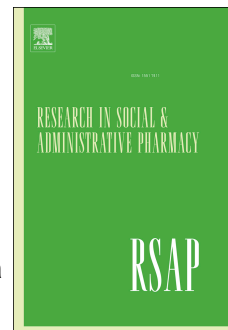


# Journal Pre-proof

How are groups of early career pharmacists and pharmaceutical scientists contributing to global health and policy development: A cross-sectional survey

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PII: S1551-7411(22)00414-4

DOI: <https://doi.org/10.1016/j.sapharm.2022.11.012>

Reference: RSAP 2062

To appear in: *Research in Social & Administrative Pharmacy*

Received Date: 10 August 2022

Revised Date: 6 November 2022

Accepted Date: 29 November 2022

Please cite this article as: Meilianti S, Oliveira R, Okoya F, Ercolin L, Mill D, Obidiegwu O, Uzman N, Lim R, How are groups of early career pharmacists and pharmaceutical scientists contributing to global health and policy development: A cross-sectional survey, *Research in Social & Administrative Pharmacy* (2023), doi: <https://doi.org/10.1016/j.sapharm.2022.11.012>.

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**Title:** How are groups of early career pharmacists and pharmaceutical scientists contributing to global health and policy development: a cross-sectional survey

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**Keywords:** Early career, Global health, Leadership, Pharmacy, Pharmaceutical

**Acknowledgements**

This work was supported and resourced by International Pharmaceutical Federation (FIP). The authors would like to acknowledge the following people:

1. Dr Catherine Duggan, FIP Chief Executive Officer, for reviewing the article.

2. Ema Paulino, Ayodeji Matuluko, Khalid Garba Mohammed, Ntani Nsutebu (Cameroon), for their initial feedback in developing the survey questions.
3. Dorothy Tong, undergraduate student at UCL School of Pharmacy, for conducting the initial pilot data analysis, and Professor Ian Bates, FIP Workforce Development Hub Director, to guide the initial pilot data analysis.
4. Participants who completed the survey and national/regional ECPGs that supported the survey's distribution.

### **Declaration of interest**

The authors declare that they have no competing interests.

### **Funding**

The authors received no specific funding for this work. RL is supported by a National Health and Medical Research Council (NHMRC) fellowship APP1156368. DM is supported by an Australian Government Research Training Program Scholarship at The University of Western Australia.

### **Authors' contributions**

Sherly Meilanti (SM): Conceptualisation, Methodology, Software, Validation, Formal analysis, Investigation, Data curation, Writing – Original Draft, Visualisation, Project administration, Supervision

Raquel Oliveria (RO): Conceptualisation, Methodology, Formal analysis, Investigation, Data curation, Project administration, Review and editing

Funmbi Okoya (FO): Conceptualisation, Methodology, Project administration, Review and editing

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Renly Lim (RL): Conceptualisation, Methodology, Formal analysis, Investigation, Data curation, Writing – Original Draft, Project administration

**1 Abstract****2 Background**

3 Early career pharmacists and pharmaceutical scientist groups (ECPGs) can make valuable  
4 contributions to addressing global health challenges and policy development. There is limited  
5 information describing their contribution to this topic. This study describes initiatives and  
6 activities related to global health and policy development led by ECPGs.

**7 Methods**

8 An online questionnaire was disseminated between July and October 2020 through the  
9 International Pharmaceutical Federation Young Pharmacists Group (FIP YPG) mailing list  
10 and its social media network. The survey consisted of questions about ECPGs' involvement  
11 in global health and policy development activities. In addition to groups or organisations, the  
12 FIP YPG also invited individual pharmacists and pharmaceutical scientists to explore their  
13 needs and views on the role of the ECPGs, and themselves as individuals in global health.  
14 Data were analysed descriptively.

**15 Results**

16 Thirty national ECPGs across six regions of the World Health Organization (WHO)  
17 participated in the survey. Most of the initiatives led by ECPGs focused on health and  
18 wellbeing, quality of education and partnership. The most common activities were webinars,  
19 social events and partnerships with other organisations. In terms of global health challenges  
20 listed by the WHO, the most common initiatives led by ECPGs were related to medicines  
21 access and medicines safety. There was some involvement of early career pharmacists,  
22 pharmaceutical scientists, and ECPGs in the policy and regulation in their countries across  
23 various topics.

**24 Conclusion**

25 To the best of the authors' knowledge, this is the first global study exploring initiatives  
26 conducted by ECPGs. This study informed initiatives that have been implemented across  
27 regions, which could be useful for other ECPGs to initiate in their country according to their  
28 needs and priorities. Fostering engagement and collaboration between ECPGs is encouraged  
29 to provide opportunities and share learning across ECPGs, which could accelerate progress  
30 towards tackling global health challenges.

