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GLOBAL SITUATION REPORT ON PHARMACY 2025

WORKFORCE, PRACTICE, POLICY

Evidence, investment and solutions to strengthen health systems

Colophon

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FOREWORD

As global health care provision continues to be challenged by inequities, emerging threats and workforce shortages, the engagement with pharmacy has never been more critical. The International Pharmaceutical Federation (FIP) plays a unique and essential leadership role in developing pharmacy policies and supporting solutions that align with, and advance, global health priorities. By providing early thought leadership, workforce intelligence, and strategic insights, FIP leads our profession's response and provides pragmatic initiatives that can drive progress in health, equity, and sustainability.

As medicines experts and front-line healthcare providers, pharmacists and the pharmacy team contribute significantly to vaccination, medication optimisation, chronic disease management, public health provision and patient information and education. Pharmaceutical impact is well documented for improved adherence, better health outcomes, and increased access to expert care. Yet, with some existing health policies, workforce strategies and financing mechanisms, the full value of pharmacists remains under-recognised to the detriment of overall health system impact.

With only five years remaining to achieve the United Nations Sustainable Development Goals (UN SDGs) and FIP Development Goals (FIP DGs), FIP's flagship initiative—the Global Situation Report on Pharmacy 2025 (GSRP)—is both timely and critical at this midpoint. It is therefore a great pleasure to present this report as a further catalyst for mission advancement and our Brisbane Calls to Action.

The GSRP offers a comprehensive overview of workforce capacity and distribution, pharmacy education and specialisation pathways, the evolving scope of pharmacy services, digital health transformation and innovation, as well as migration, equity, patient safety, and professional resilience. It provides evidence-based insights, drawing on the latest data from the FIP Global Pharmaceutical Observatory (GPO) and supported by contributions from FIP member organisations and regional stakeholders. This report provides substrate for current evidence and an accessible advocacy tool for members to showcase outcome and impact of pharmacy on global health priorities.

I extend my sincere thanks to all contributors and collaborators whose expertise and commitment made this compilation possible. All these efforts embody the FIP shared vision: To have a world where everyone has access to the medicines and pharmaceutical services they need to lead healthy lives.

I invite readers and members to explore this report, and use it to inspire meaningful actions for progress. Together, we can advance pharmaceutical sciences, practice, and education to strengthen global health for all.

Mr Paul Sinclair, AM

FIP President

Introduction

Pharmacy at the heart of sustainable, people-centred health systems

The introduction sets the scene for the report, outlining pharmacy's strategic relevance to global health goals and workforce agendas. It highlights alignment with SDGs, UHC, and FIP's Development Goals, previews key themes, and reinforces the leadership of FIP in advancing a person-centred, public health-oriented profession.

Global alignment and context

The World Health Organization (WHO) affirms that "there is no health without a workforce." Health workers are not only the backbone of health systems, but they are also essential to ensuring that services are accessible, effective, and equitable across all communities. Pharmacists and their support teams, one of the five key professions under Sustainable Development Goal (SDG) Target 3.c, form a vital pillar of this global workforce.[1,2]

In 2023, the global stock of dentists, doctors, midwives, nurses, and pharmacists reached over 52 million, yet persistent inequalities remain: while high-income countries (HICs) average one health worker for every 64 people, low-income countries (LICs) face ratios as low as one per 621.[1]

A critical moment for investment in pharmacy

As the global health agenda intensifies its focus on universal health coverage (UHC), addressing the shortfall in all health worker cadres is increasingly urgent.[1] The projected **global shortage of 11.1 million health workers by 2030**, concentrated largely in the WHO African and Eastern Mediterranean Regions, underscores the need for greater investment across the entire health workforce—including pharmacy.[1]

As medicines experts and front-line care providers, pharmacists play a pivotal role in improving health outcomes through vaccination, medication optimisation, chronic disease management, and patient education. Yet, their full contribution remains under-recognised in many health policies, workforce strategies, and financing mechanisms.

Alignment with global workforce strategies

The World Health Organization (WHO) Global Workforce Strategy 2030[2] outlines key priorities such as:

- Strengthening the workforce for health programmes
- Advancing self-care and health workforce agendas
- Protecting and investing in healthcare workers
- Promoting ethical international recruitment through the Code of Practice

While WHO provides the overarching policy framework, the International Pharmaceutical Federation (FIP) plays a unique and essential role in shaping pharmacy-specific solutions that align with—and advance—these global priorities. FIP leads the pharmacy profession's response by offering early thought leadership, workforce intelligence, and strategic insight into how pharmacy can drive progress across health, equity, and sustainability goals.

About this report: Why now, and why pharmacy?

The Global Situation Report on Pharmacy 2025 is FIP's flagship contribution to the global health workforce agenda. Released in the same year as the WHO Director-General's update to the World Health Assembly, this report comes at a critical midpoint: just five years remain to deliver on the Sustainable Development Goals.[2]

The Global Situation Report on Pharmacy 2025 provides:

1. A comprehensive global overview of the pharmacy workforce, education, and services;
2. Evidence of pharmacy's contribution to UHC and WHO workforce targets;
3. Policy guidance and advocacy tools for ministries, funders, and stakeholders;
4. A forward-looking vision aligned with FIP's Strategic Plan 2025–2030 and the WHO–FIP Collaboration Workplan (2024–2025).

The Global Situation Report on Pharmacy 2025 reflects the mission and vision of FIP:

FIP's mission is to improve global health by advancing pharmaceutical sciences, practice, and education.

FIP's vision is a world where everyone has access to the medicines and pharmaceutical services they need to lead healthy lives.

This report is a direct expression of that mission—supporting countries in strengthening their pharmacy workforce, transforming service delivery, and accelerating progress towards UHC and sustainable health systems.

What this report covers

Drawing on the latest data from FIP's Global Pharmaceutical Observatory (GPO), with contributions from FIP member organisations and regional stakeholders, this report presents:

1. Workforce capacity and distribution;
2. Pharmacy education and specialisation pathways;
3. Evolving scope of pharmacy services;
4. Digital health transformation and innovation;
5. Migration, equity, and professional resilience;

It identifies persistent gaps, emerging trends, and clear entry points for investment and policy reform—across low-, middle-, and high-income countries.

Advocacy and mobilisation tools

The Global Situation Report on Pharmacy is more than a data report—it is a strategic advocacy tool. It aims to influence national and global policy by clearly mapping where pharmacy is making an impact, what action is still needed, and who must act. It speaks to ministries of health, funders, regulators, educators, and professional bodies.

To support uptake and policy engagement, the Global Situation Report on Pharmacy is accompanied by:

A strategic **infographic** that maps FIP's proposed actions to stakeholder groups—governments, regulators, employers, educators, and professional bodies—supported by global evidence and real-world impact examples.

A series of twelve thematic **postcards**, each spotlighting a key action area, headline statistics, and practical country examples. These serve as high-impact advocacy tools for national and global decision-makers.

Pharmacy's alignment with the SDGs and FIP Development Goals

Pharmacy's contribution aligns directly with several UN SDGs, particularly:

SDG 3 – Good health and well-being	3 GOOD HEALTH AND WELL-BEING	Pharmacists directly improve health outcomes and access to care through services such as vaccination, medicines optimisation, chronic disease management, and advanced preventive care.
SDG 5 – Gender equality	5 GENDER EQUALITY	As a female-majority profession, pharmacy contributes to gender equity within the health workforce while addressing leadership disparities. Pharmacists also support women as informal caregivers and improve access to maternal and reproductive health services.
SDG 13 – Climate action	13 CLIMATE ACTION	Pharmacists advance environmental and population health through sustainable pharmacy practices, climate-resilient services, disaster response, and community-based health education.

To translate these global goals into pharmacy-specific action, FIP launched the FIP Development Goals (FIP DGs)[5] in September 2021. This structured framework comprises 21 goals spanning the domains of workforce, education, practice, and science, providing a comprehensive roadmap for national and regional pharmacy transformation.

Modelled on the structure and ambition of the UN SDGs[3], the FIP DGs[4] support countries in planning, implementing, and monitoring pharmacy transformation in ways that respond to local needs while advancing global priorities. The goals are aligned with broader health system targets, including UHC, health equity, and sustainable development.

To support this alignment, the FIP DGs have been explicitly mapped to the SDGs, reinforcing pharmacy's role as a key driver of progress toward the 2030 agenda. More information is available here.

FIP Development Goals &
UN Sustainable Development Goals

The evolving role of pharmacists

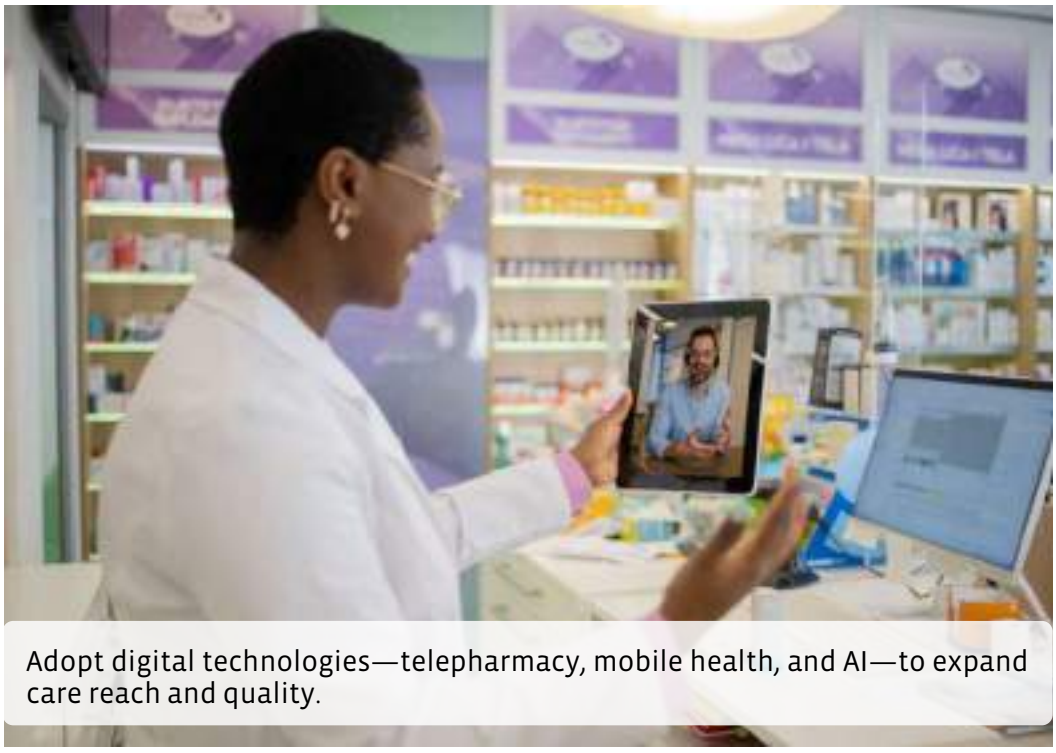
Pharmacy is undergoing a global transformation—from a product-centred discipline to a people-centred, public health-oriented profession. Today, pharmacists:

Administer vaccines and deliver preventive care

Manage chronic diseases and support medication adherence

Provide urgent care and triage, particularly in underserved or rural areas

Participate in emergency and humanitarian response operations



Adopt digital technologies—telepharmacy, mobile health, and AI—to expand care reach and quality.

However, policy, regulation, and financing have not yet fully kept pace. Real progress will depend on systemic investment and the integration of pharmacy across all levels of health reform.

Report structure: Headline themes

This report is structured around nine themes that highlight pharmacy's value across health system goals, including universal health coverage (UHC), primary healthcare (PHC), system

resilience, equity, and sustainability. Each chapter is grounded in global data, FIP tools and frameworks, and real-world case studies that reflect pharmacy's evolving scope, contributions, and potential across different healthcare settings and policy contexts.

The structure begins with a strategic overview and continues through a series of focused chapters:

CHAPTER 1

Achieving UHC through strong PHC: The role of pharmacy

This chapter outlines how pharmacy supports global goals to achieve universal health coverage by strengthening primary health care systems. It positions pharmacists as integral providers of essential services, aligned with the Astana Declaration and Lusaka Agenda, and calls for regulatory reform to ensure full integration.

CHAPTER 2

Global pharmacy workforce: Trends, challenges and opportunities

This multi-part chapter presents a global analysis of the pharmacy workforce, addressing trends, migration, competencies, new roles, gender equity, and optimal working environments. It aligns with the WHO Workforce 2030 Strategy and FIP Development Goals, highlighting the importance of structured education, ethical recruitment, professional recognition, and sustainable practice conditions.

CHAPTER 3

Advancing public health and disease prevention through pharmacy

The chapter demonstrates how pharmacists contribute to global public health, focusing on vaccination and noncommunicable diseases (NCDs). It highlights pharmacist-led interventions, enablers such as legal frameworks and training, and pharmacy's role in strengthening early intervention, education, and prevention services.

CHAPTER 4

Pharmacy in humanitarian crises and emergency response

This chapter explores pharmacy's role in disaster, conflict, and emergency settings. It highlights pharmacist-led efforts in maintaining medicine access, continuity of care, and public health response, drawing from global case studies and advocating for greater integration into humanitarian frameworks.

CHAPTER 5

Sustainability and climate action in pharmacy practice

Focusing on the intersection of planetary and public health, this chapter highlights the contributions of pharmacy to climate mitigation and adaptation. It addresses the environmental impact of pharmaceutical services and outlines FIP's SustainabilityRx agenda to build climate-resilient and environmentally responsible health systems.

CHAPTER 6

Collaborative practice across health professions and pharmacy roles

This chapter explores interprofessional and intra-professional collaboration, showcasing pharmacy's integration into multidisciplinary teams and teamwork with pharmacy technicians. It presents evidence of improved health outcomes and efficiency through collaborative service delivery models.

CHAPTER 7

Medicines and patient safety through pharmacy practice

The chapter highlights pharmacists' leadership in promoting safe, effective, and appropriate medication use. It presents evidence-based strategies for reducing medication errors, preventing harm, and supporting patient safety across all care settings, aligned with WHO and FIP global initiatives.

CHAPTER 8

Pharmacy's role in the digital transformation of health

This chapter explores FIP's global work on digital health transformation and presents examples of digital pharmacy services that enhance access, quality, and person-centred care.

Why this matters?

When pharmacy is empowered, the benefits are broad and systemic. Patients receive more timely, local, and safer care. Health systems gain trusted access points that ease the burden on physicians and hospitals. Medicines are used more appropriately and effectively, and communities become more resilient to crises and future health threats.

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CHAPTER 1

Achieving UHC through strong PHC: The role of pharmacy

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Content list

High level summary

1. Pharmacists are increasingly recognised as essential contributors to Universal Health Coverage (UHC), expanding access to essential medicines and primary care services in the community.[1] Using pharmacies—often the first point of care—helps **bring health services closer to where people live**, supporting the UHC goal of "**health for all**".
2. Fully integrating pharmacists into primary health care (PHC) improves preventive care, chronic disease management, and medication optimisation. Evidence from across the globe shows that pharmacist-delivered interventions (such as vaccinations and hypertension management) lead to better health outcomes and reduce strain on doctors and hospitals.
3. Despite their value, pharmacists remain under-recognised and under-used in many countries' health policies and laws. A 2024 commentary highlights that pharmacists are "**essential yet often overlooked**" health professionals.[2]
4. Outdated, doctor-centric views and restrictive legislation have limited pharmacists mainly to dispensing roles in some settings.[3] This misclassification deprives health systems of a readily available workforce and leads to avoidable costs from suboptimal medicine use and late interventions.
5. FIP has made PHC a strategic priority, aligning its programmes with the WHO agenda and Astana Declaration on PHC. **Through the 21 FIP Development Goals and new tools** (such as PHC self-assessment indicators), FIP is empowering pharmacy worldwide to advance PHC and UHC, documenting progress and guiding best practices.

Key message

Achieving **UHC by 2030** will require harnessing the full potential of pharmacists in primary health care. With enabling policies and investment, **pharmacy can deliver far more in health promotion, disease prevention, and treatment optimisation**—ultimately improving access, quality, and equity in health for all.

Related FIP Development Goals

This chapter aligns directly with the following FIP Development Goals (DGs),[1, 2] providing evidence and direction for their advancement through strengthened primary health care systems:

DG 7: Advancing Integrated Services – Integrating pharmacists into primary care teams to deliver comprehensive services across care levels.

DG 10: Equity & Equality – Ensuring no one is left behind by leveraging pharmacies' reach to improve equitable access to health.

DG 13: Policy Development – Creating enabling policies and regulations for pharmacy practice in PHC and UHC contexts.

DG 15: People-Centred Care – Orienting pharmacy services around the needs of individuals and communities, a core PHC principle.

DG 18: Access to Medicines & Services – Strengthening pharmacy's contribution to affordable, timely access to quality medicines and essential health services.

Call to action

1. Governments & health ministries

- Formally recognise and integrate pharmacists into national UHC and PHC strategies, including through legislative reform and expanded scopes of practice.
- Ensure sustainable financing and remuneration models for pharmacist-led services such as medication management, vaccinations, chronic disease care, and preventive interventions.
- Embed pharmacy-specific indicators into national health information and UHC monitoring frameworks to track progress and guide policy reforms using measurable data.

2. Regulatory bodies & policymakers

- Modernise regulatory frameworks to reflect pharmacists' clinical capabilities, moving beyond the dispensing role to enable broader PHC contributions, including prescribing and public health services.

3. Educational institutions & educators

- Revise pharmacy curricula to align with UHC and PHC priorities, embedding competencies in prevention, health promotion, and chronic disease management.
- Strengthen continuing professional development (CPD) to support workforce adaptability and expanded practice, particularly in underserved settings.

4. Professional associations & pharmacy leadership

- Advocate for pharmacists' inclusion in national health policies, workforce strategies, and PHC funding schemes, using evidence and the FIP Development Goals to support the case.
- Lead data-driven advocacy by collecting and showcasing pharmacy's impact on UHC outcomes, including case studies, workforce indicators, and service utilisation.

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Pharmacists are essential enablers of primary health care (PHC), with **over 77% of the global pharmacy workforce working in community settings**, according to recent FIP data. When supported by appropriate regulatory and financing reforms, pharmacists improve access to essential services — from vaccinations to chronic disease management and medication optimisation — while easing the load on primary care teams.[1-5]

FIP's global leadership — through initiatives like the Development Goals (DGs) and PHC self-assessment indicators — ensures pharmacy transformation is aligned with global health priorities like the Sustainable Development Goals (SDGs) and the Lusaka Agenda.

FIP calls on government and partners to recognise pharmacists as core PHC providers, expanding their roles to include prescribing, preventive care, and clinical services. This includes embedding pharmacists in multidisciplinary teams and establishing reimbursement models for their patient care activities.

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1. Why primary health care and universal health coverage matter to FIP

Achieving Universal Health Coverage (UHC) is a global priority that aims to ensure that all individuals and communities receive the health services they need without financial hardship.[3,4] It is a central component of the Sustainable Development Goal (SDG) 3, which targets equitable access to essential health services by 2030.[5]

Yet, significant challenges persist—particularly in low- and middle-income countries—including fragmented financing, shifting disease patterns, and deep-rooted health inequities.[6] Addressing these barriers requires sustained political commitment, strategic investments, and stronger health systems that are centred on primary health care (PHC).

PHC is the most effective and inclusive approach to organising health systems. It brings services closer to communities, enhances health outcomes, and supports people throughout their life course. Its three core components—multisectoral policy action, empowered individuals and communities, and integrated primary care with essential public health functions—are essential to progress towards UHC.[7,8]

The International Pharmaceutical Federation (FIP) places PHC at the heart of its global mission. FIP is committed to ensuring that everyone can benefit from safe, effective, high-quality, and affordable medicines and pharmaceutical care services, delivered in collaboration with pharmacists and other healthcare professionals. PHC provides the means to realise this commitment, offering "the right care, right in the community".

Recognising PHC's centrality to global health, FIP formally endorsed the 2018 Declaration of Astana, committing to accelerate its implementation.[3] This marked a strategic pivot within FIP, placing pharmacy's integration into PHC—and by extension, its contribution to UHC—at the forefront of its agenda for the decade.

To support this ambition, FIP launched the FIP Development Goals (DGs)—a structured framework that aligns pharmaceutical workforce development, education, practice, and science with UHC objectives. By empowering pharmacists to provide expanded PHC services—ranging from health promotion to chronic disease management—FIP contributes to more resilient health systems, improved health outcomes, and more equitable care.

Prioritising PHC is therefore not only about advancing the profession of pharmacy; it is about fulfilling the global vision of "health for all". For FIP, PHC lies at the heart of its purpose: supporting the transformation of health systems by empowering pharmacists to drive improved access, outcomes, and equity.

2. Global context and system-level challenges

The foundational principles of PHC were laid out in the 1978 Alma-Ata Declaration in 1978, which laid the foundation for people-centred health systems.

In recent years, there has been unprecedented global commitment to achieving UHC by 2030 (SDG target 3.8).[9, 10] The 2018 Declaration of Astana reaffirmed PHC as "the cornerstone of sustainable health systems for the achievement of UHC and the health-related SDGs".[5, 11]

More recently, the Lusaka Agenda, launched on UHC Day (12 December 2023), reflected renewed consensus on transforming health financing and delivery. It calls for five key shifts to align global health initiatives with country-led, domestically financed health systems, aiming for UHC that "leaves no one behind".[10, 12] Together, these frameworks create a supportive environment to reorient health systems towards PHC and to mobilise all health professions, including pharmacists, in the push for UHC.

Parallel to these policy shifts, the COVID-19 pandemic (2020–2022) served as a global stress test, exposing health system vulnerabilities and reaffirming the importance of robust, community-based PHC. Countries with stronger PHC services were more resilient in maintaining essential care. Pharmacists stepped up during this crisis by maintaining medicine supply chains, counselling patients, and administering tests and vaccines.[13-16]

Despite this progress, access to essential medicines remains uneven, especially in low-resource settings. Many health systems struggle with fragmented supply chains, workforce shortages, and poor integration between service levels, resulting in unreliable availability and widening disparities—especially in rural or underserved areas.[17-19]

Global health bodies have introduced several frameworks to guide countries in building stronger PHC systems. The WHO's Operational Framework for PHC (2020) and the WHO–UNICEF PHC Measurement Framework (2022)[20] provide guidance and indicators for countries to track PHC performance. Similarly, the SDGs include targets on health workforce density (Indicator 3.c.1) and access to essential medicines (Indicator 3.b.3).

These frameworks also imply the need to optimise the roles of all healthcare providers. However, the role of pharmacists in PHC remains under-recognised and underutilised in many national strategies.

In practice, PHC remains underfunded and fragmented in many countries. Health systems often remain centred around hospitals and physicians, with limited policy focus or budgetary support for PHC. Community pharmacy is frequently sidelined or left to operate within loosely regulated private sectors. In some settings, regulatory restrictions and lack of remuneration limit what pharmacists can do, even when their contributions could strengthen PHC delivery.

Furthermore, how pharmacy is reflected in national health strategies varies widely. Some countries have comprehensive pharmaceutical care policies embedded in PHC planning, while others omit pharmacy entirely from their UHC roadmaps. Addressing these gaps is essential to achieving inclusive, sustainable progress toward health for all.

3. Pharmacy-led services in PHC

Pharmacists are often the first and most frequent point of contact with the health system, especially in communities with few doctors.[21, 22] There are solid reasons why pharmacists are called "the face of health care" for many: pharmacies are widely distributed, typically offer extended opening hours, and provide walk-in access without the need for appointments.

Evidence suggests that individuals visit community pharmacies nearly twice as often as they consult with physicians or other healthcare providers. For patients with multiple chronic conditions, these pharmacy visits increase even more, sometimes exceeding visits to other care providers.[21-23] This frequent and convenient access allows pharmacists to reach individuals who might otherwise delay or avoid care due to barriers such as distance, cost, or social stigma.

In addition to accessibility, pharmacists are consistently ranked among the most trusted professionals globally.[24, 25] Trust and access together form the foundation of effective PHC. Pharmacists are therefore uniquely positioned to engage with patients early, encourage healthy behaviours, provide preventative services, and ensure continuity of care.

Community and primary care pharmacists provide a wide range of essential health services that significantly contribute to public health and population-level outcomes. The table below outlines the types of primary health care services delivered by pharmacists and selected examples of their impact, drawn from international evidence:

Service group	Pharmacy service	Example on impact
Medicines use and safety	Medicines optimisation[26, 27]	**Northern Ireland:** A pharmacist-led post-discharge medicines optimisation clinic reduced patient readmissions by 9.6% and improved patient health-related quality of life.[26] **UK**: A multicentre randomised controlled trial showed that pharmacist-led medicines optimisation in general practice reduced medication-related problems, improved medication appropriateness, and lowered healthcare costs. Patients had a reduction in MRPs from a median of 3 to 0.5. The service was cost-effective, resulting in per-patient savings and gains in quality-adjusted life years (QALYs).[27]
	Medication reconciliation[28]	**Thailand**: Pharmacist-led medication reconciliation across all care transitions reduced the risk of medication errors by 75% compared to usual care.[28]
	Medication adherence programmes[29]	**Spain**: A 6-month cluster randomised controlled trial across 98 community pharmacies evaluated a pharmacist-led medication adherence intervention for 1,186 patients with hypertension, asthma, or COPD. Patients receiving the

Service group	Pharmacy service	Example on impact
		intervention were over five times more likely to be adherent (OR 5.12, 95% CI 3.20–8.20). Clinically, the intervention group had significantly lower diastolic blood pressure, improved asthma control.[29]
	Patient counselling[30, 31]	**Nigeria**: A randomised controlled trial evaluated the impact of pharmacist-led education and counselling for elderly patients with type 2 diabetes. After four months, the intervention group showed a significant reduction in fasting blood sugar (from 156.7 to 131.8 mg/dL, $p < 0.001$), lower systolic blood pressure (from 146.4 to 133.8 mmHg, $p < 0.001$), and a marked improvement in medication adherence (from 42.7% to 94.7%, $p = 0.001$).[30] **Germany**: The AdPhaNCED trial assessed enhanced pharmacist counselling for patients on anti-TNF therapy for inflammatory bowel disease. Over 12 months, the intervention group experienced fewer and less severe adverse drug reactions (0.20 vs. 0.32 ADRs/patient/month, $p = .006$), improved ADR resolution, and greater satisfaction with medication information.[31]
Chronic disease and preventative care	Chronic disease management[32-35]	**USA:** Pharmacist-led chronic care management (CCM) in rural and underserved settings has demonstrated significant reductions in A1c (up to 1.64% over six months) and increased access to care, with a 73.8% increase in clinical encounters post-enrollment.[33, 34] **South Africa:** A pharmacist-led diabetes medication therapy management programme in a Cape Town clinic identified 453 medication therapy problems across 104 patients (an average of four per patient), demonstrating pharmacists' role in resolving drug-related issues and optimising treatment.[35]
	Point of care testing (POCT) [36, 37]	**Australia**: A feasibility study in five Western Australian community pharmacies evaluated the use of pharmacist-led C-reactive protein (CRP) point-of-care testing to manage respiratory tract infections (RTIs). Among 131 patients, pharmacists used CRP levels and clinical assessments to guide recommendations, which included over-the-counter medicines (100%), self-care advice (95.4%), and GP referrals (11.5%). By Day 5, 65% of patients had recovered, and 51% reported a change in perception about needing antibiotics.[36] **United Arab Emirates**: A pharmacist-led colorectal cancer screening programme used faecal immunochemical test (FIT) kits to identify high-risk individuals in community settings. Among 401 participants, 36.4% were found to have undiagnosed colorectal cancer.[37]
	Immunisation delivery[38]	**Switzerland:** Pharmacist-administered flu vaccines prevented 17.6 primary care visits, 0.33 hospitalisations, and 1.1 hospital days per 100,000 people per season, leading to CHF 143,021 (EUR 148,930) in savings.[38]
	Health promotion[39]	Community pharmacy initiatives, including those promoted through awareness campaigns, have demonstrated positive effects on health outcomes in areas such as smoking cessation, weight management, and immunisation uptake.[39]
	Antimicrobial stewardship interventions[39]	**China**: A pharmacist-led antimicrobial stewardship programme in a tertiary hospital reduced antibiotic prescriptions in outpatients (19.4% to 13.2%) and inpatients (64.3% to 34.7%), and lowered overall antibiotic use by 63%.[40]
Self-care and community access	Self-care initiatives[41]	**Pakistan**: A pharmacist-led self-care education programme for type 2 diabetes patients led to a significant reduction in HbA1c (from 9.00% to 8.09%, $p < 0.01$) and improved self-care behaviours and disease knowledge.[41]
	Minor ailments services (e.g., cold, allergies, urinary tract infections)	**USA:** Symptom resolution rates after pharmacist-led minor ailment services (PMAS) consultations are high, ranging from 68% to 94%.[42]

Service group	Pharmacy service	Example on impact
		Australia: A trial showed PMAS led to better outcomes, with patients gaining 0.003 QALYs at an added cost of AUD 7.14 (EUR 4.07), resulting in a **cost-effectiveness ratio of AUD 2,277 (EUR 1,300.9) per QALY**—supporting PMAS as a cost-effective care model.[43]
	Telepharmacy / digital health services	**Global**: A systematic review of 19 randomised controlled trials evaluated pharmacist-led digital health interventions for patients with type 1 and type 2 diabetes. Interventions included telephone monitoring, web-based tools, mobile apps, and text message reminders. About 53% of studies showed a reduction in HbA1c, and 26% reported improved medication adherence compared to usual care.[44] USA: An AI-enabled, pharmacist-led telepharmacy adherence programme was deployed across 10,477 patients. It identified 2,762 actionable adherence gaps, improving adherence in hypertension (+5.9%), hyperlipidaemia (+7.9%), and diabetes (+6.4%). The proportion of diabetic patients achieving A1c goals increased from 75.5% to 81.7%.[45]

4. Policy gaps and under-recognition of pharmacy

An obsolete but persistent barrier to the integration of pharmacy into PHC is the historical misclassification and under-recognition of pharmacists in health policy development.[46, 47] Traditionally, pharmacists have been seen as "supplementary" providers or purely as dispensers of medicines rather than ideally placed as primary care providers.[46-48] This outdated has contributed to restrictive legislation and the omission of pharmacy from PHC planning in many countries.[46, 48, 49]

As highlighted in a 2024 Lancet commentary[50], a "lack of awareness among policymakers about the potential roles pharmacists can assume" remains a key reason for the slow expansion of pharmaceutical services and integration into PHC. The result of these policy gaps can be described as role underutilisation: although pharmacists are trained and capable of delivering a much broader range of PHC services, they are often not authorised or remunerated to do so. For instance, despite robust evidence showing that pharmacist-led management of hypertension or diabetes improves clinical outcomes, many pharmacists are still prohibited from conducting medication reviews, adjusting therapies, or delivering structured care interventions.[50]

The absence of provider status in many jurisdictions further exacerbates the challenge. In some countries, pharmacists are not legally recognised as healthcare providers, meaning they cannot bill for clinical consultations or interventions. This creates a financial and practical disincentive to delivering services beyond dispensing. A pharmacist who spends additional time managing a patient's blood pressure may go uncompensated, making such service provision unsustainable.

At the policy level, pharmacists have sometimes been grouped into ambiguous categories like "allied health professionals" or even "mid-level providers".[48, 51] The term "mid-level" itself is controversial.[51] WHO defines mid-level providers as those with 2–3 years of training, capable of basic diagnostic and treatment tasks—this does not reflect the 4–6 years of academic and clinical education typically required for pharmacists.[51,52]

This under-recognition not only wastes a valuable healthcare resource but also shifts preventable burdens onto doctors. Tasks that pharmacists are well-equipped to manage—such as medication reviews, patient education, and preventative care—are often left to physicians, contributing to overwork, burnout, and extended patient wait times.

Until recently, few countries systematically measured indicators like “pharmacist interventions per capita” or “medication review rates in primary care.” What isn’t measured often isn’t managed or valued. FIP’s efforts through the Global Pharmaceutical Observatory aim to fill this evidence gap by collecting pharmacy-specific data to inform and influence health policy.

Health systems are gradually transitioning from a product-oriented pharmacy model to one focused on services and care delivery. However, real progress depends on enabling policies, formal provider recognition, and data-driven advocacy.[53, 54]

Successful advocacy by FIP, along with that of many national professional pharmacy associations, has led to countries revising regulations and policy (for instance, enabling prescribing rights for pharmacists in Canada, the UK, parts of Africa and Southeast Asia) and extension of public health roles (for example, vaccination services and preventative review services).

Overcoming community-based pharmacy misclassification is essentially about changing mindsets and advocating for evidence-based policy formation: recognising pharmacists as essential participants in PHC delivery and enabling greater public access to direct and impactful medicines expertise with enlightened regulation.[53, 54] This shift in both culture and policy is integral to FIP’s mission. We therefore call on member states to empower pharmacists to fully apply their medicines expertise in primary care environments as a vital part of multidisciplinary healthcare delivery.

5. FIP’s strategic contribution and initiatives

FIP has maintained official relations with the WHO since 1948, working collaboratively to place pharmacy at the heart of global health solutions. This partnership was formalised through a Memorandum of Understanding (MoU) signed at the 72nd World Health Assembly in May 2019 in Geneva, Switzerland. Building on this agreement, FIP has strengthened its alignment with WHO’s priorities, particularly in areas such as PHC, patient safety, access to medicines, and quality of care; key pillars for achieving UHC.

FIP CEO and WHO Director General

To achieve UHC through PHC, FIP has focused its efforts around four key areas:

1. **Enabling members to support UHC**
   FIP works to ensure that all its members—national organisations, academic institutions, and individual professionals—are empowered and equipped to contribute meaningfully to UHC efforts within their countries and regions.
2. **Identifying national and regional priorities**
   FIP supports the identification of context-specific priorities for the pharmaceutical workforce across all levels, ensuring these are aligned with the delivery of sustainable and effective PHC.
3. **Defining long-term goals**
   Through strategic planning, FIP has articulated clear goals for the coming decade to guide and mobilise the profession in delivering on its potential to support PHC and UHC.
4. **Facilitating collaboration and knowledge exchange**
   FIP fosters partnerships across organisations, encourages the sharing of best practices, and promotes learning from successful PHC and UHC models. This collaborative approach is grounded in evidence and supported by data-driven monitoring and evaluation.

To translate global health ambitions into pharmacy-specific actions, FIP launched the FIP Development Goals (FIP DGs) in September 2021. This structured and consensus-based framework comprises 21 goals spanning the domains of workforce, education, practice, and science, offering a comprehensive roadmap for national and regional pharmacy transformation.[1, 2]

Modelled on the structure and ambition of the United Nations Sustainable Development Goals (UN SDGs), the FIP DGs support countries in planning, implementing, and monitoring pharmacy transformation tailored to local contexts.[1]

This initiative builds on earlier FIP work, notably the Pharmaceutical Workforce Development Goals (PWDGs) launched at the FIP Global Conference on Pharmacy and Pharmaceutical Sciences Education in Nanjing, China in 2016. Inspired by the core principles of the SDGs, the PWDGs laid the groundwork for aligning pharmacy workforce development with broader global health imperatives. The FIP DGs represent an evolution and expansion of that vision, encompassing the full scope of the profession, scientific foundations, service delivery, and workforce readiness.

The FIP DGs are not aspirational alone; they are operationalised through globally validated indicators and practical assessment tools designed to support member organisations, governments, and other stakeholders in identifying gaps, monitoring progress, and implementing evidence-based reforms.[1, 55]

These tools also serve to reinforce pharmacy's integral role within broader health systems and policy priorities.

To support countries in tracking their progress, FIP has developed a globally validated set of indicators—109 in total—linked to the DGs.[55] These indicators provide measurable benchmarks to:

1. Identify gaps and disparities in pharmacy workforce and services;
2. Inform policy reforms and regulatory improvements;
3. Guide national planning; and
4. Strengthen the role of pharmacists in advancing PHC and UHC.

As of 2024, 29 indicators have been tested by FIP member organisations, and a global dashboard is under development to visualise trends in pharmacy transformation. This platform will provide easy access to country-level data, enable trends comparison and support advocacy through real-time progress tracking.

By providing measurable benchmarks, these indicators help identify gaps, assess healthcare access and workforce capacity, and enable governments and professional leadership organisations to monitor disparities and implement evidence-based interventions. Ultimately, this ensures that the pharmacy profession contributes effectively to achieving UHC by strengthening healthcare systems and guiding policy interventions.

In parallel, and with a specific focus on PHC, FIP developed a self-assessment tool designed to evaluate how well pharmacy services are integrated within national PHC frameworks.[56] This tool includes 27 pharmacy-specific indicators aligned with the WHO PHC measurement framework and indicators,[20] covering critical elements such as access to medicines, continuity of care, quality improvement, and collaborative practice.

The FIP DGs are, therefore, not just a vision; they are a roadmap underpinned by action, measurement, and accountability. In the context of PHC, they offer countries a concrete mechanism to ensure pharmacists are empowered, their services recognised, and their impact maximised in achieving equitable and accessible primary care for all.

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CHAPTER 2

Global pharmacy workforce: Trends, challenges and opportunities

This multi-part chapter presents a global analysis of the pharmacy workforce, addressing trends, migration, competencies, new roles, gender equity, and optimal working environments. It aligns with the WHO Workforce 2030 Strategy and FIP Development Goals, highlighting the importance of structured education, ethical recruitment, professional recognition, and sustainable practice conditions.

2A. The 2025 global pharmacy workforce review: Capacity, competence and coverage

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Content list

High level summary

1. **Data-driven leadership:**
   Since 2006, the FIP workforce surveillance programme has curated a longitudinal, pharmacy-specific data set for global health workforce planning. The latest 2022 data cycle captured information on 5.5 million pharmacists and 0.68 million pharmacy technicians and assistants across 83 countries (covering approximately 71 % of the global civil population). A current 2024-25 survey is now specifically mapping pharmacy technician roles, skills and distribution—giving health service planners a reliable evidence base needed for human resources for health (HRH) 2030 targets.

   Why it matters: Reliable, disaggregated data are an essential first step towards meeting WHO Workforce 2030 targets and SDG 3.c indicators. Capacity data is now more essential than ever as countries develop more advanced pharmaceutical health delivery scopes of practice.
2. **Capacity and equity gap:**
   If current trends continue, an estimated shortfall of 11 million health workers is expected by 2030.[1] The global pharmacist density disparity remains significant, with high-income countries averaging 12.1 pharmacists per 10,000 people compared to 3.8 in low-income countries (a three-fold disparity).
3. **Pharmaceutical technicians and assistants are an under-used workforce asset:**
   Our current global data suggest there are, on average, 0.63 technicians for every pharmacist, with the ratio ranging from virtually none in some low-income countries to more than 3.5 in some high-income systems. In places where technicians are fully regulated (for example, in the UK and Canada), pharmacists gain up to one-third more time for direct clinical care. There is a clear opportunity to formalise technician cadres, broaden their legal scope and introduce tiered training so they can contribute more effectively to the pharmacy team skill mix.[2,3]
4. **Demographic shift:**
   Women currently constitute 65% of the global pharmacist workforce (projected to reach 69-72% by 2030).[i] Age profiles diverge: the workforce is ageing in many high-income settings but remains predominantly under 35 in several low-income regions. The pharmacy workforce is distributed primarily across the following sectors: community settings (77%), hospitals (10%), and the pharmaceutical industry (4%).
5. **Education bottleneck:**
   Pharmacy training capacity is the supply-side challenge: 71% of countries have fewer than 0.8 pharmacy schools per million people, and annual graduate output ranges from <10 to >100 new pharmacists per million. Regions with the greatest need (e.g., Africa) have the fewest schools and graduates, while Europe and Eastern Mediterranean regions have a significant expansion of graduates, widening the gap despite a projected 40% average global growth in pharmacist density (*per capita*) by 2030 (since 2016).[4]
6. **Workforce evolution:**
   More than 50 jurisdictions now authorise pharmacist-led vaccination.[5] Increasingly, countries are deploying pharmacists for long-term disease management through medicines review and optimisation,[6] antimicrobial use stewardship[7] and primary healthcare teams[8]; all are evidence-led trends accelerated by the COVID-19 response.[9] Yet, outdated legislation and weak service remuneration still confine many pharmacists

[i] 95%CI, p<0.001 mixed model regression analysis; FIP surveillance data.

to dispensing roles and leave technicians under-used, stalling the profession's full contribution to delivering on improving population health.[10]

The table below provides a consolidated snapshot of key indicators from the FIP 2022 global pharmacy workforce survey.[ii]

INDICATOR (2023)	*TOTAL COUNT	GLOBAL AVERAGE / PROPORTION
Pharmacists	5,572,326	9.6 per 10,000 population
Pharmacy technicians	678,292	5.2 per 10,000 population
Technician:pharmacist ratio	–	0.63
Women (pharmacists)	–	65%
Under-35 share	–	44%
Community setting	–	77%
Hospital setting	–	10%
Pharmaceutical industry	–	4%

* 83 countries for pharmacists; 35 countries for technicians.

7. **FIP solutions and call to action:**
The revised Nanjing Statements,[11] the global competency framework[12] and six FIP–UNESCO Centres for Excellence[13] provide established templates for curriculum reform, faculty development and competency-based regulation.

Key message

A sufficient, equitably distributed, well-trained **pharmacy workforce is indispensable for universal health coverage, yet global capacity remains highly uneven**, making targeted investment in education, regulation and retention a top priority for FIP and its partners.

[ii] Data capture is credited as 2022 data; the surveillance and analysis were conducted during 2023-24.

Related FIP Development Goals

All 21 FIP Development Goals (DGs)[14] align with global pharmacy workforce development, as workforce and education elements are embedded in each goal.

Workforce intelligence is primarily linked to DG 12: Pharmacy Intelligence as robust data serves as the foundation for effective evidence-based workforce planning, policymaking, and advocacy.

Call to action

1. **Governments & health ministries**
   Prioritise pharmacy workforce development in national health strategies by investing in education, retention, and rural deployment, and improving data systems for evidence-based planning. Fund retention packages—competitive pay, career-path incentives, rural hardship allowances—and modern working environments. Build real-time workforce information systems to guide evidence-based deployment and migration management.
2. **Regulatory bodies & policymakers**
   Update legislation to let pharmacists vaccinate, prescribe under protocol, and practise at advanced levels; accredit specialisations and technician career ladders. Establish competency frameworks and CPD requirements. Professionalise pharmacy technicians.
3. **Educational institutions & educators**
   Align pharmacy curricula with the Nanjing Statements and future workforce needs, scale training capacity, and strengthen academic quality through competency-based education and educator development.
4. **Professional associations & pharmacy leadership**
   Advocate for the profession's role in health systems, support CPD and career development, and contribute to workforce planning, well-being, and integration into interprofessional care.
5. **International partners & funders**
   Support pharmacy workforce development in low- and middle-income countries by funding training programmes, south–south learning, and impact demonstrations, while contributing to global surveillance and research.

Using a medicine is the most common way of treating ill health and a resilient health system demands a strong pharmacy workforce to provide medicines expertise.

Yet, on average, low-income countries have access to just **1 pharmacist for every 2,600 people, compared to 3 times this for high-income countries**. Strengthening pharmacy capacity, and access to medicines, is urgent for achieving health for all.

THINK WORKFORCE. THINK HEALTH EQUITY. THINK PHARMACY.

Global pharmacy workforce snapshot:

Today, our data suggest that at least 6 million pharmacists and pharmacy technicians provide medicines support for health systems across 79 countries. Yet inequalities are stark: high-income countries have an average of **12.1 pharmacists per 10,000 population, compared to just 3.8 in low-income countries**.[1]

Pharmacy education and training capacity is also uneven, with **71%** of countries **falling below** the average global benchmark of around 1 pharmacy faculty or school per million population. Although **women represent 65% of the pharmacy workforce**—a figure expected to reach 69% by 2030—progress towards leadership equity remains incomplete.[1]

FIP urges health ministries, funders, and education leaders to scale up pharmacy education, strengthen rural workforce incentives, and include pharmacy in national UHC and workforce investment strategies.

Strengthening the pharmacy workforce is not just a professional imperative—it is a moral and public health necessity to achieve health for all.

