins may discourage some pharmacies from offering the service as robustly as they could. Additionally, pharmacists are not paid for certain related tasks like educating vaccine-hesitant patients.

Section D: Economic and public health impact

Evidence on the economic and public health impact of PBV in Canada

Cost-effectiveness and healthcare savings

Studies indicate that involving pharmacists as immunisers is cost-saving or cost-neutral while increasing coverage.

- In Ontario, after pharmacists were authorised to deliver flu shots (starting in 2012), an economic analysis compared outcomes before and after implementation. It found that in just two seasons, an additional 448,000 people got vaccinated (a 3% increase in population coverage) due to the accessibility of pharmacies. The study estimated approximately CAD 763,000 (EUR 487,812) saved in direct healthcare treatment costs for influenza, plus significant productivity gains (fewer sick days and less time off to get vaccinated) valued at over CAD 7.9 million (EUR 5,051 million).
- Another analysis across multiple provinces found that allowing pharmacists to vaccinate was associated with a modest yet meaningful uptick in flu shot coverage (~2.2% increase on average) . A 2.5% increase in influenza immunisation among Canadian seniors was projected to save CAD 16 million (EUR 10 million) in healthcare costs nationally.

Improved vaccine uptake and access

- A national survey found that 78% of Canadians would consider going to a pharmacist for a flu shot, indicating high public willingness to use this option.
- The impact is notable in influenza vaccination: by 2019, pharmacies had become the single largest channel for flu shots in Canada, surpassing physician offices as the most common place Canadians received their influenza vaccine.

PBV has shown benefits for **underserved or high-risk groups:**

- During the COVID-19 pandemic, pharmacies played a pivotal role in vaccinating vulnerable populations who might have faced challenges accessing mass vaccination clinics. Many pharmacies offered dedicated hours or outreach to seniors and immunocompromised patients. As a result, pharmacists administered an estimated 17 million doses of COVID-19 vaccines in Canada by 2022—a massive contribution that undoubtedly helped protect high-risk individuals and the general public. This scale of delivery in a short time frame also showcased how pharmacists could improve overall vaccination coverage during a crisis, which is especially relevant for underserved populations who rely on local pharmacies as their primary healthcare touchpoint.

Public health outcomes

- The Ontario study's modelling implied that the pharmacist initiative prevented enough influenza cases to save three-quarters of a million dollars in treatment costs over two years—a proxy for **reduced doctor visits and hospital visits** due to fewer infections.
- The convenience of PBV has reduced missed opportunities for vaccination: busy individuals who cannot take time off for a doctor visit can simply walk into a pharmacy, a factor which has been cited as a key influence in people deciding to get vaccinated.
- By lowering such barriers, PBV increases uptake in working-age adults who historically had suboptimal vaccination rates (for instance, working adults' flu vaccination rates improved in provinces after pharmacy programmes began, relative to those without such programmes).

Section E: Key enablers

What factors have contributed to the success of PBV in Canada?

Progressive legislation and policy support

A conducive legislative framework was the foundation; provinces enacted regulations to authorise pharmacists to immunise, often starting with a single vaccine (influenza) and gradually amending laws to widen the scope. Strong support from pharmacy regulatory bodies and professional associations helped drive these changes. Regulators and advocacy groups worked closely with governments to ensure patient safety and build trust in pharmacists' capabilities.

Public funding and reimbursement mechanisms:

The establishment of funding agreements for pharmacist vaccination removed financial barriers for patients and incentivised pharmacy participation. Provinces integrated pharmacist-delivered vaccines into public immunisation programmes (with per-dose fees), ensuring the service would be free for patients and sustainable for pharmacies. Once pharmacists could bill the government for flu shots (and later other vaccines), pharmacies large and small had a business case to offer vaccination clinics. This public funding commitment was key—it essentially formalised pharmacists as partners in public health delivery. In provinces like Alberta and BC, the decision to fund vaccines like pneumococcal and others at pharmacies further boosted the success of PBV by expanding the range of services pharmacists could offer to patients at no cost . Private sector support also played a role: some employers and insurers encouraged pharmacy vaccinations through coverage and on-site pharmacy-led clinics. Overall, having a clear reimbursement structure (and one that is regularly updated, as seen during COVID-19 when fees were adjusted) is a major enabler for PBV scale-up.

Pharmacist training and certification

Ensuring pharmacists are sufficiently trained to administer vaccines has been essential. All provinces require pharmacists to complete a certified immunisation training programme (including injection technique and emergency management of anaphylaxis) before providing vaccinations. By 2022, approximately **70% of Canada's practicing pharmacists had injection training and licensure**. Additionally, some provinces expanded training to pharmacy technicians, allowing them to immunise under certain conditions (e.g., pharmacy technicians can vaccinate in Ontario, BC, Saskatchewan, New Brunswick, and Nova Scotia).

Interprofessional collaboration and support

The success of PBV in Canada was also facilitated by engagement and partnerships with other healthcare providers and public health authorities. Early on, there was some resistance or concern from physicians and nurses (around scope overlap and revenue loss). Pharmacy leaders worked to address these concerns by emphasising the shared goal of improving vaccination rates and demonstrating that pharmacists could help reach more patients without undermining physicians' role.

Pharmacy infrastructure and technology

Pharmacies are ubiquitous and are often open in the evenings and at weekends. Their accessibility (90% of Canadians live within five kilometres of a pharmacy) and frequent patient traffic provide a ready platform to deliver vaccines conveniently. Additionally, technological advancements have supported PBV implementation: many provinces have developed or enhanced immunisation record systems that pharmacists can access. For instance, some jurisdictions linked pharmacy billing systems with public immunisation registries to enable doses administered in pharmacies to be recorded centrally. During COVID-19, provinces rapidly stood up electronic platforms (like Ontario's COVAX system), enabling real-time documentation by pharmacists and communication with public health databases. This integration of **digital records and booking systems** made the vaccination process smoother and allowed pharmacists to operate at high volume while maintaining traceability of vaccinations. Furthermore, pharmacies employed scheduling software and reminder systems (often via pharmacy apps or automated calls) to manage vaccination appointments and recalls, thereby enhancing coverage (patients could be easily reminded when they were due for a vaccine).

Public awareness and trust

Years of consistent service, with pharmacists demonstrating competence and care in giving vaccines, have built confidence. High patient satisfaction rates have been reported for pharmacy vaccination services. Pharmacies often conduct outreach and advertising (posters, local media, flu shot clinics) which raise awareness that "you can get vaccinated at the pharmacy". Nationally, public education campaigns (some by government, some by pharmacy associations) reinforced the message that pharmacist vaccinations are safe, convenient and effective. The trust was further solidified during the pandemic when pharmacists stepped up as frontline vaccinators. In turn, this public support has made it easier for policymakers to expand pharmacists' vaccination roles (there is little controversy about pharmacist-delivered vaccines today, given their track record).

Section F: Lessons learned

What key insights can other countries learn from Canada's PBV experience, and what policy recommendations would you suggest for countries considering PBV implementation?

Canada's experience with PBV offers key insights for other countries:

1. **Clear legislative framework:** Establish enabling laws and regulations that authorise pharmacists to administer vaccines. While a phased approach—starting with flu shots and expanding—helps manage risks and gain stakeholder support. Once support and confidence has grown, pharmacists should have broader authorities so that their expertise and access can be fully leveraged for wider uptake.
2. **Sustainable funding and reimbursement:** Public funding is crucial for PBV success. Governments should compensate pharmacies for vaccine administration, ensuring financial viability and removing cost barriers for patients. A mix of public and private insurance can further support sustainability.
3. **Pharmacist training and quality assurance:** Require certified immunisation training for pharmacists to build trust and ensure safety. Clear guidelines on vaccine storage, administration, and adverse event management are essential.

4. **Stakeholder engagement and collaboration:** Early engagement with physicians, nurses, and public health authorities reduces resistance and fosters teamwork. PBV should complement, not compete with, other healthcare providers.
5. **Leveraging pharmacy access and integration, as well as supply chain enablers:** Pharmacies' extended hours and locations make them ideal vaccination sites. Connecting them with immunisation registries and public health systems improves data tracking and coordination. Ensuring that there is a process for real time efficient vaccine distribution is also critical; Canada has successfully leveraged its medication wholesale distribution for some vaccines in some jurisdictions which should be expanded across the country. Delays or logistical issues in vaccine delivery can complicate efforts in uptake.
6. **Gradual expansion of scope:** Begin with high-priority vaccines (e.g., influenza, COVID-19), then broaden to other routine and travel vaccines based on public health needs. Expanding in phases ensures smooth implementation.
7. **Public awareness and vaccine confidence:** Pharmacists play a key role in addressing vaccine hesitancy. Public education campaigns should highlight the convenience and safety of PBV. Hesitancy and misinformation continue to rise due to many factors which hinders efforts.
8. **Continuous monitoring through strong surveillance mechanisms and policy adaptation:** Collect data on vaccination rates, coverage improvements, and safety outcomes. Be prepared to adjust policies based on real-world experience to enhance PBV effectiveness. In Canada, vaccine surveillance remains a challenge because of the decentralised health care system, with pharmacists managing their own immunisation programmes and no coordination through provincial or national vaccine registries. There is no single national vaccine database, which can lead to gaps in tracking vaccination rates and outcomes.

9.3 Costa Rica

Country/Territory:	Costa Rica
Member organisation	College of Pharmacists of Costa Rica

Section A: Legislative framework for funding PBV

In Costa Rica, PBV operates within the national healthcare system but relies primarily on out-of-pocket payments by individuals, with no third-party funding mechanisms in place.

In Costa Rica, the administration of vaccines under the basic vaccination schedule is handled through the public social security system. Within this system, pharmacists are involved in the distribution chain and pharmacovigilance; however, they do not directly administer vaccines. Vaccines can also be administered in private pharmacies, including those in the basic vaccination schedule (with the exception of the BCG vaccine), as well as those not included in the schedule or those reserved for at-risk groups. In the latter case, pharmacists are authorised to administer them, in addition to performing tasks such as storage, pharmacovigilance, and pharmacotherapeutic monitoring.

1. Legislative framework

The legal framework governing vaccination in Costa Rica consists of three primary laws:

1. **National Vaccination Law** (Law No. 8111)
2. **Regulations to the National Vaccination Law** (Executive Decree No. 32722-S)
3. **National Vaccination Standard** (Executive Decree No. 37808-S)

Additionally, the **National Health Policy 2023-2033** and the **2024-2028 Action Plan** issued by the Ministry of Health provide further regulatory guidance.

2. Funding and accessibility

In Costa Rica, there are no third-party financing models for vaccines not included in the official public vaccination programme. Access to these vaccines is exclusively through direct individual payment.

3. Pricing and administration fees

The retail pricing of vaccines in private pharmacies is regulated by an executive decree that establishes maximum gross marketing margins (44863-MEIC):

- **Manufacturer**: Determines the cost of the medicine (CIF price).
- **Wholesaler (distributor/drugstore)**: Maximum markup of 19% on the retail price.
- **Retailer (pharmacy)**: Maximum markup of 30.5% on the retail price.

Section B: Overview of PBV in Costa Rica

When was PBV introduced?

The exact date when the administration of injectable medications, particularly vaccines, began in private community pharmacies is unknown. However, their role has been recognised in Costa Rican regulations governing the subject and in the development of the nominal vaccination system (see reference). The provision of injectable administration services in general, and vaccines in particular, by private community pharmacies, was ratified by a 2009 ruling from the Attorney General's Office, which stated that, within the technical-legal concept of dispensing or distributing medications in pharmacies, the administration of injectables is an inherent and routine function or service of the pharmacy. Pharmacists are authorised to

administer injectable medications, including vaccines, via intramuscular, intradermal, and subcutaneous routes.

What types of vaccines are pharmacists authorised to administer?

The official list of vaccines included in Costa Rica's **basic universal public vaccination programme** is as follows: tuberculosis (BCG), polio (oral and intramuscular polio), diphtheria, pertussis (whole cell and acellular), tetanus, Haemophilus influenzae B, hepatitis B, measles, rubella, mumps, chickenpox, pneumococcal conjugate and polysaccharide, rotavirus, human papillomavirus, and COVID-19 vaccines. (See Executive Decree No. 32722, Executive Decree No. 37808-S, Vaccine schedule 1. Poster from the Pan American Health Organization and Ministry of Health, and Vaccine schedule 2. Poster from the Costa Rican Chamber of Health and Ministry of Health.

The vaccines available in Costa Rica, **both public and private**, are the following: tuberculosis (BCG), hepatitis B (HBV), oral polio vaccine (OPV), inactivated polio vaccine (IPV), paediatric triple bacterial vaccine with acellular pertussis (DTaP), adult triple bacterial vaccine with acellular pertussis (Tdap), tetanus and diphtheria vaccine (Td), quadrivalent diphtheria, Tetanus, Acellular pertussis, and inactivated poliovirus vaccine (DTaP-IPV), pentavalent diphtheria, tetanus, pertussis, hepatitis B, and Haemophilus influenzae type b vaccine (DPT-HBV-Hib), pentavalent diphtheria vaccine Diphtheria, tetanus, acellular pertussis, inactivated polio, and Haemophilus influenzae type b (DTaP-IPV-Hib), hexavalent diphtheria, tetanus, acellular pertussis, inactivated polio, Haemophilus influenzae type b, and hepatitis B vaccine (DTaP-IPV-Hib-HBV), 13-valent pneumococcal conjugate vaccine, 23-valent pneumococcal polysaccharide vaccine, monovalent rotavirus vaccine, pentavalent rotavirus vaccine, measles, mumps, rubella (MMR) vaccine, chickenpox, quadrivalent influenza vaccine, hepatitis A, rabies, yellow fever, human papillomavirus (HPV), meningococcal, typhoid fever, and COVID-19 vaccine. (See Executive Decree No. 37808-S and Vaccination).