31

## 1 Introduction

2 The United Nations (UN) established 17 Sustainable Development Goals (SDGs) in 2015 as a  
3 global call to action to alleviate poverty, protect the planet and improve people's lives and  
4 opportunities globally.<sup>1</sup> One of the SDGs related to health is SDG3: "Good health and  
5 wellbeing". SDG3 is crucial for achieving other SDGs since it is connected and interlinked to  
6 other SDGs.<sup>2</sup> In recognition that health is a critical component of a sustainable world the World  
7 Health Organization (WHO) released a list of 13 urgent global health challenges in 2020 and  
8 encouraged government, communities and international organisations to work together to  
9 tackle these challenges.<sup>3</sup> These goals are designed to improve and pave a way forward for  
10 global health. Global health can be defined as "an area for study, research, and practice that  
11 places a priority on improving health and achieving health equity for all people worldwide".<sup>4</sup>  
12 This is linked with universal health coverage, which is defined as all people and communities  
13 can afford health care.<sup>5 6</sup> Primary health care is a critical component that supports the grand  
14 goal of universal health coverage. The 2018 WHO Declaration of Astana signed at the Global  
15 Conference on Primary Health Care called on all countries to strengthen healthcare systems  
16 by increasing investment in primary health care.<sup>7</sup>

17 There is significant potential to engage and work with youth to help achieve the UN SDGs,  
18 global health activities and in strengthening primary healthcare.<sup>8 9</sup> The world currently has  
19 the largest generation of youth in its history, with more than half of the world's population  
20 under the age of 30.<sup>10</sup> Youth are becoming the most outspoken advocates of complex global  
21 health issues, and their competence using social media and digital technologies makes  
22 developing effective solutions for global health challenges more possible.<sup>11</sup> With this  
23 growing number and their unique capability, it is imperative to engage and work with youth  
24 to participate actively in the achievement UN SDGs and universal health coverage.<sup>8</sup>

25 The WHO has endorsed the importance of engaging youth to achieve SDGs and improve  
26 health care outcomes.<sup>12</sup> However, this endorsement has to be followed by commitments and  
27 action, such as by providing a space for youth to participate, develop and act as leaders.<sup>12 13</sup>  
28 The transformative potential of youth can only be achieved through participatory leadership  
29 and by establishing the requisite relationships and tools to allow youth to participate as future  
30 leaders. Meaningful youth engagement needs a mechanism and the normalisation of youth  
31 involvement at every table as equal partners and experts.<sup>13 14</sup>

32 If given the opportunity, early career (often youth) health and care workers can make  
33 valuable contributions to addressing global health challenges.<sup>13</sup> Early interaction with health  
34 systems and policymaking is important to enable them to get experience and develop  
35 themselves to tackle health-related challenges. Equipping them with professional expertise,  
36 supporting them, and implementing inclusive capacity development opportunities will  
37 increase the number of early career health and care workers participating and should guide all  
38 organisations working in the global health space.<sup>13</sup>

39 Youth-led groups are becoming more visible in global health, and they are advocating for  
40 more meaningful engagement of youth in global agendas. The Global Health Workforce  
41 Network (GHWN) Youth Hub is an example of youth involvement in policy. The Youth Hub

42 is an inter-sectoral, inter-professional community of practice hosted by the GHWN and the  
43 Health Workforce Department at the WHO. The Youth Hub aims to engage youth, work for  
44 youth and be driven by youth to promote human resources for national, regional and global  
45 health agendas. Its collaboration with the WHO brings youth strength and voice to the efforts  
46 to deliver universal health coverage and achieve the SDGs.<sup>15</sup>

47 The International Pharmaceutical Federation (FIP) is the global body representing over four  
48 million pharmacists, pharmaceutical scientists and pharmaceutical educators around the  
49 world.<sup>16</sup> The Young Pharmacists Group (YPG) of FIP is a network of early career  
50 pharmacists and pharmaceutical scientists within the federation, and consists of members  
51 who are under 35 years of age or have graduated less than 10 years from their first degree in  
52 pharmacy or pharmaceutical science.<sup>17</sup> The FIP YPG serves as a platform to facilitate  
53 connections and networking among its members and provides resources for professional  
54 development and leadership opportunities. These programs enable young pharmacists and  
55 pharmaceutical scientists to share, learn and lead positive changes at local, national and  
56 international levels.<sup>17</sup> National and international early-career pharmaceutical groups (ECPGs)  
57 such as the FIP YPG can develop and share innovative solutions to improve global health and  
58 contribute to the achievement of health for all. However, there is limited information  
59 describing the roles and contributions of early career pharmacists and pharmaceutical  
60 scientists to global health locally, nationally and internationally. This study aims to describe  
61 the activities related to global health that are undertaken by ECPGs internationally.

62

## 63 **Methods**

### 64 *Development of a questionnaire*

65 The FIP YPG project team members (authors) first developed a draft questionnaire. The draft  
66 was piloted and reviewed by the FIP leadership and a selection of FIP YPG members  
67 according to their interest in the project. The final online questionnaire was administered  
68 using QuestionPro, web-based software.<sup>18</sup> The questionnaire had four main sections: I)  
69 demographic information, II) involvement in global health activities, III) initiatives  
70 specifically led by early pharmacists and pharmaceutical scientists, and IV) initiatives in  
71 emergency preparedness (Appendix 1). The questions were related to the activities  
72 undertaken in the past, activities currently ongoing and any activities have planned for the  
73 future.

