

Impact of COVID-19 on human resources for health and policy response:

the case of Plurinational State of Bolivia, Chile, Colombia, Ecuador and Peru



Overview of findings from five Latin American countries



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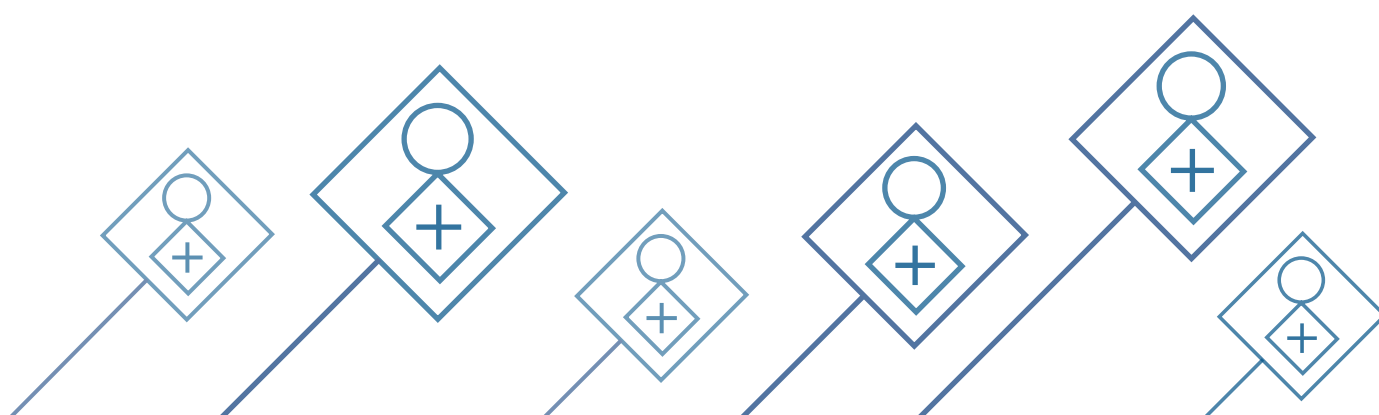
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Foreword

Act together to protect and invest in health workers

Health workers represent one of the main pillars of resilient health systems and have been fundamental in the response to COVID-19. The pandemic, in addition to highlighting the shortage of health workers, has revealed the importance of adequate information systems, and the need to promote measures to protect health workers, and to encourage and ensure decent work.

In the International Year of Health and Care Workers (2021) and in an effort to support countries in the design and implementation of strategies to address health workers' problems during COVID-19, the World Health Organization (WHO) Department of Health Workforce together with the Pan American Health Organization (PAHO) Subregional Programme for South America have supported the development and analysis of the impact of COVID-19 on health workers and the policy responses via a number of country case studies. This study provides a standardized methodology and measurement indicators to identify, analyse and quantify the multifaceted impact of the COVID-19 pandemic on human resources for health (HRH). In particular, the impacts on the working conditions of health workers, their availability and distribution in the country, their mental health, risk of infection and social welfare, have all been assessed.

The value of this study is multifaceted and has benefited from the participation of Bolivia (Plurinational State of), Chile, Colombia, Ecuador and Peru, which are part of PAHO's South American Subregion, the Andean Health Organization and the Organization of American States. The process of conducting the analysis has enhanced countries' capacities in identifying and analysing the health workforce challenges. The resulting data and information provide new insights for policy dialogue at national level, intercountry analysis, and to inform policy action and enable coordination – producing a common good for health across the region. Further, the study contributes to the global perspective by informing WHO public goods and interim guidance documents on the COVID-19 response.

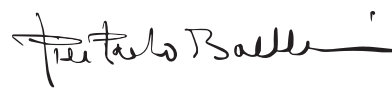
This study offers a systematization of the policies and strategies adopted by the participating countries to face the challenges of the COVID-19 pandemic on HRH. The information and lessons learned contribute to provide evidence and align policy priorities and objectives around the protection and care of the health workforce of the entire region, and highlight the need to improve investment in HRH as a priority strategy to strengthen resilience of health systems, ensuring continuity, optimal functioning, access and adequate coverage to the whole population.