In private community pharmacies in Costa Rica, pharmacists are authorised to administer all vaccines available privately, except for the tuberculosis (BCG) vaccine, which is only offered in private hospitals or maternal clinics. According to the 2021 survey on pharmaceutical services in immunisation conducted as part of the project "Pharmaceutical Services in Immunisation from Community Pharmacies: Contributing to Public Health in Costa Rica", the vaccines most frequently administered in private community pharmacies are the following:

Type of vaccine	Percentage (%)
Yellow fever	89.6
Quadrug-like influenza	88.3
Human papillomavirus (HPV)	81.4
Diphtheria-tetanus-acellular pertussis (DTaP)	61.0
Hepatitis B	60.6
13-valent pneumococcus	60.2
Chickenpox	57.6
23-valent pneumococcus	54.1
Hepatitis A	52.4
Rotavirus	48.5
Meningococcus	45.9
Measles-mumps-rubella (MMR)	39.4
Haemophilus influenzae type b (Hib)	35.1
Tetanus-diphtheria (Td)	31.6
Diphtheria-tetanus-acellular pertussis-polio (DTaP-polio)	18.2
Other	3.5

Section C: Funding model for PBV services

Who funds PBV?

In Costa Rica, vaccination coverage is extensive because the basic public vaccination programme is universal and includes 15 vaccines. This situation means that vaccine consumption in the private sector, where community pharmacies are located, is primarily focused on vaccines not included in the national basic vaccination programme, those that are included but only for specific groups, or individuals who choose not to attend social security services. The vaccination service in community pharmacies generally does not carry an additional cost for the individual, as it is included in the retail price of the medication. In the few pharmacies that charge for vaccination services, the cost ranges from approximately USD 2.00 (EUR 1.83) to USD 6.00 (EUR 5.48). In this situation, no set fee exists, and the cost of administration is at the discretion of each pharmacy.

Additional insights on remuneration

There are no known studies, technical discussions, or policy proposals that consider third-party financing (government subsidies, private insurance) for PBV in Costa Rica. Pharmacies do not offer financing options or instalment payment plans for individual vaccine purchases to improve affordability for those who choose to purchase vaccines privately.

How are remuneration rates determined, and do they differ based on vaccine type, administration setting, or patient demographics?

In Costa Rica, there are no reimbursement systems for the sale and administration of vaccines at the private community pharmacy level. A few private health insurance plans are beginning to recognise the administration of vaccines. In this case, reimbursement is processed directly by the insurance beneficiary, with the pharmacy issuing the invoice for the sale and administration of the vaccine, which is paid directly by the person receiving the service.

Are pharmacists reimbursed at the same rate as doctors or nurses? If not, what are the key differences in payment structures?

In Costa Rica, there are no reimbursement systems for the sale and administration of vaccines at the private community pharmacy level. The existence of compensation structures for medical doctors and nurses is unknown.

What are the main challenges in the funding model (e.g., administrative burdens, funding gaps, reimbursement delays)?

In Costa Rica, there are no reimbursement systems for the sale and administration of vaccines at the private community pharmacy level.

Section D: Economic and public health impact of PBV

Evidence on the economic and public health impact of PBV in Costa Rica

In Costa Rica, there are no studies on the cost-effectiveness, contribution to healthcare cost savings, reduction in hospital visits, or improved efficiency of the national health system generated by PBV . Nor is there any known influence that immunisation interventions implemented by private community pharmacies have had on vaccination acceptance among the general population, including at-risk groups.

The following actions are being implemented to begin documenting the contributions and impact of the provision of pharmaceutical immunisation services from private community pharmacies on the national health system:

- Within the framework of the project 'Pharmaceutical Services in Immunisation from the Community Pharmacy: Contributing to Public Health in Costa Rica', implemented from 2020 to 2024 by the College of Pharmacists, the research "Contribution of Influenza Vaccines Administered in Private Community Pharmacies to the General Total in Costa Rica for the Period 2018-2021" was conducted.

The purpose of this research was to evaluate the influenza vaccine sales reports due to the supply to private community pharmacies in Costa Rica, and their contribution to the national total of doses administered during the period 2018 to 2021. The results of this study are currently in the process of publication.

- Currently, the Costa Rican College of Pharmacists is developing a second project, "Development of Competencies and Tools for Implementing Activities to Prevent Vaccine-Preventable Diseases and Promote Lifelong Immunisation in Community Pharmacies", which is scheduled to begin in 2024. This project includes conducting a study titled "Impact of Diphtheria, Pertussis, and Tetanus (Tdap) Vaccine Administration in Private Community Pharmacies on National Vaccination Coverage in Costa Rica from 2019 to 2023." One of its objectives is to determine the contribution of doses administered in private community pharmacies to Tdap vaccination rates in the general population and pregnant women. This study is currently underway, and once completed, the results will be published.

Section E: Key enablers of PBV

What factors have contributed to the success of PBV in Costa Rica?

- Costa Rican regulations recognise and protect pharmacists and community pharmacies as stakeholders in the provision of immunisation services, specifically in the storage, dispensing, and administration of vaccines at the pharmacy.
- Pharmacists are available during all pharmacy opening hours and are distributed throughout the country.
- Pharmacists are trained in immunisation, pharmaceutical care, administration of injectable medications, and the provision of pharmaceutical services.
- Regular and ongoing training activities on vaccines and immunisation pharmaceutical services.
- Professional practice guides are available on immunisation pharmaceutical services.
- Leadership and participation of the Costa Rican College of Pharmacists in the implementation and development of immunisation pharmaceutical services at private community pharmacies.

[Section F: Lessons learned]

What key insights can other countries learn from Costa Rica's PBV experience, and what policy recommendations would you suggest for countries considering PBV implementation?

Among the key ideas that other countries can learn from Costa Rica's experience are:

- In Costa Rica, according to current regulations, every pharmacy must have a pharmacist during all its operating hours: a professional who assumes the scientific direction and technical responsibility of the establishment.
- The administration of injectables, including vaccines, by the pharmacist within the vaccination and injectables services of a community pharmacy is a legally protected activity. The administration of vaccines (and other injectables) is one of the healthcare functions for which pharmacists are authorised, as outlined in the Professional Profile established by their professional association. Therefore, every vaccine administered in a community pharmacy is properly safeguarded, stored, and administered by a qualified pharmacy professional.

As part of the policy recommendations for countries considering the implementation of the PBV programme, the following actions are recommended:

- Implement a regulatory framework for vaccination within the country.
- Establish an official list of vaccines as part of the national vaccination schedule.
- Promote initiatives that highlight the role of pharmacists in increasing vaccination coverage rates.
- Support pharmaceutical services in immunisation by implementing training, research, and documentation activities.

9.4 Portugal

Country/Territory:	Portugal
Member organisation	ANF - National Association of Pharmacies (ANF)/OF - Portuguese Pharmaceutical Society

Section A: Legislative framework for funding PBV

PBV in Portugal is regulated at the national level, with municipalities playing a role in funding specific vaccination initiatives. The National Health Service (SNS) provides partial or full reimbursement for vaccines included in public health campaigns, while municipality-driven funding supplements national efforts by improving access to certain vaccines.

The legislative framework governing PBV funding

In Portugal, PBV is regulated at the national level, with pharmacies playing a significant role in administering vaccines outside the National Vaccination Programme (PNV). The legislation governing this service includes Decree-Law No. 307/2007, of 31st August, which establishes the possibility for pharmacies to provide pharmaceutical services to promote health and well-being, while Ordinance No. 114/2024/1, of 22nd March, defines the governance model for the National Vaccination Programme, serving as the basis for vaccination campaigns carried out in community pharmacies.

Within the scope of the seasonal influenza and COVID-19 vaccination campaigns, the operational model, as well as the terms and conditions for the provision of this service by community pharmacies, are established by Ordinance No. 264/2023, of 17th August (for the 2023-2024 Autumn-Winter Seasonal Vaccination Campaign) and Ordinance No. 201/2024/1, of 4th September 4, (for the 2024-2025 campaign). Both ordinances state that participating pharmacies must meet specific requirements, such as maintaining a vaccine administration service in compliance with INFARMED resolutions and employing professionals properly trained in vaccine administration. Deliberation No. 139/CD/2010 (21/10/2010), followed by the following changes, Deliberation No. 145/CD/2010 (04/11/2010) and Deliberation No. 68/CD/2023 (21/09/2023).

Both campaigns are based on principles such as free access for users, accessibility, equity, and comprehensive coverage, aiming to reach all eligible individuals in Portugal. User eligibility is determined by the Directorate-General of Health (DGS), and the connection between the Ministry of Health's information systems and community pharmacies is ensured by the Shared Services of the Ministry of Health (SPMS). This ensures compliance with eligibility criteria and access to vaccination history.

For the 2023-2024 campaign, the remuneration for pharmacies was set at EUR 2.50 per administered vaccine (Ordinance No. 289/2023, of 26th September), while for the 2024-2025 campaign, this fee increased to EUR 3 per administered vaccine, with an additional EUR 0.11 per administration to cover waste management costs, provided that a maximum vaccine wastage rate of 1.5% is ensured, corresponding to the rate also maintained within SNS entities (Ordinance No. 206/2024/1, of 12th September). These legislative initiatives aim to increase vaccination coverage and improve public access to vaccines, integrating community pharmacies as key partners in Portugal's vaccination campaigns.

The role of municipality-driven funding and its contribution to national PBV programmes

Between 2018 and 2019, a pilot project for influenza vaccination without the need for a prescription or charges was established in the municipality of Loures, in the district of Lisbon.

As part of an agreement with the Ministry of Health to further integrate vaccination into the national public health system, the Directorate-General for Health (DGS) invited 39 community pharmacies to serve as vaccination points for influenza. The pilot ran in Loures from 15th October to 31st December 2018, with the goal of increasing flu vaccination coverage among individuals aged 65 and over by improving accessibility through pharmacies. The results were highly positive compared to the previous year, with the collaboration between pharmacies and national health system centres leading to a 31.8% increase in vaccination coverage in the municipality.

Building on this success, between 14th October 2019, and 31st January 2020, pharmacies in Loures received 10,000 flu vaccines from the NHS supply, available free of charge to residents aged 65 and over. This initiative was a continuation of the pilot project developed by ARS-LVT and DGS, in partnership with local pharmacies. By early January 2020, more than 9,500 people over 65 had been vaccinated against influenza at no cost in Loures pharmacies, marking a 25% increase in immunisation compared to the same period in 2019. The vaccination process in pharmacies followed the same conditions as in health centres—no medical prescription was required, and administration was free of charge for users. These partnerships played a crucial role in extending co-funded flu vaccination at a national level, financed by the NHS, ensuring accessibility and equity for the elderly population.

Following two successful years of pilot implementation in Loures and in response to the COVID-19 pandemic, in September 2020, the Ministry of Health set the goal of vaccinating at least 150,000 people aged 65 and over in pharmacies, under the same conditions as health centres. Pharmacy participation was voluntary, with vaccines provided free of charge by the SNS, while the flu vaccine administration service was partially funded at EUR 2.50 per dose, as agreed with the Ministry of Health. This funding was secured through the mobilisation of municipalities and civil society, including the Abem COVID-19 Emergency Fund from the Dignitude Association.

At present, there are no municipality-funded vaccination initiatives.

Section B: Overview of PBV in Portugal

When was PBV introduced?

PBV was introduced in 2007, with the first seasonal influenza campaign launched in 2008.

What types of vaccines are pharmacists authorised to administer?

In Portugal, pharmacists are authorised to administer a range of vaccines, including influenza, COVID-19, hepatitis B, HPV, meningococcal, pneumococcal, RSV, shingles, and the Tdap booster.

Section C: Funding model for PBV services

Who funds PBV?

There is a mixed reimbursement system in Portugal:

- Public funding: The National Health Service (SNS) reimburses PBV under specific national immunisation campaigns.
- Private funding: Patients pay out-of-pocket or use private health insurance for certain vaccinations.

Additional insights on remuneration:

The National Health Service (SNS) in Portugal reimburses the following vaccines administered or sold in community pharmacies:

1. Influenza vaccine: Available free of charge to individuals aged 50 to 84 and pharmacy healthcare professionals in NHS campaigns. Reimbursed for other target groups with a medical prescription (since 2023).

2. COVID-19 vaccine: Offered at no cost to individuals aged 50 to 84 and pharmacy healthcare professionals In NHS campaigns (since 2023).
3. Pneumococcal vaccines:
    - The 23-valent pneumococcal polysaccharide vaccine (Pn23) is reimbursed at 69% for all adults aged 65 and over, with a medical prescription, excluding administration service.
    - The 15-valent pneumococcal conjugate vaccine (Pn15) and the 20-valent pneumococcal conjugate vaccine (Pn20) are reimbursed at 37% with a medical prescription (Pn20 is only reimbursed for individuals not included in the National Vaccination Program), excluding administration service.
4. Hepatitis vaccines: The hepatitis A, hepatitis B, and combined hepatitis A and B vaccines are reimbursed at 37% with a medical prescription, excluding administration service.
5. Haemophilus influenzae type b vaccine: Reimbursed at 37% with a medical prescription, excluding administration service.

The following vaccines are available only out-of-pocket with a medical prescription: cholera, dengue, diphtheria-tetanus-pertussis, tick-borne encephalitis, Japanese encephalitis, oral typhoid fever, human papillomavirus, rabies, rotavirus, respiratory syncytial virus, herpes zoster, and varicella.

Municipalities no longer provide direct funding for PBV programmes.

How are remuneration rates determined, and do they differ based on vaccine type, administration setting, or patient demographics?

The remuneration for the PBV service, where authorities renegotiate the terms and conditions of population immunisation with pharmacies, such as in seasonal vaccination campaigns (influenza and COVID-19), is legally regulated and may vary depending on the type of vaccine. For the 2024-2025 seasonal campaign, pharmacies were reimbursed by the NHS at a rate of EUR 3 per influenza and COVID-19 vaccine administration for individuals aged 50 to 84, as previously mentioned.

To date, this remuneration has remained the same across all population demographics and risk groups. For all other vaccines administered in community pharmacies, each pharmacy can set its own PBV service fee, which currently averages around EUR 2.

Are pharmacists reimbursed at the same rate as doctors or nurses? If not, what are the key differences in payment structures?

In the NHS, doctors and nurses are salaried employees, and their remuneration is not directly tied to a fee-for-service model. There is no official reimbursement rate specifically for vaccine administration.

What are the main challenges in the funding model (e.g., administrative burdens, funding gaps, reimbursement delays)?

The funding model for PBV in Portugal presents several challenges.

Vaccines outside the national vaccination programme: For vaccines not included in the national vaccination programme, patients must obtain a prescription to access the co-payment system. Additionally, the administration fee must be paid out-of-pocket, which may act as a financial barrier and discourage uptake of this vaccine in community pharmacies.