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1. International Pharmaceutical Federation (FIP). Workforce surveillance data [unpublished]. 2025.

1. Why workforce is a priority

Achieving the mission of FIP and members—advancing pharmaceutical practice, sciences and education to support global health—relies on building and sustaining a competent, equitably distributed and well-prepared pharmacy workforce. Pharmacists and pharmacy technicians stand at the frontline of patient care, translating pharmaceutical science into safer, more effective medicines use and health outcomes. Without this essential workforce, medicines cannot be appropriately selected, supplied, monitored or optimised, limiting healthcare access and quality, and ultimately compromising patient safety.

This priority is aligned explicitly with global health objectives defined by the World Health Organization (WHO). Universal health coverage (UHC), embedded in SDG 3.8, recognises a robust health workforce, including pharmacists and pharmacy technicians, as critical for equitable healthcare delivery. WHO's Global Strategy on Human Resources for Health: Workforce 2030[15] highlights pharmacists and technicians among essential cadres required to meet the recommended global benchmark of at least 4.45 health workers per 1,000 population. Furthermore, pharmacists are directly monitored by WHO's SDG indicator 3.c.1, underscoring their strategic importance in global health workforce planning.

The urgency of investing in the pharmacy workforce is highlighted by WHO projections that predict a global shortage of health workers potentially reaching 11 million by 2035 if stronger investments in workforce development are not made.[1] Pharmacists and their support teams are an essential part of this health workforce, contributing to medication safety, patient counselling, public health (such as through vaccinations), and ensuring the appropriate use of medicines. Ensuring a sufficient, competent, and equitably distributed pharmacy workforce is therefore not only a professional imperative for FIP, but also a vital policy strategy for achieving universal health coverage and improving health outcomes in every country.

Our response to this global challenge has been systematic, evidence-based and data-driven. Since 2006, FIP has conducted the only longitudinal global pharmacy workforce surveillance programme, providing critical intelligence to inform national health workforce strategies and international accountability frameworks. The findings have been published in successive FIP global pharmacy workforce intelligence trends reports, as seen in Figure 1.

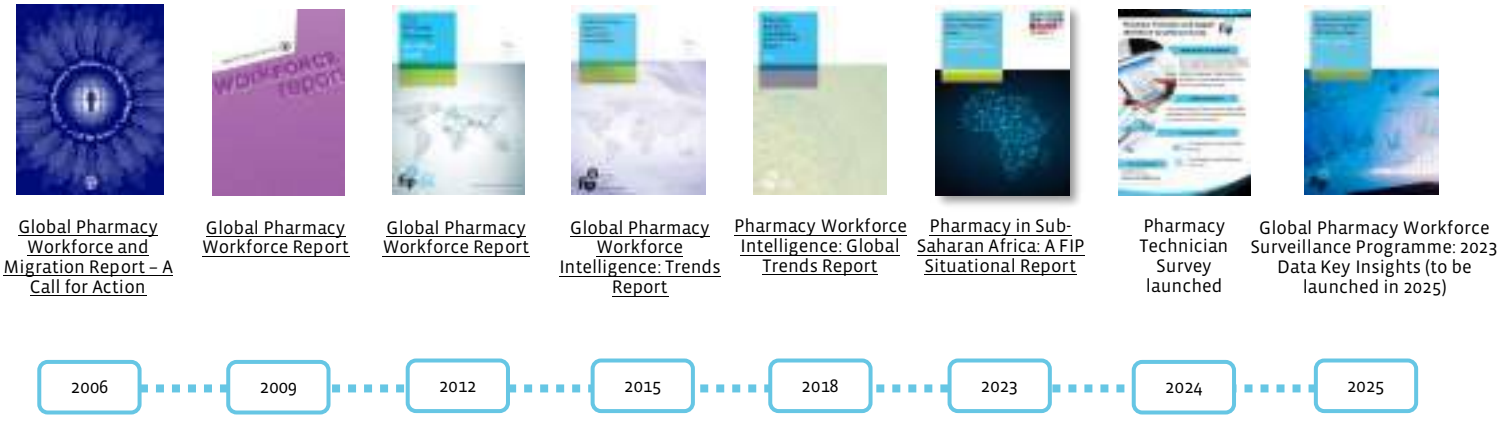

Figure 1. Global pharmacy workforce surveillance programme: Milestones and intelligence trends report publications

The 2023 FIP workforce survey captured comprehensive data from 83 countries, representing approximately 71% of the global population, with a specific follow-up survey in 2024 targeting pharmacy technicians, a cadre frequently overlooked in global health workforce analysis.

Workforce development and education are embedded in all 21 FIP Development Goals (DGs).[14] For example, DG 1 (Academic Capacity), DG 2 (Early-Career Training) and DG 5 (Competency Development) place education and training front and centre, while DG 7 (Advancing Integrated Services) and DG 13 (Policy Development) address workforce deployment, integration and policy reform. Even goals centered on access, and sustainability, such as DG 15 (People-Centred Care), DG 18 (Access to Medicines, Devices and Services) or DG 21 (Sustainability in Pharmacy), require a capable, well-prepared workforce to implement solutions on the ground.

FIP also emphasises workforce intelligence (DG 12: Pharmacy Intelligence) as foundational for effective planning, policymaking, and advocacy. By systematically collecting, analysing and disseminating workforce data, FIP provides robust evidence to governments and stakeholders, driving informed, evidence-based decisions for workforce expansion and optimisation.

Supporting these goals, FIP provides practical tools for workforce transformation, including the revised Nanjing Statements,[11] the Global Competency Frameworks,[12] and regional FIP–UNESCO Centres for Excellence (CfEs).[13] These initiatives enable pharmacy education institutions, policymakers and professional organisations worldwide to build educational capacity, standardise competencies and modernise practice regulations.

For FIP, therefore, strengthening the pharmacy workforce is not a peripheral activity; it is the most direct lever available to improve patient safety, expand access to medicines and move health systems closer to UHC and the Sustainable Development Goals by 2030.

2. Global snapshot of the pharmacy workforce

Table 1 provides a consolidated snapshot of key indicators from FIP's 2023 global pharmacy workforce survey.

Table 1: Global pharmacy workforce summary (2023)

Indicator (2023)	Total count	Global average / proportion
Pharmacists	5,572,326	9.6 per 10,000 population
Pharmacy technicians	678,292	5.2 per 10,000 population
Technician:pharmacist ratio	–	0.63
Women (pharmacists)	–	65%
Under-35 share	–	44%
Community setting	–	77%
Hospital setting	–	10%
Pharmaceutical industry	–	4%

* 83 countries for pharmacists; 35 countries for technicians.

2.1 Pharmacists

Regional distribution and pharmacist density

Across 83 countries, representing over five billion people, approximately 5.57 million pharmacists were reported in 2023, averaging 9.55 pharmacists per 10,000 population (SD=6.35; 95% CI: 8.1 - 11). However, significant disparities persist between high-income countries (HICs) and lower-middle-income

countries (LMICs). Pharmacist density in HICs averages 12.12 per 10,000 population, compared to only 3.81 per 10,000 in LMICs (p=0.015). For example, Europe has a pharmacist density nearly eight times higher than Africa (11.55 vs. 1.48 per 10,000).

Figure 2 presents pharmacist density across WHO regions. The EMR demonstrates the highest density of pharmacists (14.2 per 10,000 population), contrasting with the African region, which has the lowest density (1.48 per 10,000 population).

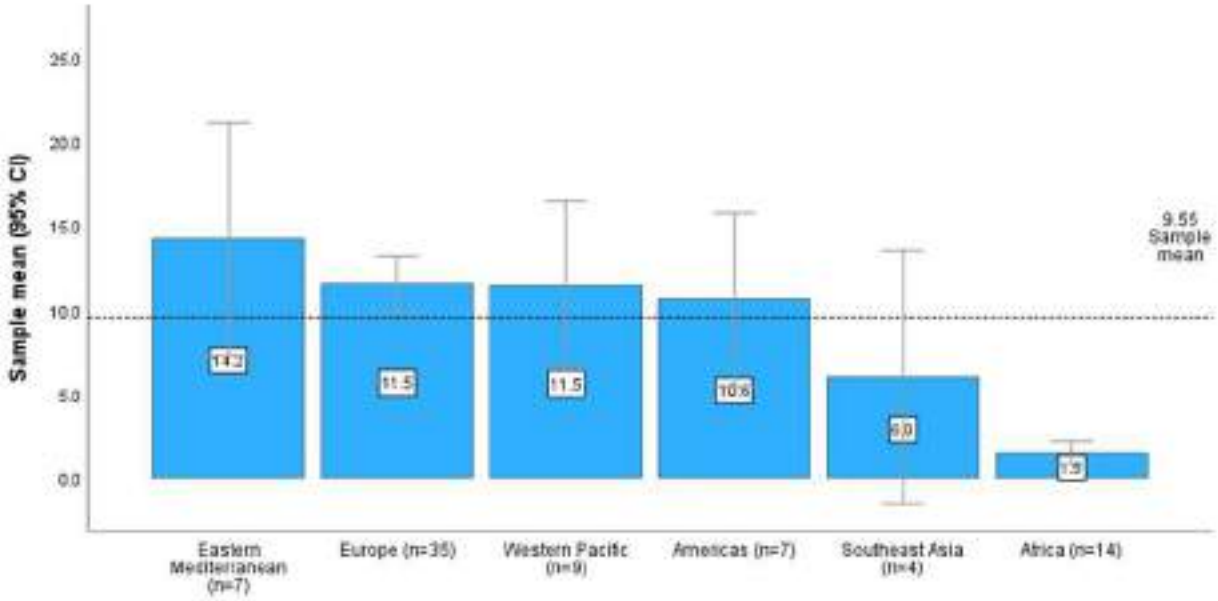

Figure 2: Pharmacist density by WHO region (pharmacists per 10,000 population), 2023

Gender and age profile

Globally, women constitute approximately 65% of the pharmacist workforce (n=63 countries and territories), with projections estimating an increase to around 68.6% by 2030. Additionally, pharmacists under 35 years of age represent a substantial proportion of the global workforce, though this varies significantly by region (p=0.011), underscoring the need for tailored workforce development strategies.

Sectoral employment distribution

Community pharmacies remain the predominant sector of employment, accounting for 77% of pharmacists globally (n=66 countries and territories), while pharmaceutical industry practice remains the lowest (4%) amongst all pharmacy practice.

As shown in Figure 3, regional variations exist in pharmacist employment sectors. The African region has the highest proportion of pharmacists working in hospital settings (approximately 20%), whereas the European region shows the greatest proportion working in community pharmacy (around 70%). In contrast, the Western Pacific region has the highest share in other sectors, such as primary care, wholesaling, academia, regulatory, and clinical biology, accounting for approximately 35%. Pharmacists in the Americas region have notable engagement within industry (approximately 40%), while the Eastern Mediterranean and South-East Asian regions exhibit more balanced distributions across community, hospital, industry, and other sectors, with community pharmacy still generally predominant. This variability underscores the importance of region-specific policies and workforce planning to enhance pharmacist utilisation across all healthcare sectors.

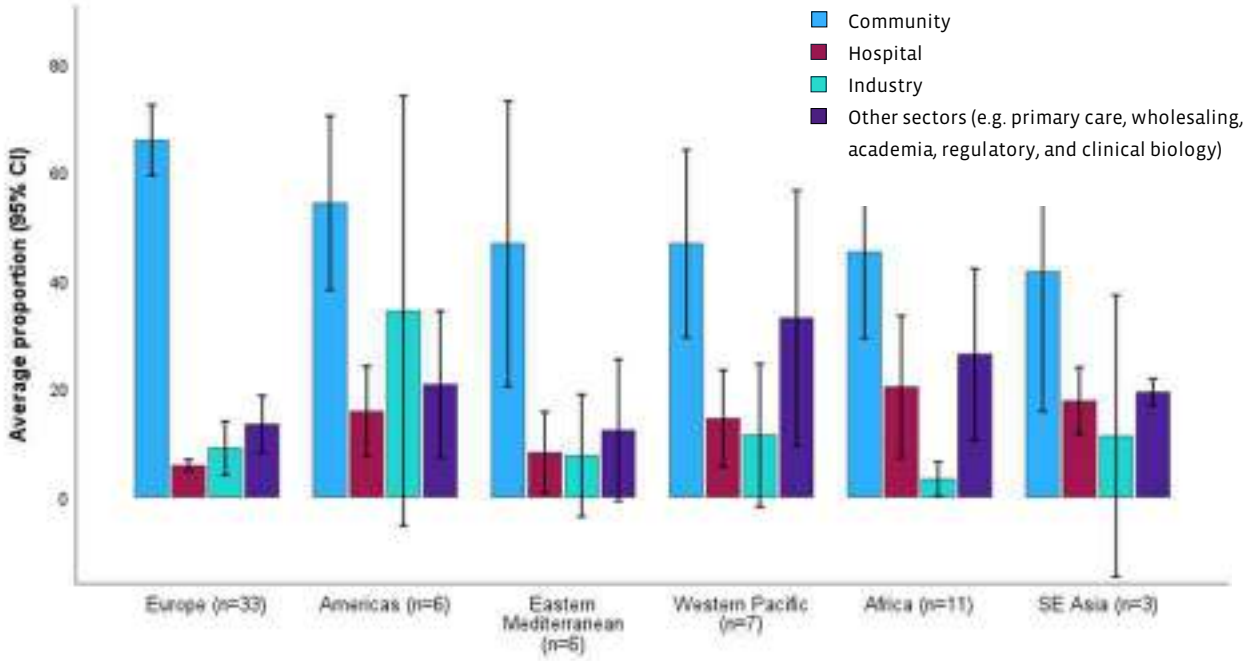

Figure 3: Proportion of pharmacists in various sectors across regions

Education infrastructure

In 2022, there were 1,011 pharmacy schools across 73 countries, with 89% accredited. However, regional distribution varies significantly (0.05–0.80 schools per million population), with 71% of countries falling below the recommended benchmark of 0.80 pharmacy schools per million people. Pharmacist graduate numbers per school also vary, from as low as 8 to as high as 176 annually. Africa has the lowest educational output, averaging only 8.90 new pharmacists per million population, compared to 101.16 per million in the Eastern Mediterranean region, revealing urgent needs for educational investments, especially in low-income regions.

Policy and regulation snapshot

Pharmacy practice globally is supported by strong regulatory commitments, with 97% of countries (n=102 countries) requiring mandatory pharmacist registration. However, regulations governing continuing professional development (CPD) vary widely; while CPD is mandated in 71% of surveyed countries (n=83 countries), specific requirements such as accreditation and competency frameworks remain inconsistent. National accreditation bodies for monitoring CPD are available in 56% of 43 countries, highlighting the need for stronger oversight for CPD quality and standards.

2.2 Pharmacy technicians and support workforce

Regional distribution and pharmacy technicians' densities

In 35 countries reporting, there are 678,292 pharmacy technicians (support personnel), equating to an average density of 5.22 technicians per 10,000 population (SD=5.32). High-income countries reported significantly higher technician densities (15.72 per 10,000) compared to LMICs (6.00 per 10,000; p=0.003), with notable regional disparities—Europe, for instance, reported 17.16 technicians per 10,000 versus Africa's 7.65.

The technician-to-pharmacist ratio ranges from near zero in some healthcare systems to about 3.7 in others, averaging 0.63 technicians per pharmacist. Figure 4 provides an overview of the average density, alongside variations across income levels and regions, as well as the ratio of technician-to-pharmacist.

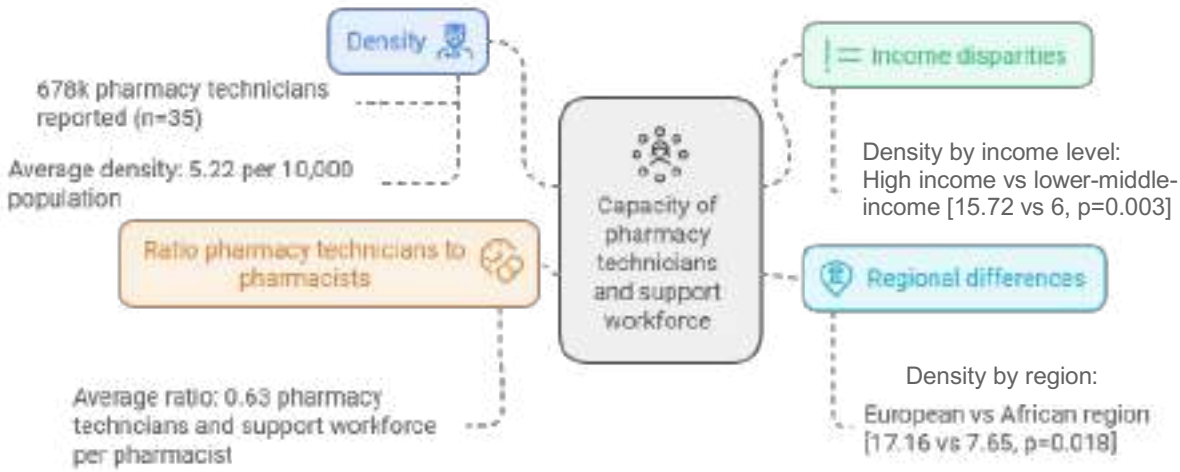

Figure 4: Pharmacy technicians' density, technician-to-pharmacist ratio, and variations of density across income levels and regions

Sectoral employment distribution

On average, 58% of pharmacy technicians (across 24 countries) work in community settings, while hospital employment remains limited, with over half of the countries reporting only up to 10% of technicians working in hospitals.

Education infrastructure

Educational infrastructure for pharmacy technicians also shows disparities. Although there are 792 accredited schools in 36 countries, half of the surveyed countries have fewer than 0.90 technician schools per million people. The annual registration rate of new technicians averages 30.79 per million people (ranging from 2 to 84, based on 22 countries), further underscoring uneven global capacity. The relationship between pharmacy schools, new registrants and graduates across regions can be seen in Figure 5.

Technician education typically ranges from two to three years, often including at least six months of practical experience. Nearly half of the countries surveyed (48.8%) require at least three years of full-time study, while 27.9% mandate two-year programmes. Practical experience is a key component of training, with six months of experiential learning being the most common requirement (38.2% of countries).

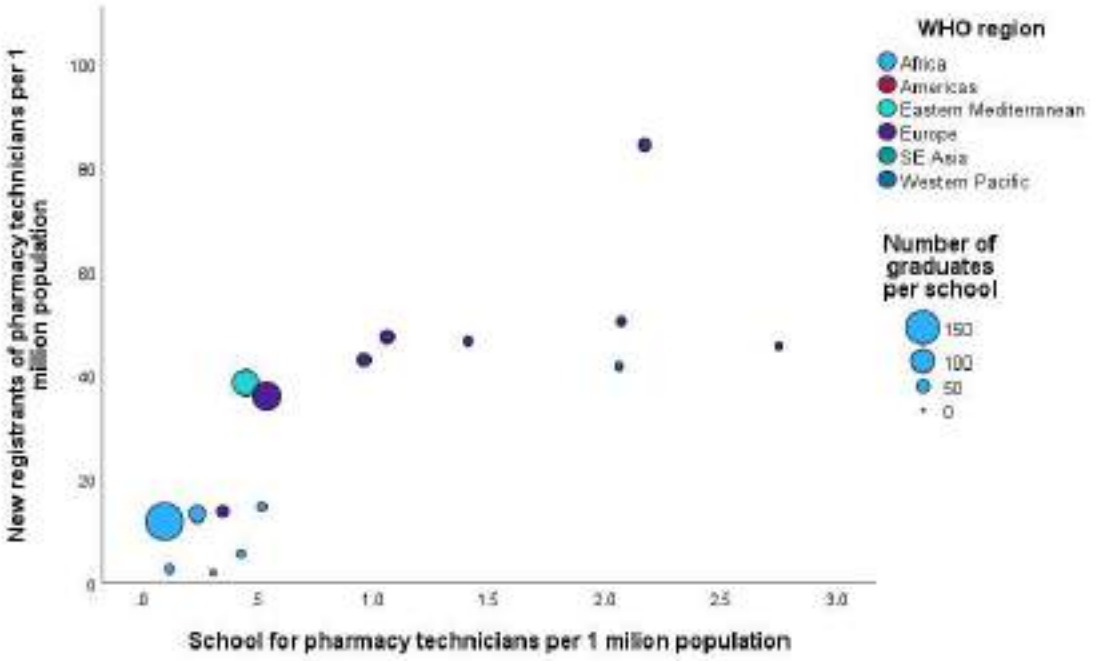

Figure 5: Relationship between pharmacy technician education availability and workforce output, by WHO region

As shown in Figure 5, the availability of pharmacy technician schools per capita is strongly associated with the production of new registrants. Each bubble represents a country, colour-coded by WHO region, with bubble size indicating the average number of graduates per school.

To provide an overview of the global variety in the technician and other pharmacy support workforce cadres, FIP conducted a structured online survey in 2017 to gather information on the roles, responsibilities, supervision, education and legal framework of the workforce. The survey was circulated to FIP member organisations, with 193 responses from 67 countries and territories.[2,3]

The results from this survey, which was published in a report[3] and a peer-reviewed article,[2] suggest that there is a variety of roles and responsibilities for pharmacy technicians and other pharmacy support workforce cadres globally, with supervision requirements varying from strictly supervised, supply-focused tasks to autonomous practice across various duties.

Education systems for pharmacy technicians also varies, ranging from on-the-job training, through vocational courses, to 3–4-year diploma programmes.

Additionally, the study found variation in legislation supporting pharmacy technicians, with systems ranging from well-regulated and registered to partially regulated with weak implementation.

Building on these findings from 2017, FIP is currently conducting a new survey on pharmacy technicians and the support workforce, with outcomes expected in 2026, which will provide updated evidence and enable comparisons with the 2017 baseline.

3. The Nanjing Statements and UNITWIN Centres for Excellence

3.1 Academic capacity and the Nanjing Statements

FIP launched the Nanjing Statements[16] at its 2016 global conference in Nanjing, China, establishing a global vision for pharmacy and pharmaceutical sciences education. Aligned with WHO's Global Strategy on Human Resources for Health: Workforce 2030,[15] these statements help countries and institutions assess, plan, and improve pharmacy education systems.

The original 67 Nanjing Statements,[16] published in 2017, outlined aspirations for improving foundational, experiential, and continuing pharmacy education. These were intended to support providers in self-assessment, gap identification, and strategic planning. In response to major global developments—including the COVID-19 pandemic, rapid workforce evolution, and emerging health priorities—FIP undertook a comprehensive revision process in 2023–2024. This effort, led by a global policy committee, incorporated diverse regional perspectives and updated guidance to reflect the current and future landscape of pharmacy education.

The updated Nanjing Statements[11] are now structured under eight domains: 1) Shared global vision; 2) Students' admission process; 3) Foundation education; 4) Professional competencies; 5) Experiential education; 6) Resources and academic staff; 7) Quality assurance and assessment; and, 8) Research. The statements serve as a guiding resource for institutions, educators, and policymakers. They directly align with several FIP Development Goals (DGs),[14] including:

- DG1 (Academic Capacity): supported by Domain 6, focusing on staff and infrastructure.
- DG2 (Early Career Training): supported by Domains 3, 4, and 5, related to education pathways and competencies.
- DG3 (Quality Assurance): supported by Domain 7.
- DG9 (Continuing Professional Development): supported by Domain 4.

These linkages reflect FIP's broader commitment to lifelong learning and quality improvement in pharmacy education. To further operationalise these statements, FIP will develop an assessment tool in 2025 to help institutions apply the framework to local and national contexts.

3.2 FIP-UNESCO UNITWIN and Centres for Excellence (CfE)

In 2010, FIP and UNESCO established the FIP–UNESCO UNITWIN Cooperation Programme[13] in Global Pharmacy Education Development (GPhEd), the first UNITWIN programme focused on pharmaceutical education, science, and practice. This landmark initiative has since become a cornerstone of FIP's mechanism to enhance academic capacity, drive innovation, and promote global health equity.

Under the renewed 2023–2027 agreement, the UNITWIN programme pursues four core objectives:

1. Enhance the integrated system of research, training, information and documentation activities in the field of global pharmacy education, addressing issues of academic capacity, quality assurance of educational systems and workforce competency;
2. Lead educational and scientific transformations, and promote global collaboration to address sustainability, inequities and technology in education through the establishment of new regional centres for excellence across all regions of the world, namely in Southeast Asia, Western Pacific, Europe, in the Americas and Eastern Mediterranean regions;
3. Contribute to the improvement of global health; and,
4. Cooperate closely with UNESCO, other UNESCO Chairs and UNITWIN Networks on relevant programmes and activities.

The programme operates through four main strategies:

- **Educational development**: Providing evidence-based tools tailored to regional needs, with support from FIP provision and partnership initiatives.
- **Shared experiences:** Facilitating collaboration and peer learning through a buddying system and structured knowledge exchange.
- **Strategic partnerships**: Engaging global and regional stakeholders to promote synergy and resource sharing.
- **Regional networking:** Establishing and strengthening regional CfEs to unify pharmacy education stakeholders and advance regional priorities.

At present, there are three active centres for excellence in Africa, Southeast Asia, and Western pacific regions.[13] These three centres house 28 academic institutions, and 20 supporting members from FIP structures and constituencies. The African region Centre for Excellence, which is also the oldest, is transitioning into the first of its kind Africa-wide Schools of Pharmacy Association. The remaining centres in Eastern Mediterranean, the Americas, and European regions will be launched later this year.

Examples of CfE-led activities that support workforce transformation include:

- The FIP Global Competency Framework: A validated adaptation for the Southeast Asia region:[17] This publication built on the foundation of the FIP Global Competency Framework (GbCF)[12] and utilised FIP's 'adopt and adapt' approach. The resource offers an evidence-based tool that serves as a blueprint for developing a pharmacy workforce that is equipped to provide high-quality care, fostering consistency in education and bridging the gap between education and professional practice.
- Academic capacity project (SEAR–WPR collaboration): A train-the-trainer course based on the FIP Competency Framework for Educators and Trainers, addressing research, mentorship, inclusion, and technology.
- Patient safety curriculum project (Western Pacific): Assessing and strengthening patient safety education in pharmacy curricula, particularly in resource-limited settings.

Together, the Nanjing Statements[11] and the UNITWIN Programme[13] provide a strategic foundation for transforming pharmacy education worldwide. They equip educators and institutions with the tools and guidance needed to align pharmacy education with evolving workforce needs and global health goals.

4. Barriers and opportunities in the pharmacy workforce

4.1 Barriers

Despite overall growth, pharmacy workforce shortages remain a critical concern—particularly in low-income countries and underserved regions such as Africa and South-East Asia, where densities fall below 2 pharmacists per 10,000 population. Several factors contribute to this persistent gap:[18-20]

- **Escalating demand**: Ageing populations, polypharmacy, and chronic disease management are increasing the need for pharmaceutical services.
- **Workforce supply pressures:** Trends such as part-time work (particularly among women), limited domestic training capacity, and restrictive immigration policies reduce available workforce hours.
- **Migration pressures:** Pharmacists are relocating from low- and middle-income countries (LMICs) to high-income settings—particularly Gulf states and OECD countries—for better remuneration and career prospects. South-East Asian graduates increasingly fill pharmacy roles in Gulf states countries,[21] while Kuwait relies heavily on expatriates, with only 26% of

pharmacists being nationals. These trends reflect structural dependency and insufficient local capacity. Pharmacy workforce migration will be examined further in the next section.

- **Supply chain instability**: Disruptions in pharmaceutical supply—driven by geopolitical tensions, economic instability, and manufacturing issues—add strain to workforce demands.

Recruitment and retention difficulties are pronounced in rural areas and public sector roles, where incentives are often limited. Even in some high-income countries, workforce distribution is uneven—urban centres have sufficient supply, but rural and remote regions face gaps. Surveys and national reports cite several deterrents to workforce retention:[10, 22-24]

1. Inadequate salaries and incentives
2. Limited career pathways and unclear advancement opportunities
3. Under-use of clinical skills
4. High workloads and workplace stress
5. Poor working conditions and professional isolation.

These factors are particularly discouraging for early-career pharmacists, many of whom report low job satisfaction. In some contexts, lack of mentoring and continuous development prompts new graduates to leave patient-facing roles or the profession entirely.[23] Without intervention, workforce deficits risk undermining essential medicine access and progress toward UHC.

4.2 Opportunities

Despite challenges, the pharmacy workforce is undergoing a promising transformation. Across countries, pharmacists are increasingly moving into expanded and specialised roles that reflect evolving health system needs. Across diverse settings, pharmacists now contribute to:

- Medication therapy management and medicines optimisation[25, 26]
- Chronic disease management and patient counselling[6, 26, 27]
- Public health services, including health screenings and tobacco cessation[28]
- Vaccination programmes and infectious disease prevention[29]
- Digital and remote care via telepharmacy and digital health apps.[30]

The COVID-19 pandemic significantly accelerated many of these functions, bringing pharmacists to the front lines as immunisers, advisors, and supply chain stabilisers. Hospital and community pharmacists alike are being integrated into interprofessional teams, contributing to therapeutic decisions and direct patient care.[9]

The expansion of specialised pharmacist roles—in oncology, geriatrics, pharmacogenomics, and others—is supported by frameworks such as FIP's Global Advanced Development Framework[31] and FIP DG 4: Advanced and specialist development. Yet, as pharmacists take on more complex responsibilities, there is an urgent need to formalise and optimise the pharmacy support workforce—particularly pharmacy technicians—so that pharmacists can shift focus from technical tasks to direct patient care.

To fully unlock the potential of the pharmacy workforce, countries need enabling policies around:

1. Licensing and scope-of-practice reform
2. Reimbursement for clinical pharmacy services
3. Competency-based training programmes
4. Workforce planning aligned with health system needs.

These strategic investments will not only strengthen national health systems but also help deliver on UHC and SDG targets by 2030.

5. Conclusion

Building and sustaining a competent, equitably distributed and well-prepared pharmacy workforce is fundamental to achieving FIP's mission and advancing global health. Pharmacists and pharmacy technicians play a critical role in delivering patient-centred care, optimising medicines use, and supporting health system performance. FIP's data-driven approach, through global workforce intelligence, provides countries with practical tools to transform pharmacy education, strengthen academic capacity, and inform workforce planning. As health systems face rising demand and persistent shortages, investing in the pharmacy workforce is both a professional necessity and a strategic policy solution to achieve universal health coverage and the SDGs by 2030.

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2B. Global pharmacy workforce migration: Trends, drivers and implications

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Content list

High level summary

1. Workforce migration is a critical issue affecting both low- and middle-income countries (LMICs) and high-income countries (HICs). It exacerbates workforce imbalances by depleting pharmacy professionals in LMICs, weakening healthcare systems, while increasing HICs dependence on foreign-trained pharmacists, creating long-term sustainability challenges.[1]

2. The decision of whether and where pharmacists migrate is driven by push and pull factors, which are shaped by the economic, political and social conditions in each country.[2-6] These factors include:

    - Push factors: Few opportunities for career advancement, low salaries, inadequate working conditions, systemic challenges in source countries, lack of resources and infrastructures, economic crises, fewer opportunities for higher education, insecurity, and lack of technology.
    - Pull factors: Better career opportunities, higher income, improved working conditions, higher standard of living, travel opportunities, better health system, better opportunities for education and specialisation, better security provision, better technology in healthcare, and economic support to the family in the source country.

3. Workforce migration is also influenced by demographic characteristics such as age and gender. Political changes and external crises—including conflicts, natural disasters, and healthcare policy reforms—further shape migration patterns.[3, 7-9]

4. Pharmacist migration has several impacts on healthcare systems:
    - Access and service gaps: Migration reduces access to care in LMICs, especially in rural areas, and disrupts service delivery in both source and destination countries.[10, 11]
    - Sustainability risks: LMICs face 'brain drain'[i] and loss of public investment, while HICs grow increasingly dependent on foreign-trained pharmacists.[12-14]

5. Country case studies are presented, illustrating migration trends within the pharmacy workforce across example countries:
    - In **Nigeria**, the number of migrating pharmacists rose from 124 in 2013 to 702 in 2024, with Canada consistently being the most preferred destination (data from the Pharmacy Council of Nigeria).
    - In **Zimbabwe**, migration increased from 35 in 2022 to 66 in 2023, before slightly declining to 59 in 2024, with Canada remaining the top destination (data from the Pharmaceutical Society of Zimbabwe).
    - **Romania** experienced a decline in pharmacist migration, with numbers falling from 198 pharmacists in 2015 to just 113 in 2021 (data from the Association of Pharmacies and Pharmacists from Romania).
    - In **Saudi Arabia**, non-Saudi pharmacists make up a majority of the pharmacy workforce, accounting for 58% (21,350) of the total 36,810 registered pharmacists (data from the Saudi Pharmaceutical Society).
    - In **Germany**, between 2012 and 2023, a total of 723,000 applications for recognition and certificate evaluation were submitted, with 6,132 coming from foreign-trained pharmacists (data from Federal Union of German Associations of Pharmacists).
    - In the **Philippines**, from 1997 to 2007, a total of 1,821 Filipino pharmacists and pharmacy assistants worked overseas. Saudi Arabia was the top destination for

[i] This report will avoid the use of this term. By 'brain drain' we mean loss of human capital and talent from one area to another.

both groups. Among pharmacists, 51% were employed in Saudi Arabia, followed by Papua New Guinea as the second most common destination at 12.6%.[15]

6. Efforts to support the integration of migrant pharmacists have been implemented in HICs. For example:
    - In **Sweden**, a multi-stakeholder initiative led by Sveriges Farmaceuter (The Swedish Pharmacists Association) in collaboration with Sveriges Apoteksförening (The Swedish Pharmacy Association), Lif, Almega, and Svensk Handel called Project Senna was implemented from 2017 to December 2024 to support foreign-trained pharmacists' integration into the Swedish labour market. Approximately 700 foreign-trained pharmacists have received help through the project, and around 800 pharmacists received Swedish licenses between 2017 and 2025 (data from the Swedish Pharmacists Association).
    - In **Germany**, the project "IQ Apotheker: Innen für die Zukunft" was initiated in January 2017 to support migrant pharmacists by providing subject-specific language courses to overcome language difficulties while preparing to obtain state recognition. So far, the project has supported over 50 pharmacists to receive their recognition and work in Rhineland Palatinate (data from Federal Union of German Associations of Pharmacists).
7. Ethical recruitment practices are fundamental to sustaining a pharmacy workforce that meets regulatory standards and addresses the evolving needs of the healthcare system.
    - In **Australia**, pharmacists are recruited through temporary visas or skilled migration pathways. The Pharmacy Board of Australia, under the Australian Health Practitioner Regulation Agency (AHPRA), oversees registration. Key steps include providing a certificate of good standing, completing an English language test (if required), passing the Overseas Pharmacist Readiness Assessment (OPRA), and obtaining approval from the Australian Pharmacy Council before final registration with AHPRA.
    - In **Ireland**, pharmacists enter via the EU/EEA route or the Third Country Qualification Route (TCQR). The Pharmaceutical Society of Ireland (PSI) manages the process. EU/EEA applicants undergo qualification recognition and register via the PSI portal or the European Professional Card. TCQR applicants complete adaptation or equivalence exams, pass the Professional Registration Examination (PRE) and then register with PSI.

Key message

Workforce migration contributes to achieving universal health coverage (UHC) by alleviating critical workforce shortages in destination countries, yet it risks destabilising health systems in source countries. To manage migration flows, coordinated action among stakeholders is essential. Strengthening data-driven efforts to monitor the workforce and identifying tailored strategies for each country will help ensure a sustainable pharmacy workforce.

Related FIP Development Goals

Workforce migration aligns with all 21 FIP Development Goals (DGs).[1] For example, DG 12: Pharmacy Intelligence drives the use of migration data for evidence-based planning and monitoring; DG 10 (Equity and Equality) aligns with ethical recruitment and integration of migrant pharmacists; and DG 21 (Sustainability in Pharmacy) supports long-term workforce resilience and sustainable service delivery.

Call to action

1. **Governments & health ministries**
   Strengthen bilateral agreements to manage ethical recruitment of the pharmacy workforce and mitigate attrition of human capital by promoting knowledge-sharing and professional development between source and destination countries.
2. **Regulatory bodies & policymakers**
   Enforce ethical international recruitment standards by aligning with global best practices. Implement monitoring systems to assess the impact of migration on national health systems, particularly with regard to workforce sustainability. Enforce accountability for unethical recruitment practices.
3. **Educational institutions & educators**
   Align curricula with both local and global health priorities, ensuring pharmacy graduates are equipped with skills needed to meet evolving healthcare demands. Expand opportunities for cross-border partnerships, such as exchange programmes to build a globally competent workforce.
4. **Professional associations & pharmacy leadership**
   Advocate for fair working conditions, professional recognition, and career development for migrant and local workers alike. Lead global dialogues on workforce equity, fostering collaboration between FIP, WHO, and national pharmacy associations to align migration with health system resilience and sustainable workforce.

Global pharmacy workforce snapshot:

Migration of pharmacists from low- and middle-income countries to wealthier nations is accelerating. In Nigeria, the number of migrating pharmacists rose from 124 in 2013 to 702 in 2024 — **a sixfold increase** — with Canada consistently being the most preferred destination (Pharmacy Council of Nigeria, unpublished).[1]

Without strong retention policies and ethical recruitment practices, global health inequities will deepen, and the projected **11.1 million health worker shortfall by 2030** will widen.[2]

FIP calls on governments and partners to invest in decent work, education expansion, and ethical recruitment frameworks — securing the pharmacy workforce needed to achieve UHC and health equity.

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2. World Health Organization. Global strategy on human resources for health: workforce 2030: report by the Director-General. Geneva: WHO; 2024. Report No.: EB156/15.

1. Why pharmacy workforce migration is a FIP priority

The international migration and mobility of health workers is a long-standing phenomenon driven by labour market imbalances.[2] In recent years, it has attracted growing global attention due to worsening health workforce shortages. Migration of the pharmacy workforce is a critical concern for FIP, as it directly affects workforce availability and impacts the accessibility, quality, and sustainability of pharmaceutical services worldwide.

Aligned with global health commitments

The issue of pharmacy workforce migration aligns closely with UN SDG 3 (Good health and well-being),[3] particularly Target 3.c which calls for "substantially increasing health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States." It is also aligned with SDG 10 (Reduced inequalities),[4] notably Target 10.7 to "facilitate orderly, safe, regular and responsible migration and mobility of people, including through implementation of planned and well-managed migration policies."

Since 2006, FIP has led global pharmacy workforce surveillance, supporting its member organisations with robust data to inform evidence-based workforce planning, policymaking and advocacy (see Chapter 2A for more information about the global pharmacy workforce). The first global pharmacy workforce report, published by FIP, was a landmark in identifying trends in international pharmacy migration. It called for regular, standardised data collection at sub-national and national levels to inform stakeholders and policy responses.[5]

FIP's ongoing surveillance aligns with the principles of the WHO Global Code of Practice on the International Recruitment of Health Personnel, which promotes the need for international cooperation, data sharing, and measures to protect the health systems of vulnerable countries from excessive outflows of skilled professionals.

Migration is addressed across several FIP Development Goals (DGs).[1] For example, DG 12 (Pharmacy Intelligence) drives the use of migration data for evidence-based planning and monitoring; DG 10 (Equity and Equality) aligns with ethical recruitment and integration of migrant pharmacists; and DG 21 (Sustainability in Pharmacy) supports long-term workforce resilience and sustainable service delivery.

Workforce migration is driven by persistent global shortages and affects countries across all income levels. Pharmacist shortages were first formally reported in the 1990s. Broader concerns around health workforce deficits date back to the 1970s, gaining momentum after the release of the world health report in 2006.[6,7] The COVID-19 pandemic has further intensified the vulnerability of countries with low workforce densities. In response, WHO published a health workforce support and safeguards list in 2023,[8] highlighting countries with the most pressing health workforce shortages and safeguarding the countries from targeted active recruitment.

In LMICs, population growth continues to outpace the expansion of the health workforce, thereby creating shortages in the availability of the health workforce, including pharmacists.[9] South-East Asia and Africa are the most affected regions with health workforce shortages of 6.9 million and 4.2 million respectively. Africa's workforce shortage is more critical when compared to the population size.[1] Pharmacists from Sub-Saharan Africa frequently relocate to HICs such as the UK, Australia, and Canada,[10] contributing to the strain on already overburdened health systems and further exacerbating workforce shortages in their home countries.

In HICs, such as the USA, UK, Canada, and Germany, the demand for health workforce has been intensified, with the COVID-19 pandemic[11] further exposing and aggravating existing staffing and workforce shortages.[12] With these ongoing migration trends, projections indicate that the movement

of pharmacists will continue to rise over the next decade, particularly among younger professionals seeking economic stability and career advancement.[13]

2. Drivers and implications of pharmacy workforce migration

2.1 Factors influencing migration

Migration is driven by a complex interplay of motivations and circumstances that shape both the decision to leave one's home country and the choice of destination. Structural drivers—push and pull factors— influence the migration flows. In addition, demographic characteristics, alongside political shifts, healthcare policy reforms and external crises further shape the scale and direction of pharmacist mobility. The details of these factors are outlined below.

1. Push and pull factors

Factors influencing migration have been categorised into push factors, which drive pharmacists to leave their home countries, and pull factors, which attract them to specific destination countries.[10, 14] As summarised in
Table 1, these push and pull factors are often shaped by the underlying economic, political, and social factors alongside the working conditions and career development within each country.[10, 14-17]

Table 1. Push and pull factors influencing migration

Push factors	Pull factors
Few opportunities for career advancement	Better career opportunities
Low salaries	Higher earning
Inadequate working conditions	Improved working conditions
Systemic challenges in source countries	Higher standard of living
Lack of resources and infrastructures	Travel opportunities
Economic crises	Better health system
Fewer opportunities for higher education	Better opportunities for education and specialisation
Job insecurity	Better security provision
Lack of technology	Better technology in healthcare
Family income and social quality	Economic support to the family in source country

Push factors are associated with source countries—which are usually LMICs—where economic crises (such as the 1997 Asian financial downturn), depress salaries and erode purchasing power, rendering pharmacy an unprofitable career domestically in the country.[18] Systemic challenges further exacerbate these pressures, whereby an oversupply of trained pharmacists relative to domestic demand creates fierce competition for scarce positions.[19] These factors collectively diminish the benefits of remaining in source countries, pushing pharmacists towards HICs where their skills command greater value. In India, Kunnumbrath et al[20] found that pharmacists earn far less in their home country than they could abroad, and feel professionally undervalued. Similarly, in Pakistan, 4.4% of respondents cited poor infrastructure and ongoing security issues as key migration drivers.[21]

Pull factors are associated with destination countries, which are usually HICs.The choice of a destination country is mostly personal, with the expectation of better living and professional circumstances.[17] Trends from Poland and Lithuania illustrate this allure, with outflows to Germany, where European Union (EU) mobility facilitates migration, and salaries are triple those at home.[22] The UK, though historically a source country, has also become a destination for Eastern European pharmacists, drawn by NHS opportunities, before some onward migration to North America or Australia.[23]

2. Demographic characteristics

Demographic characteristics such as age and gender can also influence migration. For instance, a study among UK pharmacists found that 16.7% of male pharmacists intended to work abroad

temporarily after five years on the pharmacy register, compared to 10.2% of female pharmacists.[24] Similarly, a global survey conducted by the International Pharmacy Students' Federation (IPSF) and the Young Pharmacists Group (YPG) revealed that over 80% of respondents from upper-middle, lower-middle, and low-income countries aspired to study and work abroad. Notably, around 60% of these respondents expressed plans to migrate either immediately after graduation or within five years.[10]

2.2 Impact on healthcare systems

The migration of pharmacists has far-reaching effects on healthcare systems. It undermines access to essential pharmaceutical services, disrupts service delivery, and weakens the long-term sustainability of health infrastructures in both LMICs and HICs.

