INTRODUCTION

The pharmaceutical workforce in a global health setting

Strengthening access to primary health care services and the health workforce is recognised as essential for progress on the United Nations (UN) Sustainable Development Goal (SDG) 3 and Universal Health Coverage (UHC) by 2030.[1] Delivering quality health care services is dependent on a sufficient and competent health workforce.[1] The World Health Organisation (WHO) estimates a projected shortfall of 18 million health workers by 2030, mostly in low and lower-middle income countries, prompting worldwide strategies to address this challenge; this includes a focus on the current challenges in capacity building for the education, training, and performance of the health workforce.[2] The WHO-Global strategy for the health care workforce 2030 clearly illustrates that health systems in any country can only function with an available, accessible and acceptable health workforce, equipped with competencies necessary to deliver quality care.[3]

The pharmaceutical workforce plays a key role in improving health outcomes through the responsible use of medicines and optimising effective choice and use.[4] Pharmaceutical workforce 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 scope of practice.[5] Therefore, investment in the development and advancement of the pharmaceutical workforce is imperative across all scopes and settings to address existing gaps related to education, training and performance and progress its infrastructure.[6]

From a pharmaceutical services delivery perspective, systematic development of evidence-based early career and foundation training programmes and strategies will ensure better development, training and retention of the pharmacy workforce to meet global health care challenges. In particular, strategies to optimise performance, quality and impact of the pharmaceutical workforce as a primary mechanism for contributing to societal health and well-being, ensuring effective universal health coverage, and building resilience in health systems at all levels.[7]

Pharmaceutical Development Goals for the decade ahead

The global leadership body for pharmacy, the International Pharmaceutical Federation (FIP), launched a set of global pharmaceutical Development Goals (DGs) in September 2020.[8] These goals are a key resource for transforming the pharmacy profession over the next decade globally, regionally and nationally. They align with the FIP mission to support global health by enabling the advancement of pharmaceutical practice, sciences and education and are set to transform pharmacy in alignment with wider global imperatives underpinning the UN SDGs.[9]

The work builds on the previously published pharmaceutical Workforce Development Goals[6] resulting in a holistic and integrated set of 21 pharmaceutical DGs for transforming global pharmacy. Each of the DGs comprises 3 principal elements: Practice, Science and Workforce. Alongside each element is a set of mechanisms which form tools and structures to facilitate and support the process of transformation.[9]

Foundation Training (early career training) is the second of FIP's Development Goals, that advocates for building infrastructures 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.[10]

FIP, strengthened by its partnership with WHO and UNESCO, expands initiatives that evolve pharmacy education and workforce development. Through developing policies and tools, the FIP works in alignment with international organisations such as WHO to support building a competent, flexible and adaptable workforce.

A global competency framework for early career pharmacists

The Global Competency Framework (GbCF) version 1 was initially published in 2012 and presents a core set of behavioural and practice-related competencies synthesised from the documents that should be generally applicable to the pharmacy workforce worldwide. The GbCFv1 was subject to an overarching, evidence-led validation process of literature review, evidence/document gathering, consensus group meetings, content validation meetings and an iterative content phase.[11] Findings from the validation process provided evidence that at the core, there are shared and common capability attributes across both sectors and borders globally. There are similar expectations in the competence and the practice of pharmacists as medicines experts, certainly in early years of career development.[4]

The GbCFv1 is divided into clusters, competencies, and behavioural competencies. The GbCFv1 is intended to act as a mapping tool and can be adapted according to the country or local needs. Acting as a mapping tool for the creation of country-specific needs for the development of practice and practitioner professional development, the GbCFv1 can be attached to an assessment grid and, together with appropriate assessment tools.[12]

Competency-based education and training

The GbCFv1 is aimed for pharmacists in post-graduation practice, beyond registration "Day 1" of employment, and encompassing up to (approximately) the first 2-3 years of career development. This is anchored on the premise that pharmacy education (including initial, continuing education and continuing professional development) should ensure pharmacists are equipped for practice in modern and complex health care systems. Practicing in modern and complex health care systems requires contemporary competencies, which early career pharmacists need to develop and practice.[13]

As continuing professional development (CPD) is "the process of the ongoing education and development of health care professionals, from initial qualifying education and for the duration of professional life, in order to maintain competence to practice and increase professional proficiency and expertise",[14] it is essential to acknowledge that competence is a developmental and goal-oriented process of sharpening existing competencies and adding new ones to pharmacists' professional set of skills and attributes.[15] But competence remains a moving trajectory due to a dynamic labour market driven by an array of clinical, social, technological, and ethical transformations[16] coupled with a dramatic increase in preventable and non-communicable diseases and changes in societal expectations from health systems and health workers.[16]

Competency frameworks such as the FIP GbCF outline generic competencies which act as a reference guide to pharmacists and stakeholders (educators and employers) involved in the development and training of pharmacists. In addition, pharmacists and stakeholders are further encouraged to embrace and adopt concepts of competency-based education and training (CBET) in professional development. In CBET, the focus shifts on performance of pharmacists in the workplace utilising acquired and specific competencies and incorporating competency-based instructional approaches and assessments,[17, 18] further consolidating knowledge and positively impacting patient care.[19] Competent pharmacists have the potential to improve therapeutic outcomes and patients' quality of life.[19, 20]

In 2019, in response to the increasing trends in health care delivery complexities, and increasing humanitarian emergencies (including natural disasters, political conflicts and emerging risks of both endemic and pandemic crises) the FIP global professional leadership body commissioned a review and re-drafting of the original GbCFv1 to provide enhanced future-proofing and fitness for purpose within a transnational context.

The aim of this study was to revise and update the FIP's 2012 Global Competency Framework v1 to reflect contemporary competencies for early-career pharmacists (at the time of conducting the update).

METHODS

Please refer to Appendix 1 for a glossary of terms used in the method section.

This is a qualitative study that employed four rounds E-Delphi method. E-Delphi is an online method widely used in health and social research to strengthen decision-making processes and reach consensus.[21] Using established leadership networks, FIP initiated the project with a credible group of international experts. Reviewing and revising the 2012 version of GbCF was conducted through an iterative approach with repeated and synchronised rounds of analysis and revision focusing on the broad competency areas (or clusters) and associated behavioural statements (descriptors of competencies). This iterative process involved recruiting diverse and representative international expert panels to ensure transnational credibility. The iterative revision process was carried out between January and September 2020 and comprised four phases (Figure 1). In each phase, global expertise was sought on designated sections of the GbCF relevant to their area of expertise and experience. After soliciting input from the various groups, the project team reviewed comments and suggestions individually at first then discussed any discrepancies as a group. The project team incorporated the next set of suggestions in the framework and highlighted them for evaluation by the next group of experts. A consensus was reached when there was no further comments or modification received from the consulted experts.