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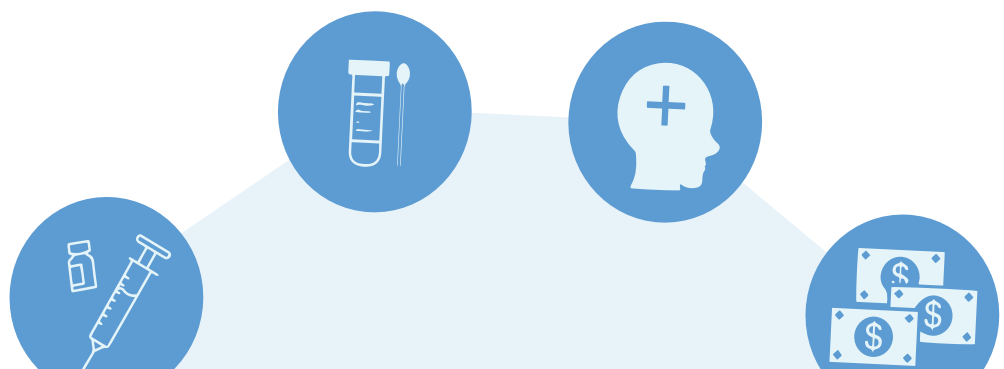
The material was reviewed and approved by Julio Pedroza from the PAHO office in Bolivia (Plurinational State of), Mario Cruz-Peñate from the PAHO office in Chile, Laura Ramírez and Luz María Salazar from the PAHO office in Colombia, Sonia Quezada from the PAHO office in Ecuador and Miguel Dávila Dávila from the PAHO office in Peru. Their inputs and explanations, in addition to new sources and updates of previously submitted data, shed light on the specific situation in each country, fine-tuned the documentation and experiences, and thereby enhanced the analysis and the findings.

The main source of information and technical feedback came from officials responsible for information about and management of HRH in each national ministry of health (MoH), who provided support in gathering and transmitting information via the questionnaire sent out to each ministry, and in meetings to present progress and results, as well as providing valuable feedback in their areas of expertise: Bolivia (Plurinational State of), Teresa Becerra, Professional Officer at the Ministry of Health; Chile, Olga Correa Flores, Head of the Department of Planning and Control of Human Resources Management in Health and Claudia Godoy, Head of the Division of Management and Development of Personnel, Under-Secretariat for Welfare Networks, Ministry of Health; Colombia, Oswaldo Barrera, Coordinator of the Exercise and Performance Unit for Human Talent in Health, Directorate for the Development of Human Talent in Health, Ministry of Health and Social Protection; Ecuador, Gino Cabezas, Professional Officer at the Directorate for Human Talent Development in Health; Marco Muñoz Herrería, National Director for Human Talent Regulation in Health; and Peru, Claudia Ugarte Taboada, Head of the General Directorate of Health Personnel and Javier Loayza, Head of the Observatory for Health Human Resources, Ministry of Health.

Michelle Guillou, Diana Hernández Hernández and Mario Parada Lezcano collated and organized the data and the documentation for the case studies.