1. Access to care

The WHO recommends a skilled health worker density of 4.45 per 1000 for a country to achieve health-related SGDs.[25] Most LMICs have poor health indices, and the WHO has estimated that countries with less than 23 health workers per 10,000 cannot deliver essential services.[26] Indeed, there is an inverse relationship between the number of doctors per population and under-5 childhood mortality.[25] In regions such as Sub-Saharan Africa, where healthcare infrastructure is already fragile, the loss of trained professionals exacerbates medication inaccessibility, driving reliance on informal vendors or untrained personnel.[25]

2. Service delivery

Pharmacist migrations induce workforce gaps that disrupt service delivery, particularly in source countries, where pharmacists are integral to medicine supply chains and interdisciplinary care. In the Philippines—a key source of healthcare professionals—high emigration rates have strained health services, disrupting vital services such as pharmacovigilance and continuity of pharmaceutical care.[18] This health worker shortage often shifts responsibilities onto overburdened nurses or physicians, who are not equipped with the necessary skill set to provide pharmaceutical care.[18] On the other hand, migrant pharmacists often face challenges that temporarily affect their service delivery. Licensing challenges, linguistic and cultural barriers, and the under-use of their skills prevent their integration into healthcare teams.[18]

3. Sustainability of healthcare systems

Healthcare systems are threatened by the strain migration imposes on source countries. There is an investment of public funds in training pharmacists in LMICs. When these pharmacists emigrate to wealthier countries, they lose this investment.[27] In countries such as Ghana, the loss of highly skilled healthcare workers with technical and intellectual pedigree affects the workforce distribution, leaving less experienced workers and eroding long-term healthcare resilience due to the inability to rapidly replenish the workforce.[28] Conversely, destination countries such as the UK exhibit a growing dependence on foreign-trained pharmacists to address domestic shortages.[29] This reliance introduces vulnerabilities, as shifts in immigration policy or global competition for talent could destabilise local service provision.

3. Country case studies

3.1 Migration trends in Nigeria, Zimbabwe, Romania, Saudi Arabia, Germany and the Philippines

The trends below represent the data gathered from FIP member organisations (MOs) in the following countries:

Nigeria (Data submitted by the Pharmacy Council of Nigeria)

The migration trend in Nigeria shows a general increase from 2013 to 2024, with numbers rising from 124 in 2013 to 702 in 2024, as shown in Figure 1. Although there were declines in 2020 and 2022, the overall trend exhibits a rise in migration. In addition, Canada remains the most preferred destination for Nigerian pharmacists who migrated between 2013 to 2024.

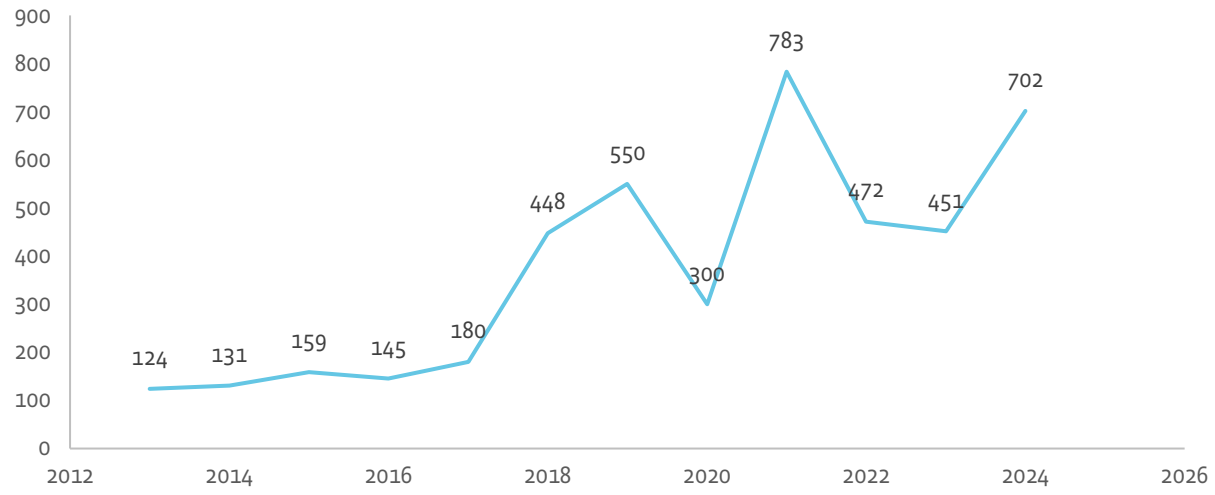

Figure 1. Trend showing the number of emigrated pharmacy workforce in Nigeria across 13 years (2012-2024)

Zimbabwe (Data submitted by the Pharmaceutical Society of Zimbabwe)

In Zimbabwe, migration increased from 35 in 2022 to 66 in 2023, before slightly declining to 59 in 2024, with Canada remaining the top destination.

Romania (Data submitted by the Association of Pharmacies and Pharmacists from Romania)

As shown in Figure 2 pharmacist migration exhibits a declining trend in the number of emigrants. The preferred destination countries are located in four regions: Europe, America, Africa and Australia, with European countries being the most preferred destination, likely due to their proximity to Romania and the relative ease of professional qualification recognition.

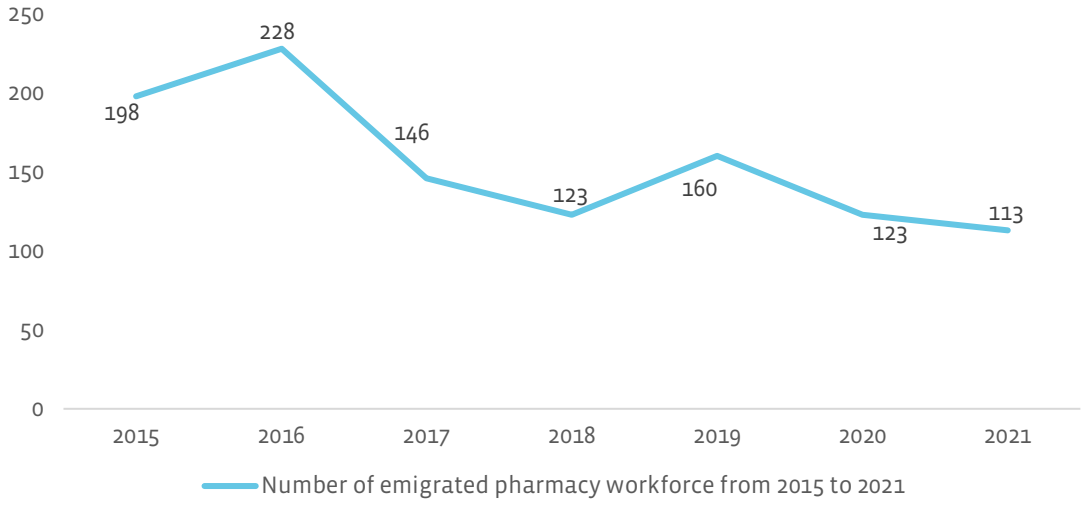

Figure 2: Number of emigrated pharmacy workforce in Romania (2015-2021)

Saudi Arabia (Data submitted by the Saudi Pharmaceutical Society)

Non-Saudi pharmacists make up a majority of the workforce, accounting for 58% (21,350) of the total 36,810 registered pharmacists.

Germany (Data submitted by ABDA - Federal Union of German Associations of Pharmacists)

Between 2012 and 2023, a total of 723,000 applications for recognition and certificate evaluation were submitted, with 6,132 coming from foreign-trained pharmacists. This highlights the notable presence of internationally trained pharmacists seeking certification.

The Philippines

The migration of Filipino pharmacists and pharmacy assistants increased from 1997 to 2007, with Saudi Arabia being the top destination country among other Gulf states. Among pharmacists, 51% were employed in Saudi Arabia, followed by Papua New Guinea as the second most common destination at 12.6%.[30]

Filipino pharmacists' migration provides an opportunity for a higher number of pharmacy graduates in the Philippines to address workforce shortages in Gulf States such as Saudi Arabia.[30] The Saudi Pharmaceutical Society stated that the mutual benefits associated with migration patterns include filling the workforce gap, especially in the community sector, financial benefit for all parties, and language similarity between source and destination countries which makes it easier for migrant pharmacists to integrate, expand, and provide coverage for community pharmacy in rural areas of Saudi Arabia.

3.2 Efforts to support the integration of migrant pharmacists in Sweden and Germany

High-income countries implement various initiatives such as including language learning assistance, cultural competency training, support networks, and workplace integration support to facilitate the integration of the workforce into the country.[31]

Sweden (Project Senna – Data submitted by Swedish Pharmacists Association)

A multi-stakeholder initiative led by Sveriges Farmaceuter (The Swedish Pharmacists Association) in collaboration with Sveriges Apoteksförening (The Swedish Pharmacy Association), Lif, Almega, and Svensk Handel called Project Senna was instrumental in integrating foreign-trained pharmacists into the Swedish labour market. The project was implemented from 2017 to December 2024 and was funded by the Swedish Public Employment Service (Arbetsförmedlingen) with additional financial contributions from Sveriges Farmaceuter.

Project Senna specifically supports pharmacists who have obtained their degrees outside the EU. Approximately 700 foreign-trained pharmacists have received help through the project, and around 800 pharmacists have received Swedish licenses between 2017 and 2025.

To obtain these licenses, applicants must complete a theoretical and practical knowledge test, six months of practical training, and a legal course. Proficiency in Swedish (at the Swedish 3 level, equivalent to upper secondary school) is required to apply for the license once all other criteria from the National Board of Health and Welfare (Socialstyrelsen) have been met. The Swedish pharmacy industry has a significant demand for foreign pharmacists, and to assist with this, pharmacies like Kronans Apotek have employed 18 pharmacists under Sweden's "new start job" programme to help them study and work.

Project Senna provides various free tools and activities to support newly arrived pharmacists and pharmacy technicians. These include:

- Regular study circles for the theoretical knowledge test, held three times a year
- Communication training and workshops for the practical exam
- Counselling and support
- Lectures
- Study visits to pharmacies and pharmaceutical companies
- Job fairs (e.g., Farmaforum).

However, the licensing process is long and demanding, typically taking between two to five years, with many pharmacists finding the Swedish language particularly challenging. Individual experiences vary; while some pharmacists benefit from the support offered, others find the requirements and time

commitment discouraging, especially given the financial and emotional strain. Despite language support, fluency in Swedish remains a major hurdle in professional settings, often delaying full workforce integration.

Germany (Project "IQ Apotheker: Innen für die Zukunft" – Data submitted by ABDA - Federal Union of German Associations of Pharmacists)

To support the integration of the pharmacy workforce into the system, a structured integration and support programme was established. This facilitates the recognition of foreign qualifications and eases the transition of internationally trained pharmacists into its healthcare system.

Central to this effort is the project "IQ Apotheker: Innen für die Zukunft" which enables migrant pharmacists to pursue their profession in Germany. The project was initiated in January 2017 and has since supported over 50 pharmacists to receive their recognition and work in Rhineland Palatinate. The project supports international pharmacists by providing subject-specific language courses to overcome language difficulties while preparing to obtain state recognition.

Other efforts include the German government's "Professional recognition for pharmacists in Germany" portal, a comprehensive resource guiding foreign professionals through the validation process for their credentials. Beyond this, targeted initiatives under Network IQ (Integration through Qualification) provide specialised support. For instance, APO-Online, a blended-learning platform, offers tailored courses to bridge gaps in regulatory knowledge (such as German pharmacy law and practices). The Interlacing Practice and Language programme integrates language training with hands-on vocational skills, ensuring pharmacists develop both linguistic proficiency and workplace readiness.

3.3 Workforce planning and ethical recruitment practices for migrants to Australia and Ireland

Workforce planning and ethical recruitment practices are critical to ensuring a sustainable and equitable pharmacy workforce. Both Australia and Ireland have implemented structured pathways for the migration and integration of foreign-trained pharmacists, reflecting their efforts to align workforce supply with healthcare demands while maintaining professional standards.

Australia

The supply of pharmacists in Australia is determined by the number of pharmacy students and the migration of foreign-trained pharmacists.[32] For the last 20 years, the number of pharmacists in Australia increased from around 13,000 to 31,955 in 2019.[33, 34] This has been associated with an increase in the number of pharmacy schools delivering entry-level pharmacy programmes from six in 2002 to 18 as of 2020.[34]

To practice in Australia, the Pharmacy Board of Australia (PBA) registers pharmacists in practicing, provisional or non-practicing categories, as part of the National Registration and Accreditation Scheme, administered by the Australian Health Practitioner Regulation Agency (AHPRA).[35, 36] The ethical migration process for pharmacy professionals to practice in Australia begins with a certificate of good standing from the source country pharmacists council/board, which is then followed by an international standardised test of English language proficiency for colleagues from non-native English-speaking countries. After that, the professional undertakes the Knowledge Assessment of Pharmaceutical Science (KAPS), now called Overseas Pharmacist Readiness Assessment (OPRA).[37] After satisfying the examiners, an Australian Pharmacy Council (APC) – KAPS letter is issued. An International Criminal History Check (ICHC) is also a requirement, followed by an application for registration with the Australian Health Practitioners Regulatory Authority (AHPRA)[38] which is then followed by a visa application.

Australia has experienced several policy shifts aimed at maintaining balance in the pharmacy workforce. In the 1990s, pharmacists were included under the General Skilled Migration (GSM) visa category, offering a direct pathway to permanent residency and citizenship.[32] Between 2005 and 2010, this pathway brought in over 2,080 pharmacists, more than half of whom were trained in Australia.[32] However, the discontinuation of GSM in 2013 led to a sharp drop in international applicants, disrupting workforce supply and university enrollments.[32]

In response, a policy was introduced in 2018[39] to boost the number of pharmacy graduates. While this increased graduate output, the sector continued to face staffing imbalances due to retirements, emigration, and career shifts—indicating that graduate expansion alone is not enough without strategies for retention and equitable distribution.

More recently, in 2021,[39] pharmacists were placed on the priority migration skilled occupation list as part of the government's pandemic response. This policy allowed for prioritised entry and travel exemptions, temporarily increasing workforce numbers to meet urgent healthcare demands. However, while effective in the short term, it underscores the importance of long-term workforce planning to prevent cyclical shortages and ensure a sustainable pharmacy workforce.

Ireland

Over 7,000 pharmacists in Ireland were registered with the Pharmaceutical Society of Ireland (PSI) in 2022.[40] In the subsequent year, there was a shortage of pharmacists in Ireland's community sector which serves as the primary point of contact for healthcare in communities.[40] Following the increased workforce shortages, the PSI commissioned a workforce intelligence report in 2023,[41, 42] which indicated that the number of pharmacists available to work could be increased by receiving and processing larger numbers of registration applications from pharmacists who qualified from countries outside of Ireland and the European Economic Area (EEA).

Recruitment of foreign pharmacists is through two distinct entry pathways: One for pharmacists with qualifications from non-European Union (EU) or European Economic Area (EEA) countries,[43, 44] and the other for those trained within the EU/EEA.[45] The "Third Country Qualification Route (TCQR)" is for migrant pharmacists from the non-EU/EEA.[41, 43, 46] Under the direction of the statutory instrument, TCQR candidates must satisfy the PSI of their standard of training by completing an 'equivalence' examination and/or undergoing an 'adaptation' period of training, after which they must pass the Professional Registration Examination (PRE), the examination taken by Irish graduates for entry to practice. All candidates taking the TCQR route to certification in Ireland since its inception in the current form have been evaluated by RCSI faculty and associated faculty assessors.[47] Depending on the individual applicant, the length of time from initial application to the issuing of an appropriate certificate to practice in Ireland can vary and has been described as lengthy by the PSI.

Pharmacists can make an application to register in Ireland with the PSI if they hold a pharmacist qualification from a European Union or European Economic Area (EEA) member state.[46] This route of registration is a two-step process. The first step is an application for recognition of your qualification, and this is referred to as Qualification Recognition. Once this is obtained, the second step is an application for registration (First Time Registration). Both steps should be completed on the PSI online registration portal. Alternatively, an application for qualification recognition may be made first using the European Professional Card (EPC) system.

A surge in applications from third-country pharmacists prompted an expansion of pharmacy schools to accommodate increased demand. Despite this, retention issues persist, as many newly qualified pharmacists either emigrate or transition out of patient-facing roles due to job dissatisfaction and workforce constraints. In addition, Ireland faces regulatory challenges such as excessive red tape[ii] and visa restrictions which pose a threat to business growth and economic development. Addressing these barriers through policy reforms can improve business competitiveness, attract foreign expertise, and drive long-term economic growth.

4. Case studies

FIP received case studies from several FIP member organisations. These contributions provide valuable insights into the pharmacy workforce migration in their respective countries:

1. Association of Pharmacies and Pharmacists from Romania, Romania
2. Canadian Pharmacists Association, Canada
3. Royal Pharmaceutical Society, United Kingdom
4. The Pharmacists' Defence Association (PDA), United Kingdom

[ii] Policy-induced barriers to trade that do not generate revenue or rents, are an important source of trade costs.

5. Conclusion

Pharmacy workforce migration is a critical global issue that directly impacts the accessibility, quality, and sustainability of pharmaceutical services, particularly in countries facing workforce shortages. FIP recognises the need for coordinated, evidence-based action to address the imbalances driving migration and to support ethical, well-managed mobility. By aligning with the WHO Global Code of Practice, UN SDGs, and its own Development Goals, FIP advances international cooperation, promotes pharmacy intelligence, and supports policies that protect vulnerable health systems while enabling fair opportunities for migrant pharmacists.

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2C. Building a capable pharmacy workforce – From competency to advanced and specialised practice

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Content list

High level summary

1. Pharmacists are increasingly taking on advanced and specialised roles in response to global health challenges such as ageing populations, rising chronic diseases, healthcare workforce shortages, and digital transformation.[1-5]
2. Developing and recognising pharmacy competencies in relation to advanced practice and specialisation is critical to building a responsive, skilled, and future-ready pharmaceutical workforce.[6-10]
3. Clarity of terminology is essential. Concepts like "competency," "capability," "advanced practice," and "specialisation" are often used interchangeably, yet they represent distinct professional trajectories that require differentiated recognition and development strategies. Global concordance on lexicon is essential, particularly as scope of practice and professional roles are rapidly extending.
4. Specialisation ideally refers to a deepening of knowledge within a defined field or scope of practice (e.g., oncology pharmacy, radio-pharmacy, mental health pharmacy, etc.),[11, 12] while advanced practice reflects vertical progression in complex competencies, such as professional responsibility, autonomy, and leadership, often across sectors.[12-15]
5. FIP provides access to global frameworks to support countries in structuring workforce development:[16]
    a. Global Competency Framework (GbCF) for early-career readiness and foundational skills.
    b. Global Advanced Development Framework (GADF) to guide progression from foundational to expert.
    c. Global Competency Framework for Educators (GCFE) to strengthen teaching and training capability (particularly for non-academic sector practitioners).
6. Digital health transformation demands new competencies. FIP has launched courses and has developed a global digital health competency framework to support pharmacists in leading and integrating digital care (due for launch early 2026).
7. Pharmacist independent prescribing is expanding worldwide, supported by evidence showing improved medicines access, improved medicines optimisation, and health system efficiency.[17] Some countries are at advanced stages of regulatory development, some have implemented, others have not. This will clearly have an impact on what we currently consider 'advanced practice' and how these varied models (independent, collaborative, protocol-based) map to foundational or advanced practice. Regulatory clarity, structured training, and public trust will all need to be addressed in this complex future picture.
8. Pharmacy specialisation continues to develop traction but lacks standardisation.[1] Definitions, credentialing pathways, and monitoring systems vary across countries, limiting mobility, recognition, and data comparability. FIP is currently building a global glossary (as a first stage) that will assist in this challenge.
9. Robust workforce intelligence is needed. Many countries lack data systems that track pharmacy specialisation and credentialing, hindering strategic workforce planning.[18-20] FIP advocates aligning with WHO's NHWA to fill these gaps.[21, 22]
10. FIP leadership in global competency advancement will support members and countries to adopt and adapt tools that build capacity, ensure career progression, and align pharmacy education and practice with health system needs.

Key message

Empowering pharmacists through competency development, specialization, and advanced practice is key to strengthening health systems and achieving universal health coverage. FIP supports this transformation by providing global frameworks and enabling national implementation.

Related FIP Development Goals

This chapter has principal alignment with the following FIP Development Goals, each of which underpins the advancement of competencies, specialisation, and advanced practice within the pharmaceutical workforce:

DG2 – Early Career Training Strategy

Supports the development of foundational competencies through frameworks such as the Global Competency Framework (GbCF), ensuring early-career pharmacists are practice-ready and equipped to grow into advanced roles.

DG4 – Advanced and Specialist Development

Provides guidance on structured progression from competent to expert-level practice using the Global Advanced Development Framework (GADF) and supports the establishment of specialisation pathways across various pharmacy sectors.

DG5 – Competency Development

Promotes the adoption and adaptation of global competency standards across all practice levels, ensuring workforce quality, alignment with health system needs, and consistency in capability development.

DG7 – Advancing Integrated Services

Highlights the evolving roles of pharmacists in prescribing, public health, digital health, and interprofessional teams, contributing to more integrated, accessible, and patient-centred healthcare delivery.

Call to action

1. **National pharmacy organisations**

   Develop and implement structured pathways for career progression by adopting and localising FIP frameworks (e.g., GbCF, GADF, GCFE), defining national specialisation criteria, and integrating these into education, CPD, and professional recognition systems to reflect evolving scopes of practice. This should include extending recognition of both specialisation and advanced practice across all pharmacy sectors, including community and primary health care, where advanced competencies such as prescribing are increasingly required.

2. **Regulatory bodies & health authorities**

   Establish enabling regulatory and policy environments that formally recognise advanced and specialist pharmacy roles, support prescribing frameworks, competency and credential-based licensure and workforce data systems aligned with WHO NHWA.

3. **Academic institutions**

   Align pharmacy education with global standards by embedding FIP competency frameworks across curricula, expanding specialisation offerings, supporting educator development through the GCFE, and ensuring training reflects current and emerging health system needs.

4. **Employers and health systems**

   Create institutional frameworks for workforce development by supporting advanced roles, pharmacist prescribing, and specialist service models. Use FIP frameworks to guide internal job grading, CPD planning, and impact evaluation on care quality and access.

5. **International partners**

   Strengthen technical support and global coordination to accelerate country-level implementation of frameworks, develop standardised digital and prescribing competencies, and expand intelligence on pharmacy specialisation and credentialing worldwide.

While **over 5.5 million pharmacists** deliver care globally, structured lifelong development remains inconsistent. FIP's frameworks — the Global Competency Framework (GbCF), Advanced Development Framework (GADF), and Competency Framework for Educators (GCFE) — provide clear pathways from foundational skills to advanced and specialist roles.[1-3]

Structured, lifelong development is essential: pharmacists are increasingly managing chronic diseases, driving public health campaigns, and delivering digital health services — but formal career progression pathways remain limited in some countries.[4,5]

FIP urges governments, educational leaders, and health partners to embed competency-based advancement into national pharmacy strategies, invest in specialisation pathways, and formally recognise the evolving roles of pharmacists as clinical, public health, and digital health leaders.

FIP frameworks support every step of the journey — from core competencies to specialisation, building the pharmacy leaders health systems need.

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1. Advancing pharmacy for global health

Developing and recognising pharmacy competencies, career advancement, and specialisations is a priority for FIP as it directly strengthens workforce capability to meet population health needs. When pharmacists are empowered with advanced skills and competencies, whether in clinical specialities (like oncology or paediatrics) or in extended roles such as prescribing and public health, patients experience better outcomes, health systems become more efficient, and progress is made toward universal health coverage (UHC).[6-10] In short, ensuring pharmacists are well-trained, competent, and able to practice at an advanced scope of practice supports the FIP mission and the shared global aim of "health for all."

Globally, healthcare systems are witnessing a growing demand for advanced healthcare services. The escalation of demand is driven by a number of factors related to technological advancements, the ageing population, the emergence of new diseases and pandemics, and the shift toward personalised medicine and patient-centred care.[2-5] Accordingly, over the past few decades, pharmacists' role has extended beyond the traditional of preparing and dispensing medications to more profound and broader involvement in direct clinical care, public health, self-care, health policies, regulatory affairs and digital health.[23-25]

2. Clarifying evolving terminology

Clarifying terminology is essential to advancing pharmacy practice on a global scale. Terms such as "competencies," "capabilities," "scope of practice," "advanced practice," "specialism" and "specialisation" are often used interchangeably, yet they carry different meanings depending on the country or health system. For instance, "expanded scope" in one context may be considered an "advanced role" in another, and prescribing rights may be defined as independent in some regions and collaborative in others.

Rather than debating definitions, FIP promotes an inclusive and practical understanding that captures the diversity of global pharmacy practice. This approach recognises that despite regional variation, pharmacists around the world are increasingly adopting new responsibilities, enhancing their skills, and delivering greater value to health systems. However, by using consistent language and clarifying overlapping concepts, FIP aims to help policymakers, regulators, and global health partners, including WHO, appreciate the full scope and significance of pharmacists' evolving contributions to public health. FIP is currently building a comprehensive, interactive, global glossary (as a first stage) that will assist in this challenge.

3. Distinguishing advanced practice from specialisation

As pharmacy evolves globally, two distinct yet interconnected concepts have emerged as cornerstones of workforce development: advanced practice and specialisation. While they are often discussed together, it is critical to distinguish their unique trajectories and implications.

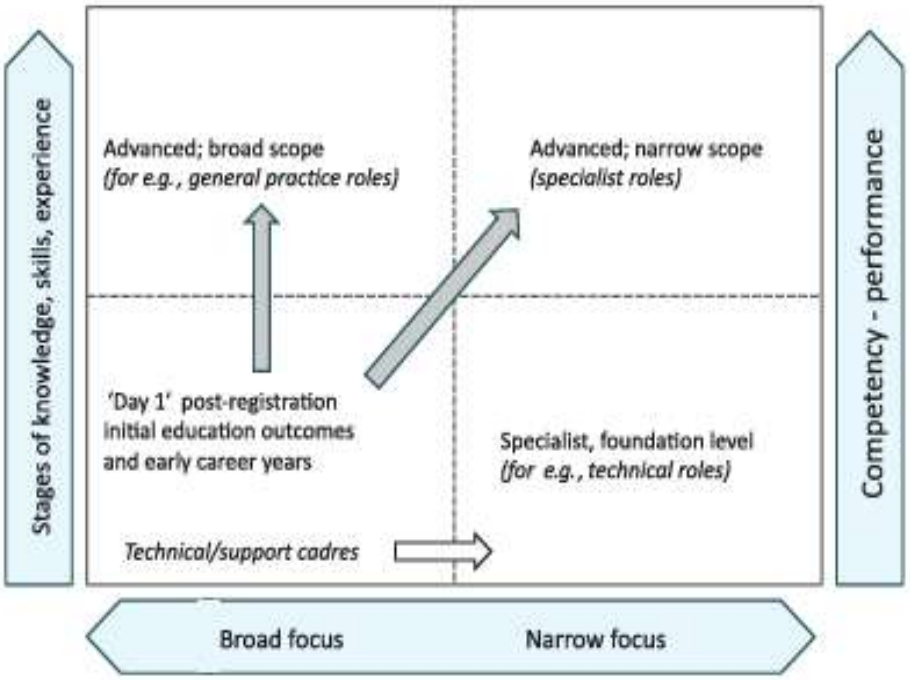
Specialisation refers to horizontal progression, acquiring in-depth expertise within a scope of practice—such as cardiology, oncology, infectious diseases, mental health pharmacy, or pharmacy informatics.[11, 12] This pathway often (but not always) includes formal or certificated education, credentialing, or recognition by national regulatory bodies or professional associations.[11, 12] Specialisation deepens domain-specific knowledge and experience and enhances a pharmacist's ability to provide targeted, high-quality care. For example, as primary health care challenges intensify in many countries, community-based pharmacy increasingly requires advanced levels of practice, including prescribing competencies. Yet, unlike family doctors or general practitioners, who typically undertake significant additional post-registration regulated training, 'community pharmacy' is seldom recognised as an advanced specialism. This perspective also resonates with the ongoing work of the FIP Taskforce on professional recognition, which is considering how recognition mechanisms can be applied consistently across the entire profession, regardless of sector.

Advanced practice represents vertical progression. Advancement focuses on developing higher-order capabilities that surpass entry-level competencies, incorporating leadership, clinical decision-making, autonomy, and complex care delivery.[12-15] It enables pharmacists to work at higher levels of responsibility and impact across various sectors, including clinical services, academia, public health, policy, and industry.[12-15] In addition, advanced practice recognition should also be considered for community and primary health care-based pharmacists, a sector that has often been overlooked in this regard. Such recognition would not only strengthen public trust in the profession but also reinforce the vision of the FIP Community Pharmacy Section (CPS).

While these pathways are distinct, they are also mutually reinforcing. Specialisation often serves as a foundation for advanced practice, and vice versa. Advanced practice roles may encompass multiple specialisations or lead interdisciplinary initiatives. The Global Advanced Development Framework (GADF), developed by FIP, captures this vision of capability progression.[16] It outlines clear levels of professional advancement—from novice to competent, advanced, and expert—applicable across all sectors of pharmacy.

Together with the Global Competency Framework (GbCF)—which defines foundational competencies for entry-level and early-career pharmacists—the GADF provides a full continuum for professional development. The GbCF forms the bedrock for initial practice readiness, while the GADF enables pharmacists to grow into advanced or expert roles, across all sectors and levels of care.

In summary, while specialisation denotes profound knowledge in a focused field, advanced practice enhances this expertise beyond initial qualification—enabling pharmacists to lead, innovate, and influence healthcare systems at a higher level. Specialisation cultivates advanced practice, as many advanced roles require deep, domain-specific knowledge.[15, 16] This dual pathway is illustrated in Figure 1, which visualises the horizontal and vertical dimensions in the evolution of pharmacy practice.[18] It should be noted however, that 'advancement' is fully compatible with a 'broad scope of practice'. Specialisation is not a necessary pre-requisite for advanced.



4. What FIP is doing: Global competency frameworks and guidelines

Recognising the critical role of an empowered pharmaceutical workforce in meeting global health priorities, FIP has prioritised:

1. Supporting countries in defining, adopting, or adapting competency frameworks across all levels of practice;
2. Encouraging career development models that reflect local health needs and support evolving scopes of practice;
3. Promoting the value of specialised expertise in areas such as prescribing, digital health, antimicrobial resistance (AMR), oncology, paediatrics, and mental health.

This strategic focus directly aligns with the FIP Development Goals (particularly DGs 1, 2, 3, 5, 8, 9, and 10), leverages the resources of the FIP Global Pharmaceutical Observatory, the FIP Hub and reflects FIP's commitment to supporting workforce transformation worldwide.

FIP and its member organisations are actively translating these needs and opportunities into concrete actions. Through a variety of frameworks, programmes, and partnerships, FIP is leading and supporting the transformation of the pharmacy workforce across all regions. Key initiatives include setting Global Competency Standards.

FIP Global Competency Framework (GbCFv2)

Recognising the need for global consensus on professional competencies, FIP launched the Global Competency Framework (GbCF) in 2012. The GbCF was the first global tool of its kind designed to guide the development, evaluation, and recognition of early-career pharmacists. It outlines competencies across four main clusters: pharmaceutical public health, pharmaceutical care, organisation and management, and professional/personal competencies.

In 2023, FIP released Version 2 of the GbCF, reflecting the evolving roles of pharmacists in health systems and responding to new global challenges. The revised framework added several new domains, including emergency preparedness and response, interprofessional collaboration, expanded self-regulation and leadership, and digital health. These additions acknowledged the shifting expectations on pharmacists to contribute across all aspects of health system strengthening—from emergency response and chronic care to public health communication and technology integration.

The GbCF is not designed to be prescriptive. Instead, it supports countries to "adopt and adapt" the framework to their national contexts. This flexibility allows countries to localise terminology, prioritise competencies based on health needs, and embed the framework into national education reforms, regulatory standards, and workforce strategies.

FIP's UNITWIN Centres of Excellence have played a key role in facilitating regional implementation. In 2024, the Centre for Excellence in the Southeast Asia region completed a validated adaptation of the GbCF for the region, engaging experts from Bangladesh, Bhutan, India, Indonesia, Myanmar, Nepal, Sri Lanka, and Thailand. This collaborative effort involved translating the framework into local languages, surveying stakeholders to assess relevance, and refining behavioural statements through consensus. The final adaptation is now being used in curriculum reform efforts in countries like Indonesia, aligning national training standards with regional needs and global benchmarks.

By providing a globally recognised structure for professional competencies, the GbCF enables alignment across education, training, service delivery, and regulation. It also supports the creation of meaningful progression pathways within the pharmacy profession and provides a strong foundation for lifelong learning and workforce development.

FIP Global Advanced Development Framework (GADF)

As pharmacy practice continues to evolve, frameworks that support career progression and high-level expertise have become essential. These frameworks not only provide structure for professional

development but also serve as tools for recognising advanced and expert-level contributions across diverse practice settings.

To address this, FIP introduced the Global Advanced Development Framework (GADF), a progression model that supports pharmacists from early career stages to advanced and expert levels. The GADF defines four key stages—early career, competent, advanced, and expert—and provides behavioural descriptors for each. This progression model is used by many countries to map workforce capabilities, establish credentialing criteria, and guide continuing professional development strategies. By using the GADF, pharmacy organisations and regulators can ensure consistent expectations, promote leadership, and expand pharmacist roles in clinical care, public health, research, and policy.

In parallel, FIP recognised that educators and trainers require specific capabilities to support this evolving workforce. To that end, FIP launched the Global Competency Framework for Educators and Trainers (GCFE). The GCFE defines the knowledge, skills, and behaviours expected of academic faculty and in-practice trainers. It addresses areas such as curriculum design, learner assessment, quality assurance, leadership, and mentoring. By supporting educators in their own professional development, the GCFE plays a critical role in improving the overall quality and responsiveness of pharmacy education systems.

These frameworks have also informed national reform efforts. For example, in Indonesia, the Ministry of Health and academic leaders have worked with FIP to map an Advanced Practice Competency Framework based on the GADF. This project aimed to define local expectations for advanced roles in hospital, community, and industrial pharmacy practice. It included stakeholder engagement, validation workshops, and alignment with the updated GbCF and national curriculum reforms. The Indonesian case illustrates how FIP tools can be tailored to country-specific needs while supporting international standards.

Together, the GADF and GCFE demonstrate FIP's commitment to supporting a capable and future-ready workforce through structured, competency-driven advancement for both practitioners and educators. These tools help ensure that pharmacy professionals are not only qualified but continuously developing the expertise needed to meet complex and changing health system demands.

Digital health competencies in pharmacy

As healthcare systems undergo rapid digital transformation, the pharmacy workforce must evolve accordingly. Pharmacists are increasingly expected to use digital tools in areas such as medicines optimisation, electronic health records, telepharmacy, and health data analytics. Digital health has become a top priority across global health policies and development strategies, with an emphasis on adopting tools that improve access, continuity, and quality of care. However, successful adoption relies on equipping pharmacists with the necessary digital competencies through structured education and professional development.

To support this need, FIP introduced the Digital Health in Pharmacy Education initiative, beginning with the 2021 FIP report titled "Digital health in pharmacy education: Developing a digitally enabled pharmaceutical workforce." This report identified significant gaps in digital literacy across many countries and provided key recommendations for integrating digital health into undergraduate, postgraduate, and continuing education programmes.

In response, FIP launched the FIP Online Course on Digital Health in Pharmacy in 2022, targeting both educators and practitioners. Developed collaboratively by the FIP Academic Pharmacy Section and the Technology Forum, the course aimed to build capacity among educators who could then embed digital health topics into pharmacy curricula. Over 230 participants enrolled in the first iteration of the course. It received positive feedback and was updated annually to reflect technological advances and evolving learning needs.

The course structure has since evolved into two certification pathways. The Foundational Certificate is awarded after completion of the first module, which introduces digital health tools and challenges relevant to pharmacy practice. Participants can then pursue an Advanced Certificate by completing

two additional modules, which focus on embedding digital health in education and supporting faculty to act as change agents in this space. Testimonials from participants highlight the course's value in enhancing professional practice and curriculum innovation across diverse regions.

This initiative complements FIP's broader efforts to define digital competencies through structured frameworks. The Digital Health Competency Framework (currently under development) aims to formally articulate the digital skills required across various pharmacy roles. Together, these initiatives ensure that pharmacists are equipped to contribute meaningfully to digital health transformation and lead innovation in health service delivery.

Professional recognition and credentialing

To complement this work, in 2025, FIP convened a global Task Force on Professional Recognition and Credentialing to develop a comprehensive thought paper (likely to be published in early 2026). The aim is to provide members with practical guidance on post-licensure credentialing systems and recognition processes that support the advancement of pharmacists' roles and competencies across various sectors. Drawing on existing FIP frameworks, international standards, and national case studies, the paper will offer a roadmap for implementing credentialing systems aligned with evolving scopes of practice. It will also reflect broad stakeholder input, including from the FIP Consortium and external partners, and is expected to guide advocacy, policymaking, and national adoption in support of an advanced and recognised pharmacy workforce.

5. Advancing pharmacy specialisations

5.1 Understanding specialisation in pharmacy

Specialisation is a horizontal expansion based on formal and informal sector-specific education and training, whether in a disease area, patient population, or healthcare setting. There is currently no globally agreed definition of pharmacy specialisation or other related terms, such as specialist or credentialed practice. National pharmacy organisations (such as the American Society of Health-System Pharmacists (ASHP), the Royal Pharmaceutical Society (RPS) in the UK, and the Society of Hospital Pharmacists of Australia (SHPA) in Australia) have been active in issuing and setting scope, criteria and requirements for specialisation; but they differ in language, content, 'certification' and implementation.[26] Standardising criteria will facilitate labour mobility and enable worldwide benchmarking. Accordingly, a unified definition of pharmacy specialisation is essential for establishing worldwide expectations, ensuring comparability across areas and facilitating reciprocal acceptance of scopes of practice.

In a 2015 report, FIP compiled a list of specialisation definitions across different regions and settings, emphasising that specialisation extends practice beyond traditional generalist domains.[26] Additionally, the report pointed out that specialisation should be on structured learning, competency recognition and regulatory or institutional validation. The FIP report is in alignment with the World Health Organization (WHO) 2030 Strategy on Human Resources for Health,[27] which highlights the role of specialised practice in improving the quality and accessibility of healthcare and in achieving universal health coverage.

Specialisation may not be linked to a job description or title. Since pharmacy practice is context- and sector-specific, different criteria could be used to categorise specialisation. The most direct approach to categorisation is based on the practice sector and activities. Accordingly, specialisation could be:

1. **Traditional specialisation** – related to knowledge and expertise within well-established clinical sectors such as oncology, neurology, and mental health. Given the complexity of healthcare needs and the heightened disease burden in the post-pandemic era, primary care-based pharmacy should increasingly be recognised as a specialisation.
2. **Service-based specialisation** – related to the nature of the services provided, such as pharmacovigilance, advanced medicine management and review, and pharmaceutical public health.

3. **Technical and system-based specialisation** – related to knowledge and expertise within growing sectors such as regulatory science, informatics, and pharmaceutical policy.
4. **Emerging specialisation** – related to knowledge and expertise within new sectors such as digital pharmacy, artificial intelligence, genomics and personalised medicine.

5.2 Global trends and regional variability

Globally, the tendency for specialisation is driven by numerous factors including:

1. **Demand for specialised and advanced healthcare services, and advanced medicinal products:** The increasing incidence of chronic illnesses and ageing demographics requires specialised treatment, including comprehensive medication management and chronic disease management programmes.[27, 28]
2. The recognition that **pharmacist prescribing** is one direct solution to the primary health care crisis, removing some of the workload burden from others in the medical team and improving long-term therapy outcomes.
3. **Technological advancements:** Incorporating digital health delivery and pharmaceutical technology has created new roles for pharmacists, such as telemedicine consultations and medication adherence applications.[23, 29-31]
4. **Financial incentives and rewards**: Specialised roles and services often provide more compensation and provide prospects for professional progression.[32, 33]

Regional comparisons show marked differences in specialisation trajectories. First, high-income countries have well-established organised specialisation pathways with formal recognition,[1, 14, 34-36] such as the state-specific framework for specialisation recognition in the USA, the national frameworks of Australia and Canada, and the credentialing pathway of specialist pharmacists in the UK. Secondly, middle-income countries, such as India and Brazil, are witnessing the establishment of formal specialisation frameworks that are being tailored to meet the growing demand for healthcare services.[26, 37, 38] Lastly, the financial and infrastructure challenges hinder developing and implementing specialisation pathways in low-income countries, as is the case in sub-Saharan Africa.[39-42]

5.3 Strengthening measurement and data systems

Robust data systems are essential for tracking trends in pharmacy specialisation, credentialing, distribution across healthcare systems, and evaluating outcomes. However, many countries lack workforce databases that categorise pharmacists by speciality, credentialing stage, or practice sector.[18-20]

Ideally, national workforce databases should collect and hold specialisation-specific indicators in terms of:

1. Number and demographics of specialist pharmacists by sector (e.g., oncology, geriatrics, informatics)
2. Types, levels, and year of credentials
3. Geographic distribution
4. Employment sector (e.g., clinical, industrial, regulatory).

Professional associations should also investigate programme effectiveness and indicators such as patient health outcomes, service quality, and accessibility. A harmonised approach to data collection and reporting would enable cross-country comparisons, mutual recognition, and alignment with Sustainable Development Goals (SDGs).[43]

5.4 Developing pathways and systems

FIP has contributed to global intelligence on pharmacy specialisation through its workforce surveys and reports, including the "Pharmacy Workforce Intelligence: Global Trends Report",[44] which provided valuable insights into capacity differences between countries and regions. However, data gaps and inconsistent methodologies continue to limit the ability to evaluate specialisation trends comprehensively.

At the national level, some professional associations have collected data related to specialisation. However, as the data collection methodologies vary considerably, there is a high level of discrepancy in the quality and depth of collected and reported data. This discrepancy hinders the possibility of cross-country or regional comparison and results in inconsistency in specialisation trend analysis. For instance, in 2019, the National Pharmacist Workforce Study indicated a two-decade rise in clinical activities conducted by USA pharmacists.[45] Nonetheless, inconsistencies in data gathering methodologies and terminology across various organisations might hinder the ability to derive complete conclusions about global specialisation trends.

5.5 Enabling governance and overcoming barriers

Enhancing data collection on pharmacy specialisation across various contexts and geographies requires the establishment of strong and strategic alliances with national, regional and international professional regulatory bodies and policy-making organisations. Institutional collaborations are crucial for addressing persistent barriers, such as the lack of integrated health workforce information systems—especially in low and middle-income countries (LMICs)—which frequently do not disaggregate pharmacists by specialisation, scope of practice or credentialing status.[46-48] Moreover, challenges such as legislative fragmentation, insufficient legal requirements for data exchange, and lack of standardised definition of specialisation persist in hindering progress.[1]

Professional regulatory authorities and policy-making entities are essential in formulating unified rules and data-gathering systems that guarantee consistency and comparability across practice sectors, countries and regions. These entities have the legal power, technological infrastructure and supervisory capability to enforce reporting obligations, manage intersectoral data flows and guarantee accountability in workforce monitoring. Pharmacy councils and health ministries may include specialisation-related areas in license or renewal procedures, thereby establishing centralised and regularly updated databases. These databases monitor specialty and facilitate overarching goals of workforce planning, professional growth, and health system enhancement.

Moreover, synchronising national data systems with global standards—such as the WHO's National Health Workforce Accounts (NHWA) and FIP's workforce development frameworks—can facilitate the implementation of uniform taxonomies and minimal datasets.[21, 22] Engaging regional health authorities in the co-design of digital workforce registries promotes the incorporation of specialisation measures into continuous professional development (CPD) records, thus improving the visibility and traceability of specialised jobs within the pharmacy workforce.

Facilitators for these collaborations include using existing infrastructures, such as electronic health records and pharmacy management systems, which may be optimised to gather data on pharmacist speciality effectively. Public-private partnerships provide further benefits by consolidating technical skills and financial resources to enhance the scope and effectiveness of these efforts. Engaging stakeholders is essential, including chemists, healthcare providers, academic institutions, and professional groups in the development and execution of data frameworks which guarantees contextual relevance, usefulness, and broader acceptance.

