

Transforming Pharmacy and Pharmaceutical Sciences Education in the Context of Workforce Development

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Foreword

Education plays a critical role in preparing a competent health workforce to meet the healthcare needs of the public, and pharmacists have an essential role in ensuring the effective and responsible use of medicines. Pharmacists are able to monitor medicines use, and support patients to adhere to medication regimens and to use medicines responsibly, and pharmaceutical scientists are able to develop novel medicines and therapeutic strategies. The International Pharmaceutical Federation (FIP) is dedicated to advancing pharmaceutical education worldwide, and has led a wide range of activities and initiatives geared towards improving medicines and their use.

The FIP Academic Pharmacy Section (AcPS) has, since its inception in 1972, focused on promoting pharmaceutical education worldwide and has facilitated many academically oriented activities. These efforts intensified in 2008 through the release of FIP's Vision 2020 and the formation of the Pharmacy Education Taskforce (PET) — a collaboration between FIP, the World Health Organization (WHO) and the United Nations Educational, Scientific and Cultural Organization (UNESCO). The PET led to the development of a comprehensive programme through a dedicated structure called FIP Education (FIPeD), and its role and function were formally introduced into the governing FIP statutes in 2016.

FIPeD integrates extensive networks such as schools of pharmacy and pharmaceutical sciences (represented by their deans through Academic Institutional Membership; AIM), experts in specific education-related fields (gathered in domains comprising the Education Development Team), and educators gathered in the AcPS. FIPeD has a major role in leading the transformation and scaling of pharmaceutical education in the context of workforce development, in collaboration with professional organisations and representative global organisations such as the WHO and UNESCO.

In the 2012 FIP Centennial Declaration, pharmacists and pharmaceutical scientists accepted responsibility and accountability for improving global health and patient outcomes by improving the development, distribution and responsible use of medicines. Achieving this goal requires a workforce of pharmacists and pharmaceutical scientists who are sufficient in number and are competent to deliver the full range of pharmaceutical services and to meet the challenges facing global health and patient care. Creating and adopting a globally shared vision that can guide country-level initiatives to develop such a pharmaceutical workforce became a priority.

FIPeD adopted a seven-pillar action plan (2013–2018) aimed at stimulating and facilitating the transformation of workforce education. The first pillar was planning a Global Conference on Pharmacy and Pharmaceutical Sciences Education. The goals of this conference were to gather policymakers, educational leaders and regulators from around the world to reach consensus about an envisioned future for pharmaceutical education. This plan became a reality when FIP hosted this unique one on 7 and 8 November 2016, in Nanjing, China.

The pathway of FIP's commitment to advancing pharmaceutical education is best described as a series of chapters. The first chapter was the Vision 2020 document when FIP made explicit its commitment to increasing its role in reforming pharmaceutical education. Following this decision, the second chapter included three important events: the creation of the PET, the signing of the Centennial Declaration at the 2012 FIP Centennial Congress in Amsterdam, Netherlands, and the establishment of FIPeD. The global conference in Nanjing represents the third chapter of FIP's efforts and journey towards advancing education. At this event, FIP led the creation of a clear roadmap on which the international community can rely to advance education and training through a globally shared vision. With the support of FIP, the next chapters will require the active participation of all pharmacists, pharmaceutical scientists and pharmacy stakeholders around the world to turn this global vision into actions.



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EXECUTIVE SUMMARY

1. Key messages

- 1.1 **The continued development of pharmacy services and the pharmaceutical sciences** relies on a well educated, competent, sufficient and well distributed pharmaceutical workforce.
- 1.2 **There is no workforce without education.** It is fundamental for the international community to agree on how pharmaceutical workforce competency is developed and assured through initial and subsequent professional education.
- 1.3 The concept of a continuously competent workforce is of **fundamental interest for professional leadership bodies** and stakeholders.
- 1.4 As FIP member organisations drive the **development of the profession** at the national level, they should always consider encompassing an **education component** [initial education and Continuing Professional Development (CPD)/Continuing Education (CE)] into their strategies.
- 1.5 FIP brought together global health and pharmacy leaders from across the world to set the future milestones for pharmaceutical education in the context of workforce development during an exceptional event, which took place in Nanjing, China, on 7 and 8 November 2016: the **Global Conference on Pharmacy and Pharmaceutical Sciences Education** — "Creating a global vision for a global workforce".
- 1.6 The conference set the **future milestones for education and workforce development** of pharmacists and pharmaceutical scientists, and created **a global vision** for transformative pharmacy and pharmaceutical sciences education.

2. Principal outcomes

Following extensive consultation, three milestone documents were presented and adopted at the global conference. Participants at the conference were able to influence and contribute to them. These are:

- 2.1 **A Global Vision for Education and Workforce** that provides a description of the future directions of our profession and how education can support the evolution of science and practice.
- 2.2 **A set of 13 Pharmaceutical Workforce Development Goals (PWDGs)** which aim to facilitate the implementation of the global vision through a series of measurable, feasible and tangible goals.
- 2.3 **A set of 67 statements on Pharmacy and Pharmaceutical Sciences Education ("the Nanjing Statements")** that describe an envisioned future for education, to enable the enhancement of professional education standards worldwide.

3. Calls for action

To translate these outcomes into actions, FIP calls on leaders in pharmacy practice, pharmaceutical sciences, and pharmaceutical education, governments and other key stakeholders to:

- 3.1 **Support and advocate** the implementation of the global vision, PWDGs and the Nanjing Statements.
- 3.2 **Engage** in a national dialogue with key stakeholders (including governments) to analyse the current workforce profile and identify the needs for change; review or develop a strategy for the pharmaceutical workforce, guided by the conclusions of the global conference.
- 3.3 **Prioritize** the adoption of the PWDGs in the context of their national strategies on health and workforce development.
- 3.4 **Report back** to FIP on how have they have implemented the conclusions of the conference.

PART 1

INTRODUCTION AND BACKGROUND

1.1 Why focus on the health workforce?

The health workforce is at the core of every healthcare system, and healthcare delivery is impossible without human resources for health.¹ Overcoming health system challenges and improving health outcomes depend on the availability, accessibility and quality of health workers.^{2,3} Human resources for health are facing significant challenges worldwide.⁴ Nearly all nations around the world face health systems constraints related to workforce issues spanning severe shortages, low accessibility, skill mix imbalances and inadequate education and training.^{5,6} According to the WHO, emerging health problems such as growing populations, changing disease patterns, and shifting economic trends will have varying effects around the world. As a result of these projected challenges, the WHO predicts that 40 million new healthcare sector jobs will be created in high- and middle-income nations by 2030, but developing nations will experience a shortage of about 18 million health workers.⁷

These challenges, coupled with the mounting evidence of the impact of health workforces on population health outcomes, have placed health workforce issues at the top of the global health agenda. The health workforce is a critical component of the post-2015 health development frameworks, notably the 17 United Nations Sustainable Development Goals (SDGs).⁸ Given that the projected workforce shortages in developing countries pose serious concerns with regard to meeting the health-related targets of the SDGs, especially when healthcare workers have been identified as essential agents of sustainable development,⁹ it is not surprising that one of the health targets under SDG 3 — “Ensure healthy lives and promote wellbeing for all at all ages” — refers specifically to the health workforce. It reads as follows:

“3.c Substantially increase 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.”

In supporting this target’s achievement, the WHO adopted a Global Human Resources for Health Strategy: Workforce 2030 at the 2016 World Health Assembly. The strategy calls for swifter progress towards the SDGs and universal health coverage through ensuring equitable access to a competent health workforce.¹⁰ Additional political attention on the question of workforce was reached through the establishment of the United Nations High-Level Commission on Health Employment and Economic Growth. The commission’s main task was to propose actions to stimulate the creation of health sector jobs, with careful consideration being given to the needs of low- and lower middle-income nations. The commission launched its final report at the 2016 UN General Assembly; the report outlines a series of 10 recommendations to transform the health workforce in the context of the SDGs.¹¹ The report also finds that investing in health workers not only has a positive impact on employment rates and economic growth, but also results in remarkable improvements in health and population outcomes.

Investing in the development of healthcare professionals’ education and training has garnered special attention as reflected by recent global policy activity on the matter. A global commission on the Education of Health Professionals for the 21st Century was formed in 2010.¹² It was charged with driving educational reforms to produce healthcare professionals who are more equipped and better prepared to meet current and future needs, and to face existing and emerging health challenges.¹³ Driven by the commission’s efforts, the WHO produced its first guidelines on health workforce education in 2013. These evidence-based guidelines, presented in a report titled “Transforming and Scaling Up Health Professionals’ Education and Training”, emphasise the importance of scaling-up the health workforce’s educational and training systems such that they will adequately meet population needs.¹⁴

Just as no healthcare system can function without a health workforce, there can be no real health workforce without proper education and training. Developing health workers through scaling up their education and training is a critical determinant of health outcomes and service delivery, and the recent activity in global strategies and initiatives not only affirms this notion but also provides an unprecedented level of support to policy-makers and stakeholders to guide them on transforming and scaling up health workforce education and training. The future of health and the integrity of our health systems are closely intertwined with the capabilities and competencies of healthcare workers; and quality health service delivery depends on sustainably strengthening health workers and their capacities to meet complex population and health needs. Investing in the education, training and development of healthcare professions has therefore become a global imperative.

1.2 Why invest in the pharmaceutical workforce?

Medicines are vital in the prevention, diagnosis, treatment and cure of disease. Access to safe and effective medicines is a fundamental human right and a central pillar of any healthcare system.¹⁵ Medicines and medicines development, medicines management and the responsible use of medicines are vital components in improving the health of nations.^{16,17} As medicine experts, the pharmaceutical workforce^a is an integral part of the healthcare team that plays a key role in bettering health outcomes through optimising patients’ use of medicines.¹⁸ In many countries, pharmacists are the most accessible of all healthcare workers and as such are at the forefront of healthcare service delivery.¹⁹ Joint FIP/WHO

^a - Pharmaceutical workforce, in this document, refers to the whole of the pharmacy related workforce (e.g. registered pharmacist practitioners, pharmaceutical scientists, pharmacy technicians and other pharmacy support workforce cadres, pre-service students/trainees) working in a diversity of settings (e.g. community, hospital, research and development, industry, military, regulatory, academia and other sectors) with a diversity of scopes of practice.

guidelines on good pharmacy practice were developed to set nationally accepted standards for the quality of pharmacy services and identified a number of key roles and functions expected from pharmacists.²⁰ However, the capacity to meet these expectations, including delivering these pharmaceutical services, depends on having an assured, competent workforce and an integrated academic workforce to train sufficient numbers of new pharmacists and other support staff at both foundation and advanced levels. This, in part, explains why pharmacists have been recognised in the indicator selected by the UN to follow-up on the achievement of the health target 3.c focusing on health workforce; the measurement will include the density of pharmacists per population (in addition to physicians, nursing personnel, midwifery personnel and dentists).²¹

Evidence from FIPeD' research projects and publications collectively calls for a clear and urgent need to invest in the capacity building of skilled medicines expertise who can meet the pharmaceutical health needs of populations around the world. Despite pharmacists being at the forefront of healthcare delivery, the global pharmaceutical workforce faces many challenges. The 2012 FIP Global Pharmacy Workforce Report described a number of problems facing pharmaceutical human resources around the world, mirroring the challenges faced by the wider global health workforce.²² Access to pharmaceutical services in developing countries and regions, such as Africa, is hindered by the insufficient supply of well trained pharmacists. This carries implications for global inequalities in access to medicines and medicines expertise. The 2015 Global Pharmacy Workforce Intelligence Trends Report illustrates that while the past decade witnessed a general increase in workforce numbers around the world, some low-income regions and countries still have a disproportionately low number of pharmacists and a low capacity for delivering pharmacy services.²³

Global variance in capacity is displayed not only in workforce numbers, but also in their education and training. Findings from the 2013 FIPeD' Global Education Report indicate that the state of pharmaceutical education varies considerably between countries and regions, in terms of academic capacity, institutional infrastructure, and quality assurance mechanisms.²⁴ Pharmacy educators continue to face challenges in meeting stakeholder requirements, and this is made more difficult in developing countries because of the lack of sufficient resources and expertise.²⁵ Calls have been made for competency-driven curricular reform to bridge the gap between pharmaceutical education and given health needs. The FIP Global Competency Framework has been developed by FIPeD' for this approach, and has been adapted and adopted by several countries for mapping country-specific needs.²⁶ In addition, an adaptable quality assurance framework has been developed and adopted by FIP to support the institutional delivery of high quality education.²⁷

Investing in transforming and scaling up pharmaceutical education is crucial for preparing a workforce that is able to adapt to new roles. In an era of rapidly accelerating changes

in healthcare delivery, the roles of pharmacists are being constantly redefined. This is driving continuous change in competency and training requirements, but there is still variation and gaps in pharmaceutical education and the range of quality assurance systems. This could be partly due to the absence of a globally shared strategy that offers achievable and adaptable objectives that are implementable on a national level. Thus, providing a globally shared and sustainable roadmap for transforming pharmaceutical education and workforce development became a priority for FIP.

1.3 Why a global conference on education?

Investments in the health workforce are needed now more than ever, and putting forward strategies to guide and facilitate workforce development is a necessity. Achieving the targets set by the UN as part of the SDGs relies on the extent of workforce-centric improvements and development plans. Global strategies based on emerging evidence and best practices can inform and fuel more concerted and multi-stakeholder action on both national and international levels. The Global Strategy on Human Resources for Health: Workforce 2030 reaffirms the importance of the pharmaceutical workforce as part of the healthcare team and outlines target milestones and policy options that link investments in education to labour market dynamics and healthcare needs. Pharmaceutical education has always been a priority for FIP and is strategically considered in the context of the larger theme of pharmaceutical workforce development. FIP recognises that there can be no effective pharmaceutical services without an efficient workforce, and that there can be no efficient workforce without a solid foundation of education and training.

Educational reform in the context of workforce development requires a sustainable and consensus-based roadmap. It is fundamental for the international community to agree on how pharmaceutical workforce competency is assured through initial and subsequent education. A globally shared vision has to be established so that pharmacists can accept responsibility and accountability for improving global health. The concept of a continuously competent workforce is of central interest for professional leadership bodies and professional stakeholders. As FIP member organisations drive the development of the profession to accommodate new services and roles, their strategies should always consider an educational component that covers both initial and continuing education. FIP provides a global platform to bring together pharmaceutical leaders from across the world to set the future milestones for pharmaceutical education in the context of workforce development.