Abbreviations

HIS	health information systems
HRH	human resources for health
HRIS	human resources information system
HWF	health workforce
IADB	Interamerican Development Bank
INEC	National Institute for Statistics and Censuses of Ecuador
INS	National Institute of Health of Colombia
IPC	infection prevention and control
MEF Peru	Ministry of Economy and Finance of Peru
MoH	ministry of health
MoH Bolivia	Ministry of Health and Sports of the Plurinational State of Bolivia
MoH Chile	Ministry of Health of Chile
MoH Ecuador	Ministry of Public Health of Ecuador
MoH Colombia	Ministry of Health and Social Protection of Colombia
MoH Peru	Ministry of Health of Peru
NHWA	National Health Workforce Account
NVP	national vaccination plan
OAS	Organization of American States
ORAS-CONHU	Andean Health Organization
ORHUS	Human Resources for Health Observatory, MoH Peru
OTHS	Observatory for Human Talent in Health, MoH Colombia
PAHO	Pan American Health Organization
PoR	presidency of the republic
PoR Colombia	Presidency of the Republic of Colombia
PoR Ecuador	Constitutional Presidency of Ecuador
PoR Peru	Presidency of the Republic of Peru
PPE	personal protective equipment
SOWN	State of the World's Nursing
SUSESO Chile	Superintendency of Social Security of Chile
WHO	World Health Organization



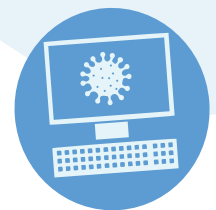
Executive summary

Health workers are at the forefront of the COVID-19 response and as such are highly exposed to a variety of risks. While efforts have been made to assess the pandemic's direct impact on the health workforce (HWF), a more comprehensive view and approach to understanding the multifaceted impact of COVID-19 on the HWF and the policies adopted by countries to address the challenges is still lacking. To gain a better insight into the impact of COVID-19 on the HWF and on policy responses a series of country case studies have been undertaken.

This paper summarizes key findings from five South American country case studies: Bolivia (Plurinational State of), Chile, Colombia, Ecuador and Peru. It looks at the impact of COVID-19 on the health, occupational safety and working conditions of the HWF and on the strategies and mechanisms used by these countries to increase, maintain and protect human resources for health (HRH), in terms of their availability, training, protection, welfare, remuneration and financing. The case studies were developed using a standardized methodology across the countries based on interim guidance, developed by WHO in 2020 (*Health workforce policy and management in the context of the COVID-19 pandemic response*); the standardized impact measurement framework; and the Health Labour Market Framework.

Impact of COVID-19 on the health workforce

The availability of HRH was reduced because workers had to go into isolation, became ill or died from COVID-19. Global estimates of COVID-19 infections and deaths tend to suggest that official reporting mechanisms do not capture the full scale of infections and deaths. Appropriate, reliable and timely information is critical for measuring the impact of COVID-19 on HRH and thus for planning and updating the health emergency response, as well as for resource allocation. Between 3.27% and 12.62% of health workers have been infected by the virus, of which between 0.20% and 1.97% have died in the countries covered in this study. Analysing how confirmed cases of COVID-19 vary across occupational groups of health workers is important for the development of infection prevention and control (IPC) guidelines, to identify health workers at increased risk of infection during health emergencies, and to estimate the HRH deficit due to infection. The highest concentration of COVID-19 cases in Colombia, Ecuador and Peru was observed among doctors and nursing personnel.



Public health decisions in relation to the HWF require an information and surveillance system in order to identify different diseases and risks. For COVID-19, this information system was linked to the regulation and implementation of tests for health workers. The testing process varied between countries depending on several factors, including funding of tests, recognition of COVID-19 as an occupational disease, availability of inputs to perform and process the tests, and defining the institutions that should guarantee testing.

Policy response

The five countries faced the COVID-19 health emergency with a shortage of health workers in key occupational groups or with regional imbalances within the country. All five countries implemented a range of measures to maintain or increase the availability of health workers and to reduce their risk of infection, in addition to the prevention and mitigation of mental health disorders. The strategies used to address HWF issues in the response to COVID-19 were connected to three pillars for HWF response to health emergencies: preparedness for the initial response; strengthening of the HWF to boost response capacity of the health system; and review and updating of measures.

Health workforce planning is a crucial element of emergency response. Country planning for an initial response to COVID-19 varied and included identifying the need for, availability of and deficits in health workers, with a view to increasing the capacity of response of the health system. Taking all five countries in the aggregate, an initial deficit of 34 261 additional health workers was projected. The challenge identified for improving data for preparedness is to develop instruments that provide real-time, comprehensive and detailed information to incentivize efforts to address shortages, both structurally and during health emergencies.

