Vaccination training in pharmacy

Global provision, barriers, and needs

2026

International Pharmaceutical Federation

Colophon

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

Authors:
Nisa Masyitah, FIP Data and Intelligence Manager
Grace Adebayo, FIP Project and Data Support Coordinator
Precious Ekpotu, FIP Data Support Coordinator
Amira Mustafa, FIP Global Pharmaceutical Observatory (GPO) Intern

Editors:
Farah Aqqad, FIP Data and Intelligence Lead
Dr Catherine Duggan, FIP Chief Executive Officer

Recommended citation:
International Pharmaceutical Federation (FIP). Vaccination training in pharmacy: Global provision, barriers, and needs. The Hague: International Pharmaceutical Federation; 2026

Cover image:
© Charday Penn | iStockphoto

Acknowledgements

This resource is supported through unrestricted funding from Sanofi Vaccines.

Contents

1 Introduction

1.1 Background and rationale

Improving vaccination coverage remains a global public health priority, particularly among adult populations where coverage often lags behind national targets. In this context, pharmacy-based vaccination (PBV) has gained increasing importance as an effective strategy to expand access to vaccination services and improve vaccine uptake and coverage rates. This report sits within wider global priorities, notably the World Health Organization's Immunization Agenda 2030, which calls for life-course approaches to vaccination and equitable access to vaccination services to improve coverage rates, leaving no one behind.[1]

Across multiple studies, pharmacist authorisation in vaccination services has been shown to have a measurable and positive impact on vaccination uptake. Evidence from the literature consistently demonstrates that pharmacy-based interventions increase vaccination acceptance, particularly among populations with low prior vaccination coverage.[2-4] In a systematic literature review by Murray and colleagues, pharmacy-based interventions were associated with increases in vaccination acceptance of up to 27% compared to standard care (physician- or nurse-led care, or no formal vaccination programme). Among individuals who had not received influenza vaccinations in the previous year, the relative increase was even greater, reaching up to 117%.[2] These findings highlight the role of pharmacies as critical access points for vaccination and as mechanisms for reaching unvaccinated or under-vaccinated populations.

The impact of pharmacists in vaccination delivery was assessed by Isenor and colleagues in their systematic review and meta-analysis of pharmacists' roles as educators, facilitators, and administrators of vaccines.[3] Pharmacists are trusted healthcare professionals, and their recommendations have been shown to increase vaccination rates to a level comparable with those of physicians and nurses in certain contexts.[3] Pharmacies also offer advantages in terms of convenience and accessibility, including extended opening hours and access to walk-in services, and may reach populations with otherwise limited access to primary health care. Together, these factors position pharmacists as effective providers of vaccination services within the community.[3]

These studies provide a strong justification for reforms to scope-of-practice through regulatory changes. Expanding the role of pharmacists in vaccination delivery offers policymakers a mechanism to extend vaccination services beyond traditional clinical settings, particularly in the context of ageing populations and growing demands on primary health care systems.

Despite this policy relevance, the adoption of PBV remains globally uneven. As of 2025, such services are available in 56 countries and territories, with influenza, COVID-19, tetanus–diphtheria–pertussis, and hepatitis B vaccines among the most common vaccinations offered in pharmacies.[5] Countries, including Australia, Canada, Ireland, Portugal, the UK, and the USA have adopted PBV, while many countries have limited these services.[5] This indicates substantial variation in regulatory approaches and levels of integration of pharmacy in primary health care (PHC).

Regulatory change alone is, however, insufficient to ensure safe and effective implementation, which depends on pharmacists being adequately prepared to assume this responsibility. Without appropriate training, the potential benefits of PBV may not be fully realised. This report, therefore, focuses on the education and training required to underpin safe and effective PBV.

Access to training programmes is consistently described as a core requirement for PBV. Political acceptance, professional legitimacy, patient confidence, and patient safety are all closely linked to pharmacists' competence as vaccinators. Training is often embedded within undergraduate curricula and reinforced through postgraduate training and continuous professional development (CPD) programmes, ensuring that pharmacists are equipped with the necessary knowledge, skills, and competencies to deliver vaccinations throughout their professional careers.

Availability of and accessibility to training also influences pharmacists' readiness and willingness to offer vaccination services. Evidence exploring pharmacists' engagement with vaccination services indicates that the lack of access to vaccination training remains a barrier to participation.[6] While completion of vaccination training and achieving certification is associated with increased ability to deliver vaccination services, these findings highlight the need for training programmes that are accessible, scalable, and aligned with evolving regulatory and professional standards.[6]

The literature underscores the important contribution of pharmacists to delivering vaccination and to achieving broader public health goals of improved adult vaccination coverage. Realising this potential requires a coordinated approach that aligns scope-of-practice expansion with quality education, training, and ongoing CPD. Embedding training programmes across the professional lifecycle is therefore essential to translating the expanded scope of practice into safe, effective, and sustainable vaccination services.

1.2 Aim and objectives of this report

In light of the expanding role of pharmacists and the growing reliance on pharmacies as vaccination providers, a comprehensive understanding of vaccination training is essential. This report therefore aims to provide an overview of the current global provision of vaccination training for pharmacists and pharmacy students worldwide, as well as identifying key barriers and priority training needs.

By analysing the global training landscape and identifying gaps and opportunities, this report aims to inform policymakers, educators, and professional bodies. It also seeks to support the development of training programmes that enable pharmacists to deliver safe, effective, and sustainable vaccination services.

The objectives of this report are:

1. To provide an overview of the current global provision of vaccination training for pharmacists and pharmacy students.
2. To identify key barriers that influence the development, implementation, and scalability of vaccination training programmes.
3. To identify priority training needs to support pharmacists and pharmacy students in delivering vaccination services safely and effectively.

1.3 Methodology

This report is based on desk-based research exclusively drawing on secondary data sources, including published peer-reviewed journal articles and existing publications from the International Pharmaceutical Federation (FIP). Evidence from journal articles was reviewed and assessed to inform the analysis of current provision, barriers, and training needs, using search terms such as PBV, vaccination training and curricula, and barriers and needs in vaccination training.

The report draws on a broad range of FIP outputs related to vaccination, including global survey findings on PBV conducted in 2016,[7] 2019,[8] and 2024,[5] evidence from training-related publications, and other FIP initiatives such as continuous professional development (CPD) and campaigns. These sources provided an overview of how the vaccination training programmes are implemented in different countries and regions. Together, peer-reviewed journal articles and FIP resources were analysed thematically around three domains (current training provision, barriers to training, and training needs) to guide the structure and content development of the report.

This report relies exclusively on secondary data sources, including peer-reviewed literature and FIP outputs. As a result, findings are dependent on the availability and quality of existing published data, which may vary across countries and regions. The absence of primary data collection means that recent developments in training programmes may not be fully captured.

2 Global analysis of vaccination training programmes

2.1 The global vaccination training landscape

In 2024, FIP conducted a global survey as part of its surveillance programme to monitor recent advances in vaccination within pharmacy practice. The results were published in the '[Leveraging pharmacy to deliver life-course vaccination: An FIP global intelligence report]', with a publicly available executive summary accessible [here].[5] Data from 116 countries and territories, as shown in Figure 1, provide insights into the status of vaccination education and training for pharmacists. A country-level summary of vaccination training provision is provided in Appendix 1.

The survey results indicate that vaccination training for pharmacists is available in more than half of the countries surveyed, including some where pharmacists are not yet authorised to vaccinate, and that training is provided in all countries where pharmacists are authorised to vaccinate.[5] It could therefore be said that a country that provides vaccination training is one prepared to support pharmacists vaccinating. Since 2016, the availability of vaccination training for pharmacists has increased significantly, with the number of countries reporting such training rising from 12 to 64 (+433%). Undergraduate education and training have expanded from 6 to 19 countries, while post-registration or professional development training has grown from 11 to 41 countries. Training is now mandatory in 22 countries, with renewal requirements in 17.[5, 7, 8]

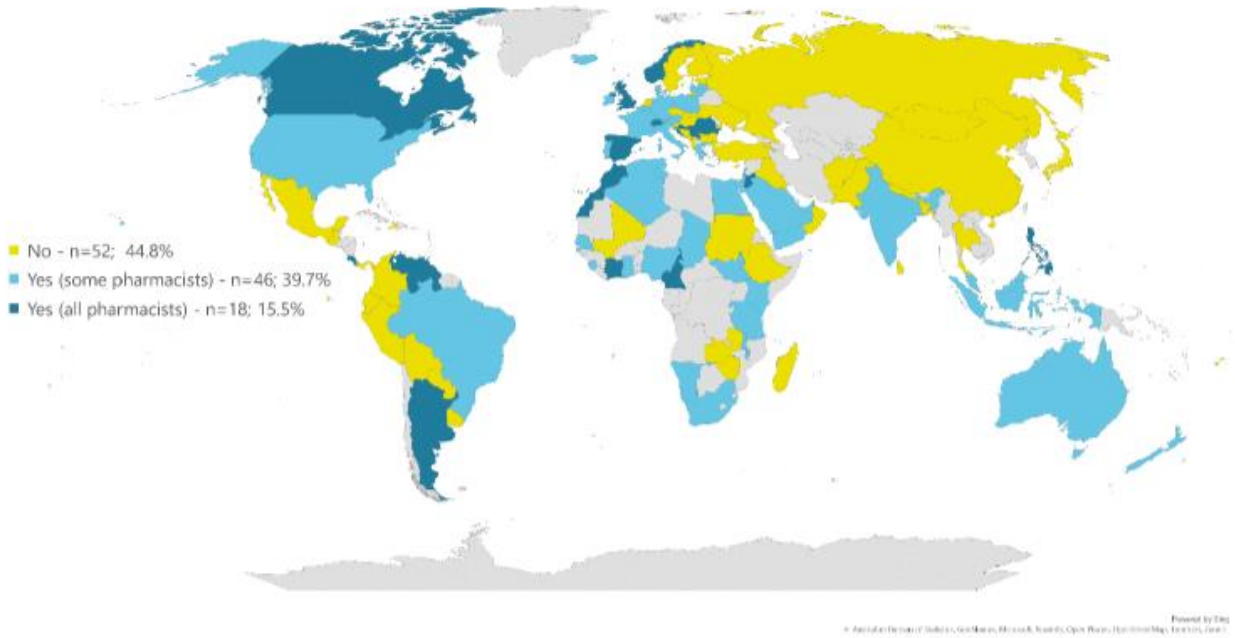


Figure 1: Availability of vaccination training for pharmacists (n=116)

This trend reflects a growing recognition of the critical role of pharmacists in vaccination services globally. However, the provision of PBV training varies substantially across countries. There are notable differences in integrating educational curricula, the depth and content of training, training modalities used, the degree of standardisation and the regulatory frameworks that underpin practice.

Expanding vaccination education and training across all levels of pharmacy practice is essential to ensure pharmacists are well-equipped to deliver vaccination services. Strengthening undergraduate and postgraduate training by

integrating vaccination content into pharmacy curricula helps build foundational competencies early in pharmacists' careers. CPD programmes should incorporate structured training to keep practising pharmacists updated on vaccination guidelines, emerging vaccine technologies, and evolving service delivery models.

2.2 Current global provision of vaccination training

Vaccination training for pharmacists is delivered across multiple stages of professional development, broadly categorised as pre-registration and post-registration education. Pre-registration refers to training undertaken prior to initial professional registration (typically within undergraduate pharmacy programmes), while post-registration includes postgraduate and CPD programmes undertaken by practising pharmacists. The training aims to equip pharmacy students and pharmacists with the competencies required to deliver vaccination services safely and effectively.

Pre-registration training focuses on establishing foundational clinical competence and professional readiness, whereas post-registration or CPD-based training builds on practice experience and supports service implementation, workflow integration and professional leadership.

The sections below describe vaccination training programmes according to where they are embedded within pharmacy education.

2.2.1 Pre-registration level for pharmacy students

At the pre-registration level, vaccination training is designed to establish foundational clinical competence and professional readiness. This includes basic knowledge of immunology, injection techniques, and the management of adverse events following immunisation (AEFI). For pharmacy students, vaccination training within undergraduate curricula represents an expansion of traditional pharmacy education into hands-on clinical practice, reflecting a shift towards viewing vaccination as a core competency expected of graduates at entry to practice.

One approach is to deploy a spiral curriculum, in which vaccination-related knowledge and skills are introduced early in the pharmacy programme and revisited at multiple points throughout the degree, each time with increasing complexity and clinical relevance. This approach has been designed and evaluated in Australia.[9] It is intended to support skill retention, progressive mastery, and alignment with subsequent experiential learning.[10] Core competencies addressed through this approach include injection administration, management of anaphylaxis, and infection prevention and control. In the first year, students are introduced to fundamental technical and safety-related skills. In the third year, students undergo reassessment of injection techniques, infection control procedures, and emergency response competencies to reinforce prior learning. In the final year, advanced vaccination-specific content is delivered once students have acquired sufficient biomedical and clinical knowledge.[9]

Beyond the spiral curriculum approach, vaccination training programmes have also been embedded in the final year of Bachelor of Pharmacy (BPharm) and/or Master of Pharmacy (MPharm) curricula, or in the fourth year of pharmacy education.[11-14] These programmes may be delivered by interprofessional teaching teams and may involve joint training of students from multiple health professions, reflecting the collaborative nature of vaccination practice.[11]

In the USA, most Doctor of Pharmacy (PharmD) programmes embed the American Pharmacists Association (APhA) Pharmacy-Based Immunization Delivery Program within the curriculum, enabling students to obtain immunisation certification during their studies. Vaccination content is introduced in the early years of the programme and integrated into pharmacotherapy rather than offered as a standalone course.[15]

The overarching goal of pre-registration vaccination training is to ensure that pharmacy graduates enter professional practice with baseline clinical competence, confidence, and readiness to participate in vaccination services in line with regulatory requirements.