Seasonal vaccination campaigns (influenza and COVID-19):

- Annual negotiation of service fees: Each year, authorities and pharmacies must renegotiate the service fee, creating administrative burden and uncertainty for pharmacies.
- Logistical complexity: The centralised purchasing model by the state can lead to delays, inefficiencies, and difficulties in stock management.
- Limited autonomy for pharmacies: The current system does not allow pharmacies to procure vaccines directly, making them dependent on government allocations, which may not always align with local demand.

Section D: Economic and public health impact of PBV

Evidence on the economic and public health impact of PBV in Portugal

The evaluation of the 2023/24 influenza and COVID-19 seasonal vaccination campaign was conducted by the Centre for Health Studies and Evaluation (CEFAR) of the National Association of Pharmacies (ANF). The main findings of the study are as follows:

Proximity and accessibility: Expanding vaccination services to pharmacies, alongside the NHS, resulted in a more than 400% increase in the number of vaccination points compared to 2022/23. In total, 3,500 vaccination points were available: 1,000 NHS units (an increase of 300 from 2022/23) and 2,488 participating community pharmacies, covering 88.8% of all pharmacies in mainland Portugal. The inclusion of pharmacies reduced the average distance to vaccination points by approximately 50%, from 2.4 km to 1.2 km per municipality. This increased proximity likely led to a higher proportion of people walking to vaccination points (54% compared to 20.3% in 2022/23) and a decrease in car use (43.1% compared to 66.3% in 2022/23). Shorter travel distances may have contributed to a 5.9% increase in vaccination coverage in municipalities where the distance reduction was most significant.

Vaccination coverage: Influenza vaccination coverage for individuals aged 65 and older remained stable at 72.1%, compared to 72.2% in the previous year. However, COVID-19 vaccination coverage decreased to 60.8%, down from 75.8% in 2022/23.

Potential savings for the NHS: Pharmacy participation in the vaccination campaign is estimated to have saved approximately 310,000 NHS staff hours, enabling healthcare professionals to focus on other primary care services. This is particularly relevant in the context of efficient resource management within the healthcare system.

Patient preference: A total of 4.5 million vaccines were administered, 70% of which were administered in pharmacies.

However, there is no evidence regarding cost-effectiveness or data on other important indicators, such as the impact on hospital visits, hospitalisations, vaccine-preventable diseases, or outbreak risks.

A published abstract can be accessed here. (Abstract citation ID: ckae144.384).

Section E: Key enablers of PBV

What factors have contributed to the success of PBV in Portugal?

Several key factors have contributed to the success of the PBV programme in Portugal. Since pharmacies were authorised to administer vaccinations, community pharmacists have actively embraced this role, and the public has widely accepted the service. Today, approximately 7,000 community pharmacists across more than 2,700 pharmacies (out of a total of 2,920 in Portugal) have been certified by the Portuguese Pharmaceutical Society to administer vaccines and other injectable medications.

High user satisfaction and the convenience of PBV have been consistently evident, as demonstrated in multiple pilot projects conducted in partnership with the Ministry of Health. Another significant milestone was granting pharmacists access to view and record administered vaccines in the National Electronic Vaccination Registry and Management Platform (VACINAS), further accelerating the expansion of vaccination services in pharmacies.

Additionally, the implementation of a centralised logistics system, supported by pharmaceutical distributors, ensured efficient vaccine delivery to pharmacies. This optimisation improved operational workflows, enhanced inventory control, and facilitated the transition of NHS-provided vaccines to pharmacies. A crucial factor in the success of the Portuguese PBV programme was the reimbursement of pharmacies by the NHS for vaccine administration. This financial support, first introduced during the 2023/24 seasonal vaccination

campaign and continued in 2024/25, has reinforced the sustainability of the service and strengthened pharmacies' commitment to providing vaccination services.

Section F: Lessons learned

What key insights can other countries learn from Portugal's PBV experience, and what policy recommendations would you suggest for countries considering PBV implementation?

Portugal's experience highlights several key lessons for countries considering PBV implementation:

1. **Progressive expansion of pharmacy involvement:** Since 2008, community pharmacies have played an increasing role in vaccination, demonstrating that gradual integration allows for better adaptation and public acceptance.
2. **Importance of pharmacist training and certification:** Ensuring that pharmacists are adequately trained and certified in vaccination services is essential for patient safety and confidence in pharmacy-administered vaccines.
3. **Public communication strategies:** Targeted communication campaigns are crucial to inform the population about PBV and increase coverage rates.
4. **Collaboration with healthcare professionals and authorities:** Strong relationships between pharmacies, healthcare providers, and policymakers are key to integrating PBV within national vaccination strategies.
5. **Digital infrastructure for vaccine records:** Electronic systems that allow pharmacies to register and share vaccination data with healthcare authorities, and improve coordination and tracking of immunisation coverage.
6. **Evidence-based policymaking:** Portugal's model has shown that collecting data on pharmacy-led vaccination efforts helps in making informed policy decisions and demonstrating the impact of PBV on public health.

To successfully implement PBV, other countries should consider the following recommendations:

1. **Ensure proper training and certification:** Establish standardised training programmes to equip pharmacists with the necessary skills and knowledge to administer vaccines safely and effectively.
2. **Develop electronic vaccine registration systems:** A digital platform should be implemented to allow seamless recording and sharing of immunisation data across healthcare settings.
3. **Foster collaboration with healthcare professionals:** Promote cooperation between pharmacies, physicians, and public health authorities to ensure PBV complements existing vaccination programmes.
4. **Establish a sustainable funding model:** Governments should consider reimbursement schemes, co-payment models, or direct funding mechanisms to ensure pharmacies are adequately compensated for vaccination services.
5. **Generate evidence on PBV:** Conduct studies and collect real-world data on PBV to assess its impact on vaccine uptake, access, and hesitancy reduction.
6. **Address logistical and regulatory challenges:** Streamline procurement and distribution channels to ensure pharmacies have timely and efficient access to vaccines.
7. **Combat vaccine hesitancy through pharmacy engagement:** Pharmacies, being accessible healthcare points, should be leveraged to provide vaccine education and combat misinformation.

9.5 South Africa

Country/Territory:	South Africa
Member organisation	Pharmaceutical Society of South Africa

Section A: Legislative framework for funding PBV

PBV in South Africa differs significantly between the public and private sectors. The public sector primarily funds vaccinations delivered in state health facilities such as clinics and community health centres. Private healthcare users rely on either medical insurance or out-of-pocket payments and largely access vaccinations in private health care facilities, such as medical practices or pharmacies.

The Pharmacy Act, 53 of 1974, allows for services which may be provided in the various categories of pharmacies. The regulations relating to the practice of pharmacy include immunisation as a service that may be offered in community and institutional pharmacies. Community and private hospital pharmacies are situated in the private sector, where users pay for vaccination services through medical insurance or out-of-pocket. Public-private partnerships with the Department of Health are possible, where the state provides stock to pharmacies, which they supply (not sell) to patients. Vaccines provided in public hospitals, and community health centres and clinics are funded from the fiscus and are provided free at the point of care. In the public sector, vaccines are procured by the provincial departments of health, relying on tenders that are awarded by the National Department of Health. Some new vaccines have been funded for a period by conditional grants to the provinces from the national budget. However, the vaccines provided by the Expanded Programme of Immunisation (EPI) are funded from the provincial health budgets.

Section B: Overview of PBV in South Africa

When was PBV introduced?

Although PBV is included in the scope of practice of pharmacists, as per the regulations relating to the practice of pharmacy, administration of vaccines requires additional training and certification.

What types of vaccines are pharmacists authorised to administer?

All vaccines listed in the EPI are deliberately included in Schedule 2 to the Medicines and Related Substances Act, 1965. Schedule 2 medicines can be initiated by a pharmacist, without a prescription. All vaccines for children and adults, including influenza, COVID-19, hepatitis B, meningococcal, RSV, shingles, oral polio vaccine (OPV), rotavirus (RV), pneumococcal conjugate (PVC), hexavalent (DTap-IPV-HepB-Hib), measles/rubella (MR), Tdap, and human papilloma virus (HPV), all form part of the Expanded Programme of Immunisation. In addition, pharmacists can also sell influenza vaccines to patients without a prescription.

However, the legal right to sell a medicine does not imply the right to administer an injection. Additional certification is required before pharmacists can administer injections. In 2022, the South African Pharmacy Council published an extended scope of practice for pharmacists relating to injections and immunisations. This additional qualification allows pharmacists to apply for a permit from the Director-General of Health and provide access for these pharmacists to Schedule 4 medicines used during the treatment of anaphylaxis (epinephrine (adrenaline), promethazine, and hydrocortisone). See the medicines list on page 33 of this document.

Section C: Funding model for PBV services

Who funds PBV?

The PBV in South Africa is primarily reimbursed through private health insurers, while public sector programmes have limited pharmacist-led vaccination coverage and vaccines are mainly delivered by nurses.

Additional insights on the funding model

In the private sector, a patient may request an influenza vaccine during the autumn months. The pharmacist will provide this medicine as pharmacist-initiated therapy (without a prescription). If the patient has medical insurance, the pharmacist will submit a claim to the insurer for reimbursement. If the patient is uninsured, out of pocket payment for the medicine will be made. A fee for the administration of the vaccine can be charged by the pharmacist. This fee may be reimbursed by the medical insurer or be paid by the patient. However, the pharmacist may also decide not to charge a service fee. The services for which a pharmacist may levy a fee are published on a regular basis by the South African Pharmacy Council.

In the public sector, a patient requesting an influenza vaccine would have it provided and administered by a nurse. No fee would be charged at a primary health care facility. The nurse will dispense and administer the vaccine to the patient, without any cost for the medicine or service.

There are 71 separate private insurers (medical schemes) in South Africa, each of which offers a range of benefit options. Each of those benefit options is associated with a formulary and set of reimbursement policies. Certain benefits may also be exhausted before the end of each calendar year. Less than 15% of the population is covered by medical schemes. The per capita spend on patients in the public and private health sectors is very different.

How are remuneration rates determined, and do they differ based on vaccine type, administration setting, or patient demographics?

A single exit price (SEP) for all medicines sold in the private sector is declared annually by holders of certificates of registration (HCR) and is made available to the public by the National Department of Health. The SEP applies regardless of the volume of medicines procured. The Minister of Health sets a maximum SEP adjustment annually, on the recommendation of the Pricing Committee. Generally, only one increase is allowed per year. However, HCRs may choose not to take advantage of the SEP adjustment. They may also apply for permission to reduce the SEP. Medical insurers may set reimbursement rules and may also establish provider networks which are contracted to the medical scheme. Reimbursement may vary between pharmacies that are included in the network and those that are excluded. Co-payments may be levied for services procured outside of the network. In addition, as the South African Pharmacy Council guidance on the services for which a pharmacist may levy a fee is not binding on insurers, reimbursement for this component may also vary.

Are pharmacists reimbursed at the same rate as doctors or nurses? If not, what are the key differences in compensation structures?

In the private sector, the SEP applies equally to all purchasers of medicines, whether pharmacies, hospitals, or medical practices. However, reimbursement for service, including the administration of vaccines, may vary. In general, medical practitioners are more likely to be reimbursed for procedures provided during a consultation, including the administration of medicines.

What are the main challenges in the funding model (e.g., administrative burdens, funding gaps, reimbursement delays)?

Some of the main challenges include:

1. Reimbursement for the service provided by pharmacists is not compulsory, nor set at an acceptable minimum quantum.
2. Reimbursement for products and services differs between insurers, and the rate of reimbursement is not standardised.

Section D: Economic and public health impact

Evidence on the economic and public health impact of PBV in South Africa

No studies have been conducted locally on the economic or public health impact of PBV in South Africa. Given that the majority of the population is dependent on the state for health care services, disentangling the contribution attributable to PBV would be difficult. There are overall estimates of the Expanded Programme on Immunisation (EPI) coverage, but those do not generally include private sector data. An example is the annual District Health Barometer, issued by the Health Systems Trust, which relies on routine data captured by the District Health Information System.

Likewise, routine data have shown some progress in coverage (e.g,. Health and Related Indicators 2023, South African Health Review 2023: strengthening cancer services, and Is South Africa closing the health gaps between districts? Monitoring progress towards universal health service coverage with routine facility data.

Section E: Key enablers

What factors have contributed to the success of PBV in South Africa?

The South African Pharmacy Council has been instrumental in providing a mechanism to certify pharmacists to administer injections, including vaccines. The South African Health Products Regulatory Authority (SAHPRA) has also enabled access by recommending that all EPI vaccines be listed in Schedule 2, allowing pharmacist-initiated therapy.

Section F: Lessons learned

What key insights can other countries learn from South Africa's PBV experience, and what policy recommendations would you suggest for countries considering PBV implementation?

There are key insights to be learned from the COVID-19 pandemic, where pharmacists administered a substantial proportion of vaccine doses. However, the challenges of ensuring efficient and fair reimbursement for those services by the National Department of Health have highlighted the potential pitfalls of such contracted services.

9.6 Great Britain (England, Scotland and Wales)

Country/Territory:	Great Britain
Member organisation's name in English:	Royal Pharmaceutical Society (England, Scotland and Wales)

Section A: Legislative framework for funding PBV

PBV in Great Britain (England, Scotland and Wales) is integrated into the National Health Service (NHS), where pharmacists play a key role in administering vaccines through NHS-backed programmes. The NHS funds pharmacist-led vaccination services, ensuring accessibility for eligible populations. Pharmacists also offer private vaccination services, allowing patients to pay out-of-pocket or through private insurers.

In England, Scotland and Wales, the National Health Service (NHS) contracts (in each of the devolved nations) with community pharmacies, enabling them to provide flu vaccinations to those eligible to receive a free flu vaccine. Criteria include eligible adults, people with certain health conditions, and frontline health and social care staff. If individuals are not eligible for a free flu vaccine on the NHS, many pharmacies offer a private service where they can pay for their flu vaccine.

Regarding COVID-19 vaccinations, community pharmacies in England provide them under a national enhanced service to those eligible for free NHS vaccinations. Some community pharmacies also offer private COVID-19 vaccination services. In Wales, the COVID-19 vaccination programme includes community pharmacies, which provide vaccinations to eligible groups based on Welsh Government policy. In Scotland, community pharmacies are involved in the COVID-19 vaccination programme, offering vaccinations to eligible individuals and providing information on local vaccination services.