Health workforce policies intended to facilitate the recruitment and deployment of additional personnel and the redeployment of existing personnel in the five countries included: recruitment of personnel through novel hiring mechanisms or adjustment of existing mechanisms; temporary allocation of HRH from non-COVID-19 services to treatment of COVID-19 patients; recourse to national and foreign students and recent graduates, retirees, volunteers and the armed forces; international cooperation; mandatory social service; and shift changes. Also, the five countries developed regulations to facilitate the hiring and deployment of additional personnel and the redeployment of existing personnel. These measures were accompanied by specific economic incentives. The biggest challenge ahead is to develop mechanisms to absorb the newly recruited HRH to reduce pre-pandemic gaps and maintain improvements in their terms and conditions of employment, such as pay increases, which in turn largely depend on identifying adequate sources of funding.

Reducing the risk of infection in health workers, in addition to the prevention and mitigation of mental health disorders in the HWF, has been a fundamental component of the response to the pandemic in the five countries. Countries implemented measures to guarantee the availability of personal pro-



protective equipment (PPE), which varied by country depending on the source of funding and on the entity responsible for procuring PPE. The main challenge was flexibility in public procurement regulations and degree of decentralization. Strengthening IPC was done via routine tests prioritizing health workers (but the periodicity varied by country), issuance of guidelines to identify risk, and the provision of training in the diagnosis and management of COVID-19. This was accompanied by improvements in working conditions such as bonuses and pay increases; life insurance (Plurinational State of Bolivia, Chile and Peru); the recognition of COVID-19 as an occupational disease for health workers (in Chile and Colombia); the identification of risk groups (which impacted availability in some of the countries) by age, comorbidity, pregnancy and child care, who then discontinued their activities and switched to work less exposed to COVID-19 such as telemedicine; and the implementation or strengthening of mental health plans. Finally, through training, new competencies were defined for the treatment of a new disease.

Countries defined strategies to finance the additional cost of the measures to respond to COVID-19. Chile, Colombia and Peru used mainly existing resources from the current and investment budgets of the general

state budget. Ecuador supplemented this with grants and loans from multilateral organizations. The main funding source in the Plurinational State of Bolivia was a World Bank loan that had been made available before the pandemic and was repurposed. Investment was focused on boosting the number of health workers to target deficits in certain occupational groups or the uneven distribution of the HWF between regions. Some of these additional HRH will need to be retained after the pandemic to close gaps and thus contribute to universal access and health coverage. In many cases, the salary improvements and incentives were bound up with better working conditions, and incentives were also made available to reduce regional disparities.

All of the above required a coordinated approach by various entities within each country, specifically the ministries responsible for health, education, labour and the economy. Additional data collection and analyses would be important to gain a better insight into the impact of the short- and long-term measures aiming at strengthening the HWF during the COVID-19 pandemic.

Even though the information collected shows a snapshot in time, it is relevant in 2021 and is helping to align priorities and objectives towards strengthening the HWF during health emergencies and increasing health system resilience. In particular, the use of data and information provide new insights for policy dialogue at national level. As a result, policy actions are informed and coordination among institutions inside the country and within the Andean countries enabled – a common good for health that supports intercountry analysis. Further, it contributes to the global perspective by informing WHO public goods and interim guidance documents on the COVID-19 response.





1 Introduction



Health workers are at the forefront of the COVID-19 response and as such are highly exposed to different risks including infection and death, fatigue, occupational burnout, stress, harassment, and physical and psychological violence. While efforts have been undertaken to assess the pandemic's direct impact on the health workforce (HWF), the focus has been mainly on infection and deaths. However, global estimates of COVID-19 infections and deaths tend to suggest that official reporting mechanisms do not capture the full scale of infections and deaths.