Furthermore, incorporating sophisticated analytics, including machine learning and big data methodologies, offers prospects for recognising implementation obstacles, predicting workforce requirements, and guiding adaptive policy approaches. These data-driven insights facilitate regional harmonisation, mutual recognition of specialisations, and the integration of pharmacy indicators into comprehensive human resources for health (HRH) plans and policy discussions.[1, 27] Ultimately, via collaborative governance and technical innovation, these collaborations may create sustainable data ecosystems that enhance pharmacy specialisation and improve patient care results.

5.6 Enhancing global health workforce surveillance with pharmacy specialisation data

One way to facilitate global specialised pharmacy workforce planning is by emulating the WHO National Health Workforce Handbook (NHWA) to design and implement a unified data collection methodology. Using a NHWA-type approach will enable the collection and reporting of specialisation data across multiple variables and across three principal domains: availability; performance; and, enabling environment.[21] Efforts could be made to design a specialisation-specific chapter within the second domain—performance—addressing variables such as (i) specialist classification, (ii) credentialing agency, (iii) educational pipeline indicators, and (iv) specialist retention and attrition rates.

The proposed chapter might provide technical assistance in monitoring pharmaceutical specialism, including definitional criteria, data-collecting instruments, and suggested indicators. This linkage would enhance visibility, comparability, and policy responsiveness in pharmacy workforce planning at all levels.

6. Pharmacist prescribing – the current global landscape

Healthcare policy trends on pharmacist prescribing

There is a growing policy trend for pharmacists to extend the scope of practice to include more overt prescribing activities.[17] The leading countries are the UK, Canada, and New Zealand, with several countries like Australia, France and Switzerland in the early stage of evolution.[49, 50] The healthcare system drivers include the increased demand for primary health care services, increased emergency department visits, an ageing population with comorbidities and complex pharmacotherapy, and in some regions, reduced access primary health care human resources.[51-54] The COVID-19 pandemic further highlighted the critical role of pharmaceutical care public health contributions in healthcare systems. Community pharmacists played a vital role in responding to public health needs by improving vaccination rates and ensuring continued access to essential health services.[55] Their contributions during the pandemic brought increased political awareness of the potential for better utilisation of primary health care professionals, including the pharmacy network.[55-58]

As global policy trends continue to develop, there is currently variability in pharmacist prescribing practices worldwide.[55] Different countries have adopted diverse models of pharmacist prescribing, not only within community and primary pharmacy settings but other settings such as tertiary care and acute sector hospitals.[59] Some jurisdictions permit independent prescribing, allowing pharmacists to manage and optimise pharmacotherapy, while others implement collaborative prescribing models, where pharmacists prescribe within agreed guidelines or within defined protocols.[55]

Current evidence suggests that pharmacist prescribing enhances patient outcomes, improves medicines adherence, and enhances accessibility to care, amongst other factors such as reducing workloads on human resources elsewhere in healthcare system.[60] However, successful implementation depends on factors such as regulatory frameworks, structured training programmes, government funding, physical infrastructure, information technology and public awareness and acceptance.[61, 62] As more governments consider expanding pharmacist prescribing, evidence-based policies will be crucial in ensuring patient safety and optimising healthcare delivery.

International context

Pharmacist prescribing has evolved significantly across different WHO regions, with each country adopting and adapting models to address common healthcare challenges.[55]

Americas

Pharmacy prescribing practices in Canada are legislated at the provincial and territorial levels. As of February 2025, all provinces and territories allow pharmacists to prescribe medications for a variety of common ailments except for Northwest Territories and Nunavut.[63] However, regulatory amendments are under consideration to extend prescribing rights to these regions.[63, 64] In Alberta, pharmacists can obtain additional prescribing authorisation (APA) which enables them to prescribe Schedule 1

medicines.[65] This provides the same authority to prescribe as medical practitioners, except for narcotics, controlled substances, targeted drugs such as mifegymiso, or medical assistance in dying.[66] Of note are exemptions for prescribing and providing controlled substances under Section 56(1) of the Controlled Drugs and Substances Act (CDSA) to allow pharmacists to extend or renew existing prescriptions for controlled substances, but not to prescribe at initial access or manage ongoing care.[67]

Pharmacist prescribing varies widely by state in the USA. Certain states including Alaska, California, Colorado, Hawaii, New Jersey and New Mexico can initiate prescriptions for contraception, HIV pre-exposure and prophylaxis, naloxone, and smoking cessation.[55] In some cases, this authority is granted through population based collaborative prescribing practice agreements.[68] There have also been federal policy changes, such as the FDA's authorisation for pharmacists to prescribe nirmatrelvir/ritonavir (Paxlovid™) for COVID-19.[69] In Montana, pharmacists can prescribe medicines based on diagnostic tests such as for influenza or group A streptococcus.[68] Idaho has one of the broadest autonomous prescribing scopes, covering preventive care and treatments for acute and chronic conditions.[70]

In Costa Rica, the Ministry of Health has regulated for pharmacists to supply hormonal contraception, such as levonorgestrel, in pharmacies without a prescription.[71] However, there is no regulatory framework for independent pharmacist prescribing. The College of Pharmacists of Costa Rica are working on a proposal for an executive decree (a government-issued order) that would officially allow pharmacists to recommend or prescribe certain medications as part of their professional role. In Brazil, pharmacists can prescribe prescription-only medications through collaborative agreements, with dosage adjustments and prescription renewals being the most common activities.[72-74]

Europe

Pharmacists in the UK have been able to become accredited as independent prescribers following a university qualification since 2006,[75] enabling them to prescribe autonomously for any condition within their clinical competence. Around a third of all pharmacists are now independent prescribers in the UK, and from 2026 all pharmacists graduating from an updated university degree qualification will qualify as prescribers following their foundation trainee year.

In Wales and Scotland, community pharmacists have been able to prescribe and be reimbursed by the National Health Service (NHS) for several conditions. Community pharmacist independent prescribers can also provide private services, such as travel medicine. Additionally, registered pharmacists who are not current regulated independent prescribers can provide treatment for other urgent conditions under defined protocols, such as UTIs via Community Pharmacy Extended Care Services.[76] In February 2024, following similar successful services in Wales and Scotland, a new NHS Pharmacy First service was announced in England enabling pharmacists to supply prescription only medication for acute otitis media, uncomplicated urinary tract infections in women, sore throat, sinusitis, impetigo, shingles, and infected insect bites. [77]

In Ireland, following the publication of "Expert Taskforce to Support the Expansion of the Role of Pharmacy Final Report", pharmacists can now provide treatment for conditions including allergic rhinitis, impetigo, shingles, and uncomplicated UTIs. [78]

In France, community pharmacists have extended responsibilities that include administering vaccines in the vaccination schedule for people aged 11 and over[79] and conducting medication optimisation reviews.[80] A French study is currently evaluating a pharmacist-led protocol for managing uncomplicated female cystitis.[80] Additionally, pharmacists can test for streptococcal A bacteria in sore throat cases and provide appropriate antibiotics.[81, 82]

Switzerland and Denmark are following similar models. Danish pharmacists can renew prescriptions for conditions such as gastrointestinal reflux, ulcerative colitis prophylaxis, type 1 and type 2 diabetes, eczema and psoriasis, hypertension, hypercholesterolemia, and hormonal contraception.[55] In Switzerland, pharmacists can prescribe medicines from a pre-defined list (Dispensing Category B) for conditions such as seasonal allergic rhinitis, urogenital tract disease and acute diseases of the respiratory system.[83] In Poland, pharmacists can prescribe medications classified as "prescription-only", with the exception of those containing narcotics or psychotropic substances.[84]

Western Pacific

The Pharmacy Council of New Zealand also regulates pharmacist prescribing through competency and registration standards, enabling pharmacists who have completed an accredited post-registration prescribing course to prescribe medications as pharmacist prescribers.[85] Pharmacists are encouraged as best practice to work collaboratively with healthcare teams (e.g., general practice, rest homes or hospital settings). Prescribing pharmacists have the authority to prescribe for patients under their care to initiate, modify, or discontinue therapy, including the continuation or adjustment of treatments originally prescribed by others.[85] Registered pharmacists who have not yet completed an accredited prescribing course post-graduation can offer extended services, such as antibiotics for UTIs, after completing mandatory training modules for specific conditions developed by pharmacy organisations.[86] A framework has been created to evaluate whether medicines proposed for restricted classification or pharmacist supply without prescription are within pharmacists' current scope of practice or whether additional training or materials are required.[87]

Australia allows pharmacist prescribing through state and territory regulations. This began in Queensland in 2020 with the urinary tract infection pharmacy pilot (UTIPP-Q) in Queensland and expanded into a statewide community pharmacy scope of practice pilot covering conditions including mild to moderate acne, acute diffuse otitis externa, and allergic and nonallergic rhinitis.[88, 89] New South Wales and the Australian Capital Territory have trialled pharmacist prescribing for urinary tract infections, hormonal contraception and dermatological conditions.[90] Victoria, South Australia, Western Australia and Tasmania have introduced similar initiatives,[91-94] while plans are underway for similar programmes in the Northern .[95]

In Singapore, pharmacists can prescribe as collaborative prescribing practitioners and have an approved drug formulary.[96, 97]

Other examples: Africa, South-East Asian and Eastern Mediterranean regions

In South Africa, pharmacists who have completed a course in primary care drug therapy can assess patients and prescribe medications listed in the Primary Health Care Standard Treatment Guidelines and Essential Medicines List.[98, 99] In some countries such as Israel there is legislation to allow pharmacist prescribing, but in practice pharmacists do not actively prescribe medications due to a variety of implementation factors.[73]

7. Conclusion

The global trend to implement pharmacist prescribing rights highlights a shift toward more accessible, effective and efficient healthcare service provision. While the scope and models of pharmacist prescribing have some minor variation by country, the overall trend increasingly indicates further recognition of pharmacist contribution to patient care and a significant solution to the global primary healthcare crisis. As governments and regulators continue to refine policy and practice frameworks, further developments and uptake in pharmacist prescribing will enhance healthcare access and improve outcomes, particularly in underserved communities.

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2D. Pharmacy workforce deployment and new practice environments

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High level summary

1. In traditional settings (primary care, community pharmacy, and hospitals), pharmacists have proven to reduce GP workload, lower emergency visits, manage chronic diseases, provide public health services, and improve medication adherence.[1-3]
2. The evolving healthcare landscape requires a pharmacy workforce in new practice environments beyond traditional community and hospital settings, such as correctional facilities, hospice care (palliative care), mental health services, sports pharmacy, and digital health. Their responsibilities include:
    - In correctional facilities, pharmacists contribute to comprehensive medication therapy management for psychiatric and chronic illnesses, diabetes management, and HIV care. They manage methadone programmes and provide continuity of care for inmates transitioning back to the community.[4, 5]
    - In hospice care, pharmacists perform crucial tasks such as medication reviews, clinical consultations, and regulatory compliance oversight, ensuring safe and effective care for terminally ill patients.[6]
    - In mental health services, pharmacists manage medications, detect early issues of mental health, reduce stigma, and contribute to suicide prevention.[7-9]
    - In sports pharmacy, pharmacists support athletes with medication management, doping prevention, supplement advice, and injury prevention.[10, 11]
    - Digital health and AI are revolutionising pharmacy practice by enhancing healthcare delivery using telepharmacy, mobile health applications and other digital tools. It helps automate prescription validation and drug interaction analysis, allowing pharmacists to focus more on patient-centred care and expanding healthcare access.[12, 13]
3. Pharmacy technicians are expanding beyond traditional roles, finding new opportunities in non-conventional settings such as medication access programmes, insurance administration, automation and technology management, pharmaceutical manufacturing, telepharmacy, and specialised fields such as compounding, informatics, and veterinary pharmacy.[14-18]
4. The pharmacy workforce faces multiple challenges in adapting to new practice settings, including keeping pace with complex therapies, meeting the needs of diverse populations, gaining professional recognition, and overcoming barriers such as time constraints, ethical concerns, insufficient collaboration with other healthcare professionals.[19-22]
5. Optimising the future pharmacy workforce depends on embracing technological advances, fostering collaborative innovation through new thinking models, and promoting environmental sustainability in pharmacy education and practice.[13, 23-25]

Key message

As healthcare continues to evolve, the pharmacy workforce plays an increasingly vital role across both traditional and emerging practice settings. Expanding into areas such as correctional facilities, hospice care, mental health services, sports pharmacy, and digital health, pharmacists contribute to improving access to care, strengthening medication management, and advancing public health. This transformation aligns with FIP's vision to equip the pharmacy workforce with the competencies, leadership, and innovative practices needed to meet global health challenges.

Related FIP Development Goals

All 21 FIP Development Goals (DGs)[26] align with pharmacists' evolving roles in new practice environments, as workforce, practice, and education elements are embedded in each goal. In particular, DG 5 (Competency Development) is reflected in the need for pharmacists to adapt and expand their skill sets to meet the demands of emerging practice settings. DG 14 (Medicine Expertise) aligns with pharmacists' critical role in medication management across both traditional and new environments. DG 18 (Access to Medicines, Devices, and Services) is supported by the expanded role of pharmacists in improving access to pharmaceutical services in new practice settings.

Call to action

1. **Government & health ministries**
   Support policy development that facilitates pharmacists' integration into new practice settings. Invest in digital health and AI infrastructure to equip pharmacists with tools that improve patient care and optimise workflows.
2. **Regulatory bodies & policymakers**
   Update regulations to allow pharmacists to take on expanded roles in the new practice settings, ensuring they can fully contribute to patient care, especially in areas such as medication management, patient education and public health.
3. **Educational institutions & educators**
   Revise pharmacy curricula to incorporate training for pharmacists in correctional facilities, hospice care, mental health services, sports pharmacy, and digital health, preparing them for evolving roles in various practice settings.
4. **Professional associations & pharmacy leadership**
   Promote the role of pharmacists in non-traditional healthcare settings by advocating for their contributions in multidisciplinary teams. Offer leadership training programmes specifically designed for pharmacists to build the skills needed to take on expanded roles in new practice settings.

Across the world, pharmacists are expanding healthcare reach by delivering services in non-traditional settings — often working in partnership with primary healthcare teams, family doctors, and community clinics.

- **In correctional facilities**, pharmacists manage psychiatric and chronic conditions, support diabetes and HIV care, run methadone programmes, and ensure continuity of care for people transitioning back into the community.[1,2]
- **In hospice care**, pharmacists perform tasks such as medication reviews, clinical consultations, and regulatory compliance oversight, ensuring safe and effective care for terminally ill patients.[3]
- **In mental health services**, pharmacists monitor medications, detect early warning signs, reduce stigma, and contribute to suicide prevention strategies.[4-6]
- **In sports pharmacy**, pharmacists guide athletes on safe medicine use, supplement risks, doping prevention and injury management.[7,8]

FIP calls for wider recognition of the diverse scope of practice of pharmacists and acceptance of pharmacy professionals to serve in non-traditional settings.

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1. Why pharmacy workforce deployment in novel practice environments is a global priority

As healthcare systems worldwide undergo rapid transformation due to demographic shifts, geopolitical challenges, and evolving health demands, the role of the pharmacy workforce is increasingly critical. This is particularly crucial in least-developed countries, where access to healthcare remains constrained.

Studies have shown that pharmacist's impact is highly positive in traditional settings, such as the community and primary care. By managing medication reviews and chronic disease conditions, they reduce GP workload and emergency department visits,[1] alleviating pressure on healthcare systems and improving health outcomes.[2] Moreover, evidence from community-driven pharmacy programmes, local health councils, and pharmacist-led public health initiatives demonstrates that empowering pharmacists with decision-making authority and strengthening community engagement can bridge care gaps effectively.[3]

The evolving healthcare landscape requires a pharmacy workforce in new practice environments beyond traditional community and hospital settings, such as correctional facilities, hospice care (palliative care), mental health services, sports pharmacy, and digital health. Although less studied in the literature, the deployment of pharmacists in these new practice settings has shown potential for improving access to care and expanding pharmaceutical services. These roles allow pharmacists to leverage their expertise in medication management, patient education, and collaborative care to enhance healthcare delivery in diverse settings. Consequently, the trend towards incorporating pharmacists into multidisciplinary teams across emerging areas represents a strategic approach to addressing evolving healthcare challenges, managing resources, and improving patient outcomes.[27]

All 21 FIP Development Goals (DGs)[26] align with pharmacists' evolving roles in new practice environments, as workforce, practice, and education elements are embedded in each goal. In particular, DG 5 (Competency Development) is reflected in the need for pharmacists to adapt and expand their skill sets to meet the demands of emerging practice settings. DG 14 (Medicine Expertise) aligns with pharmacists' critical role in medication management across both traditional and new environments. DG 18 (Access to Medicines, Devices, and Services) is supported by the expanded role of pharmacists in improving access to pharmaceutical services in diverse settings.

Expanding the role of pharmacists in new practice settings aligns with FIP's strategic vision of advancing the pharmacy workforce to meet evolving global health needs. FIP recognises that integrating pharmacists into diverse new practice settings can bridge healthcare gaps and optimise pharmaceutical service delivery. FIP is therefore committed to supporting policy development, education, research, and advocacy to ensure the pharmacy workforce is equipped for these expanded responsibilities.

2. Pharmacists in traditional practice environments

The integration of pharmacists into primary care teams has demonstrated benefits for healthcare systems and patient outcomes.[28] A systematic review by Hayhoe et al[29] found that pharmacists in these settings:

- Reduced GP workload by decreasing the number of GP appointments and time spent on medication-related administration;

- Lowered emergency department attendance, suggesting improved access to primary care services, and alleviating pressure on overburdened healthcare systems; and,
- Contributed to a nearly 10% decline in non-urgent or less-urgent emergency room visits.[30]

Pharmacists in primary care teams have also been particularly effective in:

- Managing chronic diseases;[31]
- Providing medication reviews, which are especially beneficial for elderly patients with complex medication regimens;[13] and,
- Improving diabetes-related health metrics and other preventive care measures.[32]

Community pharmacists move beyond traditional medication dispensing to provide a wide range of patient-centred services. Their responsibilities include:[33-37]

- Medication management: Community pharmacists are recognised as medication experts, ensuring prescription appropriateness, counseling patients, and promoting medication adherence to improve health outcomes and reduce adverse events.
- Health promotion and disease prevention: They provide health education, vaccination services, and support for chronic disease management, helping to reduce unnecessary healthcare visits and hospitalisations.
- Clinical services: Pharmacists now deliver clinical interventions such as MedChecks, medication therapy management, and ambulatory care, shifting from a product-oriented to a patient-oriented approach.
- Public health and crisis response: During the COVID-19 pandemic, pharmacists have taken on roles in maintaining drug supply chains, delivering telehealth services, dispelling misinformation, and supporting mass vaccination efforts.

Pharmacists in hospitals play a critical and expanding role in patient care, medication management, and healthcare team collaboration. Their responsibilities include:

- Medication management: Pharmacists are central to developing drug policies, managing formularies, and ensuring safe prescribing practices. They review and verify medication orders, adjust dosages, and provide drug information and recommendations, especially for complex therapies like antibiotics and anticoagulants.[38, 39]
- Clinical services: Direct involvement in patient care includes medication therapy management, therapeutic drug monitoring, and discharge counselling. Pharmacists often lead or participate in transitions-of-care programmes and provide specialised outpatient services, such as anticoagulation management.[38, 39]
- Patient education: Pharmacists educate patients about their medications, including usage, side effects, and safety, which has been shown to improve patient understanding and satisfaction.[40]
- Interdisciplinary teamwork: Pharmacists are increasingly integrated into hospital care teams, contributing to workflow efficiency, patient safety, and improved outcomes.[40]

3. Pharmacists in new practice environments

Correctional facilities

Pharmacists in correctional facilities have evolved from basic care providers to integral members of the healthcare team, playing a crucial role in medication management, clinical services, and public health initiatives. The American Society of Health-System Pharmacists (ASHP) has recognised the importance of pharmacists in correctional health facilities, advocating for their involvement to ensure safe and effective care.[41]

Pharmacists in these settings contribute significantly to improving healthcare outcomes for incarcerated populations through various activities such as:

- Comprehensive medication therapy management for psychiatric and chronic illnesses, diabetes management, and HIV care.[4]
- Public health initiatives, such as managing methadone programmes and providing continuity of care for inmates transitioning back to the community.[5]

The integration of pharmacists into correctional healthcare teams has demonstrated potential for improving patient outcomes, controlling costs, and addressing the unique health challenges faced by incarcerated individuals.[42]

Hospice care

Pharmacists contribute to the interdisciplinary team's efforts in hospice care to optimise medication management, ensure patient comfort, and support caregivers. As integral members of the hospice care team, pharmacists are involved in:

- Comprehensive medication therapy management: Managing complex symptoms and chronic illnesses. They perform crucial tasks such as medication reviews, and clinical consultations, ensuring safe and effective care for terminally ill patients.[43]
- Pain and symptom management: Developing personalised medication regimens, often utilising compounding techniques to meet individual patient needs.[6]

Their expertise is particularly valuable in:[44]

- Managing complex drug interactions
- Avoiding over-utilisation of medications
- Education on proper medication administration to patients and caregivers.

Furthermore, hospice pharmacists play a role in cost reduction by discontinuing futile medications and procedures, while also providing emotional support to patients and families during challenging times.[45]

Mental health services

Pharmacists contribute to mental health care through the following activities:

- Medication therapy management: Supporting individuals with mental health conditions, particularly through medication therapy management and early detection of mental health issues.[7]
- Medication reviews: Assisting with medication adherence and side effect management to patient outcomes and quality of life.[8]

Pharmacists also contribute to:

- Reducing mental health stigma: Engaging in consumer-led education programmes, which have shown long-term benefits in improving attitudes towards mental health care.[9]
- Multidisciplinary mental health teams' integration: Working with mental health teams improve medication safety and clinical outcomes.[7]

As the field of mental health care continues to evolve, pharmacists are increasingly recognised as essential members of the healthcare team, with calls for expanded roles in areas such as suicide prevention and psychological first aid.[46]

Sports pharmacy

Pharmacists play an integral role in sports medicine, contributing to athletes' health and performance across amateur and professional settings. The FIP Policy statement on "The role of the pharmacist in the fight against doping in sport,"[47] highlighting pharmacists' expertise in medication management, drug interactions, and supplement safety is crucial for optimising athletic performance while ensuring compliance with anti-doping regulations.

FIP published a report in 2022, Sports pharmacy practice and education: A global overview,[10] which explores the evolving role of pharmacists in sports healthcare. The report outlines the following:

- The specialty of sports pharmacy, which includes medication management, doping control, and support at sporting events.
- The importance of pharmacists as accessible healthcare providers who offer medicines-related information to athletes, contributing to the anti-doping movement.
- The need for pharmacists to be knowledgeable in sports science, anti-doping regulations, and physiopharmacology, advocating for specialised training and continuing professional development.

Sports pharmacists collaborate closely with multidisciplinary teams, including physicians, physiotherapists, and nutritionists to: [11]

- Develop comprehensive treatment plans and implement injury prevention strategies.
- Provide valuable services such as medication therapy management, personalised supplement recommendations, and education on proper medication use to athletes and support staff.[13]
- Contribute to doping prevention through athlete education and careful medication review, helping to maintain the integrity of sports competitions.

Digital health

Digital health and artificial intelligence (AI) are revolutionising pharmacy and telepharmacy practices, enhancing pharmacists' capabilities in patient care, medication management, and healthcare outcomes. A 2023 report, titled "How can digital health interventions support national pharmaceutical care delivery?,"[12] aims to guide pharmacists and healthcare stakeholders in adopting digital solutions for a more efficient and patient-centered healthcare system. Key insights include the integration of digital technologies in pharmacy practice to:

- Enhance healthcare delivery: Using of e-health records, telepharmacy, mobile health applications, and other digital tools to improve patient outcomes.
- Develop a digitally competent workforce: Emphasising the need for digital competency in pharmacy and the development of digital health policies.
- Improve chronic disease management: Streamlining pharmaceutical care, facilitate better patient engagement, and support the management of chronic diseases.

AI-powered systems are streamlining complex processes such as inventory management, automated prescription validation, and drug interaction analysis, allowing pharmacists to focus more on patient-centred care.[13] In telepharmacy, AI-enabled chatbots and virtual assistants provide round-the-clock patient support, improving medication adherence and disease management.[13] Machine learning algorithms are enhancing real-time medication adherence tracking and predictive analytics, offering actionable insights to pharmacists and healthcare providers.[48]

Furthermore, AI applications in telepharmacy are addressing accessibility challenges and pharmacists' shortage in underserved regions, with studies showing significant improvements in patient satisfaction and adherence rates.[49] Despite these advancements, challenges such as data privacy concerns and the need for equitable access to digital health tools persist.[50]

4. Pharmacy technicians in new practice environments

Pharmacy technicians are increasingly finding opportunities in non-conventional pharmacy settings, expanding their roles beyond traditional retail and hospital environments. Key areas where pharmacy technicians are involved include:

- Medication access programmes: Working as patient care or engagement coordinators to facilitate access to low-cost medications.[14]
- Insurance contract management and licensing audits: Contributing to the administrative side of pharmacy practice.
- Automation and technology: Managing medication dispensing systems and bridging the gap between pharmacy and information technology.[13]
- Pharmaceutical manufacturing: Opportunities for technicians to work in manufacturing-type environments without direct patient interaction.[15]
- Telepharmacy: Providing remote pharmaceutical care, including medication therapy management and prescription verification.[16, 17]
- Specialisation: Specialised roles such as compounding pharmacy technicians, informatics pharmacy technicians, and veterinary pharmacy technicians are becoming more prevalent, allowing technicians to apply their skills in unique healthcare settings.[16, 18]

5. Challenges and strategies to expand scope in novel practice environments

The pharmacy workforce faces several challenges in adapting to new practice settings, including the need to:

- Adapt to evolving drug therapies: Keep up with specialised drug therapies and manage public health issues, often under resource constraints.[19]
- Address the specific needs of diverse populations: For example, adapting to serve an aging population, managing chronic conditions, multimorbidity, and complex therapies,[19] and transitioning to more active participation in patient care and health improvement requires continuous education and skill development.[22]

Nevertheless, recognition of their professional roles is a major challenge,[20] while they face barriers such as lack of time, ethical challenges, insufficient collaboration due to concerns about professional boundaries by other healthcare professionals, and inadequate facilities, leading to stress and burnout.[21]

The integration of pharmacists into new settings necessitates changes in regulations, policies, education, and practice standards to support their expanded scope of practice and ensure quality in pharmacy services.[51]

Optimising the pharmacist's role requires embracing technological advancement, innovative thinking models, and sustainability aspects. Key considerations include:

- Technological advancement and AI integration: The rapid adoption of artificial intelligence (AI) in pharmacy education and practice enhances learning, improves patient care and optimises workflows. AI is increasingly involved in clinical decision-making, medication management, and the generation of educational content.[13]
- Engagement in collaborative innovation: Pharmacists can accelerate innovation by participating in scrums, hackathons, or design thinking methods, fostering cross-disciplinary collaboration[23] and enhancing problem-solving capabilities.[24]
- Environmental sustainability: Integrating environmental considerations into pharmacy education and practice—such as promoting eco-friendly medicines and reducing pharmaceutical waste—can contribute to ecological sustainability while maintaining patient-centred care.[25]

6. Conclusion

The prioritisation of pharmacy workforce deployment and employment in new practice environments reflects FIP's strategic commitment to addressing the dynamic needs of global health systems. As healthcare challenges grow in complexity, particularly in underserved and evolving care settings, pharmacists are uniquely positioned to extend their impact beyond traditional roles. By advancing workforce development, fostering interdisciplinary collaboration, and embracing innovative technologies, FIP envisions a globally empowered pharmacy workforce capable of delivering equitable, patient-centred care across diverse environments. This alignment with the FIP Development Goals underscores the organisation's role in driving policy, education, and practice transformation, ensuring pharmacists are equipped to meet current and future healthcare demands.

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2E. Advancing gender equity and women's leadership in pharmacy

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Content list

High level summary

1. Women make up 67% of the global health and social care workforce but only 25% of senior roles.[1] This leadership gap is a critical inefficiency—we are not fully leveraging the talent of half the workforce. In pharmacy, women currently constitute 65% of the workforce globally (up from 59.5% in 2016 and projected to be 69% by 2030) yet continue to face barriers to leadership.
2. FIP has a focus on gender equity activities that support the WHO's call to reduce the gender leadership gap in health and contribute to SDG 5 (Gender Equality) and SDG 3 (Health & Well-being).
3. As the global pharmacy leadership organisation, FIP has made gender equity a strategic priority. Through combined activities mediated through the FIP Development Goal 10: Equity & Equality, activities such as the EquityRx programme, FIP Women in Science and Education (FIPWiSE), global surveys, and policy guidance, FIP is actively supporting our members to identify gaps and implement solutions.
4. Within pharmacy, addressing gender disparities ensures equal opportunities for career advancement, leadership, and professional development.
5. Challenges that hinder women's leadership development in pharmacy include gender biases, cultural norms, unequal access to mentorship, systemic barriers, lack of leadership exposure, and work-life balance difficulties. In a 2024 FIPWiSE survey, 45% of women reported exposure to psychosocial risks or violence at work; rigid schedules and unequal parental-leave policies further derail careers.
6. Key enablers for professional gender equity include access to mentorship programmes, financial support, professional development opportunities, gender-responsive policies, and stronger community networks.

Key message

A pharmacy workforce that reflects the talent and leadership potential of women is indispensable to Universal Health Coverage (UHC), patient safety and resilient health systems. Today, women are the numerical majority in pharmacy but a minority in leadership roles; closing that leadership gap is both an equity imperative and a strategic investment in care quality.

Related FIP Development Goals

FIP Development Goal 10: Equity & Equality – Addressing gender and diversity inequalities in the pharmaceutical workforce, education, and career progression.

FIP Development Goal 6: Leadership Development – Ensuring strategies to develop leadership skills across all career stages

Call to action

1. **Governments & regulators**
   Integrate gender equity into national workforce strategies, ensure inclusive policies (e.g., maternity leave, equal pay), and mandate leadership representation reporting.
2. **Professional organisations**
   Promote mentorship and leadership development programmes; advocate for equity-focused workforce policy reform.
3. **Educational institutions**
   Embed gender-responsive leadership training and ensure equal access to fellowships, research funding, and academic leadership roles.
4. **Employers & health systems**
   Create positive practice environment standards (i.e., safe, flexible, inclusive).

Women make up 67% of the global health and social care workforce but only 25% of senior roles.[1] This "leadership gap" is a critical inefficiency – we are not fully leveraging the talent of half the workforce. In pharmacy, women constitute 65% of the workforce globally (a figure projected to rise to nearly 69% by 2030)— yet continue to face barriers to leadership.[2]

Pharmacists are also key agents for advancing gender-responsive services — supporting women as patients, caregivers, and health leaders. Pharmacy has the potential to model what true equity looks like in healthcare.[3-5]

Through FIP Development Goal 10: Equity & Equality, EquityRx programme and FIP Women in Science and Education (FIPWiSE), global surveys, and policy guidance, FIP is actively supporting members to identify gaps and implement solutions.

FIP urges governments, funders, and health leaders to mainstream gender equity into every aspect of pharmacy workforce planning, leadership development, education, and public health services.

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1. Why gender equity is a FIP priority

Achieving gender equity and empowering women leaders in pharmacy is integral to FIP's strategy on workforce development and strengthening health systems. Pharmacy is an advanced caring profession largely delivered by women; ensuring our workforce has equal career development opportunities aligns with FIP core values of inclusiveness and justice. Gender equity in pharmacy is more than social justice—it directly improves patient outcomes.[1] Health systems cannot perform at their best when highly trained, talented female pharmacists are constrained by bias, career 'glass ceilings', or inadequate support.

For health systems, having gender equity in the workforce has been shown to improve system performance. When women in the workforce are paid and promoted equally, attrition declines and more professionals remain in patient care, helping to address workforce shortages.[2] Conversely, gender inequities (such as wage gaps or harassment) undermine morale and drive talented pharmacists out of the profession.

By championing Development Goal 10 on Equity and Equality, FIP is guiding country-level policy to remove avoidable barriers so that every pharmacist—regardless of gender—can advance to their full potential and scope of practice. This commitment is also reflected in the FIP Hub and equity leaders (regional leads were appointed to focus on this agenda).

2. Global context and policy relevance

Gender gaps in health leadership are a global concern. The World Health Organization and partners (such as Women in Global Health) have highlighted the stark imbalance: Women comprise roughly 67% of the health and social care workforce but only 25% of health leadership roles.[1] This phenomenon—"delivered by women, led by men" —represents a systemic inequity and lost opportunity in health systems.

The WHO's Gender Equity in the Health Workforce initiative, including the 2021 policy action paper 'Closing the Leadership Gap', urges all countries to address the barriers that keep women out of leadership.[1]

At the United Nations level, Sustainable Development Goal (SDG) 5 is a commitment to achieve gender equality and empower all women and girls. Within SDG 5, target 5.5 calls for ensuring women's full participation and equal opportunities for leadership at all levels of decision-making. The pharmacy sector contributes to this global indicator as advancement in our field supports broader SDG progress. Additionally, gender equity in pharmacy connects to SDG 3 (health): a more equitable workforce can deliver better health services for all genders.

Many countries have echoed these priorities in recent World Health Assembly meetings and national policies. For example, resolutions have urged Member States to incorporate gender-disaggregated health workforce data and to promote women's leadership as part of pandemic recovery and health system resilience. The global momentum is clear: addressing gender inequity is recognised as key to optimising the health workforce.

3. The role and value of pharmacists in addressing gender disparities

Pharmacists play a dual role in advancing gender equity, both within the profession and through the services they provide. As healthcare providers, pharmacists are well-positioned to promote equity in patient care. Within the profession itself, however, more progress is needed to ensure equitable opportunities for women.

Globally, women now make up the majority of the pharmacist workforce in most countries. FIP workforce data show a clear upward trend: in 2006, approximately 50% of pharmacists were women; by 2016, this rose to 59.5% and, according to the latest 2023 FIP surveillance survey, women currently represent 65% of the global pharmacy workforce. This increase in proportion is accelerating across all regions, albeit at different rates ($p<0.001$). At the current global average pace—3.3% every five years—women are projected to comprise between 69% to 72% of the workforce by 2030 (95%CI, $p<0.001$)[i].

Pharmacists play a community and patient-facing role in addressing gender disparities in health outcomes. Around the world, women often experience inequities as patients or caregivers, from maternal health needs to being the primary managers of family health. Pharmacists, as one of the most accessible healthcare providers, are uniquely positioned to support women in these roles. For example, pharmacists can:

- **Empower women as informal caregivers:** Women frequently manage medications for their children, elders, or partners. Pharmacists can provide tailored counselling and tools to support these informal caregivers. FIP's policy statement on "Pharmacists supporting women as informal carers" underscores the value pharmacists add by educating and equipping women caregivers, thereby improving medication adherence and health outcomes.[3]
- **Address women's health needs directly**: Pharmacists often assist with reproductive health services, maternal and child health, and management of chronic diseases that affect women (such as advising on safe medication use in pregnancy, providing contraception guidance, screening for gender-based violence signs, etc.). By ensuring pharmacy services are gender-responsive (sensitive to issues like privacy, cultural norms, literacy), pharmacists help overcome access barriers women might face in other settings.

In short, pharmacists contribute to gender equity by improving health literacy and access for women and by modelling gender-inclusive professional practice. This is a virtuous cycle: supporting women within pharmacy strengthens the profession's ability to support women in society, ultimately contributing to more equitable health outcomes for all.

Regional insights

Figure 1 illustrates the mean percentage of female pharmacists across six WHO regions, based on FIP's 2023 Global Pharmacy Workforce Survey.[ii] Each bar represents the average proportion of women in the pharmacy workforce per region, with 95% confidence intervals shown.

Female representation is highest in Southeast Asia (74.7%) and Europe (73.2%), followed by the Western Pacific (66.4%) and Americas (61.7%). In contrast, the African (48.1%) and Eastern Mediterranean (44.6%) regions show lower female representation. While these differences do not necessarily imply systemic inequality, they underscore the importance of monitoring gender balance and ensuring equitable career opportunities for all pharmacists across regions.

[i] FIP mixed model regression analysis using workforce surveillance data from 2006 to 2023.

[ii] As part of its workforce surveillance programme, FIP has been conducting surveys to monitor global pharmacy workforce capacity since 2006. Figures regarding the current cross-sectional proportion of female pharmacists is based on the results of the 2023 data capture survey.

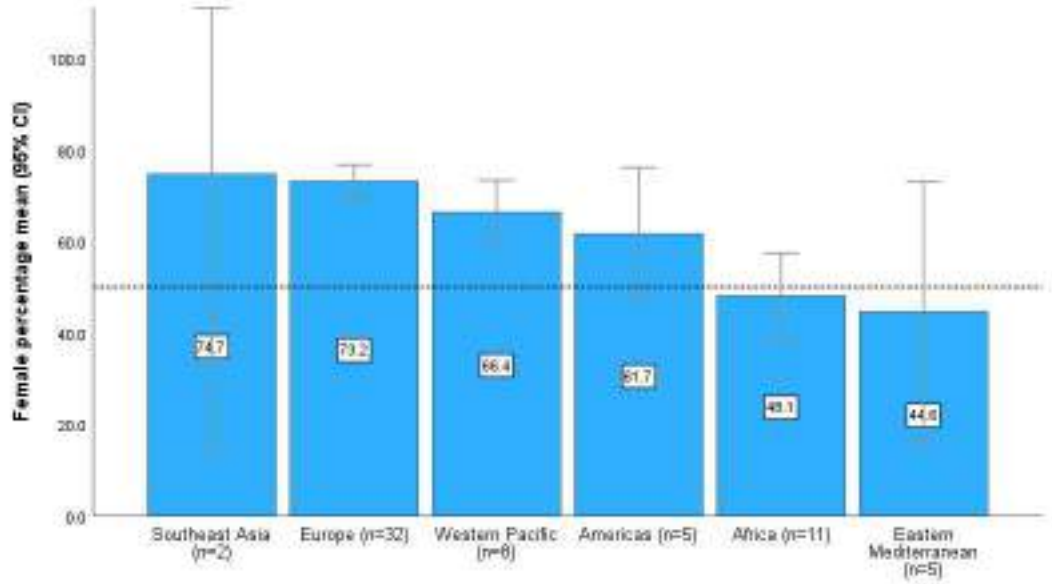

Figure 1. Regional distribution of female representation in the pharmacy workforce (2023)

Some countries have made rapid and significant strides. Australia reported that women's representation in key pharmacy leadership positions reached 58% by 2022, up from 47% in 2018.[4] In the USA, the proportion of women in pharmacy management roles (such as pharmacy managers or supervisors) increased to 58.8% in 2019, from just 40.5% a decade earlier.[5] These improvements suggest that as the female workforce proportions increase, combined with intentional efforts, the leadership gap can start to close.

Challenges and enablers to gender equity and leadership in pharmacy

Despite women forming most of the pharmacy workforce in most countries, a complex mix of workplace, cultural, and systemic factors continues to limit their progression into senior roles. The 2024-25 FIPWiSE survey (n=414; 92% from practice/science/education; 48% with ≥ 15 years' experience) underscores how these challenges manifest:

- **Workplace barriers:** Limited flexible working arrangements, persistent gender pay gaps, and higher exposure to workplace harassment or violence creates hostile environments that drive women away from leadership pathways. Almost half (45%) of survey respondents reported unsafe circumstances (psycho-social risks, threats, or violence); the top cited cause was "lack of a culture where everyone is valued."
- **Cultural expectations and bias**: Stereotypes that associate leadership with masculine traits still influence promotions and hiring. Women pharmacists may be passed over for leadership roles due to conscious or unconscious bias or discouraged from applying. The "labyrinth" of challenges (as WHO describes it) includes balancing family responsibilities— in many societies, women pharmacists are mothers or caregivers, often unsupported by adequate maternity or parental-leave policies— and forces many women to trade leadership opportunities for family obligations.
- **Lack of mentors and networks**: Historically, leadership begets leadership – with mostly men in senior roles, women have had fewer mentors of the same gender or supportive professional networks to open doors. This is changing as more women reach mid-career and extend a hand to others, but mentoring programmes need scaling up. Initiatives like FIPWiSE are crucial to fill this gap by connecting women professionals and showcasing role models.

- **Systemic issues:** In some countries, formal policies—such as legal mandates for equal opportunity In hiring, or enforcements against discrimination— still lag. Without a policy framework, progress can be slow or uneven.

FIP's report, 'Empowering women: Advancing female entrepreneurship in community pharmacy', further highlights these challenges. Cultural norms and gender biases often shape perceptions of leadership, while systemic barriers, such as limited mentorship access and imbalanced caregiving responsibilities, complicate women's career advancement. Additionally, reduced confidence to pursue leadership roles, linked to fewer visible female role models, remains a significant hurdle.[6]

To accelerate women's progression into leadership, a range of interconnected enablers is essential. These include targeted mentorship, professional development opportunities, inclusive workplace policies, and strong peer networks. Financial support schemes and leadership training can address disparities in advancement, while policies promoting workplace safety, flexibility, and equity create enabling environments. Crucially, all efforts must be underpinned by data-driven accountability—using gender-disaggregated metrics to track progress—and by the visible recognition of women leaders to inspire future generations.[6] Table 1 outlines these key enablers and highlights examples of FIP's ongoing efforts.

Table 1: Key enablers supporting women's advancement into pharmacy leadership

Enabler	How it works	FIP-linked examples
Structured mentorship and sponsorship	Connects early-career women with experienced leaders who offer guidance, networking, and visible support for promotions.	Nine-month FIPWiSE + ECPG mentorship scheme (launched 2024).
Inclusive workplace policies	Flexible hours, paid parental leave, anti-harassment protocols, and transparent pay structures improve retention and progression.	FIP policy advocacy and toolkits
Leadership development programmes	Targeted training (negotiation, strategic planning) and leadership fellowships build confidence and competencies.	FIPWiSE webinars and interview series
Data-driven accountability	Gender-disaggregated workforce and leadership metrics highlight gaps and drive corrective action.	Global Pharmacy Workforce Surveys & FIP Intelligence reports
Visibility and recognition	Showcasing female role models normalises women in senior roles and inspires others.	FIPWiSE interview series; Women in Pharmacy forums at FIP Congress; IWD digital events (2024, 2025).

In summary, the data reveal a paradox: pharmacy is increasingly a female-driven profession, yet its leadership structures often do not reflect this reality. The trends are moving in the right direction—more women are entering, and some cracks are appearing in the glass ceiling—but significant work remains to achieve equity. This is precisely why FIP's concerted efforts through surveys, toolkits, and advocacy, and working together with members, are vital: to translate the growing presence of women in pharmacy into equitable power and influence within the profession.

4. FIP and member contributions and actions

FIP, together with our members, have long been committed to addressing gender equity through global programmes, policy leadership, and strategic advocacy. As part of its 21 Development Goals (DGs), FIP DG10: Equity and Equality calls for clear and actionable strategies to address inequalities in the pharmaceutical workforce and education, while promoting equitable access to pharmaceutical services and building global capacity in pharmaceutical sciences.

One of the key vehicles for implementing this commitment is EquityRx, FIP's equity and equality programme, launched in 2018. Positioned under the strapline of "Pharmacy - leaving no one behind", EquityRx consolidates, and coordinates work on gender, diversity, and equity. It comprises several focused programme areas—gender equity, the FIP Women in Science and Education (FIPWiSE) initiative, health literacy, maternal health, and vaccine equity—and translates DG10 into tangible, localised actions to support member organisations.

EquityRx engages FIP members to identify challenges in achieving equity, collects data to understand disparities, and provides tools and recommendations to support gender-responsive workforce policies. FIP expanded the scope of this programme in 2019 to encompass broader equity dimensions, including equitable access to care and services. EquityRx is designed to support members at all levels—locally, regionally, and globally—,aligning their equity efforts with the FIP strategic goals and the UN Sustainable Development Goals.

The FIPWiSE initiative (launched in 2020) specifically supports and elevates women in pharmaceutical sciences and pharmacy education—sectors where women are often underrepresented in senior roles. Activities include:

- A structured global mentorship programme developed in collaboration with the FIP Early Career Pharmacists Group (ECPG), connecting young professionals with experienced leaders over a nine-month cycle.
- A toolkit for positive practice environments[7] designed to raise awareness and provide possible solutions for individuals, employers and institutions that can enable positive practice environments for women in pharmaceutical sciences and pharmacy education, and provides learnings that are transferable across the entire pharmaceutical workforce.
- Social media campaigns and a FIPWiSE interview series featuring outstanding women scientists and educators who have achieved career milestones and led innovation.