2.2.2 Post-registration level and CPD programmes for practising pharmacists

Post-registration vaccination training programmes are designed for practising pharmacists and focus on extending the scope of practice, maintaining competence, and supporting real-world vaccination service delivery. Post-registration vaccination training may be delivered in the form of workshops or CPD programmes, with participants typically receiving CPD credits upon completion, such as those implemented in Canada.[16]

These programmes often extend beyond technical vaccination skills to address service implementation, workflow integration, and professional leadership. Training content may include refresher sessions covering vaccination epidemiology, national vaccination recommendations, and pharmacists' scope of practice, alongside interactive clinical cases focused on vulnerable or high-risk populations. Structured discussions of best practices and competency gaps, informed by pharmacists' field experience, as well as facilitated roundtable discussions encouraging peer exchange and reflection, can be incorporated. Peer-based and case-based learning approaches are particularly effective in building confidence among practising pharmacists.[16]

A modular system is one of the approaches used in post-registration vaccination training. In a modular system, training is organised into discrete modules, each aligned with a defined set of competencies or skills that pharmacists may complete with a varying degree of autonomy.[17] Successful completion of each module is formally recognised through certification. An example is the programme developed by the Irish Institute of Pharmacy, aligned with the requirements of the Pharmaceutical Society of Ireland (PSI).[18] Training content includes cardiopulmonary resuscitation (CPR) for adults and children, responsiveness to an emergency, management of anaphylaxis, parenteral medicines administration, and the delivery of a PBV service.[18]

Overall, post-registration and CPD-based vaccination training plays a critical role in ensuring ongoing professional competence, supporting safe service expansion, and enabling pharmacists to respond to evolving population needs and health system demands.

Taken together, these models show that vaccination competence is built progressively across the professional lifecycle, not from taking a single training course.

2.3 Training modalities and delivery models

Vaccination training programmes are delivered through a range of pedagogical modalities designed to support the acquisition, reinforcement, and applicability of clinical competencies. The programme aims to ensure that pharmacy students and practising pharmacists develop not only technical proficiency but also clinical judgement, communication skills, and readiness for real-world vaccination service delivery.

Across undergraduate and postgraduate levels, vaccination training is increasingly characterised by the use of patient simulation, blended and multimodal learning, CPD workshops, and interprofessional and experiential learning. As illustrated in Figure 2, the following sections describe key training modalities and delivery approaches used in pharmacy vaccination training programmes, drawing on empirical evidence from the literature.

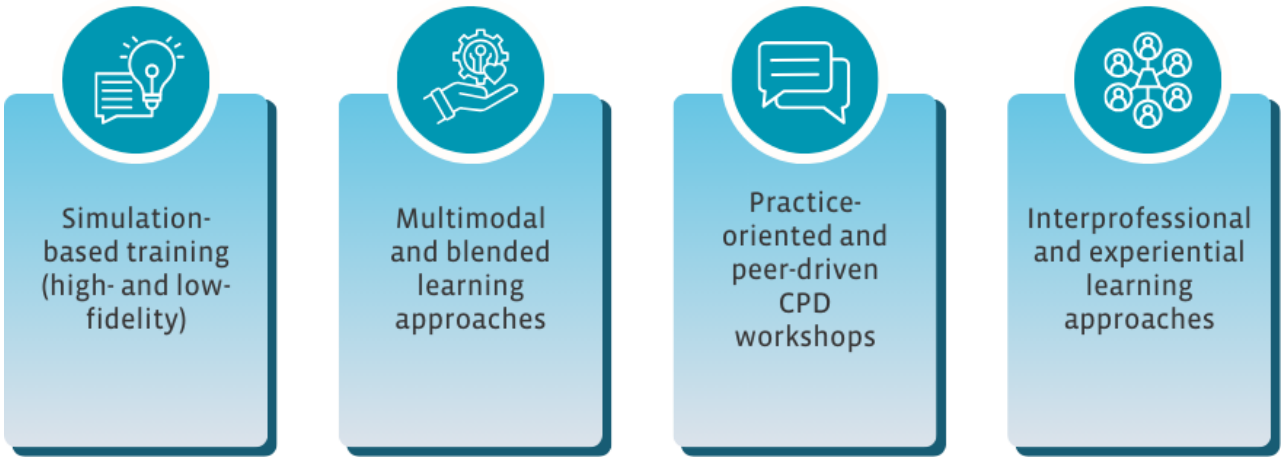


Figure 2: Training modalities and delivery models

2.3.1 Simulation-based training (high- and low-fidelity)

High-fidelity simulation is a training modality that enables pharmacy students to practise vaccination skills within realistic, controlled clinical environments. By using advanced mannequins capable of simulating vital signs, verbal communication, and physiological responses (e.g., changes in heart rate or blood pressure), high-fidelity simulation allows students to integrate technical vaccine administration with patient communication and clinical decision-making.

Evidence supporting this approach comes from a randomised controlled trial in Germany conducted as part of a fourth-year clinical pharmacy course. The study employed a pre- and post-training design to compare high-fidelity simulation with low-fidelity simulation training, evaluated through wearable injection pads. Both groups received identical theoretical instruction covering patient assessment, eligibility screening, informed consent, vaccine preparation, intramuscular administration, and recognition and management of adverse events. Student performance was assessed through Objective Structured Clinical Examinations (OSCEs) conducted before and after the training.[14]

Although both groups demonstrated improvements following training, students in the high-fidelity group showed significantly greater improvement overall. The most pronounced differences favoured high-fidelity simulation in domains including patient information and counselling, vaccine administration technique, and the management of emergencies associated with vaccination.[14]

These findings suggest that low-fidelity simulation is sufficient for basic skill acquisition. However, high-fidelity simulation offers added value in preparing students for real-world practice, particularly in managing emergencies. As such, high-fidelity simulation training could play a key role in preparing pharmacists for vaccination services. Pharmacy curricula may consider adopting simulation-based learning using advanced technologies to support professional confidence and patient safety.

2.3.2 Multimodal and blended learning approaches

The increasing role of pharmacists in vaccination delivery has driven the adoption of multimodal pedagogical approaches that integrate online and face-to-face learning, skills workshops, and simulation. This training approach is intended to support competency development and ensure safe vaccination practice among pharmacy graduates.

Bushell and colleagues (2015) evaluated a vaccination training programme embedded in the final year of the Bachelor's and Master of Pharmacy programmes at the University of Canberra, Australia. The training programme was developed in accordance with the National Immunisation Education Framework for Health Professionals and aligned with professional practice standards, immunisation service guidelines, and accreditation requirements.[9]

The programme used a blended, multimodal pedagogical approach combining online learning and face-to-face learning. Components included interactive e-learning modules, videos, interactive lectures, case studies, and intensive skills-based workshops delivered over four full-day sessions. A key innovation was the integration of simulation and mixed reality, including role play, low-fidelity adult and paediatric mannequins, standardised patients, and Microsoft HoloLens applications to support students' understanding of anatomical landmarks, injection safety, and management of adverse events. The programme was delivered by an interprofessional teaching team comprising pharmacy and nursing academics, as well as pharmacist vaccinators and nurse practitioners, underscoring collaborative practice in vaccination delivery.[9]

The results indicated that a university-embedded vaccination training programme, delivered through a multimodal approach, produced knowledgeable, competent, and confident pharmacists able to deliver vaccination services. The findings supported formal recognition of undergraduate vaccination training, reduction of duplicated post-graduate certification, and consideration of supervised student participation in vaccination delivery. Ultimately, this training has implications for vaccination uptake, pandemic preparedness, and health system resilience.

2.3.3 Practice-oriented and peer-driven CPD workshops

For practising pharmacists, vaccination training needs extend beyond technical injection skills to include service implementation. This can be delivered as part of CPD programmes, for example, through workshops. In Canada, a study was conducted to design, implement, and evaluate the Pharmacy Best Practice Workshops for pharmacy owners in Québec. This programme was positioned as a professional "retooling" strategy, enabling pharmacists to adapt rapidly to expanded responsibilities.

The workshops consisted of four integrated components: a refresher session covering vaccination epidemiology, national recommendations, and scope of practice; interactive clinical cases focused on access for vulnerable populations; structured discussions of best practices and competency gaps informed by fieldwork; and, facilitated roundtable discussions encouraging peer exchange and reflection.

To receive CPD credits, participants completed a mandatory anonymous questionnaire and reported improved confidence and readiness to implement vaccination services, high perceived relevance and applicability of the clinical cases, and strong appreciation for the interactive format and opportunities for peer learning.

These findings align with international evidence indicating that pharmacist vaccination training must extend beyond technical skills. They also underscore that the expanding scope of practice must be accompanied by targeted educational support addressing implementation challenges. Operational readiness, leadership, workflow integration, and peer-assisted learning are critical for sustainable service delivery. Such practice-oriented, peer-driven training models are essential to maximise the public health impact of PBV services.

2.3.4 Interprofessional and experiential learning approaches

Interprofessional and experiential learning represents an important modality for strengthening vaccination competence while addressing workforce capacity constraints. Implementing vaccine delivery as an Entrustable Professional Activity (EPA) enables workforce readiness, responds to public health needs, and addresses gaps in interprofessional education.

In Australia, interprofessional, student-led influenza vaccination clinics involving final-year pharmacy, medical, and nursing students were developed. The programme aimed to evaluate the impact of interprofessional influenza vaccination training on students' perceived knowledge, skills, confidence, and attitudes towards vaccination practice.[11]

The programme consisted of both online and in-person training. Prior to the in-person training, students completed seven interactive online modules designed to establish foundational knowledge. These modules addressed core topics such as immunology, vaccine development and formulation, influenza and its vaccines, government-funded immunisation programmes, and the broader public health impact of vaccination. This was followed by a six-hour interprofessional workshop focused on attainment of applied skills and collaborative practice. Workshop activities included patient assessment and consent, organisation of the vaccination setting, safe sharps handling and needlestick injury prevention, identification and management of adverse events including anaphylaxis, and hands-on practice of intramuscular and subcutaneous injection techniques. To ensure clinical preparedness, students were also required to complete accredited training in anaphylaxis management as well as first aid and cardiopulmonary resuscitation (CPR).[11]

Evaluation findings demonstrated improvement in students' perceived knowledge, skills, and confidence in administering vaccines. High levels of satisfaction among vaccine recipients were also reported. Overall, the interprofessional vaccination training and student-led influenza clinics were safe, effective, and highly valued by both student vaccinators and vaccine recipients.[11]

This model offers a scalable approach to strengthening vaccination workforce capacity, improving access to vaccination services, and embedding interprofessional experiential learning within health professional education.

While each training modality demonstrates potential benefits in strengthening vaccination competence among pharmacists and pharmacy students, their implementation is influenced by contextual, institutional, and resource-related factors. Table 1 summarises the key features, strengths, and limitations of the principal training modalities identified in the literature.

Table 1: Summary of vaccination training modalities and delivery models

Modality and delivery approaches	Key features	Strengths	Limitations
Simulation-based training (high- and low-fidelity)	Use of mannequins or wearable injection pads; OSCE-based assessment; integration of technical skills, patient communication, and emergency management; controlled clinical environment	Improves technical skills and emergency preparedness; high-fidelity simulation enhances clinical judgement and realism; safe environment for repeated practice	High-fidelity simulation requires advanced equipment, infrastructure, and trained faculty; may be resource-intensive and less accessible in low-resource settings
Multimodal and blended learning	Combination of online modules and in-person lectures, workshops, and simulation; OSCE-based assessment	Supports comprehensive competency development; reinforces knowledge through multiple formats; reduces duplication of post-graduate certification	Requires coordination across modalities; may demand institutional resources, faculty time, and technological infrastructure
Practice-oriented and peer-driven CPD workshops	Refresher sessions; interactive clinical cases; structured discussions of best practices; peer exchange; focus on implementation readiness and workflow integration	Addresses real-world service delivery challenges; strengthens confidence and leadership capacity; is responsive to practising pharmacists' needs; promotes peer learning	Impact may vary depending on participant engagement; short-duration workshops may not ensure sustained competency without ongoing support or follow-up training
Interprofessional and experiential learning approaches	Student-led vaccination clinics; online and in-person modules; EPA integration; hands-on injection training; anaphylaxis and CPR certification	Strengthens collaborative practice; improves confidence and workforce readiness; scalable in settings with institutional support	Requires coordination across disciplines; dependent on institutional and regulatory support; may be logistically complex to implement

Key summary:

- Pharmacist vaccination training has expanded worldwide and is now available in most countries where vaccination authority exists.
- Vaccination competence is developed progressively across the professional lifecycle, from pre-registration to post-registration level and CPD-based programmes.
- Training extends beyond injection technique to include clinical assessment, emergency management, communication, workflow integration, and leadership.
- Diverse training modalities and delivery models include simulation (high- and low-fidelity), multimodal and blended learning, practice-oriented and peer-driven CPD workshops, and interprofessional experiential learning.
- Effective vaccination training underpins workforce readiness, service sustainability, and the public health impact of PBV.

3 FIP's support for vaccination training: resources and initiatives

FIP's work on vaccination began in 2011 with the 'FIP & WHO Joint Guidelines on Good Pharmacy Practice: Standards for Quality of Pharmacy Services,' which highlighted the administration of medicines, vaccines, and other injectable therapies as a core role of pharmacists. This early guidance laid the foundation for recognising pharmacists as key contributors to vaccination and public health.

Building on this foundation, FIP launched resources and initiatives to support pharmacists globally in acquiring the knowledge and skills needed to deliver safe and effective vaccination services.