All other vaccinations provided via community pharmacies in England, Wales, and Scotland are either commissioned as local NHS services or offered as private services, such as travel vaccinations. The ability of local Integrated Care/Health Boards to commission local services from community pharmacy assists with increasing access to under-vaccinated populations, including remote and rural areas of Britain.

Section B: Overview of PBV in Great Britain (England, Scotland, and Wales

When was PBV introduced?

The flu vaccination service, started In 2015, was the first vaccination service to be commissioned in England via community pharmacies. According to Public Health Scotland data, PBV began in Scotland in 2014, and according to the Welsh Government, it began in Wales in 2012.

What types of vaccines are pharmacists authorised to administer?

Pharmacists in Great Britainare authorised to administer several vaccines, provided they have undergone the relevant training, including:

- Influenza, COVID-19, hepatitis B, HPV, meningococcal, pneumococcal, RSV, shingles, and Tdap booster.
- Additional vaccines include free NHS travel vaccines (hepatitis A, typhoid, cholera, polio).

These services would be commissioned locally or offered privately. From May 2025 to March 2027, NHS England will commission pharmacies to provide whooping cough vaccinations under an enhanced respiratory

syncytial virus (RSV) and pertussis vaccination service. This will be via a national enhanced service specification.

Section C: Funding model for PBV services

Who funds PBV?

The PBV in the Great Britain is funded through multiple sources:

- Public reimbursement: NHS-funded vaccinations are reimbursed through state-run health systems.
- Private sector reimbursement: Some vaccinations are covered by private health insurance.
- Out-of-pocket payment: Some vaccinations are paid directly by customers in pharmacies.

Additional insights on the funding model of PBV

Flu and COVID-19 vaccinations are free to anyone who fits the eligibility criteria. Country specific details are available here:

Scotland: Scottish Vaccine Update - Winter 2024/25 Programme
Wales: Winter Respiratory Vaccination Programme 2024 to 2025
England: National Flu Immunisation Programme 2024 to 2025

If these vaccinations are offered privately in community pharmacies, the cost varies. Some COVID-19 vaccinations cost around GBP 98 (EUR 116.39). Similarly, free travel vaccinations given in community pharmacies will be reimbursed through locally commissioned NHS services, and others are paid for privately by the patient.

How are remuneration rates determined, and do they differ based on vaccine type, administration setting, or patient demographics?

The remuneration rates for flu and COVID-19 vaccinations differ slightly between the devolved nations. Locally commissioned services such as hepatitis vaccinations are negotiated at a local level. Private vaccination prices are decided by the provider.

Are pharmacists reimbursed at the same rate as doctors or nurses? If not, what are the key differences in compensation structures?

Each nation, in an attempt to minimise competition between different sectors of the NHS, charges a flat rate fee to all independent contractor types, i.e., GPs and pharmacists.

In Scotland, when the General Medical Services Contract 2018 came in, the Vaccine Transformation Programme moved all vaccination into Health and Social Care Partnerships and away from GP practices, thus centralising services. Minimal numbers of GPs are now involved in immunisation campaigns.

What are the main challenges in the funding model (e.g., administrative burdens, funding gaps, reimbursement delays)?

The challenges surround the extensive planning required well ahead of flu season, to ensure the appropriate level of vaccination stock is ordered, often before the publication of the projected eligibility criteria within each country. This year in Scotland, changes to the eligibility criteria for NHS vaccinations increased demand for private treatment, and available supply did not meet demand.

Section D: Economic and public health impact

Evidence on the economic and public health impact of PBV in Great Britain

We are not aware of a study that looks at this within the population as a whole. However, PBV has the potential to free up space in GP practices. It could also improve patient access, coverage, and access in deprived areas, as indicated here: PBV in England: Exploring opportunities and impact on health equity.

According to Community Pharmacy England, there were 3.7 million flu vaccinations via community pharmacies in the 2023/2024 season.

A report from the Company Chemists' Association (CCA) shows that community pharmacies delivered more than half of all COVID-19 vaccines given to Black/Black British, Asian/Asian British, and mixed ethnicity groups in the Spring 2024 vaccination programme.

Section E: Key enablers

What factors have contributed to the success of PBV in Great Britain?

Success has been due to the local and national commissioning of services, education and training available through statutory education bodies, and high-quality accessible care delivered from pharmacies, which encourage patients to access the service. Improvements in record keeping through digital vaccine record tools have supported the growth in this area. In addition, a change to legislation to allow pharmacy technicians to administer medicines (including vaccines) under a patient group direction (PGD) is another enabler that will demonstrate impact year on year.

Section F: Lessons learned

What key insights can other countries learn from Great Britain's PBV experience, and what policy recommendations would you suggest for countries considering PBV implementation?

- Ensure that the right member of the community pharmacy team can undertake the vaccination, e.g., pharmacy technicians under PGD, with pharmacists undertaking clinical assessment and prescribing.
- Ensure that community pharmacies have the necessary clinical environment to undertake the service.
- Full integration of community pharmacy contractors into the NHS, via nationally commissioned services, education and training, and integrated digital records.

9.7 UK (England, Scotland, Wales and Northern Ireland)

Country/Territory:	UK
Member organisation's name in English:	Pharmacists' Defence Association

Section A: Legislative framework for funding PBV

PBV in the UK is integrated into the National Health Service (NHS), where pharmacists play a key role in administering vaccines through NHS-backed programmes. The NHS funds pharmacist-led vaccination services, ensuring accessibility for eligible populations. Pharmacists also offer private vaccination services, allowing patients to pay out-of-pocket or through private insurers.

Vaccination is not compulsory in the UK, and PBV funding varies in the separate UK nations.

The National Vaccination Strategy sets out the approach for England.

In England and Wales, the NHS national influenza and COVID-19 vaccination programmes delivered in community pharmacies are funded through contractual frameworks and advanced (influenza) and enhanced (COVID-19) services. Bodies representing NHS pharmacy owners (or contractors) are recognised by the government in England and Wales and agree on services and funding under respective contractual frameworks for delivering pharmaceutical services.

England:
Flu Vaccination Service - Community Pharmacy England
COVID-19 Vaccination Service - Community Pharmacy England

Wales:
Seasonal Flu Vaccination (FLU) - Community Pharmacy Wales
Primary Care COVID-19 Immunisation Service 2021 - Community Pharmacy Wales

In Scotland, regional NHS organisations such as Health Boards lead on the provision of vaccination services and can engage community pharmacies to deliver vaccinations to specific groups, to provide 'mop-up' vaccinations or sessional sessions, usually by local agreement with Community Pharmacy Health Board Committees who represent contractors in a geographical area.

Influenza and COVID-19 vaccination services are commissioned nationally across Northern Ireland (see the Service Specification).

Section B: Overview of PBV in the UK

When was PBV introduced?

Community pharmacies in the UK nations began delivering NHS flu vaccinations at different times:
England: Community pharmacies were enabled to deliver flu vaccinations in 2015.
Scotland: The flu vaccination service was introduced in 2020.
Wales: Community pharmacies began offering flu vaccinations in 2012.
Northern Ireland: The flu programme was officially launched in 2020.

Pharmacies were offering private and locally commissioned services prior to these dates, but this was not universal.

What types of vaccines are pharmacists authorised to administer?

In the UK, pharmacists can administer a variety of vaccines, including:

- **NHS and private influenza vaccinations**
- **NHS and private COVID-19 vaccinations**
- **NHS MMR vaccinations** in some areas where local arrangements are made to increase uptake, but this is not universal.
- **NHS and private RSV and pertussis vaccination service:** not a universal NHS service from pharmacies but commissioned where local NHS organisations have unmet need.
- **Travel vaccinations**: Some pharmacists offer private travel vaccinations, such as those for hepatitis A, typhoid, and cholera. Pharmacists are also able to provide yellow fever vaccinations but require registration with the National Travel Health Network and Centre (NaTHNac) to be able to issue valid certificates for travel.

Other private vaccination services delivered by pharmacists include:
Private and occupational health:
Shingles
Pneumococcal
RSV
Hepatitis A & B
Typhoid
Cholera
Meningitis ACWY
Japanese encephalitis
Rabies
Yellow fever
HPV
Chickenpox
Pertussis (whooping cough)
MMR (measles, mumps, and rubella)
Hepatitis B (occupational health) with testing of antibodies.

Section C: Funding model for PBV services

Who funds PBV?

The PBV in the UK is funded through multiple sources:

- Public reimbursement: NHS-funded vaccinations are reimbursed through state-run health systems.
- Private sector reimbursement: Some vaccinations are covered by private arrangements.
- Out-of-pocket payment: Some vaccinations are paid directly by customers in pharmacies.
- Occupational health schemes paid for by employers.

Additional insights on the funding model of PBV

Please see the section above. There is a mixed model of private provision and core NHS vaccination services which are commonly delivered in community pharmacies in the UK such as influenza and COVID-19.

Nationally, NHS-commissioned PBV (e.g., flu and COVID-19) are paid for by a nationally agreed tariff for the service part (remuneration) and also vaccine cost (reimbursement).

Private PBV pricing is decided independently by the pharmacy contractor or proprietor.

How are remuneration rates determined, and do they differ based on vaccine type, administration setting, or patient demographics?

Remuneration will vary depending on the service which has been agreed, either as part of a nationally agreed framework or local agreement. NHS services will be remunerated at the same rates for participating pharmacies and will include a level of reimbursement of the vaccine (determined by the drug tariff pricing) and a service fee for the administration of the vaccination.

Are pharmacists reimbursed at the same rate as doctors or nurses? If not, what are the key differences in compensation structures?

There are separate negotiations and contractual frameworks for services provided in GP practices. The vaccination and immunisation standard for GP practices requires different components to that of a community pharmacy-based service, for example, a systematic invitation for vaccinations to all cohorts, etc., so they are therefore not comparable. There has been a general move to align these, but this has not fully happened yet.

What are the main challenges in the funding model (e.g., administrative burdens, funding gaps, reimbursement delays)?

The overall funding model for community pharmacy in England is in need of reform. The funding has been set at just under GBP 2.6 billion (EUR 3.04 billion) for a number of years while operating costs and inflation pressures have increased. Many pharmacy operators are finding the financial situation unsustainable overall, and the number of pharmacies has reduced as a consequence.

Inadequate reimbursement rates

- The fees paid per vaccination often fail to fully cover the costs of service delivery, including staff time, consumables, and operational overheads. This can make participation financially unviable for some pharmacies and the service not universally available to patients.

Delayed payments

- Pharmacies experience delays in receiving payments from NHS commissioners due to how the contractual framework has been set up. Cash flow issues can arise, particularly for smaller, independent pharmacies that lack financial reserves.

Administrative burden

- Claiming reimbursement involves complex paperwork, data entry, and compliance with strict reporting requirements and systems that are not integrated. This increases workload and may require additional staff, reducing overall profitability.
- NHS appointment booking is preferable to GPs, and not many pharmacies participate in allowing patients to book via the NHS booking system due to administrative burden.

Unpredictable demand and stock issues

- The allocation of vaccines can be inconsistent, with some pharmacies receiving insufficient stock while others face wastage due to over-supply. Supply chain issues can disrupt service delivery and financial planning. Pharmacies need to place their orders 12 months in advance to guarantee early delivery.

Costs

- Pharmacies must often invest in training, storage facilities (e.g., fridges for temperature-sensitive vaccines), and software for record-keeping before being reimbursed, posing financial risks.
- Pharmacies are not reimbursed to deal with clinical waste and need to arrange this privately, reducing overall profitability.
- Limited availability of ‘sale or return’ exists, which at times leads to significant financial loss and vaccine waste.

Competition with GP practices

- In some areas, pharmacies compete with GP surgeries for patients, making it harder to achieve the vaccination volumes necessary for financial viability. GPs have the ability to send out mass invitations to all patients compared to pharmacies, who are generally unable to do this.

Short-term funding models

- NHS vaccination services are often commissioned on a temporary or seasonal basis, making long-term investment in infrastructure and workforce development challenging. This also has a detrimental impact on cash flow for many pharmacies due to the 'peaks and troughs' associated with costs and payments.

Lack of clarity in contracts

- Changes to service specifications, unclear funding agreements, and shifting NHS priorities can create uncertainty for pharmacies, making it difficult to plan effectively. For example, changes in the season start date, changes in eligible cohorts, etc.

Section D: Economic and public health impact

Evidence on the economic and public health impact of PBV in the UK

Evidence on cost-effectiveness:

- Do community pharmacists add value to routine immunisation programmes? A review of the evidence from the UK
- National Community Pharmacy NHS influenza vaccination service in Wales: a Primary Care mixed methods study
- Shaping the future delivery of NHS vaccination services
- *https://cpe.org.uk/learn-more-about-community-pharmacy/the-value-of-pharmacy/*
- *https://thecca.org.uk/nhse-must-commission-pharmacies-to-administer-more-vaccines-to-reverse-worrying-trends-in-uptake/*
- *See further references at point 3: https://www.abpi.org.uk/value-and-access/vaccines/economic-and-societal-impacts-of-vaccines/*

Section E: Key enablers

What factors have contributed to the success of PBV in the UK?

- The success of the COVID-19 and influenza vaccination programmes is largely due to the national commissioning of the service and widespread uptake from pharmacies to deliver. It is now well known in the general population that these vaccinations are available in pharmacies, and confidence in pharmacists delivering vaccinations is high.
- The expansion of Patient Group Directions (PGDs) and National Protocol arrangements has allowed a wider range of healthcare professionals, including pharmacy technicians, to administer vaccinations.
- National Protocol arrangements enabled the rapid mobilisation of non-healthcare-trained vaccinators, who worked alongside experienced vaccinators under clinical governance frameworks.
- Digital patient records have streamlined vaccination documentation and improved data-sharing between pharmacies and GPs. Online booking systems and text reminders have enhanced patient engagement and uptake of vaccination services.
- Barcoding and scanning systems improve vaccine tracking and reduce administrative errors.

- Government and NHS campaigns promoting pharmacy vaccinations have helped increase uptake, particularly for flu and COVID-19 vaccines.
- The COVID-19 pandemic significantly boosted public confidence in PBV, reinforcing their role in mass immunisation efforts.

Section F: Lessons learned

What key insights can other countries learn from the UK's PBV experience, and what policy recommendations would you suggest for countries considering PBV implementation?