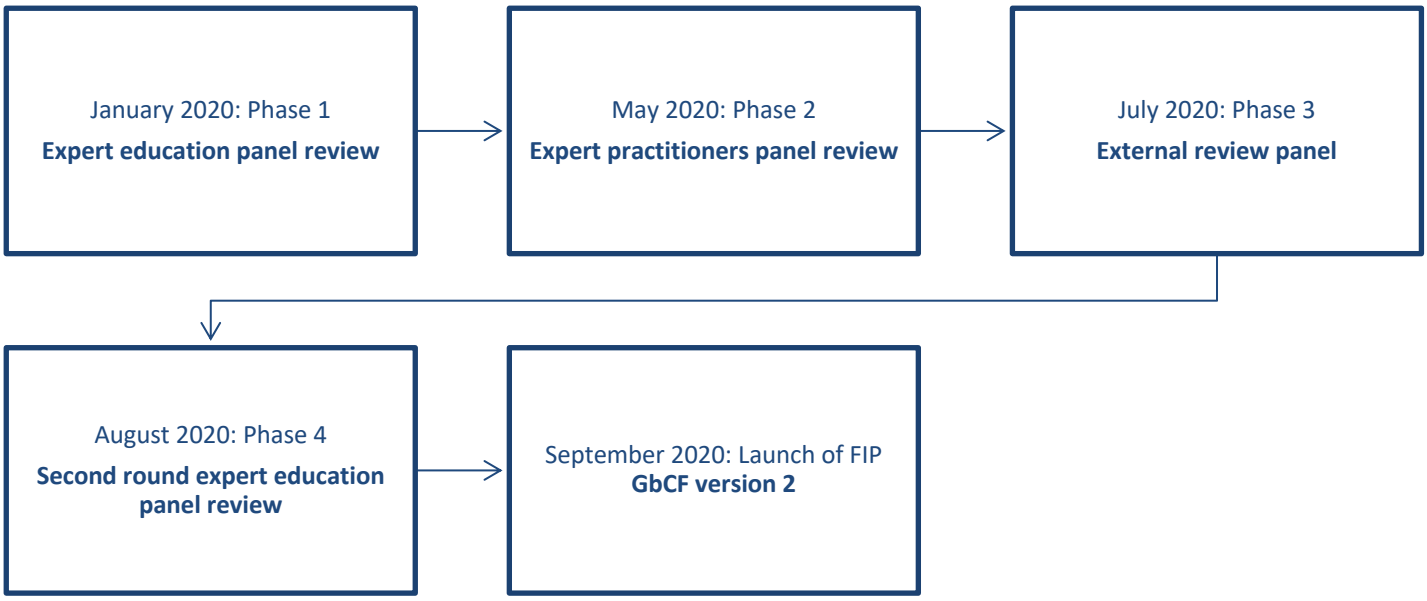

Figure 1: Multi-phased revision process of the FIP GbCF

Phase one: Expert education panel review

The initial phase in the revision process was conducted by DG2 Leads (AA, DB and SM). In this phase, DG2 Leads carried out a scoping review of contemporary pharmacists' roles based on literature search, the existing GbCF as a reference document and the expertise shared by the three DG2 Leads. The DG2 Leads have extensive knowledge and perspectives as each one of them either worked with or trained early career pharmacists in a different country and region. Whilst it was recognised to define a pharmacist's role is fraught with difficulties, as much seems to depend on context, sector of work, pharmacist's career stage and experience,[22] commonalities were identified and supported by current literature. Data in the form of competency area(s) and relevant behavioural statement(s) were collated and added to the existing GbCF. The information was collated via Microsoft Excel highlighting new and revised behavioural statements. This phase also involved extensive discussion with the GbCF 2012 developers on contemporary competencies (knowledge, skills or values and attitudes) deemed necessary to reflect an expanding and changing role of pharmacists worldwide. The discussion sessions were supplemented with findings from recent research publications and competency frameworks stemming from pharmacy, medical and nursing profession education, and training extracted in Phase one.[23-26] Behavioural statements in the original GbCF were also revised to ensure their currency to practice as it is known today, and changes were annotated accordingly (Table 4). The original developers were also given the opportunity to provide their professional comments and revisions.

Phase two: Expert practitioner panel review

In phase two the revision task involved consultations with a constituted panel of global expert practitioners. The panel comprised nominated FIP Global Leads on Advanced and specialist development (FIP DG4), Leadership development (FIP DG6), Advancing integrated services (FIP DG7), Working with others (FIP DG8), Continuing professional development strategies (FIP DG9), and Impact and outcomes (FIP DG 11). Each DG group was tasked to conduct a review of particular competency clusters and behavioural statements that were deemed to align with their area of expertise. The group task outcomes, referenced with information, comments, and revisions, were focused on three relevant issues related to transnational acceptance of the Goal. These were:

1) Should the cluster name be linked with "development" rather than "competency"? *e.g. PC competence development, Public Health competence development.*

2) What is the validity of scope of the current list of competency behaviours, particularly the newly added statements?

3) What behaviours are missing from the designated competency cluster?

A two-week turnover period was scheduled to allow DG2 Leads to collect data. After consulting the experts from FIP groups and receiving feedback, the Group Leads revised all comments, and incorporated edits and revisions made in the GbCF. In this phase, group Leads systematically reviewed all the validated comments before preparing the Framework for final revision.

Phase three: External review panel

Following the addition of new competencies and revision of existing ones, this phase involved iterative revision by a wider network of educational and practice experts to ensure wider applicability and relevancy of competencies in the revised framework to pharmacy practice worldwide. The external review panel was selected by convenience sampling and comprised 14 experts from Europe, Eastern Mediterranean and Western Pacific. The experience and expertise of the panel included academia, professional education and training, and research in workforce development. This process can be described as iterative consultation. Iterative consulting in this phase was seen as important to further provide validation to the added and modified statements from the perspective of experts in the field. The iterative consultation additionally included external reviewers.[27]

Phase four: Second round expert education panel review

After phase three consultation and compiling all revisions for updating the GbCF, the new version of the GbCF was re-presented to Phase 1 reviewers (the initial GbCFv 1 developers) for a final review and minor editing. In this final phase, reformatting the GbCFv2 was conducted including a schematic representation of the framework with competency clusters and competency domains (Figure 2).