In supporting the implementation of the UN and WHO recommendations and policies and in line with FIPeD' five-year action plan, FIP decided to address the development of future milestones for education and training by hosting a Global Conference on Pharmacy and Pharmaceutical Sciences Education.

The conference intended to make a significant contribution to improving global health outcomes by ensuring that there is a sufficient, well distributed and competent pharmaceutical workforce to meet the current and future needs in the development, distribution, and responsible use of medicines. The global conference was the first conference of its kind, and it aimed to meet the principles accepted in 2012 through the FIP Centennial Declaration and to reach agreement on how pharmaceutical workforce competence can be assured through education. Through the leadership role of FIP, pharmacy is the first health profession to play an active role in translating the WHO Global Strategy on Human Resources for Health into a professional context.

The global conference aimed to create dialogue and consensus among policy makers, educators, professional and scientific leaders, and regulators, to set the future milestones for education and workforce development strategies, activities and projects. The scope of the Conference was to address the education and developmental needs to create a competent pharmaceutical workforce, including initial education and training for pharmacists and pharmaceutical scientists. Continuing education and continuing professional development were also acknowledged as fundamental aspects of a competent workforce and are of central interest to both professional leadership bodies and professional stakeholders.

The objectives of the global conference were to:

1. Describe the current state of pharmacy and pharmaceutical sciences education globally;
2. Define the envisioned education based on current and future needs for the discovery, development, distribution, and responsible use of medicines;
3. Create a blueprint for the envisioned Education and a toolkit on how to reach it; and
4. Develop strategies on how to address barriers to changing the current state of education and to ensure the implementation of the conference recommendations.

The FIP Executive Committee appointed a worldwide expert group to serve as the planning committee to design the Global Conference. The Conference was jointly organised and co-hosted by FIP and the Chinese Pharmaceutical Association (an FIP member organisation in China) and took place on 7 and 8 November 2016, in Nanjing, China. Over 600 participants from 46 countries and territories (listed in Annex 1) attended the Global Conference. Unique in its format, the global conference was a strategic, two-day conference fostering an innovative environment at which international experts and leaders gathered to adopt a vision to guide the future activities of the profession. The first day of the programme consisted of high-level presentations on key topics related to education in the context of pharmaceutical workforce development, around: 1) global policies driving workforce development, 2) the imperatives for change in pharmacy and pharmaceutical sciences, and 3) the key areas for change in education. Using

outcomes from a series of workshops on the second day, FIP plans to establish the tools and information needed to translate the key outcomes of the global conference into mechanisms applicable and meaningful at local (e.g., educational institutions), national and regional levels.

References

1. Diallo K, Zurn P, Gupta N, & Dal Poz M. Monitoring and evaluation of human resources for health: an international perspective. *Human Resources for Health*, 2003; 1(1):1-13. Available from: <https://human-resources-health.biomedcentral.com/articles/10.1186/1478-4491-1-3>
2. Anand S, & Bärnighausen T. Human resources and health outcomes: cross-country econometric study. *The Lancet*, 2004;364(9445):1603-1609. Available from: <http://www.thelancet.com/journals/lancet/article/PIIS0140673604173133/abstract>
3. Bossert T, Bärnighausen T, Bowser D, Mitchell A., & Gedik G. Assessing Financing, Education, Management and Policy Context for Strategic Planning of Human Resources for Health. Geneva: WHO, 2007. Available from: http://www.who.int/hrh/tools/assessing_financing.pdf?ua=1.
4. Hongoro C & McPake B. How to bridge the gap in human resources for health. *The Lancet*, 2004;364(9443):1451-1456. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/15488222>
5. Chen L, Evans T, Anand S, Boufford JI, Brown H, Chowdhury M, Cueto M, Dare L, Dussault G, Elzinga G, Fee E, Habte D, Hanvoravongchai P, Jacobs M, Kurowski C, Michael S, Pablos-Mendez A, Sewankambo N, Solimano G, Stilwell B, De Waal A & Wibulpolprasert S. Human resources for health: overcoming the crisis. *The Lancet*, 2004;364(9449):1984-1990. Available from: [http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(04\)17482-5/abstract](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(04)17482-5/abstract)
6. Narasimhan V, Brown H, Pablos-Mendez A, Adams O, Dussault G, Elzinga G, Nordstrom A, Habte D, Jacobs M, Solimano G, Sewankambo N, Wibulpolprasert S, Evans T & Chen L. Responding to the global human resources crisis. *The Lancet*, 2004;363(9419):1469-1472. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/15121412>
7. World Health Organization (WHO). Health in 2015: from MDGs, Millennium Development Goals to SDGs, Sustainable Development Goals. Geneva: WHO, 2015. Available from: http://www.who.int/gho/publications/mdgs-sdgs/MDGs-SDGs2015_toc.pdf?ua=1
8. United Nations (UN). Sustainable Development Goals. 2015. Available from: <http://www.un.org/sustainabledevelopment/sustainable-development-goals/>
9. Wyss K. An approach to classifying human resources constraints to attaining health-related Millennium Development Goals. *Human Resources for Health*, 2004;2(1):1-8. Available from: <https://human-resources-health.biomedcentral.com/articles/10.1186/1478-4491-2-11>
10. World Health Organization (WHO). Global Strategy on Human Resources for Health: Workforce 2030. Geneva: WHO, 2016. Available from: http://www.who.int/hrh/resources/pub_globstrathrh-2030/en/
11. World Health Organization (WHO). Final report of the expert group to the High-Level Commission on Health Employment and Economic Growth. Geneva: WHO, 2016. Available from: <http://www.who.int/hrh/com-heeg/reports/report-expert-group/en/>
12. Bhutta ZA, Chen L, Cohen J, Crisp N, Evans T, Fineberg H, Frenk J, Garcia P, Horton R, Ke Y, Kelley P, Kistnasamy B, Meleis A, Naylor D, Pablos-Mendez A, Reddy S, Scrimshaw S, Sepulveda J, Serwadda D & Zurayk H. Education of health professionals for the 21st century: a global independent Commission. *The Lancet*, 2010;375(9721):1137-1138. Available from: [http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(10\)60450-3/abstract](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(10)60450-3/abstract)

13. Frenk J, Chen L, Bhutta ZA, Cohen J, Crisp N, Evans T, Fineberg H, Garcia P, Ke Y, Kelley P, Kistnasamy B, Meleis A, Naylor D, Pablos-Mendez A, Reddy S, Scrimshaw S, Sepulveda J, Serwadda D & Zurayk H. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *The Lancet*, 2010;376(9756):1923-1958. doi: 10.1016/S0140-6736(10)61854-5. Available from: [http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(10\)61854-5/fulltext?_eventId=login](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(10)61854-5/fulltext?_eventId=login)
14. World Health Organization (WHO). Transforming and scaling up health professionals' education and training: World Health Organization Guidelines 2013. Geneva: WHO, 2013. Available from: http://www.who.int/hrh/resources/transf_scaling_hpet/en/
15. Bigdeli M, Jacobs B, Tomson G, Laing R, Ghaffar A, Dujardin B & Damme WV. Access to medicines from a health system perspective. *Health Policy and Planning*, 2012;28(7):692-704. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/23174879>
16. World Health Organization (WHO). The Pursuit of Responsible Use of Medicines: Sharing and Learning from Country Experiences. Geneva: WHO, 2012. Available from: <http://apps.who.int/iris/handle/10665/75828>
17. Almarsdóttir AB, Traulsen JM. Rational use of medicines – an important issue in pharmaceutical policy. *Pharmacy World and Science*, 2005;27(2):76-80. Available from: <http://link.springer.com/article/10.1007/s11096-005-3303-7>
18. Nkansah N, Mostovetsky O, Yu C, Chheng T, Beney J, Bond CM & Bero L. Effect of outpatient pharmacists' non-dispensing roles on patient outcomes and prescribing patterns. *Cochrane Database of Systematic Reviews*, 2010;7. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/20614422>
19. Anderson C, Bates I, Futter B, Gal D, Rouse M & Whitmarsh S. Global perspectives of pharmacy education and practice. *World Medical and Health Policy*, 2010;2(1):5-18. Available from: <http://onlinelibrary.wiley.com/doi/10.2202/1948-4682.1052/pdf>
20. International Pharmaceutical Federation (FIP) and World Health Organization (WHO). Joint FIP/WHO guidelines on good pharmacy practice: standards for quality of pharmacy services. WHO Technical Report Series, No. 961, 2011. Geneva: WHO, 2011. Available from: http://www.fip.org/good_pharmacy_practice
21. United Nations (UN). SDG Indicators Metadata repository. United Nations, 2017. Available from: <http://unstats.un.org/sdgs/metadata/>
22. International Pharmaceutical Federation (FIP). 2012 FIP Global Pharmacy Workforce Report. The Hague: FIP, 2012. Available from: <http://fip.org/educationreports>
23. International Pharmaceutical Federation (FIP). 2015 Global Pharmacy Workforce Intelligence Trends Report. The Hague: FIP, 2015. Available from: <http://fip.org/educationreports>
24. International Pharmaceutical Federation (FIP). 2013 FIPeD Global Education Report. The Hague: FIP, 2013. Available from: <http://fip.org/educationreports>
25. Anderson C, Bates I, Brock T, Brown AN, Bruno A, Futter B, Rennie T & Rouse MJ. Needs-based education in the context of globalization. *American Journal of Pharmaceutical Education*, 2012;76(4):1-3. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3355276/>
26. International Pharmaceutical Federation (FIP). A Global Competency Framework Version 1. The Hague: FIP, 2012. Available from: <http://fip.org/educationreports>
27. International Pharmaceutical Federation (FIP). Quality Assurance of Pharmacy Education: the FIP Global Framework | 2nd Edition. The Hague: FIP, 2014. Available from: <http://fip.org/educationreports>

PART 2

TRANSFORMING THE PHARMACEUTICAL WORKFORCE

2.1 A new era for transformative education for the future workforce

2.1.1 Pharmacy drivers and changes

The current drivers of transformative change in healthcare will clearly require a responsive and paralleled scale up of the global health workforce's capacity. The evolution of health professions have largely been a response to changes in healthcare systems and population needs. These continuous changes drive the reprofessionalisation of the workforce, where health professionals are compelled to re-evaluate their capacities, both quantitative and qualitative, and reshape their roles and practice scopes to be able to meet health needs.¹ In recent years, the pharmaceutical profession has witnessed substantial transformation with unprecedented changes occurring within both pharmacy practice and the pharmaceutical sciences.

In pharmacy practice, evolving roles toward more patient-focused service provision have been a steady trend over recent decades.² Within the redefining concept of pharmaceutical care, the practice of pharmacy has undergone a progressive shift from being primarily product-oriented to becoming increasingly more patient-oriented.³ The profession is under pressure to advance and expand the roles of pharmacists and pharmaceutical scientists to meet the needs of healthcare systems around the world.^{4,6} Extended and new advanced roles for pharmacists, as providers of healthcare services and as scientists, are increasingly being recognised and valued globally.⁷ Collaborative practice within healthcare teams benefit patient outcomes, and pharmacists worldwide are expected to work interprofessionally to provide their essential medicines expertise.^{8,9} Pharmacists are also becoming more involved in prescribing medicines and providing critical information about the benefits, risks and potential adverse interactions to patients and other healthcare providers.¹⁰

The pharmaceutical sciences — the sciences underpinning the discovery, development, production and use of medicines — are also facing new challenges.¹¹ The ever-pressing need to develop safer medicines while ensuring that medicines development is efficient and cost-effective means that the “science of medicines” will continue to undergo rapid and unprecedented transformation.¹² The need to discover new medicines and develop smart medicines delivery systems is shaping the future of the pharmaceutical sciences. These changes will affect not only scientists but also pharmacy practitioners. For example, the impact of personalised medicine on the profession is becoming increasingly important.¹³ Pharmaceutical scientists will need to acquire specialist knowledge on genomics and the genetic basis for disease and treatment, and pharmacists will need to adapt to a resultant shift in the clinical management of patients from a one-size-fits-all approach to one that takes into account the individual variability of every patient.^{14,15}

2.1.2 Education for better healthcare

As we enter this new health era, the need for a roadmap to drive workforce transformations in the context of the UN's SDGs and the WHO's Global Strategy is greater than ever. Health professional bodies and associations play a central role in leading and setting out the vision and blueprints for advancing the workforces that they represent. As the global professional body representing more than three million pharmacists and pharmaceutical scientists around the world, FIP endeavours to spearhead the development of the pharmaceutical profession and workforce and facilitate the implementation of the global health development goals within the realm of pharmacy. In doing so, FIP acknowledges the importance of understanding our dynamic landscape as a prerequisite to setting out a transformation approach. For this reason, discussing workforce development drivers was a purposively prominent feature of the global conference programme.

The discussions focused on the rationale for change by considering the evolving nature of future healthcare roles and services. They also provided a description of potential new scopes of practice, reflecting the desirable profile of future pharmacists, pharmaceutical scientists and pharmacy students as part of the healthcare and pharmaceutical workforce. These discussions revolved around four central themes: the centrality of the patient, the changing nature of workforce intelligence, roles and services of practice and science, and collaboration within healthcare teams. These themes, discussed by keynote speakers at the Global Conference's plenary sessions⁶, explore concepts and factors that drive and shape workforce development plans, strategies and frameworks.

⁶ - The contents of sections 2.1.3 to 2.1.6 were stimulated by the discussions presented by keynote speakers during [Session 2: “Global Workforce: Education for better healthcare”](#) of the global conference. FIP acknowledges: Dr John Cahill, global chief executive officer, McCann Health for his presentation, briefly summarised for parts of section 2.1.3 “It's always about our patients”; Dr Jim Campbell, executive director, Global Health Workforce Alliance, and director of the Health Workforce Department, at the World Health Organization, for his presentation, briefly summarised for parts of section 2.1.4 “The changing influence of workforce intelligence”; Ms Ema Paulino, FIP Professional Secretary, and Prof Giovanni Pauletti, FIP Scientific Secretary, for their presentation, briefly summarised for parts of section 2.1.5 “Roles and services of practice and science”; And Mrs Helen Gordon, chief executive, Royal Pharmaceutical Society, UK, for her presentation, briefly summarised for parts of section 2.1.6 “Working with other health care professionals”. All presentations are available at <http://www.fip.org/abstracts>

2.1.3 It's always about our patients

Healthcare professionals undertake their work for the ultimate benefit of patients, so it is agreed that the patient effectively sits at the centre of the healthcare universe. Patients today have ready access to more information than ever before. In some cases, they are well informed, empowered healthcare consumers who can dictate the quality of health services by choosing their advisers and expert counsels, selecting their products services and brands, and then sharing their experiences. In other cases, more traditional models of patient engagement prevail — and, of course, the wide range of patient experiences around the world reflects their levels of education, the nature and quality of the respective healthcare systems and the different means of access available to them. Easily accessible search and social platforms enable patients to research health, diseases and medicines. Patients' quests for authentic information raise their expectations of health services and delivery. Health professionals therefore need to strive to remain the patient's most trusted source. This can be achieved not only by ensuring the highest level of workforce competency and capability, but also by being able to converge and collaborate in a model of shared-care where the patient is at the centre. Pharmacists are easily accessible, well informed and trusted medicines experts. Pharmaceutical workforce education and practice requirements must therefore ensure the proper recognition of pharmacists as innovators, problem solvers, communicators and consumer health advocates.