74 Section 1 of the questionnaire requested participants' demographic information and requested  
75 participants to select and outline possible activities organised by ECPGs and groups that the  
76 ECPGs engage with. Section 2 of the questionnaire requested participants to map their  
77 current involvement and initiatives towards the 17 SDGs<sup>1</sup>, 13 urgent global health challenges  
78 established by WHO in 2020<sup>3</sup>, and an open question related to primary healthcare initiatives  
79 in relation to supporting the achievement of universal health coverage. Participants were also  
80 asked to provide examples of their initiatives in free text questions. Section 3 of the  
81 questionnaire listed the possible involvement of pharmacists in policy and regulation, general  
82 pharmaceutical services, specific pharmaceutical services, and condition-specific

83 pharmaceutical services. Participants were asked to select any possible activities that they led  
84 or were involved in those categories.

85 This paper describes the results of the first three sections of the survey, which focused on  
86 SDGs, urgent global health challenges, primary healthcare initiatives, involvement in the  
87 policy and regulation, groups that ECPGs were currently engaged with and activities that  
88 ECPGs provided to their members. Results on emergency preparedness will be reported in a  
89 separate paper.

90

### 91 *Survey distribution*

92 Based on the list of ECPGs compiled as part of a member needs assessment conducted in  
93 2019,<sup>19</sup> the FIP YPG invited 40 national and regional ECPGs from 34 countries to participate  
94 in the survey. In addition to groups or organisations, the FIP YPG also invited individual  
95 pharmacists and pharmaceutical scientists to explore their needs and views on the role of the  
96 ECPGs, and themselves as individuals in global health. The focus of this paper is to describe  
97 the role of ECPGs in global health. Questions about the needs and views of individual  
98 pharmacists and pharmaceutical scientists on the role of ECPGs were included in the survey  
99 but were analysed and reported separately, and not included in this paper.

100 The online questionnaire-based survey was disseminated between July and October 2020  
101 (four months) to FIP YPG individual members through Mailchimp. Promotion via social  
102 media platforms (Facebook, LinkedIn, Twitter, Instagram) was also conducted. The ECPGs  
103 and individuals were also encouraged to share the survey throughout their personal networks.  
104 A reminder to complete the survey was sent every two weeks. The survey was also shared  
105 through FIP YPG's national/regional ECPGs networks, with whom contact was made at the  
106 beginning of the survey to be further shared to their networks.

107

### 108 *Data analysis*

109 The data were imported into, coded and analysed in Microsoft Excel 2016. Frequency and  
110 percentage were calculated to analyse the quantitative findings using Microsoft Excel,  
111 whereas the qualitative findings were coded inductively using NVivo version 11.

112 According to the questionnaire, the survey respondents were divided into three categories of  
113 respondents: 1) Individuals responding to the survey who did not have an ECPG in their  
114 country; 2) Individuals responding to the survey who did not answer on behalf of an  
115 organisation but who acknowledge the presence of an ECPG in their country; 3) Individuals  
116 responding to the survey on behalf of their organisations, i.e., as representatives from an  
117 ECPG. This manuscript aimed to describe the role of ECPGs in global health; therefore, only  
118 data from groups 2 and 3 were used in the analysis. The purpose of collecting data from  
119 individuals who did not have an ECPG in their country was to explore their expectations of  
120 the role of ECPGs in their country if the country establishes one. Data from Group 1 were  
121 excluded from this paper, and have been reported separately in an FIP report.<sup>20</sup> Both group 2  
122 and group 3 responses were triangulated, checked by organisations and combined by project

123 teams prior to analysis. The analysis was conducted at a country level, and any discrepancies  
124 found were resolved by verifying the responses to the known ECPGs.

125

### 126 *Ethical considerations*

127 Formal ethical approval was waived for this study because according to Dutch law, no  
128 approval by a medical ethics committee was necessary. Ethical oversight and approval were  
129 gained from the FIP Executive and Board structures and are on record. Access to the data  
130 with identifiable information was restricted to the research team who was directly involved in  
131 this study. Participation in the survey was voluntary with no incentives, and professional  
132 leadership associations and other national agencies were free to choose not to provide data.

133

## 134 **Results**

135 Responses from group 2 (i.e. individuals responding to the survey who did not answer on  
136 behalf of an organisation but who acknowledge the presence of an ECPG in their country)  
137 and group 3 (i.e. representatives from an ECPG) were combined prior to analysis, and thus  
138 results presented herein refer to groups not individuals. Overall, the survey was completed by  
139 30 national ECPGs across six regions of the WHO (Table 1). Twenty of the forty previously  
140 identified ECPGs responded to this survey (response rate: 50%), with the addition of 10  
141 newly identified national ECPGs. The region with the most responses was Africa (n:9; 30%)  
142 while the region with the least responses was South East Asia (n: 2; 7%).