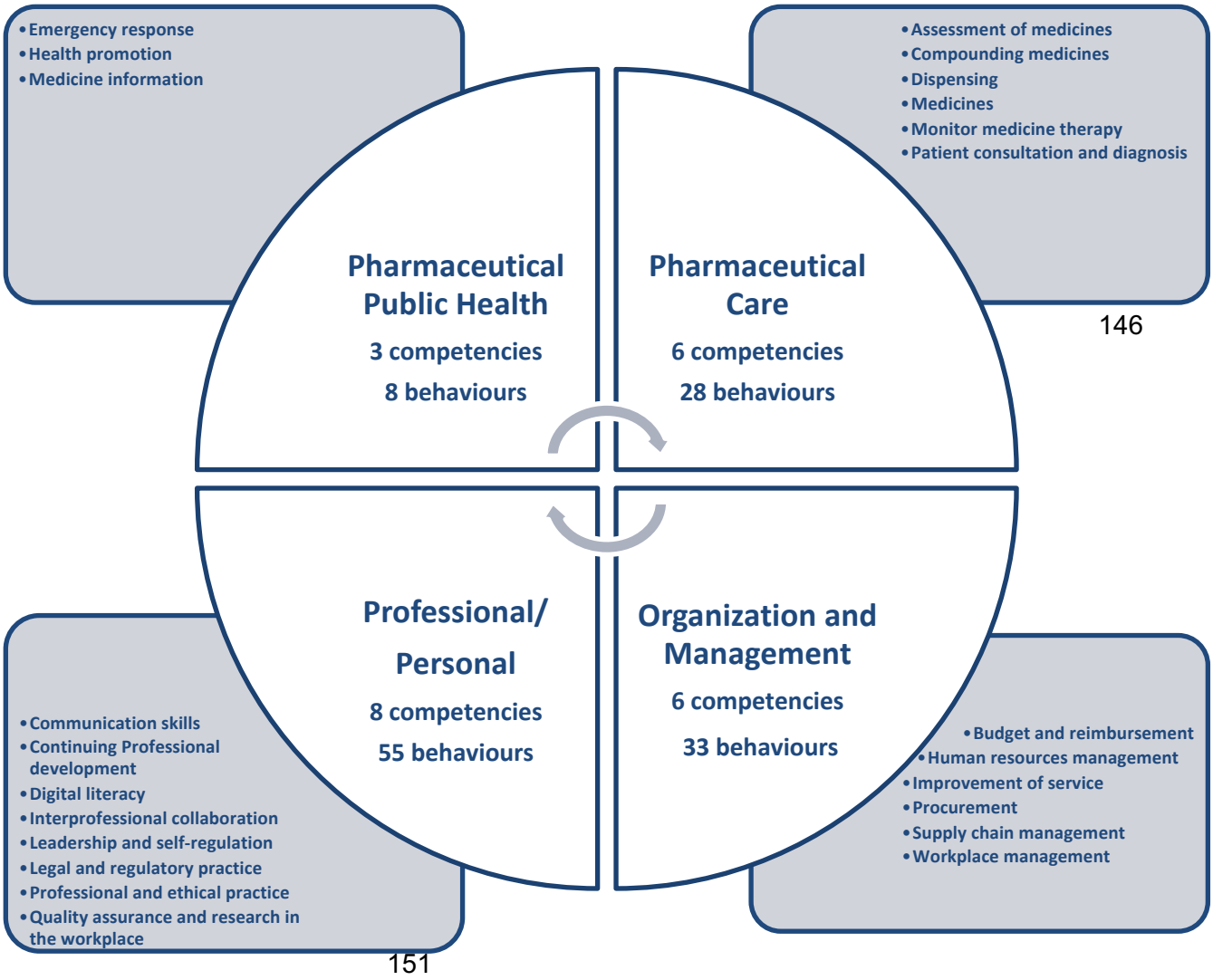

Figure 2: Global Competency Framework version 2 competency clusters

RESULTS

In September 2020, revisions to the GbCF were completed and an updated version GbCFv2 was developed. The number of behavioural statements increased from 100 to 124 behavioural statements, with 23 competency domains, increasing from 20, but remain structured within four broad competency clusters.

New competencies

As an outcome of the methodology, three new competencies were added to the GbCF (emergency response, digital literacy, and interprofessional collaboration) and one competency was renamed from self-management to: leadership and self-regulation (Table 2).

Emergency response:

The emergency response competency group was added to the Pharmaceutical Public Health cluster to cover competencies related to national and international emergencies and crises. With the recent COVID-19 pandemic[28] and ongoing health crisis around the world,[29] pharmacists have demonstrated the pivotal role they have in public health preparedness and response. Therefore, the pharmaceutical workforce, including early career pharmacists, should at least have the minimum necessary competency to act in response to crisis.[30]

Digital literacy:

Another competency that was added to the GbCF was digital literacy. This group of competencies was added to the professional/personal cluster to emphasise the vital role of technology in providing health care services. The use of technology and digital platforms is incorporated in all health care facilities globally.

Interprofessional collaboration:

That last added competency was interprofessional collaboration. This was also added to the professional/personal cluster. Collaborative practice within health care teams benefits patient outcomes,[31] and pharmacists worldwide are expected to work inter-professionally to provide essential medicines expertise.[31]

Leadership and self-regulation:

Finally, the competency 'self-management' was re-named as 'Leadership and self-regulation' to incorporate important aspects of leadership self-regulation which promote time management and prioritisation in the workplace.[32]

Table 2: Distribution of competencies in GbCF 2012 and GbCF 2020

GbCF 2012		**GbCF 2020**	
Cluster	Competencies	Cluster	Competencies
1. Pharmaceutical Public Health	1.1 Health Promotion 1.2 Medicines information and advice	1. Pharmaceutical Public Health	1.1 **Emergency response*** 1.2 Health promotion 1.3 Medicines information and advice
2. Pharmaceutical Care	2.1 Assessment of medicines 2.2 Compounding medicines 2.3 Dispensing 2.4 Medicines 2.5 Monitor medicines therapy	2. Pharmaceutical Care	2.1 Assessment of medicines 2.2 Compounding medicines 2.3 Dispensing 2.4 Medicines 2.5 Monitor medicines therapy 2.6 Patient consultation and diagnosis

	2.6 Patient consultation and diagnosis		
3. Organisation and Management	3.1 Budget and reimbursement 3.2 Human resources management 3.3 Improvement of service 3.4 Procurement 3.5 Supply chain and management 3.6 Workplace management	3. Organisation and Management	3.1 Budget and reimbursement 3.2 Human resources management 3.3 Improvement of service 3.4 Procurement 3.5 Supply chain management 3.6 Workplace management
4. Professional/Personal	4.1 Communication skills 4.2 Continuing professional development (CPD) 4.3 Legal and regulatory practice 4.4 Professional and ethical practice 4.5 Quality assurance and research in the workplace 4.6 Self-management	4. Professional/Personal	4.1 Communication skills 4.2 Continuing Professional Development (CPD) 4.3 **Digital literacy*** 4.4 **Interprofessional collaboration*** 4.5. **Leadership and self-regulation**** 4.6 Legal and regulatory practice 4.7. Professional and ethical practice 4.8. Quality assurance and research in the workplace

* New/added competencies
** Modified title/competencies

Additional competency behaviours

Twenty-four new behaviours were added to the GbCF (Table 3). Two new behaviours were added to the new competency 'emergency response'. One new behaviour was added to the competency 'health promotion' to address national and local priorities. Additionally, one new behaviour was added to 'Medicine's information and advice' to ensure competence related to health informatics and proper use of technology. Another two new behaviours were added to the competency 'assessment of medicine' to reflect necessary competencies related to patients' information retrieval and interpretation to ensure optimum patient care.