2.1.4 The changing influence of workforce intelligence

There is a projected gap between the health workforce and health system needs around the world, and especially in low-income countries. The WHO's High-Level Commission on Health Employment and Economic Growth seeks to highlight the benefits across the SDGs from investments in the health workforce, reaffirming the objectives set in the WHO's Global Strategy on Human Resources for Health: Workforce 2030. Mounting evidence suggests that investing in the health workforce employment is not a burden on economies,¹⁶⁻¹⁸ but rather a multiplier of economic growth.¹⁹ Quality workforce intelligence is key to undertaking robust analyses on labour market dynamics to ensure the needed capacities are met. The quality of workforce intelligence is therefore a priority area in global workforce policies and initiatives. The WHO's National Health Workforce Accounts aim to facilitate the standardisation of health workforce intelligence and information systems. In line with these global directions, FIP has made substantial progress on the workforce intelligence front exemplified by the Global Pharmacy Workforce Report series²⁰⁻²² and the recent Global Pharmacy Workforce Intelligence Trends Report.²³ These reports provide the most comprehensive and up-to-date syntheses of global pharmaceutical workforce data.

2.1.5 Roles and services of practice and science

Contemporary roles and services of the pharmaceutical workforce span a number of sectors. Community pharmacy, hospital pharmacy, pharmaceutical industry, regulations, marketing, research, and academia are among the most common practice sectors. While the technical expertise and professional experiences required differ for each of these sectors, the fundamental skills, attitudes and values are largely common across all practice areas. Regardless of the practice sector, a qualified global workforce of pharmacists and pharmaceutical scientists is anticipated to share several characteristics in the future that include: diverse educational backgrounds, high-level inter-/cross-disciplinary training, collaborative approach to healthcare team work, commitment to undertake life-long learning, cultural tolerance, optimism and self-motivation, personalised professional development plans, and ability to receive assistance from internal and external support structures. In addition to this common paradigm, bridging the gaps between science and practice in education is another factor driving the global vision for workforce development. Integrated healthcare provision and medicines expertise requires a more "one workforce" approach, and the creation, education and training of a flexible and adaptable workforce requires us to reduce sectoral boundaries in workforce planning.

2.1.6 Working with other healthcare professionals

Delivering optimal patient care requires multi-professional collaboration between all healthcare team members. A well developed global consensus reinforces that collaboration in healthcare provision leads to better outcomes for patients. This is especially important as healthcare systems become more complex, needing effective and creative solutions generated collectively by all healthcare professionals. Interprofessional education is the foundation for collaborative practice and FIP's "Interprofessional education in a pharmacy context: Global report" from 2015 describes the key tenets of interprofessional education, relationships with collaborative practice, and the emerging links to better patient care.⁹ Implementing interprofessional collaboration is not without challenges, and the role of professional associations and bodies is integral to making collaborative work a reality. Leadership organisations need to gear efforts towards providing the rationale for collaborative practice, and to promote and lead change locally and globally. By actively contributing to and progressing projects by other organisations, such as FIP, pharmacy leadership bodies can support the development of a pharmaceutical workforce that is ready and able to work with other healthcare professionals.

2.2 Adoption of a roadmap for a needs-based pharmaceutical workforce transformation

Transforming the global workforce requires a global vision with clear and consensus-based objectives. FIP led the adoption of a developmental roadmap for continuous education and training through a shared vision for improving global health. Through the global conference, FIP set a roadmap that can facilitate the transformation of pharmaceutical education and workforce by providing the appropriate strategic tools to support and develop quality driven education at national levels. An extensive consultation process (before and at the Global Conference) resulted in three major documents that were presented and adopted at the Global Conference on Pharmacy and Pharmaceutical Sciences Education:

1. Global Vision for Education and the Workforce
2. Pharmaceutical Workforce Development Goals
3. Nanjing Statements on Pharmacy and Pharmaceutical Sciences Education

The methodologies underlying the development of these three documents are summarised in [Table 2.1](#). The planning and drafting of the documents, as well as the extensive internal and external consultation processes are detailed. Draft versions of the Nanjing Statements were available for public consultation between April and September 2016, and the Global Vision and Pharmaceutical Workforce Development Goals (PWDGs) were available for public consultation between July and September 2016, to engage individuals and professional bodies around the world. Every pharmacist, pharmaceutical scientist, pharmacy student, pharmaceutical association corporate partners, and other stakeholders in health were welcome to contribute in order to shape the future of pharmacy and pharmaceutical sciences education and training.

Table 2.1: Planning and drafting, and consultation processes behind final drafts of the Global Vision, PWDGs, and Nanjing Statements.

	Planning and Drafting	FIP Consultation	Public and organisational consultation
Global Vision for Education and the Workforce	Draft of the Global Vision was developed by FIP experts	Member Organisations, Executive Committee, Bureau, Boards and FIP <i>Ed</i>	99 comments, suggestions and support were received from 31 countries and territories
Pharmaceutical Workforce Development Goals (PWDGs)	Draft of the PWDGs was the result of the content analysis of FIP <i>Ed</i> output since 2008	Member Organisations, Executive Committee, Bureau, Boards and FIP <i>Ed</i>	689 comments, suggestions and support were received from 23 countries and territories
Nanjing Statements on Pharmacy and Pharmaceutical Sciences Education	Draft of the Statements on Pharmacy and Pharmaceutical Sciences Education prepared by the Working Group on Statements from the Planning Committee	Member Organisations, Executive Committee, Bureau, Boards and FIP <i>Ed</i>	3,216 comments, suggestions and support were received from 22 countries and territories Live voting process by country delegates during the global conference Online iteration after global conference to understand country delegates' voting decisions

2.2.1 Global Vision for Education and Workforce

FIP developed a Global Vision for Education and Workforce underpinned by global strategies and recommendations on human resources for health and translated into a pharmaceutical expertise context. This document aims to provide a vision for the transformation of pharmaceutical education in the context of current and future workforce needs.

Developed in the context of education and training for the global pharmaceutical workforce, the global vision describes FIP's role in leading change on a global level and links to current global health and health education policies. It consists of a description of the future directions for the profession and how education can support evolution in that direction. Pharmaceutical leaders and stakeholders will be able to rely on it for the development of their own strategies (based on local needs), and for advocacy perspective towards policy-makers and all stakeholders.

The global vision begins with the Nanjing Declaration, which signifies the joint professional commitment of all pharmacists, pharmaceutical scientists, professional leadership organisations and government agencies to drive and support the development of the pharmaceutical workforce in line with this vision.

NANJING DECLARATION

Pharmacists and pharmaceutical scientists accept responsibility for the development and sustainability of an adaptable and capable global workforce working in partnership for better healthcare through transformative and continuous education. Our professional workforce will continuously strive to develop new medicines and to improve the use of existing medicines for better healthcare. Professional leadership organisations and government agencies can contribute to this vision by supporting progressive policies for professional development and practitioner recognition processes.

Leading change

The FIP Centennial Declaration in 2012 on improving global health by closing gaps in the development, distribution and responsible use of medicines stated: "Pharmacists and pharmaceutical scientists accept responsibility and accountability for improving global health and patient health outcomes by closing gaps in the development, distribution and responsible use of medicines."

In support of this centennial declaration is the acknowledgement that worldwide variability exists in how pharmaceutical scientists, pharmacists and pharmacy support staff are educated, trained and utilised. The challenges of development, distribution and responsible use of medicines can only be met with an adaptable pharmaceutical workforce

that deploys its knowledge, skills and abilities to the fullest degree in a wide array of environments and in collaboration with other stakeholders in healthcare.

FIP believes it is important that we articulate our vision for education, training and workforce development and for the progressive transformation of the overall workforce. This vision links to current global health and health education policy for all our member organisations and partners and the anticipated health challenges of the future.

Supporting and developing high standards of education and training

Through this vision for education and workforce, FIP seeks to promote and enhance the health and well-being of civil society through professional leadership and development of our professional workforce. FIP will also seek to ensure our profession's contribution to the health and well-being of patients and the advancement of pharmaceutical sciences.

In the delivery of these broad aims FIP believes that professional education, training and development should be primarily directed to:

Producing high quality professionals for high quality patient care, public health and scientific advancement objectives, ensuring all education and training delivered to our professional workforce is of the highest quality and prepares them well for current and future roles.

FIP believes it is our responsibility to engage the whole pharmaceutical workforce with this vision, to lead on, and define the skills, knowledge, attitudes and behaviours of pharmacists, pharmaceutical scientists, pharmacy technicians and other pharmacy support workforce cadres in all settings.

Developing our vision for the whole pharmaceutical workforce

FIP believes that a needs-based, outcomes-focused approach to education, workforce development and continuing education and training should be adopted. This means promoting models of education and training that ensure that all members of our workforce have access to the highest quality education and training experiences possible.

Pharmacy is a science-based profession and also a patient-facing profession; it is essential to build in learners, from initial education and training onwards, the capacity to demonstrate empathy for others, strong interpersonal communication skills and the understanding of the importance of teamwork and collaboration. The challenges of development, distribution, and responsible and safe use of medicines require a diverse workforce that is prepared to provide leadership for change in practice and to commit to lifelong learning to keep pace and lead the process with continuous changes in science and patient care.

With these principles in mind, models of education and training need to be flexible and adaptable to allow for innovations and developments led by educational experts, practitioners and leaders, among others, within responsible organisations.

Global education, training and development principles and imperatives

FIP believes that our strategic approach to education and workforce development should be grounded in the following principles:

1. The future workforce needs to be flexible in its development, adaptable to change and consciously competent within known scopes of practice.
2. Education provider organisations and education stakeholders should transparently support quality-driven development of education programmes founded on scientific knowledge and expertise in medicines.
3. Education and training in practice and science-oriented environments should reflect the best evidence and experience for an excellent education, including workplace education models and work-based learning systems.
4. Education providers should ensure that all teachers and tutors have access to teacher training programmes and development in order to become high quality teachers and trainers for our profession — we cannot achieve the best workforce without the best educators.
5. All members of the pharmaceutical workforce should have access to the best-practice education, the best in clinical, scientific and expert leadership and the best learning experiences to help equip them to become competent and capable practitioners in all relevant fields.
6. Access to systems for continuing professional development are essential for maintaining and advancing the competencies and capabilities of pharmacists and pharmaceutical scientists throughout their careers.
7. Workforce planning for healthcare for individuals and populations should be based on team-based collaborative care models and interprofessional models involving all relevant healthcare professionals.

Sufficient financial support from public and private sources must be available to sustain the mission of educational institutions that prepare the pharmaceutical workforce. There should be support to promote the participation of academic faculties, professional organisations, scientific societies, practitioners, preceptors and students in national and international activities of pharmacy and healthcare.

A needs-based approach to workforce and patient care

Our vision for the advancement and development of our workforce is aligned with identified drivers of demographic changes in healthcare, continuous developments in therapeutic technologies and the need for better access to medicines and medicines expertise. This means a continuous process of evolution and development.

An evolving pharmaceutical workforce is one that can adapt its core roles and responsibilities to meet the new and emerging needs of patients and civil society. For FIP, this means providing the necessary global leadership to encourage the development of the pharmaceutical workforce across all sectors to meet changing demographic and healthcare needs. FIP needs to promote advanced generalist and specialist skills development, leadership development and, most importantly, the flexibility to adapt to changing patient and health system needs.

The global workforce must be adaptable, flexible and constantly developed. It will need to be scientifically literate, holistic and patient-focused. Our education and training approach to getting the best from our workforce requires a focus on patient-centred professionalism, better healthcare partnerships both globally and regionally, and good clinical and scientific leadership.

Pharmacy leaders from practice, education and research should engage in workforce planning efforts in each country and region to ensure that plans include due attention to the integration of pharmacists, pharmaceutical scientists and pharmacy support cadres to meet local health needs. Workforce planning efforts should also be documented and shared internationally.

To pursue these aims, FIP believes that the development of a high level set of clear and common learning standards that are manageable in number will directly promote better education and healthcare outcomes..

Our commitment: The FIP vision for the pharmaceutical workforce

1. All patients will have access to the best pharmaceutical healthcare through a high quality pharmaceutical workforce. There is no healthcare without a properly qualified workforce.
2. All our pharmacy professionals responsible for providing patient care will ensure the adoption of actions for the responsible use of medicines that are clinically effective, safe and of suitable quality.
3. Our workforce will acknowledge and recognise our own core responsibilities for education, training and development of clinical, scientific and academic roles, and of pharmaceutical healthcare leadership.

4. All members of our workforce should have equitable access to education and development opportunities throughout their careers with a particular emphasis on early career foundation training and development.
5. FIP will commit to supporting the scientific workforce to constantly provide better medicines and healthcare through the application of research and development science.
6. All pharmacy professionals will be able to demonstrate continuous development in their skills, knowledge and competencies using appropriate standards and evidence-led professional development frameworks in all care, science and academic settings and for the ultimate benefits of patients and civil society.
7. Our pharmaceutical workforce will be valued across all countries and territories and at all career stages and recognised by patients and civil society for its impact and expert contribution to healthcare.

The FIP commitment to supporting this vision

Patients, civil society, health system planners, governments and the healthcare professionals we work with have a clear interest in the impact of the pharmaceutical healthcare workforce. FIP will therefore identify global priorities for professional development, education and training required to achieve this vision.

FIP will work with and influence policymakers on the transformation of education and training for our workforce to improve care and outcomes for patients, including the advancement of medicines science.

FIP will promote recognition of the importance of quality assured lifelong learning provision for our global workforce.

FIP will promote access to expertise in workforce development and support tools, including the development of workforce intelligence systems and workforce planning models.

A robust global pharmacy and pharmaceutical sciences workforce, supported by transformative education practices, will be able to lead the changes required to assure universal access to quality medicines and medicines information. Further, the pharmaceutical workforce can contribute significantly to the appropriate use of medicines through research and by active participation in pharmaceutical care in collaboration with patients and other healthcare professionals.