FIP has also leveraged its policy leadership to promote gender equity on the global scale. A key milestone was the 2019 'FIP Statement of Policy on pharmacists supporting women and responsible use of medicines - Empowering informal carers'.[2] This statement highlighted the disproportionate care burden carried by women and the critical role pharmacists can play in supporting them through education, advocacy, and access to essential health services. The policy aligns with broader UN SDGs and reflects FIP's and members' mission for equitable and inclusive healthcare systems.

In 2024 and 2025, FIP hosted a series of impactful digital events under EquityRx, timed with International Women's Day:

- "Gender equity in the health workforce: Accelerating progress" (2024) highlighted persistent gender equity gaps and called for policy and workplace reforms.
- "Reducing inequities in the health and pharmacy workforce: The importance of maternity and parental leave policies" highlighted the biases and challenges faced by pregnant women and mothers in the pharmaceutical workforce and explored the impact of inadequate maternity leave policies while advocating for more equitable workplace practices.

- "Women in pharmacy: Leadership & empowerment" (March 2025) brought together women leaders from multiple regions to share their journeys and explored solutions like mentorship, inclusive organisational policies, and leadership development.

5. Case study

FIP received a case study from the General Pharmaceutical Council of Spain, which provides valuable insights into gender equity and women's leadership in pharmacy in Spain.

6. Conclusion

Gender equity and leadership in pharmacy is not a "women's issue"—it is a profession-wide priority and a linchpin for stronger health systems. Empowering women in pharmacy leadership roles unlocks the full potential of the workforce, improves organisational performance, and ensures that the pharmacy profession mirrors the diversity of the communities it serves.

Gender equity in pharmacy is a strategic imperative for workforce sustainability and stronger health systems. As women now constitute the majority of the global pharmacy workforce, their underrepresentation in leadership is a critical gap that undermines progress. FIP recognises this disparity and has made gender equity a central focus through Development Goal 10 and initiatives such as EquityRx and FIPWiSE. By promoting inclusive policies, mentorship, and leadership development, FIP is working to dismantle structural barriers and foster environments where all pharmacists, regardless of gender, can thrive. Advancing women in pharmacy leadership is essential, not just for the profession, but for achieving broader global health and development goals.

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2F. Optimal working environments

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High level summary

1. Optimal working environments for pharmacists are essential for ensuring high-quality patient care, job satisfaction, and overall well-being.
2. A supportive workplace should provide adequate staffing, manageable workloads, and sufficient breaks to prevent burnout.
3. Clear communication channels, collaborative teamwork, and access to continuous professional development help pharmacists stay informed and engaged. Additionally, fostering a culture of respect and safety, including measures to prevent workplace violence, enhances job security and motivation.
4. Ultimately, an optimal work environment empowers pharmacists to perform their roles effectively while maintaining their professional and personal well-being.
5. FIP and the World Health Professions Alliance (WHPA) advocate for positive practice environments (PPEs), a concept that FIP has advanced through toolkits, workforce intelligence, and gender-responsive strategies such as the FIPWiSE PPE Toolkit.
6. Strategic, data-driven workforce planning is essential: Countries must assess population trends, disease burdens, and policy priorities to ensure the supply of pharmacy professionals aligns with national health needs—examples from Namibia and Ireland show practical impact using FIP tools.
7. Emotional intelligence is foundational to workforce resilience: FIP's Emotional Intelligence Toolkit provides early-career pharmacists with practical strategies to strengthen communication, manage stress, and foster workplace well-being.
8. Workplace equity must be gender-responsive: The FIPWiSE Positive Practice Environment Toolkit for Women in Science and Education supports the creation of inclusive, supportive work environments—crucial in a profession where women make up most of the workforce but remain underrepresented in leadership.

Key message

Creating fair, safe, and supportive working environments is a prerequisite for workforce sustainability, quality care, and gender equity in pharmacy. FIP is leading global efforts to enable positive practice environments through data-driven tools, policy advocacy, and inclusive leadership development.

Related FIP Development Goals

All 21 FIP Development Goals (DGs)[1] align with optimal working environments, as workforce elements are embedded in each goal.

Call to action

1. Implement national and institutional workforce development strategies that incorporate safe staffing, retention strategies, and capacity building, to build a sustainable and resilient pharmacy workforce.
2. Promote positive practice environments (PPEs) through workplace safety policies, anti-harassment measures, flexible scheduling, and professional recognition systems.
3. Support workforce retention and satisfaction through career development programmes, for example through continuous professional learning (e.g., strengthening emotional intelligence), to enhance pharmacists' skills and job satisfaction.
4. Advocate for reasonable remuneration, in addition to workload limits and adequate staffing to prevent work-related stress and improve patient care quality.
5. Use data and workforce intelligence to track workplace challenges, monitor progress, and inform evidence-based advocacy.

Pharmacists are essential to public health — yet many still work in fragile environments marked by chronic understaffing, excessive workloads, burnout, and limited career progression. In some settings, fear of speaking up, rigid performance quotas, and inadequate mental health support further threaten service sustainability and safety.[1-3]

FIP has placed **Positive Practice Environments (PPEs)** at the heart of its workforce transformation strategy. Through initiatives such as the FIPWiSE toolkit, emotional intelligence resources, and its leadership in the World Health Professions Alliance (WHPA), FIP provides practical tools, benchmarks, and policy guidance to help stakeholders build safer, fairer, and more resilient workplaces.[4,5]

A healthy pharmacy workplace supports retention, performance, and well-being, ultimately leading to better patient safety, stronger teamwork, and more responsive health systems.[4,6]

FIP calls on health ministries, professional bodies, and employers to prioritise safe staffing, support structures, and mental health protections for the pharmacy workforce.

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1. Workforce development, planning and retention

Workforce development and planning are key for global healthcare reform. The World Health Organization (WHO) has made it clear that there is no possibility of healthcare delivery without a corresponding capable and competent workforce; simply put, there is no health without workforce.[1] FIP has outlined in its strategic plan its aim to support pharmaceutical workforce development around the world to deliver the vision of a world where everyone benefits from access to safe, effective, quality and affordable medicines and health technologies, as well as from pharmaceutical care services provided by pharmacists, in collaboration with other healthcare professionals.

FIP has developed a comprehensive workforce development strategy and published a series of influential global reports on subjects ranging from workforce intelligence and capacity building, to quality assurance frameworks and continuing professional development. In addition, FIP has developed a number of tools designed to support progressive and transformative workforce development.[2] Countries around the globe have used these tools to transform pharmaceutical education and ultimately create a flexible and adaptable pharmaceutical workforce.[3, 4]

FIP also advocates for health workforce planning to be a strategic process that assesses current and future healthcare needs to ensure that the right number of skilled pharmacy professionals are trained and available when they enter the workforce. Countries such as Namibia collaborated with FIP when analysing factors such as population growth, disease trends and healthcare policies to estimate workforce supply and demand at the time of graduation.[5] In Ireland, such analysis helped institutions align educational programmes with health care needs, preventing shortages.[6]

Effective planning also considers geographic distribution, ensuring that underserved areas receive adequate healthcare coverage. Representatives of pharmacy organisations in Australia have developed a rural pharmacist recruitment and retention tool, to address issues such as poor attraction, recruitment, and retention.[7, 8]

Indeed, attraction, recruitment, and retention are important. In the recent literature, the link between employee attitudes, such as job satisfaction and organisational commitment, personal dimensions, such as stress and alcohol abuse, and work-life-balance have become intertwined. These links inform the development of more focussed strategies to assist in retaining talented staff.[9] A 2024 study looking into haematology and oncology pharmacists, as highly specialised and important professionals in healthcare systems, revealed institutional support is essential in modernising practice models, revamping professional development, creating better measures of direct and indirect patient care activities, and ensuring effective support for well-being.[10] As part of this topic, FIP published a toolkit, empowering (early career) pharmacists with emotional intelligence tools, to enhance job satisfaction through better communication, decision-making, and workplace relationships. Pharmacists and pharmacy staff frequently interact with patients, healthcare providers, and colleagues, requiring empathy, self-awareness, and emotional regulation to handle stressful situations effectively. Strong emotional intelligence fosters a positive work atmosphere, reduces burnout, and improves overall job fulfillment, enhancing both job satisfaction and the quality of care.[11]

2. Challenges in working environments

Whilst regulating pharmacy services reimbursement practices should be the first priority, as confirmed by a 2021 study conducted in the USA,[12] acknowledging local contexts of workplaces, giving adequate control, applying adaptive thinking, enhancing connectivity, and dynamic continuous learning opportunities are improving the experience of providing care in community-based pharmacies.[13, 14] However, these factors can be lacking; in a study conducted in Canada in 2016, pharmacists working in chain community pharmacies, who must meet monthly quotas for expanded services, reported a significant negative impact on their working conditions and the perceived safety of patient care.[15] Similarly, in a study from the USA in 2021, company climate and workflow were perceived the most negatively by those working in chain pharmacies. For example, a majority of pharmacists feared being disciplined for addressing patient safety concerns with management, which may be detrimental to patient safety.[16] Such work-related stress may contribute to potentially unsafe practices of patient care.

3. Positive practice environments

The World Health Professions Alliance (WHPA), of which FIP is a founding member, advocates for positive practice environments (PPEs)—health care settings that support excellence and decent work conditions. These have the power to attract and retain staff, provide quality patient care and strengthen the health sector as a whole.[17]

PPEs are necessary to provide equal rights, obligations, equal treatment, and opportunities for all genders according to their needs, to achieve gender equity and PPEs in workplaces. Given that women form the majority of the pharmacy workforce,[18] FIP developed the FIPWiSE (FIP women in science and education initiative) toolkit for positive practice environments, building on the WHPA PPE campaign. FIP used the toolkit as a basis to describe and identify factors that enable PPEs from a pharmaceutical science and pharmacy education perspective. The toolkit provides a set of possible solutions for individuals, employers, institutions, and policymakers, as well as real-life examples, perspectives, and good practice implementations and suggestions from women around the world.[19]

4. Conclusion

Strengthening the pharmaceutical workforce requires not only strategic planning and education but also supportive working environments. FIP's global efforts have guided countries in aligning workforce supply with health needs, while also promoting well-being, gender equity, and retention through positive practice environments. Ensuring that pharmacists are both well-prepared and well-supported is essential to sustaining high-quality, accessible healthcare.

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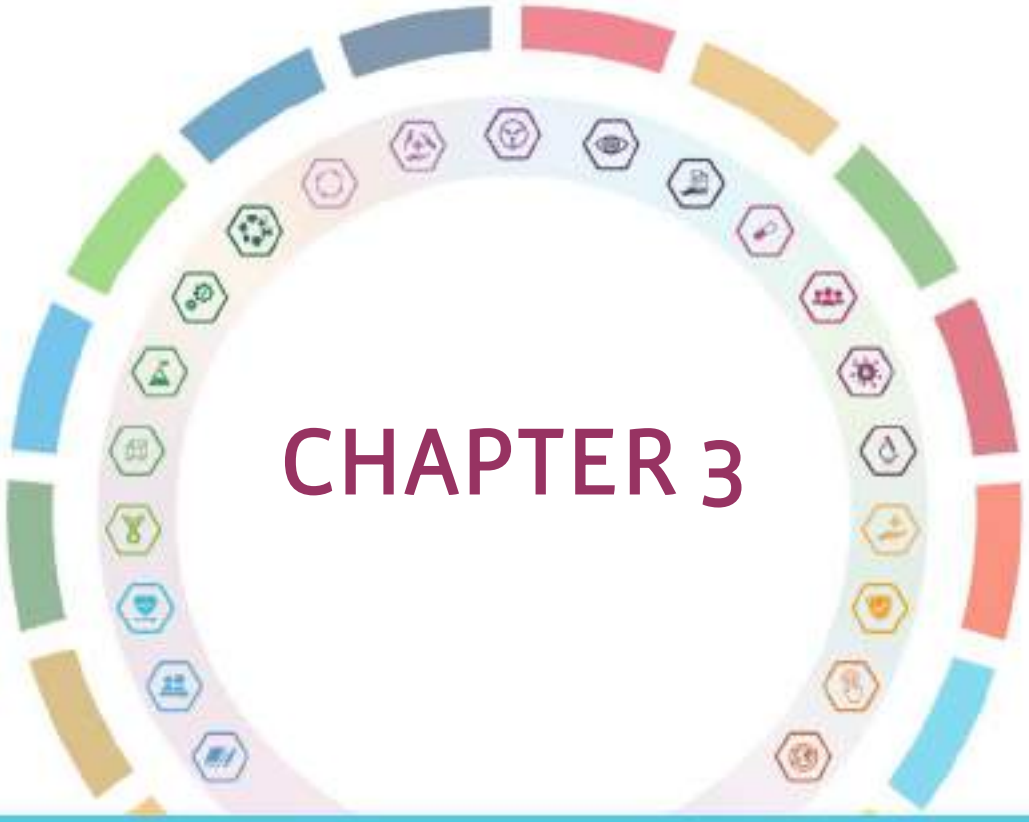

CHAPTER 3

Advancing public health and disease prevention through pharmacy

This chapter highlights the essential role of pharmacists in advancing public health and disease prevention, focusing on two primary areas: vaccination and the management of non-communicable diseases (NCDs). It demonstrates how pharmacy-led services contribute to stronger, more equitable health systems through early intervention, risk mitigation, and improved access.

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Content list

High level summary

1. Empowering pharmacists in disease prevention helps people stay healthy and productive, drives economic growth, eases health system burdens, and supports the World Health Organization's (WHO) goal of leaving no one behind, contributing to SDG 3 (Health & Well-being).[1]
2. Pharmacy-based vaccination (PBV) is now available in 56 countries and territories—an increase of nearly 65% since 2020, when only 34 had authorised PBV. However, barriers to implementation still exist globally.[2]
3. Regulatory and policy constraints, such as the absence of clear legal frameworks and limitations on the practice of pharmacists, perceived lack of government support, resistance from physicians and nurses, limited access to vaccination information systems, funding mechanisms, and underrepresentation in vaccination technical committees, deter PBV progress.[2-4]
4. The surge from 12 to 64—a 433% increase—in the number of countries integrating vaccination training into pharmacy education since 2016, reflects the growing global recognition of the critical role of pharmacists in immunisation and the need to equip them with essential competencies.[2]
5. Less restrictive legal reforms, interprofessional support and collaboration, and sustainable remuneration models are key drivers for PBV implementation and expansion.[2, 3, 5]
6. Within pharmacy, improving public awareness of pharmacists' roles in vaccination and addressing the perceptions that may deter patients from using pharmacy-based vaccination services is crucial for maximising the expertise and accessibility of pharmacists to increase vaccine coverage rates.[6]
7. Noncommunicable diseases (NCDs) are the leading cause of morbidity and mortality worldwide, responsible for at least 43 million deaths in 2021, with 18 million of these occurring before the age of 70. Of these premature deaths, 82% occurred in low- and middle-income countries (LMICs).[7] This poses a significant challenge to public health and the sustainability of healthcare systems. Recognising this, FIP has prioritised not only the management of NCDs, but also their prevention and the reduction of associated risk factors as a core part of its mission to advance pharmaceutical practice, science and education in support of global health.
8. The prevention and management of NCDs require interventions that are effective, cost-effective, affordable and feasible. These should be incorporated into national policies and supported by appropriate indicators for both NCDs and their risk factors. Such interventions must promote health equity and be designed to target both populations and individuals in order to improve health outcomes.[8]
9. FIP's 2019 reference paper, "Beating non-communicable diseases in the community: The contribution of pharmacists", highlighted the significant impact of pharmacy services in the prevention, screening, management and therapeutic optimisation of NCDs.[9]
10. Between 2012 and 2025, FIP has produced over 175 publications and resources supporting disease prevention efforts.[10, 11] Through the disease prevention programme and FIP Development Goal 16: Communicable disease, FIP continues to provide templates for professional competency development and advocate leveraging pharmacists to achieve the WHO's Immunization Agenda 2030.
11. In parallel, through its non-communicable diseases programme and FIP Development Goal 15: People-centred care, FIP supports actions aligned with the WHO Global Action Plan for the prevention and control of NCDs 2023–2030 and its implementation roadmap. This commitment is reinforced by FIP's endorsement of the Declaration of Astana in 2018, ensuring pharmacy contributes to universal health coverage by 2030, in line with SDG target 3.4 to reduce premature mortality from NCDs.[12, 13]

Key message

Disease prevention remains a priority for FIP, as expanding pharmacists' roles in vaccination, screening, and the prevention of NCDs and their risk factors will improve health outcomes and strengthen healthcare systems. Success depends on high-level stakeholder engagement, advocacy, education, and collaboration to address vaccine hesitancy and maximise impact.

Related FIP Development Goals

Pharmacy-based vaccination and vaccine-related services are linked to 14 of the 21 FIP Development Goals, with a central role in eight.

In particular, DG 16: Communicable diseases, is overtly linked to the prevention of this group of diseases, in which vaccination plays a prominent role.

NCD-related services are linked to 10 of the 21 FIP Development Goals, with a central role in six.

In particular, DG15: People-centred care, provides the basic conceptual framework for the design of the FIP Practice Transformation Programme on NCDs. Although DG15 is not specifically called "Non-communicable diseases", it is focused on the role of pharmacists in this group of conditions, which of course requires a patient-centred, interprofessional care approach.

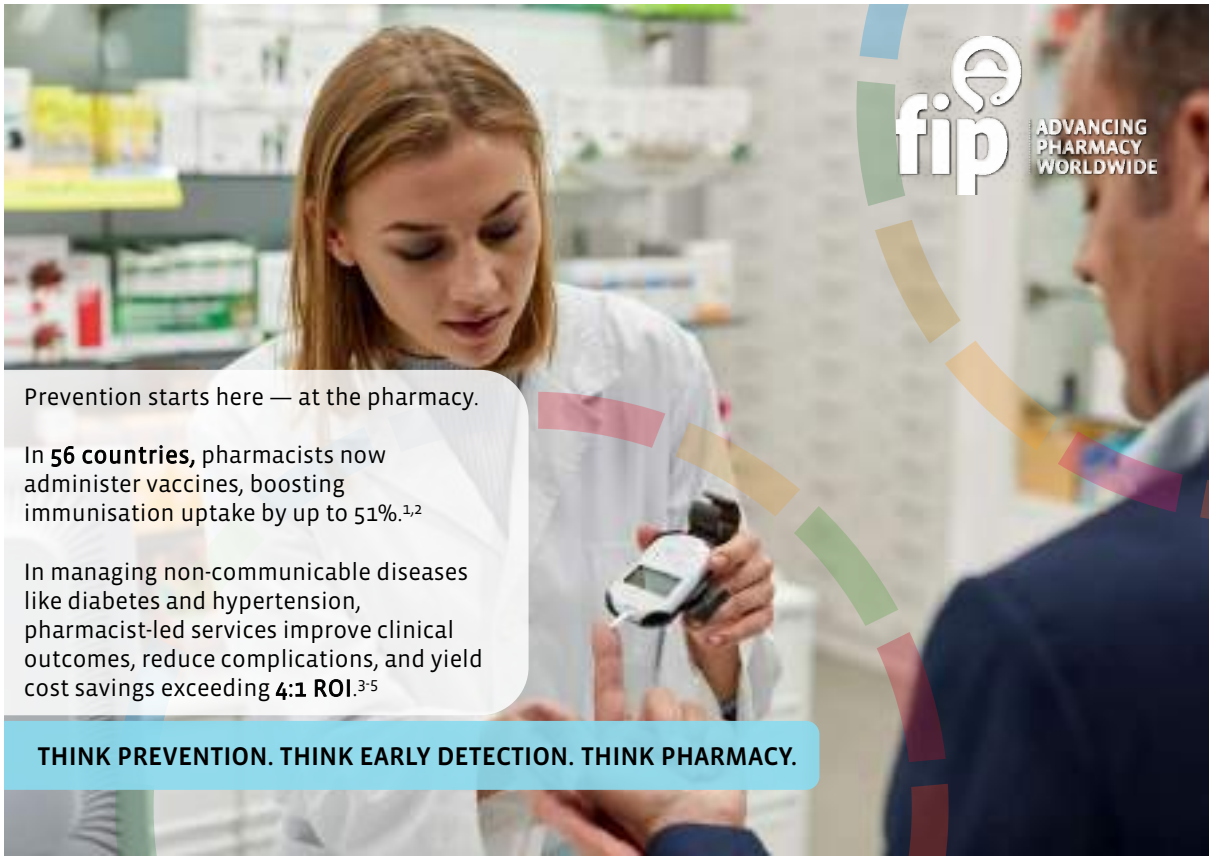
Call to action

1. **Governments & health ministries**
   - Drive collaboration across healthcare, policy, and the public to accelerate pharmacist integration into vaccination delivery; enable year-round vaccine delivery by pharmacists to reduce seasonal strain, increase uptake, lower financial barriers, and improve equitable access.
   - Expand pharmacists' legal scope to deliver preventive health services. Update legislation to formally authorise pharmacists to administer a full range of vaccines (influenza, HPV, COVID-19, RSV, pneumococcal, etc.) across all eligible age groups.
   - Expand pharmacists' roles in immunisation campaigns, non-communicable disease (NCD) screening (e.g., hypertension, diabetes), tobacco cessation, and early cancer screening.
   - Include pharmacists in national health data systems. Ensure pharmacists are connected to immunisation registries, chronic disease registries, and health surveillance platforms to enable seamless data sharing and real-time public health intelligence.
   - Mandate pharmacists' representation in national and regional health advisory bodies (such as NITAGs and UHC committees) to strengthen multidisciplinary decision-making and integrate pharmacy expertise early into public health policy planning.
2. **Regulatory bodies & policy makers**
   - Enact legal reforms to expand pharmacists' prescribing authority, promote sustainable funding and require pharmacist participation in national immunisation registries to ensure full data access and improve patient safety.
   - Mandate the inclusion of pharmacists as core members of NITAGs and equivalent advisory bodies.
   - Mandate comprehensive vaccination training in pharmacy education and professional development to boost competency, build public trust, and drive higher vaccine uptake.
3. **Educational institutions & educators**
   - Strengthen academic quality through competency-based education to equip professionals with essential skills and knowledge.
   - Embed public health and immunisation leadership into pharmacy education. Require pharmacy curricula to include comprehensive, competency-based public health modules (vaccination, health promotion, behavioural change communication).
   - Advance interprofessional education (IPE): Develop and scale up training programmes where pharmacy students learn side-by-side with medical and nursing students on preventive healthcare delivery

- Support research in pharmacy-led public health models: Invest in longitudinal studies assessing the health and economic outcomes of pharmacist-led vaccination and NCD services.

4. **Professional associations & pharmacy leadership**
   - Create opportunities to educate other healthcare professionals, foster interprofessional collaboration, and advocate for inclusion through key data sharing.
   - Champion pharmacist-led public health initiatives: Run national campaigns highlighting pharmacy's successes in vaccination, screening, NCD management, and preventive health education.
   - Build capacity through continuous education: Offer certified training programmes on vaccination techniques, patient-centred preventive counselling, and chronic disease management.
5. **Funders**
   - Ensure insurance reimbursement for pharmacy-administered vaccines.
   - Fund research and pilot programmes on pharmacist-delivered preventive services (immunisation, NCD screening, health literacy interventions).
6. **Healthcare providers (e.g., physicians, nurses)**
   - Develop collaborative models for preventive services: Foster formalised shared-care arrangements with pharmacists for vaccinations, chronic disease screening, and minor ailment management.
   - Promote joint referral pathways: Physicians and nurses should actively refer patients to pharmacist-led services such as smoking cessation clinics, blood pressure checks, and preventive screenings.
7. **International partners**

   Encourage greater pharmacist representation in global organisations like the UN and WHO to strengthen contributions to immunisation policies and expand their role in life-course vaccination and NCDs prevention.



Community pharmacies are expanding access to preventive services at scale:

- Blood pressure screening
- Tobacco cessation counselling
- Life-course vaccination
- Minor ailments management
- Early detection of chronic diseases

In **Switzerland**, pharmacist-administered flu vaccines prevented 17.6 primary care visits, 0.33 hospitalisations, and 1.1 hospital days per 100,000 population per season, leading to CHF 143,021 (EUR 148,930) in savings.[5]

In the **USA**, pharmacist-led flu vaccinations could prevent up to 16 million cases per year, saving USD 69.5 billion (EUR 62.47 billion) in productivity losses.[6]

In chronic disease management, pharmacist-led services **improve HbA1c by 0.7% to 2%,** enhance inhaler technique up to **7 times better** than usual care[3,7-10]

In **South Africa**, pharmacist-led medication reviews identified an average of 4 medication-related problems per patient in a diabetes programme.[11]

FIP calls on governments and policymakers to expand pharmacists' scope to deliver preventive services, including vaccination and early detection programmes, and to integrate pharmacy into national public health strategies.

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1. Why pharmacy matters

Pharmacists' integration into immunisation services and NCD care offers a high-impact, cost-effective approach to strengthening health systems. Vaccination, one of the most effective public health interventions, prevents an estimated 2.5 million deaths annually.[14] Pharmacists enhance immunisation coverage by improving accessibility, building vaccine confidence, and extending reach to underserved populations.[15, 16] Their role is especially critical as they often serve as primary points of contact in communities.

Pharmacists also address the global challenge of NCDs, which account for over 43 million deaths annually, with 82% of premature deaths occurring in low- and middle-income countries.[7] Through early detection, medication optimisation, and interdisciplinary collaboration, pharmacists contribute to more sustainable and equitable health outcomes. The role of pharmacists in both domains exemplifies their ability to operate at the intersection of clinical care, public health, and system efficiency.[8, 9]

2. Pharmacy-based vaccination

2.1 The global context

At the Global Conference on Primary Health Care in October 2018, held in Astana, Kazakhstan, the World Health Organization (WHO) launched the Astana Declaration, which reaffirmed the central role of primary health care (PHC) in achieving better health outcomes.[12] This declaration highlighted the importance of strengthening PHC systems to ensure equitable health for all.[12]

Achieving universal health coverage (UHC) remains a vital goal globally. Vaccination is one of the most effective public health interventions for mitigating disease burden, preventing an estimated 2.5 million deaths annually.[14] Immunisation against vaccine-preventable diseases reduces morbidity and mortality, contributes to herd immunity and eases pressure on healthcare systems by lowering emergency visits and hospitalisations. Furthermore, life-course immunisation plays a crucial role in mitigating the burden of non-communicable diseases (NCDs) and addressing the growing impact of climate change on vaccine-preventable diseases.

FIP recognises disease prevention as a strategic priority. By advancing the pharmacist's role in prevention, FIP supports individuals to stay healthy and productive, while contributing to stronger health systems, reduced societal costs, and improved quality of life. These goals align closely with WHO's commitment to leaving no one behind.

2.2 The expanding role of pharmacy in vaccination

A cornerstone of FIP's prevention programme is expanding pharmacists' involvement in improving vaccination coverage across the life course. Pharmacists contribute to immunisation efforts through advocacy, equitable access, and safety monitoring. Their accessibility and reach make them uniquely positioned to serve high-risk and underserved populations, while their patient-centred approach builds trust and counters vaccine hesitancy and misinformation.

In practice, pharmacists are responsible for multiple components of immunisation delivery: promoting vaccine uptake, storing and managing vaccine supplies, maintaining accurate records, administering vaccines, and managing potential adverse reactions such as anaphylaxis. In addition, they contribute to vaccine safety through pharmacovigilance and play a role in research and development.

Unfortunately, in some parts of the world, there is scepticism from various stakeholders around the ability of pharmacists to deliver vaccination services. However, given their accessibility, qualifications, and experience in patient care management, pharmacists—particularly those employed in community pharmacies or primary care facilities—are poised to play a pivotal role in advancing global immunisation endeavours. Through this approach, they contribute to the efficient and resilient operation of the healthcare system and deliver value to patients.

2.3 Strengthening the evidence base for pharmacist-led vaccination

Expanding authorisation for pharmacy-based vaccination

Pharmacists' roles in delivering vaccination services have expanded significantly in recent years, with more countries formally authorising this practice. As of 2024, FIP's landmark publication 'Leveraging pharmacy to deliver life-course vaccination: An FIP global intelligence report' revealed that among the 117 countries and territories for which pharmacy-based vaccination (PBV) data is available, PBV is authorised in 56 of these, representing 47.9% of the total.[2, 17]

This represents an important increase of 22 countries (64.7%) in relation to data reported by FIP in 2020, which had identified 34 countries and territories with PBV.[2, 17] This indicates active changes in pharmacy practice and regulatory frameworks to include vaccination services in pharmacies.

In 26 countries or territories (49%) pharmacists are authorised to prescribe certain vaccines for administration. This marks a noticeable increase from 2020 when most respondents (68%) lacked prescribing authority, and only seven respondents (21%) authorised pharmacists to prescribe some vaccines.[2, 17] Vaccines administered include influenza, COVID-19, Tdap boosters (against tetanus, diphtheria and pertussis), hepatitis B, pneumococcal, human papillomavirus (HPV), herpes zoster (shingles) and meningococcal vaccines.[2, 17] A milestone in expanding vaccination options available at pharmacies was marked by the emergence of the respiratory syncytial virus (RSV) vaccine in nine countries.

Countries continue to make favourable legislative changes which can support pharmacists' prescribing authority and simplify patient journeys, further improving vaccination coverage rates.[2, 15] For example, South Australia is the first state in Australia to pass legislation allowing pharmacists to administer all vaccines to all ages. As seen in Australia, Canada, France, Ireland, Portugal, UK and USA, advocacy in policy change and collaboration among healthcare professionals, policy makers and the public are necessary for the successful implementation of PBV, ensuring better access and uptake of essential vaccines.[18-20]

PBV can reduce the burden in other areas of the healthcare system. For example, in England, 35% of adult NHS influenza vaccinations are currently provided in pharmacies. If the same proportion of pharmacy-based vaccinations were provided for the shingles and pneumococcal NHS programmes, more than 400,000 GP practice appointments could be saved per year.[21] This equates to more than 80,000 hours of healthcare professional (principally practice nurse) time within the general practice (GP) setting. [21]

Funding models to maximise access and uptake

According to the 2024 FIP intelligence report, among the 37 countries analysed, a majority (21 countries) rely on out-of-pocket payments for pharmacy-based vaccination.[2] Several studies have shown that when individuals are required to pay directly for vaccines, financial barriers can deter timely vaccination, especially in settings where economic disparities are pronounced.[5] For example, Ecarnot and colleagues suggest that the convenience and accessibility of pharmacy-based vaccinations are only fully realised when cost barriers are minimised.[20] By contrast, public reimbursement mechanisms—as seen in 13 countries—have been linked to higher vaccination rates by removing the direct cost burden on patients.[2, 20] The fact that only ten countries offer free pharmacy-funded vaccinations and nine rely on private insurance reimbursement suggests that, overall, there is a relatively low integration of funding mechanisms that promote universal access.[2, 20]

The out-of-pocket payment is a widely adopted funding model across all WHO regions. Public reimbursement is the most common model for funding pharmacy-based vaccinations in Europe (nine countries), reflecting strong governmental support for pharmacy-based vaccinations.[2, 19] Countries such as Belgium, France, Germany, and the UK have integrated these services into their national health systems, ensuring minimal direct costs to patients and promoting higher vaccination rates.[2, 19] Optimising the pharmacy-based vaccination delivery and potentially reconsidering payment incentives might increase efficiency. A study in the UK shows that with NHS payments (excluding product fees), a shift to pharmacy-based vaccination could be (at least) cost-neutral to the NHS and could generate increased revenues for pharmacy.[21]

Public support and patient satisfaction

The evolution and expansion of pharmacy-based vaccination continues to demonstrate significant value to patients. In Germany, a study found that more than 9 out of 10 patients were highly satisfied with vaccinations administered in pharmacies.[2] Satisfaction with key aspects of service delivery such as scheduling, waiting time, quality of information, hygiene, and perceived safety was similarly high, with positive ratings exceeding 95% across the board.[2]

A 2023 national survey of 2,125 Canadian adults found that the majority believed expanding the range of services offered at pharmacies, including vaccinations, would improve both access to and quality of healthcare.[2] In Romania, public perceptions of pharmacy-based services were also favourable, with reported satisfaction linked to positive pharmacist–patient interactions, the clarity of information provided, and the accessibility and affordability of services.[2]

In Belgium, more than 1,200 citizens expressed support for receiving vaccinations at pharmacies and from pharmacists.[2, 15, 19] In the USA, evidence from 2023 shows that states allowing pharmacists to prescribe and administer vaccines independently—or through a statewide standing order—had 9% higher vaccination rates for RSV, pneumococcal, and shingles vaccines compared to states where a physician prescription or restrictive protocol was required.[4, 16, 22]

Addressing implementation challenges

While pharmacist-administered vaccination has emerged as a viable strategy to expand immunisation coverage, especially in underserved communities, it is not without its challenges, as identified from the 2024 FIP intelligence survey and other literature:[2-4, 15, 19, 23-26]

I. Regulatory and policy constraints: The absence of clear legal frameworks and limitations in pharmacists' scope of practice can limit effective pharmacist-administered vaccination

services. For example, there are explicit laws that prevent pharmacists from administering vaccines in Barbados, Bulgaria, Cyprus (Northern), and Estonia.[3] However, in Australia, gradual regulatory reforms—culminating in South Australia's 2025 authorisation for pharmacists to administer all vaccines—demonstrate how policy evolution can improve vaccine access.[19, 27]

II. Lack of acceptance and support: There continues to remain a lack of acceptance and support from governmental bodies and other healthcare professions for pharmacists providing vaccination services. Professional resistance from physicians and nurses are often fuelled by concerns over clinical oversight and professional competition.[2, 4] This observation suggests the need for enhanced advocacy to educate key stakeholders on the advantages of engaging pharmacists in vaccination efforts and to establish productive interprofessional alliances. France's model of interprofessional collaboration, involving training programmes co-developed with medical associations, showcases how mutual trust and clear boundaries can be fostered.[3] Additionally, public trust and vaccine confidence are critical; Canada's success in countering misinformation through coordinated public awareness campaigns and community engagement highlights the importance of strategic communication.[3] Collectively, these best practices underscore the need for comprehensive, multi-stakeholder approaches to overcome implementation challenges and scale pharmacist-administered vaccination services effectively.

III. Restricted access to vaccination records: Immunisation documentation, including full access to vaccination records (reading), the ability to record administered vaccines in a shared immunisation registry (writing), and reporting capabilities—has become increasingly important. The proportion of countries reporting that pharmacists have such full access has increased slightly, from 33.3% (33 out of 99 countries) in 2020 to 39.7% (28 out of 73 countries) in 2024. Despite this modest improvement, limited access may still result in inconsistent communication between pharmacists and other healthcare providers regarding individuals' vaccination status. However, it is worth noting a progressive example: as of 1 March 2025, pharmacists in Australia are required by regulation to record the pregnancy status of individuals at the time of vaccination in the Australian Immunisation Register (AIR).[28] This expansion of data access and reporting will help consolidate vaccination records across providers and reduce the risk of both under- and over-vaccination.

IV. Inconsistent training: The lack, or inconsistency, of effective and timely training to pharmacists further impedes the implementation of pharmacy-based vaccination services. However, there has been an increase in the number of countries incorporating vaccination training into both undergraduate and postgraduate education. Since 2016, the number has risen from 12 to 64 countries (+433%).[2] Greece and Hong Kong, which previously offered training only at the postgraduate level, have now extended it to undergraduate studies.[2] This trend indicates a growing recognition of the vital role pharmacists play in vaccination efforts, accompanied by an increasing emphasis on equipping them with essential skills and knowledge.

Representation in policy and technical advisory groups

Despite pharmacists' role in providing accessible and evidence-based immunisation services to communities, their presence in advisory and decision-making roles on Vaccine Technical Committees, such as National Immunisation Technical Advisory Groups (NITAGs) and equivalent bodies, remains limited or underrepresented.[16] The mapping of 184 countries and territories reveals pharmacy representation on NITAGs in only 31 countries, with varying levels of participation that limit their impact on the final recommendations of the NITAG to policymakers and health authorities.[16] In some countries (such as France and the USA), pharmacy is represented in the NITAG by design, meaning that pharmacist organisations are purposefully and permanently included in the NITAG through one or more representatives of professional organisations. In other countries, some pharmacists serve on NITAGs due to their individual scientific, technical or professional expertise (such as Malta and South Africa).[16]

Given pharmacists' contributions across the immunisation value chain—from manufacturing and distribution to prescribing and public education—it is essential to include pharmacy as a core member of national advisory bodies. Expanding representation by design will ensure that national immunisation strategies fully reflect the expertise and reach of the pharmacy workforce.

2.4 FIP actions and contributions

FIP strongly advocates for the integration of pharmacists in vaccination services, recognising their potential to improve life-course vaccination coverage. The importance of this agenda is reflected in the FIP Development Goals (DGs), where 17 of the 21 DGs relate to vaccination, and DG 16 specifically addresses the prevention of communicable diseases, in which vaccination plays a prominent role.[29, 30]

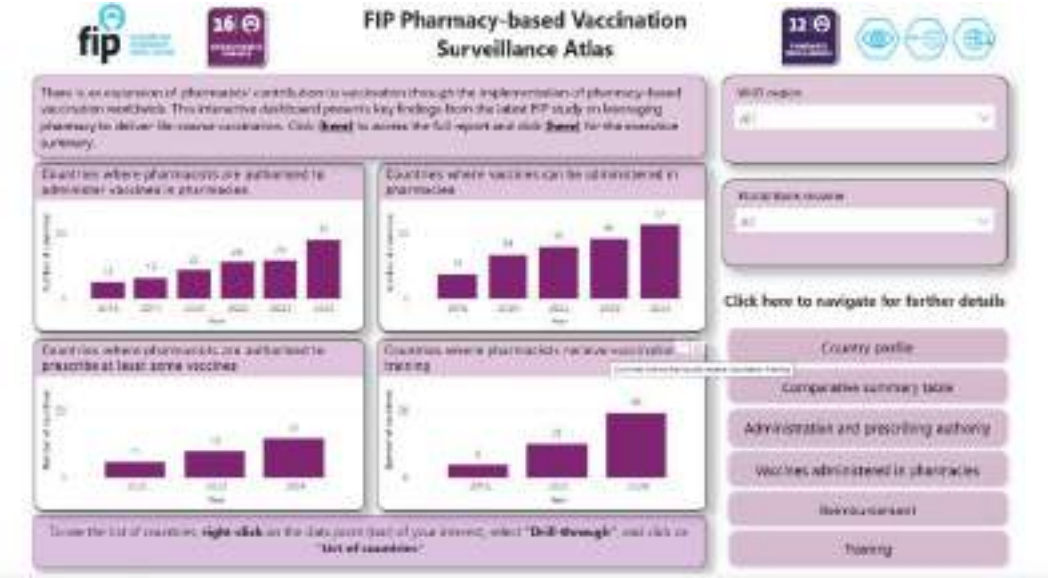
FIP has been a longstanding advocate for expanding pharmacists' roles in immunisation. This commitment was formally reinforced in 2011 through the publication of the joint WHO-FIP "Good Pharmacy Practice guidelines",[31] which recognised the administration of medicines, vaccines, and other injectables as a core responsibility of pharmacists. Since then, FIP has continued to lead global efforts to advance pharmacy-based vaccination.

FIP's extensive portfolio of vaccination-related resources underpins the evidence-based expansion of the pharmacist's role in immunisation. This includes professional development materials such as publications, webinars, CPD Bites, and the "Let's Talk About Vaccines" campaign, alongside a wide range of policy and advocacy tools, including brochures and infographics. All of these resources are accessible through the FIP prevention microsite: https://prevention.fip.org/vaccination/

In 2023, FIP released a Statement of Policy on the role of pharmacy in life-course vaccination to emphasise the importance of expanding vaccination schedules and strategies beyond infancy, as well as integrating pharmacists into patient immunisation pathways.[6]

Building on previous surveys, in 2024, FIP published a comprehensive report, 'Leveraging pharmacy to deliver life-course vaccination: An FIP global intelligence report', which evaluated various aspects of pharmacist-led vaccination, including advocacy activities, regulatory frameworks, vaccine administration and prescribing, training and certification, access to vaccination records, and remuneration models.[2] It also identified barriers to expanding these services within pharmacy

practice. To complement this, FIP launched an interactive digital atlas, that showcases key findings and insights from its global vaccination surveillance efforts. This dynamic resource is continuously updated, providing real-time access to the latest developments in pharmacist-led immunisation.[17]



In April 2024, FIP held the first global vaccination summit, laying the groundwork for a global policy framework supporting pharmacist-led life-course immunisation.[23] The second summit,[32] held in March 2025, reviewed progress, presented new data, and explored innovations in vaccine development and delivery through pharmacy.

Publications released during 2025 include:

	Funding models, and economic and societal impact of pharmacy-based vaccination - Findings from FIP reports and literature With an analysis of the funding models, economic value, and broader societal benefits of pharmacy-based vaccination (PBV) services worldwide, this report explores challenges to sustainable financing of PBV and highlights both direct and indirect savings generated through PBV, including improved immunisation coverage and reduced burden of vaccine-preventable diseases.
	Policy progress, stakeholder engagement and challenges in pharmacist-led vaccination: Findings from FIP reports and literature This report highlights policy developments, the expanding role of pharmacists in improving immunisation access, and key challenges such as regulatory restrictions and professional resistance.

		Pharmacy representation on national immunisation technical advisory groups (NITAGs) (members-only resource) This publication highlights the critical benefits of including pharmacists in these committees, explores the barriers preventing their involvement, identifies opportunities to enhance their representation, and outlines concrete strategies for engaging key stakeholders.
		FIP knowledge and skills reference guide for professional development in vaccination services This guide builds on existing FIP data and resources to enhance pharmacists' training and education in pharmacy-based vaccination.

2.5 Call to action: Strengthening pharmacy-based vaccination

Expanding pharmacists' roles in immunisation is essential to improving health outcomes, reducing pressure on health systems, and building more resilient primary care infrastructure. The implementation and scale-up of pharmacy-based vaccination should be prioritised through high-level stakeholder engagement, education, and targeted advocacy. As vaccine hesitancy remains a global health threat, pharmacists are critical allies in boosting public confidence and coverage.

1. Review and reform restrictive legislation: Governments should review and amend laws that limit the delivery of pharmacy-based vaccination services. Legislative updates should grant pharmacists prescribing authority for a broader range of vaccines and extend both public and private insurance reimbursement for vaccinations administered by pharmacists. In addition, enabling pharmacists to deliver vaccines year-round—beyond seasonal campaigns for influenza or COVID-19—can relieve pressure on healthcare systems during peak periods, improve timely access, and support equitable and sustained vaccine uptake across populations.

2. Promote interprofessional collaboration: Policymakers should invest in fostering collaboration between pharmacists, other healthcare professionals, health authorities, and the public to support the effective integration of pharmacists into national immunisation programmes. Educating medical professionals on the value and safety of pharmacist-led vaccination will help build mutual trust and enable interprofessional models of care. This, in turn, can increase vaccine acceptance, improve public health outcomes, and expand service reach—particularly in underserved areas.

3. Mandate access to shared immunisation records: To promote continuity of care and patient safety, governments should mandate pharmacists' full access to national immunisation registries. This includes rights to read, record, and report vaccination data. Integrated

participation in these shared systems ensures real-time documentation, reduces duplication, and enhances coordinated decision-making across health providers.

4. Embed vaccination training in pharmacy education: Comprehensive vaccination training should be embedded into undergraduate pharmacy curricula and continued through mandatory professional development. This will ensure that pharmacists are equipped with the clinical knowledge and communication skills needed to safely deliver vaccination services, respond to public concerns, and reinforce vaccine confidence among diverse populations.

5. Include pharmacy in national immunisation policy: Policymakers should mandate the inclusion of pharmacists as designated members of National Immunisation Technical Advisory Groups (NITAGs) and equivalent decision-making bodies. Representation by pharmacy organisations—rather than ad hoc or individual appointments—ensures that pharmacists contribute meaningfully to national immunisation strategies and that the unique perspectives of pharmacy practice are reflected in policy recommendations.