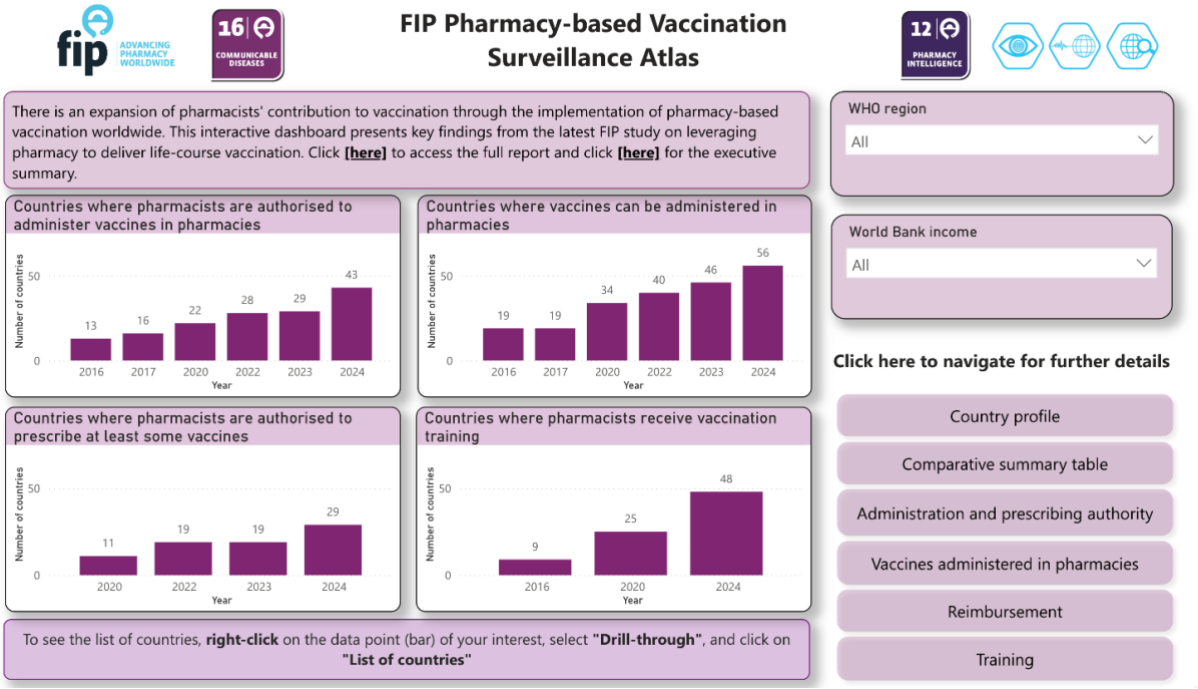
a. FIP PBV Surveillance Programme

For nearly a decade, FIP has conducted systematic surveillance of pharmacists' involvement in vaccination services, based on global survey rounds carried out in 2016, 2019, and 2024. Drawing on data provided by FIP member organisations and additional sources, these findings are disseminated through FIP's global intelligence reports and its interactive PBV surveillance atlas. Together, these resources provide comprehensive insights into PBV services worldwide, including training programmes.

FIP global intelligence reports:

a. An overview of current pharmacy impact on immunisation. A global report (2016)
b. An overview of pharmacy's impact on immunisation coverage. A global survey (2020)
c. Leveraging pharmacy to deliver life-course vaccination: An FIP global intelligence report (2024)

The PBV surveillance atlas:



b. FIP Training-related Publications

FIP has developed a range of publications to support professional development in vaccination:

- FIP Knowledge and Skills Reference Guide for Professional Development in Vaccination Services (2025)

The FIP Knowledge and Skills Reference Guide (2025) categorises knowledge and skills into broad, core, and specific domains covering vaccine science, administration, patient care, safety, regulatory compliance, and emerging challenges such as digital health and vaccine hesitancy. The guide links with national legislation, professional codes, and certification considerations, making it an essential resource for practitioners, educators, students, and regulators.

- Vaccination of special risk groups: A toolkit for pharmacists (2022)
  This toolkit aims to provide the pharmacy workforce with relevant and concise guidance on immunisation practices. It discusses disease states, their effects on the populations, and the benefits of receiving the vaccines against each disease.
- FIP vaccination handbook for pharmacists: Procedures, safety aspects, common risk points and frequently asked questions (2021)
  This handbook aims to support individual pharmacists in understanding how they can contribute to improving vaccination coverage through services ranging from patient education and advice to logistical roles and the administration of vaccines.
- Building vaccine confidence and communicating vaccine value: A toolkit for pharmacists (2021)
  This toolkit identifies common reasons for concern or hesitancy related to vaccine safety and efficacy and proposes effective approaches to address them in a variety of ways through pharmacy-led campaigns and through interactions with individual patients.

c. FIP CPD Bites/Videos

The FIP CPD Bites initiative reflects FIP's commitment to supporting pharmacists in lifelong learning. These concise, practice-oriented learning videos expand pharmacists' knowledge in key public health areas, particularly vaccination and pharmacy-led disease prevention.

1. Improving HPV-related cancers and diseases education among pharmacists
   This CPD Bites series (3 episodes) strengthens pharmacists' understanding of HPV immunisation, its public health relevance, and communication strategies for improving vaccine acceptance.
2. Addressing vaccine fatigue, complacency, and confidence
   This CPD Bites series (3 episodes) equips pharmacists with evidence-based tools to recognise vaccine fatigue and complacency, thereby strengthening community trust.

d. FIP "Let's talk about vaccines!" Campaign

The campaign strengthens pharmacists' capacity to engage communities effectively on vaccination. Supported by a tailored CPD Bites series, it enhances pharmacists' communication and clinical confidence.

As pharmacists assume expanding roles in public health, their education must equip them with the competencies needed for safe and effective vaccination. Embedding vaccination skills from undergraduate training through to CPD ensures readiness for evolving health challenges. Investing in pharmacist education ultimately strengthens both professional growth and the sustainability of global vaccination programmes.

Overall, FIP's resources and initiatives reflect a sustained commitment to strengthening pharmacists' roles in vaccination. By combining global intelligence data, training-related publications/videos and advocacy strategies, FIP supports pharmacy workforce development and promotes the integration of PBV into national immunisation strategies. Through this comprehensive approach, FIP contributes to enhancing pharmacists' competence, confidence, and impact in advancing life-course immunisation.

4 Barriers to vaccination training for pharmacists

Pharmacists are increasingly recognised as key contributors to vaccination services globally. However, vaccination training remains inconsistent across various educational and practice settings. Multiple barriers at the individual, organisational, and system levels continue to limit pharmacists' preparedness and readiness to deliver vaccination services. Addressing these barriers is essential to improve competence and promote the successful implementation and scale-up of PBV services. This chapter, as illustrated in Figure 3, outlines the key barriers to vaccination training programmes.

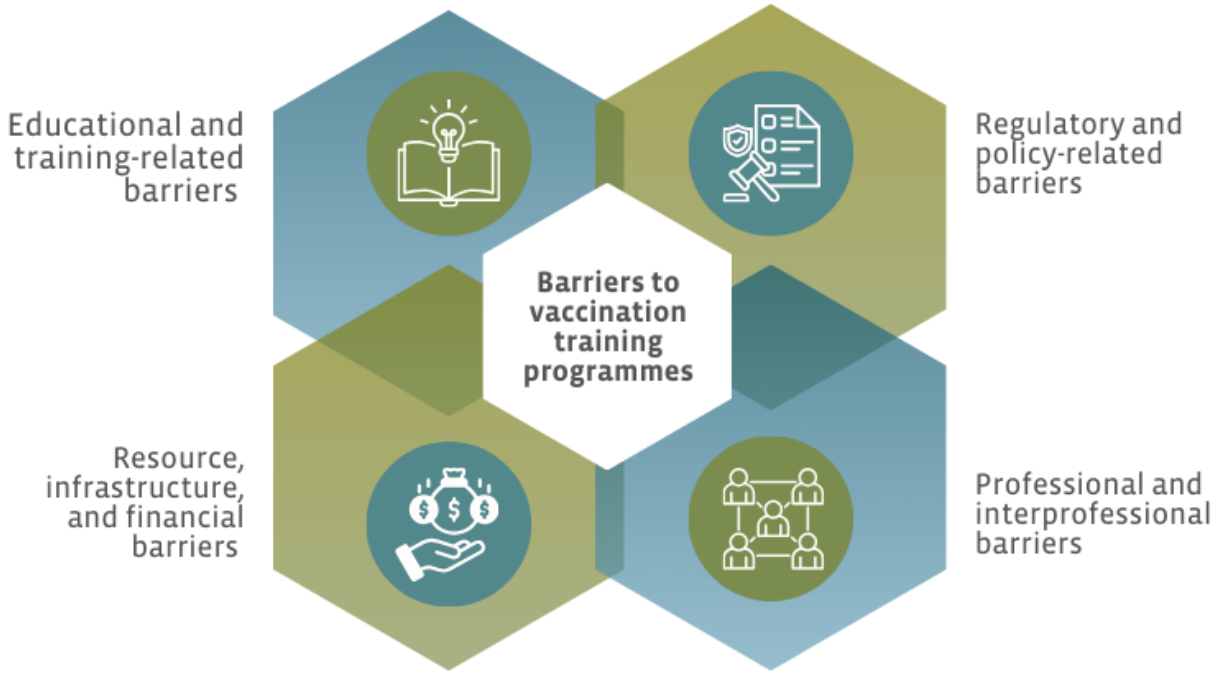


Figure 3: Barriers to vaccination training programmes

4.1 Educational and training-related barriers

Pharmacists' roles in vaccination have expanded to include vaccine administration within and outside pharmacy premises, as well as vaccine prescribing in some settings. However, persistent barriers in education and training, such as insufficient access to vaccine administration training, a lack of CPD opportunities, and limited hands-on practical exposure, continue to constrain their ability to fully assume these roles.

4.1.1 Insufficient undergraduate training and practical exposure

In many settings, pharmacy curricula do not include mandatory competencies in vaccination administration, resulting in substantial variability in the depth, content, and assessment of vaccination training.[19] This lack of standardisation in foundational education limits pharmacists' preparedness to assume vaccination roles upon graduation. Evidence indicates that vaccination education in pharmacy schools is often theory-based, with little or no training in vaccine administration skills. For example, in the Middle East, over 61% of pharmacy colleges teach vaccination theory but do not offer training in vaccine administration techniques.[20]

Similar inconsistencies have been reported in high-income countries. In Canada, the time allocated to vaccination education ranges widely from as little as one hour to as much as 50 hours, with marked variation in curriculum content, practical exposure, and evaluation methods across pharmacy programmes.[21] Such disparities contribute to uneven graduate competence in key areas, vaccine indications, contraindications, adverse events recognition, and patient safety.

Evidence from several African countries, including Ethiopia, Uganda, Zimbabwe, and Nigeria, further highlights the limited integration of vaccination training within undergraduate pharmacy programmes.[19] In Poland, only 17–50% of community pharmacists reported receiving adequate vaccination training at pharmacy school.[22] Beyond theoretical knowledge gaps, there is a consistent lack of structured training in injection techniques and other hands-on skills that are essential for vaccination delivery.[19]

In addition to technical skill gaps, in many programmes, communication skills, vaccine confidence, and strategies to address misinformation are not explicitly embedded within vaccination training, leaving pharmacists underprepared for conversations with hesitant or fearful patients. Consequently, many pharmacists enter professional practice without the practical competence or confidence required to safely and effectively administer vaccines.

4.1.2 Lack of access to CPD programmes

CPD is essential for further equipping pharmacists with the skills required to deliver safe and effective vaccination services, particularly as vaccination guidelines evolve frequently.[23] Evidence shows that pharmacists recognise the importance of ongoing education and training workshops to strengthen their competence in vaccination practice.[24] However, barriers related to CPD programmes limit participation in vaccination-related services.

A major barrier is the limited availability and poor structure of vaccination CPD programmes or access to training. In Poland, pharmacists have insufficient training courses to adequately prepare them for vaccine administration, and those who participated in pilot programmes demonstrated greater confidence and fewer perceived barriers, indicating that the training is effective but not widely accessible.[22] Similar findings were reported in other settings where a lack of ongoing workshops and structured training opportunities was cited as a key obstacle. In Nigeria, more than half of pharmacists surveyed had never received any training on vaccination delivery, and where training occurred, it was often brief (less than three days) and largely provided by professional associations rather than through coordinated national programmes. This fragmented approach reflects the absence of a standardised framework for pharmacist vaccinator training.[25]

In addition, the predominantly short theoretical nature of available training further limits the impact of CPD. Many programmes emphasise general vaccination knowledge without adequately covering practical components such as injection techniques, adverse event management, documentation, and vaccine storage.[26] This leaves pharmacists feeling inadequately prepared for real-world vaccination responsibilities, even in settings where they are legally recognised as immunisers. Evidence also shows that pharmacists with more clinically oriented education (e.g., PharmD) report greater willingness and acceptability of vaccination practice, suggesting that current CPD and earlier training pathways do not sufficiently bridge practical skill gaps.[26]

Cost and time pressures are also significant barriers to CPD participation. Community pharmacists frequently report heavy workloads that leave little time for additional training. In Ethiopia, over 70% of pharmacists identified the cost and time required for professional development as key obstacles to pursuing vaccination training.[27] Similar concerns were noted in Lebanon, where the financial burden of additional training and professional development reduced pharmacists' involvement in vaccination services.[28] While pharmacists were willing to vaccinate despite limited support from physicians, active participation in vaccination services declines when the cost and time required for further training become a burden. Without financial support, reimbursement, or institutional incentives, pharmacists are discouraged from investing in vaccination-related CPD.

Finally, there is a lack of standardised certification pathways for pharmacist vaccinators. Across several settings, training is ad hoc, inconsistently delivered, and not embedded within formal professional development systems. This absence of a coordinated national or regulatory framework for vaccination certification contributes to variations in competence, confidence, and readiness among pharmacists, further limiting the scale-up of PBV services.

In many countries, vaccination training programmes are not routinely or systematically evaluated. There are limited mechanisms to verify whether completion of training translates into demonstrated competence in practice, and evaluation results are rarely used to inform curriculum updates. As a result, training programmes may not fully respond to evolving professional roles, technological advances, or public health priorities, reducing opportunities for continuous quality improvement.