To that end FIP commits to the Global Vision for Education and Workforce.

2.2.2 The Pharmaceutical Workforce Development Goals

Driven by the development of the Global Vision, the Pharmaceutical Workforce Development Goals (PWDGs) were developed as a means to activate and give purpose to the Vision. They were adopted by the profession to implement the Vision. These global Goals describe workforce development through education and will be applicable to the primary mission of professional leadership organisations. There are 13 PWDGs that have been grouped into three clusters:

1. Academy (focus on the schools, universities and education providers);
2. Professional development (focus on the pharmaceutical workforce); and
3. Systems (focus on policy development, governmental strategy and planning, and monitoring systems).

The 13 goals are aimed at supporting the implementation of the Global Vision for Education and Workforce. They are aligned with major international policies (from the UN SDGs and the WHO Human Resources for Health Strategy 2030). The PWDGs will be a significant directive force for actions, fund-raising and near- and long-term deliverables for FIP.



FIP will adhere to a set of principles^c for PWDGs that will guide the subsequent plan of action. These will form the basis of yearly action planning for FIP, FIPeD and relevant stakeholders. Pharmaceutical leaders and stakeholders will be able to use them to assess the current stage of their own workforce development and capacity, assisting the development of strategies at national level, as well as fostering engagement and dialogue with policy-makers.

There has been no attempt to prioritise or attach levels of importance to individual PWDGs; the current imperative is to disseminate their overall scope and range, and to highlight to national leadership organisations their potential influence and adaptability from a national perspective. For each PWDG, a summative set of drivers, imperatives and indicators is provided. Table 2.2 lists the 13 PWDGs. These 13 goals were the product of extensive external and internal consultation processes summarised earlier in Table 2.1.

^c - PWDG principles and goals are aligned with the Nanjing conference objectives as described in the terms of reference.




Table 2.2: The Pharmaceutical Workforce Development Goals: Description, rationale, drivers and potential indicators.

Cluster	PWDG	PWDG general description. Countries/territories and member organisations should have:	Rationale, drivers, and potential indicators
<p>Academy Focus on the schools, universities and education providers</p>	 <p>1. Academic capacity</p>	<p>Engagement with pharmaceutical higher education development policies and ready access to leaders in pharmaceutical science and clinical practice in order to support supply-side workforce development agendas.</p>	<ul style="list-style-type: none"> • Increase the capacity to provide a competent pharmaceutical workforce by developing initial education and training programmes that are fit for purpose, according to national health resource needs (clinical practice, pharmaceutical science areas and stakeholders across all cadres). • Develop new and innovative ways to attract young pharmacists into all areas of pharmaceutical practice and science (e.g. encourage young pharmacists to consider careers in clinical academia, as preceptors/trainers, in industrial pharmacy, regulatory sciences, nuclear and veterinary pharmacy, among others). • Capacity building should include the ability to meet minimum national standards of facilities, educators and student support in order to ensure access to quality education for all students. • Enhance interprofessional education and collaboration with key stakeholders, including governments, national and international pharmacy/pharmaceutical organisations and patient advocacy groups to achieve sustainable solutions for capacity development. • The clinical academic educator workforce needs more attention to training, career development and capacity building, which must, importantly, include research capacity enhancement.
	 <p>2. Foundation training and early career development</p>	<p>Foundation training infrastructures in place for the early post-registration (post-licensing) years of the pharmaceutical workforce as a basis for consolidating initial education and training and progressing the novice workforce towards advanced practice.</p>	<ul style="list-style-type: none"> • Create clear and purposeful education and training pathways/programmes to support post-registration (post-graduation) foundation training (clinical practice and pharmaceutical science areas). • Develop early career maps and frameworks to support a seamless transition into early career practice and towards advanced practice. • Develop structured approaches to early career mentoring systems to support novice practitioners to engage with peers and preceptors (in clinical practice and pharmaceutical science areas across the pharmaceutical workforce).

Cluster	PWDG	PWDG general description. Countries/territories and member organisations should have:	Rationale, drivers, and potential indicators
<p>Academy Focus on the schools, universities and education providers</p>	 <p>3. Quality assurance</p>	<p>Transparent, contemporary and innovative processes for the quality assurance of needs-based education and training systems.</p>	<ul style="list-style-type: none"> • Ensure the quality of the workforce by quality assuring the continuous development and the delivery of adequate and appropriate education and training; quality assurance needs to address academic and institutional infrastructure in order to deliver the required needs and competency-based education and training. • Establish standards-based global guidance for quality assurance of pharmacy and pharmaceutical science education in the context of local needs and practice. • Implement fair, effective and transparent policies and procedures for quality assurance of pharmacy and pharmaceutical science education and training. • Define critical stakeholder input on development of adequate education and training and fair and effective policies, including necessary student input.
<p>Professional development Focus on the pharmaceutical workforce</p>	 <p>4. Advanced and specialist expert development</p>	<p>Education and training infrastructures in place for the recognised advancement of the pharmaceutical workforce as a basis for enhancing patient care and health system deliverables.</p>	<ul style="list-style-type: none"> • Need for a common and shared understanding of what is meant by “specialisation” and “advanced practice” in the context of scope of practice and the responsible use of medicines. • Ensure competency and capability of an advanced and expert pharmacist in all sectors (including specialisations extending into industry and administration settings) for greater optimisation of complex pharmaceutical patient care. This may now include prescribing roles within a recognised scope of practice. • Systematic use of professional recognition programmes/systems as markers for advancement and specialisation across the workforce, including advanced pharmaceutical scientists.

Cluster	PWDG	PWDG general description. Countries/territories and member organisations should have:	Rationale, drivers, and potential indicators
<p>Professional development Focus on the pharmaceutical workforce</p>	 <p>5. Competency development</p>	<p>Clear and accessible developmental frameworks describing competencies and scope of practice for all stages of professional careers. This should include leadership development frameworks for the pharmaceutical workforce.</p>	<ul style="list-style-type: none"> • Use of evidence-based developmental frameworks to support the translation of pharmaceutical science within scope of practice, across all settings and according to local/national needs. • Support professional career development by using tools, such as competency frameworks, describing competencies and behaviours across all settings. • Evidence of clear policy that links leadership development (from early years) with competence attainment for the advancement of practice activities.
	 <p>6. Leadership development</p>	<p>Strategies and programmes in place that develop professional leadership skills (including clinical and executive leadership) for all stages of career development, including pharmaceutical sciences and initial education and training.</p>	<ul style="list-style-type: none"> • Creation of programmes/strategies for the development of leadership skills (including tools and mentoring systems), to support pharmacists and pharmaceutical scientists through their careers. • Advocacy for leadership development in healthcare teams, linked to collaborative working activities (for example, promotion of team-based approaches to healthcare service delivery). • Ideally, this should be linked with competency and foundation and early year career development activities.
	 <p>7. Service provision and workforce education and training</p>	<p>A patient-centred and integrated health services foundation for workforce development, relevant to social determinants of health and needs-based approaches to workforce development.</p>	<ul style="list-style-type: none"> • Systematic development of education and training activities based on local healthcare systems, their capacity and funding. • Evidence of systematic development policies and strategies for the strengthening and transforming pharmaceutical workforce education and the systematic training of trainers/educators. • Education providers must ensure, by the provision of evidence-based approaches, that lecturers/teachers/trainers are themselves appropriately trained for capability and competency. • Enable the pharmaceutical workforce* and key stakeholders to promote health equity through actions related to social determinants of health.

Cluster	PWDG	PWDG general description. Countries/territories and member organisations should have:	Rationale, drivers, and potential indicators
<p>Professional development Focus on the pharmaceutical workforce</p>	 <p>8. Working with others in the healthcare team</p>	<p>Clearly identifiable elements of collaborative working and interprofessional education and training which should be a feature of all workforce development programmes and policies.</p>	<ul style="list-style-type: none"> Evidence of policy formation to demonstrate how healthcare professionals can develop and engage in partnerships to achieve better health outcomes. Develop education and training strategies/programmes to ensure collaboration within the pharmaceutical workforce and training on medicines for other healthcare professionals. Ideally, this should be linked with formal professional development activities.
<p>Systems Focus on policy development, governmental strategy and planning, and monitoring systems</p>	 <p>9. Continuing professional development strategies</p>	<p>All professional development activity clearly linked with needs-based health policy initiatives and pharmaceutical career development pathways.</p>	<ul style="list-style-type: none"> Evidence of an effective continuing professional development strategy according to national and local needs. Development of programmes to support professional development across all settings of practice and all stages of a pharmacist's career. Ideally, this should be linked with all professional development activities across the workforce. Education in continuing professional development strategies and self-directed behaviours should be initiated at the student level.
	 <p>10. Pharmaceutical workforce gender and diversity balances</p>	<p>Clear strategies for addressing gender and diversity inequalities in pharmaceutical workforce development, continued education and training, and career progression opportunities.</p>	<ul style="list-style-type: none"> Demonstration of strategies to address the gender and diversity inequalities across all pharmaceutical workforce and career development opportunities. Ensure full and effective participation and equal opportunities for leadership at all levels of decision-making in pharmaceutical environments; avoidable barriers to participation for all social categories are identified and addressed. Engagement and adoption of workforce development policies and enforceable legislation for the promotion of gender and diversity equality; policies and cultures for the empowerment of all without bias. This should be applicable to academic capacity and leadership development activities.

Cluster	PWDG	PWDG general description. Countries/territories and member organisations should have:	Rationale, drivers, and potential indicators
<p>Systems Focus on policy development, governmental strategy and planning, and monitoring systems</p>	 <p>11. Workforce impact and effect on health improvement</p>	<p>Evidence of the impact of the pharmaceutical workforce within health systems and health improvement.</p>	<ul style="list-style-type: none"> Engagement with systems to measure the impact of the pharmaceutical workforce on health improvement and healthcare outcomes. Links with needs-based education, training and workforce planning. Gather continuous data points to monitor the performance of the pharmaceutical workforce. Ideally, this should be linked with strategies to enhance workforce intelligence.
	 <p>12. Workforce intelligence</p>	<p>A national strategy and corresponding actions to collate and share workforce data and workforce planning activities (skill mixes, advanced and specialist practice, capacity). Without workforce intelligence data there can be no strategic workforce development.</p>	<ul style="list-style-type: none"> FIP should aim to have a global workforce compendium of case studies developed by 2019. Develop monitoring systems to identify workforce trends to enable decision making on deployment and supply of pharmaceutical workforce noting that time-lags are often present in these activities. Ideally, this should be linked with stewardship and leadership for professional leadership bodies.
	 <p>13. Workforce policy formation</p>	<p>Clear and manageable strategies to implement comprehensive needs-based development of the pharmaceutical workforce from initial education and training through to advanced practice.</p>	<ul style="list-style-type: none"> Adopt and strengthen sound policies and enforceable legislation for holistic needs-based approaches to professional development across all settings and stages. Develop strategies where pharmaceutical science and professional services are the driving forces for this activity.

The evidence-based PWDGs were designed to be achievable, measurable, feasible, tangible, developmental and relevant to all countries and territories. To prepare the implementation of the goals at the national level, a series of workshops was organised to identify and share best practices to promote educational change. The PWDGs provided context for the workshops' seven areas of focus:

1. Initial and early education
2. Quality assurance and accreditation
3. Educating for collaborative working
4. Practice and science
5. Educating for future goals
6. Educating for advanced practice
7. Clinical practice

The workshops aimed to address the drivers and challenges of achieving the PWDGs on a global scale. This includes key messages on what the challenges are to achieving the goals, and what strategies and tactics can be used to overcome these. The realistic ways of promoting and disseminating the goals and engaging with stakeholders were also discussed. [Table 2.3](#) presents a summary of the key workshop outcomes for each area of focus and related PWDGs.

Table 2.3 Global conference workshop descriptions and summaries of key outcomes.

Workshop area of focus and related PWDG(s)	Workshop description	Summary of key outcomes
Workshop 1: Initial and early education PWDG(s): 1. Academic capacity	This workshop provided an overview on how to align initial education with the country needs. It also focused on the first 1,000 days of practice, addressing suitable training and mentorship for young pharmacists and pharmacy students.	The definition scope of PWDG 1 Academic Capacity is wide and can include a number of concepts such as: having the right mix of academic expertise; quantity, quality, infrastructure; optimised learning environment; and producing pharmacists who can meet the country needs and adapt to future ones. A number of drivers of implementing the first PWDG were identified, and these include: automation (e.g., e-learning and simulation); applying best practices; and creating collaborative education and training environments. In addition, targets for implementation can be found in: developing graduate employability skills; reviewing evaluation methods; and adopting an outcomes-based learning system.
Workshop 2: Quality assurance and accreditation PWDG(s): 3. Quality assurance	This workshop provided a conceptual framework for the design, implementation and assessment of the quality of contemporary educational programmes.	The challenges in achieving PWDG 3 can lie in: diversity within and between countries; resources (e.g., human resources and funding); stakeholder engagement; resistance to change; governmental control and regulatory constraints. Identifying solutions and addressing these challenges can be accomplished through: communicating and collaborating with stakeholders; developing strategies to incentivise stakeholders and government bodies; encouraging more association-driven strategies; seeking FIP assistance and support; and using tools already developed. Identifying gaps, conducting needs analyses, setting implementation targets, and capitalising on existing capacities and resources can all facilitate achievement of the goal.