A behavioural statement related to improving health literacy increasing patient education and counselling was added to 'Patient consultation and diagnosis' competency. Another two behavioural statements were added to 'Supply chain management' and 'Continuing Professional Development (CPD)' competencies to minimize risk of medicines shortages and to highlight the importance of life-long learning, respectively. Four new behaviours were added to the new competency 'Digital literacy' to ensure that the pharmacy workforce is able to identify skills adaptations linked with advancing health care technology. Four new behaviours were included in the new competency 'Interprofessional collaboration' to better enable the pharmacy workforce to work in teams and with other health care professionals.

198 The 'Interprofessional collaboration' competency also includes a fifth behaviour that was moved from the 'Human
199 resources management' competency found in the GbCF 2012. Three new behaviours were added to the competency
200 'Leadership and self-regulation' to reflect the importance of emotional intelligence, flexibility and adaptability, as well as
201 resilience.

202 Finally, four new behaviours were added to the 'Professional and ethical practice' competency. These involved behaviours
203 related to social accountability and support to patients to make informed choices about medicine use.

204 Table 3: Additional competency behaviours in the GbCFv2 2020

Competencies	Behaviours
1.1 Emergency response	1.1.1 Participate in the response to public health emergencies
	1.1.2 Assist the multidisciplinary health care teams in emergency situations
1.2 Health promotion	1.2.3 Identify and support national and local health priorities and initiatives
1.3 Medicines information and advice	1.3.3 Support the patient's use of health information technologies and digital communication (including IT driven health solutions)
2.1 Assessment of medicines	2.1.1 Gather, analyse, research, and interpret information about the patient and patient's medicines-related needs (e.g. indication, effectiveness, safety and adherence)
	2.1.2. Retrieve relevant patient information (including drug history, or immunisation status for example) and record of allergies to medicines and Adverse Drug Reactions (ADR) in medication record
2.6 Patient consultation and diagnosis	2.6.4 Evaluate, assess, and develop health literacy education and counselling on medicines and health care needs
3.5 Supply chain management	3.5.7 Mitigate risk of medicines shortages and stock outs through liaison and appropriate communication with health care staff, health care stakeholders, clients/customers and patients
4.2 Continuing Professional Development (CPD)	4.2.9 Demonstrate engagement/participation in professional development and lifelong learning activities
4.3 Digital literacy	4.3.1 Identify, manage, organise, store, and share digital information
	4.3.2 Critically appraise, analyse, evaluate, and/or interpret digital information and their sources
	4.3.3 Where applicable, participate in digital health services that promote health outcomes and engage with digital technologies (e.g. social media platforms & mobile applications) to facilitate discussions with the patient and others
	4.3.4 Maintain patient privacy and security of digital information related to the patient and workplace
4.4 Interprofessional collaboration	4.4.1 Respect and acknowledge the expertise, roles and responsibilities of colleagues and other health professionals
	4.4.2 Participate, collaborate, advise in therapeutic decision-making, and use appropriate referral in a multi-disciplinary team*
	4.4.3 Engage in collaborative practice, research and service provision to optimise patient health outcomes
	4.4.4 Engage in relationship-building with health professionals allowing conflict resolution, teamwork, communication, and consultation
	4.4.5 Demonstrate mutual respect and adopt shared values of the workplace and toward patient care

4.5. Leadership and self-regulation	4.5.6 Recognise and describe emotional information about self and others (e.g. self-awareness, self-regulation, motivation, social skills and empathy)
	4.5.7 Demonstrate flexibility and adaptability to a variety of conditions and circumstances
	4.5.8 Recognise when affected by setbacks or stress and manage with effective coping strategies (resilience)
4.7. Professional and ethical practice	4.7.2 Fulfil duty of care to the patient and the public
	4.7.4 Comply with patient privacy legislation including documentation of information
	4.7.5 Consider available evidence and support the patient to make informed choices about medicine use
	4.7.9 Demonstrate awareness of socially accountable practice (including cultural and social needs; cultural safety, respect, and responsiveness; diversity, equity and inclusiveness).

205 * Moved from the 'Human Resources management' competency found in GbCF 2012
206
207
208 **Modified behaviours**
209
210 Table 4 presents the behaviours that were in the GbCF 2012 but were modified and updated in the GbCF 2020.
211
212 Table 4: Updated competency behaviours in the GbCFv2 2020

Competencies	Behaviours	
	GbCF 2012	GbCF 2020
1.2 Health promotion	1.1.1 Assess the primary health care needs (taking into account the cultural and social setting of the patient)	1.2.1 Assess the **patient's/population's** primary health care needs (taking into account the cultural and social setting of the patient**/populations**)
	1.1.2 Advise on health promotion, disease prevention and control, and healthy lifestyle	1.2.2 Advise and **provide services directly associated with public health provision**; disease prevention and control (e.g. **vaccination services provision**); and healthy lifestyle
1.3 Medicines information and advice	1.2.2 Identify sources, retrieve, evaluate, organise, assess and disseminate relevant medicines information according to the needs of patients and clients and provide appropriate information	1.3.2 Identify sources, retrieve, evaluate, organise, assess and **provide relevant and appropriate** medicines information according to the needs of patients and clients
2.1 Assessment of medicines	2.1.2 Identify, prioritise and act upon medicine-medicine interactions; medicine-disease interactions; medicine-patient interactions; medicines-food interactions	2.1.3 Identify, prioritise**, resolve and follow up** on medicine-medicine interactions; medicine-disease interactions; medicine-patient interactions; medicines-food interactions
2.3 Dispensing	2.3.1 Accurately dispense medicines for prescribed and/or minor ailments and monitor the dispense (re-checking the medicines)	2.3.1 Accurately dispense medicines for prescribed and/or minor ailments, **including an embedded checking process**
2.5 Monitor medicines therapy	2.5.2 Ensure therapeutic medicines monitoring, impact and outcomes (including objective and subjective measures)	2.5.2 **Apply** therapeutic medicines monitoring and assess impact, and outcomes (including objective and subjective measures)
2.6 Patient consultation and diagnosis	2.6.1 Apply first aid and act upon arranging follow-up care	2.6.1 **Support urgent care needs (physical and mental) of patients and others** and act upon arranging follow-up care