4.2 Regulatory and policy-related barriers

PBV services are feasible, well accepted, and effective in improving vaccination rates. However, pharmacists' roles are often constrained by restrictive policies and laws, which are compounded by limited governmental support and inconsistencies in legislative frameworks across regions.

4.2.1 Lack of legal authorisation and scope-of-practice restrictions

A major barrier to PBV across many settings is limited legal authorisation and restrictive scope-of-practice policies. Although pharmacists' authority to vaccinate has expanded in some countries, regulations in several jurisdictions still limit the types of vaccines pharmacists may administer, the age groups they can serve, and the procedures they must follow before or after vaccination.[29] Requirements, such as notifying a patient's primary care provider and extensive documentation, are often viewed as burdensome and reduce efficiency, leading to missed opportunities to vaccinate. In some cases, pharmacists are permitted to administer certain vaccines (e.g., influenza) but not others (e.g., zoster) or must obtain additional approvals before vaccinating walk-in patients. These requirements slow service delivery and reduce accessibility.

In Lebanon, legal and regulatory frameworks strictly prohibit pharmacists from administering vaccines, restricting their role to dispensing only.[30] This position was reaffirmed by a Ministry of Public Health memorandum in 2020, despite strong willingness among pharmacists to vaccinate and evidence that some already do so informally. Similarly, in Austria, only physicians and nurses under physician supervision are legally permitted to vaccinate, preventing pharmacists from contributing directly to vaccination efforts, despite their accessibility and interest.[31] Pharmacists in these settings also express concerns about legal liability and highlight the need for legislative reform to enable PBV services.

Comparable restrictions are reported in Ethiopia,[24] where community pharmacists are not allowed to provide vaccination services due to a lack of regulatory support, and in other contexts where pharmacists are limited to roles as educators and advocates rather than vaccinators. These legal constraints not only limit pharmacists' participation in vaccination programmes but also create fragmented training expectations and reduce incentives to pursue vaccination-related competence.

4.2.2 Absence and inconsistency of certification processes and policy

In high-income countries such as the USA, while there are established certification pathways for pharmacist immunisers, vaccination training is not uniformly standardised across all colleges and schools of pharmacy. Although most institutions cover core vaccination topics, evidence shows that some topics are less consistently addressed, including the ethics of vaccination and the management of accidental needle-stick injuries.[15] These inconsistencies in curriculum content affect the depth, quality, and comprehensiveness of vaccination training, demonstrating that the presence of certification systems does not necessarily guarantee uniform competency.

In several low- and middle-income countries, the barrier is more pronounced due to the complete absence of nationally coordinated certification pathways. In countries such as Nigeria and Zimbabwe, pharmacists largely depend on ad hoc, externally driven, or professional association-led training programmes, as no structured national framework exists to guide vaccination.[19]

Similarly, in Lebanon, although pharmacists are legally permitted to sell vaccines across settings, legislation does not clearly define or authorise their role in administering vaccines or other injectable medications.[32] This regulatory ambiguity creates inconsistency across practice environments and contributes to variations in pharmacists' readiness to provide vaccination services. Evidence shows that only a small proportion of pharmacists have completed formal vaccination training, reflecting the lack of standardised, nationally mandated certification pathways and explicit policy direction. As a result, in some settings, pharmacists vaccinate in the absence of clear legislation and standardised requirements, further highlighting the urgent need for coherent policy guidance and structured certification systems.

In many countries, pharmacists are also not explicitly recognised within national immunisation strategies or advisory structures where they are able to advocate, with evidence, the impact of PBV. As such, limited integration into national immunisation technical advisory groups (NITAGs) further weakens policy incentives to define clear training and certification expectations for the pharmacy workforce. As a result, training programmes remain fragmented and insufficiently aligned with national immunisation strategies.

4.2.3 Jurisdictional variability in training and practice laws

In the USA, PBV is well established, yet the scope of pharmacists' authority and the expectations for training, certification, and oversight vary across states.[33, 34] Each state possesses independent power to define pharmacists' scope of practice, and this has produced wide variation in the legal requirements that govern vaccination delivery. In some states, pharmacists must complete extensive additional training, maintain liability insurance, follow strict record-keeping procedures, and notify patients' primary providers before or after vaccination, while others impose minimal additional requirements beyond standard licensure.[34]

Differences are also evident in prescriber oversight. While certain states permit pharmacists to prescribe and administer vaccines independently, others require operation under a physician-signed protocol, standing order, or patient-specific prescription.[33, 34] As of 2016, ten jurisdictions had granted pharmacists independent prescriptive authority for vaccines, whereas several states neither clearly authorised nor prohibited such authority, leaving pharmacists reliant on regulatory interpretation.[34] This creates operational uncertainty and uneven access to vaccination services across state lines. For example, California illustrates how laws can evolve when it moved from requiring physician protocols in 1995 to granting pharmacists independent authority to initiate vaccines for patients three years and older under Senate Bill 493.[33]

Jurisdictional variability further extends to patient age restrictions, and the types of vaccines pharmacists may administer. Some states allow pharmacists to vaccinate individuals as young as three years old and authorise administration of any vaccine recommended by the Advisory Committee on Immunization Practices (ACIP). Others restrict pharmacist-administered vaccines to adults only or specify limited vaccine categories in legislation.[17]

These variations influence how pharmacists are trained, how pharmacies structure their workflow, and how broadly vaccination services can be offered. States with broader legal authority enable pharmacists to deliver comprehensive, year-round vaccination services, while restrictive states limit pharmacists' ability to practice at the full extent of their training. Overall, this jurisdictional variability creates fragmented training expectations and unequal public access to PBV services.[16 17]

4.2.4 Restrictions on pharmacy technician roles

Pharmacy technicians are integral members of the pharmacy workforce, supporting a wide range of services and helping to reduce pharmacists' workload.[35] In the context of vaccination, pharmacy technicians can contribute to vaccine administration, patient education, and improving access to vaccination services, particularly in community pharmacy settings. However, similar to the challenges faced by pharmacists, there are regulatory and practice restrictions that limit the involvement of pharmacy technicians in vaccination service delivery.[35]

These restrictions constrain team-based models of vaccination delivery and may reduce capacity to expand services in high-demand periods such as influenza season or public health emergencies.

4.3 Professional and interprofessional barriers

In settings where legislation does not clearly define pharmacists as vaccination providers, pharmacists often experience limited recognition from physicians and other healthcare professionals.[25, 28, 36] For example, in Lebanon, only a small proportion of pharmacists reported feeling fully accepted by local physicians or recognised by public health authorities as immunisers.[28] This disconnect between regulatory frameworks and service realities creates uncertainty about professional roles and discourages some pharmacists from pursuing formal vaccination training even though many still administer vaccines in practice.

These tensions are often driven by physicians' concerns about pharmacists' readiness, training and authority to vaccinate, as well as perceptions that pharmacists are encroaching on traditional medical or nursing responsibilities.[36] Physicians and nurses have expressed doubts about whether pharmacists possess sufficient training to administer vaccines and have shown limited support for vaccination services delivered in a pharmacy setting or for expanding pharmacists' scope of practice.[37] Such professional reservations are sometimes reflected in patient preferences for receiving vaccinations in clinical or hospital settings, which can reduce demand for pharmacist-provided vaccination services.

Limited exposure to interprofessional education during training further reinforces these perceptions, as pharmacists, physicians and nurses often have few opportunities to learn about each other's roles in vaccination within shared educational settings.

Experience from France, however, demonstrates that these perceptions can change over time. Initial hesitation from doctors and nurses shifted as pharmacists administered a large number of vaccines, with over 90% of French pharmacies actively participating in vaccination (2016 – 2021).[38] This expansion also highlighted the relief pharmacists provided to an overstretched healthcare system facing workforce shortages and heavy workloads, reinforcing the value of pharmacists as integral members of the vaccination workforce.

4.4 Resource, infrastructure and financial barriers

4.4.1 Resource-related barriers

Resource constraints include time constraints, workload pressures, insufficient staffing, and a lack of certified personnel to support vaccination activities. When pharmacies operate with limited manpower and heavy patient loads, pharmacists have little opportunity to participate in professional development or dedicate time to vaccination-related training.

Studies have grouped these challenges under a broader "lack of resources" barrier category, which includes insufficient time to document vaccinations, difficulty determining patient eligibility, and the absence of adequately trained staff. For example, a notable proportion of pharmacists identified inadequate certified staff and challenges with eligibility assessment as barriers,[28, 39] indicating that without trained personnel and efficient workflow systems, opportunities for experiential learning and skill development during training are restricted.

The time commitment required for professional development and training has also been identified as a major limitation in several settings. Pharmacists report that routine responsibilities leave little room for additional training activities, with many highlighting lack of time and funds as key obstacles.[28, 36] Insufficient staffing and operational support further compound this problem, as pharmacists must prioritise immediate service delivery over long-term skill development.

4.4.2 Infrastructural barriers

Infrastructural barriers affect service delivery, vaccination education, and training for pharmacists. A fundamental requirement for practical vaccination training is the availability of appropriate storage space, reliable cold-chain capacity (refrigerators, freezers, and stable electricity), sharps disposal systems, emergency response equipment such as anaphylaxis kits, and tools for proper documentation and adverse event reporting.[19] Where these are absent, pharmacists have limited opportunities to practice, demonstrate competence, or participate in hands-on vaccination training within their practice settings.

Evidence from multiple countries shows how infrastructural gaps restrict training and preparedness. In Jordan, community pharmacies often lack the essential infrastructure required to safely deliver vaccination services despite existing training and qualification guidance from the Ministry of Health and the Jordan Pharmacists Association.[40] While some pharmacies possess basic cold-chain equipment, critical safety resources, including anaphylaxis kits, are often missing, leaving only a small proportion of pharmacies fully equipped for vaccination activities. This limits the ability of pharmacists to translate training into practice.

Similar patterns are observed in Nigeria, where the absence of vaccine storage equipment, sharps disposal systems, and emergency kits is significantly associated with reduced pharmacists' engagement in vaccination services, largely due to inadequate funding to procure necessary infrastructure.[25] This lack of equipment not only affects service provision but also hinders pharmacists' ability to undergo practical training in vaccine handling and administration. In Ethiopia, pharmacists also reported inadequate storage and limited resources as constraints to delivering vaccination services.[24]

These challenges are often most pronounced in rural and underserved areas, where pharmacies may be the most accessible health facility yet lack the infrastructure required to support vaccination services and associated training.

These findings reflect broader challenges in many countries where logistical constraints and limited resources prevent the delivery of comprehensive vaccination services in pharmacies. For example, a large proportion of pharmacists identified a lack of storage facilities (71.6%) and a lack of training opportunities (96.0%) as major barriers to providing vaccination services.[41] Without adequate infrastructure, pharmacies cannot serve as effective sites for experiential learning, thereby restricting pharmacists' ability to acquire, maintain, and apply vaccination competencies.

4.4.3 Financial barriers

The costs associated with professional development and additional vaccination training are frequently reported as key barriers, particularly where there is limited funding support for continuing education. Financial barriers are related to reimbursement delays, or costs associated with training for services provided.[28, 36] When pharmacists must personally bear the expense of training without assurance of reimbursement for vaccination services, it becomes difficult to justify investing in vaccination-related upskilling.

Evidence from multiple settings shows that inadequate reimbursement for vaccination services further discourages participation in training. In Ethiopia, for example, pharmacists reported inadequate reimbursement as a significant barrier, which indirectly affects their willingness and ability to invest in vaccination training.[24] Similarly, in Lebanon, higher costs associated with vaccination training were found to reduce pharmacists' engagement in vaccination programmes, even where willingness to vaccinate existed.[28]

Broader financial pressures within pharmacies also affect training capacity. These include the cost of stocking vaccines, inconsistent vaccine availability, and challenges related to patient insurance coverage, all of which were identified as financial barriers.[39] While some pharmacists did not view vaccine stocking costs as a direct barrier, concerns about insurance coverage and operational expenses highlight the financial strain that can limit budgets for training materials, certification courses, and practice-based learning resources.

Overall, when financial incentives, reimbursement mechanisms, and funding for continuing education are inadequate, pharmacists are less likely to pursue, complete, or sustain vaccination education and training, thereby limiting their preparedness to deliver vaccination services.

Key summary:

- Vaccination training for pharmacists is hindered by inconsistent undergraduate education, limited practical exposure, and insufficient integration of communication and vaccine confidence skills.
- CPD opportunities are often fragmented, short, costly, and lack standardised certification pathways, reducing sustained competence and readiness.
- Restrictive legal frameworks, unclear scope of practice, and jurisdictional variability create fragmented training expectations and limit incentives to pursue vaccination competence.
- Professional resistance and limited interprofessional recognition discourage pharmacists from engaging fully in vaccination roles and related training.
- Resource, infrastructure, and financial constraints, including time pressures, staffing shortages, inadequate facilities, and poor reimbursement, restrict access to and implementation of vaccination training.

5 Training needs and implementation strategies

The previous chapter highlighted that barriers to vaccination training for pharmacists are multifactorial and often systemic, spanning issues relating to education, regulations, professional development, and resources. Building on these findings, this chapter examines the training needs required to support safe, effective, and sustainable PBV services. As shown in Figure 4, it focuses on curriculum-embedded training across pre- and post-registration education, interprofessional collaboration, and broader system-level interventions necessary to strengthen implementation and long-term integration.