6. Strengthen global pharmacy representation: Expanding pharmacist representation in global platforms such as the WHO and UN health initiatives will reinforce the profession's strategic role in advancing life-course immunisation worldwide.

3. Pharmacists in NCD screening, prevention and chronic care

3.1 The global context

NCDs are the leading cause of morbidity and mortality worldwide, responsible for at least 43 million deaths in 2021, with 18 million of these occurring before the age of 70. Of these premature deaths, 82% occurred in low- and middle-income countries (LMIC).[7] This poses a significant challenge to public health and sustainable healthcare systems.

The Sustainable Development Goal (SDG) target 3.4 specifically aims to reduce premature mortality from NCDs by one-third by 2030.[13] In alignment with this global goal, FIP has made the prevention and management of NCDs a strategic priority across its programmes in pharmaceutical education, practice, and science. FIP's vision (to ensure access to medicines and pharmaceutical care services provided by pharmacists) aligns directly with global efforts to reduce the burden of NCDs.

Effective responses to NCDs must be evidence-based, cost-effective, affordable, and feasible. These interventions should be integrated into national health policies and supported by robust indicators tracking both disease prevalence and risk factors. Equity must be at the centre of these strategies—ensuring that services are targeted to at-risk populations and that individuals receive tailored care to improve health outcomes.

The World Health Organization (WHO) has identified five priority NCD areas: cardiovascular diseases, cancer, chronic respiratory diseases, diabetes, and mental health. These are driven by modifiable risk factors including tobacco use, unhealthy diet, harmful alcohol consumption, physical inactivity, and air pollution.[7, 33] In addition, other conditions—such as obesity, chronic kidney disease, oral and eye health conditions, and thyroid disorders—also contribute substantially to the global NCD burden.[7, 33]

Addressing NCDs comprehensively requires an integrative approach that recognises the links between these diseases, their shared risk factors, and the complex interactions with comorbidities.[33, 34] A people-centred model is essential in managing these conditions, ensuring that treatment plans

are tailored to address both individual health needs and the broader impact of multiple coexisting diseases, with a focus on improving overall quality of life and health outcomes.

3.2 The role of pharmacy in NCDs

Pharmacists, due to their accessibility, clinical expertise, and regular interactions with patients and communities, are uniquely positioned to support the prevention, early detection, and management of NCDs. Their contributions span the continuum of care, from primary prevention to treatment optimisation and long-term management.

NCDs contribute to significant economic and healthcare burdens, with cardiovascular diseases, cancers, diabetes, and chronic respiratory diseases accounting for 80% of premature NCD-related deaths.[7] These diseases not only cause significant morbidity and mortality but also place immense pressure on health systems, economies, and social structures.

The continued rise in NCD prevalence is largely driven by modifiable risk factors, including tobacco use, physical inactivity, harmful alcohol consumption, unhealthy diets, and air pollution. While global frameworks have prioritised these areas, progress remains uneven. There is a critical need for scalable, cost-effective interventions that improve early detection, disease management, and prevention—particularly within PHC systems.

Pharmacists are well placed to address these challenges within community and primary care settings by delivering accessible, evidence-based services that improve early detection, prevention, and management outcomes. Their key contributions include:

1. **Health education and behaviour change counselling:**
   Pharmacists provide individual and community-based education to reduce modifiable risk factors such as tobacco use, poor diet, sedentary lifestyle, and harmful alcohol consumption. They empower patients through personalised advice, public health messaging, and motivational interviewing.
2. **Community-based screening and early detection:**
   Pharmacists conduct risk assessments and offer point-of-care testing (such as blood pressure, blood glucose, cholesterol) to detect conditions like hypertension, diabetes, and dyslipidaemia. They identify at-risk individuals and refer them to appropriate care in a timely manner.
3. **Monitoring and optimisation of pharmacotherapy:**
   Pharmacists support safe and effective medication use through therapeutic monitoring, adherence support, adverse drug reaction prevention, deprescribing where appropriate, and identifying drug-related problems to optimise health outcomes.
4. **Medication therapy management (MTM):**
   MTM services include comprehensive medication reviews, reconciliation, and long-term support for people with chronic conditions. These services ensure therapeutic effectiveness and prevent medication-related harm.
5. **Support for lifestyle modification and self-management:**
   Pharmacists help patients manage NCDs by guiding self-monitoring practices, supporting behaviour change, and coaching on nutrition, physical activity, and risk reduction.
6. **Patient education and counselling:**
   Through one-on-one or group interventions, pharmacists promote disease understanding, improve medication literacy, and increase adherence to both pharmacological and non-pharmacological treatments.
7. **Digital health integration:**
   Pharmacists utilise mobile health (mHealth) tools, digital adherence technologies, telehealth platforms, and electronic health records to support chronic disease management, remote monitoring, and timely interventions.
8. **Public health promotion:**

Pharmacists lead or support health campaigns targeting issues such as smoking cessation, obesity prevention, cardiovascular risk awareness, and responsible self-care, reinforcing positive health behaviours at the community level.

9. **Interprofessional collaboration:**
   Pharmacists work alongside physicians, nurses, public health professionals, and allied health providers in multidisciplinary teams to ensure person-centred, coordinated care across the continuum—from prevention to palliative support.
10. **Support for immunisation strategies:**
    Pharmacists also contribute to public health and immunisation strategies, particularly for people living with NCDs who face elevated risks of complications from vaccine-preventable diseases. By facilitating access to vaccination, pharmacists help protect high-risk populations and reduce the burden on health systems.

These interventions, in close collaboration with other health professionals, deliver value to patients and contribute to making health systems more efficient, resilient and sustainable.

3.3 Evidence based contributions of pharmacy in NCD prevention and management

Several pharmacist-led interventions in NCD management are well documented across FIP's global resources. For example, community pharmacy-based blood pressure screening and management programmes have demonstrated success in detecting undiagnosed hypertension and improving blood pressure control rates.[35, 36] In diabetes care, pharmacist-led medication reviews, patient education, and the use of digital adherence tools have led to improved glycaemic control and reduced complication rates.[37] Pharmacists also play a critical role in managing asthma and chronic obstructive pulmonary disease (COPD), helping patients improve inhaler technique, medication use, and symptom control.[38]

Tobacco cessation is another key area where pharmacists have demonstrated public health impact. Their involvement includes the provision of nicotine replacement therapy (NRT), behavioural counselling, and patient education. The FIP report, "Pharmacist-led tobacco cessation services: Evidence of impact and country highlights", shows that pharmacy-based cessation services are associated with improved health outcomes, economic savings, increased health system efficiency, and reduced pressure on other healthcare sectors through interdisciplinary collaboration.[39, 40]

At the country level, pharmacy-led tobacco cessation efforts in India and Jordan, supported by FIP, illustrate the value of structured pharmacist involvement. In collaboration with the Indian Pharmacists Association (IPA) and the Jordan Pharmacists Association (JPA), FIP has contributed to integrating pharmacists into national cessation strategies, delivering training (both digital and in-person), strengthening workforce capacity, and promoting service uptake. These initiatives demonstrate how pharmacists can be mobilised at scale to support national NCD control efforts.

3.4 FIP actions and contributions

For many years, FIP has been highlighting the critical roles that pharmacists play in addressing the burden of NCDs and supporting its member organisations to advocate for and develop professional services in this area.

A key milestone in this area was the 2019 publication of the reference paper 'Beating non-communicable diseases in the community: The contribution of pharmacists',[9] which highlighted the significant impact of pharmacy services in prevention, screening, management, and therapeutic optimisation of NCDs. In the same year, FIP adopted the statement of policy on 'The role of pharmacists in non-communicable diseases',[8] which reaffirmed the evolving role of the profession in addressing the NCD crisis.

In 2021, in response to the Astana Declaration and FIP's ongoing commitment to NCD care, the FIP Practice Transformation Programme (PTP) on NCDs was launched.[41, 42] This flagship project aims to deliver FIP's commitment to the WHO's Astana Declaration and the primary health care agenda, with a focus on non-communicable diseases.

Building on these foundations, the FIP PTP on NCDs aligns particularly with FIP Development Goal (DG) 15: People-centred care, as well as DG 7: Advancing integrated services and DG 14: Medicines expertise. It also supports DG 8, DG 18, DG 19, DG 5, DG 12, and DG 21, reinforcing a comprehensive approach to NCD management.

The programme provides tools and strategic support to FIP member organisations to develop and implement pharmacy services that can have a sustained positive impact on the prevention, screening, management, and treatment optimisation of NCDs, ultimately improving patient outcomes and health systems' efficiency and sustainability. The programme focuses on five disease areas: cancer, cardiovascular diseases, chronic respiratory diseases, diabetes, and mental health, as well as on risk factors for NCDs, such as tobacco use, harmful alcohol use, unhealthy diet, physical inactivity, and air pollution.

FIP's commitment to strengthening the role of pharmacists in public health and NCD management is reinforced through its policies, programme, and resources, advocating for pharmacy-led interventions that contribute to disease prevention and improved health outcomes. Pharmacists are increasingly recognised as key contributors to reducing the burden of NCDs, and FIP continues to expand its efforts to support and empower them in this role.

Since 2021, FIP has developed a range of handbooks, knowledge and skills guides, global reports and digital events to support pharmacy practice in NCD prevention and management. These resources, which include publications on specific NCDs, provide pharmacists with a strong foundation to engage in the prevention, management, and treatment optimisation of non-communicable diseases.

The FIP NCDs website offers a wealth of resources, including policy guidelines, handbooks, knowledge and skills reference guides, and tools to help pharmacists expand their role in NCD prevention and management.[43]

In addition to the publication of these resources, in March 2024 FIP became a member of the Global Alliance Against Chronic Respiratory Diseases (GARD), hosted by the WHO. This membership not only recognises pharmacists' role in preventing and managing chronic respiratory diseases (CRDs) but also opens doors for further collaboration with other GARD members and WHO itself. FIP's involvement in GARD strengthens its position as a key player in the global fight against chronic diseases, particularly in areas like tobacco cessation and respiratory disease management.

FIP has been a long-term supporter of the implementation of the WHO Framework Convention on Tobacco Control (WHO FCTC) and holds the status of Observer to the Conference of the Parties to the WHO Framework Convention on Tobacco Control (CoP FCTC).[44] In February 2023, this status was renewed after a successful application.

FIP's work in the field of NCDs has also been acknowledged by the WHO Global Coordination Mechanism on NCDs (GCM/NCD). In August 2024, FIP was recognised as the GCM Participant of the Month, an honour that highlights the organisation's valuable contribution to global NCD efforts. This recognition included the promotion of FIP's NCD resources on the Knowledge Action Portal (KAP) and their inclusion in the monthly GCM newsletter, reaching a broad international audience of NCD stakeholders.[45]

FIP continues to advocate for the inclusion of pharmacists in national and international health policies, working alongside international organisations to improve access to NCD care.

3.5 Call to action: Empowering pharmacy in the NCD response

To strengthen national and global responses to non-communicable diseases (NCDs), governments, health systems, and relevant stakeholders are called upon to:

1. Integrate pharmacists as key actors in NCD prevention and control: Enable pharmacists to practice to their full scope by enacting supportive regulations and recognising their expertise in prevention, early detection, therapeutic optimisation, and long-term disease management.
2. Invest in people-centred pharmacy service models: Ensure equitable access to safe, quality-assured medicines, vaccines, and medical devices through sustainable pharmacist-led services embedded within primary health care systems.
3. Strengthen policies that address root causes of NCDs: Promote healthy behaviours, reduce exposure to risk factors, and address inequalities through coordinated, cross-sectoral public health policies with pharmacy integrated at all levels.
4. Implement evidence-based pharmacist-led interventions: Scale up proven models for education, screening, counselling, and therapeutic monitoring—adapting them to country contexts and enabling pharmacists to contribute fully to NCD strategies.
5. Support interprofessional collaboration: Foster collaborative care models that position pharmacists within multidisciplinary teams, ensuring integrated, patient-centred care that includes patients, families, and caregivers.[46]
6. Recognise pharmacies as accessible public health hubs: Position pharmacies as community-based centres for NCD screening, health promotion, and vaccination, with pharmacists recognised as frontline public health professionals.
7. Leverage digital health and innovation: Support the use of mobile health tools, electronic health records (EHRs), adherence tracking systems, and point-of-care diagnostics to enhance pharmacist-led care and NCD outcomes.
8. Promote responsible self-care and community empowerment: Integrate pharmacy-based self-care models that empower individuals and families in disease prevention, early action, and long-term health management.
9. Ensure fair remuneration for pharmacy services: Develop payment and incentive models that reflect the clinical and economic value of pharmacist-delivered NCD services and reward the implementation of high-impact, evidence-based practices.
10. Commit to sustainable investment in pharmacy-led research and innovation: Allocate funding for real-world evidence generation, digital health solutions, and outcomes research to demonstrate and enhance the impact of pharmacists on NCD management.
11. Build and sustain a competent pharmacy workforce: Ensure that pharmacy education, training, and regulatory frameworks reflect pharmacists' evolving roles in NCD care. Workforce development plans must prioritise positive practice environments and career sustainability.

4. Conclusion

Pharmacists are increasingly recognised as essential partners in communicable and non-communicable disease prevention, with pharmacy-based vaccination and wider public health services contributing directly to SDGs. Progress is evident, with more countries authorising pharmacists to deliver vaccines and expanding vaccination training in pharmacy education, yet barriers remain in regulation, policy, financing, and public perception. Overcoming these challenges will require legal and policy reforms, stronger interprofessional collaboration, and investment in education, research, and remuneration. By enabling pharmacists to fully apply their expertise and accessibility, health systems can strengthen prevention, improve equity in vaccine and NCD care, and advance universal health coverage.

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CHAPTER 4

Pharmacy in humanitarian crises and emergency response

This chapter explores pharmacy's role in disaster, conflict, and emergency settings. It highlights pharmacist-led efforts in maintaining medicine access, continuity of care, and public health response, drawing from global case studies and advocating for greater integration into humanitarian frameworks.

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Content list

High level summary

1. FIP empowers pharmacists in humanitarian crises by providing training, resources, and guidance to ensure effective delivery of medicines and healthcare in emergencies, while fostering collaboration among global stakeholders to enhance pharmacists' capacity in disaster response and preparedness.
2. The FIP HumanityRx programme explores topics such as how to manage supply chains, ensure medicine access, and address public health challenges in crises, supporting both immediate relief efforts and long-term healthcare resilience for vulnerable populations.
3. FIP advocates for **pharmacists' integration into emergency management plans at all levels**, calls for increased training, interprofessional collaboration, and funding for pharmacist-led initiatives, and highlights the critical role pharmacists play in supply chain management, vaccination, and disease prevention in conflict and disaster-affected areas.

Key message

Pharmacists are **essential frontline responders in humanitarian and disaster settings**—ensuring medicine availability, safeguarding supply chains, and delivering public health services. However, their inclusion **in emergency preparedness and response** remains limited. Greater recognition, formal integration, and targeted investment are needed to fully leverage their potential in crises.

Related FIP Development Goals

Humanitarian crises and emergency response is primarily linked with Development Goal 18: Access to medicines, devices and services as pharmacies are accessible health points during such crises.

Call to action

1. To enhance pharmacists' role in emergency and disaster response, international bodies like the UN and WHO should increase their representation in strategic planning.
2. Pharmacists need formal training in disaster management to effectively handle complex crises.
3. Strengthening interprofessional collaboration through dedicated platforms is essential, along with boosting funding for pharmacist-led initiatives in supply chain management, vaccination efforts, and disease prevention in conflict-affected areas.

In **Türkiye**, 4,500 pharmacists provided 74 days of free pharmaceutical care to millions affected by the 2023 earthquakes. (Turkish Pharmacists Association (TPA))

In **Japan**, 2,395 pharmacists were deployed after the 2024 earthquake to provide emergency care in shelters and evacuation centres. (Japan Pharmaceutical Association (JPA))

In **Lebanon**, pharmacists supported cholera vaccination and emergency medicine supply for displaced populations. (Order of Pharmacists of Lebanon (OPL), INSPECT-LB)

In **New Zealand**, pharmacists led medicine supply coordination during the 2023 cyclone, ensuring access despite community isolation. (Health New Zealand Te Whatu Ora)

In **South Africa**, pharmacists used makeshift home pharmacies to ensure chronic treatment continued after looting destroyed facilities. (Pharmaceutical Society of South Africa (PSSA))

Despite these proven contributions, many disaster frameworks still fail to recognise or integrate pharmacy as part of emergency health systems.

FIP calls for the formal integration of pharmacists into national and global disaster frameworks. Investing in pharmacy means protecting lives — before, during, and after disaster strikes.

www.fip.org

This information is based on case study submissions received from FIP member organisations.

1. Healthcare impact in disaster and emergency situations

Crises have a profound impact, particularly in fragile environments where healthcare systems face overwhelming pressure. These challenges deepen existing inequalities, disrupt essential services, and heighten risks for vulnerable populations. In such circumstances, healthcare professionals play a crucial role in addressing urgent medical needs and supporting community health. In conflict zones and disaster-affected areas, disruptions in medical supply chains can have devastating consequences. Climate-related emergencies—such as hurricanes, floods, droughts, and extreme heat—further disrupt healthcare delivery and supply chains.

Collaboration with other medical professionals enhances patient care, particularly in emergencies where pharmacists' expertise in pharmacotherapy, drug interactions, and disease management is invaluable, especially using technology.[1] In refugee camps and emergency units, they work with logistics teams, doctors, and nurses to assess needs, prevent medication errors, ensure quality control, and manage diseases such as malaria, tuberculosis, and HIV/AIDS in resource-limited settings.

2. Role of pharmacists in disaster and emergency situations

Pharmacists are key to procuring, distributing, and ensuring the appropriate use of medications. They facilitate access to essential treatments, including antibiotics, vaccines, and chronic disease medications, while also preventing the circulation of counterfeit drugs.[2] In humanitarian situations, pharmacists support medical teams to ensure the distribution of medicines, managing stock, and providing critical guidance on pharmaceutical care in disaster and emergency settings.[3] For instance, in war-torn nations like Syria and Yemen, pharmacists have established mobile clinics, managed essential medicine stockpiles, and overseen distribution systems to maintain continuity of care.

From war zones to natural disasters and pandemics, pharmacists provide stability in chaotic situations. Their role extends beyond dispensing medicines to include clinical care, logistical support, health education, and public safety. Their adaptability and problem-solving skills bridge immediate relief efforts with long-term recovery, ensuring that healthcare services remain available to those in need. By prioritising both survival and quality of care, pharmacists offer hope and stability in the most challenging circumstances.

Pharmacies often serve as accessible health points during such crises, maintaining medicines availability through stockpiling, emergency dispensing, and backup power for temperature-sensitive treatments like vaccines and insulin. During disasters, pharmacists in many regions have the authority to provide emergency refills when prescribers are unavailable, ensuring continuity of care. Strengthening policies, such as national emergency refill protocols and mobile pharmacy units, is essential for improving access to medication when it is most needed.

3. System aspects of response, recovery and preparedness

Integrating pharmacy services into emergency preparedness frameworks enhances health system resilience.[4] Hospitals and community pharmacies are refining disaster response plans to define pharmacy roles in various crisis scenarios, such as pandemics and natural disasters. Regular training and drills prepare pharmacists to manage medicine distribution in shelters and address surges in

demand. Collaboration with emergency management agencies ensures that pharmaceutical logistics are seamlessly incorporated into disaster planning. Strengthening pharmacy networks—through coordination between hospital, community, and supply chain pharmacists—creates a safety net, ensuring medication access even if some facilities are affected.[5] These preparedness efforts, recommended by WHO, contribute to more resilient healthcare systems and effective crisis response strategies.[6] Challenges in aspects such as donations of medicines to affected areas are still present across the globe.[7]

Humanitarian efforts led by pharmacists worldwide highlight their ability to adapt to diverse crises. However, gaps remain, particularly in training and awareness of their potential contributions. Organisations like FIP are working to address these challenges to ensure that essential medicines and healthcare services remain accessible. By doing so, pharmacists play a vital role in safeguarding public health, mitigating crisis consequences, and strengthening resilience within affected communities.

4. FIP actions and contributions

FIP plays a pivotal role in advancing humanitarian efforts within the global pharmacy community, particularly in crisis situations such as natural disasters, conflicts and pandemics, providing guidance, resources, and training to pharmacists and healthcare professionals to ensure the effective delivery of medicines and healthcare services in emergency settings. By fostering collaboration among its member organisations, FIP strengthens the capacity of pharmacists to respond to humanitarian crises, addressing challenges such as medicine shortages, access to essential treatments, and the safe distribution of supplies. Through its initiatives, FIP not only supports immediate relief efforts but also promotes long-term resilience and equitable access to healthcare for vulnerable populations worldwide.

At FIP, we wish to support the profession during a crisis and create awareness of pharmacists' roles in disasters and emergencies, using their communities as support frameworks to ensure the profession's preparedness. FIP is proud to have supported a number of colleagues to continue to provide pharmaceutical care in places affected by disasters this year. However, during our work, we have identified gaps, such as the lack of specific training for pharmacists and awareness on how they can be more engaged, and FIP will be working to address these as part of its commitment.

4.1 FIP HumanityRx programme

The FIP HumanityRx programme[8] aims to empower pharmacists to play a vital role in humanitarian crises and emergency response. This programme provides comprehensive resources, training, and guidance to enhance the preparedness and effectiveness of pharmacists in delivering essential healthcare services during disasters, conflicts, and pandemics. It focuses on critical areas such as ensuring access to medicines, managing supply chains, and addressing public health challenges in crisis settings. By fostering collaboration among global stakeholders, including NGOs, governments, and healthcare organisations, the programme strengthens the pharmacy profession's capacity to respond to emergencies. Through its efforts, the FIP Humanitarian Programme underscores the importance of pharmacists in building resilient healthcare systems and supporting vulnerable populations during times of need.

The humanitarian programme is mainly linked to the FIP Development Goal 18 – Access to medicines, devices and services,[9] as one important aspect of disaster and emergency situations is the continuation of treatment and access to safe and effective medicines.

4.2 FIP structures and groups

The Military and Emergency Pharmacists Section (MEPs) has worked on managing emergencies for many years, supporting the impact of crises in increasingly fragile environments. It is paramount that

pharmacists continue the work post-emergency and provide sustained humanitarian support, which can be achieved in many ways. Examples of our work include the FIP Global humanitarian competency framework (GbHCF)[10] which provides an international competency framework for pharmacists working in the humanitarian arena. It is intended to guide education and training programmes in this increasingly important field of practice. This resource is also available in several languages, increasing its accessibility to pharmacy colleagues around the world.

In 2024, FIP established the FIP Humanitarian Response Advisory Group (HRAG) to provide expertise and advice to FIP on matters related to its scope, by bringing together pharmacists working in the humanitarian arena from within the FIP membership to exchange views on current activities (problem areas, best practice, emerging trends and technologies, etc.), establish new contacts, and work together on joint projects that add value and are aligned with the FIP Strategic Plan.

The main objectives of the FIP HRAG are:

1. To provide ad-hoc technical expertise and advice on humanitarian resilience matters to FIP and its members;
2. To provide ad-hoc technical expertise and advice for FIP's collaboration with partners, namely WHO, in the area of humanitarian resilience;
3. To explore global initiatives and developments in the humanitarian arena and the impact on the role of pharmacists;
4. To keep abreast of emerging pharmacy roles in increasingly resilient health systems;
5. To provide guidance and education for pharmacists in the humanitarian arena;
6. To outline evolutions related to disaster and emergency settings and how pharmacists can contribute to these;
7. To facilitate the gathering and sharing of information on humanitarian resilience, particularly as it applies to pharmacy.

4.3 FIP resources and activities

Following the COVID-19 pandemic,[11] the increasing natural disasters seen in recent years, and recent and ongoing wars and conflicts, FIP set out to launch a commitment to humanitarian support in crises and disasters.[12] The FIP document "Responding to disasters: Guidelines for pharmacy"[13] provides guidance on what pharmacists need to consider in assessing the potential impact of disasters on the services they deliver.

FIP has also issued a statement that called for all parties to the conflict in Israel and Gaza to adhere to obligations under international humanitarian law, namely that under the Geneva Conventions the ill-treatment and killing of civilians is prohibited and the sick and wounded must be cared for. FIP condemns all acts of violence or war causing suffering. We call for immediate cessation of any acts that risk the lives of civilians or health workers. Access to health is a human right and any attack on health workers and the patients they serve is abhorrent and unacceptable.

Furthermore, FIP sought to derive key lessons, recommendations, and considerations for the future in a report linked to the COVID-19 pandemic: "Pandemic Preparedness, Response and Recovery: Lessons Learnt for Global Pharmacy". The report is accompanied by a digital supplement on pandemic preparedness, response and recovery, which collates key resources from the global health community, other health professions and key research outputs, and which will continuously be updated to include emerging data and lessons to expand and include more examples from FIP members as the world continues to recover and learn from COVID-19.

The FIP policy statement "The role of pharmacists in disaster and emergency management"[14] underscores the critical contributions of pharmacists in responding to crises such as natural disasters, pandemics, and conflicts. It highlights pharmacists' expertise in ensuring access to essential medicines, managing supply chains, and providing patient care during emergencies. This statement

emphasises the need for pharmacists to be integrated into disaster preparedness and response plans at local, national, and global levels. It also calls for enhanced training and education to equip pharmacists with the skills necessary to address public health challenges in crisis settings. By advocating for the inclusion of pharmacists in emergency management frameworks, it aims to strengthen healthcare systems, improve outcomes for affected populations, and build resilience for future crises.

4.4 Advocating access: FIP's call to support medicines for war-affected communities

As part of its commitment to equitable access to medicines, and in collaboration with Pharmacists without Borders (PwB)- UK, FIP launched the "Medicines To" campaign in 2023, beginning with the Medicines to Africa initiative. This first phase marked a significant step forward in strengthening regional preparedness and response frameworks, made possible through the collaboration and leadership of FIP member organisations across Africa.

In 2024, the campaign expanded to support communities affected by the ongoing conflict in Gaza. The Medicines to Gaza initiative builds on the solidarity and momentum of the campaign's beginnings, and is further reinforced by the signing of a memorandum of understanding between FIP, PwB, the Jordan Pharmacists Association (JPA), and other charity partners. This agreement paves the way for long-term collaboration and growth of the initiative.

Through this campaign, FIP facilitates the sharing of good practices around fundraising, supply coordination, and raising awareness of the specific needs arising in disaster and emergency contexts. It also calls on the global pharmacy community to stand in solidarity, contribute expertise, and mobilise resources to ensure that essential medicines reach those most in need. Together, we can make a tangible difference in the lives of vulnerable populations affected by war.

More information can be found here.

5. Case studies

FIP has collected several case studies from colleagues across the globe, through the support given to FIP members linked to the FIP HumanitarianRx Programme.

CAMEROON

- The derailment of Camrail's intercity Train 152 near Eséka railway station on the Douala-Yaounde line in Cameroon, carrying over 1,200 passengers due to a road closure, was a major tragedy. The Cameroon National Order of Pharmacists (CNOPC) responded swiftly by mobilising pharmacists and coordinated with the government and healthcare associations to deliver critical medical aid to support victims. This case highlights the importance of organised healthcare interventions during large-scale emergencies and the crucial role of professional associations in disaster relief efforts.

JAPAN

- The January 2024 earthquake in Japan, resulted in 281 deaths, three missing persons, 1,326 injuries, and extensive damage to 156,660 buildings. In response, the Japan Pharmaceutical Association (JPA) swiftly established a disaster response headquarters, deploying 2,395 pharmacists and 13 support vehicles over 50 days to deliver medical assistance in affected regions. JPA also launched a fundraising initiative, contributing over 54 million yen to the Ishikawa Pharmaceutical Association to support affected pharmacists. This case highlights the critical role of professional healthcare organisations in disaster response and the importance of coordinated efforts in providing medical aid and financial support.

NEW ZEALAND

- The February 2023 cyclone in New Zealand caused extensive flooding, property destruction, service outages, and the complete severance of transport links, thereby isolating communities and resulting in multiple fatalities. In response, Health New Zealand Te Whatu Ora coordinated the pharmaceutical response, empowering local pharmacy leaders to manage medicine supply chains and providing support to affected community pharmacies. It facilitated funding for prescription co-payments and pharmacist locums, ensuring uninterrupted access to essential medications. This case highlights the importance of resilient healthcare systems and coordinated pharmaceutical interventions during natural disasters.

TÜRKIYE

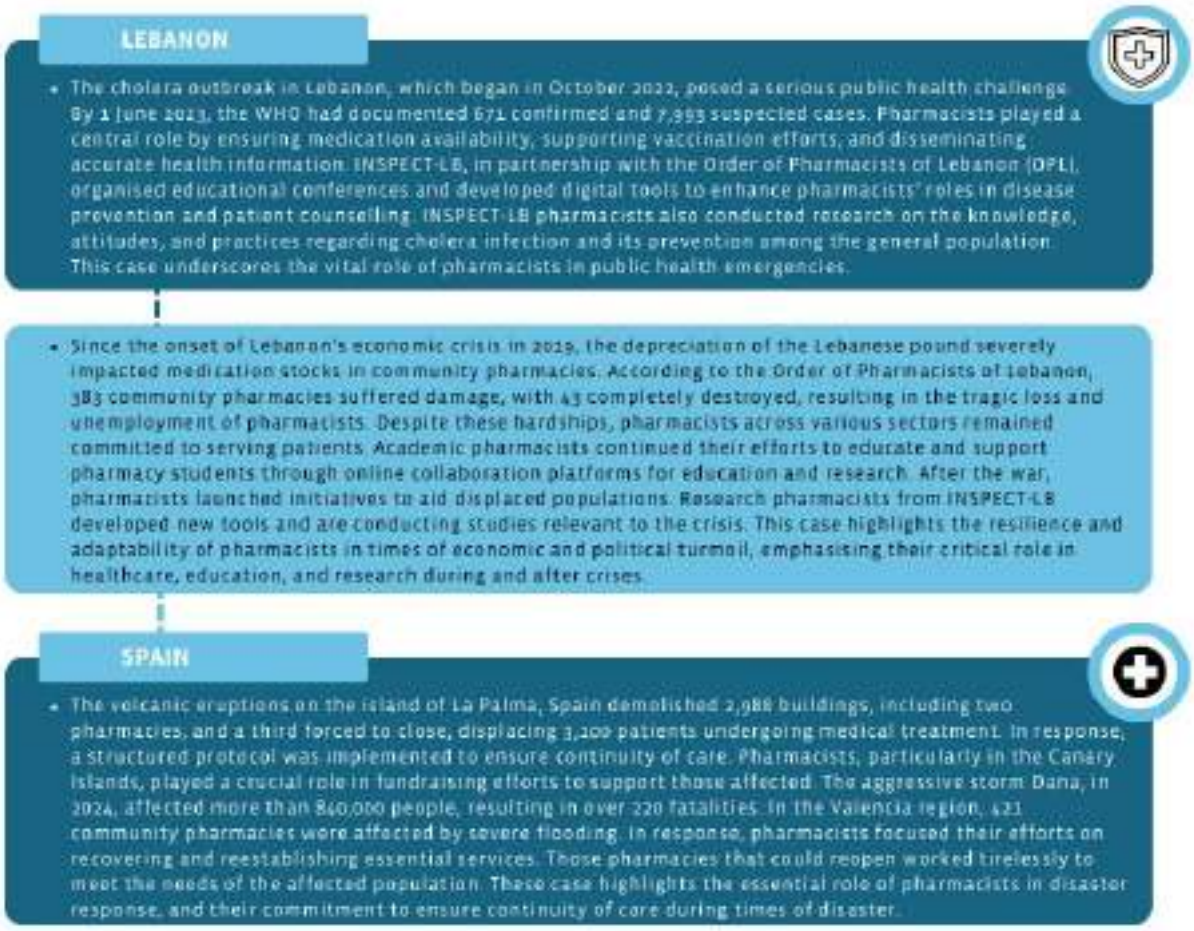
- The devastating earthquakes of February 2023, struck Kahramanmaraş and Elbistan, marking the most destructive seismic events in Türkiye in the last century, impacting 11 provinces, 62 districts, and 10,390 villages. In response, the Turkish Pharmacists Association (TPA), in coordination with Regional Pharmacist Chambers, mobilised about 4,500 volunteer pharmacists to provide free uninterrupted pharmaceutical services for 74 days. TPA launched a humanitarian relief campaign, collecting and delivering essential supplies to support those affected. This case highlights the critical role of pharmacists in emergency response, showcasing the power of professional solidarity and organized efforts in disaster relief.

SOUTH AFRICA

- Following the widespread looting and arson in South Africa in 2021, numerous pharmacies were destroyed, disrupting access to essential healthcare, and resulting to unauthorised access to medications and loss of medical records. Despite personal and financial losses, pharmacists demonstrated remarkable commitment to ensuring continued access to medications by operating makeshift pharmacies from their homes, and coordinating access through neighboring pharmacies. In response, the Independent Community Pharmacy Association (ICPA) and the Pharmaceutical Society of South Africa (PSSA) raised over R10 million to aid in the recovery efforts. This underscores the dedication of pharmacists in crisis situations and the importance of coordinated financial and logistical support in restoring healthcare access.

UKRAINE

- The launch of the Russian Federation's military offensive on February 24, 2022, led to a severe humanitarian crisis in Ukraine. This conflict limited access to essential supplies and services, and medical care, particularly in rural areas. In response, the Ukrainian government approved a decree on August 4, 2023, allowing the establishment of mobile pharmacy units to improve access to medications in underserved regions. According to the Ministry of Health, only 12% of Ukrainian villages have pharmacies, making this initiative a crucial step toward ensuring continued pharmaceutical care for affected populations. This case underscores the importance of adaptive healthcare solutions during crises.



6. Call to action

Despite their invaluable contributions, further integration of pharmacists into emergency response frameworks is necessary. Increased representation in global humanitarian organisations such as the United Nations (UN) and the World Health Organization (WHO) would enable pharmacists to contribute strategically to disaster response planning. Additionally, specialised training in emergency and disaster management would enhance their ability to respond effectively. Strengthening interprofessional collaboration is also essential, creating platforms where pharmacists work alongside other healthcare providers to maximise impact. Funding pharmacist-led initiatives in supply chain management, vaccination campaigns, and disease prevention efforts would further bolster their role in crisis settings.

The following recommendations from the FIP policy statement provide a summary of what the different stakeholder groups can do to further involve pharmacists in humanitarian and disaster situations.

Governments and policymakers should prioritise the inclusion of pharmacists with relevant expertise in both local and national civil protection structures. By doing so, they ensure that pharmacists play an active role in disaster management, particularly in situations requiring the secure and continuous supply of essential medicines. Additionally, governments must establish comprehensive disaster and emergency contingency plans at the local and national levels that are specifically tailored to address the most likely risks, ensuring uninterrupted access to high-quality care and medicines during crises. Well-established working relationships between civil protection agencies, disaster management entities, and the pharmacy sector are critical to define clear interdependencies and roles, especially concerning the security and integrity of supply chains during emergencies. Moreover, governments must implement policies for the pharmacy sector concerning

the supply, distribution, and donation of medicines, providing a framework for coordinated and efficient responses in disaster scenarios.

FIP member organisations and pharmacy professional associations should advocate for the crucial role pharmacists play in disaster and emergency management, ensuring they are recognised and integrated into national and local preparedness plans. These organisations should promote capacity-building initiatives throughout pharmacists' careers, equipping them with the skills needed to respond effectively in crises. They must also develop and support strategies for disaster and emergency management within their respective structures, using frameworks developed by WHO and national guidelines for medicines donations. Furthermore, these associations should mobilise pharmacists and pharmacies to operate during disasters, ensuring that their services remain accessible to the public in times of need, and promote the exchange of best practices to strengthen the pharmacy sector's response in emergencies.

Academic pharmacy institutions should incorporate emergency preparedness into their core curricula, ensuring that both administrators and educators have personal and institutional disaster response plans in place. Educational programmes at undergraduate and postgraduate levels must integrate disaster and emergency management training, providing students with the necessary knowledge and skills to function effectively in such contexts. In addition, academic institutions should conduct research focused on pharmacy in disaster settings, specifically researching how to maintain access to safe and effective medicines in humanitarian crises. Academic leaders, educators, and researchers should also contribute to or lead national, regional, and global strategies aimed at improving disaster preparedness and response, reinforcing the social responsibility of the profession in these critical situations.

Individual pharmacists must take proactive steps in preparing for disasters by creating a personal and family emergency response plan, tailored to the specific risks in their geographical area. They should also be fully aware of their workplace’s disaster plans and their role within them, ensuring that they can assist in maintaining adequate stocks of medicines, managing emergency communication protocols, and addressing potential service disruptions. Pharmacists should maintain strong connections with local professional networks to coordinate their role in disaster response and be equipped with a first aid kit relevant to their context and expertise. Furthermore, they should have an evacuation plan in place and participate in disaster preparedness training to stay updated on best practices. Collaboration with other healthcare providers and community organisations is also essential, as it ensures a coordinated and comprehensive approach to disaster response.

FIP commits to supporting pharmacy associations by providing an overview of the skills pharmacists need to effectively work in disaster preparedness and emergency response settings. FIP will also liaise with national ministries of health and other relevant stakeholders to enhance the impact of pharmacists' roles in these situations, ensuring that their contributions are fully integrated into disaster response plans. By raising visibility for pharmacists' specific roles in humanitarian efforts, FIP encourages global participation in these activities. The organisation will share success stories and opportunities for engagement among its member organisations, promoting cross-collaboration and empowering regional and national leaders to strengthen their humanitarian work. FIP will also advocate for interprofessional collaboration in humanitarian settings and engage with the UN to help develop pharmaceutical sub-clusters within humanitarian response frameworks, ensuring a more coordinated and effective approach to disaster relief.

While pharmacists have demonstrated their invaluable contributions, there is more than can be done to integrate and support them in emergency response frameworks.

We propose the following actions to strengthen pharmacists’ role in humanitarian work:

1. Increased representation: International humanitarian bodies, including the UN and WHO, should consider increasing pharmacists' representation in strategic planning for emergency responses.
2. Formal training: Pharmacists should be provided with specific training in disaster and emergency management to strengthen their ability to respond to complex crises.
3. Interprofessional collaboration platforms: Establish robust platforms that foster interprofessional collaboration, allowing pharmacists to fully contribute alongside other healthcare professionals.
4. Funding and support for initiatives: Increase funding for pharmacist-led initiatives, particularly in medicine supply chain management, vaccination campaigns, and disease prevention in conflict zones.

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CHAPTER 5

Sustainability and climate action in pharmacy practice

Focusing on the intersection of planetary and public health, this chapter highlights the contributions of pharmacy to climate mitigation and adaptation. It addresses the environmental impact of pharmaceutical services and outlines FIP's SustainabilityRx agenda to build climate-resilient and environmentally responsible health systems.

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High level summary

1. FIP is committed to advancing sustainability in global healthcare through FIP Development Goal 21: Sustainability in pharmacy.
2. FIP drives sustainability in global healthcare by promoting responsible pharmacy practices, integrating sustainability into education and pharmacy services, and fostering collaboration with healthcare professionals and policymakers.
3. Through initiatives linked to the FIP SustainabilityRx programme, such as policy statements, and climate advocacy efforts, FIP empowers pharmacists to adopt sustainable practices, reduce medicine waste, and contribute to climate resilience.
4. FIP recommends actions linked to integrating environmental and air pollution topics into pharmacy education and continuing professional development, promoting pharmacist-led roles in addressing environmental health risks, and urging governments to incorporate environmental risk assessments into medicine approval processes and pharmaceutical policies.

Key message

FIP is leading the advancement of **sustainability in global healthcare** through its Development Goal 21 and the SustainabilityRx programme by empowering pharmacists, **integrating environmental topics** into education and practice, reducing medicine waste, and advocating for climate-resilient policies in collaboration with governments and health stakeholders.

Related FIP Development Goals

Sustainability and climate action is primarily linked with Development Goal 21: Sustainability in pharmacy, as it ensures the sustainability of the environment and minimises negative consequences of pharmaceuticals and pharmacy practice for the environment.

Call to action

1. Sustainable remuneration

Sustainable pharmacy remuneration models are essential for maintaining services and pharmacy viability. Incentives for additional services must cover costs and encourage uptake while supported by evidence-based strategies to drive real change.

2. Education & advocacy

Pharmacists need training to tackle climate-related health challenges. Collaborating with WHO can integrate climate-health into education and CPD. Financial incentives can support specialisation, while professional associations and public campaigns can elevate pharmacists' roles in environmental health.

3. Green curriculum

Pharmacy curricula should embed environmental topics across practice areas. Teaching "green pharmacy" principles and responsible medicine disposal will prepare pharmacists to promote sustainable use and reduce environmental harm.

4. Policy integration

Environmental risks must be considered in medicine regulation. Pharmacists should be part of national climate and emergency strategies, advising on eco-conscious procurement, disposal, and formulary decisions.

5. Intersectoral collaboration

Tackling environmental health requires collaboration. Pharmacists should work with public health, environment, and agriculture sectors to reduce pharmaceutical pollution and antimicrobial resistance.

6. Regulatory innovation

Environmental sustainability in pharmacy can be driven by new regulations, including mandatory risk assessments, green practices, and eco-friendly innovations. WHO urges integrating environmental stewardship into healthcare standards.

Pharmacists implement eco-responsible actions, such as efficient inventory management, reducing pharmaceutical waste, and improving waste segregation, all of which contribute to lowering the carbon footprint of healthcare delivery.[1]

Pharmacists educate the public and healthcare staff on environmentally responsible drug disposal, reducing the risk of pharmaceutical pollutants entering the environment.[2,3]

Through the FIP SustainabilityRx programme and Development Goal 21 (Sustainability in pharmacy), FIP supports green pharmacy practice — from eco-packaging and green procurement to public awareness campaigns and climate advocacy.

FIP calls on governments, health leaders, and funders to formally integrate pharmacy into national climate and health strategies — including emergency preparedness, environmental risk mitigation, and sustainable healthcare delivery.

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1. The environmental role of pharmacy

Climate change is an important undermining reality impacting health worldwide, driving more frequent extreme weather, shifting disease patterns, and threatening food and water security. WHO estimates an extra 250,000 deaths per year between 2030–2050 from climate-related malnutrition, malaria, diarrhoea and heat stress, making climate change a defining global health threat.[1]

FIP plays a crucial role in advancing sustainability within global healthcare by promoting responsible practices, education, and innovation in pharmacy. By integrating sustainability into pharmaceutical science, education and practice, FIP aims to strengthen its vision of a world where everyone benefits from access to safe, effective, quality and affordable medicines and health technologies. Through this programme, FIP also aims to empower pharmacists to address challenges such as medicine waste, climate change, and resource scarcity, ultimately contributing to the United Nations Sustainable Development Goals (SDGs) and a healthier, more sustainable future.

Pharmacy's contributions to environmental sustainability are crucial because of its profound influence on public health and the ecosystem. Pharmacies play a vital role in the management and distribution of medications, processes that can have environmental repercussions at every stage—from manufacturing to disposal. Reducing and safely disposing of pharmaceutical waste is a core mitigation role.[2] Pharmacists implement take-back programmes and educate patients on returning unused or expired medicines for proper disposal (such as incineration). This prevents drugs from entering landfills or water systems, where they can harm wildlife and contaminate drinking water. By embracing other sustainable practices, such as using eco-friendly packaging, pharmacists can substantially lessen the environmental footprint of pharmaceuticals. For instance, switching to reusable or recyclable packaging and avoiding unnecessary single-use plastics align with emerging standards for sustainable medical product use. These efforts not only cut waste but also raise patient awareness about environmentally conscious medication use.