To provide a more comprehensive view on the impact of the COVID-19 on the HWF, WHO developed a standardized measurement impact framework (WHO, 2021a). The framework aims at providing a comprehensive understanding and approach to monitoring the impact of COVID-19 on health workers as well as a common set of standardized measurement indicators and pertinent data sources, that can gauge this multifaceted impact and synthesize the evidence. Of particular importance in informing this framework, five countries from South America have collaborated with PAHO and WHO on comprehensively assessing the impact of COVID-19 on their HWF and reviewing the policies adopted to address the existing challenges related to shortages and the measures implemented to protect and support the HWF.

Health workers are key to building resilient health systems and they have been critically important in the response to COVID-19. But the pandemic has revealed problems with regard to the availability of HRH, the lack of personal protective equipment (PPE), and inadequate working conditions. Medical workers in health services have a higher risk of infection from severe acute respiratory syndrome coronavirus (SARS-CoV-2) due to factors such as the lack of or improper use of PPE, non-compliance with infection prevention and control (IPC) protocols, and insufficient training, all of which limit the availability of HRH.

This paper provides a summary and highlights the key findings of country case studies on COVID-19 and the HWF in five South American countries: Bolivia (Plurinational State of), Chile, Colombia, Ecuador and Peru. It analyses the impact of COVID-19 on the health, occupational safety and working conditions of the HWF, in addition to national policies adopted to address problems and increase the availability and training of HRH to boost the response capacity between March and December 2020. In an effort to support national policy-makers, academics and researchers in designing and implementing strategies to address HWF issues during COVID-19 and health emergencies, this study aims to present and share experiences around the planning and implementation of policies to address the

challenges generated by COVID-19 in Bolivia (Plurinational State of), Chile, Colombia, Ecuador and Peru, member countries of the Andean subregion of PAHO, the Andean Health Organization (ORAS) and the Organization of American States (OAS). The lessons learned, the challenges of the impact of COVID-19 on HRH and the policies adopted by these countries will yield data on preparedness for health emergencies and the development of HRH management policies to make health systems more resilient.

The paper is organized as follows: first, a brief description of the countries' health systems and analysis of the HRH situation before COVID-19; second the methodology; the impact of COVID-19 on health workers is then analysed; followed by the

general response strategy of each country. The national policy response is then outlined across five areas:

- ◆ general response strategy;
- ◆ estimated need for HRH;
- ◆ measures to maintain or increase HRH;
- ◆ occupational health and safety measures to protect and support HRH, IPC, training and vaccination; and
- ◆ financing.

Conclusions are then suggested, with a summary of the findings, similarities, differences and challenges in the five countries, under each of these themes.



2 Country context



The existing configuration of the health system needs to be analysed to identify whether it favours or restricts the adoption of policies and strategies to deal with national health emergencies.

One of the general features of the health systems in the five countries is the existence of different subsystems within them. As a consequence, country health systems are characterized by multiple sources of financing and the coexistence of various types of health service providers. This means that the **health systems are highly fragmented**. This fragmentation is compounded by **autonomy in hiring HRH in the subnational public sphere and in the private sector**. Fragmentation in hiring health workers has some advantages but there are some clear concerns regarding coordination and the effectiveness of regulations. While the autonomy of hiring health workers in the private sector can increase effectiveness of improving HWF surge capacity, fragmentation can reduce effectiveness of regulation and governance.