Workshop area of focus and related PWDG(s)	Workshop description	Summary of key outcomes
<p>Workshop 3: Educating for collaborative working</p> <p>PWDG(s): 6. Leadership development 8. Working with others</p>	<p>This workshop addressed interprofessional and intraprofessional education, and models of collaboration between higher education institutions, sectors, science and practice.</p>	<p>Achieving leadership, PWDG 6, depends on students being provided with early leadership development opportunities and having leadership as part of accreditation standards. Applying leadership skills is imperative in developing relationships with other professionals to enhance collaboration. Achieving PWDG 8 depends on nurturing collaborative skills in pharmacy students from the first semester onward, as well as developing more collaborative experiential training programmes. Transparency, trust and confidence are integral to successful collaborative practice. Collaborative practice drivers such as engagement from professional associations, credentialing incentives and remuneration models can facilitate achieving PWDG 8. Examples of ways to disseminating the implementation of include establishing guidelines, scientific publications and centres of excellence.</p>
<p>Workshop 4: Practice and science</p> <p>PWDG(s): 7. Service provision and workforce education and training 13. Workforce policy formation</p>	<p>This workshop addressed how education prepares science to translate into practice and practice to inform science.</p>	<p>Participants discussed goals terminology, demonstrating the importance of reaching consensus on definitions. They also shared ways of integrating science and practice through education. One was through redesigning initial education such that pharmacy students are introduced to practice from day 1. In addition to undergraduate education, targeting postgraduate studies can be a means to science/practice integration (e.g., clinical practice-based research and data collection). Recalibrating the curriculum to accommodate new emerging therapies and advanced services was also identified. And introducing innovative modules that allow students to design new pharmaceutical services would encourage them to think about the link between science and practice.</p>
<p>Workshop 5: Educating for future goals</p> <p>PWDG(s): 6. Leadership development 9. Continuing Professional Development strategies</p>	<p>This workshop addressed future roles for pharmacists and pharmaceutical scientists, including the scope, technological, clinical and scientific aspects of new roles.</p>	<p>It is important to understand the motivating factors that influence pharmacists' CPD habits in order to address the challenges facing goal achievability. It is also important for FIP to communicate strategies to member organisations to help them engage with stakeholders, such as the government, in order to facilitate meeting the PWDGs. Updated documents and guidance documents are a critical first step towards achieving the goals.</p> <p>Outcomes regarding PWDG 6 on leadership development resonate with other workshop outcomes for same goal. Empowering students with leadership-fostering activities has been identified as a key driver. Targeting mentoring programmes and creating centres of excellence can benefit both PWDGs 6 and 9. Disseminating the implementation of PWDG 6 depends on developing specific processes describing how pharmacists can be engaged to take up leadership programmes.</p>

Workshop area of focus and related PWDG(s)	Workshop description	Summary of key outcomes
<p>Workshop 6: Educating for advanced practice</p> <p>PWDG(s): 2. Foundation training 4. Advanced and specialist development</p>	<p>This workshop addressed specialisation, professional development, professional recognition and credentialing.</p>	<p>There are major variances amongst different countries, in terms of terminology recognition, legislation and scope of practice, infrastructures of practice sites, and existing support structure (e.g., professional organisations). Sharing experiences (both positive and negative) and best practices is important to achieving the goals. There is a need for top-down policy and educational structural changes to progress advanced and specialist development and practice. Expanding the role of FIP<i>Ed</i> beyond congresses and reports to disseminating "how to" guides that can assist with real policy implementation is important. Also, developing a global advanced practice and specialisation framework (in addition to the FIP competency framework that already exists) can help countries advance practice in their jurisdictions.</p>
<p>Workshop 7: Clinical practice</p> <p>PWDG(s): 5. Competency development 11. Workforce impact</p>	<p>This workshop addressed how to transform education of pharmacists to better prepare them for clinical roles.</p>	<p>There is consensus that clinical practice refers to patient-focused care in any practice setting and that expanding the role of pharmacists in clinical practice is both desirable and achievable. There are a number of drivers to embracing clinical roles: refining practice scope and activities to have time for clinical practice; fostering new ways of working that connect pharmacists to other members of the healthcare team; establishing remuneration systems for the outcomes of clinical services; and assuring competence to deliver excellent patient care. Additionally, there are regional differences regarding progress toward clinical services, and countries developing new services may benefit from learning lessons from others who have already implemented clinical practices.</p>

The interactive sessions were intended as a tool in identifying best practices for promoting change and their outcomes are critical for future success. The workshop delegates and participants represented many countries, organisations and scopes of expertise. Participant feedback and workshop outcomes will be used to feed directly into the global transformation agenda.

Common themes were identified across the achievability of the goals, assessment and metrics, financial incentives and the role of FIP. The achievability of the PWDGs depends on several factors, including consideration of locality needs and capacities when adopting the goals. Engagement with stakeholders and engagement from and between professional associations are additional important factors to achieving workforce goals.

2.2.3 Statements on Pharmacy and Pharmaceutical Sciences Education (Nanjing Statements)

The Nanjing Statements on Pharmacy and Pharmaceutical Sciences Education describe the envisioned future for pharmaceutical education needed to enhance professional standards worldwide. The Nanjing Statements are intended for education providers, including Schools of Pharmacy and providers of Continuing Professional Development and Continuing Education. They are to be used for the purposes of self-assessment and monitoring (at country level or at the education provider level), identification of gaps and strategic planning, and improving the process of education.

The Nanjing Statements underwent extensive consultation and validation processes before, during and after the global conference.

Initial development of the Nanjing Statements

The Nanjing Statements were developed by FIP to guide the process of educational reform. The Global Conference Planning Committee set up a working group dedicated to the development of the original draft Nanjing Statements. This draft list of statements underwent extensive review by the entire Planning Committee, FIP Bureau, FIPED, FIP Boards, and expert groups to ensure completeness and a balanced representation of science and practice. A total of 80 statements grouped into eight clusters comprised the first draft.

Validation Phase I

The 80 statements were subject to public consultation before the Nanjing Conference. A total of 3,216 comments, suggestions and supporting remarks were received from 22 countries and territories. Comments offered included clarifications, suggestions for consolidation and wording changes. These comments were carefully considered by the working group during their revision of the draft, resulting in a set of 70 Statements.

Validation Phase II

The 70 statements underwent a second validation phase at the global conference in Nanjing. A live voting process by 36 delegations from 37 countries was arranged to evaluate the level of global consensus and drive a consensus-based validation approach by stakeholders from around the world. From the 70 statements voted upon, 64 reached more than 80% of agreement at the global conference. Six statements received less than 80% of votes in agreement but all were above 50%.

Validation Phase III

The working group conducted an online iteration within country delegates on the six statements which did not reach the 80% approval rate, to understand the reasoning and

context leading to their decision at the global conference. Based on the post-Nanjing online consultation and the collective agreement of the country delegates, the working group kept one, consolidated four into two and eliminated one of the statements.

The final version consists of 67 statements adopted by consensus, representing the international expectations on what an effective pharmaceutical education system looks like to meet local needs. They are grouped into eight clusters:

1. Shared Global Vision
2. Professional Skills Mix
3. Recruitment of Students
4. Foundation Training and Leadership
5. Experiential Education
6. Resources and Academic Staff
7. Quality Assurance
8. and Continuing Professional Development

Nanjing Statements on Pharmacy and Pharmaceutical Sciences Education

Cluster 1:	Shared Global Vision
Description on the cluster:	A shared global vision promotes workforce development in the context of pharmaceutical education and training. This global vision should help professional leadership bodies, educators and regulators in developing a national or regional vision based on the priorities and resources of the country or region, with the aim of developing new medicines and improving their use for better health.
1.1	Workforce planning, at national and local levels, should include the roles of all relevant personnel, (e.g., pharmacy technicians/assistants, generalist pharmacists, specialists, advanced practitioners and pharmaceutical scientists) sufficient to meet local health needs as part of the healthcare system.
1.2	The education and training of pharmacists should have an underlying foundation in both the physical and biological sciences sufficient to prepare the student for current and future practice.
1.3	Schools ^d should teach students so they can attain competencies in professional values, ethics and professionalism by graduation in order to improve the responsible use of medicines, their discovery, development, manufacturing and distribution.
1.4	Schools should ensure that the needs and future trends in healthcare delivery, advancement in the profession, the pharmaceutical industry and education are taken into account to develop and update the curriculum.
1.5	Schools should promote the message that pharmacists are patient advocates and care providers who provide / facilitate efficient access to quality medicines with the goal of helping patients make the best use of their medicines.
1.6	Academic staff should add to the evidence that pharmacists can improve the responsible use of medicines to improve effectiveness, safety and efficient use of limited resources and should convey to the students the skills to achieve this.
1.7	All pharmacists and academic staff should be encouraged to participate in scholarly activity to generate new knowledge in their area of expertise.
1.8	Pharmacists should be champions for good health and wellness promotion, preventive medicine and holistic patient management. Pharmacists must undertake this through an economic, social, cultural and ethical perspective.

^d - In this document, schools are defined as "Schools of Pharmacy and/or Pharmaceutical Sciences"

Cluster 2:	Professional Skills Mix
Description on the cluster:	Pharmacists in all settings and pharmaceutical scientists need competence, skills, knowledge and attitudes to meet the needs of the public and interact with other healthcare professionals.
2.1	The proper balance of science and practice should be established and taught: biomedical sciences, including pathophysiology, pharmacology and pharmacotherapy, should be distributed throughout the curriculum and should be taught in the context of patients and medicines.
2.2	Aspects of pharmaceutical chemistry, pharmaceutical technology and pharmaceutical analysis should be included in the curriculum to present the processes related to the development, production and registration of medicinal products. Students should be taught both basic pharmaceutical sciences and the use of medicines in the context of the patient care.
2.3	Pharmaceutical regulatory sciences should be included as part of the curriculum to provide knowledge and skills to students relevant to ensure the quality and safety of medicines and appropriate professional practice.
2.4	Besides the basic sciences, clinical, social and administrative sciences are fundamental when they support learning about patients and their use of medicines.
2.5	Training and education in ethical competence should be explicitly described as a core competency and as part of the professionalism of the pharmacist in scientific and clinical practice.
2.6	Students must develop the knowledge and skills to critically assess scientific evidence, including that which is applicable to patient care and population health.
2.7	Graduate education and training for the pharmaceutical workforce should include opportunities for cross-disciplinary learning.
2.8	Professional communication, documentation, lifelong learning and critical thinking should be core competencies of pharmacists and pharmaceutical scientists.
2.9	Students should have the ability and opportunity to learn to apply the scientific knowledge that is taught in the classroom in any field within the profession.
2.10	Pharmaceutical science courses will have a laboratory component to enhance students' scientific skills.
2.11	Pharmacists should learn to work collaboratively with other healthcare professionals and scientists in medical, scientific and social fields.

Cluster 3:	Recruitment of Students
Description on the cluster:	Recruiting students who have a profile that fits the requirements of the school and is aligned with the profile of pharmacists desired for the country.
3.1	Admissions practices should consider the value of a diverse student body reflecting regional population characteristics.
3.2	Students entering a school should have a strong scientific background, evidence of good academic performance and demonstrate good social and emotional skills.

Cluster 4:	Foundation Training and Leadership
Description on the cluster:	Foundation training includes the process of education and leadership development for students and new graduates in pharmacy and the pharmaceutical sciences with a priority on developing the next generation of clinical, scientific, academic and professional leaders.
4.1	There is a common scientific core for both pharmacists and pharmaceutical scientists, but the context for learning and teaching is different.
4.2	Students should understand social determinants of health.
4.3	Clinical competency should be assessed at relevant stages and assessment of student learning has to determine the extent to which students can effectively apply the knowledge taught in practice.
4.4	Assessment of student learning should include an ability for independent and self-directed learning that is necessary for continuing professional development after graduation.
4.5	Pharmaceutical scientists and pharmacists should gain skills in interpersonal communication and teamwork.
4.6	Schools should prepare students to be future mentors, supervisors, preceptors and leaders. This includes promoting a culture of peer support and knowledge sharing among students and encouraging students to mentor younger students.

Cluster 5:	Experiential Education
Description on the cluster:	Experiential education programmes are where students incrementally develop their pharmacy practice and science skills in a wide variety of real-life settings.
5.1	Experiential education should foster development of critical thinking and problem solving processes relative to drug discovery and medicines use.
5.2	Students should have the opportunity to reflect on the clinical learning experience through patient case presentations, and development and discussions of patient notes/pharmaceutical care plans.
5.3	Pharmacy students should participate in direct patient care experiences in hospital and community practice settings and in other practice experiences defined by local needs for pharmacists.
5.4	Students should be provided with supervised laboratory and clinical experience throughout the curriculum, including demonstrations and simulations.
5.5	Students should have the opportunity to learn to apply the clinical and pharmaceutical knowledge that is taught in the classroom in practical settings by working under the supervision of a faculty member or volunteer preceptor with patients and other healthcare professionals and with other scientists.
5.6	Students should have the opportunity to participate in internships / rotations with appropriate supervision and guidance, based on mutually determined learning objectives.
5.7	Students should have opportunities to learn in a wide array of practice environments, including caring for a diverse group of patients in various cultural and health state environments.
5.8	Non-traditional settings (e.g., regulatory, industrial, non-governmental organisations) are appropriate environments for selective experiential education internships/rotations.
5.9	The culture of risk assessment, risk management and patient safety should be communicated clearly as an objective for a pharmacist when practising in different settings.
5.10	Students should demonstrate the ability and the right attitude to follow confidentiality policies.
5.11	Preceptors should be provided with opportunities to contribute to curricular decision-making, assessment and strategic activities.

Cluster 6:	Experiential Education
Description on the cluster:	Resources and academic staff refer to equipment, finances, technology and human resources needed to properly prepare pharmacists and pharmaceutical scientists.
6.1	Schools should allocate resources to demonstrate opportunities and disciplines available to both pharmacists and pharmaceutical scientists.
6.2	Financial resources (public funding, contributions from students and other sources) should enable the objectives of pharmaceutical education and training to be met.
6.3	The facilities and equipment for practice and science laboratory work should be up to date, in good condition, and in sufficient quantity to allow learners to benefit from practical learning.
6.4	Required educational resources and supporting technologies should be available to students in the school.
6.5	A safe environment should be provided for faculty staff and learners.
6.6	Academic staff should have academic or professional experience that supports their main area of teaching and research.
6.7	Academic staff should demonstrate active participation in sharing their knowledge and promoting collaboration with colleagues in their field (and other fields) at a national and international level.
6.8	The teaching performance of academic staff should be taken into consideration for their academic advancement.
6.9	Academic staff should demonstrate that they continuously update their teaching material so as to ensure relevance to contemporary aspects and support future developments.
6.10	Active learning techniques should be used in the classroom by academic staff.
6.11	All academic staff should engage in continuing professional development that is relevant to their work and responsibilities.
6.12	Academic staff at schools should collaborate with preceptors and experiential learning sites to assure quality learning.
6.13	All academic staff should have opportunities to contribute to curricular decision-making.
6.14	The school should support and promote the academic staff, preceptors, students and administrators to engage in professional activities with other health sectors.