2. Mitigation and adaptation in pharmacy practice

The pharmacy profession can contribute to both mitigation (reducing the environmental impact of medicines) and adaptation (ensuring continued care during climate crises).[3] Sustainable procurement measures can also be an important step as pharmacists and medicines purchasers can favour manufacturers with lower carbon processes and seek suppliers who use green chemistry and reduced packaging.[4] Coordinating purchasing to minimise transport (such as sourcing locally where possible, and selecting efficient delivery routes) and maintaining optimal inventory (to avoid overstock and expiry) are practices that cut down on emissions and waste.[5]

Pharmacists contribute to community adaptation by educating and empowering patients to manage health risks from climate change.[6] They counsel vulnerable patients (such as those with chronic conditions, the elderly, or those without secure housing) on preparing for extreme heat or cold—such as how to store medicines safely during heatwaves to prevent degradation, or the importance of having an emergency supply of critical medications.[7]

3. Pharmacy-led public health outreach

Pharmacy-led outreach programmes can disseminate information on preventing climate-sensitive illnesses (for instance, advising on mosquito bite prevention and providing repellent in areas with new malaria or dengue risk).[8] In heat emergencies, pharmacy teams may support extra monitoring of at-risk patients, such as checking on those with cardiovascular or kidney issues during heat spells.[8]

Through public health campaigns, pharmacists reinforce messages about sanitation after floods, safe water usage, and mental health self-care post-disaster. By serving as trusted health advisors, especially in underserved or remote areas, pharmacists help communities understand and adapt to climate-related health threats.[9] This educational and supportive role not only addresses immediate health needs but also builds longer-term resilience by fostering informed, prepared, and healthier communities.

By aligning with global health priorities, pharmacy expands its patient-care role to include planetary health stewardship.[10] Through these efforts and through risk-assessment activities, pharmacies can help combat pollution, preserve biodiversity, and ensure the health and well-being of both present and future generations, linking to the current priorities of WHO around environmental health.[11]

4. FIP actions and contributions

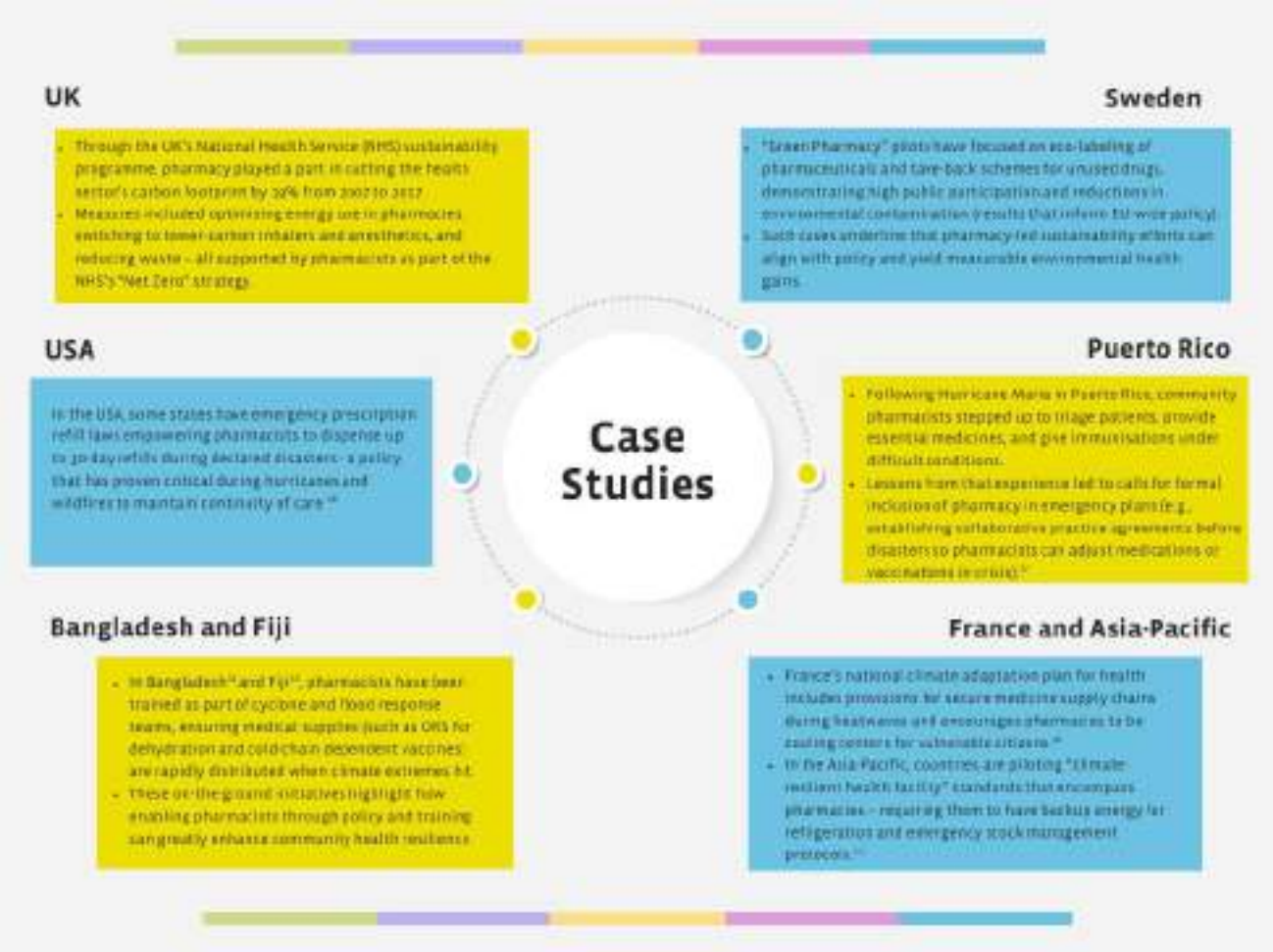
The FIP SustainabilityRx programme[12] serves as a comprehensive hub for advancing sustainability in pharmacy and healthcare worldwide. It provides resources, tools, and guidance to pharmacists, educators, and policymakers to integrate sustainable practices into their work. The programme focuses on sustainable pharmacy services and models as well as environmental and planetary health, and social aspects of sustainability. The programme supports the implementation and delivery of FIP Development Goal 21 (Sustainability in pharmacy)[13] and underpins the FIP vision for equitable access to safe and affordable medicines globally, both in terms of environmental sustainability and the sustainability of pharmaceutical services and workforce.

FIP has always recognised the responsibility of the profession towards the environment as well as the role of pharmacists in mitigating the health impacts of environment-related diseases. Examples of our work include a Call to Action to mobilise pharmacists to mitigate the impact of air pollution on health, and a report on green pharmacy practice.[14] In 2021, FIP took a step forward in formally recognising the role of pharmacists in the fight against climate change, the single biggest threat facing us all. We sent a letter to COP26 leaders, making clear our commitment on tackling climate change through pharmacy and raising the visibility of pharmacists, pharmaceutical scientists and pharmacy educators in this endeavour. FIP also signed the Healthy Climate Prescription, an open letter from over 450 organisations representing more than 45 million healthcare workers coming together to call for action to address the climate crisis, including building climate resilient, low-carbon, sustainable health systems and ensuring that pandemic recovery investments support climate action and reduce social and health inequities.

The FIP policy statement "Environmental sustainability within pharmacy"[15] aims to guide the global pharmacy community in integrating sustainability into their practices. It outlines key principles, strategies, and actionable steps for pharmacists to adopt environmentally responsible approaches in their daily operations. The document emphasises the importance of reducing the environmental impact of pharmaceuticals, promoting sustainable supply chains, and addressing challenges such as medication waste and resource efficiency. By providing a clear framework, it empowers pharmacists to contribute to global sustainability goals while maintaining high standards of patient care.

FIP's participation in COP29 highlighted the presence of pharmacists in climate change, supporting the efforts of the recent Baku coalition for Climate and Health that was signed on Human Development Day, which helps capture momentum and commitments from previous climate-related events. In this event, health remained a key focus with an announcement of WHO's special report for COP29 which made a clear case that health is the argument for climate action.

5. Case studies



6. Call to action

The policy statement on Environmental sustainability within pharmacy highlights some recommendations for policy makers and pharmacy organisations, among other stakeholders. Some of these recommendations are described below in different main areas that are important for the profession globally.

Ensuring **sustainable pharmacy remuneration models** is critical to maintain both the viability of pharmacies and the delivery of essential services. Payment structures for additional services should cover associated costs and provide appropriate incentives to support their adoption. However, effective implementation requires more than incentives alone—investment should focus on evidence-based approaches and proven strategies to drive meaningful practice change.

In parallel, **education, training, and advocacy efforts** must equip the pharmacy workforce to address climate-related health challenges. Collaboration with WHO and international partners can help embed climate-health topics into pharmacy education and continuing professional development (CPD). This would prepare pharmacists to respond to climate-related emergencies, adopt sustainable practices, and manage emerging environmental health issues. Scholarships or financial incentives could encourage specialisation in environmental health, while enabling pharmacists to act as trusted advocates through public awareness campaigns, supported by ministries and WHO. Professional associations also play a key role in expanding pharmacy services to address air pollution and defining the necessary competencies for this evolving role.

Pharmacy curricula should embed environmental considerations across all practice areas, ensuring pharmacists understand the environmental impact of pharmaceuticals and their role in promoting sustainable medicine use and proper waste disposal. Schools should incorporate "green pharmacy" principles and patient education on responsible medicine disposal into pharmaceutical care training.

Policy and regulatory frameworks should integrate environmental risk assessments into medicine approval processes, promote global access to environmental hazard data, and support national programmes for classifying pharmaceutical environmental risks. Pharmacists should be formally recognised as key contributors to climate-health action, with their services integrated into national climate adaptation plans, health emergency strategies, and environmental health initiatives. Within healthcare institutions, pharmacists can advise on environmentally responsible medicine selection, procurement, and disposal, and those involved in formulary management should account for environmental risks when selecting medicines.

Given that environmental health challenges span multiple sectors, **intersectoral collaboration** is essential. Pharmacists should work closely with public health, environmental agencies, and local communities to address pharmaceutical pollution and antimicrobial resistance in the environment. Establishing cross-sector committees—including health, environment, agriculture, and pharmacy representatives—would help coordinate strategies for sustainable pharmaceutical practices and pollution reduction.

Finally, **regulatory innovation** can drive sustainability across pharmacy and pharmaceutical industries by setting standards for environmentally responsible operations. This could include requiring environmental risk assessments for new medicines, mandating green pharmacy practices, and encouraging adoption of eco-friendly innovations such as biodegradable packaging and green chemistry. WHO's call to action reinforces the importance of embedding environmental stewardship into healthcare quality standards, accelerating progress toward sustainable healthcare systems.

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CHAPTER 6

Collaborative practice across health professions and pharmacy roles

This chapter explores interprofessional and intra-professional collaboration, showcasing pharmacy's integration into multidisciplinary teams and teamwork with pharmacy technicians. It presents evidence of improved health outcomes and efficiency through collaborative service delivery models.

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High level summary

1. Interprofessional collaboration (ICP) encompasses a wide range of collaborative efforts among healthcare professionals from different professional backgrounds.
2. Pharmacists play a crucial role in ICP by contributing their expertise in medication management, patient education, and clinical decision-making. Their involvement extends across hospital settings, primary care, long-term care facilities, and community pharmacies, where they work alongside other professionals to optimise medication therapy, enhance patient safety, and improve overall health outcomes.[1]
3. By actively participating in team-based care, pharmacists help facilitate seamless communication, ensure the safe and effective use of medications, and support holistic, person-centred approaches to treatment and disease prevention. However, governments and agencies must provide appropriately structured health systems to support ICP with processes defining professional competencies, practice standards, and scopes of practice, that permit and facilitate effective collaborative practice.
4. Intraprofessional collaboration between pharmacists and pharmacy technicians is essential to increase healthcare efficiency, improve patient care and optimise the use of workforce skills. Effective collaboration allows pharmacists to focus on clinical and patient-centred services, while technicians manage technical and operational tasks to ensure the safe and efficient use of medicines. The extent of this collaboration varies around the world, influenced by regulatory frameworks, workforce capacity and training systems. Strengthening this collaboration through clear role definitions, supportive policies and professional development opportunities can improve pharmacy services and contribute to better health outcomes.[2]

Key message

Pharmacists are essential team members of **interprofessional collaboration** as they bring valuable **expertise in medication management, patient education, and clinical decision-making**. Their collaboration with other healthcare professionals is critical to optimise medication therapy and support better health outcomes.

Related FIP Development Goals

This chapter aligns with FIP Development Goal 8: Working with others as it ensures inter- and intra-professional collaboration and multi-disciplinary healthcare.

Call to action

1. Interprofessional collaboration

Global health stakeholders—including governments, policymakers, professional bodies, educators, and patient organisations—should advance interprofessional collaboration by:

- Structuring health systems to support ICP through adequate funding, policy, and governance mechanisms.
- Actively engaging health professional associations in developing ICP frameworks and funding models.
- Providing pharmacists with guidance and training to integrate team-based care into routine practice.
- Ensuring pharmacists have timely, secure access to patient data to support collaborative decision-making.
- Defining healthcare roles based on the competencies needed for quality care, avoiding over-reliance on task shifting as a substitute for building sustainable, skilled workforces.

2. Intraprofessional collaboration

- Policymakers, pharmacy organisations, regulators, and educators should enhance pharmacist-technician collaboration by:
- Establishing clear roles and responsibilities to facilitate efficient task division and team-based care.
- Developing structured education and professional development pathways for pharmacy technicians.
- Updating regulatory frameworks to enable appropriate task expansion while safeguarding patient safety.
- Promoting team-based approaches that foster mutual respect, communication, and shared accountability between pharmacists and pharmacy technicians to improve care delivery and outcomes.

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Global pharmacy workforce snapshot:

Today, our data suggest that at least 6 million pharmacists and pharmacy technicians provide medicines support for health systems across 79 countries. Yet inequalities are stark: high-income countries have an average of 12.1 pharmacists per 10,000 population, compared to just 3.8 in low-income countries.[1]

Pharmacy education and training capacity is also uneven, with 71% of countries falling below the average global benchmark of around 1 pharmacy faculty or school per million population. Although women represent 65% of the pharmacy workforce—a figure expected to reach 69% by 2030—progress towards leadership equity remains incomplete.[1]

FIP urges health ministries, funders, and education leaders to scale up pharmacy education, strengthen rural workforce incentives, and include pharmacy in national UHC and workforce investment strategies.

Strengthening the pharmacy workforce is not just a professional imperative—it is a moral and public health necessity to achieve health for all.

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1. Introduction: Interprofessional collaborative practice

Pharmaceutical care is based on a patient-centred approach, collaboration with carers, prescribers and other healthcare professionals (i.e., integrated care), prevention, detection and resolution of medication-related problems, and taking responsibility for optimising medication use in order to improve health outcomes and quality of life.[2]

According to the World Health Organization (WHO), collaborative practice "happens when multiple health workers from different professional backgrounds work together with patients, families, carers and communities to deliver the highest quality of care across settings".[1]

The World Health Professions Alliance (WHPA), of which FIP is a founding member, together with the International Council of Nurses, FIP, World Physiotherapy, FDI World Dental Federation and the World Medical Association expands “interprofessional collaboration” to refer to teamwork among licensed health professionals who follow strict ethical standards. In contrast, “health workers,” a term widely used by WHO and at the global policy level, includes unregulated providers such as personal care and community health workers with varying training and accountability.[3] Confusing these roles can impact care quality and patient safety. While collaboration between professionals and health workers is crucial for supervision and patient-centred care, it differs from interprofessional collaboration (ICP), and these terms should not be conflated.[4]

2. FIP contributions in promoting interprofessional collaborative practice

Acknowledging the importance of interprofessional collaborative practice (ICP), FIP has established “Working with others” as its 8th Development Goal.[5,6] Development Goal 8 aspires to strengthen the contributions of pharmacists by enhancing their effective collaboration with other healthcare professionals across the health system. The FIP Statement of Policy on ICP calls for such collaboration, where pharmacists are being recognised as a core member of the multidisciplinary team.[7]

3. Key evidence to support and enhance pharmacists' role in interprofessional collaborative practice

3.1 Pharmacists as part of multidisciplinary teams

ICP in healthcare encompasses a wide range of collaborative efforts among various healthcare professionals, including physicians, nurses, pharmacists, physiotherapists, dentists, and other allied health professionals. ICP can occur in both hospital and community or primary health care settings. The collaboration can be formal, with defined roles and protocols, or informal, through ongoing communication and shared decision-making among healthcare professionals. The formal includes structured team-based approaches such as multidisciplinary rounds in hospitals, collaborative medication reviews in pharmacies, integrated chronic disease management in primary care, and coordinated public health initiatives.[8]

Examples of such collaborations include a medication management service, with a prescriber (often a physician), an administrator (often a nurse) and a pharmacist. For example, a scoping review found that nurse-pharmacist collaborations in community settings improved disease management,

prevented adverse drug events, and reduced hospitalisations. They also enhanced medication safety, shortened wait times for general practitioners, and improved chronic disease self-management.[9]

Antimicrobial stewardship is an example in the hospital setting, where pharmacists work with medical professionals and review patient antimicrobial therapy using the hospital's electronic medical record to ensure that antimicrobial orders are appropriate in terms of dose, dosage form, route of administration, frequency, duration of therapy, and the indication for antimicrobial therapy.[10]

Furthermore, interprofessional collaboration that supports patients with chronic diseases, reducing polypharmacy, managing rare diseases, and individualisation of pharmacotherapy are also examples of interprofessional practice where multiple healthcare professionals are involved, with clear roles within the team.

As the global shortage of qualified health workers remains a major challenge for healthcare systems, redefining and redistributing tasks is key to meeting patient needs. With advancing education and the integration of new technologies, it is critical to allow professionals to practice at the top of their training and expertise to optimise patient outcomes. In this context, pharmacists—especially in community settings—play a vital yet often overlooked role in strengthening healthcare delivery.[11]

When designing interprofessional collaboration infrastructure, it is crucial to establish clear roles, responsibilities, and support systems to ensure task-sharing. One study found that failing to do so leads to frustration as the workload increases without corresponding adjustments to the remuneration. In the study, many reported feeling that tasks were being "dumped" on them without recognition or reward for their efforts.[11] To prevent such issues, collaboration must involve equitable task sharing, adequate training, and appropriate compensation to sustain effective and fair teamwork, fostering mutual accountability among healthcare professionals.

Another example of task-sharing is collaborative medication review and medication management programmes (MMPs). These are well-established, usually pharmacist-led strategies for improving medication safety and effectiveness. When conducted interprofessionally, these programmes may yield even better outcomes, with studies recommending further exploration of how general practitioners (GPs) and pharmacists can best complement each other in MMPs.[11]

3.2 Collaborative practice in primary care

In recent years it has been shown that pharmacist involvement in multidisciplinary teams through interprofessional collaboration can avoid medication errors or harm, while increasing access to health services for patients.[12] In ICP, pharmacists can either work at the same setting with other health care professionals or support collaboration remotely.

In the UK, embedding clinical pharmacists into general practice has improved patient safety and health outcomes through a person-centred approach and better management of chronic conditions by providing advice for patients who take multiple medications.[13-15] Meanwhile, in Canada, pharmacists have been integrated into Canadian family practices as part of a large-scale demonstration project.[15,16] This model of working has allowed pharmacists to perform medication reviews and assessments, develop therapeutic plans with family physicians and patients, and provide education to patients and healthcare professionals to improve patient outcomes.[16, 17]

In the Netherlands, groups of general practitioners and pharmacists meet regularly to exchange views and information about prescribing medicines. The aim is to ensure good prescribing and dispensing policies, and thus better patient care.[18]

Studies show that pharmacists in an interprofessional healthcare team can improve access to primary healthcare as well as patient outcomes,[19, 20] and by supporting the management of chronic diseases, pharmacists can provide medicines information to patients and other healthcare professionals in addition to advising on treatment-related issues.[19,20] In Australia, pharmacists provide a variety of non-dispensing services to support GPs and improve patient care.[19]

Patients also appreciate the input of pharmacists in the primary care setting. They report satisfaction with aspects such as the personal nature of the care, and the pharmacists' ability to both listen and explain why medications have been prescribed and how to take them.[21]

3.3 Collaborative practice in secondary care

The importance of collaborative working is reflected in the FIP Basel Statement, which states that the overarching goal of hospital pharmacists is to optimise patient outcomes through collaborative, inter-professional, responsible use of medicines and medical devices.[22] In order to promote interprofessional education and team-based care, the statement also indicates that the role of hospital pharmacists, including collaborative prescribing, should be included in the curriculum of other healthcare professionals, and vice versa—that the roles of other healthcare professionals should also be included in the pharmacy curriculum.[22, 23]

Close interprofessional and interdisciplinary collaboration between healthcare professionals is of great importance to ensure the ongoing effectiveness of antibiotics and reduce the rate of antimicrobial resistance.[22] The appropriate implementation of antimicrobial stewardship programmes in hospitals—which function to monitor and record all aspects of antibiotic use, with a focus on clinical parameters, antibiotic resistance, and cost—requires the involvement of a multidisciplinary team including pharmacists, physicians and other professionals.[23] Studies have shown that interprofessional collaboration between physicians, nurses, and hospital pharmacists can significantly reduce the consumption of broad-spectrum antibiotics such as carbapenems.[24]

The involvement of pharmacists in interprofessional collaborative practice can also alleviate stress and burnout among healthcare professionals, minimise the risk of overprescribing or mis-prescribing, improve access to medications, and contribute to a comprehensive, coordinated, and safe healthcare system that effectively responds to the needs of both the population and individual patients.[7]

4. FIP contributions in promoting intraprofessional collaborative practice

4.1 Collaboration between pharmacists and pharmacy technicians

Collaboration between pharmacists and pharmacy technicians[i] (intraprofessional collaboration) plays a crucial role in optimising healthcare delivery, improving patient outcomes, and enhancing operational efficiency. Pharmacy technicians assist pharmacists in dispensing medications, managing inventory, and providing patient counselling. Additionally, they handle procurement and stock ordering, ensuring the continuous availability of medicines.[25] The extent of this collaboration varies significantly across countries, influenced by factors such as regulatory frameworks, training requirements, and workforce capacity.

The 2017 FIP report on technicians and pharmacy support workforce cadres working with pharmacists,[26] alongside the 2023 report on key priorities in education and training for pharmacy

[i] Pharmacy technicians are individuals who have received basic level of training to assist pharmacists to perform pharmaceutical services.

professionals across 21 countries[27] and the 2018 pharmacy workforce intelligence report which presents global trends,[28] provide valuable insights into the roles and integration of pharmacy technicians worldwide. In lower-income countries, particularly in rural areas where access to pharmacists is limited, pharmacy technicians play a crucial role in supporting safe access to medicines. In higher-income countries, pharmacy technicians take on responsibilities that allow pharmacists to expand their scope of practice towards more clinical and patient-centred roles.[26-28]

4.2 FIP Advisory Committee for the Pharmacy Technicians and Support Workforce Strategic Platform

Recognising the vital role of the pharmacy support workforce in strengthening pharmaceutical services and advancing healthcare delivery, FIP established the Pharmacy Technician and Support Workforce Domain within the FIPEd Education Development Team in 2011. Following FIPEd's restructuring in 2019, the Pharmacy Support Workforce (PSW) domain transitioned to a Workforce Development Hub (WDH) with the pharmacy technician and support workforce as a focused strategic platform.

The essential role of pharmacy technicians in supporting both intraprofessional collaboration within pharmacy teams (pharmacists and pharmacy technicians) and interprofessional collaboration with other healthcare professionals is gaining recognition as a key factor in improving health outcomes and strengthening multidisciplinary care teams.

In 2019 the Pharmacy Technician Advisory Committee (PTAC) was formalised to provide strategic direction and expert guidance on the global development of the pharmacy support workforce. Currently, the committee includes 26 members (pharmacy technicians and pharmacists) from 10 countries and is aligned with FIP's workforce mission and Development Goals. This advisory committee plays a crucial role in advancing pharmacy technician leadership, workforce development, and global integration within FIP.

5. Key evidence to support and enhance intraprofessional collaborative practice

In addition to FIP reports that provide a broad overview of workforce trends, other relevant studies have examined the dynamics of pharmacists' and pharmacy technicians' collaboration. One such study, conducted by Jetha and colleagues in Ontario, Canada, explored collaboration through interviews with pharmacists, pharmacy technicians, and educators.[29] The findings revealed several barriers to effective integration, including inconsistent collaboration, knowledge gaps, and a lack of professional identity among pharmacy technicians. Strategies to address these challenges include incorporating soft skills training—such as communication and conflict resolution—into pharmacy technician education.[29] Integrating pharmacy technicians improves workflow efficiency, reduces medication errors, and allows pharmacists to focus on clinical tasks.

Furthermore, an intraprofessional educational event called "Partners in Pharmacy" was evaluated by Guirguis and colleagues, demonstrating the value of structured collaboration in pharmacy education. This event brought together pharmacy and pharmacy technician students to engage in case discussions.[30] The results showed a positive reception, with a 49% response rate and over 85% of respondents agreeing that the event improved their confidence and learning experience.[30] Key takeaways from the event included a better understanding of each other's roles and scope of practice, enhanced teamwork and communication, and increased confidence in collaborative work.[30]

Beyond education and training, a study by Oamen examined the relationship between behavioural antecedents, intraprofessional collaborative behaviour, and work performance among community pharmacists in southwestern Nigeria.[31] Using structural equation modelling, the study found that knowledge-sharing behaviour, competitive behaviour, and customer-focused behaviour contributed to increased collaboration among pharmacists.[31] However, only customer-focused behaviour had a direct impact on work performance, suggesting that while collaboration among pharmacists is beneficial, it does not automatically translate into better work performance outcomes.[31]

The integration of pharmacy technicians into clinical workflows improves operational efficiency, reduces medication errors, and enhances patient care. Several recommendations for strengthening pharmacist-pharmacy technician collaboration in the future are as follows:

1. **Strengthen regulatory frameworks:** Establish clearer guidelines for pharmacy technician roles and responsibilities to reduce inconsistencies in practice and ensure safe integration into pharmacy services.
2. **Enhance workforce planning:** Collect and integrate workforce data to support evidence-driven policy decisions, addressing pharmacist shortages and optimising the pharmacy technician workforce.
3. **Expand education and training:** Incorporate soft skills training (e.g., communication, teamwork, conflict resolution) into pharmacy technician curricula to improve collaboration with pharmacists.
4. **Promote interprofessional education:** Implement structured joint pharmacist-pharmacy technician learning events or workshops to foster mutual understanding, teamwork, and role clarity among pharmacist and pharmacy technician students.
5. **Encourage knowledge sharing:** Develop workplace initiatives that facilitate continuous learning and collaboration between pharmacists and pharmacy technicians to improve workflow efficiency and patient care.
6. **Improve role recognition:** Strengthen professional identity and recognition for pharmacy technicians to enhance motivation, job satisfaction, and retention within the workforce.

By prioritising these strategies, healthcare systems can leverage the full potential of pharmacy technicians, allowing pharmacists to focus on clinical and patient-centred roles while ensuring efficient and effective pharmaceutical services.

6. Case study

FIP received a case study from the Community Pharmacy Section which provides valuable insights into interprofessional collaboration between pharmacists and physicians.

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CHAPTER 7

Medicines and patient safety through pharmacy practice

The chapter highlights pharmacists' leadership in promoting safe, effective, and appropriate medication use. It presents evidence-based strategies for reducing medication errors, preventing harm, and supporting patient safety across all care settings, aligned with WHO and FIP global initiatives.

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High level summary

1. Patient safety is fundamental to the provision of healthcare in all settings, ensuring that individuals receive safe, effective, and high-quality care without avoidable harm.[1]
2. Patient and medication safety is a top priority for pharmacists, who play a critical role in ensuring the safe use of medicines, reducing medication errors, and enhancing overall treatment outcomes.[1]
3. Medicines reconciliation, a key pharmacist-led patient safety service, has been widely implemented across various countries. This service helps identify and resolve discrepancies in patients' medication regimens, leading to improved clinical outcomes, enhanced patient safety, and significant economic benefits by reducing hospital readmissions and adverse drug events.[2]
4. Pharmacists play a crucial role in safeguarding patient safety by preventing substandard and falsified (SF) medical products from entering the supply chain. Through rigorous quality control measures, regulatory compliance, and collaboration with health authorities, pharmacists help ensure that patients receive only safe and effective medications.[3]
5. FIP supports pharmacists by providing essential tools, guidelines, and resources to strengthen their role in patient safety, medication management, and overall healthcare delivery.

Key message

Pharmacists are central to patient and medication safety, driving improvements in clinical outcomes and **protecting public health through proactive medication management** and rigorous quality control.

Related FIP Development Goals

This chapter primarily maps against FIP Development Goal 19: Patient Safety, emphasising mechanisms to reduce medication-related harm, quality assurance processes, and supportive regulatory frameworks. It also aligns closely with Development Goal 20: Digital

Health, through promoting pharmacist access to electronic health records for improved medication safety practices, and Development Goal 15: People-centred Care, highlighting pharmacists' roles in collaborative and patient-centred medication management.

Call to action

1. Policymakers & regulators

Establish clear regulatory frameworks to support pharmacists' roles in medication safety, including enabling access to electronic health records and creating robust systems for proactive, non-punitive medication error reporting. Strengthen enforcement against substandard and falsified medical products through regional and international collaboration.

2. Healthcare professionals (pharmacists, physicians, nurses)

Enhance interprofessional collaboration to optimise medication safety and patient care. Implement and actively participate in medication reconciliation and error-reporting initiatives. Foster a culture of continuous quality improvement and proactive risk management within healthcare organisations.

3. Educational institutions

Integrate comprehensive patient and medication safety training into pharmacy curricula, including the management of substandard and falsified medicines. Promote continuous professional development programmes focused on medication safety and risk management.

4. Patients and the public

Engage actively with pharmacists and healthcare professionals regarding medication use, adherence, and safety practices. Participate in educational campaigns to increase awareness of safe medication practices and the risks associated with substandard and falsified medicines.

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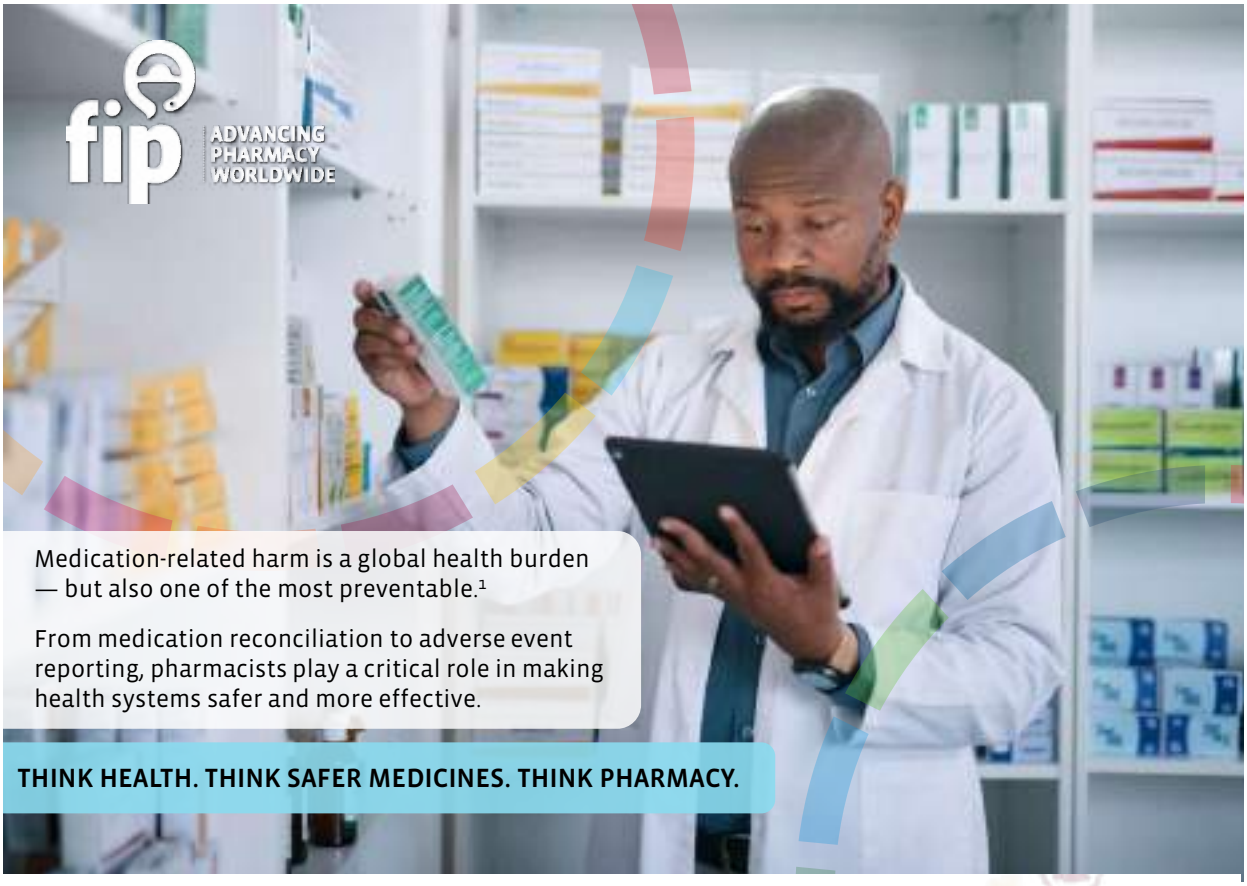

Pharmacists work at every stage of the medication use process to reduce harm — from prescribing and dispensing, to monitoring and patient counselling.

In **Thailand**, pharmacist-led medication reconciliation across all transitions of care reduced the risk of medication errors by 75% compared to usual care.[2]

In **South Africa**, a pharmacist-led medication therapy management programme for diabetes patients at a primary healthcare clinic in Cape Town identified 453 medication therapy problems across 104 patient records, averaging four interventions per patient.[3]

In **Saudi Arabia**, multidisciplinary collaborative care involving pharmacists achieved better health outcomes for patients with diabetes compared to physician-based care alone -HbA1c reduction (9.33±1.80 vs. 10.30±1.66; p=0.017) within nine months. Pharmacist interventions also helped optimise medication regimens and reduced the frequency of hypoglycaemia.[4]

FIP urges governments, health ministries, and global health stakeholders to systematically integrate pharmacists into national medication safety frameworks, invest in pharmacist training for safety roles, and champion pharmacists as essential partners in the WHO Medication Without Harm global challenge.

www.fip.org

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1. Introduction: The centrality of medication safety

Medicines are one of the most common interventions used in healthcare to cure and prevent diseases and alleviate symptoms. Medicines are used by all—from the very young to the elderly—in both inpatient and outpatient settings. Patients often manage medications at home, sometimes with support from carers or family members. Alongside prescribed medicines, many symptoms and conditions can be effectively managed through self-care, often with advice from community pharmacists.[1]

However, effective medicine management remains challenging due to factors such as complex pharmacotherapies, polypharmacy, ageing populations with multiple comorbidities, and insufficiently coordinated resources within healthcare systems.[2]

Patient safety is broadly acknowledged by the World Health Organization (WHO) as a patient being free from any harm and/or accidental injuries during the course of receiving healthcare.[3] As stated by the WHO, medication safety—a key aspect of patient safety—involves preventing and managing medication-related errors and harm throughout a person's medication journey. FIP highlights the pharmacist's vital role in patient safety, aligning with its vision of ensuring access to safe, effective, and high-quality medicines and pharmaceutical care. Medication-related harm is preventable if it arises from identifiable causes and can be mitigated through procedural modifications or guideline adherence. Understanding the prevalence, nature, and severity of medication-related harm is essential for setting achievable patient safety improvement goals.[1,4]

Patient safety is fundamental to the provision of healthcare in all settings. However, avoidable adverse events, errors, and risks associated with healthcare remain major challenges for patient safety globally. The WHO has adopted the Global Patient Safety Action Plan 2021–2030 with a vision of "a world in which no one is harmed in health care, and every patient receives safe and respectful care, every time, everywhere." The action plan provides strategic direction for eliminating avoidable harm in healthcare and improving patient safety in different practice domains through policy actions on safety and quality of health services, as well as for implementation of recommendations at the point of care. The action plan provides a framework for countries to develop their respective national action plans on patient safety, as well as to align existing strategic instruments for improving patient safety in all clinical and health-related programmes.[5]

2. Safe medicines: Addressing substandard and falsified medical products

As an important part of patient safety, addressing substandard and falsified (SF) medical products is crucial. Defined by the WHO, these products pose serious risks to public health, with the problem growing globally.[6]

Pharmacists play a key role in safeguarding patient safety by preventing SF medical products from entering the supply chain. As gatekeepers of medication management, they ensure medicines are safe, properly distributed, and of certified quality. Their role in good distribution practices is vital to preventing harm. FIP has advocated against fake medicines for over 20 years, emphasising pharmacists, pharmaceutical scientists, and educators as essential in this fight. At the 76th World Health Assembly in May 2024,[7] as well as at the WHO Executive Board in February 2025,[8] FIP highlighted pharmacists' role in minimising harm from SF medicines and strengthening patient safety worldwide.[7,8]

3. FIP promoting patient safety

FIP has taken a global coordination role in implementing the philosophy of safe pharmaceutical care internationally among its member organisations and countries. According to the principles of pharmaceutical care, pharmacists are expected to ensure the quality and safety of medication therapies, at all levels, through collaborative care and patient interaction. Thus, pharmaceutical care introduced the principles of prospective risk management to medication use. FIP Development Goal 19: Patient Safety calls for patient safety mechanisms to be in place, linked to reducing medication-related harm, quality assurance processes, and legislation and regulations.

FIP has been closely collaborating with the WHO regarding implementing pharmaceutical care into practice, and for over a decade, has been closely involved in advancing and advocating for global patient safety. For example, FIP was an early supporter of the WHO Medication Safety Challenge and was an integral part of its official launch at the summit of health ministers in Bonn, Germany, in 2017. Since this launch, FIP has been an invaluable asset to promoting patient safety, taking an essential role in annual global health ministers' summits and other critical policy events.

In 2024, at the 6th Global Ministerial Summit on Patient Safety in Santiago, Chile, FIP outlined the key role of pharmacists as medicines experts and in patient safety under the theme "Bringing and sustaining changes in patient safety policies and practices". The summit brought together health authorities from around the world to address emerging challenges and opportunities in patient safety, such as the integration of information technologies and artificial intelligence in health care. FIP will also advocate for pharmacists' role in patient safety at the upcoming Summit in Manila, Philippines in April 2025.

4. Promoting patient safety and the pharmacist role

Patient and medication safety is a top priority for pharmacists. Traditionally, pharmacists have protected people from harmful substances such as "poisons", and today, they play a crucial role in ensuring medicines are used safely. Pharmacists, as key healthcare professionals specialising in medication management, contribute to patient safety through direct care and teamwork in healthcare settings. They are well-positioned to advocate for safer medication systems, including managing shortages, and promoting a culture of patient safety in healthcare organisations.

Safe pharmacotherapy is divided into drug safety and medication safety. Drug safety focuses on pharmaceutical products, particularly their harm-benefit balance concerning adverse drug reactions (ADRs). An ADR is an unintended, harmful response to a medication taken at normal doses for disease prevention, diagnosis, treatment, or physiological function modification. Medication safety involves preventing and managing medication errors (MEs), which result from mistakes in the medication-use process due to omissions or commissions. A "near miss" (also called a "close call" or "potential adverse drug event") is a medication error that could have caused harm but did not, either due to chance or timely intervention. Near misses signal underlying system issues that could lead to adverse drug events (ADEs) if not addressed.[9, 10]

Pharmacists play a vital role in patient safety by identifying, analysing, and managing patient-related risks and incidents, including adverse events and medical errors, to enhance care and minimise harm. They actively engage in activities to prevent, mitigate, or address adverse outcomes in healthcare delivery to ensure safe pharmacotherapy.

Through the entire medication use process, pharmacists serve as access points between the community, hospital, and other health systems to optimise medication treatments and adherence,

promote patient self-management and monitoring, and improve patients' healthcare experiences and results. They have key roles in:

1. Ensuring the appropriateness of prescriptions at initiation of treatment;
2. Ensuring the accurate and appropriate supply of medications;
3. Ensuring patients are using their medications in the correct way;
4. Identifying and resolving clinically significant, potentially harmful medication-related problems; and,
5. Ensuring safety in transitions of care between hospitals/other healthcare units and the community.

At the health systems level, pharmacists lead medication safety and quality improvement programmes, address drug shortages, and implement patient safety and stewardship initiatives in areas such as antimicrobials, opioids, and pharmacogenomics.

Pharmacists play a crucial role in ensuring medication safety by managing the storage, handling, and dispensing of medicines. They ensure that medications are stored under appropriate conditions to maintain their efficacy, handle them with care to prevent contamination or damage, and dispense them accurately to patients. This management helps prevent medication errors and ensures that patients receive the correct treatment. Additionally, pharmacists are integral to pharmacovigilance, actively monitoring and reporting substandard and falsified (SF) medicines. Their vigilance in detecting and reporting SF medicines helps protect public health by preventing these harmful products from reaching patients and ensuring that authorities can take swift action to remove them from the supply chain.

5. FIP policy and mechanisms for advocacy

In its statement of policy, 'The role of pharmacists in promoting patient safety' (2020),[11] FIP recommends collaborative approaches involving healthcare professionals, patients, and the public in key decisions, considering varying roles across countries. It furthermore:

- Suggests defining individual and shared responsibilities in national health and medication policies, in consultation with healthcare professionals and their associations.
- Calls for regulatory frameworks supporting information sharing for safe patient care, including pharmacist access to clinical data through electronic health records.
- Advocates for maximising pharmacy services to enhance patient adherence and medication optimisation; and,
- Encourages non-punitive and proactive reporting of medication errors by all stakeholders, alongside dissemination of evidence-based approaches for error reduction.

To empower pharmacists, FIP has launched two toolkits that support pharmacists in medicines reconciliation services: Medication review and medicines use review. A toolkit for pharmacists (2022)[12] and Medicines reconciliation: A toolkit for pharmacists (2021).[13] FIP also advocates that in order to perform these services, it is essential for the pharmacist to have access to the patient's medication profile.

Furthermore, FIP has produced SF toolkits to support pharmacists in ensuring the supply of medicines in a proper and just manner, and to check for unauthorised sales of medicines or medical products that are not of certified quality. As the final member of the pharmaceutical distribution chain, as well as often being supply chain managers, pharmacists are crucial in preventing the introduction of SF medical products into the supply chain and in promoting adherence to good distribution practices.

FIP has produced tools that enable pharmacists in community and hospital settings to quickly detect SF medical products that have penetrated supply chains, report them to authorities, and educate and advise patients who have been exposed to them. Jointly with the WHO and partners, FIP has developed a competency framework[14] for pharmacists, outlining core knowledge, skills, and attitudes relating to SF medical products for pharmacy undergraduates. This framework lists the requisite

competencies (at the pre-service level) to address SF medical products in policy and practice settings. A comprehensive course on SF medical products for pharmacy students, supported by a curriculum guide[14] based on this framework, formalises and structures information available to pharmacists, covering the root causes of SF medical products, early warning signals, good procurement practices, working with authorities, and advice to patients. It is complemented by five modules focused on online pharmacy and the risks associated with substandard and falsified medical products sold online, along with a handbook for educators.

6. Country-case examples

Medicines reconciliation has been implemented in many healthcare settings, and it has notable impacts on patient, clinical, and economic outcomes. An example from Thailand shows that overall, the risk of medication error in patients who received medicines reconciliation in all transitions of care was 75% lower than those receiving usual care. It also highlights that it is essential for the pharmacist to have access to the patient's medication profile.[10]

In the Canadian province of Ontario, MedsCheck is an interview conducted between the pharmacist and the patient as a form of medication review (also known as medication use review). Certain criteria must be met for patients to be eligible for this service, including a minimum number of prescription medicines and specific timeframes, such as a recent hospital discharge, referral from a physician or nurse practitioner, or a pharmacist's clinical judgement. The service is remunerated by the provincial government province of Ontario.[15]

In South Africa, pharmacist-led medication therapy management of diabetes patients at a primary healthcare clinic in Cape Town showed that when a retrospective and prospective audit was conducted from patient folders of stable patients who attended the clinic, of 104 patient folders audited, a total of 453 medication therapy problems were identified, averaging four interventions per folder reviewed. This demonstrates pharmacists can identify, resolve, and prevent medication therapy problems and rationalise appropriate medication therapy.[15]

Similarly in Saudi Arabia, multidisciplinary collaborative care involving pharmacists achieved superior outcomes for patients with diabetes. In comparison to standard physician-based care, the involvement of pharmacists resulted in a significant HbA1c reduction ((9.33±1.80 vs.10.30±1.66), p=0.017) within nine months. Moreover, pharmacists' care helped optimise medication therapy and decreased the frequency of hypoglycaemia.[17]

Pharmacist-led interventions can address clinical and financial aspects of patient care and facilitate optimal treatment for difficult-to-manage medical conditions (see case study Annex 1). This further facilitates many aspects of patients' safe medication practices and efficient time-bound interventions. In the USA, a study demonstrated that a pharmacist-managed venous thromboembolism clinic provides financial benefit compared to physician-managed outpatient care.[18]

Further examples are included in Annex 2.