	2.6. Assess and diagnose based on objective and subjective measures	2.6.3 Assess and diagnose based on objective and subjective measures **(where applicable)**
	2.6.5 Document any intervention (e.g. document allergies, medicines and food in the patient medicines history)	2.6.6 Document any intervention (e.g. document allergies, **such as from** medicines and **nutrition** in the patient's medicines history)
3.1 Budget and reimbursement	3.1.1 Acknowledge the organisational structure	3.1.1 Acknowledge the **workplace** organisational structure
	3.1.3 Ensure appropriate claims for the reimbursement	3.1.3 **Manage** appropriate claims for reimbursements
3.2 Human resources management	3.2.1 Demonstrate organisational and management knowledge (e.g. know, understand and lead on medicines management, risk management, self-management, time management, people management, project management, policy management)	3.2.1 Demonstrate organisational and management **skills** (e.g. **plan, organise** and lead on medicines management; risk management; self-management; time management; people management; project management; policy management.)
3.4 Procurement	3.4.5 Select reliable supplies of high-quality products (including appropriate selection process, cost effectiveness, timely delivery)	3.4.5 **Identify and** select reliable supplier(s) **3.4.6** Select reliable supply of high-quality products (including appropriate selection and procurement processes, cost effectiveness, timely delivery)
3.5 Supply chain management	3.5.2 Ensure accurate verification of rolling stocks	3.5.2 **Verify** the accuracy of rolling stocks
4.1 Communication skills	4.1.3 Demonstrate cultural awareness and sensitivity 4.1.4 Tailor communications to patient needs	4.1.3 Tailor communication that is appropriate to the patient's needs (including health literacy, cultural or language barriers, social needs, and emotional status)
4.2 Continuing Professional Development (CPD)	4.2.6 Identify learning needs	4.2.4 Identify learning **and development** needs
	4.2.4 Evaluate learning	4.2.5 Evaluate learning **and development progress**
	4.2.5 Identify if expertise needed outside the scope of knowledge	4.2.6 Identify if expertise is needed outside **current** scope of knowledge
4.6 Legal and regulatory practice	4.3.2 Apply knowledge in relation to the principals of business economics and intellectual property rights including the basics of patent interpretation	4.6.2 **Apply the principles of business economics** and intellectual property rights including the basics of patent interpretation
	4.3.5 Demonstrate knowledge in marketing and sales	4.6.5 **Apply the principles** of marketing and sales
	4.3.7 Understand the steps needed to bring a medicinal product to the market including the safety, quality, efficacy, and pharmacoeconomic assessments of the product	4.6.7 **Recognise the** steps needed to bring a **medical device or medicine** to the market including the safety, quality, efficacy and pharmacoeconomic assessments of the product
4.7. Professional and ethical practice	4.4.1 Demonstrate awareness of local/national codes of ethics	4.7.1 Demonstrate awareness **and employment** of local/national codes of ethics
	4.4.2 Ensure confidentiality (with the patient and other health care professional)	4.7.3 **Maintain privacy and** confidentiality (with the patient and other health care professionals)
	4.4.5 Take responsibility of own action and for patient care	4.7.8 **Demonstrate professional responsibility for all decisions made and actions taken**
	4.4.4 Recognise own professional limitation	4.7.7 Recognise professional limitations **of self and others in the team**
4.8. Quality assurance and	4.5.1 Apply research findings and understand the benefits risk (e.g. pre-	4.8.1 Apply research findings and understand risk-benefit **analyses** (e.g. pre-clinical, clinical trials,

research in the workplace	clinical, clinical trials, experimental clinical-pharmacological research and risk management	experimental clinical pharmacological research, and risk management)
	4.5.2 Audit quality of service (ensure that they meet local and national standards and specifications)	4.8.2 Audit quality of service (meet local and national standards and specifications)
	4.5.5 Ensure medicines are not counterfeit and quality standards	4.8.5 Ensure medicines are not counterfeit and **adhere** to quality standards
4.5. Leadership and self-regulation*	4.6.4 Ensure punctuality	4.5.4 **Prioritise work**, practice punctuality **and time management**
	4.6.5 Prioritise work and implement innovative ideas	4.5.5 **Develop,** implement **and monitor** innovative ideas

*Previously named self-management

Final framework

Table 5 presents the final clusters, competencies and behaviours in the GbCF 2012.

Table 5: FIP Global Competency Framework (GbCF) version 2 - 2020

1. Pharmaceutical Public Health	
Competencies	**Behaviours**
1.1 Emergency response	1.1.1 Participate in the response to public health emergencies
	1.1.2 Assist the multidisciplinary health care teams in emergency situations
1.2 Health promotion	1.2.1 Assess the patient's/population's primary health care needs (taking into account the cultural and social setting of the patient/populations)
	1.2.2 Advise and provide services directly associated with public health provision; disease prevention and control (e.g. vaccination services provision); and healthy lifestyle.
	1.2.3 Identify and support national and local health priorities and initiatives
1.3 Medicines information and advice	1.3.1 Counsel the patient/population on the safe and rational use of medicines and devices (including the selection, use, contraindications, storage, and side effects of non-prescription and prescription medicines)
	1.3.2 Identify sources, retrieve, evaluate, organise, assess and provide relevant and appropriate medicines information according to the needs of patients and clients
	1.3.3 Support the patient's use of health information technologies and digital communication (including IT driven health solutions)
2. Pharmaceutical Care	
Competencies	**Behaviours**
2.1 Assessment of medicines	2.1.1 Gather, analyse, research, and interpret information about the patient and patient's medicines-related needs (e.g. indication, effectiveness, safety and adherence)
	2.1.2. Retrieve relevant patient information (including drug history, or immunisation status for example) and record of allergies to medicines and Adverse Drug Reactions (ADR) in medication record
	2.1.3 Identify, prioritise, resolve and follow up on medicine-medicine interactions; medicine-disease interactions; medicine-patient interactions; medicines-food interactions
	2.1.4 Appropriately select medicines (e.g. according to the patient, hospital, government policy, etc)

2.2 Compounding medicines	2.2.1 Prepare pharmaceutical medicines (e.g. extemporaneous, cytotoxic medicines), determine the requirements for preparation (calculations, appropriate formulation, procedures, raw materials, equipment etc.)
	2.2.2 Compound under the good manufacturing practice for pharmaceutical (GMP) medicines
2.3 Dispensing	2.3.1 Accurately dispense medicines for prescribed and/or minor ailments, including an embedded checking process
	2.3.2 Accurately report defective or substandard medicines to the appropriate authorities
	2.3.3 Appropriately validate prescriptions, ensuring that prescriptions are correctly interpreted and legal
	2.3.4 Dispense devices (e.g. Inhaler or a blood glucose meter)
	2.3.5 Document and act upon dispensing errors
	2.3.6 Implement and maintain a dispensing error reporting system and a 'near misses' reporting system
	2.3.7 Label the medicines (with the required and appropriate information)
	2.3.8 Learn from and act upon previous 'near misses' and 'dispensing errors'
2.4 Medicines	2.4.1 Advise patients on proper storage conditions of the medicines and ensure that medicines are stored appropriately (e.g. humidity, temperature, expiry date, etc.)
	2.4.2 Appropriately select medicines formulation and concentration for minor ailments (e.g. diarrhoea, constipation, cough, hay fever, insect bites, etc.)
	2.4.3 Ensure appropriate medicines, route, time, dose, documentation, action, form and response for individual patients
	2.4.4 Package medicines to optimise safety (ensuring appropriate re-packaging and labelling of the medicines)
2.5 Monitor medicines therapy	2.5.1 Apply guidelines, medicines formulary system, protocols, and treatment pathways
	2.5.2 Apply therapeutic medicines monitoring and assess impact, and outcomes (including objective and subjective measures)
	2.5.3 Identify, prioritise, and resolve medicines management problems (including errors)
2.6 Patient consultation and diagnosis	2.6.1 Support urgent care needs (physical and mental) of patients and others and act upon arranging follow-up care
	2.6.2 Appropriately refer the patient or carer
	2.6.3 Assess and diagnose based on objective and subjective measures (where applicable)
	2.6.4 Evaluate, assess, and develop health literacy education and counselling on medicines and health care needs
	2.6.5 Discuss and agree with the patient on the appropriate use of medicines, taking into account patients' preferences
	2.6.6 Document any intervention (e.g. document allergies, such as from medicines and nutrition in the patient's medicines history)
	2.6.7 Obtain, reconcile, review, maintain and update relevant patient medication and disease history
3. Organisation and Management	
Competencies	**Behaviours**
3.1 Budget and reimbursement	3.1.1 Acknowledge the workplace organisational structure
	3.1.2 Effectively set and apply budgets
	3.1.3 Manage appropriate claims for reimbursements
	3.1.4 Ensure financial transparency