### 143 *Sustainable development goals (SDGs)*

144 The mapping of initiatives led by ECPGs to support the achievement of each SDG is  
145 presented in Table 2. More than half of all respondents (n:16; 53%) have initiatives related to  
146 SDG3 (Good health and wellbeing). An example of initiatives shared by ECPGs in Africa  
147 was their social media activities related to COVID-19 and public health issues, particularly in  
148 advocating for pharmacists' role in non-communicable diseases and in vaccination. The  
149 ECPGs in South East Asia region shared their initiatives where their committee provided  
150 health promotion education to communities in collaboration with local primary healthcare  
151 settings.

152 A third of respondents (n:10; 33%) have initiatives related to SDG4 (Quality education),  
153 followed by 23% (n:7) of respondents who have initiatives related to SDG17 (Partnerships  
154 for goals). ECPGs in Africa further shared their initiatives related to SDG4 by providing  
155 grants and scholarships to support their members and early career pharmacists exchange  
156 programme. ECPGs in the South East Asia region described their collaboration with external  
157 organisations in service provision related to smoking cessation programmes related to  
158 SDG17.

159 Only two ECPGs in Eastern Mediterranean and Western Pacific region have initiatives in  
160 SDG13 (Climate Action). Looking at SDG8 (Decent work and economic growth), which also  
161 promoted the decent work of youth, there were only three early career groups in Africa,  
162 Europe and Western Pacific regions having initiatives related to this SDG. The ECPGs in



163 Europe further expanded their initiative in this SDG related to establishing a position paper  
164 about job conditions for early career pharmacists and advocating for fair salaries for early  
165 career pharmacists.

166

### 167 *13 urgent global health challenges*

168 The mapping of initiatives led by ECPGs, which relate to the 13 urgent health challenges, is  
169 presented in Table 3. More than half of respondents (n:17; 57%) indicated that their groups  
170 have initiatives related to expanding access to medicines; this was highlighted by ECPGs  
171 globally. Most initiatives further shared were related to the use of technology in supply chain  
172 management or establishing the mobile clinic. ECPG, based in the Western Pacific region,  
173 further expanded their initiatives, namely increasing pharmacist autonomy through  
174 prescribing arrangements and pharmacists participating in Team Care Arrangements, which  
175 is a government-funded service for patients with chronic medical condition and complex  
176 needs requiring on-going care from a multidisciplinary team.<sup>21</sup> More than a quarter of  
177 respondents mapped their initiatives towards protecting medicines that protect people (n:10;  
178 33%) and protecting people from dangerous products (n:9; 30%). They highlighted their  
179 initiatives related to social media campaigns on antibiotic awareness, substandard and  
180 falsified medicines and safe disposal of expired medicines.

181

### 182 *Primary health care initiatives*

183 Twelve out of 30 respondents (40%) expressed that the ECPGs in their countries had led  
184 some initiatives in primary health care. The initiatives were mainly related to campaigns and  
185 education and training for their members by organising or participating in congress and  
186 webinars on primary healthcare, such as vaccination, pharmacy professional services  
187 (diabetes management, wound care, medication reviews).

188

### 189 *Policy and regulation*

190 Figure 1 compares the policy and regulation initiatives led by ECPGs to involvement of early  
191 career pharmacists and pharmaceutical scientists in the same country to those initiatives.  
192 There was some (23-53%) involvement of early career pharmacists and pharmaceutical  
193 scientists in policy and regulation (blue bar). The orange bar shows a smaller proportion (3-  
194 23% of respondents) of initiatives led by ECPGs in policy and regulation. ECPG, based in the  
195 eastern Mediterranean region, reported their initiatives on providing youth voice in the drug  
196 formulary development with the government institution. The other initiatives reported by  
197 ECPGs in Africa to support the prevention programme is leading a campaign against drug  
198 abuse and being involved in the policy document development on remuneration for early-  
199 career practitioners.

200

### 201 *Organisations that ECPGs are currently engaged with*

202 The most common organisations that ECPGs across regions engaged with were universities  
203 (n: 21; 70%), pharmacy organisations (n: 19; 63%) and government (n: 13; 43%).  
204 Engagement with universities was through their involvement in supporting research and  
205 development and organising training for students to reach out to future early career  
206 pharmacists. In terms of collaboration with pharmaceutical organisations, this usually  
207 includes consultation on guidelines development, standards and protocols. Through  
208 engagement with ministries and agencies, the ECPGs were involved in policy development.  
209 The ECPG in Western Pacific provided information that they were actively engaging the  
210 Pharmaceutical Services Program of the Ministry of Health to champion the interest of early  
211 career government pharmacists. This ECPG also works closely with state and federal  
212 government departments and politicians to advocate for pharmacists, particularly regarding  
213 current priorities of pharmacist-administered vaccination and medicine safety.