Community pharmacies have been involved in vaccination programmes for a number of years and now deliver around 25% of all flu and COVID-19 vaccinations in England alone.

Key insights:

1. Allowing pharmacy technicians to administer vaccines under Patient Group Directions (PGDs) enhances workforce flexibility.
2. National protocol arrangements effectively mobilised non-healthcare-trained vaccinators to work alongside experienced vaccinators within a clinical governance framework.
3. Collaboration between public and private sectors ensures effective vaccine distribution and logistics (e.g. COVID-19).
4. Pharmacies act as an accessible (convenient locations and extended hours) alternative to GP clinics and hospitals, helping to increase overall vaccination rates.
5. Electronic patient records and data-sharing with GPs ensures seamless integration into national healthcare system records.
6. Online booking systems and text reminders improve patient convenience and uptake; this is not always available to pharmacies, but should be standard.

Policy recommendations:

1. Enable pharmacists and pharmacy technicians to administer vaccines through PGDs or equivalent legal mechanisms.
2. Develop standardised training and accreditation requirements for pharmacy vaccinators, with declarations of competence to allow practice across 'borders'.
3. Implement national protocol-style arrangements to expand the vaccinator workforce in emergency situations.
4. Ensure pharmacy vaccination records are linked to national immunisation databases to prevent duplication and improve coverage tracking.
5. Promote collaboration between pharmacies, GPs, and public health bodies to optimise service delivery.
6. Establish public-private partnerships for vaccine supply chain efficiency, e.g., national voucher schemes.
7. Empower pharmacists to combat vaccine hesitancy through targeted communication strategies.
8. Ensure vaccination services are conveniently located and available beyond standard healthcare hours.
9. Use data analytics to predict demand and manage vaccine distribution effectively.

9.8 USA

Country/Territory:	USA
Member organisation's name in English:	American Pharmacists Association

Section A: Legislative framework for funding PBV

PBV in the USA operates predominantly within a private-sector-driven model, where vaccine services are reimbursed primarily by private insurance providers, employer-sponsored health plans, and patient out-of-pocket payments. While some vaccines are covered under Medicare, Medicaid, and state-level public health programmes, most vaccinations in pharmacies are billed through private insurers.

Depending on the patient population and provider enrolment, vaccines are covered under Medicare (a programme for seniors and some disabled persons), Medicaid (a programme for low-income individuals), and state-level public health programmes. Children under 19 years of age are eligible for the Vaccines for Children (VFC) Programme if they meet certain criteria, including being uninsured, Medicaid-eligible, or American Indian or Alaskan Native. However, pharmacy participation in VFC is low. Most vaccinations in pharmacies are billed through private insurers and Medicare. The authority and scope of PBV is determined by state laws and regulations.

Section B: Overview of PBV in the USA

When was PBV introduced?

The Washington State Pharmacists Association initiated the first ongoing formalised training of pharmacists in vaccine administration in 1994. On 1st November 1996, the American Pharmaceutical (now Pharmacists) Association (APhA) began its nationally recognised training programme for pharmacists, Pharmacy-Based Immunisation Delivery: A National Certificate Programme for Pharmacists.

What types of vaccines are pharmacists authorised to administer?

State laws and regulations vary regarding the scope of vaccines a pharmacist can administer, depending on the state in which the pharmacist is practicing. Most pharmacists can administer vaccines across the lifespan through statutory or regulatory authorisation, standing orders, collaborative practice agreements, or prescriptions. Federal authority, through PREP Act Amendments, permits pharmacists to administer COVID-19 and influenza vaccines to patients aged three years and older, regardless of state regulations. Pharmacists are also authorised to administer the different vaccines, including hepatitis B, human papillomavirus, meningococcal, pneumococcal, RSV, shingles, and Tdap booster.

Section C: Funding model for PBV services

Who funds PBV?

The PBV in the USA is funded through multiple sources:

- Private insurance reimbursement: The primary source of funding, where pharmacies bill private health insurers.

- Public reimbursement: Some vaccines are covered by Medicare (Part B, Part D), Medicaid, and federal or state-administered programs like Vaccines for Children (VFC).
- Out-of-pocket payment: Some patients pay directly for vaccines not covered by insurance.

Additional insights on the funding model for PBV

In the current payment landscape, pharmacists receive compensation for vaccine administration which is comparable to other members of the immunisation community. Payment levels vary across the board, depending on the programme. Medicare rates are based on regional factors and are used by some payers as a benchmark. Medicaid rates and who can vaccinate Medicaid patients are determined by the state, and in many cases, are at rates that do not support provider engagement. A challenge that pharmacy encounters is the method for vaccine billing, whether through a patient's medical coverage or the pharmacy coverage; medical and pharmacy/prescription coverage dictates the billing process, which differs between the two. As vaccines that were primarily provided by the government transition to the commercial market, the cost for initial financial outlay, level of reimbursement, and promptness of payment have increased, and a lack of promptness of payment has increased pressure on providers.

How are remuneration rates determined, and do they differ based on vaccine type, administration setting, or patient demographics?

The payment rates to pharmacists vary by plans within the private sector. Whether pharmacists are recognised providers is determined by the benefit plan and the pharmacy's agreement to participate

Are pharmacists reimbursed at the same rate as doctors or nurses? If not, what are the key differences in compensation structures?

The rates paid to pharmacists for most vaccines are comparable to those paid to other members of the immunisation community (e.g., health plan recognised providers such as physicians, nurse practitioners, or physician associates).

What are the main challenges in the funding model (e.g., administrative burdens, funding gaps, reimbursement delays)?

Across the immunisation community, the level of reimbursement continues to be a challenge for providers. Vaccination needs to be at adequate reimbursement levels to sustain the practice's ability to maintain itself within communities and to not be an administrative burden on providers. The cost of many of the vaccines has increased or shifted from government-provided to the commercial market, where providers have to absorb costs up front, without prompt reimbursement, which is a burden, and providers are losing the ability to carry these costs due to the Impact of pharmacy benefit managers (PBMs) on cash flow.

Section D: Economic and public health impact

Evidence on the economic and public health impact of PBV in the USA

Economic impact

- **Cost savings**: Pharmacist-led vaccination services have shown significant cost savings by reducing the burden of vaccine-preventable diseases.
- **Increased access**: Pharmacies provide convenient access to vaccinations, reducing the need for more expensive healthcare settings.
- **Reduced healthcare costs**: Vaccinations administered by pharmacists help lower overall healthcare costs by preventing diseases and reducing hospitalisations.

Public health impact

- **Improved vaccination rates**: Pharmacists' involvement in vaccination programmes has led to increased vaccination rates, particularly in underserved communities.
- **Chronic disease management**: Pharmacists play a crucial role in managing chronic diseases and providing vaccinations, which contribute to better population health outcomes.

- **Accessibility**: Over 90% of the USA population lives within five miles of a community pharmacy, making vaccinations more accessible.
- **Public trust**: Pharmacists are trusted healthcare professionals, which encourages more people to get vaccinated.

PBV has a profound impact on the economy and public health. PBV services make vaccines more accessible, reduce healthcare costs, and improve overall health outcomes. Pharmacists played a crucial role in the COVID-19 vaccination efforts. According to the CDC, pharmacies administered approximately **40.5 million** bivalent COVID-19 vaccine doses between 1st September 2022 and 30th September 2023. This represents a significant portion of the total vaccinations administered during that period. Pharmacists' involvement in the vaccination campaign greatly increased accessibility and convenience for the public, contributing to the overall success of the vaccination efforts.

References:

1. Strand MA, Bratberg J, Eukel H, Hardy M, Williams C. Community Pharmacists' Contributions to Disease Management During the COVID-19 Pandemic. Prev Chronic Dis. 2020;17:E69. Available at: https://pubmed.ncbi.nlm.nih.gov/32701431/
2. IQVIA Institute for Human Data Science. Trends in Vaccine Administration in the United States. United States; 2023. Available at: https://www.iqvia.com/-/media/iqvia/pdfs/institute-reports/trends-in-vaccine-administration-in-the-united-states/iqvia-institute-trends-in-vaccine-administration-in-the-us-for-web.pdf
3. El Kalach R, Jones-Jack N, Elam MA, Olorukooba A, Vazquez M, Stokley S, et al. Federal Retail Pharmacy Program Contributions to Bivalent mRNA COVID-19 Vaccinations Across Sociodemographic Characteristics - United States, September 1, 2022-September 30, 2023. MMWR Morb Mortal Wkly Rep. 2024;73(13):286-90. Availble at: https://pubmed.ncbi.nlm.nih.gov/38573866/

Section E: Key enablers

What factors have contributed to the success of PBV in the USA?

The accessibility of community-based providers, like pharmacies, has been a driver in the USA. Having willing and able pharmacy teams has facilitated the growth of PBV. When efforts began in the USA in 1996, APhA adopted the policy that called on pharmacists to assume at least one of three roles: educator, facilitator, and/or administerer of vaccines. The advocacy team worked with the Medicare programme to establish pharmacists' ability to bill for and be paid to administer vaccines, just like physicians and other providers. APhA also created a pharmacy-based immunisation certificate training programme to train pharmacists and other team members to administer vaccines across the lifespan and manage vaccine programmes. This was a critical decision as pharmacists' authority was expanding. It was felt, regardless of pharmacists' administration authority, that pharmacists needed to be knowledgeable about vaccines across the lifespan so they could be trusted public educators. Today, more than 500,000 pharmacists, pharmacy interns, and pharmacy technicians have been trained to administer vaccines across the lifespan. The value of pharmacist engagement within the immunisation community was demonstrated during COVID-19 by pharmacists and pharmacy personnel administering well over 50% of the COVID-19 vaccines in the USA over the course of the pandemic. Regardless of gender, race, ethnicity, or income, most people received COVID-19 vaccine at pharmacies; when temporary and government public health sites were excluded, more than 90% of COVID-19 vaccines were delivered at pharmacies.

Section F: Lessons learned

What key insights can other countries learn from the USA's PBV experience, and what policy recommendations would you suggest for countries considering PBV implementation?

It is important to adopt a policy that supports pharmacists' role as educators, facilitators and/or administering vaccines. This approach supports the engagement of pharmacists as vital members of the immunisation

community, positioned as important community-based and accessible providers. Providing training to pharmacy teams so they can serve and be viewed as credible sources of vaccine and public health information and services is also key. Recommendations for other countries include:

- Engage with other stakeholders in state and community vaccination efforts.
- Train pharmacists in vaccinations across the lifespan.
- Identify community needs and structure your approach to address those needs and prove the abilities of pharmacy teams. If needed, offer a pilot to demonstrate ability.
- Follow established guidelines and provide consistent public messaging with other members of the immunisation community.
- Resist artificial barriers and advocate standardised approaches and requirements in alignment with other healthcare provider expectations.
- Ensure efficient mechanisms for the documentation of vaccinations provided by pharmacy, as well as access to the patient's immunisation history.
- Ensure adequate and equitable payment to pharmacy providers, as well as efficient processes.
- Advocate for seed or grant funds to support practice implementation.

10 Recommendations

10.1 Emerging suggestions for funding models

The sustainability of PBV relies on effective funding mechanisms, which vary across different countries. Currently, out-of-pocket payments remain the dominant model in 21 countries, as reported in the 2024 vaccination surveillance data. This financial barrier limits equitable vaccine access, underscoring the need for expanded public and private reimbursement models or hybrid funding approaches.

To ensure long-term sustainability and equitable access, the following funding strategies are recommended:

1. Governments should formally include PBV within national immunisation strategies, allocating funds for vaccine costs, administration services, and infrastructure development. This approach can enhance accessibility and affordability of vaccination services.
2. Establishing clear regulatory frameworks that designate pharmacies as official vaccination providers will increase access, uptake, and public confidence in pharmacist-led immunisation services.
3. A flexible funding approach combining public subsidies, private insurance, and direct payments can ensure financial sustainability while maintaining affordability for individuals. Collaboration among governments, insurers, and pharmacies is key.
4. Expanding coverage to all vaccines administered in pharmacies under national immunisation programmes will support wider vaccine accessibility and improve coverage rates.
5. Targeted campaigns should inform the public about available free or reimbursed vaccines in pharmacies, increasing awareness and participation in PBV programmes.

10.2 Strategies for integration and expansion

To maximise the impact of PBV while balancing public health priorities and economic feasibility, strategic expansion is essential. Key approaches include:

1. Policy alignment with public health goals: Ensuring PBV supports national immunisation targets and aligns with broader healthcare system priorities, including pandemic preparedness and disease prevention strategies.
2. Leveraging case study insights: Using successful PBV models from Australia, Canada, Costa Rica, Portugal, South Africa, the UK, and the USA as templates for regional adaptation, addressing country-specific regulatory, financial, and logistical challenges.
3. Strengthening public-private partnerships: Collaborating with governments, insurers, and pharmacies to establish sustainable reimbursement mechanisms and improve service delivery.
4. Enhancing digital infrastructure: Implementing electronic immunisation records to track vaccination coverage and ensure seamless integration of PBV with national healthcare databases.

11 Conclusions

PBV has become a key part of public health efforts against vaccine-preventable diseases (VPDs). However, its sustainability depends on robust, long term funding mechanisms to ensure the continuity of the service. The influence of national health system financing models on PBV implementation, particularly in how system structure (i.e., Beveridge, Bismarck, National Health Insurance, Out-of-Pocket, and Hybrid) affects PBV reimbursement and service integration. Globally, out-of-pocket payments are the most common funding model adopted in pharmacies. Regional variations exist, with Europe primarily relying on public reimbursement, while many other regions rely more on out-of-pocket payments.

PBV contributes to direct cost savings by increasing immunisation rates, reducing healthcare expenditures, and improving vaccine accessibility. Pharmacists offer convenient, community-based vaccination services, complementing traditional healthcare settings and addressing disparities in vaccine uptake. Evidence from multiple countries highlights PBV's economic impact, with cost savings driven by reduced hospitalisations, fewer medical consultations, and lower treatment expenses. Studies find that pharmacist-led vaccination enhances vaccine coverage and trust, further strengthening vaccination strategies.

Beyond direct cost savings, PBV also contributes to indirect economic benefits by reducing productivity losses, enhancing workforce efficiency, and mitigating disease-related economic burdens. By increasing vaccine accessibility, PBV minimises absenteeism, presenteeism, and caregiver burdens, while preventing long-term disability and premature mortality. This leads to greater economic stability and reduced strain on healthcare systems. Additionally, vaccines play a crucial role in lowering the risk of non-communicable diseases (NCDs), such as cardiovascular events, pneumonia-related complications, and cervical cancer.