	3.1.5 Ensure proper reference sources for service reimbursement
3.2 Human resources management	3.2.1 Demonstrate organisational and management skills (e.g. plan, organise and lead on medicines management; risk management; self-management; time management; people management; project management; policy management.)
	3.2.2 Identify and manage human resources and staffing issues
	3.2.3 Recognise and manage the potential of each staff member and utilise systems for performance management (e.g. conduct staff appraisals)
	3.2.4 Recognise the value of pharmacy team and of a multidisciplinary team
	3.2.5 Support and facilitate staff training and continuing professional development
3.3 Improvement of service	3.3.1 Identify, implement, and monitor new services (according to local needs)
	3.3.2 Resolve, follow up and prevent medicines related problems
3.4 Procurement	3.4.1 Access reliable information and ensure the most cost-effective medicines in the right quantities with the appropriate quality
	3.4.2 Develop and implement contingency plans for shortages
	3.4.3 Efficiently link procurement to formulary, to push/pull system (supply chain management) and payment mechanisms
	3.4.4 Ensure there is no conflict of interest
	3.4.5 Identify and select reliable supplier(s)
	3.4.6 Select reliable supply of high-quality products (including appropriate selection and procurement processes, cost effectiveness, timely delivery)
	3.4.7 Supervise procurement activities
	3.4.8 Understand the tendering methods and evaluation of tender bids
3.5 Supply chain management	3.5.1 Demonstrate knowledge in store medicines to minimise errors and maximise accuracy
	3.5.2 Verify the accuracy of rolling stocks
	3.5.3 Ensure effective stock management and running of service with the dispensary
	3.5.4 Ensure logistics of delivery and storage
	3.5.5 Implement a system for documentation and record keeping
	3.5.6 Take responsibility for quantification and supply chain forecasting
	3.5.7 Mitigate risk of medicines shortages and stock outs through liaison and appropriate communication with health care staff, health care stakeholders, clients/customers and patients
3.6 Workplace management	3.6.1 Address and manage day-to-day management issues
	3.6.2 Demonstrate the ability to take accurate and timely decisions and make appropriate judgements
	3.6.3 Ensure the production schedules are appropriately planned and managed
	3.6.4 Ensure the work time is appropriately planned and managed
	3.6.5 Improve and manage the provision of pharmaceutical services
	3.6.6 Recognise and manage pharmacy resources (e.g. financial, infrastructure)
4. Professional/Personal	
Competencies	**Behaviours**
4.1 Communication skills	4.1.1 Communicate clearly, precisely, and appropriately while being a mentor or tutor

	4.1.2 Communicate effectively with health and social care staff, support staff, patients, carer, family relatives and clients/customers, using lay terms and checking understanding
	4.1.3 Tailor communication that is appropriate to the patient's needs (including health literacy, cultural or language barriers, social needs, and emotional status)
	4.1.4 Use appropriate communication skills (e.g. verbal and non-verbal) to establish and maintain rapport with the patient and others including when communicating through digital and electronic platforms
4.2 Continuing Professional Development (CPD)	4.2.1 Document CPD activities
	4.2.2 Engage with students/interns/residents
	4.2.3 Evaluate accuracy of knowledge and skills
	4.2.4 Identify learning and development needs
	4.2.5 Evaluate learning and development progress
	4.2.6 Identify if expertise is needed outside current scope of knowledge
	4.2.7 Recognise own limitations and act upon them
	4.2.8 Reflect on performance
	4.2.9 Demonstrate engagement/participation in professional development and lifelong learning activities
4.3 Digital literacy	4.3.1 Identify, manage, organise, store, and share digital information
	4.3.2 Critically appraise, analyse, evaluate, and/or interpret digital information and their sources
	4.3.3 Where applicable, participate in digital health services that promote health outcomes and engage with digital technologies (e.g. social media platforms & mobile applications) to facilitate discussions with the patient and others
	4.3.4 Maintain patient privacy and security of digital information related to the patient and workplace
4.4 Interprofessional collaboration	4.4.1 Respect and acknowledge the expertise, roles and responsibilities of colleagues and other health professionals
	4.4.2 Participate, collaborate, advise in therapeutic decision-making, and use appropriate referral in a multi-disciplinary team
	4.4.3 Engage in collaborative practice, research and service provision to optimise patient health outcomes
	4.4.4 Engage in relationship-building with health professionals allowing conflict resolution, teamwork, communication, and consultation
	4.4.5 Demonstrate mutual respect and adopt shared values of the workplace and toward patient care
4.5. Leadership and self-regulation	4.5.1 Apply assertiveness skills (inspire confidence)
	4.5.2 Demonstrate leadership and practice management skills, initiative and efficiency
	4.5.3 Document risk management (critical incidents)
	4.5.4 Prioritise work, practice punctuality and time management
	4.5.5 Develop, implement and monitor innovative ideas
	4.5.6 Recognise and describe emotional information about self and others (e.g. self-awareness, self-regulation, motivation, social skills and empathy)
	4.5.7 Demonstrate flexibility and adaptability to a variety of conditions and circumstances