214 The ECPGs in Europe and Western Pacific provided more information on their involvement  
215 with pharmacists and pharmaceutical scientists in different countries through the FIP YPG  
216 and regional networks such as the Asian Young Pharmacists Group. The ECPG in the  
217 Western Pacific was involved in the health coalition through their parent organisations and  
218 actively disseminated the information through pandemics to highlight their engagement with  
219 other healthcare professionals. Only 3 ECPGs reported that they engaged with patient  
220 organisations and caregivers. Engagement with the general public mainly was through  
221 organising health campaigns. There is also a dedicated channel and website to engage the  
222 general public on health education created by the ECPG in the Western Pacific region.

223

#### 224 *Activities for capacity building led by ECPGs*

225 Table 4 highlights the activities and engagement related to workforce capacity building that  
226 was conducted by ECPGs across regions. The most common activities organised by ECPGs  
227 are webinars (n: 21; 70%) followed by social events (n: 19; 63%) and partnerships with other  
228 organisations (n: 19; 63%). The least common activity organised by ECPGs was to provide  
229 opportunities for grants and scholarships, which were only organised by ECPGs in Africa and  
230 Western Pacific countries. International YPG conferences were only organised by ECPGs in  
231 the Americas, South East Asia and Western Pacific region. Similarly, conducting a project  
232 and research was only stated by ECPGs in Africa, South East Asia and Western Pacific  
233 region.

234 An analysis of the open text of the respondents where they elaborated on their activities  
235 revealed five common themes of the activities, including i) campaigns, ii) conference and  
236 social events, iii) education and training, iv) partnership and collaboration, and v) project and  
237 research:

- 238 i) Campaigns were more common in Africa, Eastern Mediterranean and Western Pacific  
239 regions. The ECPGs reported campaigns celebrating the WHO global health days and  
240 involving the public to advocate for pharmacists' role. Conference and social events  
241 were common in Africa, South East Asia and Western Pacific regions.
- 242 ii) The conferences that the ECPGs organised were usually part of their parent  
243 organisation's conference. The conferences were organised annually to gather their

- 244 members to foster collaboration, learning, and professional development from each  
245 other. The ECPGs described social events as networking events during the conference,  
246 exercise-related events, annual retreats, team building, or social media interaction.
- 247 iii) The most common themes of activities conducted across regions were education and  
248 training. The activities include webinars and training, career pathway development and  
249 educational competitions. The topics of the webinars and training were varied across  
250 regions, including soft skills training for pharmacists and specialised disease  
251 knowledge for pharmacists to support them in expanding their knowledge of  
252 pharmaceutical care. ECPGs reported some webinars and training related to digital  
253 health, data science, politics and governance and business and leadership.
- 254 iv) Some programmes to support partnership and collaboration were highlighted by  
255 ECPGs, including early career pharmacists exchange, internship, mentorship, speed  
256 dating night, career empowerment dialogue and other programmes to support the career  
257 pathway advancement of their members. The ECPGs also reported some innovative  
258 educational competitions that they conducted to push their members' creativity further.
- 259 v) Only one ECPG further described their initiative in a research project related to  
260 advocacy, organisation, public perception and pharmacists' development in the country.

261

## 262 Discussion

263 For the first time, this international study explored initiatives by ECPGs that are related to  
264 global health and their involvement and engagement with national policy and regulations.  
265 The study also explored activities that ECPGs organised to support their members, as well as  
266 organisations that the ECPGs engaged with to support their activities and initiatives. The  
267 results show that there is a wide international network of ECPGs with initiatives that span  
268 almost all of the SDGs.

269 An ECPG can be formed under the parent organisation (i.e. part of the national  
270 pharmaceutical organisation in that country) or as an independent group.<sup>22</sup> For example, the  
271 Malaysian Pharmacists Society-Young Pharmacists Chapter (MPS YPC) is under the parent  
272 organisation MPS. ECPGs that were not part of the parent organisation might need to  
273 independently outsource and seek funding for undertaking initiatives. This may explain the  
274 relatively low number of initiatives undertaken by ECPGs in the Eastern Mediterranean  
275 region. Partnering and collaborating with the national pharmaceutical organisation in that  
276 country may assist with strengthening the ECPG's ability to undertake new initiatives  
277 through resource sharing, in particular, sharing of knowledge, network and funding resources.  
278 ECPGs already have some involvement in the policy and regulatory space, however, more  
279 active engagement is needed to ensure development of future leaders in policy and  
280 regulation.<sup>23</sup> Having a collective voice within ECPGs and partnering with national  
281 pharmaceutical groups may provoke more youth engagement in the policy and regulation.<sup>24</sup>

282 The 2019 FIP YPG survey found that international YPG conferences, webinars, opportunities  
283 for grants and scholarships, involvement in projects, and leadership development were among  
284 the top priorities of early career pharmacists and pharmaceutical scientists.<sup>19</sup> YPG networking  
285 events are larger conferences such as the FIP annual conference are more affordable and

286 accessible opportunities for early career pharmacists and pharmaceutical scientists to make  
287 informal connections. In the current survey, international YPG conferences, grants and  
288 scholarship, and involvement in projects were activities offered only by a small fraction of  
289 ECPGs when compared to other activities. This study found that these activities were more  
290 common in South East and Western Pacific regions which could be due to the existence of  
291 regional ECPG to facilitate this, namely the Asian Young Pharmacists Group (AYPG).  
292 Activities such as involvement in projects provide early career pharmacists and  
293 pharmaceutical scientists the opportunity to hone their leadership and management skills and  
294 to promote workforce development. However, they take considerable skill and resourcing to  
295 organise, thus further support may be needed by those with experience in these areas to  
296 facilitate ECP to continue and build on these activities. Similarly, international YPG  
297 conferences could be a platform to share activities and initiatives across nations. Fostering  
298 engagement and collaboration between ECPGs is encouraged to provide opportunities and  
299 share learning across ECPGs, which could accelerate progress in the pharmaceutical  
300 workforce development and global health.