Cluster 6:	Experiential Education
6.15	The school should support and promote the participation of academic staff, preceptors, students and administrators in national and international activities of pharmacy and related experiences

Cluster 7:	Quality Assurance
Description on the cluster:	Quality assurance refers to the key aspects and mechanisms to identify opportunities for and make improvement in pharmacy and pharmaceutical sciences education to ensure a good, sustainable performance and suitable competencies of the future workforce.
7.1	A quality improvement programme should be in place at the school and university, and examples of specific improvement should be demonstrated periodically.
7.2	Metrics should exist to measure, monitor, manage and improve the quality of the education and training provided.
7.3	Quality metrics should include feedback from students and new graduates, faculty, preceptors and key external stakeholders, such as employers and professional bodies.
7.4	Policies and procedures support regular review of the curriculum and allow developments in the curriculum to take place in a timely manner so as to keep up with the changes in the profession, technology and society.
7.5	The pharmacy and pharmaceutical scientist degree programmes should be offered at a university level and all the experiential components (placements) in clinical, industrial and institutional settings are undertaken under the supervision of the school.
7.6	Competencies should be assessed throughout the curriculum, not just at the end of it, and before the internship period.
7.7	A formal system of quality assurance, administered by a government or an independent agency approved by the government, should be in place and required for all schools.
7.8	The accreditation system should use published standards that have been developed and adopted with broad stakeholder involvement.
7.9	The accreditation system should use policies and procedures that ensure: evaluation by appropriately qualified and experienced peers; absence of conflict of interest; confidentiality; and fair and consistent application of standards.
7.10	Quality improvement should always include a clear process for handling student concerns/issues/complaints that is transparent so that students are informed of the progress and outcome of any concern that is raised.

Cluster 8:	Continuing Professional Development
Description on the cluster:	Continuing professional development (CPD) refers to building on previous education as a pharmacist and pharmaceutical scientist.
8.1	CPD should apply both to those in the regulated professional practice and to those working in unregulated professional practice, such as academia and the pharmaceutical sciences.
8.2	All members of the pharmaceutical workforce should accept a responsibility to manage their own CPD.
8.3	Promotion of CPD should begin with students at the start of their education.
8.4	Schools should support CPD for graduated professionals to prepare them for advanced practice roles.

References

- Birenbaum A. Reprofessionalization in pharmacy. *Social Science and Medicine*, 1982;16(8):871-878. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/7101003>
- World Health Organization (WHO) and International Pharmaceutical Federation (FIP). *Developing Pharmacy Practice: A Focus on Patient Care*. Geneva: WHO, 2006. Available from: <http://apps.who.int/medicinedocs/en/d/Js14094e/>
- Hepler CD & Strand LM. Opportunities and responsibilities in pharmaceutical care. *American Journal of Hospital Pharmacy*, 1990;47(3):533-543. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/2316538>
- Giberson S, Yoder S & Lee MP. *Improving Patient and Health System Outcomes through Advanced Pharmacy Practice: A Report to the U.S. Surgeon General. Office of the Chief Pharmacists. U.S. Public Health Service*, 2011. Available from: http://www.accp.com/docs/positions/misc/improving_patient_and_health_system_outcomes.pdf
- McMillan S, Sav A, Kelly F, King M, Whitty J & Wheeler A. Is the pharmacy profession innovative enough?: meeting the needs of Australian residents with chronic conditions and their carers using the nominal group technique. *BMC Health Services Research*, 2014;14(1):476. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/25281284>
- International Pharmaceutical Federation (FIP) and University College London (UCL). *From Making Medicines to Optimising Outcomes: The evolution of a profession 1912-2012*. The Hague: International Pharmaceutical Federation (FIP), 2012. Available from: https://www.fip.org/centennial/media_publications
- International Pharmaceutical Federation (FIP). *Advanced Practice and Specialisation in Pharmacy: Global Report*. The Hague: FIP, 2015. Available from: <http://fip.org/educationreports>
- International Pharmaceutical Federation (FIP). *FIP Reference Paper on Collaborative Practice (2009, Istanbul)*. The Hague: FIP, 2009. Available from: <http://fip.org/educationreports>
- International Pharmaceutical Federation (FIP). *Interprofessional Education in a Pharmacy Context: Global Report*. The Hague: FIP, 2015. Available from: <http://fip.org/educationreports>
- Nissen L. Pharmacist prescribing: what are the next steps? *American Journal of Health-System Pharmacy*, 2011;68(24):2357-2361. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/22135062>
- Rowland M, Noe CR, Smith DA, Tucker GT, Crommelin DJA, Peck GG, Rocci ML, Besançon L & Shah VP. Impact of the Pharmaceutical Sciences on Healthcare: A Reflection over the Past 50 Years. *Journal of Pharmaceutical Sciences*, 2012;101(11):4075-4099. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/22911654>
- International Pharmaceutical Federation (FIP). *Stimulating Interest in Pharmaceutical Sciences: A guide for FIP's predominantly scientific member organisation*. The Hague: FIP, 2015. Available from: <http://fip.org/ChangeTheWorld>
- Mirnezami R, Nicholson J & Darzi A. Preparing for precision medicine. *The New England Journal of Medicine*, 2012;366:489-491. Available from: <http://www.nejm.org/doi/full/10.1056/NEJMp1114866#t=article>
- Hamburg MA & Collins FS. The Path to Personalized Medicine. *The New England Journal of Medicine*, 2010;363:301-304. Available from: <http://www.nejm.org/doi/full/10.1056/NEJMp1006304#t=article>
- Airley R & Evans A. How the science of personalized medicines will change the clinical management of patients in the pharmacy. *Future Medicinal Chemistry*, 2012;4(16):2023-2027. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/23157235#>
- Baumol WJ. Macroeconomics of unbalanced growth: the anatomy of urban crisis. *American Economic Review*, 1967;57(3):415-426. Available from: http://www.jstor.org/stable/1812111?seq=1#page_scan_tab_contents
- Hartwig J. What drives healthcare expenditure?--Baumol's model of 'unbalanced growth' revisited. *Journal of Health Economics*, 2008;27(3):603-623. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/18164773>



18. Hartwig J. Can Baumol's model of unbalanced growth contribute to explaining the secular rise in healthcare expenditure? An alternative test. *Applied Economics*, 2011;43(2):173-184. Available from: <http://www.tandfonline.com/doi/full/10.1080/00036840802400470>
19. Arcand JL, Araujo EC, Menkulasic G & Weber M. Health Sector Employment, Healthcare Expenditure and Economic Growth: What are the Associations? World Bank Group: Washington DC, in press.
20. International Pharmaceutical Federation (FIP). Global Pharmacy Workforce and Migration Report. The Hague: FIP, 2006. Available from: <http://www.fip.org/educationreports>
21. International Pharmaceutical Federation (FIP). Global Pharmacy Workforce Report. The Hague: FIP, 2009. Available from: <http://www.fip.org/educationreports>
22. International Pharmaceutical Federation (FIP). Global Pharmacy Workforce Report. The Hague: FIP, 2012. Available from: <http://www.fip.org/educationreports>
23. International Pharmaceutical Federation (FIP). Global Pharmacy Workforce Intelligence Trends Report. The Hague: FIP, 2015. Available from: <http://www.fip.org/educationreports>



PART 3

TRANSLATING OUTCOMES INTO ACTIONS

3.1 Supporting FIPed activities

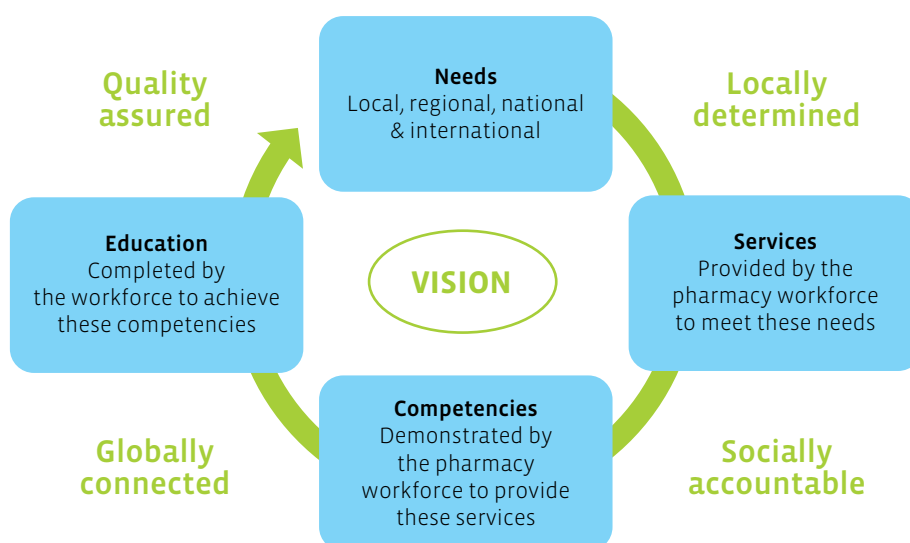
FIP works as a global convener of efforts to highlight and champion the role of the pharmaceutical profession, as well as to advance pharmacy practice, pharmaceutical science and develop education.¹ For example, joint FIP/WHO guidelines on good pharmacy practice describe nationally accepted standards for the quality of pharmacy services,² and the commitment to health outcomes through optimal medicines utilisation was captured in the FIP Centennial Declaration where “pharmacists and pharmaceutical scientists accept responsibility and accountability for improving global health and patient health outcomes by closing gaps in the development, distribution, and responsible use of medicines”.

With this declaration comes the duty to assure that the pharmaceutical workforce is adequately educated and trained to carry out its responsibility to the public and adhere to the accountability for bettering health. The past decade witnessed a longstanding history of activities demonstrating FIP’s efforts in leading change in workforce development and education, with evidence of its use at country and institutional levels, in alignment with global health and health workforce policies and strategies developed by the WHO and the United Nations.³

FIPed builds, advocates for, and disseminates evidence-based guidance, consensus-based standards, tools and resources for educational development and quality assurance, as well as developing and facilitating education-related policy that supports advancement of the profession.

FIPed has developed tools that enable global action to improve pharmaceutical education, which are locally adaptable and then applied to ensure that specific country and regional needs are met (listed in Annex 2). FIP advocates for the consistent use of a needs-based approach to education with an emphasis on linking pharmaceutical education with the health needs of populations and national priorities. The FIP “needs-based education” model suggests that pharmaceutical education should be locally determined, socially accountable, globally connected, and quality assured to meet the given health needs of communities (Figure 3.1).

Figure 3.1: FIP Needs-based educational model.



3.2 Engaging with the participants

The key outcomes of the global conference are a platform and roadmap to inform the future development of the pharmaceutical workforce. Their relevance relies on the capacity to translate the global vision, PWDGs and Nanjing Statements into national strategy and action plans. The ultimate success of these outcomes is dependent on the level of engagement and involvement of global pharmacy leaders, stakeholders and individuals. FIP is committed to maximising stakeholder engagement not only through public consultation and feedback sought before the global conference, but also with targeted participant engagement and validation activities in Nanjing.

One of the features of the global conference's programme was the high level of engagement between FIP and the international participants and among the participants themselves. Some examples of this engagement were panel discussions with member state representatives, workshops with global participants on the PWDGs, live consultation with country delegates on the Nanjing Statements, and media team interviews with a range of high-level officials and participants during the two-day conference.

The interviews were conducted to gather feedback and share opinions from around the world about the perceived impact of the conference, its implications, the applicability of its outcomes, and the key take-home messages. Highlights from some of the interviews are shared below. Selected responses and direct quotes are also included in this report to provide a lasting snapshot of the general sentiments of the conference participants.

High-level officials from international organisations were primary contributors to the conference presentations and discussion topics. The alignment between the PWDGs and the WHO's Global Strategy have been affirmed by Jim Campbell, director of the WHO Health Workforce Department. He voiced his strong encouragement for FIP's efforts in setting out the pharmaceutical workforce development agenda with these PWDGs:

"This is a remarkable achievement and I applaud FIP for its efforts in developing these Pharmaceutical Workforce Development Goals (PWDGs). The clear alignment with the World Health Organization's human resource for health policies is welcome and demonstrates strong leadership for this critical health workforce."

The potential implications of this global conference and its outcomes are "profound" according to Mrs Helen Gordon, chief executive of Great Britain's Royal Pharmaceutical Society (RPS). As a national leadership body, the RPS intends to use the precedent of the PWDGs to provide guidance for its workforce planning strategy. Mrs Gordon urges everyone to use the PWDGs to take action in their own countries and highlighted the precedent FIP have set in holding this event:

"This is the first time there is a global position on workforce development goals and principles for pharmacy workforce development and education."

Professor Yao Wen-Bing, Vice-president, China Pharmaceutical University described the legacy in the global conference as a historic milestone that provided an opportunity for the international community to come to closer agreement on how to educate and "cultivate a real workforce". He described the implications of the conference for all countries and regions around the world:

"With this conference, we are getting closer and closer to reaching international consensus on the way forward for pharmacy education."

Professor Wang Xiao-Liang and Dr Ding Lixia, vice-president and secretary general, respectively, of the Chinese Pharmaceutical Association, collectively stressed the effectiveness of the conference sessions in providing rationale and context for change by portraying the nature of future healthcare roles and services. Professor Wang voiced special support for the standards set by FIP's three documents, with particular focus on the impact of the Nanjing Statements:

"The Nanjing Statements set new global standards for pharmaceutical education and training and will with no doubt shape the development of the profession in China."

Feedback from the participants indicates their intention on using the key outcomes in their own settings. Senegal's official delegate, Dr Chiekhou Oumar Dia, who is also the president of the Pharmaceutical Council of Senegal, intends to use the key outcomes as a benchmark to evaluate the workforce development capacities offered in both educational and practice sectors in his country.

Mrs Pamela Schweitzer, chief pharmacy officer of the US Public Health Service expressed her plans to "plant the seeds" by sharing the conference's outcomes with pharmacy organisations as well as other health disciplines so they can incorporate them into their own goals. She described the impact of this milestone event:

"Meeting the leaders of the world in the field of pharmacy was the highlight of this conference. This is the start of a global movement for pharmacy."

The global conference participants expressed their shared enthusiasm for the progress made so far in drawing a new roadmap for pharmaceutical workforce transformation. Moving forward, FIP urges all participants, stakeholders and member organisations to take steps and actions in implementing the global vision, PWDGs and Nanjing Statements in their own contexts.

References

1. Burns DT, Deelstra H. Origins of the creation of the international pharmaceutical federation in 1912: the centenary. *Microchimica Acta*, 2012;178(1):29-35. Available from: <http://link.springer.com/article/10.1007%2F500604-012-0786-5>
 2. International Pharmaceutical Federation (FIP) and World Health Organization (WHO). Joint FIP/WHO guidelines on good pharmacy practice: standards for quality of pharmacy services. WHO Technical Report Series, No. 961, 2011. Geneva: WHO, 2011. Available from: http://www.fip.org/good_pharmacy_practice
 3. International Pharmaceutical Federation (FIP). Transforming Our Workforce: Workforce development and education: Systems, tools and navigation. The Hague: FIP, 2016. Available from: <http://www.fip.org/educationreports>
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PART 4

IMPLEMENTATION AND FORWARD STRATEGIC PLANNING AFTER NANJING

FIP is committed to supporting the implementation of the Global Vision for Education and Workforce, the Pharmaceutical Workforce Development Goals (PWDGs) and the Nanjing Statements; we will lead through advocacy and engagement with key stakeholders and member organisations.