	4.5.8 Recognise when affected by setbacks or stress and manage with effective coping strategies (resilience)
4.6 Legal and regulatory practice	4.6.1 Apply regulatory affairs and the key aspects of pharmaceutical registration and legislation
	4.6.2 Apply the principles of business economics and intellectual property rights including the basics of patent interpretation
	4.6.3 Be aware of and identify the new medicines coming to the market
	4.6.4 Comply with legislation for drugs with the potential for abuse
	4.6.5 Apply the principles of marketing and sales
	4.6.6 Engage with health and medicines policies
	4.6.7 Recognise the steps needed to bring a medical device or medicine to the market including the safety, quality, efficacy and pharmacoeconomic assessments of the product
4.7. Professional and ethical practice	4.7.1 Demonstrate awareness and employment of local/national codes of ethics
	4.7.2 Fulfil duty of care to the patient and the public
	4.7.3 Maintain privacy and confidentiality (with the patient and other health care professionals)
	4.7.4 Comply with patient privacy legislation including documentation of information
	4.7.5 Consider available evidence and support the patient to make informed choices about medicine use
	4.7.6 Obtain patient consent (it can be implicit on occasion)
	4.7.7 Recognise professional limitations of self and others in the team
	4.7.8 Demonstrate professional responsibility for all decisions made and actions taken
	4.7.9 Demonstrate awareness of socially accountable practice (including cultural and social needs; cultural safety, respect, and responsiveness; diversity, equity and inclusiveness).
4.8. Quality assurance and research in the workplace	4.8.1 Apply research findings and understand risk-benefit analyses (e.g. pre-clinical, clinical trials, experimental clinical pharmacological research, and risk management)
	4.8.2 Audit quality of service (meet local and national standards and specifications)
	4.8.3 Develop and implement standing Operating Procedures (SOP's)
	4.8.4 Ensure appropriate quality control tests are performed and managed appropriately
	4.8.5 Ensure medicines are not counterfeit and adhere to quality standards
	4.8.6 Identify and evaluate evidence-base to improve the use of medicines and services
	4.8.7 Identify, investigate, conduct, supervise and support research at the workplace (enquiry-driven practice)
	4.8.8 Implement, conduct and maintain a reporting system of pharmacovigilance (e.g. report Adverse Drug Reactions)
	4.8.9 Initiate and implement audit research activities

220

221 **DISCUSSION**

222 This study aimed to revise and update the FIP's 2012 Global Competency Framework v1 to reflect contemporary
223 competencies for early-career pharmacists. After a four-round Delphi process with 29 international experts, the number of

behavioural statements increased from 100 to 124 behavioural statements, with 23 competency domains, increasing from 20, but remain structured within four broad competency clusters.

Competency frameworks in health professions education and training are used to help practitioners navigate and advance their careers.[12, 24, 33-35] In addition to the GbCF, in 2021 FIP developed the FIP Global Humanitarian Competency Framework to provide an international competency framework for pharmacists working in the humanitarian arena, that would be used to guide education and training programmes in this increasingly important field of practice.[36] More recently, in a global effort to consolidate CBET for healthcare professionals and provide structural support, the WHO published the Global Competency and Outcomes Framework for Universal Health Coverage,[35] to advance progress towards UHC through alignment of health worker education approaches with population health needs and health system demands.[35] In pharmacy, pharmacists' early career development can be supported by these frameworks and specifically the FIP GbCF has been used as a base in several countries for the development and implementation of their own frameworks.[37, 38,39]

Whilst the revision of the original FIP GbCF did not change the overall structure of the revised framework, the number of competencies and associated behavioural statements increased due to important additions. These included emergency response, digital literacy, interprofessional collaboration and an expansion of leadership and self-regulation.

Pharmacists and pharmacies remain crucial for public access to medicines expertise and public health delivery; however, they are also uniquely positioned to serve patients impacted by disasters such as natural disasters; infectious diseases; and man-made disasters.[40] Research on the role of pharmacists in emergency response to disasters[41] and humanitarian crisis[42] is not lacking. Pharmacists have pivotal roles in the prevention, preparedness, response, and recovery to disasters and shared decision-making process during crises.[43] These 'non-traditional' roles during the COVID-19 pandemic have been amplified with additional services in vaccination and supply chain management but also where humanitarian crises have worsened. However, professional support and further training of pharmacists in emergency response and preparedness, and associated knowledge and skills remain limited.[41] The pharmaceutical workforce, including early career pharmacists, needs to have access to a necessary competency framework to act in response to a crisis – making "emergency response" a significant new addition to the GbCF.

Building on this, the FIP Global Humanitarian Competency Framework was produced as a further, more advanced, extension as a developmental framework designed to be used for and by pharmacists specifically working in the humanitarian arena.[36] In conjunction with the revised GbCF, both frameworks ensure that an "adopt and/or adapt" approach for implementation can be applied at global, regional, national and organisational levels. The adopt and/or adapt method is centred on the concept of progressive evidence-led development without requiring duplication or replication, whereby contextual and situational specifics around practice, professional, and regulatory circumstances can be adapted from what has been shown to work in practice. Equally important is having a digitally equipped pharmaceutical workforce that is able to face the many challenges of digital technologies incorporated in patient care and health services.

Pharmacists must be prepared with the knowledge and skills in digital technology to fulfil their roles efficiently and effectively. We have all been disrupted by the COVID-19 pandemic and forced to integrate digital technology into our lives to sustain our professional and social demands and wants. Subsequently, adding behavioural statements on digital literacy would also apply to pharmacists needing baseline guidance on digital competencies. The new foundational competencies represent actions that pharmacists can perform when dealing with digital inquiries/services/products particularly related to digital health provision. These competencies outline what pharmacists may need to identify and manage to critically appraise and participate in digital health, and to maintain privacy and security of digital information. The FIP DG 20 on digital health specifically focuses on enablers of digital transformation within the pharmaceutical workforce and on effective processes to facilitate the development of a digitally literate workforce.

The World Health Organization projected shortfall of 15 million health workers by 2030, mostly in low- and lower-middle income countries, is alarming.[44] Pharmacists, in particular, are lacking in the workforce in many countries.[5] Efforts for transforming and scaling up health professionals' education and training including interprofessional education have been advocated by WHO and resonated by FIP and the profession globally.[31] In addition, interprofessional education and training needs to be strengthened to advance team-based approaches promoting holistic patient centered care and engagement between health care professions. Five behavioural statements were added to the GbCFv2 covering pertinent aspects of interprofessional collaboration for professional development ranging from demonstrating mutual respect, building relationships and effectively engaging in collaborative practice.

Other vital skills early career pharmacists must acquire are leadership and self-regulation. Self-regulation is "an ability to control responses within the self- It is both behavioural (personality) and biological (temperament/disposition)".[45] Optimal self-regulation is directly related to how well performers manage novel events, a capacity that is influenced by temperament, early developmental experiences, and personality traits.[45] Pharmacists like other health care workers have leadership, mentoring, educator and team-based roles that need to be developed and promoted from early years in practice. But pharmacists around the world are consistently being challenged by numerous factors that make their work conditions stressful such as high workload, low job control, job dissatisfaction and stressful workplaces.[46, 47] At the same time, there is the basic assumption that, if employees are well educated for their profession (in this case pharmacists), they are assumed to be willing and able to autonomously regulate their job tasks responsibly, solve daily problems and proactively ask feedback from colleagues if necessary.[48] Early career pharmacists require to demonstrate a level of self-awareness, responsibility and self-management that will allow them to remain calm in challenging situations and respond or practise more effectively, both independently and within teams or groups.