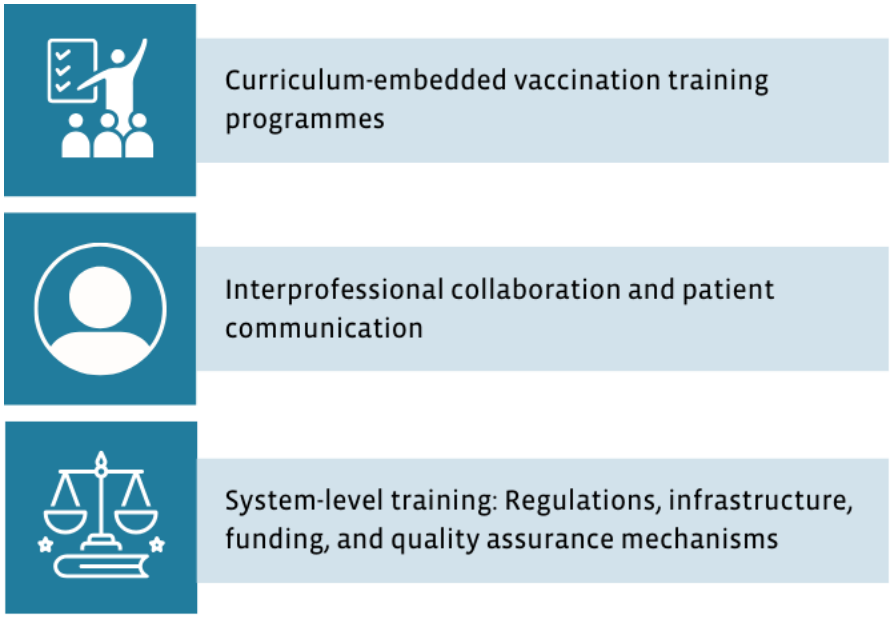


Figure 4: Training needs to support PBV

5.1 Curriculum-embedded vaccination training across pre- and post-registration education

Curriculum-embedded vaccination training programmes should clearly define the knowledge, skills, and system-level competencies that pharmacists must acquire to deliver vaccination services safely and effectively. Competencies in vaccination are built not only through theoretical knowledge but also through hands-on training. Such programmes may be implemented at the pre-registration (undergraduate) or post-registration (postgraduate or CPD) level, depending on national regulatory frameworks.

At the pre-registration level, and as discussed in previous chapters, vaccination training can be delivered through a multimodal approach that combines online learning, face-to-face teaching, and simulation-based training, with competency assessed through Objective Structured Clinical Examinations (OSCEs). Training may be embedded within the final year of the pharmacy curriculum or delivered through a spiral curriculum, in which core concepts are revisited throughout the programme with increasing depth and clinical relevance. This approach facilitates the progressive development and integration of vaccination-related competencies into practice.

At the post-registration level, vaccination training programmes are designed for practising pharmacists and focus on extending scope of practice, maintaining competence, and supporting real-world service delivery. These programmes are commonly delivered through CPD activities that provide formal recognition or credits upon completion.

Across both pre- and post-registration programmes, vaccination training should ensure pharmacists achieve core competencies across three domains: foundational knowledge, clinical skills, and integration of vaccination into routine pharmacy practice. The key competencies within each domain are outlined below.

5.1.1 Immunology, vaccines, and vaccine-preventable diseases

Pharmacists must acquire a foundational understanding of immunology underpinning vaccination, including the organisation of the immune system, mechanisms of innate and adaptive immunity, and the principles of active and passive immunity. Training should address how vaccines confer individual and population-level protection, the characteristics and indications of different vaccine types (including live attenuated, inactivated, non-replicating, and subunit vaccines), and approaches to identifying evidence of immunity or prior infection.[9] In addition, pharmacists should be familiar with vaccine-preventable diseases, including their epidemiology, pathology, and clinical presentation, to support safe clinical decision-making and effective patient counselling.[9]

5.1.2 Injection techniques

Safe vaccine administration relies on demonstrated competence in injection techniques. Foundational injection skills training includes hand hygiene, infection control, preparation of injectable medicines, subcutaneous and intramuscular injection techniques, and emergency management of anaphylaxis. These competencies can be revisited later in the curriculum to address skill attrition, with advanced vaccination training focusing primarily on intramuscular injection, particularly deltoid administration. Advanced training also addresses correct injection technique to minimise complications such as shoulder injury related to vaccine administration (SIRVA) and peripheral nerve injury. Injection skills are taught as part of integrated clinical decision-making, consent, communication, and post-vaccination care.[9]

5.1.3 Adverse events management

Despite the importance of post-marketing surveillance, substantial underreporting of adverse events following immunisation (AEFIs) persists, undermining vaccine safety monitoring and public confidence. Vaccination training should therefore equip pharmacists with the skills and professional responsibility to recognise, manage, and report AEFIs through national reporting systems to support robust vaccine safety surveillance and public trust in vaccination programmes.[42]

5.1.4 Cold-chain management

As part of vaccination training, pharmacists must develop competence in vaccine storage and cold-chain management. Most routinely used vaccines require storage between +2°C and +8°C, while others require frozen (−20°C) or ultra-cold (−80°C to −70°C) conditions. Vaccines vary in their sensitivity to heat and freezing, and inappropriate storage can irreversibly compromise potency, even in the absence of visible damage.

Vaccination training should therefore emphasise that cold chain integrity relies not only on compliant refrigeration equipment, but also on the physical environment in which it operates, including stable ambient temperatures, controlled humidity, adequate ventilation, and sufficient clearance around refrigeration units.[43] Competence in cold-chain management is essential to minimise temperature excursions and ensure vaccines administered in pharmacy settings remain safe and effective.

5.1.5 Workflow integration into vaccination services

Beyond individual clinical skills and knowledge, effective PBV services require integration into routine pharmacy workflow, supported by clearly defined roles and responsibilities across the pharmacy team. As pharmacies expand vaccination services, additional demands related to logistics, storage, appointment scheduling, documentation, and reporting increase operational complexity, making structured training in service integration essential.[44]

As described by Srirangan and colleagues, integration of vaccination services into pharmacy workflow can be achieved by enabling pharmacists to:[16]

- systematically identify patients at risk of vaccine-preventable diseases;
- proactively review patient records to assess vaccination needs;
- provide targeted vaccination information tailored to the patient;
- communicate vaccine recommendations during dispensing;

- document clinical interventions appropriately in patient records.

Embedding these practices through training helps ensure vaccination services are delivered efficiently, consistently, and sustainably within routine pharmacy operations.

5.2 Interprofessional collaboration and patient communication

Sustainable PBV services depend not only on pharmacists' clinical competence, but also on their ability to build trust with patients and collaborate effectively with other healthcare professionals. Resistance from other healthcare professionals and vaccine hesitancy among the public have been identified as key barriers to implementation in several countries. By explicitly including interprofessional collaboration and patient communication in vaccination training, programmes can directly address some of the professional and patient-facing barriers described in Section 3.

5.2.1 Interprofessional collaboration

Interprofessional collaboration between healthcare professionals is essential to optimising patient care and reducing pressures on primary care services. As the role of community pharmacists expands to alleviate general practitioner (GP) workload, vaccination training should include structured opportunities to develop collaborative competencies with other healthcare professionals, particularly GPs.

One literature review examining collaboration between GPs and community pharmacists found that effective collaboration was facilitated by adequate resources, close professional proximity, clear and regular communication, prior experience of working together, and mutual understanding of each profession's roles and capabilities in patient care.[45] These enabling factors are closely linked to training and education, as interprofessional education (IPE) can enhance role clarity, communication skills, and shared understanding of the scope of practice.

A qualitative study exploring professional stakeholders' perspectives on PBV services in Switzerland reported that interprofessional collaboration was limited and in need of improvement. Participants in this study highlighted strategies to address these gaps, including joint training workshops, shared educational events, and informal social interactions aimed at building trust. Additionally, a gradual expansion of pharmacists' roles was suggested as a practical approach to strengthening collaboration over time.[46]

These findings suggest that vaccination training programmes should incorporate interprofessional learning activities that foster familiarity, trust, and shared responsibility across professions. In practice, this may include joint simulation exercises, interprofessional case-based workshops, shared vaccination clinics, and structured IPE modules embedded within undergraduate and CPD programmes.

5.2.2 Public health and professional roles

Vaccination training should include a clear understanding of pharmacists' public health role within national immunisation strategies. Vaccination contributes not only to individual protection but also to broader population health outcomes, including disease prevention and health system resilience. Training should therefore ensure pharmacists understand how their vaccination services align with national immunisation schedules, priority target populations, regulatory frameworks, and ethical responsibilities.

The role of pharmacists in public health is particularly important given strong evidence that healthcare provider recommendation is a key driver in vaccination behaviour. A systematic literature review of routine adult vaccination among adults aged 50 years and over found that provider recommendation consistently influences vaccination behaviour, alongside self-efficacy (the ability to exercise control over one's own health) and awareness of vaccine-preventable diseases.[47] These findings underscore the influence pharmacists can exert as accessible healthcare professionals.

Pharmacy interventions range from passive distribution of leaflets and posters to protocols requiring an active pharmacist role in vaccinations, including regular checks of vaccine status, proactive recommendations, and conversations about vaccination, and the delivery of PBV programmes.[2] Interventions with active and clearly defined pharmacist roles are more effective than passive approaches,[2] indicating that meaningful improvements in vaccination rates rely on pharmacist active engagement rather than the presence of PBV services alone.

Vaccination training should therefore prepare pharmacists not only to administer vaccines, but also to function as credible public health advocates and educators, capable of promoting vaccination uptake through consistent, evidence-based recommendations.

5.2.3 Patient communication

To support pharmacists in navigating vaccine-related conversations, vaccination training should include structured communication frameworks tailored to pharmacy practice. Shen and Tan introduced the ASPIRE communication framework, a six-step, action-oriented approach designed specifically for vaccination counselling in pharmacies.[48] The framework includes:

A: Assume people want to get vaccinated and be prepared for questions.
S: Share key facts and credible sources to counter misinformation.
P: Present strong recommendations and personal or community vaccination stories.
I: Initiate discussions about side effects proactively using trusted information.
R: Respond by actively listening to questions and concerns.
E: Empathise with and understand patients' fears and perspectives.

Given the growing influence of digital communication on vaccination attitudes, particularly in the post-COVID-19 era, training should also equip pharmacists to recognise and address misinformation circulating through social media, messaging platforms, and other online sources. Pharmacists should be able to engage confidently with concerns shaped by digital content and to guide patients towards evidence-based information.

The ASPIRE framework is intended as a practical protocol rather than a rigid script. Its inclusion in vaccination training supports pharmacists in delivering consistent vaccine recommendations, while retaining flexibility to tailor discussions to individual patient contexts.[48] Embedding such frameworks within training can help address vaccine hesitancy and misinformation, and strengthen patient trust. Training providers may adapt these communication approaches to local languages, cultural contexts and priority populations to maximise their relevance and impact.

5.3 System-level training: Regulations, infrastructure, funding, and quality assurance mechanisms

In response to the systemic barriers that constrain pharmacists' ability to deliver vaccination services, this section focuses on the training needs required to support sustainable PBV. It examines how training programmes should prepare pharmacists to navigate regulatory requirements, effectively use immunisation information systems for documentation, understand funding mechanisms in place, and engage with quality assurance processes that support consistent and sustainable service delivery. By addressing these interconnected domains, this section outlines the essential non-clinical competencies pharmacists must develop to deliver vaccination effectively within pharmacy settings.

5.3.1 Regulations

Vaccination training programmes for pharmacists must incorporate regulatory competence as a core learning outcome, reflecting the wide variation in legal frameworks governing pharmacist-administered vaccination globally. Across countries, pharmacist-administered vaccination is governed by specific legal provisions that determine who may vaccinate, which vaccines may be administered, and under what conditions. Training programmes, therefore, need to ensure pharmacists are adequately prepared to understand and apply the specific legislative provisions that define their vaccination role.

FIP, through its report '[Policy progress, stakeholder engagement and challenges in pharmacist-led vaccination],' indicates that regulatory frameworks frequently specify training, accreditation, or certification as prerequisites for pharmacist involvement in vaccination. As such, vaccination training programmes should be designed in close alignment with regulatory and professional standards to help ensure pharmacists are not only clinically competent, but also legally prepared to deliver vaccination services.

Regulatory competence should include understanding eligibility criteria, age and vaccine restrictions, documentation and consent requirements, professional liability and indemnity arrangements and reporting obligations for adverse events. Training should also highlight when pharmacists need to refer to or collaborate with other providers under local protocols, standing orders or prescribing arrangements.

Regulatory-focused training is essential to support the sustainability and scalability of PBV. As policies continue to evolve, often expanding vaccines or integrating pharmacies into national immunisation strategies, pharmacists require training that enables them to adapt to regulatory updates and maintain compliance with legal and professional standards.

In some contexts, training may also introduce pharmacists to basic advocacy skills and mechanisms for engaging with regulators and professional bodies on scope-of-practice and training requirements, supporting coherent policy development over time.

In addition to training for regulatory competence, structured tools are available to support countries in strengthening regulatory frameworks for PBV implementation. FIP has developed a regulatory self-assessment and implementation tool that is designed to assist national ministries of health, regulators, and professional organisations in identifying strengths and gaps within existing legislative and regulatory frameworks and to inform vaccination policy and planning efforts.[49] The tool is based on the experiences of professional regulators in countries where pharmacy-led vaccination has been successfully introduced and regulated. The self-assessment tool is provided in Appendix 2 for reference and adaptation to local contexts.

5.3.2 Infrastructure: Use of immunisation information systems for documentation

Beyond physical infrastructure, effective PBV also depends on digital infrastructure that supports accurate and timely documentation. Immunisation information systems (IISs), also known as vaccination registries, are computerised population-based databases that consolidate vaccination records from participating providers. They play a critical role in accurately assessing patients' immunisation status, reducing missed opportunities and unnecessary revaccination, and supporting outbreak response and vaccination planning.[50]

Training on IIS use should also address data protection, patient consent and confidentiality requirements, ensuring that pharmacists understand how to handle vaccination data in line with national privacy regulations.

Despite their importance, pharmacy participation in IISs has historically been limited in some settings, particularly for routine (non-COVID-19) adult vaccinations in the USA.[51] Evidence from a randomised-controlled trial among independent community pharmacists in Alabama demonstrates that pharmacist-centred, practical training significantly increases IIS enrolment and improves awareness, knowledge, and attitudes. However, training alone was insufficient to ensure sustained IIS use or complete reporting.[52]

These findings highlight the need for training programmes that go beyond basic system access to build pharmacists' competence in integrating IIS use into routine workflow, supported by enabling policies, interoperable technologies, and organisational processes.