301 This study found that there were only two ECPGs having initiatives in SDG 13 (Climate  
302 change). This may change in the future since initiatives in climate change within the  
303 pharmaceutical fields have been gaining traction in recent years. FIP published a policy  
304 statement on "Environmentally sustainable pharmacy practice: green pharmacy" in 2016<sup>25</sup>  
305 and signed a letter to the UN Climate Change Conference (COP26) titled: "Pharmacy stand  
306 up to climate change" .<sup>26</sup> FIP also published a report describing the role of pharmacists to  
307 mitigate the impact of air pollution on respiratory health.<sup>27</sup> In addition, there has been some  
308 movement to call for meaningful youth engagement in the climate action<sup>28 29</sup> and a recent  
309 publication proposed a four-pronged strategy (integration, education, climate health  
310 storytelling and investment) by governments and organisations to foster climate health youth  
311 leadership.<sup>24</sup>

312 This study found an initiative by an ECPG in Europe on SDG8 (Decent work and economic  
313 growth), related to the establishment of a position paper about job conditions and fair salaries  
314 for early career pharmacists. This initiative is in line with a recent call for action established  
315 by the GHWN Youth Hub, in which in building a resilient and adaptable early career health  
316 and care workforce, it is imperative to provide support and improve the working conditions  
317 of the early career health and care workforce.<sup>30</sup> Focusing on pharmacy, a recent toolkit  
318 developed by FIP Women in Science and Education (WiSE) about positive practice  
319 environments could be useful to develop sustainable and supportive working conditions in the  
320 workplace.<sup>31</sup> Similarly, a study conducted on early career pharmacists and pharmaceutical  
321 scientists identified that job and career satisfaction could be improved by creating and  
322 implementing a well-structured system that provides an appropriate working environment,  
323 proper remuneration, and greater autonomy.<sup>32</sup>

324 As one of the most accessible healthcare professionals, pharmacists and pharmaceutical  
325 scientists play a pivotal role in health care systems and can speed up efforts to achieve  
326 universal health coverage through providing quality primary health care.<sup>33</sup> Provision of  
327 medicines and pharmaceutical care is already a key role for pharmacists and pharmaceutical

328 scientists in most countries. In 2019, the Ankara Commitment to Action on Primary Health  
329 Care, which included thirteen statements for pharmacists to take action on primary health  
330 care, was developed and signed by 800 pharmacy leaders from over 35 countries.<sup>34</sup> It is  
331 therefore unsurprising that the most common initiatives led by ECPGs to tackle the WHO  
332 urgent global health challenges were "expanding access to medicines", followed by  
333 "protecting the medicines that protect us" and "protecting people from dangerous products".

334

#### 335 Limitations

336 This study has some limitations. First, the survey was conducted only in English. Not all  
337 respondents may have been fluent in English. The availability of the questionnaire only in  
338 English may also partially explain the low response rate from certain regions. Another  
339 limitation was that the data collected could be viewed as being subjective. This type of data is  
340 not fact-checked and relies on the knowledge and awareness of the respondents about the  
341 activities of the ECPGs. Also, there was a time factor of the initiatives that this study had not  
342 explored, in which the initiatives could have been done 10 years ago or recently carried out.  
343 However, this study sought responses from representatives who had been nominated by their  
344 ECPGs which means that the authors can be fairly confident that their responses were  
345 accurate representations of initiatives conducted by the groups they were answering on  
346 behalf. Although the survey covered respondents across the six WHO regions, there was a  
347 skewed distribution in some regions and a small sample of respondents. This may limit the  
348 generalisability of this study's findings across countries.

349

#### 350 Future work

351 It is clear that ECPGs are ready and willing to contribute to global health and policy  
352 development, however, more work needs to be done to support and connect ECPGs globally.  
353 One area of work include better connecting ECPGs with the national pharmaceutical group in  
354 that country to combine efforts, resources and build on each other's strengths. This study also  
355 found some involvement of early career pharmacists and pharmaceutical scientists in the  
356 policy and regulation. To further promote ECPGs in policy and regulation, national groups  
357 may need to be better connected to national organisations that are recognised and supported  
358 by decision makers (e.g., parent professional organisations, government). Further study could  
359 be done to explore how ECPGs can help more actively engage youth in policy processes.  
360 This study showed that less than half of the respondents indicated that ECPGs in their  
361 countries had initiatives in primary health care. Further work is needed to explore the details  
362 of primary health care initiatives led by ECPGs, and how this can have impact on supporting  
363 pharmacists' commitment towards Declaration of Astana and the Ankara Commitment.