7. Call to action

FIP and its members need to continue raising awareness about medication safety and the role of pharmacists in healthcare. To ensure a holistic approach to patient care, it is crucial to strengthen collaboration with physicians, nurses, and other healthcare providers. Establishing protocols for promptly handling and reporting medication errors and adverse drug reactions is essential for maintaining patient safety. Additionally, organising health education campaigns and workshops can effectively inform the public about safe medication practices and the importance of adhering to prescribed treatments, while maximising pharmacy services can enhance patient adherence and medication optimisation.

Whilst the fallibility of humans and their resultant errors appears to be a contributing factor to medication errors and patient harm, errors often do not have a single cause. Healthcare organisations and systems, including people that create legislation and policy, people that implement standards and guidelines, and healthcare professionals who deliver services and provide patient care, are all responsible for ensuring patient safety. To make healthcare systems safer, a shift towards a collaborative systems approach that fosters a safety culture and promotes effective prospective risk management and continuous quality assurance through building system defences, is needed. Policy makers, in collaboration with pharmacists' organisations, need to define individual and shared responsibilities in national health and medication policies. Such policies should support information sharing for safe patient care, including granting pharmacists access to clinical data via electronic health records. They should also encourage non-punitive and proactive reporting of medication errors by all stakeholders, along with disseminating evidence-based approaches for error reduction.

Similarly, well-trained pharmacists in community and hospital settings can swiftly detect SF medical products in supply chains, report them to authorities, and educate and advise affected patients. In addition, tackling this problem necessitates robust legal frameworks, regional and international cooperation, heightened public awareness, and stronger enforcement measures, to help pharmacists in safeguarding the integrity of the supply chain and ensuring the availability of safe and effective medicines.

Annex 1: Case study from Finland

INITIATIVE ON PHARMACISTS' ROLE IN MEDICATION WITHOUT HARM: RECENT DEVELOPMENTS IN FINLAND

National medication safety programme for community pharmacies (Valo 2022-2026)
Website: https://valo.apteekki.fi/information-in-english/

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The National Medication Safety Programme for Community Pharmacies (VALO 2022-2026) is a programme launched by the Association of Finnish Pharmacies, together with the Finnish Centre for Client and Patient Safety. The main goal of this evidence-informed programme is to enhance medication safety in outpatient care by enhancing community pharmacists' involvement in medication error reporting and prospective medication risk management, in collaboration with local and regional social and health services providers. The goal is that by the end of 2026, outpatient medication safety and risk management actions will be regionally coordinated across organisational boundaries. The Valo Programme supports the implementation of the National Client and Patient Safety Strategy (2022-2026) by the Ministry of Social Affairs and Health.

The Valo Programme will also support enhancing medication safety culture and expertise in community pharmacies by providing easily accessible scalable CE training (such as online webinars and courses) and practical tools. The first step to coordinate actions was to establish a network of pharmacists nominated in their workplace to be responsible for implementing medication safety actions. Today, almost every private community pharmacy in Finland has a nominated medication safety pharmacist.

The Valo Programme consists of the following four main projects:

1. National implementation of the patient safety incident reporting system (HaiPro) into community pharmacies

The voluntary patient safety incident reporting system, HaiPro, has been widely used in health and social care services in Finland since 2007. During 2007-2017, more than one million reports were submitted, of which 43.5% dealt with medication or fluid therapy. As part of the Valo Programme, HaiPro was implemented into community pharmacies for in-house reporting during 2021. Before implementation, the reporting system was modified to better adapt to the operational environment of community pharmacies. The HaiPro system guides community pharmacies to observe medication safety risks in operational processes. In addition to dispensing errors, HaiPro assists in monitoring risks and errors related to self-care, automated dose-dispensing, and e-pharmacy services, among many other functions.

During spring 2022, the HaiPro patient safety incident reporting in community pharmacies was extended to become cross-border between pharmacies and local health and social services units.

This procedure was first piloted in two regional well-being services counties. After the successful pilot phase, the incident reporting between community pharmacies and health and social care units was nationally enabled in well-being counties by the end of 2024.

In outpatient care, the medication use process comprises multiple actors and stages. Inter-organisational HaiPro reporting enables gathering data about the safety and feasibility of the entire medication use process, including prescribing, follow-up and self-management of the medication.

2. Developing medication safety culture and expertise in community pharmacies

The medication safety culture and expertise in community pharmacies will be developed to meet the needs of the health and social services system and to reach the goals of the national Client and Patient Safety Strategy. Achieving these objectives will be facilitated and coordinated with the help of appointed medication safety pharmacists in every community pharmacy in Finland. The continuous development of the medication safety expertise and practices will be supported by continuing education or in-house training and providing practical tools.

The pharmacy owners, managers and medication safety pharmacists make a core team to lead implementation of safety culture in community pharmacies.

3. Developing cooperation and coordination in community pharmacies and regionally

Sufficient cooperation and coordination will ensure that learning from others takes place and that effective development measures are carried out. When it comes to risk management, it is vital that risks can be identified before they actualise in one's own department.

The peer development process of community pharmacies utilises the network of medication safety pharmacists and the nationally accumulative HaiPro incident data from community pharmacies. Distributing the information from the HaiPro data to community pharmacies enables utilising information about the risks and developing proactive processes in each community pharmacy. The larger dataset can help identify risks in the medication use process in real time that may remain unidentifiable in the data of a single community pharmacy. The data also shows measures that community pharmacies have taken to minimise and avoid risks.

4. Research

The Valo Programme is guided by scientific research. A research strategy (2023-2026) was developed in cooperation with the University of Helsinki and recently published in English (originally published in 2023, peer reviewed publication: Mäkinen et al. 2025, see below).

The research strategy contains the core research areas that support implementation of the programme in a sustainable way, leading to permanent changes in the community pharmacy practice as part of local social and health services that are under major reform in Finland. The aim is to improve medication safety both in community pharmacies and in health and social services system in Finland.

The research cooperation with the University of Helsinki will be ongoing throughout the entire programme. This approach enables generating research data in a coordinated and thorough manner continuously based on the research strategy, while also making it possible to assess the effectiveness of the programme's actions.

The knowledge gained from the research will be used in recognising, choosing, and prioritising new measures for the programme. The research results will also be applied to developing medication safety practices, and to support management and decision-making both in community pharmacies as well as other areas of health and social care services.

Annex 2: List of additional examples

Country	Example	Resource
Australia	**Domiciliary medication management review (home medicines review), residential medication management review, and MedsCheck** Through home medicines review and residential medication management review, pharmacists meet patients, review their medication management needs, consult with additional allied healthcare professionals, and make suggestions of changes to medication therapy to the general practitioner. The review aims to optimise medication therapy and prevent additional medication-related harm, especially in patients at risk of medication errors due to, for example, recent changes to their health or treatment plan. The medication management review is initiated by the physician (general practitioner or inpatient physician) and is remunerated by the federal government. Furthermore, MedsCheck services are also provided in the community setting, with a focus on patients' understanding of their medicines.	https://www.fip.org/file/5100
Canada	**Documentation in the patient's medical record by clinical pharmacists in a Canadian university teaching hospital** Clinical pharmacists' documentation in patients' medical records could be improved to achieve the goal of all significant clinical recommendations or interventions being documented.	https://pmc.ncbi.nlm.nih.gov/articles/PMC6592655/
Canada	**MedsCheck** In the Canadian province of Ontario, MedsCheck is an interview conducted between the pharmacist and the patient as a form of MUR. Certain criteria must be met for patients to be eligible for this service, including a minimum number of prescription medicines and specific time-frames, such as a recent hospital discharge, referral from a physician or nurse practitioner, or a pharmacist's clinical judgement. The service is remunerated by the provincial government.	https://www.fip.org/file/5100
England	**Structured medication reviews and MUR** Structured medication reviews involve pharmacists and patients, in addition to a multidisciplinary approach, to assess the safety and effectiveness of medication therapy. Previously, MUR was a remunerated service aimed at optimising medication therapy and addressing adherence issues but, since March 2021, it has been decommissioned.	https://www.fip.org/file/5100
Finland	**Medication reconciliation** Finnish hospital pharmacists take part in medication reconciliation during admission and discharge to ensure patients have accurate medication records. This includes verifying the prescribed medications against the patient's prior regimen and addressing discrepancies such as omissions or duplications.	https://www.fip.org/file/4757.

France	**Impact of pharmacist interventions on clinical outcome and cost avoidance in a university teaching hospital** Prescription review and interventions by pharmacists significantly reduce hospitalisation days and healthcare costs, making this service highly efficient.	https://link.springer.com/article/10.1007/s11096-018-0733-6
Ireland	**Evaluation of the ability of pharmacy and medicine students to calculate drug dosage** Drug dose calculation continually provides challenges among healthcare graduates, and additional and varied learning resources may enable students to attain and retain an acceptable standard of skill throughout their professional careers.	https://pharmacyeducation.fip.org/pharmacyeducation/article/view/331?utm
Japan	**Brown bag programme** Led by the Hiroshima Pharmaceutical Association, the brown bag programme is a MUR service conducted by community pharmacists, where patients from the region are invited to take all their medicines to a pharmacy (in the commonly used brown paper bags). The pharmacist then addresses potential safety concerns, including issues regarding adherence, and educates patients about their medicines and health issues through an interview.	https://www.fip.org/file/5100
New Zealand	**MUR and medicines therapy assessment (MTA)** MUR services can be provided by accredited pharmacists to increase patients' knowledge about their medicines and improve their adherence. MTA can also be provided by accredited pharmacists as a form of clinical assessment to identify, resolve and prevent medicine related problems as well as optimise the effectiveness of medication therapy.	https://www.fip.org/file/5100
Scotland	**Medicines, care and review service** Community pharmacists partner with patients to review medicines use and address any concerns regarding medication therapy. A care plan is developed to address such issues and determine methods to improve medicines use.	https://www.fip.org/file/5100
Slovenia	**Medicines use review (MUR) in community pharmacies and additional clinical medication reviews in healthcare centres** Pharmacists in Slovenia undertake MUR according to a standard operating procedure among targeted patients in the community pharmacy setting. Medication review services are also performed in healthcare centres by clinical pharmacists using different sources, such as patient interviews, medication histories and clinical data. The conclusions of the service are thereafter transferred to the patient's general practitioner.	https://www.fip.org/file/5100

South Korea	**Effect of nationwide concurrent drug utilisation review (DUR) programme on drug-drug interactions (DDIs) and related health outcomes** Implementation of a DUR programme may reduce the adverse health outcomes posed by DDIs in patients on a combination of benzodiazepines and enzyme inhibitors potentially QTc-prolongation agents.	https://pubmed.ncbi.nlm.nih.gov/34402911/
South Korea	**Toward safer prescribing: Evaluation of a prospective drug utilisation review (DUR) system on inappropriate prescriptions, prescribing patterns, and adverse drug events (ADE) and related health expenditure in South Korea** The introduction of the DUR system was associated with more efficient prescribing, including a reduction in drug-drug interactions and an increase in the use of gastro-protective drugs. The system had a positive effect on patient outcome but was not associated with reduced ADE-related costs.	https://pubmed.ncbi.nlm.nih.gov/30145461/
Spain	**REVISA project and conSIGUE programme** Drawing on experience and guidance from the UK, Spanish community pharmacies implemented an MUR service. Pharmacists met with patients to review their medicines and ensure their understanding of their medication therapy. The REVISA project was undertaken to assess the establishment of the service. In addition, medicine review services within community pharmacies among older patients with polypharmacy were also evaluated through the conSIGUE programme.	https://www.fip.org/file/5100
Switzerland	**Polymedication check** The Swiss Polymedication Check (MUR) was conducted through a structured patient interview along with medication history, aimed at patients taking at least four medicines for at least three months. This service aimed to address issues of medication adherence and improve patients' understanding of their medicines, but has been decommissioned since July 2020.	https://www.fip.org/file/5100
The Netherlands	**Clinical medication reviews** To address polypharmacy in the elderly, pharmacists across different care settings can conduct medication reviews to increase the effectiveness of medication therapy in this high-risk population as well as contribute to de-prescribing. This is usually performed based on the STRIP method (Systematic Tool to Reduce Inappropriate Prescribing).	https://www.fip.org/file/5100
UK	**Clinical interventions by community pharmacists using patient medication records** Community pharmacists effectively use patient medication records to conduct clinical interventions, resulting in improved patient outcomes and reducing at-risk patient grouping.	https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.2042-7174.1994.tb00779.x?saml_referrer=

United Arab Emirates	**Adoption of electronic patient medication records in community pharmacies in the United Arab Emirates: A cross-sectional survey** Implementing electronic patient medication records in community pharmacies in the UAE has potential benefits for patient safety and medication therapy management.	https://pubmed.ncbi.nlm.nih.gov/37551925/
USA	**Patient medical records: Evaluation of knowledge, perception and utilisation among hospital pharmacists in secondary and tertiary hospitals in Lagos State** Hospital pharmacists in Lagos State believe unrestricted access to patient medical records improves pharmaceutical care and satisfaction, but only 51.6% currently have access to all information.	https://pharmabiosciencejournal.com/index.php/pbj/article/view/2222
USA	**Access to medical records' impact on community pharmacist–delivered medication therapy management: A pilot from the medication safety research network of Indiana (Rx-SafeNet)** Community pharmacists identified more medication-related problems and preventive care omissions when reviewing unedited medical records compared to usual care pharmacists.	https://journals.sagepub.com/doi/10.1177/0897190017735422
USA	**Retrospective drug utilisation review (DUR): Impact of pharmacist interventions on physician prescribing** Retrospective DUR is an effective interventional programme which results in decreased numbers of interventions per physician and provides a significant impact on future prescribing habits.	https://pubmed.ncbi.nlm.nih.gov/21935338/
Australia	**Home medicines reviews: a national survey of Australian accredited pharmacists' health service time investment** Accredited pharmacists in Australia invest significant time in performing comprehensive home medicines review services, particularly during in-home patient consultations and report collation and completion.	https://pubmed.ncbi.nlm.nih.gov/34457093/
Norway	**Medication dose calculation errors and other numeracy mishaps in hospitals: Analysis of the nature and enablers of incident reports** Numeracy errors due to lack of or improper safeguards occurred during all medication management stages. Dose miscalculation after dilution of intravenous solutions, infusion pump programming, and double-checking were identified as unsafe practices.	https://onlinelibrary.wiley.com/doi/10.1111/jan.15072?utm

Saudi Arabia	**Pharmacists' perceptions on safety alerts of the drug utilisation review (DUR) in electronic health records in a tertiary healthcare hospital** Positive perceptions about DUR led to changing the prescription in response to an alert. Therefore, improving the DUR system is crucial to prevent pharmacists from missing important alerts and to increase their awareness of clinically significant alarm signals.	https://www.mdpi.com/2226-4787/11/4/119
Slovenia	**Pharmacist-led clinical medication review service in primary care: The perspective of general practitioners** Since 2016, Slovenia has systematically reimbursed and made available an advanced-level medication review service nationwide in primary care settings.	https://bmcprimcare.biomedcentral.com/articles/10.1186/s12875-022-01963-w
USA	**A range of** medication therapy management (**MTM) services across various care settings** Pharmacists provide medication therapy management services in all care settings in which patients take medications. While pharmacists in different settings may provide different types of MTM services, the goal of all pharmacists providing medication therapy management is to make sure that the medication is right for the patient and his or her health conditions, and that the best possible outcomes from treatment are achieved.	https://www.pharmacist.com/Practice/Patient-Care-Services/Medication-Management
USA	**Frequency of and risk factors for medication errors by pharmacists during order verification in a tertiary care medical centre** An increase in the number of orders verified per shift was associated with an increased rate of pharmacist errors during order verification in a tertiary care medical centre.	https://pubmed.ncbi.nlm.nih.gov/26294240/
USA, Canada, UK, Israel, South Africa	**Impact of pharmacists providing a prescription review and monitoring service in ambulatory care or community practice** Pharmacist-run prescription review and monitoring services may improve clinical outcomes, but more rigorous research is needed to assess their impact on drug safety, quality of life, and cost-effectiveness.	https://journals.sagepub.com/doi/epdf/10.1345/aph.19374
China	**Remote pharmacy service in primary care: The implementation of a cloud-based pre-prescription review system.** The cloud-based pre-prescription review system effectively reduces inappropriate prescriptions in Chinese community health centres, improving patient care and enhancing pharmacist involvement. Three percent of prescriptions were flagged for review, with 49.9% needing correction.	https://pubmed.ncbi.nlm.nih.gov/33386239/
Iran	**Drug utilisation evaluation of imipenem and assessing the role of pharmacist interventions** The role of the pharmacist in drug utilisation evaluations is of great importance for optimal use of drugs and reducing mortality rates caused by infectious diseases.	https://jmums.mazums.ac.ir/article-1-14871-en.html

Malaysia	**Pharmacists' interventions on prescribing errors in Malaysia** Increasing the number of pharmacists and total prescriptions received in Malaysia strongly correlates with interventions on prescribing errors, highlighting their vital role in patient safety and healthcare quality.	https://pubmed.ncbi.nlm.nih.gov/39319113/
Thailand	**Comparison of accuracy and speed in computer-assisted versus conventional methods for paediatric drug dose calculation: A scenario-based randomized controlled trial** Computer-assisted prescription calculation provides benefits over the conventional method in accuracy of all medication dosages and in time required for calculation, while enhancing the drug prescription ability of paramedics.	https://journals.sagepub.com/doi/full/10.1177/2333794X21999144?utm
Latin America	**Systematic review of cross-national drug utilisation studies in Latin America: methods and comparability** Drug utilisation studies comparing data cross-nationally are scarce in Latin America. In general, validity of the comparisons is hampered by a potential risk of extrapolation bias given the lack of available data on drug consumption from the public healthcare sector. Setting up systems to remediate this situation is a future challenge for researchers and (supra)national authorities in the region.	https://pubmed.ncbi.nlm.nih.gov/26486230/
Uganda	**Strengthening pharmaceutical systems for palliative care services in resource limited settings: Piloting a mHealth application across a rural and urban setting in Uganda** A mobile health application in Uganda improved patient record management, pharmacy forecasting, procurement, and distribution of essential health commodities for palliative care services in resource-limited settings.	https://pubmed.ncbi.nlm.nih.gov/26895882/
Ethiopia	**An initiative in Ethiopia focused on implementing medication reconciliation as a standard practice to achieve the quality use of medicines** The programme aimed to reduce medication-related adverse events, particularly during transitions of care, thereby improving patient outcomes.	https://bmjopen.bmj.com/content/6/11/e012322?utm_
India	**Review of pharmaceutical calculations** The use of calculations in pharmacy is varied and broad-based. It encompasses calculations performed by pharmacists in traditional as well as in specialised practice settings and within operational and research areas in industry, academia, and government.	https://rjptonline.org/HTMLPaper.aspx?Journal=Research+Journal+of+Pharmacy+and+Technology%3BPID%3D2016-9-11-47&utm
India	**Role of a clinical pharmacist in drug utilisation evaluation, medication adherence and pharmacovigilance** Pharmacy professionals have undertaken the responsibility to eliminate medication-based problems by extending a helping hand to increase medication adherence by patient education and use of compliance aids as well as performing extensive drug research to aid in prescription.	https://www.ijbcp.com/index.php/ijbcp/article/view/5561

Lebanon	**A pharmacist-led medication review service with a deprescribing focus guided by implementation science** A pharmacist-led medication review service with a deprescribing focus significantly increased patient satisfaction compared to routine care in a low-income care facility in Lebanon.	https://pubmed.ncbi.nlm.nih.gov/36794277/
Egypt	**MTM services** In four tertiary hospitals in Egypt, clinical pharmacists implemented MTM services aimed at optimising medication use. The interventions resulted in reduced drug therapy problems and associated costs, supporting healthcare system sustainability.	https://pubmed.ncbi.nlm.nih.gov/39823444/
Ghana	**MTM services** A quasi-experimental study was conducted at the Wenchi Methodist Hospital in Ghana, focusing on hypertensive patients. Pharmacists provided MTM services, including comprehensive medication reviews, patient counseling, and identification of medication-related problems. The intervention led to significant improvements in blood pressure control and the resolution of medication-related issues.	https://pmc.ncbi.nlm.nih.gov/articles/PMC5597148/?utm_
Pakistan	**Medication reconciliation** A study at a tertiary care hospital in Pakistan evaluated medication reconciliation compliance over four years. Pharmacists conducted medication histories within 24 hours of patient admission. The study highlighted significant discrepancies between medication histories taken by physicians and those collected by pharmacists, emphasising the importance of pharmacist-led reconciliation in identifying and resolving errors.	https://pmc.ncbi.nlm.nih.gov/articles/PMC10989168/?utm_

Legend:

High income country	Middle income country	Low income country

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CHAPTER 8

Pharmacy's role in the digital transformation of health

This chapter explores FIP's global work on digital health transformation and presents examples of digital pharmacy services that enhance access, quality, and person-centred care.

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We would also like to acknowledge the important contributions of the FIP Technology Advisory Group and the Working Group on Data to this chapter on digital health.

Content list

High level summary

1. Digital health is transforming pharmacy practice by enabling remote care, optimising clinical decision-making, and expanding access to underserved populations.
2. Pharmacists are leveraging technologies such as AI, telehealth, robotic automation, and real-world data to improve safety, efficiency, and patient outcomes.
3. The International Pharmaceutical Federation (FIP) has played a central role in shaping digital health policy and practice, including the creation of the Technology Advisory Group (TAG) in 2019 and the publication of digital health position statements.
4. Pharmacy-led digital innovations are demonstrating measurable impact in public health areas such as antimicrobial stewardship (AMS) and vaccination services, with national case studies showing improved prescribing practices and expanded immunisation access.
5. Despite progress, gaps remain in digital literacy, infrastructure, and regulation across countries, particularly in low-resource settings.
6. FIP continues to address these challenges through global needs assessments, development of digital health competency frameworks, and training resources for pharmacy educators and professionals.
7. The forthcoming WHO Global Strategy on Digital Health (2028–2033) provides an opportunity for pharmacists to further integrate into digital health governance, equity strategies, and system-wide transformation.

Key message

Pharmacists are driving digital transformation in healthcare by leveraging technologies such as telehealth, AI, and mobile health to expand access, improve patient outcomes, and enhance the safety and efficiency of pharmaceutical care.

Related FIP Development Goals

This chapter aligns primarily with FIP Development Goal 20: Digital Health, which addresses digital transformation across the pharmacy workforce, practice, and science domains.

Development Goal 20 calls for systems, structures, and enablers to build a digitally competent pharmaceutical workforce and deliver high-quality digital health services that improve access, efficiency, and patient outcomes.
This includes:

- Developing digital health competencies in education and training
- Integrating digital technologies such as shared EHRs, AI, and mobile health into practice to enhance service delivery and widen equity
- Supporting workforce policies that create opportunities in digital health, including governance and data ethics
- Promoting the role of pharmacy in digital innovation and real-world data use for patient-centred care.

Call to action

The following calls to action are proposed for key stakeholder groups:

1. **Governments & health ministries**
   Integrate pharmacists into national digital health strategies by investing in infrastructure, education, and equitable access to technology-enabled pharmaceutical care. Expand the reach of digital pharmacy services through policies that support telepharmacy, mobile health, and the use of real-world data for service delivery and health system planning.
2. **Regulatory bodies & policymakers**
   Modernise regulatory frameworks to enable pharmacy-led digital health services, including teleconsultations, digital prescribing, and electronic health records. Incorporate digital competencies into licensure and continuing professional development (CPD) systems, and establish governance standards for data privacy, interoperability, and the ethical use of emerging technologies.
3. **Educational institutions & educators**

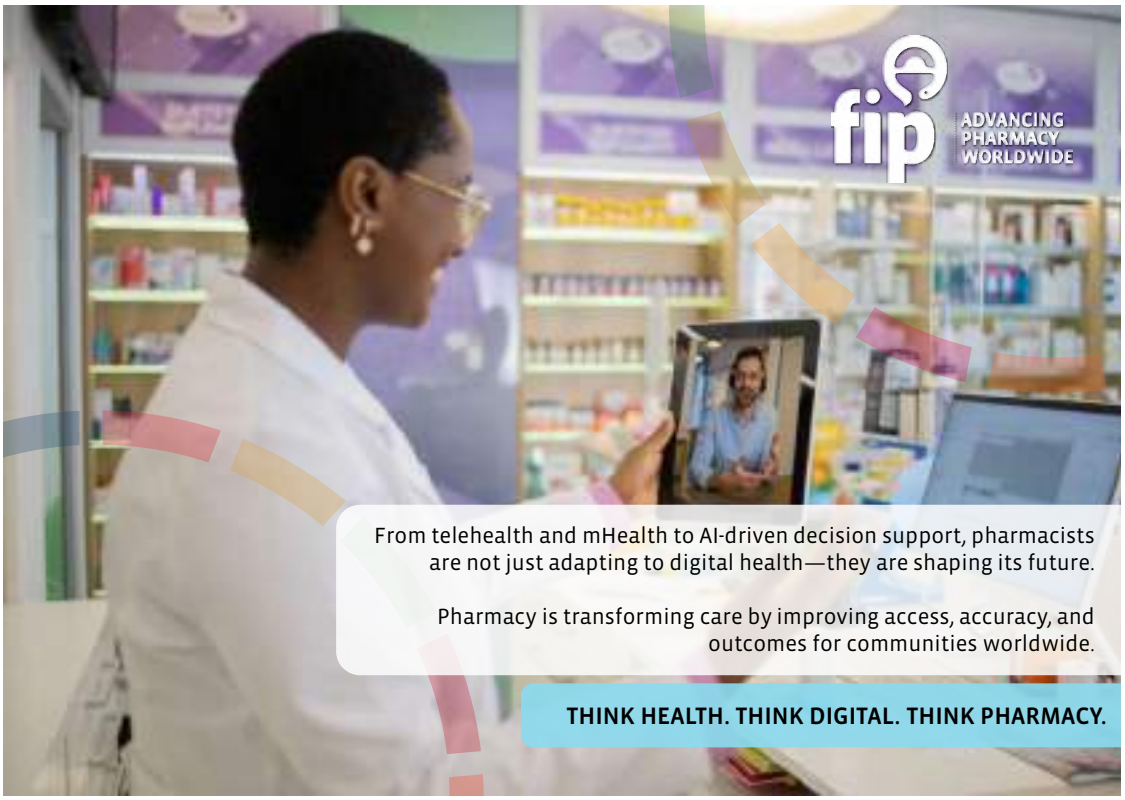
Integrate digital health into pharmacy curricula by aligning education with evolving service delivery models. Expand training capacity through interdisciplinary and experiential learning approaches and equip educators with the tools and knowledge to teach digital health effectively.

4. **Professional associations & pharmacy leadership**

   Advocate for the integration of digital tools in pharmacy practice, support CPD and lifelong learning in digital health, and collaborate with national stakeholders to strengthen the pharmacist's role in digital service delivery. Promote knowledge exchange and peer learning through the documentation and dissemination of digital innovations and practice models.

3. **International partners & funders**

   Support the digital transformation of pharmaceutical services in low- and middle-income countries through investments in infrastructure, training, and South–South cooperation. Contribute to global research and data-sharing efforts that advance the role of pharmacists in digital health and strengthen universal health coverage.



Pharmacists now provide virtual consultations, remote medication therapy management, and telepharmacy services, making care more accessible and convenient for patients, especially in underserved areas.[1]

In a randomised controlled trial, pharmacist-led telehealth for diabetes and depression improved cardiovascular medication adherence by 14%, antidepressant adherence by 26%, and overall adherence by 13.9% over six months.[2]

A mobile health intervention for kidney transplant recipients led to a 61% reduction in medication errors and a significant decrease in serious adverse events and hospitalisations (incident risk ratio for hospitalisations: 0.46).[3]

FIP urges governments and ministers of health to invest in digital technologies that would support pharmacists in delivering health care services more effectively, with less errors and more accurate records.

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1. Introduction and context

Digitalisation presents numerous benefits to healthcare systems worldwide. By leveraging digital health technologies, patients and healthcare professionals can communicate remotely, improving patient adherence, satisfaction, and access to care due to convenience and reduced barriers.[1, 2] These tools also empower patients by enabling greater self-monitoring, access to health information, and involvement in shared decision-making.

Beyond remote care, advances in digital tools such as clinical decision support systems (CDSS) contribute to more accurate, efficient, and personalised care.[2-4]

For pharmacists, this transformation represents a pivotal opportunity to redefine their roles in both individual patient care and broader health system improvement. Digital health solutions—including telehealth, mobile health (mHealth), e-prescriptions, and AI—are increasingly embedded in pharmacy services, enhancing efficiency, reducing geographic barriers, and promoting medication optimisation.[5] For instance, mHealth apps allow for real-time medication reminders and symptom tracking, while e-prescriptions reduce dispensing errors and streamline access to medications.

These shifts in practice align with international efforts to embed digital health into the fabric of healthcare systems.

In response to the growing role of technology in health systems, the World Health Organization (WHO) launched the Global Strategy on Digital Health (2020-2025) to guide governance and implementation at global, regional and national levels.[6] A key motivation behind this strategy is the reduction of global health inequities through scalable, digital-first solutions. Despite facing valid critiques—such as definitional ambiguities, market-driven approaches, and challenges in implementation—the strategy's core principles remain highly relevant.[7-10] These include promoting interoperability, data security, workforce development, ethical standards, and the advancement of universal health coverage.[7-10]

However, the COVID-19 pandemic and rapid acceleration of digital innovation have exposed limitations in the strategy's adaptability.[7-10] The pandemic revealed critical gaps in digital infrastructure, data interoperability, and workforce readiness—highlighting the need for more agile and inclusive governance models in digital health. In May 2025, the 78th World Health Assembly called on WHO to develop a new Global Strategy on Digital Health for 2028–2033.[11] This next phase will be aligned with the UN's Pact for the Future and the 2030 Agenda for Sustainable Development, ensuring that digital health contributes directly to equitable, resilient, and people-centred health systems.[12] A central priority will be ensuring that low- and middle-income countries are not left behind in the digital health transition, with targeted support for capacity building and infrastructure development.

Building on the foundational principles of the current strategy, the forthcoming phase is expected to introduce clearer taxonomies, adaptive governance mechanisms, enhanced regulatory oversight for emerging technologies, and greater emphasis on health equity, sustainable financing, and pandemic preparedness.[7-10] To support implementation of this global vision, a robust, digitally skilled health workforce will be essential.

Aligning with the evolving vision, FIP, under Development Goal 20 (Digital Health), has led global efforts to build a digitally competent pharmaceutical workforce, advocating for the inclusion of digital competencies in national and institutional training frameworks, as well as supporting ongoing education and system-wide capacity building.[13]

Digital technologies—from electronic health records and AI to data governance systems—can bridge equity gaps and enhance the safety, effectiveness, and efficiency of pharmaceutical care. Pharmacists, as

accessible and trusted health professionals, are uniquely positioned to lead the responsible use of digital tools within community and clinical settings.

These efforts contribute directly to FIP's vision: a world where everyone benefits from safe, effective, quality, and affordable medicines and pharmaceutical services, delivered in collaboration with other health professionals.

2. FIP's global leadership in digital health transformation

FIP has taken a leading role in supporting the digital transformation of pharmacy practice through policy development, global collaboration, and capacity building. This commitment reflects the growing need for the pharmacy profession to adapt to rapidly evolving digital health ecosystems and to ensure pharmacists are equipped to deliver quality care in increasingly tech-enabled healthcare systems.

FIP established the Technology Advisory Group (TAG) in 2019—a dedicated group that monitors and analyses emerging digital trends and their relevance to pharmacy. TAG serves as a dedicated platform for monitoring global digital trends and their implications for pharmacy practice. It provides member organisations with strategic insights, technical guidance, and expert analysis to support the effective adoption and integration of transformative digital solutions across various pharmaceutical sectors. Additionally, TAG facilitates knowledge exchange between member organisations by hosting webinars, producing digital health toolkits, and contributing to global working groups on pharmacy informatics and innovation.

Building on this foundation, FIP published its position statement on emerging technologies and pharmacy practice in 2020, outlining how technological advancements are reshaping the roles and responsibilities of pharmacists and setting strategic directions for the profession's digital evolution.[14] This statement also highlighted priority areas such as artificial intelligence, mobile health applications, and telepharmacy, providing guidance on how these technologies can be ethically and effectively implemented in various pharmacy settings.

In 2021, FIP followed with a comprehensive Statement of Policy on Digital Health, reaffirming its commitment to promoting the adoption of common digital standards and terminologies to enhance global e-health interoperability and health information exchange.[15]

Through this policy framework, FIP advocates for:

- The development of international strategies to advance interoperable, patient-centred digital technologies in pharmacy;
- Capacity building by supporting member organisations with educational resources and tools to enhance digital health literacy;
- Positive engagement with digital transformation by fostering a culture of innovation across the profession;
- Strengthening research, international collaboration, and the inclusion of digital health in pharmacy education and training curricula;
- Evaluating the impact of digital tools on patient outcomes and professional practice through continuous monitoring and feedback mechanisms.

As digital health continues to reshape healthcare delivery, FIP remains committed to empowering the pharmacy workforce to lead and innovate, ensuring that pharmacists play a central role in the co-creation of digital health systems that are safe, effective, and equitable.

3. Transforming pharmacy practice through digital tools and advanced technology

Digital platforms particularly telehealth, mobile health (mHealth), and e-prescriptions are revolutionising how pharmacists deliver care, particularly in underserved and remote areas. These tools address geographical and systemic barriers, enabling pharmacists to extend their reach beyond traditional settings and contribute to universal health coverage.

These technologies enable pharmacists to offer virtual consultations, medication therapy management, and remote monitoring services, improving access, adherence, and continuity of care. Furthermore, digital platforms support asynchronous communication, allowing pharmacists to follow up with patients through secure messaging and mobile apps, which can enhance patient engagement and satisfaction.

FIP's mHealth report highlights how pharmacists are leveraging mobile health tools to manage chronic conditions, deliver preventive services, and promote adherence across diverse populations.[16] Such tools are particularly impactful in managing diseases like diabetes and hypertension, where timely monitoring and intervention are critical. These mobile health interventions are especially valuable in low-resource settings, where access to continuous in-person care may be limited or inconsistent.

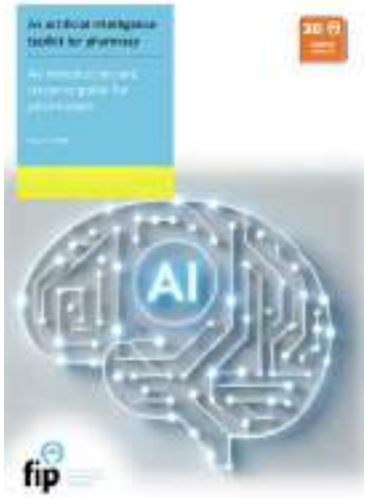
In parallel, e-prescriptions streamline access to medicines by reducing dispensing delays and errors, while ensuring alignment with electronic health records (EHRs). Pharmacists serve as key custodians of medication safety—validating prescriptions for accuracy and appropriateness based on individual patient profiles. With the integration of decision-support systems, pharmacists can also receive real-time alerts about potential drug interactions, duplications, or contraindications, further strengthening patient safety.

Pharmacy's role extends further into the digital transformation of healthcare through the integration of emerging technologies and data-driven approaches, as outlined in FIP's TAG report Advancements in Digital Pharmacy Post COVID-19.[5] This includes the use of artificial intelligence for personalised medicine, blockchain for secure data exchange, and advanced analytics to inform population health management.

Digital innovation	Pharmacy application	Evidence of impact
Artificial intelligence (AI) and clinical decision support systems (CDSS)	AI-enabled CDSS tools equip pharmacists with real-time, evidence-based insights to support personalised therapy and improve patient outcomes. Pharmacogenomic CDSS applications also enable tailoring treatments to individual genetic profiles.[5]	A study involving high-risk Medicaid patients found that implementing an AI-supported clinical medication management programme led to a 17.4% reduction in monthly medication costs, along with decreased emergency department visits and hospital admissions, demonstrating improved patient outcomes and positive return on investment.[17]
Robotic process automation (RPA)	RPA enhances pharmacy efficiency by automating routine tasks such as inventory management, regulatory reporting, and data entry. This reduces administrative burdens, allowing pharmacists to dedicate more time to clinical roles and patient engagement.[5]	Implementation of a robotic dispensing system was shown to reduce preventable dispensing errors from 0.204% to 0.044%, and unpreventable errors from 0.015% to 0.002%, while decreasing median dispensing time per prescription from 60 seconds to 23 seconds.[17]

Real-world data (RWD) applications	In chronic respiratory care, pharmacists can use air quality and pollen data to anticipate flare-ups and adjust therapies.[5] For non-communicable diseases, integrating biometric data (e.g., glucose or blood pressure readings) facilitates proactive medication adjustments and personalised care planning.[5]	In a study of Medicaid populations, AI-powered platforms leveraging RWD were associated with lower emergency department use, reduced hospitalisations, and decreased medication costs, highlighting the clinical and economic value of pharmacist-led data-driven care.[17]

Together, these innovations place pharmacists at the forefront of digital healthcare, improving safety, efficiency, and reach of services.



To further support pharmacists in navigating the complexities of artificial intelligence, FIP developed the AI Toolkit for Pharmacy Practice (2024), a practical guide aimed at enhancing the understanding and responsible integration of AI technologies within pharmaceutical settings. The toolkit features real-world use cases, ethical frameworks, risk mitigation strategies, and step-by-step implementation guidance tailored to pharmacists across various practice environments. It serves as a foundational resource for building AI readiness, enabling evidence-based decision-making, and strengthening digital capacity at both institutional and national levels.

4. Strengthening capacity through digital health education and assessment

In 2021, FIP engaged with its member organisations to explore digital health priorities, revealing that most national pharmacy leadership bodies consider digital health a critical component of workforce development.

In response, the FIP Global Pharmaceutical Observatory (GPO) launched a multinational needs assessment project (MNAP), "How can digital health support national pharmaceutical care delivery? A regional and global assessment of priorities and challenges."[18] to explore digital readiness and integration needs across regions.

This project brought together stakeholders through six regional meetings and a global roundtable to map existing initiatives, identify barriers and enablers, and produce actionable recommendations to enhance pharmacists' contributions to digital health integration.

Key findings from these engagements included:

- Strengthening secure health information exchange and patient digital literacy;
- Co-developing digital solutions with pharmacists and patients;
- Implementing evaluation frameworks for digital tool effectiveness;

- Promoting interprofessional digital collaboration across health systems.

Despite progress, significant challenges remain, including:

- Wide disparities in public digital literacy and access;
- Lack of clear regulatory frameworks and enforcement mechanisms;
- Insufficient funding and inadequate digital infrastructure;
- Limited educator capacity and absence of structured digital health training pathways in pharmacy education.

To address these capacity gaps, pharmacy workforce development must prioritise structured education and ongoing training in digital health. In 2021, FIP published the Digital health in pharmacy education report,[19] presenting results from a global survey of 1,060 pharmacy professionals. While 61% reported daily use of digital tools—primarily e-prescribing, mobile apps, and e-dispensing—only 25% had received formal training in digital health, either during their studies or through continuing professional development.

The survey also highlighted key barriers for pharmacy schools, including lack of faculty expertise, insufficient curricular resources, and unclear educational guidance. These gaps underscore the urgency of embedding digital competencies into pharmacy curricula and investing in faculty development to ensure future-ready pharmacy professionals.

To support countries in addressing these gaps, FIP is currently developing a dedicated digital health competency framework. Building on the Global Competency Framework (GbCF), first introduced in 2012 and updated in 2020 (see Chapter 2C), this new framework is designed to guide digital health education in a scalable and context-sensitive manner. It aims to support both curriculum development at the institutional level and workforce planning at the national level.

Complementing this initiative, the FIP Digital Health Course for educators and practitioners equips pharmacists with the knowledge and skills needed to embed digital health into pharmacy education and practice, thereby fostering a digitally competent workforce.

Together, these efforts are helping to develop a digitally enabled pharmacy workforce, one that is well-positioned to lead innovation, expand access, and deliver higher-quality pharmaceutical care in the digital era.

5. Evidence from digital health in pharmacy

Pharmacists' digital health efforts are particularly evident in priority public health areas such as:

1. **Antimicrobial stewardship (AMS)**

Digital tools enhance pharmacists' ability to support appropriate antimicrobial use and align prescribing with established guidelines. Clinical decision support systems (CDSS), electronic checklists, and integrated audit platforms allow pharmacists to identify deviations from recommended protocols and intervene in real time.[20, 21]

Case example: Community pharmacy AMS — The PAMSI model (England)[20]

The Pharmacy Antimicrobial Stewardship Intervention (PAMSI), introduced through the English Pharmacy Quality Scheme, equipped community pharmacists with digital tools such as AMS checklists, e-learning modules, and documentation systems. These tools enabled pharmacists to carry out structured prescription reviews, provide patient counselling, and document interventions digitally.

Impact: High rates of prescription reviews, improved community surveillance, and increased interventions at the point of dispensing.

Case example: Digital surveillance and AMS in surgical departments — 7-VINCut study (Spain)[22]
Pharmacists at Hospital de Granollers used computerised alerts and electronic reviews to monitor prolonged antibiotic therapy in surgical patients. By flagging therapies exceeding standard duration thresholds, pharmacists were able to initiate stewardship discussions with surgical teams.
Impact: Timely discontinuation of unnecessary antibiotic courses, reduced risk of resistance development, and strengthened pharmacist-physician collaboration in AMS

2. Vaccination services

Pharmacists' digital health efforts have improved vaccine accessibility, operational efficiency, and health equity.

Case example: Digital appointment system for COVID-19 vaccinations (Taiwan)[23]
During the COVID-19 pandemic, Taiwan launched a pharmacist-led national digital booking platform enabling community pharmacies to manage online scheduling. Over 80% of community pharmacies participated, ensuring equitable access and real-time appointment tracking.
Impact: Improved vaccination flow, reduced overcrowding, and ensured fair allocation based on need.

Case example: Telepharmacy for vaccine counselling[24]
Pharmacists across various countries implemented telepharmacy platforms to conduct vaccine eligibility assessments, manage follow-ups, and address patient concerns via video consultations—particularly benefiting rural and underserved populations.
Impact: Maintained high levels of care during COVID-19 while eliminating geographic access barriers.

6. Case study

FIP received a case study from the Royal Dutch Pharmacists Association (KNMP), which provides valuable insights into the role of pharmacists in the digital health transformation in the Netherlands.

7. Conclusion

The digitalisation of pharmacy practice marks a transformative shift in how pharmaceutical care is delivered, positioning pharmacists as central actors in the evolution of equitable, efficient, and patient-focused health systems. As highlighted throughout this chapter, digital tools such as mHealth, e-prescriptions, AI and real-world data, are reshaping service delivery, expanding pharmacists' reach, and enhancing clinical decision-making. Through strategic leadership, capacity building, and global collaboration, FIP has been instrumental in guiding this transition, ensuring that pharmacists are equipped to harness emerging technologies responsibly and effectively.

Yet, realising the full potential of digital health in pharmacy will depend on overcoming persistent barriers, including disparities in digital literacy, infrastructural gaps, and the need for comprehensive education and regulatory frameworks. Moving forward, embedding digital health into every level of pharmacy practice is not only necessary, but also critical to achieving universal health coverage and fostering resilient, future-ready healthcare systems.

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