5.3.3 Funding models

The FIP report on '[Funding models, and economic and societal impact of pharmacy-based vaccination]' highlights wide variation in PBV funding models globally, including public reimbursement, private insurance reimbursement, out-of-pocket payments, and pharmacy-funded services. This variability creates a need for training programmes to equip pharmacists with foundational knowledge of how vaccination services are financed within the health system, including who pays for vaccines, what components are reimbursed (e.g., vaccine product versus administration fee), and under what conditions reimbursement applies. Training that addresses these components can support pharmacists in delivering financially viable services while minimising cost barriers for patients.

Training programmes should incorporate the economic rationale (direct and indirect cost savings for health systems) to help pharmacists understand the value proposition of PBV to policymakers, payers, and other stakeholders. It also includes practical skills related to financial workflows, such as billing processes, documentation requirements, and engagement with public or private payers. By embedding knowledge of funding models and economic impact into vaccination training, pharmacists can advocate for sustainable financing arrangements that support long-term expansion of PBV services.

5.3.4 Quality assurance mechanisms

Beyond regulatory compliance, infrastructure, and funding, sustainable PBV requires quality assurance mechanisms to ensure that vaccination training programmes meet consistent and recognised standards. In health professions education, quality assurance encompasses structured processes such as accreditation, external review, and continuous quality improvement designed to safeguard educational quality and protect patient safety and public trust.[53, 54]

One example of a quality assurance mechanism specific to vaccination training is the FIP Seal, which is awarded to education and training programmes that demonstrate excellence and alignment with FIP's mission and Development Goals, recognising those that meet high global standards of quality and relevance.

Programmes undergo a structured self-assessment against FIP's criteria, reflecting core values such as professional development, quality CPD, and progress towards the FIP's Development Goals. The FIP Seal serves as a symbol of trust and a commitment to excellence, fostering collaboration between CPD providers and members to meet evolving professional needs.

FIP Seal-awarded courses, including those focused on pharmacy-based vaccination, are designed to strengthen competence in delivering safe, informed, and effective immunisation services globally. Examples of FIP Seal-awarded courses include:

a. Pharmacy-Based Immunisation Delivery International Certificate Training Programme (American Pharmacists Association) – equips pharmacists with nationally standardised skills to deliver immunisation services safely and effectively, enhancing their contribution to public health.
b. Vaccine and Injectable Medicines Administration course (National Association of Pharmacies) – provides practical training on administration techniques, cold chain management, and patient safety.
c. Impetus to flu vaccination uptake and coverage (Omnicuris) - strengthens pharmacists' capacity to lead influenza vaccination campaigns and improve uptake.
d. COVID-19 Education for Pharmacists (Immunize.io) - video-based series on COVID-19 vaccines, safety, and communication strategies, supporting pharmacists worldwide.
e. Mpox and Vaccinology Training (AKSUMIA Global Learning Solutions) - specialised training on Mpox vaccination and management, equipping pharmacists to address emerging infectious diseases.

Table 2 synthesises the key barriers identified in Section 4 and maps them against the corresponding training needs outlined in this chapter. By clustering barriers into thematic domains and aligning them with targeted educational responses, the table provides a structured overview of how training interventions can directly address systemic gaps.

Table 2: Mapping identified barriers to corresponding training needs

Barrier cluster	Corresponding training needs
Educational and training-related barriers	Curriculum-embedded vaccination training across undergraduate and CPD programmes; competency-based, multimodal training with theoretical and practical components
Regulatory and policy-related barriers	Training aligned with regulatory frameworks and policy requirements, including certification pathways and legal compliance training, and quality assurance mechanism

Barrier cluster	Corresponding training needs
Professional and interprofessional barriers	Interprofessional education and collaborative training opportunities to strengthen teamwork and clarify roles in vaccination delivery
Resource-related barriers	Training focused on workflow integration and service implementation within routine pharmacy practice

Key summary:

- Vaccination training should be curriculum-embedded across undergraduate, postgraduate or CPD levels, using competency-based, multimodal approaches that integrate theory, simulation, and OSCE-based assessment.
- Core competencies must cover immunology, injection technique, anaphylaxis and AEFI management, cold-chain integrity, and integration of vaccination into routine pharmacy workflow.
- Training should strengthen interprofessional collaboration and structured patient communication, positioning pharmacists as trusted public health advocates and educators.
- System-level readiness requires training aligned with regulatory frameworks, digital information systems for vaccination registries, sustainable funding, and quality assurance mechanisms.

6 Recommendations

The following recommendations outline the key training-related actions needed to enhance pharmacist preparedness and readiness and ensure safe and effective vaccine delivery, to address the barriers and training needs identified in this report:

1. Education and CPD

a. Align vaccination training programmes with national regulatory and policy frameworks, ensuring pharmacists meet clearly defined legal and professional standards for vaccine delivery.
b. Integrate curriculum-embedded vaccination training within undergraduate and/or postgraduate pharmacy education to establish a strong foundation of knowledge, skills, confidence, and readiness for vaccination practice.
c. Implement structured, competency-based CPD programmes that support scope expansion, competence maintenance, and adaptation to evolving vaccination policies, technologies and service models.

2. Interprofessional collaboration and system enablers

a. Expand interprofessional education initiatives to strengthen collaboration between pharmacists and other healthcare professionals, improving coordination of vaccination services and reinforcing public and professional trust in PBV.
b. Extend vaccination training beyond clinical competence to include workflow integration, use of vaccination registries and other digital tools, pharmacovigilance responsibilities, and understanding of financing and reimbursement arrangements.
c. Invest in training-enabling infrastructure, technologies and incentives for training and service delivery, including cold-chain capacity, emergency equipment, digital systems, and protected time or financial support for professional development to support sustainable vaccination service provision and alignment with public health priorities.

3. Quality assurance and evaluation

a. Conduct studies to evaluate the effectiveness of vaccination training programmes, including their impact on pharmacist knowledge, skills and confidence, service delivery indicators, and patient outcomes such as satisfaction, confidence, and trust.
b. Encourage CPD providers and accreditation bodies to adopt the FIP Seal for vaccination-related programmes, helping to ensure that training aligns with international quality standards and FIP's global mission.

Additional recommendations were developed during the Global Vaccination Summit in The Hague, The Netherlands, in 2025. The Summit brought together international experts, innovators, and leaders to advance scholarly and policy dialogue on the role of pharmacy in life-course vaccination. The recommendations related to education, training, and certification include the following:

1. Mandate structured, accredited training and certification for pharmacist-administered vaccination services.
2. Invest in ongoing professional development to reflect advances in vaccine technology and practice.
3. Adopt good practice frameworks (e.g., SOPs, flowcharts, technical manuals) to support safe, high-quality vaccine delivery.

Embedding vaccination training across pharmacy education and professional development will help ensure a capable and adaptable workforce ready to meet the evolving role of pharmacists as vaccinators and public health demands.

7 Conclusions

PBV has been widely reported to improve access to vaccination services and contribute to increased vaccination uptake and coverage rates. By leveraging the accessibility of community pharmacies, several countries have expanded pharmacists' scope of practice to include vaccine administration, and in some settings, vaccine prescribing. As more jurisdictions consider implementing or further expanding PBV, the expansion of the scope of practice creates an urgent need for robust, standardised training to ensure pharmacists are adequately prepared to deliver these extended services safely and effectively in their routine practice.

Vaccination training programmes have been established in many countries worldwide, delivered across undergraduate and postgraduate levels, and CPD programmes. Training models vary considerably, ranging from curriculum-embedded programmes for pharmacy students to modular, CPD-based certification for practising pharmacists. Across settings, a growing emphasis is placed on simulation-based training (high- and low-fidelity), multimodal learning, interprofessional education, and practice-oriented workshops. Together, these approaches reflect global recognition of vaccination as a core and evolving competency within pharmacy practice, while also highlighting substantial heterogeneity in training structure.

Despite this progress, this report evaluates persistent and multifactorial systemic barriers that continue to limit pharmacists' preparedness and readiness to deliver vaccination services. These barriers span educational gaps, lack of regulatory frameworks, limited interprofessional recognition, as well as resource, infrastructure, and financing constraints. Collectively, these challenges contribute to uneven competence, confidence, and willingness among pharmacists in vaccination services.

Addressing these barriers requires a coordinated approach built around three core training components.

1. First, curriculum-embedded vaccination training should be strengthened across undergraduate, postgraduate, and CPD pathways to ensure progressive development of competencies such as immunology, injection techniques, adverse event management, cold-chain handling, and workflow integration.
2. Second, training must explicitly address interprofessional collaboration and patient communication, equipping pharmacists to work effectively with other healthcare professionals and to deliver clear, evidence-based vaccine recommendations that build patient trust.
3. Third, system-level training is essential to support sustainable implementation, including competence in regulatory requirements, use of immunisation information systems, understanding of funding mechanisms, and engagement with quality assurance processes that support consistent and sustainable service delivery.

Taken together, these elements provide a framework for developing a capable and adaptable pharmacy workforce that is ready to meet current and future public health vaccination demands.

8 References

1. World Health Organization (WHO). Immunization Agenda 2030: A global strategy to leave no one behind. Geneva: [Internet]. 2020. [Cited: 15 January 2026]. Available at: https://www.who.int/publications/m/item/immunization-agenda-2030-a-global-strategy-to-leave-no-one-behind.
2. Murray E, Bieniek K, del Aguila M et al. Impact of pharmacy intervention on influenza vaccination acceptance: a systematic literature review and meta-analysis. International Journal of Clinical Pharmacy. 2021;43(5):1163-72. [Cited: 15 January 2026]. Available at: https://doi.org/10.1007/s11096-021-01250-1.
3. 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. [Cited: 15 January 2026]. Available at: https://www.sciencedirect.com/science/article/pii/S0264410X16307927.
4. 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):1698. [Cited: 15 January 2026]. Available at: https://link.springer.com/article/10.1186/s12889-019-8044-y.
5. International Pharmaceutical Federation. Leveraging pharmacy to deliver life-course vaccination: An FIP global intelligence report. The Hague, The Netherlands: Federation IP [Internet]. 2024. [Cited: 27 January 2026]. Available at: https://www.fip.org/file/5851.
6. Udoh A, Ernawati D, Ikhile I et al. Pharmacists' Willingness to Offer Vaccination Services: A Systematic Review and Meta-Analysis. Pharmacy. 2024;12(4):98. [Cited: 30 January 2026]. Available at: https://www.mdpi.com/2226-4787/12/4/98.
7. International Pharmaceutical Federation. An overview of current pharmacy impact on immunisation: A global report. The Hague, The Netherlands: Federation IP [Internet]. 2016. [Cited: 27 January 2026]. Available at: https://www.fip.org/file/4751.
8. International Pharmaceutical Federation. An overview of pharmacy's impact on immunisation coverage: A global survey. The Hague, The Netherlands: Federation IP [Internet]. 2020. [Cited: 27 January 2026]. Available at: https://www.fip.org/file/5851.
9. Ann Bushell M-J, Morrissey H, Nuffer W et al. Development and design of injection skills and vaccination training program targeted for Australian undergraduate pharmacy students. Currents in Pharmacy Teaching and Learning. 2015;7(6):771-9. [Cited: Available at: https://www.sciencedirect.com/science/article/pii/S1877129715000854.
10. Harden RM. What is a spiral curriculum? Med Teach. 1999;21(2):141-3. [Cited: 30 January 2026]. Available at: https://www.tandfonline.com/doi/abs/10.1080/01421599979752.
11. Carroll PR, Hanrahan J. Development and evaluation of an interprofessional student-led influenza vaccination clinic for medical, nursing and pharmacy students. Pharmacy Practice. 2022;19(4):01-12. [Cited: 30 January 2026]. Available at: https://dx.doi.org/10.18549/pharmpract.2021.4.2449.
12. Bushell M, Frost J, Deeks L et al. Evaluation of Vaccination Training in Pharmacy Curriculum: Preparing Students for Workforce Needs. Pharmacy (Basel). 2020;8(3). [Cited: 30 January 2026]. Available at: https://www.mdpi.com/2226-4787/8/3/151.
13. Gaspar A, Delwaide A-L, Dubois N et al. Development and evaluation of a simulation-based vaccination training course for pharmacy students. Pharmacy Education. 2025;25(1):359-72. [Cited: 30 January 2026]. Available at: https://dx.doi.org/10.46542/pe.2025.251.359372.
14. Sayyed SA, Sharkas AR, Ali Sherazi B et al. Development and Assessment of Innovative High-Fidelity Simulation Vaccination Course Integrating Emergency Cases for Pharmacy Undergraduates-A Randomized Controlled Study. Vaccines (Basel). 2023;11(2). [Cited: 2 February 2026]. Available at: https://www.mdpi.com/2076-393X/11/2/324.
15. Prescott WA, Jr., Bernhardi C. Immunization Education in US Pharmacy Colleges and Schools. Am J Pharm Educ. 2019;83(5):6765. [Cited: 2 February 2026]. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC6630863/.
16. Srirangan K, Lavenue A. Helping Québec Pharmacists Seize the Vaccination Service Opportunity: The Pharmacy Best Practice Workshops. Pharmacy. 2021;9(1):51. [Cited: 6 February 2026]. Available at: https://www.mdpi.com/2226-4787/9/1/51.
17. Ruiz-Torrubiano R, Knopp S, Krystallidis A et al. A scheduling perspective on modular educational systems in Europe. Heliyon. 2024;10(21):e39694. [Cited: 2 February 2026]. Available at: https://www.sciencedirect.com/science/article/pii/S2405844024157258.
18. The Pharmaceutical Society of Ireland. Vaccinations Training: 2026. updated [accessed: 6 February 2026]. Available at: https://www.psi.ie/education-and-training/vaccinations-training.