364

#### 365 Conclusion

366 This study described the large number of initiatives that have been implemented across global  
367 regions. Sharing these initiatives will be useful for other ECPGs who may wish to initiate

368 similar activities according to their needs and priorities. It also shines a light on the good  
369 work these groups are doing to contribute to global health and highlights that more needs to  
370 be done to ensure their efforts are connected into broader society and national health  
371 strategies so that the benefits can be largely recognised. ECPG-led initiatives are likely  
372 making a positive impact on global health improvement. Further study exploring the impact  
373 that ECPGs-led initiatives have had would be beneficial.

374

375 **Figure legend**

376 Figure 1: Involvement of early career pharmacists and pharmaceutical scientists and  
377 Initiatives led by ECPGs in policy and regulation

378

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**Table 1: Respondents' demographics**

WHO Region	Responses n (%)	Respondents' countries
Africa	9 (30%)	Algeria*, Cameroon* <sup>†</sup> , Ghana*, Kenya*, Mauritius*, Nigeria*, South Africa*, Tanzania*, Zimbabwe*
Americas	3 (10%)	Argentina, Brazil, United States
Eastern Mediterranean	3 (10%)	Lebanon* <sup>†</sup> , Pakistan*, Yemen* <sup>†</sup>
Europe	6 (20%)	Croatia, Cyprus, Poland, Portugal* <sup>†</sup> , Turkey, Ukraine* <sup>†</sup>
Southeast Asia	2 (7%)	India*, Indonesia*
Western Pacific	7(23%)	Australia*, Cambodia* <sup>†</sup> , Japan* <sup>†</sup> , Malaysia*, Philippines, Singapore, Taiwan
<b>Total</b>	<b>30 (100%)</b>	

\*Respondents answered on behalf of organisations (n: 20)

<sup>†</sup>Groups that are not part of umbrella pharmaceutical organisations, where the ECPGs are a part of their parent organisation, such as the national pharmaceutical group in the country (n:7).

**Table 2: Initiatives led by ECPGs mapped to each SDG**

Sustainable Development Goal (SDG)	Responses* n (%)	Regions				
		AF	EM	EU	SEA	WP
1: No poverty	2 (7%)				✓	✓
2. Zero Hunger	4 (13%)	✓			✓	✓
3. Good health and wellbeing	16 (53%)	✓	✓	✓	✓	✓
4. Quality education	10 (33%)	✓	✓	✓	✓	✓
5. Gender equality	3 (10%)	✓				✓
6. Clean water and sanitation	2 (7%)	✓				✓
7. Affordable and clean energy	1 (3%)	✓				
8. Decent work and economic growth	3 (10%)	✓		✓		✓
9. Industry, innovation and infrastructure	5 (17%)	✓		✓	✓	✓
10. Reduced inequalities	3 (10%)	✓		✓		✓
11. Sustainable cities and communities	2 (7%)	✓				✓
12. Responsible consumption and production	1 (3%)	✓				
13. Climate action	2 (7%)		✓			✓
14. Life below water	0 (0%)					
15. Life on land	0 (0%)					
16. Peace, justice and strong institutions	1 (3%)					✓
17. Partnerships for the goals	7 (23%)	✓		✓	✓	✓
<b>Total</b>		<b>12</b>	<b>3</b>	<b>6</b>	<b>6</b>	<b>13</b>

\*Total number of responses (N): 30; ✓There were initiatives led by any ECPGs in the region on the specific SDG. AF: Africa; EM: Eastern Mediterranean; EU: Europe; SEA: South East Asia; WP: Western Pacific