The incorporation of mental health triage and first aid in addition to physical first aid is important to highlight in the revised GbCF. According to the WHO one in every eight people in the world live with mental disorders.[49] Pharmacists, in their expanding roles, are accessible to provide drug expertise and play an important part in collaborative mental health care including provision of mental health first aid.[50] This has been added in point 2.6.1 "Support urgent care needs (physical and mental) of patients and others and act upon arranging follow-up care".

Foundation training is needed by all regulated health care professionals and early career pharmacists are no exception as they transition towards more advanced stages of practice. To support pharmacists in their transitional phase, it is recommended that professional pharmacy organisations and regulators have a competency framework to support pharmacist professional development and career progression. The GbCFv2 is designed to be adopted and adapted for registered pharmacists to assist with their career progression. The implementation of the GbCFv2 not only supports pharmacists in their career progression but is crucial for professional bodies to progress towards meeting the FIP Global Vision for Pharmaceutical Workforce & Education[51] and the FIP Development Goals (FIP DGs), particularly FIP DG 2 focused on early career training strategy. The GbCF supports and complements progression of the pharmaceutical workforce related to other DGs such as advanced and specialist development; competency development; leadership development; advancing integrated services, working with others; continuing professional development strategies and medicines expertise.

A competency developmental framework meets a number of functional purposes ranging from curriculum development and pre-registration programmes, CPD, development of specialisation, and advanced practice, as well as a benchmark for society by stating the professional role of a pharmacist.[52] However, this can only be achieved with support from pharmacy leaders and relevant stakeholders to formulate policies related to the implementation of competency frameworks and foundation training strategies. FIP's Workforce Transformation Programme (WTP) is a practical and flexible model, which will: assist countries in assessing their individual pharmacy workforce needs and priorities; support them to develop needs-based national workforce strategies and infrastructure; and provide co-created solutions, tools, mechanisms and resources for implementation. FIP also supports its members and the wider profession community through its dissemination strategies of the GbCF and other developmental frameworks and resources including an online catalogue of resources (the FIP Development Goals microsite) which hosts case studies, publications and research projects in various countries where such frameworks are being applied in practice, and for workforce development and education.

Strengths of our research on this new revision are the engagement with internal experts representing a range of national professional environments and pharmaceutical care delivery cultures. This credibility lends weight to the transnational generalisability of the framework. One limitation is that in the revision of the framework, it may not have been possible to capture all competencies, services, and roles pharmacists are engaged with at the time. However, we argue this is not the aim of the GbCF; rather it is to represent a generic, comprehensive, framework from which nationalised specifics can be applied. The GbCF may also outline competencies that are irrelevant to pharmacists' scope of practice in particular contexts or countries. However, it is encouraged to view these as enabling competencies to support pharmacists in providing a wider scope of services to patients and enhancing professional performance.[53] The GbCF version 2 remains a dynamic and relevant framework that will be updated every 5-8 years to reflect new competencies for contemporary and essential pharmacy services in practice and inclusive of all settings.

Conclusions

In this study, the FIP GbCF original version of 2012 was revised and updated which resulted in the production of a second version composed of 124 behavioural statements embedded in four broad competency clusters. The validated framework is intended to act as a mapping tool for pharmacists to progress towards effective and sustained performance and to prepare them for advanced and specialist roles and services. With a global perspective in mind, the GbCF ensures that an "adopt and adapt" approach for implementation can be consistently applied at global, regional, national and organisational levels.

Acknowledgements

The authors wish to thank all the review panels for their contribution to reviewing the FIP Global Competency Framework.

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Appendix 1

Glossary of FIP-specific terms

Term	Description
Competency (Competencies-plural)	Observable components of knowledge, skills, attitudes and values expressed as actual behaviour which can be measured and assessed
Competence	Capacity to perform job responsibilities (or pertaining to situations) effectively.
FIP DGs	Development goals for transforming global pharmacy across science, practice and workforce & education to support global health.
Workforce Development Hub (WDH)	FIP workforce development hub.
WDH director	Director of the FIP workforce development hub.
DG Lead/ WDH Lead	A pharmacy practitioner, academic or pharmaceutical scientist with an area of interest or expertise in any sector in pharmacy.
DG2 leads	A pharmacy practitioner, academic or pharmaceutical scientist with an area of interest or expertise in early career pharmacist development and training.
GbCF developer	Experts in the pharmacy field who first developed the GbCF in 2012 based on extensive literature search, content analysis, expert panels/focus groups and a global survey.
Expert Education Panel	A pharmacy academic, or pharmaceutical scientist, or education expert with an area of interest or expertise in early career pharmacist development and training.
Expert Practitioner Panel	A pharmacy practitioner or pharmaceutical scientist with an area of interest or expertise in early career pharmacist development and training.
External Review Panel	A pharmacy practitioner, academic or pharmaceutical scientist with an area of interest or expertise in any sector in pharmacy outside the FIP Hub/Boards/Sections/Groups.

459 **Appendix 2**

460 Composition of expert groups

Phase **Expert groups (no)**	**Country**	**Region**	**Area of expertise**
Internal review (Total no=18)			
DG4: Advanced and specialist development (n=3)	Indonesia	Asia	Academia, research in interprofessional education and training
	Australia	Western Pacific	Experiential training
	United Kingdom	Europe	Academia, research
DG6: Leadership development (n=3)	USA	America	Academia, research in leadership
	UK	Europe	Pharmaceutical public health
	USA	America	Academia, research in leadership
DG8: Working with others (n=3)	USA	America	Interprofessional education and curriculum development
	Switzerland	Europe	Interprofessional education
	Brazil	America	Academia and research
DG7: Advancing integrated services (n=3)	Lebanon	Eastern Mediterranean	Academia and research, practitioner
	South Africa	Africa	Professional development and support
	Germany	Europe	Academia, industrial research, and innovation
DG9: Continuing professional development (CPD) strategies (n=2)	Jordan	Eastern Mediterranean	Academia, research and quality assurance in pharmacy education.
	Australia	Europe	CPD and practice
DG11: Impact and outcomes (n=1)	Philippines	Western Pacific	Academia, workforce development and support
DG5: Competency development (n=3)	Australia	Western Pacific	Academia, research in workforce competency development
	UK	Europe	Academia, research in workforce competency development
	Croatia	Europe	CPD and quality assurance in pharmacy education
External review (Total n=11)			
	Netherlands	Europe	Data and intelligence
	Australia	Western Pacific	Academia, pharmacy practice and ethics
	Australia	Western Pacific	Academia, clinical pharmacy and competency development
	Australia	Western Pacific	Early career pharmacist training and development
	Australia	Western Pacific	Research – mediciens safety
	Australia	Western Pacific	Research – pharmacy education and training
	UK	Europe	Academia and research
	Australia	Western Pacific	Research, clinical practice

	Australia	Western Pacific	Pharmacy practice teaching, leadership and management
	Australia	Western Pacific	Post-graduate pharmacy education
	Australia	Western Pacific	Curriculum development, health services research

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