PBV's impact extends beyond economic benefits to broader societal outcomes, including improved healthcare equity, enhanced cognitive development for children, and reduced antimicrobial resistance. By expanding vaccination access, PBV narrows disparities, supports universal health coverage, and strengthens preventive healthcare systems. Vaccination also protects school attendance by reducing absenteeism, empowers women's health by safeguarding pregnancies, and extends life expectancy by reducing infectious disease-related mortality. Additionally, vaccine contributes to stronger public health infrastructure by integrating preventive care and health education, reinforcing its role as an essential, long-term public health investment.

Despite these benefits, sustainability remains a challenge due to funding inconsistencies, reliance on out-of-pocket payments, and limited public reimbursement in many regions. Ensuring the long-term success of PBV requires structured funding mechanisms, policy integration, and multi-sector collaboration. Governments, insurers, and healthcare stakeholders must work together to establish equitable reimbursement models, expand public funding, and promote hybrid financing strategies that balance public and private contributions.

Additionally, investments in pharmacist training, digital health infrastructure, and public awareness campaigns will further support the scalability and impact of PBV programmes. As more countries recognise the clinical, economic, and societal benefits of PBV, integrating it into national healthcare strategies will be essential for achieving universal health coverage and strengthening global vaccination efforts.

Moving forward, a coordinated approach involving policymakers, healthcare professionals, and pharmacy associations will be critical to ensuring that PBV remains a sustainable, accessible, and impactful public health intervention.

12 References

1. Rodrigues CMC, Plotkin SA. Impact of Vaccines; Health, Economic and Social Perspectives. Front Microbiol. 2020;11:1526. Available at: https://pubmed.ncbi.nlm.nih.gov/32760367/.
2. Patikorn C, Cho JY, Lambach P et al. Equity-Informative Economic Evaluations of Vaccines: A Systematic Literature Review. Vaccines (Basel). 2023;11(3). Available at: http://pubmed.ncbi.nlm.nih.gov/36992206/.
3. Burke M, Rowe T. Vaccinations in Older Adults. Clin Geriatr Med. 2018;34(1):131-43. Available at: https://www.geriatric.theclinics.com/article/S0749-0690(17)30079-4/abstract.
4. Wagner A, Weinberger B. Vaccines to Prevent Infectious Diseases in the Older Population: Immunological Challenges and Future Perspectives. Front Immunol. 2020;11:717. Available at: https://pubmed.ncbi.nlm.nih.gov/32391017/.
5. Doyon-Plourde P, Fakih I, Tadount F et al. Impact of influenza vaccination on healthcare utilization – A systematic review. Vaccine. 2019;37(24):3179-89. Available at: https://www.sciencedirect.com/science/article/pii/S0264410X19305250.
6. Aldajani FN, Aldosari M. Pharmacist-led vaccination services in the Middle East. Journal of Pharmaceutical Policy and Practice. 2023;16(1):171. Available at: https://doi.org/10.1186/s40545-023-00664-8
7. Bach AT, Goad JA. The role of community pharmacy-based vaccination in the USA: current practice and future directions. Integrated Pharmacy Research and Practice. 2015;4(null):67-77. Available at: https://www.tandfonline.com/doi/abs/10.2147/IPRP.S63822.
8. Yemeke TT, McMillan S, Marciniak MW et al. A systematic review of the role of pharmacists in vaccination services in low-and middle-income countries. Res Social Adm Pharm. 2021;17(2):300-6. Available at: https://pubmed.ncbi.nlm.nih.gov/32295736/.
9. Lum ZK, Nguyen AD, Szeto J et al. Spinning the globe from west to east: A mixed-method study to examine the impact of pharmacists on immunization advocacy and delivery in Asia Pacific. J Am Pharm Assoc (2003). 2021;61(5):605-13. Available at: https://pubmed.ncbi.nlm.nih.gov/34023278/.
10. Burson RC, Buttenheim AM, Armstrong A et al. Community pharmacies as sites of adult vaccination: A systematic review. Hum Vaccin Immunother. 2016;12(12):3146-59. Available at: https://pubmed.ncbi.nlm.nih.gov/27715409/.
11. Kirkdale CL, Nebout G, Megerlin F et al. Benefits of pharmacist-led flu vaccination services in community pharmacy. Ann Pharm Fr. 2017;75(1):3-8. Available at: https://pubmed.ncbi.nlm.nih.gov/27717412/.
12. Carter A, Msemburi W, Sim SY et al. Modeling the impact of vaccination for the immunization Agenda 2030: Deaths averted due to vaccination against 14 pathogens in 194 countries from 2021 to 2030. Vaccine. 2023. Available at: https://www.ncbi.nlm.nih.gov/pubmed/37537094.
13. World Health Organization (WHO). Immunization Agenda 2030: A global strategy to leave no one behind. [Internet]. 2021. Available at: https://www.who.int/docs/default-source/immunization/strategy/ia2030/ia2030-document-en.pdf.
14. Le LM, Veettil SK, Donaldson D et al. The impact of pharmacist involvement on immunization uptake and other outcomes: An updated systematic review and meta-analysis. J Am Pharm Assoc (2003). 2022;62(5):1499-513.e16. Available at: https://pubmed.ncbi.nlm.nih.gov/35961937/.
15. Kowalczuk A, Wong A, Chung K et al. Patient Perceptions on Receiving Vaccination Services through Community Pharmacies. Int J Environ Res Public Health. 2022;19(5). Available at: https://pubmed.ncbi.nlm.nih.gov/35270231/.
16. Stämpfli D, Martinez-De la Torre A, Simi E et al. Community Pharmacist-Administered COVID-19 Vaccinations: A Pilot Customer Survey on Satisfaction and Motivation to Get Vaccinated. Vaccines (Basel). 2021;9(11). Available at: https://pubmed.ncbi.nlm.nih.gov/34835251/.
17. Bartsch SM, Taitel MS, DePasse JV et al. Epidemiologic and economic impact of pharmacies as vaccination locations during an influenza epidemic. Vaccine. 2018;36(46):7054-63. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC6279616/pdf/nihms-1507833.pdf.
18. Westrick SC, Patterson BJ, Kader MS et al. National survey of pharmacy-based immunization services. Vaccine. 2018;36(37):5657-64. Available at: https://pubmed.ncbi.nlm.nih.gov/30049631/.
19. International Pharmaceutical Federation (FIP). FIP Statement of Policy: The role of pharmacy in life-course vaccination. The Hague: International Pharmaceutical Federation [Internet]. 2023. Available at: https://www.fip.org/file/5638.
20. International Pharmaceutical Federation (FIP). Pharmacy-based vaccination: Recent developments, success stories and implementation challenges. The Hague: International Pharmaceutical Federation [Internet]. 2023. Available at: https://www.fip.org/file/5704.

21. International Pharmaceutical Federation (FIP). Leveraging pharmacy to deliver life-course vaccination: An FIP global intelligence report. The Hague: International Pharmaceutical Federation [Internet]. 2024. Available at: https://www.fip.org/file/5851.
22. International Pharmaceutical Federation (FIP). An overview of current pharmacy impact on immunisation: A global report 2016. The Hague: International Pharmaceutical Federation [Internet]. 2016. Available at: https://www.fip.org/files/fip/publications/FIP_report_on_Immunisation.pdf.
23. International Pharmaceutical Federation (FIP). An overview of pharmacy's impact on immunisation coverage: A global survey. The Hague: International Pharmaceutical Federation [Internet]. 2020. Available at: https://www.fip.org/file/4751.
24. Jones M, Jetelina KK. More to Offer Than Direct Clinical Benefit: FDA's Vaccine Licensure Process Ignores Population Health and Social Determinants of Disease. Am J Epidemiol. 2024;193(1):1-5. Available at: https://pubmed.ncbi.nlm.nih.gov/37527824/.
25. World Health Organization (WHO). Societal benefit of immunization. [Internet]. 2015. Available at: https://iris.who.int/bitstream/handle/10665/346179/WHO-EURO-2015-3379-43138-60396-eng.pdf.
26. Lindstrand A, Cherian T, Chang-Blanc D et al. The World of Immunization: Achievements, Challenges, and Strategic Vision for the Next Decade. J Infect Dis. 2021;224(12 Suppl 2):S452-s67. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC8482029/pdf/jiab284.pdf.
27. Romero-Mancilla MS, Mora-Vargas J, Ruiz A. Pharmacy-based immunization: a systematic review. Frontiers in Public Health. 2023;11. Available at: https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2023.1152556.
28. Al Meslamani AZ, Jarab AS. The economic impact of pharmacist intervention during pandemics. Expert Review of Pharmacoeconomics & Outcomes Research. 2024;24(3):323-6. Available at: https://www.tandfonline.com/doi/pdf/10.1080/14737167.2023.2287487.
29. Office of Health Economics. The socio-economic value of adult immunisation programmes: 2024. Available at: https://www.ohe.org/wp-content/uploads/2024/04/Socio-Economic-Value-of-Adult-Immunisation.pdf.
30. Nandi A, Shet A. Why vaccines matter: understanding the broader health, economic, and child development benefits of routine vaccination. Hum Vaccin Immunother. 2020;16(8):1900-4. Available at: https://www.tandfonline.com/doi/pdf/10.1080/21645515.2019.1708669.
31. Deshpande M, Schauer J, Mott DA et al. Parents' perceptions of pharmacists as providers of influenza vaccine to children. J Am Pharm Assoc (2003). 2013;53(5):488-95. Available at: https://www.japha.org/article/S1544-3191(15)30385-X/abstract.
32. Wrześniewska-Wal I, Grudziąż-Sękowska J, Pinkas J et al. Public Knowledge and Beliefs Regarding Pharmacy-Based Immunization in Poland-A Nationwide Cross-Sectional Study, 2024. Vaccines (Basel). 2024;12(8). Available at: https://pubmed.ncbi.nlm.nih.gov/39203961/.
33. Gicquelais RE, Safi H, Butler S et al. Association of School-Based Influenza Vaccination Clinics and School Absenteeism—Arkansas, 2012-2013. Journal of School Health. 2016;86(4):235-41. Available at: https://onlinelibrary.wiley.com/doi/abs/10.1111/josh.12372.
34. Andre FE. What can be done to make vaccines more trendy? Expert Rev Vaccines. 2005;4(1):23-5. Available at: https://pubmed.ncbi.nlm.nih.gov/15757470/.
35. Isenor JE, Edwards NT, Alia TA et al. Impact of pharmacists as immunizers on vaccination rates: A systematic review and meta-analysis. Vaccine. 2016;34(47):5708-23. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0264410X16307927?via%3Dihub.
36. Sakeena MHF, Bennett AA, McLachlan AJ. Enhancing pharmacists' role in developing countries to overcome the challenge of antimicrobial resistance: a narrative review. Antimicrobial Resistance & Infection Control. 2018;7(1):63. Available at: https://doi.org/10.1186/s13756-018-0351-z.
37. Micoli F, Bagnoli F, Rappuoli R et al. The role of vaccines in combatting antimicrobial resistance. Nat Rev Microbiol. 2021;19(5):287-302. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC8626314/.
38. Ecarnot F, Crepaldi G, Juvin P et al. Pharmacy-based interventions to increase vaccine uptake: report of a multidisciplinary stakeholders meeting. BMC Public Health. 2019;19(1). Available at: https://bmcpublichealth.biomedcentral.com/counter/pdf/10.1186/s12889-019-8044-y.pdf.
39. Ehreth J. The global value of vaccination. Vaccine. 2003;21(7-8):596-600. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0264410X02006230?via%3Dihub.
40. Bonanni P, Picazo JJ, Rémy V. The intangible benefits of vaccination - what is the true economic value of vaccination? J Mark Access Health Policy. 2015;3. Available at: https://mdpi-res.com/d_attachment/jmahp/jmahp-03-26964/article_deploy/jmahp-03-26964.pdf?version=1699984056.
41. Christenson B, Hedlund J, Lundbergh P et al. Additive preventive effect of influenza and pneumococcal vaccines in elderly persons. Eur Respir J. 2004;23(3):363-8. Available at: https://pubmed.ncbi.nlm.nih.gov/15065822/.