**Table 3: Initiatives led by ECPGs related to the urgent global health challenges in 2020**

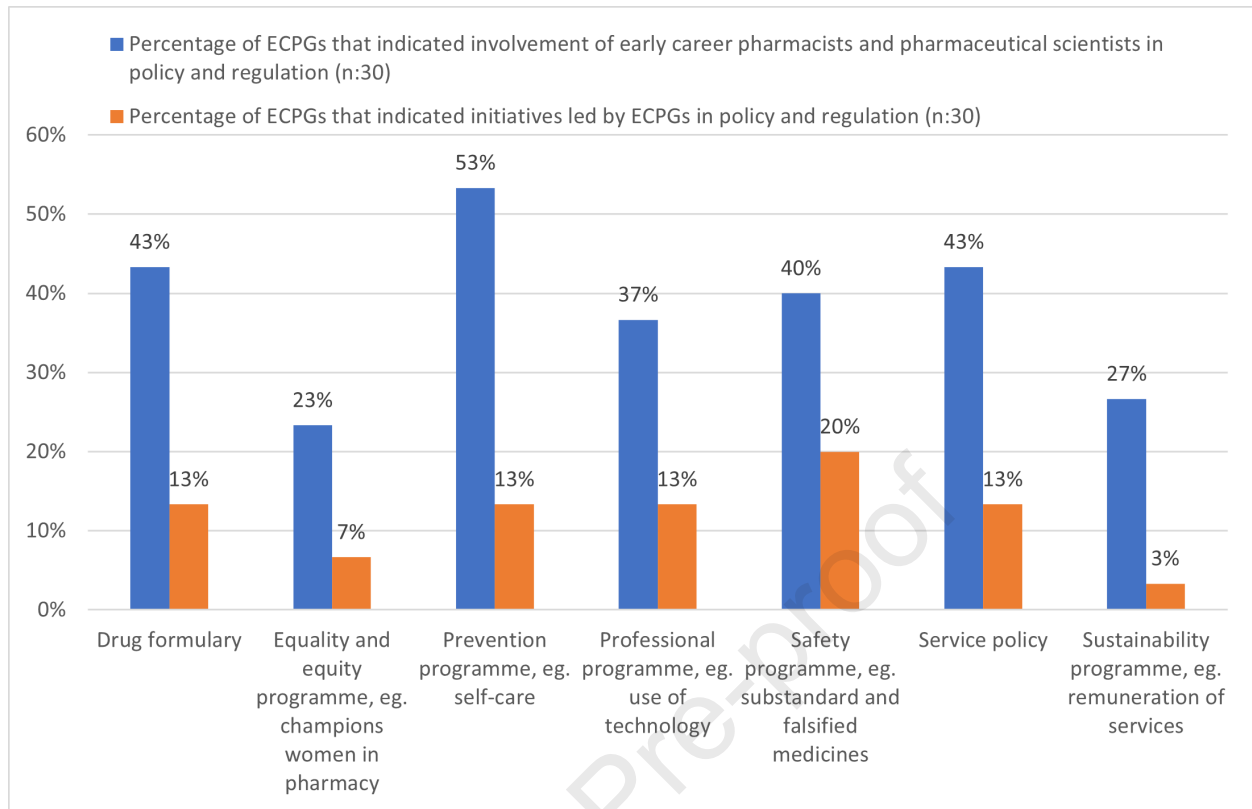
13 urgent global health challenges	Responses*		Regions				
	n (%)	AF	AM	EM	EU	SEA	WP
Expanding access to medicines	17 (57%)	✓	✓	✓	✓	✓	✓
Protecting the medicines that protect us	10 (33%)	✓		✓		✓	✓
Protecting people from dangerous products	9 (30%)	✓		✓			✓
Stopping infectious diseases	7 (23%)	✓		✓			✓
Making health care fairer	6 (20%)	✓		✓		✓	✓
Preparing for epidemics	6 (20%)	✓		✓			✓
Delivering health in conflict and crisis	5 (17%)			✓	✓	✓	✓
Earning public trust	5 (17%)	✓		✓	✓		✓
Keeping health care clean	5 (17%)			✓	✓		✓
Investing in the people who defend our health	4 (13%)	✓					✓
Harnessing new technologies	3 (10%)	✓			✓		✓
Keeping adolescents safe	2 (7%)				✓		✓
Elevating health in the climate debate	1 (3%)			✓			
<b>Total</b>		<b>9</b>	<b>1</b>	<b>10</b>	<b>6</b>	<b>4</b>	<b>12</b>

\*Total number of responses (N): 30; ✓There were initiatives led by any ECPGs in the region on the specific global health challenges. AF: Africa; AM: America; EM: Eastern Mediterranean; EU: Europe; SEA: South East Asia; WP: Western Pacific

**Table 4: Activities for capacity building led by ECPGs**

Types of activities for capacity building	Responses* n (%)	Regions					
		AF	AM	EM	EU	SEA	WP
Webinar	21 (70%)	✓	✓	✓	✓	✓	✓
National/Regional YPG social event	19 (63%)	✓	✓	✓	✓	✓	✓
Partnership/collaboration with other organisations	19 (63%)	✓	✓	✓	✓	✓	✓
National/Regional YPG conference	16 (53%)	✓	✓	✓	✓	✓	✓
Career pathway development	12 (40%)	✓		✓	✓	✓	✓
Campaigns	11 (37%)	✓		✓	✓	✓	✓
Training (in-person/online)	9 (30%)	✓		✓		✓	✓
Leadership development	8 (27%)	✓			✓		
Educational/clinical contests/competitions	8 (27%)	✓		✓	✓	✓	✓
Other professional development programmes	8 (27%)	✓	✓	✓			✓
International YPG Conference	5 (17%)		✓			✓	✓
Project/Research	5 (17%)	✓				✓	✓
Opportunities for grants/scholarship	3 (10%)	✓					✓
<b>Total</b>		<b>12</b>	<b>6</b>	<b>9</b>	<b>8</b>	<b>10</b>	<b>12</b>

\*Total number of responses (N): 30; ✓There were initiatives led by any ECPGs in the region on the specific global health challenges. AF: Africa; AM: Americas; EM: Eastern Mediterranean; EU: Europe; SEA: South East Asia; WP: Western Pacific



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