19. McKeirnan KC, Truter I, Fogarty T-L. A Systematic Review of Immunization Administration Training for African Pharmacists and Student Pharmacists. American Journal of Pharmaceutical Education. 2024;88(6):100705. [Cited: 28 January 2026]. Available at: https://dx.doi.org/10.1016/j.ajpe.2024.100705.
20. El Hajj MS, Saleh M, Ibrahim N et al. A Cross-Sectional Study of Vaccination-Related Education in Pharmacy Programs in the Middle East. Am J Pharm Educ. 2024;88(7):100715. [Cited: 28 January 2026]. Available at: https://linkinghub.elsevier.com/retrieve/pii/S0002945924104342.
21. Pelly LP, Pierrynowski Macdougall DM, Halperin BA et al. THE VAXED PROJECT: An Assessment of Immunization Education in Canadian Health Professional Programs. BMC Medical Education. 2010;10(1):86. [Cited: 28 January 2026]. Available at: https://dx.doi.org/10.1186/1472-6920-10-86.
22. Merks P, Religioni U, Bilmin K et al. Readiness and Willingness to Provide Immunization Services after Pilot Vaccination Training: A Survey among Community Pharmacists Trained and Not Trained in Immunization during the COVID-19 Pandemic in Poland. Int J Environ Res Public Health. 2021;18(2). [Cited: 28 January 2026]. Available at: https://www.mdpi.com/1660-4601/18/2/599.
23. International Pharmaceutical Federation (FIP). FIP knowledge and skills reference guide for professional development in vaccination services. Federation IP [Internet]. 2025. [Cited: 28 January 2026]. Available at: https://www.fip.org/file/6190.
24. Ayenew W, Anagaw YK, Limenh LW et al. Readiness of and barriers for community pharmacy professionals in providing and implementing vaccination services. BMC Health Services Research. 2024;24(1). [Cited: 30 January 2026]. Available at: https://dx.doi.org/10.1186/s12913-024-11349-6.
25. Oladigbolu AA, Okafor UG, Oluwaseyi CO et al. Community pharmacy workforce willingness, readiness, and infrastructural capacity to deliver vaccination services: a cross-sectional survey in Nigeria. BMC Health Services Research. 2025;25(1). [Cited: 30 January 2026]. Available at: https://dx.doi.org/10.1186/s12913-025-12655-3.
26. Jarab AS, Al-Qerem W, Mukattash TL. Community pharmacists' willingness and barriers to provide vaccination during COVID-19 pandemic in Jordan. Human Vaccines & Immunotherapeutics. 2022;18(1):2016009. [Cited: 2 February 2026]. Available at: https://doi.org/10.1080/21645515.2021.2016009.
27. Tadele S, Demissie BN, Tamiru MT et al. Knowledge and attitudes of community pharmacists on vaccination, barriers and willingness to implement community pharmacy-based vaccination services in Ethiopia. Hum Vaccin Immunother. 2023;19(3):2291243. [Cited: 2 February 2026]. Available at: https://www.tandfonline.com/doi/full/10.1080/21645515.2023.2291243.
28. 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. [Cited: 2 February 2026]. Available at: https://onlinelibrary.wiley.com/doi/10.1002/hsr2.1206.
29. Burson RC, Buttenheim AM, Armstrong A et al. Community pharmacies as sites of adult vaccination: A systematic review. Human Vaccines & Immunotherapeutics. 2016;12(12):3146-59. [Cited: 5 February 2026]. Available at: https://doi.org/10.1080/21645515.2016.1215393.
30. Youssef D, Abou-Abbas L, Farhat S et al. Pharmacists as immunizers in Lebanon: a national survey of community pharmacists' willingness and readiness to administer adult immunization. Human Resources for Health. 2021;19(1):131. [Cited: 2 February 2026]. Available at: https://doi.org/10.1186/s12960-021-00673-1.
31. Lindner N, Riesenhuber M, Müller-Uri T et al. The role of community pharmacists in immunisation: a national cross-sectional study. International Journal of Clinical Pharmacy. 2022;44(2):409-17. [Cited: 2 February 2026]. Available at: https://doi.org/10.1007/s11096-021-01357-5.
32. Sakr F, Akiki Z, Dabbous M et al. The role of pharmacists in providing immunization to the general population: Are Lebanese pharmacists ready for this role? Pharm Pract (Granada). 2021;19(4):2565. [Cited: 2 February 2026]. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC9013194/.
33. Bach AT, Goad JA. The role of community pharmacy-based vaccination in the USA: current practice and future directions. Integr Pharm Res Pract. 2015;4:67-77. [Cited: 2 February 2026]. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC5741029/.
34. Schmit CD, Penn MS. Expanding state laws and a growing role for pharmacists in vaccination services. J Am Pharm Assoc (2003). 2017;57(6):661-9. [Cited: 6 February 2026]. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC5704925/.
35. Valeiro C, Silva V, Balteiro J et al. Pharmacy Technicians in Immunization Services: Mapping Roles and Responsibilities Through a Scoping Review. Healthcare. 2025;13(15):1862. [Cited: 2 February 2026]. Available at: https://www.mdpi.com/2227-9032/13/15/1862.
36. Abdulselam M, El-Awaisi A, Nasr ZG et al. Barriers and facilitators for pharmacist-led vaccination services: A systematic review using the Consolidated Framework for Implementation Research (CFIR). Explor Res Clin Soc Pharm. 2026;21:100687. [Cited: 2 February 2026]. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC12811634/.

37. Di Castri AM, Halperin DM, Ye L et al. Healthcare provider awareness, attitudes, beliefs, and behaviors regarding the role of pharmacists as immunizers. Human Vaccines & Immunotherapeutics. 2022;18(7):2147356. [Cited: 5 February 2026]. Available at: https://doi.org/10.1080/21645515.2022.2147356.
38. Haems M, Lanzilotto M, Mandelli A et al. European community pharmacists practice in tackling influenza. Exploratory Research in Clinical and Social Pharmacy. 2024;14:100447. [Cited: 5 February 2026]. Available at: https://www.sciencedirect.com/science/article/pii/S266727662400043X.
39. Davies A, Schreiber D, Carey C et al. Community pharmacists' pneumococcal vaccine knowledge and perceived barriers to vaccination. Vaccine. 2025;53:126930. [Cited: 28 January 2026]. Available at: https://linkinghub.elsevier.com/retrieve/pii/S0264410X25002270.
40. Alnahar SA, Gkountouras G, Darwish RM et al. Community pharmacists workforce readiness to deliver vaccination services: A cross-sectional study from Jordan. Pharmacol Res Perspect. 2022;10(2):e00943. [Cited: 28 January 2026]. Available at: https://bpspubs.onlinelibrary.wiley.com/doi/10.1002/prp2.943.
41. Boniface ES, Ejie IL, Ofili SC et al. Readiness and Willingness to Provide Immunization Services: A Survey of Community Pharmacists in Anambra State, Nigeria. Asian Journal of Medical Principles and Clinical Practice. 2023;6(2):208-17. [Cited: 28 January 2026]. Available at: https://journalajmpcp.com/index.php/AJMPCP/article/view/179.
42. Hodel KVS, Fiuza BSD, Conceição RS et al. Pharmacovigilance in Vaccines: Importance, Main Aspects, Perspectives, and Challenges—A Narrative Review. Pharmaceuticals. 2024;17(6):807. [Cited: 2 February 2026]. Available at: https://www.mdpi.com/1424-8247/17/6/807.
43. Pambudi NA, Sarifudin A, Gandidi IM et al. Vaccine cold chain management and cold storage technology to address the challenges of vaccination programs. Energy Reports. 2022;8:955-72. [Cited: 6 February 2026]. Available at: https://www.sciencedirect.com/science/article/pii/S2352484721014785.
44. Kirkdale CL, Nebout G, Taitel M et al. Implementation of flu vaccination in community pharmacies: Understanding the barriers and enablers. Ann Pharm Fr. 2017;75(1):9-16. [Cited: 28 January 2026]. Available at: https://linkinghub.elsevier.com/retrieve/pii/S0003450916300530.
45. Bollen A, Harrison R, Aslani P et al. Factors influencing interprofessional collaboration between community pharmacists and general practitioners-A systematic review. Health Soc Care Community. 2019;27(4):e189-e212. [Cited: 28 January 2026]. Available at: https://onlinelibrary.wiley.com/doi/10.1111/hsc.12705.
46. Jusufoska M, Abreu de Azevedo M, Tolic J et al. "Vaccination needs to be easy for the people, right ?": a qualitative study of the roles of physicians and pharmacists regarding vaccination in Switzerland. BMJ Open. 2021;11(12):e053163. [Cited: 20 January 2026]. Available at: https://doi.org/10.1136/bmjopen-2021-053163.
47. Eiden AL, Barratt J, Nyaku MK. Drivers of and barriers to routine adult vaccination: A systematic literature review. Human Vaccines & Immunotherapeutics. 2022;18(6):2127290. [Cited: 20 January 2026]. Available at: https://doi.org/10.1080/21645515.2022.2127290.
48. Shen AK, Tan ASL. Trust, influence, and community: Why pharmacists and pharmacies are central for addressing vaccine hesitancy. Journal of the American Pharmacists Association. 2022;62(1):305-8. [Cited: 20 January 2026]. Available at: https://doi.org/10.1016/j.japh.2021.10.001.
49. International Pharmaceutical Federation (FIP). Pharmacy-led vaccination services: Regulatory self- assessment and implementation tool. The Hague: [Internet]. 2023. [Cited: 2 March 2026]. Available at: https://www.fip.org/file/5507.
50. National Center for Immunization and Respiratory Diseases (U.S.). 2018-2020 CDC Immunization Information System stragetic plan: 2017. updated [accessed: 20 January 2026]. Available at: https://stacks.cdc.gov/view/cdc/50698.
51. Westrick SC, Patterson BJ, Kader MS et al. National survey of pharmacy-based immunization services. Vaccine. 2018;36(37):5657-64. [Cited: Available at: https://pubmed.ncbi.nlm.nih.gov/30049631/.
52. Hastings TJ, Ha D, Fox BI et al. Increasing use of immunization information systems for routine vaccinations in independent community pharmacies: A randomized controlled trial. Journal of the American Pharmacists Association. 2022;62(4):1270-9.e2. [Cited: 20 January 2026]. Available at: https://doi.org/10.1016/j.japh.2022.02.010.
53. Burdick W, Dhillon I. Ensuring quality of health workforce education and practice: strengthening roles of accreditation and regulatory systems. Hum Resour Health. 2020;18(1):71. [Cited: 15 February 2026]. Available at: https://link.springer.com/article/10.1186/s12960-020-00517-4.
54. Amaral E, Norcini J. Quality assurance in health professions education: Role of accreditation and licensure. Med Educ. 2023;57(1):40-8. [Cited: 15 February 2026]. Available at: https://asmepublications.onlinelibrary.wiley.com/doi/10.1111/medu.14880.
55. International Pharmaceutical Federation (FIP). Pharmacy-based vaccination: Recent developments, success stories and implementation challenges. The Netherlands: Federation IP [Internet]. 2023. [Cited: 6 February 2026]. Available at: https://www.fip.org/file/5704.

56. International Pharmaceutical Federation (FIP). An overview of pharmacy's impact on immunisation coverage: A global survey. The Hague: [Internet]. 2020. [Cited: 6 February 2026]. Available at: https://www.fip.org/file/4751.
57. Bonilla Acosta ML, González T, Hernández Soto L et al. Pharmaceutical services in immunization: Contributions, experiences, and implementation in the Americas region. [Internet]. 2021. [Cited: 20 January 2026]. Available at: https://www.fip.org/file/5076.
58. Health Inspectorate of the Republic of Latvia. For the attention of pharmacies, register for vaccination against Covid-19 infection: 2022. updated [accessed: 20 January 2026]. Available at: https://www.vi.gov.lv/lv/aptieku-ieveribai-par-registresanos-vakcinacijas-pret-covid-19-infekciju-veiksanai.
59. Pharmaceutical Group of the European Union (PGEU). The role of community pharmacists in vaccination. [Internet]. 2023. [Cited: 30 January 2026]. Available at: https://www.pgeu.eu/wp-content/uploads/2023/11/The-role-of-community-pharmacists-in-vaccination-PGEU-Position-Paper.pdf.
60. Ministry of Health New Zealand. Immunisation Handbook 2024 Version 1. Government NZ [Internet]. 2024. [Cited: 30 January 2026]. Available at: https://www.tewhatuora.govt.nz/for-the-health-sector/vaccine-information/immunisation-handbook-2024-version-1.