42. Patel AR, Breck A, Law MR. The impact of pharmacy-based immunization services on the likelihood of immunization in the United States. Journal of the American Pharmacists Association : JAPhA. 2018;58 5:505-14.e2. Available at: https://pubmed.ncbi.nlm.nih.gov/30076098/.
43. Swamy GK, Heine RP. Vaccinations for pregnant women. Obstet Gynecol. 2015;125(1):212-26. [Cited: Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC4286306/.
44. Gauld N, Martin S, Sinclair O et al. A Qualitative Study of Views and Experiences of Women and Health Care Professionals about Free Maternal Vaccinations Administered at Community Pharmacies. Vaccines (Basel). 2020;8(2). Available at: https://mdpi-res.com/d_attachment/vaccines/vaccines-08-00152/article_deploy/vaccines-08-00152.pdf?version=1585481049.
45. Zhang S, Kwach B, Omollo V et al. The Acceptability of Pharmacy-Based HPV Vaccination in Western Kenya among Pharmacy Clients and Providers. Vaccines (Basel). 2023;11(12). Available at: https://pubmed.ncbi.nlm.nih.gov/38140211/.
46. Hughes C. Pharmacists and vaccination in pregnancy. Canadian Pharmacists Journal / Revue des Pharmaciens du Canada. 2019;152(6):424-6. Available at: https://journals.sagepub.com/doi/abs/10.1177/1715163519877896.
47. Sakala IG, Yoshikazu H-O, Johnson F et al. Influenza immunization during pregnancy: Benefits for mother and infant. Human Vaccines & Immunotherapeutics. 2016;12(12):3065-71. Available at: https://doi.org/10.1080/21645515.2016.1215392.
48. Biederman E, Kelly D, Lynne S et al. The association between maternal human papillomavirus (HPV) experiences and HPV vaccination of their children. Human Vaccines & Immunotherapeutics. 2021;17(4):1000-5. Available at: https://doi.org/10.1080/21645515.2020.1817714.
49. Shearley AE. The societal value of vaccination in developing countries. Vaccine. 1999;17 Suppl 3:S109-12. Available at: https://pubmed.ncbi.nlm.nih.gov/10559542/.
50. Deslandes R, Evans A, Baker S et al. Community pharmacists at the heart of public health: A longitudinal evaluation of the community pharmacy influenza vaccination service. Research in Social and Administrative Pharmacy. 2020;16(4):497-502. Available at: https://www.sciencedirect.com/science/article/pii/S1551741119300580.
51. International Pharmaceutical Federation (FIP). An overview of current pharmacy impact on immunisation A global report The Hague: International Pharmaceutical Federation [Internet]. 2016. Available at: https://www.fip.org/files/fip/publications/FIP_report_on_Immunisation.pdf.
52. Haems M, Lanzilotto M, Mandelli A et al. European community pharmacists practice in tackling influenza. Explor Res Clin Soc Pharm. 2024;14:100447. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC11068921/pdf/main.pdf.
53. World Health Organization (WHO). Health financing. Available at: https://www.who.int/health-topics/health-financing#tab=tab_1.
54. Lameire N, Joffe P, Wiedemann M. Healthcare systems—an international review: an overview. Nephrology Dialysis Transplantation. 1999;14(suppl_6):3-9. Available at: https://doi.org/10.1093/ndt/14.suppl_6.3.
55. World Economic Forum (WEF). The world has 4 key types of health service – this is how they work: 2020. Available at: https://www.weforum.org/stories/2020/10/covid-19-healthcare-health-service-vaccine-health-insurance-pandemic/#:~:text=The%20Beveridge%20Model.
56. Musgrove P. Health insurance: the influence of the Beveridge Report. Bull World Health Organ. 2000;78(6):845-6. Available at: https://iris.who.int/handle/10665/268151.
57. Tulchinsky TH. Bismarck and the Long Road to Universal Health Coverage. Case Studies in Public Health. 2018:131-79. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC7149836/.
58. van der Zee J, Kroneman MW. Bismarck or Beveridge: a beauty contest between dinosaurs. BMC Health Serv Res. 2007;7:94. Available at: https://bmchealthservres.biomedcentral.com/articles/10.1186/1472-6963-7-94.
59. Patel V, Parikh R, Nandraj S et al. Assuring health coverage for all in India. The Lancet. 2015;386(10011):2422-35. Available at: https://doi.org/10.1016/S0140-6736(15)00955-1.
60. Dieleman J, Campbell M, Chapin A et al. Evolution and patterns of global health financing 1995–2014: development assistance for health, and government, prepaid private, and out-of-pocket health spending in 184 countries. The Lancet. 2017;389(10083):1981-2004. Available at: https://doi.org/10.1016/S0140-6736(17)30874-7.
61. Bielska I, Hampel E, Johnson A. An Overview of the Canadian Health Care System. 2012;10:51-6. Available at: https://doi.org/10.4467/20842627OZ.12.007.0894.
62. Nashan B, Hugo C, Strassburg CP et al. Transplantation in Germany. Transplantation. 2017;101(2):213-8. Available at: https://journals.lww.com/transplantjournal/fulltext/2017/02000/transplantation_in_germany.1.aspx.
63. Sven Neelsen MS, and Mutriba Latypova,. Reducing High Out-of-pocket Health Spending for Better Financial Protection in Health in Tajikistan [Internet]. Available at:

https://documents1.worldbank.org/curated/en/099012524121034381/pdf/P1720021dce4510c19eb91145a7f44bb9e.pdf.
64. Aregbeshola BS. Out-of-pocket payments in Nigeria. The Lancet. 2016;387(10037):2506. Available at: https://doi.org/10.1016/S0140-6736(16)30798-X.
65. Carroll JC, Herbert SMC, Nguyen TQ et al. Vaccination equity and the role of community pharmacy in the United States: A qualitative study. Vaccine. 2024;42(3):564-72. Available at: https://www.sciencedirect.com/science/article/pii/S0264410X23015098.
66. Zhou T, Salman D, McGregor AH. Recent clinical practice guidelines for the management of low back pain: a global comparison. BMC Musculoskelet Disord. 2024;25(1):344. Available at: https://bmcmusculoskeletdisord.biomedcentral.com/counter/pdf/10.1186/s12891-024-07468-0.pdf.
67. Give Well. New Incentives (Conditional Cash Transfers to Increase Infant Vaccination): 2024. Available at: https://www.givewell.org/international/technical/programs/new-incentives/april-2024-version.
68. International Pharmaceutical Federation (FIP). FIP global vaccination advocacy toolkit: Supporting and expanding immunisation coverage through pharmacists. The Hague: International Pharmaceutical Federation [Internet]. 2019. Available at: https://www.fip.org/files/content/fip-council-documents/Council-documents/FIP-VaccinationToolkit.pdf.
69. Bernsten C, Andersson K, Gariepy Y et al. A comparative analysis of remuneration models for pharmaceutical professional services. Health policy. 2010;95(1):1-9. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0168851009002930?via%3Dihub.
70. Skelton JB. Pharmacist-provided immunization compensation and recognition: white paper summarizing APhA/AMCP stakeholder meeting. J Am Pharm Assoc (2003). 2011;51(6):704-12. Available at: https://pubmed.ncbi.nlm.nih.gov/22068191/.
71. Sim TF, Wright B, Hattingh L et al. A cross-sectional survey of enhanced and extended professional services in community pharmacies: A pharmacy perspective. Research in Social and Administrative Pharmacy. 2020;16(4):511-21. Available at: https://www.sciencedirect.com/science/article/pii/S155174111830915X.
72. Poudel A, Lau ETL, Deldot M et al. Pharmacist role in vaccination: Evidence and challenges. Vaccine. 2019;37(40):5939-45. Available at: https://www.sciencedirect.com/science/article/pii/S0264410X19311363.
73. International Pharmaceutical Federation (FIP). Supporting life-course immunisation through pharmacy-based vaccination: Enabling equity, access and sustainability. A toolkit for pharmacists. The Hague: International Pharmaceutical Federation [Internet]. 2023. Available at: https://www.fip.org/file/5588.
74. Sakr F, Dabbous M, Rahal M et al. Challenges and opportunities to provide immunization services: Analysis of data from a cross-sectional study on a sample of pharmacists in a developing country. Health Sci Rep. 2023;6(4):e1206. Available at: https://pubmed.ncbi.nlm.nih.gov/37064320/.
75. Gianfredi V, Filia A, Rota MC et al. Vaccine Procurement: A Conceptual Framework Based on Literature Review. Vaccines (Basel). 2021;9(12). Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC8707219/.
76. Salo H, Sakalauskaitė M, Lévy-Bruhl D et al. Prices of paediatric vaccines in European vaccination programmes. Vaccine X. 2023;15:100392. Available at: https://pubmed.ncbi.nlm.nih.gov/37779660/.
77. Robert A, Farrington J, Longworth L. CO4 An Evaluation of the Differences in Vaccine Approval and Procurement Processes between Healthcare Systems during a Pandemic. Value Health. 2020;23:S401. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC7728550/.
78. Tsai Y, Zhou F, Lindley MC. Insurance Reimbursements for Routinely Recommended Adult Vaccines in the Private Sector. Am J Prev Med. 2019;57(2):180-90. Available at: https://pubmed.ncbi.nlm.nih.gov/31248743/.
79. Shi C, Ye Z, Shao Z et al. Multidisciplinary Guidelines for the Rational Use of Topical Non-Steroidal Anti-Inflammatory Drugs for Musculoskeletal Pain (2022). J Clin Med. 2023;12(4). Available at: https://mdpi-res.com/d_attachment/jcm/jcm-12-01544/article_deploy/jcm-12-01544-v3.pdf?version=1677113275.
80. Martin P, Gupta D, Natarajan KV. Vaccine Procurement Contracts for Developing Countries. Production and Operations Management. 2020;29(11):2601-20. Available at: https://onlinelibrary.wiley.com/doi/abs/10.1111/poms.13229.
81. World Health Organization (WHO). Principles and considerations for adding a vaccine to a national immunization program: from decision to implementation and monitoring. [Internet]. 2014. Available at: https://www.who.int/publications/i/item/9789241506892.
82. Pan American Health Organization. PAHO Revolving Fund. Available at: https://www.paho.org/en/revolving-fund.
83. DeRoeck D, Bawazir SA, Carrasco P et al. Regional group purchasing of vaccines: review of the Pan American Health Organization EPI revolving fund and the Gulf Cooperation Council group purchasing program. Int J Health Plann Manage. 2006;21(1):23-43. Available at: https://pubmed.ncbi.nlm.nih.gov/16604847/.
84. International AIDS Vaccine Initiative. Policy brief: Procurement and Pricing of New Vaccines for Developing Countries. [Internet]. 2008. Available at:

https://assets.publishing.service.gov.uk/media/57a08bb7ed915d622c000e55/IAVI_Procurement_and_Pricing_of_New_Vaccines_for_Developing_Countries_2008_ENG.pdf.
85. Clinton Health Access Initiative (CHAI). Vaccine Procurement and Data Use: Understanding barriers to data use and recommended interventions to address them. [Internet]. 2021. Available at: https://www.clintonhealthaccess.org/wp-content/uploads/2024/02/Vaccine-Procurement-SFA-2020-vf.pdf
86. UNICEF. UNICEF's engagement with Gavi, the Vaccine Alliance. [Internet]. 2020. Available at: https://www.unicef.org/media/65841/file/UNICEF.
87. Vogler S, Haasis MA, van den Ham R et al. European collaborations on medicine and vaccine procurement. Bull World Health Organ. 2021;99(10):715-21. Available at: https://pubmed.ncbi.nlm.nih.gov/34621089.
88. Atkins K, van Hoek AJ, Watson C et al. Seasonal influenza vaccination delivery through community pharmacists in England: evaluation of the London pilot. BMJ Open. 2016;6(2):e009739. Available at: http://bmjopen.bmj.com/content/6/2/e009739.abstract.
89. Smith PJ, Lindley MC, Rodewald LE. Vaccination coverage among U.S. children aged 19-35 months entitled by the Vaccines for Children program, 2009. Public Health Rep. 2011;126 Suppl 2(Suppl 2):109-23. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC3113436/.
90. National Academy for State Health Policy. Increasing Access to Routine Child Immunizations: State Approaches for Increasing Pharmacy Enrollment in the VFC Program: 2022. Available at: https://nashp.org/increasing-access-to-routine-child-immunizations-state-approaches-for-increasing-pharmacy-enrollment-in-the-vfc-program/#:~:text=State%20Approaches%20for%20Increasing%20Pharmacy,income%20children.
91. World Health Organization (WHO). Influenza (seasonal). Available at: https://www.who.int/news-room/fact-sheets/detail/influenza-%28seasonal%29.
92. International Federation of Pharmaceutical Manufacturers & Associations (IFPMA). The economic and health benefits of adult immunisation. World Health Summit Meeting Report. Available at: https://www.ifpma.org.
93. International Longevity Centre - UK (ILC-UK). An economic analysis of flu vaccination. London: International Longevity Centre - UK [Internet]. 2018. Available at: https://www.ilcuk.org.uk.
94. IQVIA Canada. The unmet value of vaccines in Canada. Adult Vaccine Alliance. [Internet]. 2024. Available at: https://www.iqvia.com.
95. World Health Organization. GHE: Life expectancy and healthy life expectancy. Available at: https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates/ghe-life-expectancy-and-healthy-life-expectancy.
96. Our World in Data. Life expectancy 2024. Available at: https://ourworldindata.org/life-expectancy.
97. Institute for Health Metrics and Evaluation (IHME). Global life expectancy to increase nearly 5 years by 2050 despite challenges. Available at: https://www.healthdata.org/news-events/newsroom/news-releases/global-life-expectancy-increase-nearly-5-years-2050-despite.
98. Office of Health Economics. Adult vaccination delivers 19 times investment 2024. Available at: https://www.ohe.org/news/adult-vaccination-delivers-19-times-investment/.
99. Ozawa S, Clark S, Portnoy A et al. Return On Investment From Childhood Immunization In Low- And Middle-Income Countries, 2011-20. Health Aff (Millwood). 2016;35(2):199-207. Available at: https://pubmed.ncbi.nlm.nih.gov/26858370/.
100. Brunner I, Schmedders K, Wolfensberger A et al. The economic and public health impact of influenza vaccinations: contributions of Swiss pharmacies in the 2016/17 and 2017/18 influenza seasons and implications for vaccination policy. Swiss Med Wkly. 2019;149:w20161. Available at: https://smw.ch/index.php/smw/article/download/2707/4336.
101. O'Reilly DJ, Blackhouse G, Burns S et al. Economic analysis of pharmacist-administered influenza vaccines in Ontario, Canada. Clinicoecon Outcomes Res. 2018;10:655-63. Available at: https://pubmed.ncbi.nlm.nih.gov/30498367/.
102. Office of Health Economics. Pharmacy-based vaccination in England: Exploring opportunities and impact on health equity: 2024. Available at: https://www.gsk.com/media/11665/ohe-pharmacy-based-vaccination-in-england.pdf.
103. Shen AK, Peterson A. The pharmacist and pharmacy have evolved to become more than the corner drugstore: a win for vaccinations and public health. Hum Vaccin Immunother. 2020;16(5):1178-80. Available at: https://pubmed.ncbi.nlm.nih.gov/31456479/.
104. Richardson WM, Wertheimer AI. A Review of the Pharmacist as Vaccinator. Innov Pharm. 2019;10(3). Available at: https://pubmed.ncbi.nlm.nih.gov/34007574/.
105. Isenor JE, Bowles SK. Evidence for pharmacist vaccination. Can Pharm J (Ott). 2018;151(5):301-4. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC6344972/pdf/10.1177_1715163518783000.pdf.