The global conference showcased best practice and innovative approaches to professional education and workforce development, all aimed towards developing and sustaining a quality-based flexible, adaptable and competent pharmaceutical workforce, in alignment with the UN Sustainable Development Goals.^e In addition, our leadership will align with the WHO Global Human Resources for Health Strategy and the recommendations and conclusions of the UN High-Level Commission on Health Employment and Economic Growth.^f These approaches cover the whole workforce development timeline from pre-service education to advanced practice and specialisation.

This comprehensive report should be considered in conjunction with previous FIPeD publications (see [Annex 2](#)) so as to inform and guide strategic planning and change management of the pharmaceutical workforce at local, national and regional levels.

FIP believes that pharmacists and pharmaceutical scientists associations, and importantly pharmaceutical education leaders, have a key role to play to translate this vision into a reality at local (for example, institutional), national and regional levels, so that the pharmaceutical workforce meets the public health and population needs with regards to pharmaceutical care and medicines expertise.

To this end, FIP is developing mechanisms to support the development and implementation of pharmaceutical workforce development strategies, integrated into the overall human resources for health strategies promoted by global and national agencies.

Already, FIP has instigated the formation of a steering group, under the aegis of FIPeD, to develop needs assessments and gap analyses which will guide the identification of priority areas for action. Such group will be led by, and engage with, pharmacists and pharmaceutical scientists associations, education leaders and other influential stakeholders to identify indicators and impact measures in order to monitor progress; such indicators will be crucial for demonstrating relevance and the need for investment.

FIP recognises the importance of economic indicators, reflecting the need for necessary resources to develop a sustainable workforce and to additionally quantify the return on investment for the economy of any country through this pharmaceutical healthcare workforce. This is not only a social accountability obligation but will also support transnational advocacy by providing rigorous evidence.

This work will serve as a foundation for a dialogue to agree upon clear objectives for pharmaceutical workforce development, and strategies to achieve these objectives. Due consideration will be given to the identification of synergies and appropriate levels of engagement and collaboration with relevant stakeholders.

The implementation and forward strategic plan, driven from the outcomes of the Nanjing conference, will directly assist pharmacists and pharmaceutical scientists associations and institutions involved in pharmaceutical workforce development; this programme of work will be evaluated and disseminated for impact of these actions at local and national levels.

FIP will continue to provide clear leadership and assistance in the transformation of our pharmaceutical workforce and will monitor the outcomes of the implementation of the conclusions of the Global Conference on Pharmacy and Pharmaceutical Sciences Education on a two-year and five-year time frame.

This is our call for action for realising the vision and goals for the transformation of healthcare provision and the health of patients.

^e - In particular, SDG 3.c. See Part 1.1

^f - World Health Organization (WHO). Global Strategy on Human Resources for Health: Workforce 2030. Geneva: WHO, 2016. Available from: http://www.who.int/hrh/resources/pub_globstrathrh-2030/en/

World Health Organization (WHO). Final report of the expert group to the High-Level Commission on Health Employment and Economic Growth. Geneva: WHO, 2016. Available from: <http://www.who.int/hrh/com-heeg/reports/report-expert-group/en/>

PART 5

CONCLUSIONS AND FUTURE STEPS

The Global Conference on Pharmacy and Pharmaceutical Sciences Education was a milestone for developing a globally shared vision and roadmap for transforming pharmacy and pharmaceutical sciences education in the context of workforce development.

By drawing this roadmap in alignment with global health strategies and policies, FIP strives to make significant contributions to improving global health outcomes by ensuring that the pharmaceutical workforce around the world is appropriately educated and competent to close gaps in the development, distribution and responsible use of medicines.

The result of extensive planning, drafting and consultation processes, three key documents were presented at the conference and adopted by FIP:

1. Global Vision for Education and Workforce
2. Pharmaceutical Workforce Development Goals
3. Nanjing Statements on Pharmacy and Pharmaceutical Sciences Education

5.1 Calls to action to all relevant stakeholders

This report outlines a way forward for workforce development through transforming pharmacy and pharmaceutical sciences education. It is intended to be used to stimulate policy action and discussion, and is aimed at all member organisations and stakeholders including professional associations, regulators, higher education institutions, employers, industry, government and individual pharmacists.

Considering the significant stride forward in establishing a global consensus on a shared vision, it is crucial that concrete steps are taken by all pharmacy stakeholders, member organisations, academic institutions and governments to implement the global vision, PWDGs and Nanjing Statements in their own countries and territories.

Implementing the global vision, achieving the PWDGs and adopting the Nanjing Statements successfully require stimulating interest and discussions, collaboration and engagement between and across all stakeholder groups, identifying future objectives through understanding existing needs, and utilising available resources and tools to facilitate development initiatives. A number of possible steps can be taken to advance the local workforce development agenda.

Analysing needs at the local level

Analysis at the local level is important to establish needs-based objectives to meet the strategies of the global vision, PWDGs and Nanjing Statements. FIP encourages stakeholders to understand existing systems and capacities at the both the institutional and national levels. FIPeD tools and resources can be used to develop a current analysis of the situation of education and pharmaceutical workforce.

Stimulating discussions and sharing ideas

Stimulating discussions and raising awareness of the three outcomes of the global conference is an important stepping-stone to garnering attention and starting initiatives. FIP encourages conference participants and country delegates to share the key outcomes of the global conference. Organising discussion opportunities with the relevant stakeholders through conferences, a series of consultations, or workshops and presentations can be used to:

1. Discuss the recommendations from the global conference
2. Share the key messages and tenets of the Global Vision for Education and Workforce and use to assess or develop aligned national strategies
3. Discuss the Pharmaceutical Workforce Development Goals and identify priority goals for development based on existing and future needs
4. Discuss the Nanjing Statements on Pharmacy and Pharmaceutical Sciences Education and employ them a self-assessment tool for local pharmaceutical education systems
5. Develop an advocacy document to support the global vision and raise awareness on the need to invest in the national and global pharmaceutical workforce

Working together to achieve progress

Leaders from practice, education and research should collaborate in workforce planning efforts at a national level to ensure that plans include adequate attention to the integration of pharmacists, pharmaceutical scientists and pharmacy support roles to meet local health needs. Establishing partnerships across pharmacy sectors and stakeholder group is an important prerequisite to sustainable planning, development and implementation.

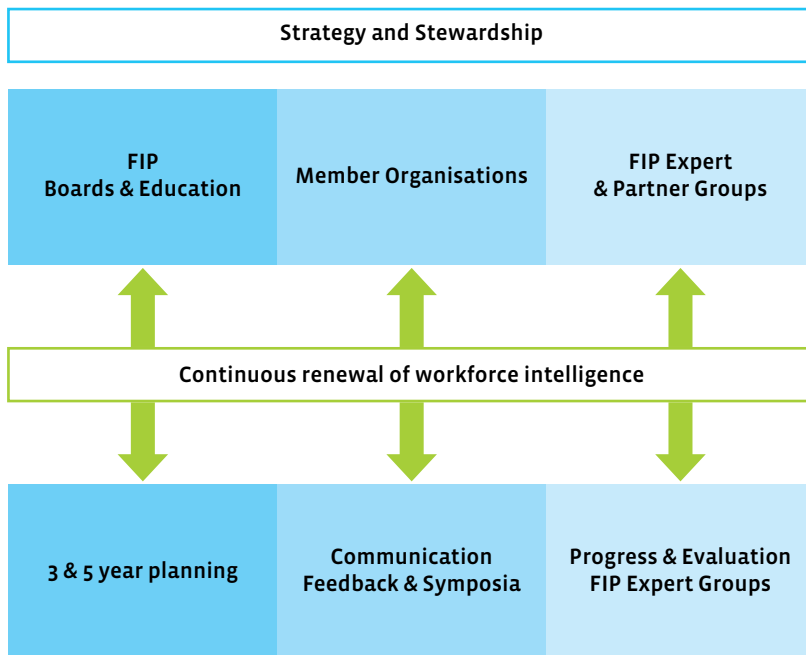
Using existing tools and resources

National professional and scientific associations, governments and academic institutions are strongly encouraged to collaborate and use the resources developed by FIP to lead transformational workforce change in their own settings. FIPeD resources and networks can be used to implement educational development change. [Annex 2](#) provides an extensive overview of FIPeD tools and resources, and [Annex 3](#) provides a comprehensive bibliography of global resources, tools, studies and guidelines.

5.2 FIP's commitment to education

Communicating and dissemination, monitoring, evaluation, systematic planning and comprehensive stakeholder engagement are clear objectives for FIP to coordinate global efforts for pharmaceutical workforce development fit to meet future pharmaceutical healthcare needs (See [Figure 5.1](#)). It is clear, taking the evidence and advice of our global partners such as the WHO, that workforce development needs a clear and credible underpinning of workforce intelligence. FIP, under the aegis of *FIPeD*, is committed to coordinating these critical steps, ensuring that the voice of experts, practitioners and leaders are all taken into account; it will not be possible to produce aggregate global change without direct local involvement and there has to be a commitment to find and disseminate best practice to avoid duplication and reinvention.

Figure 5.1: Strategic Planning Framework.








The global conference was a historic moment for the pharmaceutical profession, but it is now time to turn this moment into momentum to set in motion a global movement of transformational change for the pharmaceutical workforce to improve global health.

ANNEX 1. LIST OF PARTICIPATING COUNTRIES AND TERRITORIES

Afghanistan
Australia
Bangladesh
Belgium
Brazil
Cambodia
Canada
China
China Taiwan
Croatia
Ethiopia
Finland
France
Germany
Ghana
India
Indonesia
Iraq
Ireland
Japan
Jordan
Kenya
Korea, Republic of
Malaysia
Malta
Mexico
Mongolia
Netherlands
New Zealand
Nigeria
Norway
Pakistan
Philippines
Portugal
Romania
Russian Federation
Rwanda
Senegal
Singapore
South Africa
Spain
Sweden
Switzerland
Turkey
United Kingdom
United States of America
Uruguay

ANNEX 2. OVERVIEW OF FIPeD TOOLS

	FIPeD Tools/Description	Concept/Content	Aimed for:
	<p>Quality Assurance</p> <p>The Framework is offered primarily as a tool — to be used in whole or in part — to facilitate the establishment of systems of quality assurance in countries where no such formal systems exist or for improvement of existing systems. Where regional similarities and collaborations exist, the Framework may also be applied at a regional rather than national level. Where resources or other constraints limit the immediate application of some of the principles outlined in the Framework, it is hoped that the document can serve as a “road map” for the future.</p> <p>http://bit.ly/29zgrSc</p>	<ul style="list-style-type: none"> • Prerequisites for Quality Assurance in Pharmacy Education • Quality Criteria and Quality Indicators for Pharmacy Education • The Quality Assurance Agency • Glossary 	<ul style="list-style-type: none"> • Higher Education Institutions • Professional Associations • Regulators
	<p>Workforce Intelligence</p> <p>The reports have set out to recognise the major challenges facing both the profession and global healthcare systems. The quality, scope and capability of the workforce are dependent on the nature of initial and life long professional development curricula, and the quality of available practitioner support and recognition structures.</p> <p>http://bit.ly/29kipF8</p>	<p>2006</p> <ul style="list-style-type: none"> • Data from 17 countries and territories • Case studies from 7 countries and territories [Australia, Canada, Ireland, Ghana, Kenya, New Zealand, United Kingdom] <p>2009</p> <ul style="list-style-type: none"> • Data from 56 countries and territories • Case studies from 7 countries and territories [Australia, Canada, Great Britain, Kenya, Jordan, Uruguay, Vietnam] • Needs-based Educational Model • WHO chapter <p>2012</p> <ul style="list-style-type: none"> • Data from 90 countries and territories • Case studies from 9 countries and territories [Afghanistan, Costa Rica, Ghana, Great Britain, Japan, Pacific Islands, Singapore, South Africa, Tanzania] • WHO chapter <p>2015</p> <ul style="list-style-type: none"> • Trends analysis conducted with data from the workforce reports (2006, 2009 and 2012) • Data from 51 countries and territories 	<ul style="list-style-type: none"> • Professional Associations • Regulators • Higher Education Institutions • Industry

	FIPEd Tools/Description	Concept/Content	Aimed for:
	<p>FIP UNESCO-UNITWIN Global Pharmacy Education Development Network UNITWIN/Cooperation Programme on Global Pharmacy Education (GPhED) was created within the framework of the UNESCO-UNITWIN Programme to fulfil objectives such as sharing best educational practice between and among education institutions and other education providers across borders.</p>	<ul style="list-style-type: none"> • Network of Schools • Centres of Excellence: Global – 1st one, African Centre of Excellence [Founding partners: Ghana, Uganda, Nigeria, Namibia, Zambia, Malawi] 	<ul style="list-style-type: none"> • Higher Education Institutions • Educators
	<p>Global Competency Framework (GbcF) Promotes the development of knowledge, skills, attitudes and behaviours that an individual develops through education, training, development and experience as means to create a capable practitioner workforce in all healthcare professions. The GbcF v1 is divided in 4 clusters/areas of practice, 20 competencies and 100 behavioural competencies. It is intended to act as a mapping tool and can be adapted according to the country or local needs. These competencies improve therapeutic outcomes, patients' quality of life, scientific advancement and enhancement of public health imperatives. http://bit.ly/1TIMWe3</p>	<p>The GbcF contains:</p> <ul style="list-style-type: none"> • The drivers for the development of a global competency framework. • The process of the GbcF development. • The concept of the GbcF competencies. • Guidance on how to use the GbcF. • The GbcF framework. 	<ul style="list-style-type: none"> • Professional Associations • Regulators • Higher Education Institutions • Employers • Industry • CPD/CE providers • Individual Pharmacists
	<p>Pharmacy Support Workforce Pharmacy technicians and support staff, pharmacists and individuals who work with the pharmacy support workforce in education, practice, regulation, development and promotion explore how to educate, develop and fully utilise the pharmacy support workforce within the healthcare system. The discussions and debate during this one-and-a-half-day symposium focus on areas of critical importance for sustainability of healthcare programmes, with a focus on global initiatives that support and strengthen the work of mid-level cadres in the delivery of pharmacy services.</p>	<ul style="list-style-type: none"> • The domain initiated an annual FIP Global Pharmacy Technician and Pharmacy Support Workforce Symposium in 2012, which has been the basis for increased sharing and practice development. 	<ul style="list-style-type: none"> • Professional Associations • Regulators • Higher Education Institutions • Employers
	<p>Global Education Report Academic and Institutional Capacity Domain FIPEd Global Education report provides a baseline on the current status, transformation and scaling up of pharmacy and pharmaceutical sciences education globally. http://bit.ly/29qvmko</p>	<ul style="list-style-type: none"> • Data from 109 countries and territories • Case studies from 14 countries and territories [Chile, Great Britain, Japan, Jordan, Malaysia, Namibia, Philippines, Portugal, Saudi Arabia, Switzerland, Thailand, UAE, USA, Zimbabwe] 	<ul style="list-style-type: none"> • Professional Associations • Regulators • Higher Education Institutions