Appendix 1: Summary of vaccination training for pharmacists - country details

Country	Training about vaccine administration?	Career stage(s) of vaccination training		Training mandatory?	Renewal of certification?	How long is the certificate valid for?	Vaccination training providers				Training accredited by a regulator?
		Undergraduate	Post-registration/ Post-grad/ CPD				Professional organisations	Ministry of health	Universities	Industry	
Afghanistan	No										
Albania*	No										
Algeria	Yes (some)[55]			Yes[55]							
Argentina	Yes (all)	Yes		No	No		Yes	Yes	Yes	Yes	Yes
Armenia	No										
Australia	Yes (some)	Yes[56]	Yes	No	No		Yes				Yes
Austria	Yes (some)		Yes	No	No		Yes				No
Bangladesh*	No										
Barbados	Yes (some)		Yes	No	No		Yes				No
Belgium	Yes (some)		Yes	No	Yes	3 years	Yes		Yes		Yes
Bolivia	No										
Bosnia & Herzegovina*	No										
Brazil	Yes (some)		Yes	Yes	Yes	Not specified	Yes	Yes	Yes	Yes	Yes
Bulgaria*	No										
Cameroon	Yes (all)		Yes	No	Yes	Not specified	Yes				Yes
Canada	Yes (all)	Yes	Yes[56]	Yes	Yes	2-3 years (for CPR)	Yes		Yes		Yes
Cape Verde	Yes (some)**	Yes		No	No			Yes			Yes
Chad	Yes (some)		Yes	No							No
China*	No										
China Taiwan	Yes (some)		Yes	No	No		Yes				No
Colombia*	No										

Country	Training about vaccine administration?	Career stage(s) of vaccination training		Training mandatory?	Renewal of certification?	How long is the certificate valid for?	Vaccination training providers				Training accredited by a regulator?
		Undergraduate	Post-registration/ Post-grad/ CPD				Professional organisations	Ministry of health	Universities	Industry	
Congo, Dem. Rep. of the*	No										
Congo, Rep. Of	No[56]										
Costa Rica	Yes (all)	Yes	Yes[56]	No	No		Yes		Yes		No
Côte d'Ivoire	Yes (all)	Yes	Yes	Yes							Yes
Croatia	Yes (all)	Yes		No	Yes	1 year			Yes		Yes
Cyprus*	No										
Czech Republic	No										
Denmark	Yes (some)		Yes	Yes	Yes	1 year					No
Ecuador*	No										
Egypt	Yes (some)		Yes	No							Yes
Estonia*	No										
Ethiopia	No										
Fiji	No										
Finland*	No										
France	Yes (some)	Yes	Yes[56]	Yes	No		Yes		Yes		Yes
Germany	Yes (some)	Yes[56]	Yes	Yes	No		Yes				Yes
Ghana	Yes (some)		Yes	No	Yes	1 year					Yes
Greece	Yes (some)	Yes[56]	Yes	Yes[55]							Yes
Guatemala	No[57]										
Guyana	Yes (all)		Yes	Yes	Yes	1 year	Yes	Yes			Yes
Haiti	No										
Hong Kong SAR, China	Yes (some)	Yes	Yes[56]	Yes	Yes	5 years	Yes		Yes		Yes
Hungary*	No										
Iceland	Yes (some)		Yes	No	No		Yes				Yes

Country	Training about vaccine administration?	Career stage(s) of vaccination training		Training mandatory?	Renewal of certification?	How long is the certificate valid for?	Vaccination training providers				Training accredited by a regulator?
		Undergraduate	Post-registration/ Post-grad/ CPD				Professional organisations	Ministry of health	Universities	Industry	
India	Yes (some)	Yes[56]	Yes	No	No						No
Indonesia	Yes (some)		Yes	Yes	No						No
Iraq	No										
Ireland	Yes (some)		Yes	No	Yes	Varies	Yes				Yes
Israel	Yes (some)	Yes[56]	Yes	No	No		Yes	Yes	Yes		Yes
Italy	Yes (some)		Yes	Yes	No		Yes				Yes
Japan*	No										
Jordan	Yes (all)	Yes[56]	Yes	No	No		Yes				Yes
Kenya	Yes (some)		Yes	No							No
Korea (Rep. of)	No										
Kosovo*	No										
Kuwait	No										
Latvia	Yes (some)[58]		Yes[55]	Yes[55]					Yes[55]		
Lebanon	Yes (some)	Yes		No	No				Yes		No
Lithuania	Yes (some)		Yes	No	Yes	5 years			Yes		Yes
Luxembourg	Yes (some)[59]										
Madagascar	No										
Malawi	Yes (some)		Yes	No	Yes	1 year		Yes			No
Malaysia	Yes (some)		Yes	No	Yes	2 years	Yes		Yes		No
Mali	No										
Malta	Yes (all)		Yes	No	Yes	2 years (ERC certificate)	Yes				No
Mauritius	No										
Mexico	No[57]										
Mongolia*	No										
Montenegro*	No										

Country	Training about vaccine administration?	Career stage(s) of vaccination training		Training mandatory?	Renewal of certification?	How long is the certificate valid for?	Vaccination training providers				Training accredited by a regulator?
		Undergraduate	Post-registration/ Post-grad/ CPD				Professional organisations	Ministry of health	Universities	Industry	
Morocco	Yes (all)	Yes		Yes	No				Yes		No
Namibia	Yes (some)	Yes		No	Yes				Yes		No
Nepal*	No										
Netherlands*	No										
New Zealand	Yes (some)		Yes	Yes[60]	Yes[60]	2 years[60]					Yes
Nigeria	Yes (some)		Yes	No	No		Yes		Yes		Yes
North Macedonia (Republic of)	No										
Norway	Yes (all)		Yes	Yes	Yes	3 years	Yes				No
Oman	No										
Pakistan*	No										
Panama	No										
Paraguay*	No										
Peru	No[57]										
Philippines	Yes (all)	Yes[56]	Yes	No	No	3 years[56]	Yes	Yes			Yes
Poland	Yes (some) [55]		Yes[55]	Yes[55]							
Portugal	Yes (some)		Yes	Yes	Yes	5 years	Yes				Yes
Romania	Yes (all)		Yes	Yes	Yes	5 years			Yes		No
Russian Federation*	No										
Rwanda	Yes (some)		Yes	No							Yes
Saudi Arabia	Yes (some) [55]		Yes[55]	Yes[55]							
Senegal	Yes (some)	Yes	Yes	Yes							No
Serbia	Yes (all)	Yes		No	No				Yes		No
Sierra Leone	Yes (some)		Yes	No	No			Yes			No
Singapore	Yes (some)		Yes	No							Yes

Country	Training about vaccine administration?	Career stage(s) of vaccination training		Training mandatory?	Renewal of certification?	How long is the certificate valid for?	Vaccination training providers				Training accredited by a regulator?
		Undergraduate	Post-registration/ Post-grad/ CPD				Professional organisations	Ministry of health	Universities	Industry	
Slovak Republic	No										
Slovenia*	No										
South Africa	Yes (some)	Yes[56]	Yes	No	No				Yes		Yes
South Sudan	Yes (some)		Yes	No	No		Yes	Yes			No
Spain	Yes (all)	Yes	Yes[56]	Yes	No		Yes		Yes	Yes	Yes
Sri Lanka*	No										
Sudan	No										
Sweden*	No										
Switzerland	Yes (all)	Yes	Yes[56]	Yes	No	2 years[56]			Yes		Yes
Tanzania	Yes (some)	Yes	Yes	Yes							Yes
Thailand	No										
Tunisia	Yes (some)	Yes		Yes	No			Yes			No
Türkiye*	No										
Ukraine*	No										
United Arab Emirates	Yes (some) [55]		Yes[55]	Yes[55]				Yes[55]			
UK	Yes (all)	Yes[56]	Yes	Yes	Yes	1 year					Yes
USA	Yes (some)	Yes	Yes[56]	No	No		Yes		Yes		Yes
Uruguay*	No										
Venezuela	Yes (all)	Yes	Yes	Yes			Yes[57]				Yes
Yemen	Yes (some)		Yes	No	No		Yes			Yes	No
Zambia	No										
Zimbabwe	No										

*Data provided for subsequent questions have been removed as they are considered not applicable. ** Data are modified to yes(some) because Cape Verde stated that trained pharmacists administer vaccines in a pharmacy

Appendix 2: PBV regulatory self-assessment and implementation tool

Vaccination

Objective	Description and proposed language for legislative/regulatory requirements	Are these regulations in place in your jurisdiction?	Priority given to this category + Comments
There is enabling legislation to allow pharmacists to be vaccinators.	*A pharmacist who meets the required qualifications may, subject to any restrictions or conditions set out in the regulations or regulatory framework and in the course of the practice of pharmacy, engage in the act of administering medicines or vaccines that are designated in the regulations.*	☐ Yes ☐ No ☐ Yes, but need updating ☐ No, but the regulatory environment is sufficiently enabling	☐ 1 (top priority) ☐ 2 ☐ 3 ☐ 4 ☐ 5 (lowest Comments: Click or tap here to enter text.
There are comprehensive and clear regulations describing the conditions under which pharmacists can be vaccinators.	*A pharmacist may administer vaccines through intradermal, subcutaneous, intramuscular injection or other routes only if he or she holds a current certification to do so. A pharmacist may administer a vaccine that is prescribed by an authorised practitioner to a person or may administer a vaccine without a prescription to a person as part of a vaccination programme.*	☐ Yes ☐ No ☐ Yes, but need updating ☐ No, but the regulatory environment is sufficiently enabling	☐ 1 (top priority) ☐ 2 ☐ 3 ☐ 4 ☐ 5 (lowest Comments: Click or tap here to enter text.
Education and training programmes are available and required for pharmacists to be vaccinators.	*A pharmacist must be certified/authorised to administer a vaccine by injection or other routes through successfully completing the required education and training requirements approved by the regulator. Certification can occur during the undergraduate programme or through accredited continuing education.*	☐ Yes ☐ No ☐ Yes, but need updating ☐ No, but the regulatory environment is sufficiently enabling	☐ 1 (top priority) ☐ 2 ☐ 3 ☐ 4 ☐ 5 (lowest Comments: Click or tap here to enter text.

Objective	Description and proposed language for legislative/regulatory requirements	Are these regulations in place in your jurisdiction?	Priority given to this category + Comments
There is a centralised vaccination reporting database system in place and/or patient personal vaccination booklet system.	*A pharmacist who plans to administer a vaccine to a patient must check with the vaccination patient data to confirm it is clinically appropriate to administer and, once the vaccination is completed, report the details of the administration to the patient vaccination record.*	☐ Yes ☐ No ☐ Yes, but need updating ☐ No, but the regulatory environment is sufficiently enabling	☐ 1 (top priority) ☐ 2 ☐ 3 ☐ 4 ☐ 5 (lowest Comments: Click or tap here to enter text.
Pharmacists may administer vaccines offsite from the pharmacy to reach homebound patients, those living in remote and underserviced areas and in other community locations such as care or nursing homes, workplaces, schools, etc.	*Pharmacists certified in administration may administer vaccines outside the pharmacy in compliance of all the requirements of vaccine storage and administration and be prepared to readily address emergency patient response situations and monitor patients after administration.*	☐ Yes ☐ No ☐ Yes, but need updating ☐ No, but the regulatory environment is sufficiently enabling	☐ 1 (top priority) ☐ 2 ☐ 3 ☐ 4 ☐ 5 (lowest Comments: Click or tap here to enter text.
Pharmacists must have an understanding of the risk, safety, value and impact of vaccination and act as educators of the public regarding the vaccination programmes.	*Pharmacists must be knowledgeable in the value and impact of vaccination programmes on population health and provide factual information to the public in support of the science of vaccines and vaccination programmes.*	☐ Yes ☐ No ☐ Yes, but need updating ☐ No, but the regulatory environment is sufficiently enabling	☐ 1 (top priority) ☐ 2 ☐ 3 ☐ 4 ☐ 5 (lowest Comments: Click or tap here to enter text.

Objective	Description and proposed language for legislative/regulatory requirements	Are these regulations in place in your jurisdiction?	Priority given to this category + Comments
Pharmacy personnel qualified by suitable training should be able to administer vaccines.	*Pharmacy personnel trained and certified to administer vaccines may do so within the pharmacy or at external locations as permitted in the regulations*	☐ Yes ☐ No ☐ Yes, but need updating ☐ No, but the regulatory environment is sufficiently enabling	☐ 1 (top priority) ☐ 2 ☐ 3 ☐ 4 ☐ 5 (lowest Comments: Click or tap here to enter text.

Vaccine prescribing

Objective	Description and proposed language for legislative/regulatory requirements	Are these regulations in place in your jurisdiction?	Priority given to this category + Comments
There is enabling legislation to allow pharmacists to prescribe vaccinations or to be able to supply and administer without a prescription.	*A pharmacist who meets the required qualifications may, subject to any restrictions or conditions set out in the regulations and in the course of the practice of pharmacy, engage in the act of prescribing/administering vaccines that are designated in the regulations.*	☐ Yes ☐ No ☐ Yes, but need updating ☐ No, but the regulatory environment is sufficiently enabling	☐ 1 (top priority) ☐ 2 ☐ 3 ☐ 4 ☐ 5 (lowest Comments: Click or tap here to enter text.

Vaccine supply chain management

Objective	Description and proposed language for legislative/regulatory requirements	Are these regulations in place in your jurisdiction?	Priority given to this category + Comments
There is legislation requiring the registration and licensure of manufacturers and wholesale pharmaceutical distributors (for vaccine distribution to community settings and/or healthcare providers in licensed facilities).	*Any person or business engaged in the distribution of medicines and vaccines to licensed facilities or healthcare professionals for the purpose of administration to a member of the public must be licensed and comply with all applicable statutes and regulations and specifically those requiring tracking, storage, transport and cold-chain requirements.*	☐ Yes ☐ No ☐ Yes, but need updating ☐ No, but the regulatory environment is sufficiently enabling	☐ 1 (top priority) ☐ 2 ☐ 3 ☐ 4 ☐ 5 (lowest Comments: Click or tap here to enter text.
Legislation prohibits unsafe return and redistribution activities.	*Licensed pharmaceutical and vaccine distributors cannot accept for redistribution any medicine or vaccine from a licensed facility or healthcare professional unless the distributor originally supplied that exact vaccine, as confirmed through lot number and expiry date, to the facility or healthcare professional and can be assured the quality of the vaccine has been maintained.*	☐ Yes ☐ No ☐ Yes, but need updating ☐ No, but the regulatory environment is sufficiently enabling	☐ 1 (top priority) ☐ 2 ☐ 3 ☐ 4 ☐ 5 (lowest Comments: Click or tap here to enter text.
Legislation requires integrity of the vaccine to be distributed.	*Licensed pharmaceutical and vaccine distributors must ensure vaccines are obtained from legitimate sources and are required to keep accurate records of acquisitions and visually examine vaccines for the possibility of being falsified vaccines or having been subject to improper storage or damage.*	☐ Yes ☐ No ☐ Yes, but need updating ☐ No, but the regulatory environment is sufficiently enabling	☐ 1 (top priority) ☐ 2 ☐ 3 ☐ 4 ☐ 5 (lowest Comments: Click or tap here to enter text.

Additional notes

Additional notes *For objectives identified as a priority, use this section to indicate priority sequencing and implementation requirements*

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