106. Singh T, Taitel M, Loy D et al. Estimating the Effect of a National Pharmacy-Led Influenza Vaccination Voucher Program on Morbidity, Mortality, and Costs. J Manag Care Spec Pharm. 2020;26(1):42-7. Available at: https://pubmed.ncbi.nlm.nih.gov/31880234/.
107. Rahim MHA, Dom SHM, Hamzah MSR et al. Impact of pharmacist interventions on immunisation uptake: a systematic review and meta-analysis. J Pharm Policy Pract. 2024;17(1):2285955. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC10775721/.
108. Prioli KM, Akincigil A, Namvar T et al. Addressing racial inequality and its effects on vaccination rate: A trial comparing a pharmacist and peer educational program (MOTIVATE) in diverse older adults. J Manag Care Spec Pharm. 2023;29(8):970-80. Available at: https://pubmed.ncbi.nlm.nih.gov/37523315/.
109. International Longevity Centre - UK (ILC-UK). Never too late: Prevention in an ageing world. London: International Longevity Centre - UK [Internet]. 2020. Available at: www.ilcuk.org.uk.
110. Hoffmann K, Paczkowska A, Michalak M et al. Impact of the SARS-CoV-2 Vaccination Program on Presenteeism and Absenteeism among Healthcare Workers in Poland. Vaccines (Basel). 2023;12(1). Available at: https://mdpi-res.com/d_attachment/vaccines/vaccines-12-00023/article_deploy/vaccines-12-00023.pdf?version=1703400031.
111. Calabrò GE, Rumi F, Fallani E et al. The Economic and Fiscal Impact of Influenza Vaccination for Health Care Workers in Italy. Vaccines (Basel). 2022;10(10). Available at: https://mdpi-res.com/d_attachment/vaccines/vaccines-10-01707/article_deploy/vaccines-10-01707.pdf?version=1665577163.
112. Global Self-care Federation. Self-care socio-economic research: The global social and economic value of self-care 2022. [Internet]. 2022. Available at: https://www.selfcarefederation.org/sites/default/files/media/documents/2022-06/FINAL_GSCF%20Socio-Economic%20Research%20Report%2022062022.pdf.
113. Nakhaei K, Jalilian H, Arab-Zozani M et al. Direct and indirect cost of COVID-19 patients in Iran. Health Policy Technol. 2021;10(4):100572. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC8574083/pdf/main.pdf.
114. Centers for Disease Control and Prevention. Influenza Activity in the United States during the 2023–2024 Season and Composition of the 2024–2025 Influenza Vaccine: 2024. Available at: https://www.cdc.gov/flu/whats-new/flu-summary-2023-2024.html.
116. Privor-Dumm LA, Poland GA, Barratt J et al. A global agenda for older adult immunization in the COVID-19 era: A roadmap for action. Vaccine. 2021;39(37):5240-50. Available at: https://pubmed.ncbi.nlm.nih.gov/32703743/.
117. World Health Organization (WHO). Noncommunicable diseases: 2024. Available at: https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases.
118. Chevalier-Cottin EP, Ashbaugh H, Brooke N et al. Communicating Benefits from Vaccines Beyond Preventing Infectious Diseases. Infect Dis Ther. 2020;9(3):467-80. Available at: https://pubmed.ncbi.nlm.nih.gov/32583334/.
119. Falcaro M, Castañon A, Ndlela B et al. The effects of the national HPV vaccination programme in England, UK, on cervical cancer and grade 3 cervical intraepithelial neoplasia incidence: a register-based observational study. Lancet. 2021;398(10316):2084-92. Available at: https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)02178-4/abstract.
120. Behrouzi B, Bhatt DL, Cannon CP et al. Association of Influenza Vaccination With Cardiovascular Risk: A Meta-analysis. JAMA Netw Open. 2022;5(4):e228873. Available at: https://pubmed.ncbi.nlm.nih.gov/35486404/.
121. Davidson JA, Banerjee A, Douglas I et al. Primary prevention of acute cardiovascular events by influenza vaccination: an observational study. Eur Heart J. 2023;44(7):610-20. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC9925273/pdf/ehac737.pdf.
122. Chow EJ, Rolfes MA, O'Halloran A et al. Acute Cardiovascular Events Associated With Influenza in Hospitalized Adults : A Cross-sectional Study. Ann Intern Med. 2020;173(8):605-13. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC8097760/pdf/nihms-1693415.pdf.
123. Modin D, Jørgensen ME, Gislason G et al. Influenza Vaccine in Heart Failure. Circulation. 2019;139(5):575-86. Available at: https://www.ahajournals.org/doi/pdf/10.1161/CIRCULATIONAHA.118.036788?download=true.
124. Tong X, Gao L, Wong ICK et al. Effects of sequential vs single pneumococcal vaccination on cardiovascular diseases among older adults: a population-based cohort study. Int J Epidemiol. 2024;53(1). Available at: https://pubmed.ncbi.nlm.nih.gov/38332579/.
125. Jaiswal V, Ang SP, Lnu K et al. Effect of Pneumococcal Vaccine on Mortality and Cardiovascular Outcomes: A Systematic Review and Meta-Analysis. J Clin Med. 2022;11(13). Available at: https://pubmed.ncbi.nlm.nih.gov/35807082/.
126. Marra F, Zhang A, Gillman E et al. The protective effect of pneumococcal vaccination on cardiovascular disease in adults: A systematic review and meta-analysis. Int J Infect Dis. 2020;99:204-13. Available at: https://www.ijidonline.com/action/showPdf?pii=S1201971220305828.

127. Benedict Kpozehouen E, Raina Macintyre C, Tan TC. Coverage of influenza, pneumococcal and zoster vaccination and determinants of influenza and pneumococcal vaccination among adults with cardiovascular diseases in community. Vaccine. 2024;42(22):126003. Available at: https://www.sciencedirect.com/science/article/abs/pii/S0264410X24006194?via%3Dihub.
128. Nasreen S, Gebretekle GB, Lynch M et al. Understanding predictors of pneumococcal vaccine uptake in older adults aged 65 years and older in high-income countries across the globe: A scoping review. Vaccine. 2022;40(32):4380-93. Available at: https://pubmed.ncbi.nlm.nih.gov/35781171/.
129. Kaur P, Mehrotra R, Rengaswamy S et al. Human papillomavirus vaccine for cancer cervix prevention: Rationale & recommendations for implementation in India. Indian J Med Res. 2017;146(2):153-7. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC5761024/pdf/IJMR-146-153.pdf.
130. Lei J, Ploner A, Elfström KM et al. HPV Vaccination and the Risk of Invasive Cervical Cancer. N Engl J Med. 2020;383(14):1340-8. Available at: https://www.nejm.org/doi/pdf/10.1056/NEJMoa1917338?download=true.
131. Wang R, Pan W, Jin L et al. Human papillomavirus vaccine against cervical cancer: Opportunity and challenge. Cancer Lett. 2020;471:88-102. Available at: https://pubmed.ncbi.nlm.nih.gov/31812696/.
132. World Health Organization (WHO). Chronic obstructive pulmonary disease (COPD): 2024. Available at: https://www.who.int/news-room/fact-sheets/detail/chronic-obstructive-pulmonary-disease-(copd).
133. Fortis S, Wan ES, Kunisaki K et al. Increased mortality associated with frequent exacerbations in COPD patients with mild-to-moderate lung function impairment, and smokers with normal spirometry. Respir Med X. 2021;3. Available at: https://www.sciencedirect.com/science/article/pii/S2590143520300129?via%3Dihub.
134. Mallah N, Urbieta AD, Rivero-Calle I et al. New Vaccines for Chronic Respiratory Patients. Arch Bronconeumol. 2024;60(9):565-75. Available at: https://www.sciencedirect.com/science/article/pii/S030028962400190X?via%3Dihub.

13 Special acknowledgement

FIP would like to thank all member organisations that kindly contributed to this report:

Australia

Pharmaceutical Society of Australia

Canada

Neighbourhood Pharmacy Association of Canada (Non-FIP member)

Costa Rica

College of Pharmacists of Costa Rica

Portugal

National Association of Pharmacies

Portuguese Pharmaceutical Society

South Africa

Pharmaceutical Society of South Africa

UK

Royal Pharmaceutical Society (Scotland, England and Wales)

Pharmacists' Defence Association (England, Scotland, Wales and Northern Ireland)

USA

American Pharmacists Association

Annex

Appendix 1. Case study template

Country/Territory:	*[To be completed]*
Member organisation's name in English:	*[To be completed]*
Case study author(s):	*[To be completed]*
Email address:	*[To be completed]*

Note:
Some sections require **validation** against existing data from the FIP's vaccination surveillance survey, case study report and advocacy toolkit. Please ensure all insights and updates reflect the latest practices and policies. If available, please provide policy documents, reports, or research findings that support your response.

Section A: Legislative framework for funding PBV

1. **[Context of the legislative framework in the Country]**

   Please provide a 150-200-word case study outlining:
   - The legislative framework governing PBV funding in [country].

[To be completed]

Section B: Overview of PBV in [country]

2. **When was PBV introduced?**

[To be completed]

3. **What types of vaccines are pharmacists authorised to administer?**

[To be completed]

Section C: Funding model for PBV services

4. **Who funds PBV?**

[To be completed]

5. **Additional insights on reimbursement:**

[To be completed]

6. **How are reimbursement rates determined, and do they differ based on vaccine type, administration setting, or patient demographics?**

[To be completed]

7. **Are pharmacists reimbursed at the same rate as doctors or nurses? If not, what are the key differences in compensation structures?**

[To be completed]

8. **What are the main barriers pharmacists face in reimbursement (e.g., administrative delays, regulatory restrictions)?**

[To be completed]

Section D: Economic and public health impact

9. **If available, please provide evidence on the economic and public health impact of PBV in [Country]. Your response should address:**
   - What studies exist on the cost-effectiveness of PBV?
   - How has PBV contributed to cost savings in healthcare expenditures, reduced hospital visits, or improved efficiency?
   - How has PBV influenced vaccination uptake, particularly among underserved or high-risk populations?
   - Have there been measurable reductions in vaccine-preventable diseases, hospitalisations, or outbreak risks?

[To be completed]

Section E: Key enablers

10. **What factors have contributed to the success of PBV in [Country]?**
    Consider aspects such as legislation, funding mechanisms, pharmacist training, public-private partnerships, and technological advancements.

[To be completed]

Section F: Lessons learned

11. **What key insights can other countries learn from [Country]'s PBV experience?**
12. **What policy recommendations would you suggest for countries considering PBV implementation?**

[To be completed]

Appendix 2. Summary of funding models for PBV[21]

Country	Is PBV available?	Can pharmacists administer vaccines in pharmacies?	Remuneration (Yes/No)	By public (state-run) health systems or insurers	By private health systems or insurers	The service is paid for by the customer	The service is provided free of charge (i.e., the pharmacy takes on the cost of the service)
Afghanistan	No						
Albania	Yes						
Algeria	Yes	Yes	No				✓
Argentina	Yes	Yes	Yes	✓	✓	✓	
Armenia	No						
Australia	Yes	Yes	Yes	✓		✓	
Austria	No						
Bangladesh	Yes		Yes			✓	
Barbados	No						
Belgium	Yes	Yes	Yes	✓			
Bolivia	Yes						
Bosnia & Herzegovina	No						
Brazil	Yes	Yes	Yes			✓	
Bulgaria	No						
Cameroon	Yes	Yes	No				✓
Canada	Yes	Yes	Yes	✓			
Cape Verde	Yes	Yes	Yes			✓	
Chad	Yes	Yes	Yes				
Chile	No	No					
China	No						
China Taiwan	No	No					
Colombia	No						
Congo, Dem. Rep. of the	No						
Congo, Rep. Of	No						
Costa Rica	Yes	Yes	No				✓

Côte d'Ivoire	No						
Croatia	Yes		No				✓
Cuba	No						
Cyprus	No						
Czech Republic	No						
Denmark	Yes	Yes	Yes	✓		✓	
Ecuador	No						
Egypt	No						
El Salvador	No						
Estonia	Yes						
Ethiopia	No						
Fiji	No						
Finland	Yes						
France	Yes	Yes	Yes	✓			
Germany	Yes	Yes	Yes	✓	✓		
Ghana	Yes	Yes	Yes			✓	
UK	Yes	Yes	Yes	✓	✓	✓	
Greece	Yes	Yes					
Guatemala	No						
Guyana	No						
Haiti	No						
Hong Kong SAR, China	No						
Hungary	No						
Iceland	Yes	Yes	Yes	✓			
India	No						
Indonesia	No						
Iraq	No						
Ireland	Yes	Yes	Yes	✓		✓	
Israel	Yes	Yes	No				✓
Italy	Yes	Yes	Yes	✓		✓	
Japan	No						
Jordan	Yes	Yes	Yes			✓	

Kenya	Yes	Yes	Yes				
Korea (Rep. of)	No						
Kosovo	No						
Kuwait	No						
Latvia	Yes	Yes					
Lebanon	Yes	Yes	No				✓
Lithuania	Yes	Yes	Yes				
Luxembourg	Yes						
Madagascar	No						
Malawi	No						
Malaysia	No						
Mali	No						
Malta	Yes						
Mauritius	No						
Mongolia	No						
Montenegro	No						
Morocco	No						
Namibia	Yes	Yes	Yes			✓	
Nepal	Yes		Yes			✓	
Netherlands	Yes						
New Zealand	Yes	Yes	Yes				
Nigeria	Yes	Yes	No				✓
North Macedonia (Republic of)	No						
Norway	Yes	Yes	Yes	✓		✓	
Oman	No						
Pakistan	Yes						
Panama	No						
Paraguay	Yes	Yes	No				✓
Philippines	Yes	Yes	Yes			✓	
Poland	Yes	Yes	Yes				
Portugal	Yes	Yes	Yes		✓	✓	
Romania	Yes	Yes	Yes			✓	✓

Russian Federation	No						
Saudi Arabia	Yes						
Senegal	No						
Serbia	No						
Seychelles							
Sierra Leone	Yes	Yes	Yes			✓	
Singapore	No						
Slovak Republic	No						
Slovenia	No						
South Africa	Yes	Yes	Yes		✓		
South Sudan	Yes	Yes	No				✓
Spain	No						
Sri Lanka	No						
Sudan	No						
Suriname							
Sweden	Yes						
Switzerland	Yes	Yes	Yes		✓	✓	
Tanzania	No						
Thailand	No						
Tunisia	Yes	Yes	Yes		✓	✓	
Turkey	No	No					
Ukraine	No						
United Arab Emirates	Yes	Yes					
USA	Yes	Yes	Yes	✓	✓		
Uruguay	No						
Venezuela	Yes	Yes					
Yemen	Yes	Yes	Yes		✓	✓	
Zambia	No						
Zimbabwe	No						

International
Pharmaceutical
Federation

Fédération
Internationale
Pharmaceutique

Andries Bickerweg 5
2517 JP The Hague
The Netherlands
-
T +31 (0)70 302 19 70
F +31 (0)70 302 19 99
fip@fip.org
-
www.fip.org