	FIPEd Tools/Description	Concept/Content	Aimed for:
	<p>Continuing Professional Development/ Continuing Education (CPD/CE) Report CPD is “the responsibility of individual pharmacists for systematic maintenance, development and broadening of knowledge, skills and attitudes, to ensure continuing competence as a professional, throughout their careers”. An ongoing cyclical process involving: self-appraisal, developing a personal learning plan, taking action or implementing the learning plan, and evaluation. The report has presented the current trends and activities with regard to professional development and lifelong learning across countries and territories globally. http://bit.ly/29vvRUE</p>	<ul style="list-style-type: none"> • Data from 66 countries and territories • Case studies from 9 countries and territories [Australia, Canada, Croatia, Japan, Namibia, New Zealand, Northern Ireland, Oman and USA] 	<ul style="list-style-type: none"> • Professional Associations • Regulators • Higher Education Institutions • Employers • Industry • Other providers of CPD/CE
	<p>Interprofessional Education (IPE) Report The report presents a collection of case studies and examples that reflect innovation and creativity centred on IPE. These case studies highlight diverse approaches and show that IPE is becoming a more mainstream education activity for students, trainees and practitioners worldwide. Still, FIPEd acknowledges the limited evidence and evaluation regarding the long-term impact of IPE initiatives. This suggests that it is needed to continue to follow projects such as those highlighted here and also encourage stronger interprofessional dialogue about monitoring and evaluation methods. http://bit.ly/29qUuUg</p>	<ul style="list-style-type: none"> • A WHO case study. • Case studies from 12 regional, national and institutional-level examples and initiatives [Professional bodies, Accreditation agencies, Student organisations, Australia, China, Kenya, Lebanon, Malaysia, Namibia, Philippines, UK (Great Britain), Uruguay] 	<ul style="list-style-type: none"> • Professional Associations • Higher education institutions • Employers
 	<p>PharmAcademy PharmAcademy is the go-to place for pharmacy educators worldwide to connect, and share knowledge and resources. It is a community site designed to connect pharmacy educators globally. http://pharmacademy.org/</p> <p>Pharmacy Education Journal Hosted by PharmAcademy, the journal is a peer-reviewed publication, allowing free submission and access to over 500 articles around pharmacy and pharmacy education workforce. 14,000 journal article downloads since August 2015. http://bit.ly/2a1pdbC</p>	<p>PharmAcademy, is an online platform where is possible to:</p> <ul style="list-style-type: none"> • Learn from others with more experience. • Teach and guide others with less experience. • Publish stories and news items of interest to the community. • Join or create groups of peers that share common interests. • Participate in the development of pharmacy education. • Publish on the <i>Pharmacy Education Journal</i>. 	<ul style="list-style-type: none"> • Educators • Individual Pharmacists • Authors

	FIPeD Tools/Description	Concept/Content	Aimed for:
	<p>Advanced Practice and Specialisations Report This report is the most comprehensive collection of data and evidence that relates to practitioner advancement of practice and policy, and maps out a wide range of national initiatives worldwide. This report should be viewed as a first attempt to map out global trends and will stimulate further reportage and analysis as engagement in this practice continues to progress. http://bit.ly/29zgP3j</p>	<ul style="list-style-type: none"> • Data from 48 countries and territories • Case studies from 17 country and territories [Argentina, Australia, Canada, China, India, Ireland, Japan, Malaysia, New Zealand, Philippines, Portugal, Singapore, South Africa, Spain, Switzerland, United Kingdom (Great Britain), USA] 	<ul style="list-style-type: none"> • Professional Associations and Regulatory Authorities • Employers • Individual Pharmacists
	<p>Transforming Our Workforce Transforming Our Workforce is an enabling document designed to have a long half-life. It describes evidence-based and tested tools and mechanisms whereby leadership bodies and policy-makers can gain traction for advancing the pharmacy workforce. http://bit.ly/29kipF8</p>	<ul style="list-style-type: none"> • Development case studies of the 10 FIPeD tools • Case studies from 14 national and institutional-level examples and initiatives [Australia, Chile, Croatia, India, Jordan, Malawi, New Zealand, Kenya, Serbia, Spain, Thailand, UK (Great Britain)] 	<p>All Stakeholders</p> <ul style="list-style-type: none"> • Professional Associations • Regulators • Higher Education Institutions • Employers • Industry • Individual Pharmacists

ANNEX 3. BIBLIOGRAPHY

- Almarsdóttir AB, Traulsen JM. Rational use of medicines – an important issue in pharmaceutical policy. *Pharmacy World and Science*, 2005;27(2):76-80. Available from: <http://link.springer.com/article/10.1007/s11096-005-3303-7>
- Anand S, Bärnighausen T. Human resources and health outcomes: cross-country econometric study. *The Lancet*, 2004;364(9445):1603-1609. Available from: <http://www.thelancet.com/journals/lancet/article/PIIS0140673604173133/abstract>
- Anderson C, Bates I, Brock T. Seven Billion Humans and 98 Trillion Medicine Doses. *American Journal of Pharmaceutical Education*, 2017;75(10):194. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3279010/>
- Anderson C, Bates I, Beck D, et al. The WHO UNESCO FIP Pharmacy Education Taskforce: Enabling Concerted and Collective Global Action. *American Journal of Pharmaceutical Education*, 2008;72(6):127. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2661156/>
- Anderson C, Bates I, Beck D, et al. The WHO UNESCO FIP Pharmacy Education Taskforce. *Human Resources for Health*, 2009; 7(45). Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2697153/>
- Anderson C, Bates I, Brock T, et al. Needs-based education in the context of globalization. *American Journal of Pharmaceutical Education*, 2012;76(4):1-3. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3355276/>
- Anderson C, Bates I, Brock T, et al. Needs-Based Education in the Context of Globalization. *American Journal of Pharmaceutical Education*, 2012;76(4):56. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3355276/>
- Anderson C, Bates I, Futter B, et al. Global perspectives of pharmacy education and practice. *World Medical and Health Policy*, 2010;2(1):5-18. Available from: <http://onlinelibrary.wiley.com/doi/10.2202/1948-4682.1052/pdf>
- Anderson C, Bates I, Futter B, et al. Global Perspectives of Pharmacy Education and Practice. *World Medical and Health Policy*, 2010;2(1):2. Available from: <http://onlinelibrary.wiley.com/doi/10.2202/1948-4682.1052/abstract>
- Anderson C, Brock T, Bates I, et al. Transforming Health Professional Education. *American Journal of Pharmaceutical Education*, 2011;75(2):22. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3073096/>
- Bates I, Bruno A. Competence in the Global Pharmacy Workforce. A discussion paper. *International Pharmacy Journal*, 2009, 23: 30-33. Available from: https://www.fip.org/files/fip/PharmacyEducation/Bates__Bruno_Competence_in_Global_Pharmacy_Workforce.pdf
- Bates I, John C, Bruno A, et al. An Analysis of the Global Pharmacy Workforce Capacity. *Human Resources for Health*, 2016;14(61). Available from: <https://human-resources-health.biomedcentral.com/articles/10.1186/s12960-016-0158-z>
- Bhutta ZA, Chen L, Cohen J, et al. Education of health professionals for the 21st century: a global independent Commission. *The Lancet*, 2010;375(9721):1137-1138. Available from: [http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(10\)60450-3/abstract](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(10)60450-3/abstract)
- Bossert T, Bärnighausen T, Bowser D, et al. Assessing Financing, Education, Management and Policy Context for Strategic Planning of Human Resources for Health. Geneva: WHO, 2007. Available from: http://www.who.int/hrh/tools/assessing_financing.pdf?ua=1
- Bruno A, Bates I, Brock T, et al. Towards a Global Competency Framework. *American Journal of Pharmaceutical Education*, 2010;74(3):56. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2865424/>
- Chen L, Evans T, Anand S, et al. Human resources for health: overcoming the crisis. *The Lancet*, 2004;364(9449):1984-1990. Available from: [http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(04\)17482-5/abstract](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(04)17482-5/abstract)
- Diallo K, Zurn P, Gupta N, et al. Monitoring and evaluation of human resources for health: an international perspective. *Human Resources for Health*, 2003; 1(1):1-13. Available from: <https://human-resources-health.biomedcentral.com/articles/10.1186/1478-4491-1-3>
- Frenk J, Chen L, Bhutta ZA, et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. *The Lancet*, 2010;376(9756):1923-1958. doi: 10.1016/S0140-6736(10)61854-5. Available from: [http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(10\)61854-5/fulltext?_eventId=login](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(10)61854-5/fulltext?_eventId=login)
- Hongoro C, McPake B. How to bridge the gap in human resources for health. *The Lancet*, 2004;364(9443):1451-1456. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/15488222>
- International Pharmaceutical Federation (FIP) and University College London (UCL). From Making Medicines to Optimising Outcomes: The evolution of a profession 1912-2012. The Hague: International Pharmaceutical Federation (FIP), 2012. Available from: https://www.fip.org/centennial/media_publications
- International Pharmaceutical Federation (FIP) and World Health Organization (WHO). Joint FIP/WHO guidelines on good pharmacy practice: standards for quality of pharmacy services. WHO Technical Report Series, No. 961, 2011. Geneva: WHO, 2011. Available from: http://www.fip.org/good_pharmacy_practice
- International Pharmaceutical Federation (FIP). A Global Competency Framework Version 1. The Hague: FIP, 2012. Available from: <http://fip.org/educationreports>
- International Pharmaceutical Federation (FIP). Advanced Practice and Specialisation in Pharmacy: Global Report. The Hague: FIP, 2015. Available from: <http://fip.org/educationreports>
- International Pharmaceutical Federation (FIP). Continuing Professional Development/Continuing Education in Pharmacy: Global Report. The Hague: FIP, 2014. Available from: <http://fip.org/educationreports>
- International Pharmaceutical Federation (FIP). Global Education Report. The Hague: FIP, 2013. Available from: <http://fip.org/educationreports>
- International Pharmaceutical Federation (FIP). Global Pharmacy Workforce and Migration Report. The Hague: FIP, 2006. Available from: <http://fip.org/educationreports>
- International Pharmaceutical Federation (FIP). Global Pharmacy Workforce Report. The Hague: FIP, 2009. Available from: <http://fip.org/educationreports>
- International Pharmaceutical Federation (FIP). Global Pharmacy Workforce Report. The Hague: FIP, 2012. Available from: <http://fip.org/educationreports>
- International Pharmaceutical Federation (FIP). Global Pharmacy Workforce Intelligence Trends Report. The Hague: FIP, 2015. Available from: <http://fip.org/educationreports>
- International Pharmaceutical Federation (FIP). Global Vision for Education and Workforce. The Hague: FIP, 2016. Available from: <http://fip.org/educationreports>
- International Pharmaceutical Federation (FIP). Interprofessional Education in a Pharmacy Context: Global Report. The Hague: FIP, 2015. Available from: <http://fip.org/educationreports>
- International Pharmaceutical Federation (FIP). Nanjing Pharmaceutical Workforce Development Goals. The Hague: FIP, 2016. Available from: <http://fip.org/educationreports>
- International Pharmaceutical Federation (FIP). Nanjing statements on pharmacy and pharmaceutical sciences education. The Hague: FIP, 2016. Available from: <http://fip.org/educationreports>

International Pharmaceutical Federation (FIP). Quality Assurance of Pharmacy Education: the FIP Global Framework | 2nd Edition. The Hague: FIP, 2014. Available from: <http://fip.org/educationreports>

International Pharmaceutical Federation (FIP). Transforming Our Workforce. Workforce development and education: Systems, tools and navigation. The Hague: FIP, 2016. Available from: <http://fip.org/educationreports>

Narasimhan V, Brown H, Pablos-Mendez A, et al. Responding to the global human resources crisis. *The Lancet*, 2004;363(9419):1469-1472. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/15121412>

United Nations (UN). Sustainable Development Goals. 2015. Available from: <http://www.un.org/sustainabledevelopment/sustainable-development-goals/>

Whitmarsh S, Futter B, Rouse M, et al. A Case Study in Terminology: the FIP Pharmacy Education Taskforce. *American Journal of Pharmaceutical Education*, 2010;74(7):134. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2972529/>

World Health Organization (WHO) and International Pharmaceutical Federation (FIP). Developing Pharmacy Practice: A Focus on Patient Care. Geneva: WHO, 2006. Available from: <http://apps.who.int/medicinedocs/en/d/Js14094e/>

World Health Organization (WHO). Final report of the expert group to the High-Level Commission on Health Employment and Economic Growth. Geneva: WHO, 2016. Available from: <http://www.who.int/hrh/com-heeg/reports/report-expert-group/en/>

World Health Organization (WHO). Global Strategy on Human Resources for Health: Workforce 2030. Geneva: WHO, 2016. Available from: http://www.who.int/hrh/resources/pub_globstrathrh-2030/en/

World Health Organization (WHO). Health in 2015: from MDGs, Millennium Development Goals to SDGs, Sustainable Development Goals. Geneva: WHO, 2015. Available from: http://www.who.int/gho/publications/mdgs-sdgs/MDGs-SDGs2015_toc.pdf?ua=1

World Health Organization (WHO). The Pursuit of Responsible Use of Medicines: Sharing and Learning from Country Experiences. Geneva: WHO, 2012. Available from: <http://apps.who.int/iris/handle/10665/75828>

World Health Organization (WHO). Transforming and scaling up health professionals' education and training: World Health Organization Guidelines 2013. Geneva: WHO, 2013. Available from: http://www.who.int/hrh/resources/transf_scaling_hpet/en/

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Members: Claire Anderson, UK; Lilian Azzopardi, Malta; Luc Besançon, the Netherlands; Olivier Bugnon, Switzerland; Mahama Duwiejua, Ghana; Hans Linden, Sweden; Don Mager, USA; Lucinda Maine, USA; Robert Sindelar, Canada; Qidong You, China; Hiroshi Suzuki, Japan.

Support

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FIP CEO: Luc Besançon, the Netherlands

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