Like most Latin American countries, in recent decades Bolivia (Plurinational State of), Chile, Colombia, Ecuador and Peru have transformed

their health systems with a view to increasing financial protection for the population and moving towards universal coverage and access which in turn has boosted the HWF. The different policies for strengthening HRH have led to greater availability of health workers in Chile, Ecuador and Peru. Estimates from National Health Workforce Account (NHWA) data, in Bolivia (Plurinational State of), Chile, Colombia, Ecuador, Peru, show an increase in the number of doctors and nursing personnel of between 5–60% and 20–53% respectively.¹

However, the density of doctors and nursing personnel per 10 000 population in the five countries is lower in every case than the average for the region of the Americas (Table 1); and, with the exception of Chile and Ecuador, the data on the density of doctors and nurses are at levels below the estimated density of 44.5 per 10 000 population deemed to be generally necessary to reach a high level of coverage for essential health services linked to the Sustainable Development Goals. Although this critical threshold does not represent a national planning objective, it has been used by the countries in the study as an approximate threshold of minimum requirements for availability of HRH.

¹ In Chile, the number of health workers in the public sector grew by 49% between 2013 and 2019 (MoH Chile, 2020a) and in Peru (public and private sector) by 27% between 2013 and 2018 (MoH Peru, 2019). In the Plurinational State of Bolivia, prior to the pandemic, there was a shortage of HRH, specifically specialist professionals in hospitals; no numbers were provided (MoH Bolivia, 2020a).

Table 1. Density of doctors and nursing professionals per 10 000 population

Country	Doctors (1)	Nursing personnel (2)
Bolivia (Plurinational State of)	10.3 (1.a)	15.6 (2.a)
Chile	25.9 (1.b)	26.8 (2.b)
Colombia	21.8 (1.c)	13.9 (2.c)
Ecuador	23.4 (1.d)	25.1 (2.d)
Peru	15.2 (1.e)	18.1 (2.e)
Latin America and the Caribbean (LAC) 33 countries	29.8 (1.f)	42.4 (1.f)
Americas Region (35 countries)	28.3 (1.f)	82.7 (1.f)

(1) Includes general practitioners and specialists at all levels of care.

(1.a) 2017 data. WHO NHWA Data Portal.

(1.b) 2018 data. WHO NHWA Data Portal.

Note: 22.9 at 2016 according to MoH Chile (2017). Report on health workforce gaps by health service. Note 01, letter i. Budget law Fiscal; 2017.

(1.c) 2018 data. WHO NHWA Data Portal.

Note: 20.1 at 2017 according to MoH Colombia/Observatory for Human Talent in Health (OTHS) (2017). Indicators for monitoring human resources in health by occupational profile.

(1.d) 2018 data. INEC (2020). Statistical Register of Health Resources and Activities; 2020.

Note: 22.2 at 2017 according to WHO NHWA Data Portal.

(1.e) 2020 data. MoH Peru/Human Resources for Health Observatory (ORHUS) (2020). Information on Human Resources for Health from the Ministry of Health and Regional Governments.

Note: 8.2 at 2018 according to WHO NHWA Data Portal.

(1.f) 2018 estimates. WHO NHWA Data Portal.

(2) Nursing personnel include professional nurses and associate professional nurses where available.

(2.a) 2017 data. WHO (2020a). State of the World's Nursing (SOWN). Includes nursing professionals, assistant nurses and undefined nursing staff, where data available.

(2.b) 2018 data. WHO NHWA Data Portal

Note: 24.4 at 2016 according to MoH Chile (2017). Report on health workforce gaps by health service. Note 01, letter i. Budget law Fiscal. 2017.

(2.c) 2018 data. WHO NHWA Data Portal.

Note: 12.6 at 2017 according to MoH Colombia/Observatory for Human Talent in Health (OTHS) (2017). Indicators for monitoring human resources in health by occupational profile.

(2.d) WHO (2020a). State of the World's Nursing (SOWN). Includes nursing professionals, assistant nurses and undefined nursing staff, where data available.

Note: 24.7 in 2018 according to INEC (2020). Statistical Register of Health Resources and Activities; 2020.

(2.e) 2020 data. MoH Peru /Human Resources for Health Observatory (ORHUS) (2020). Information on Human Resources for Health from the Ministry of Health and Regional Governments. See the case study for information on the density of physicians, nurses, obstetricians, and total density.

Note: 24.3 in 2018 according to WHO (2020a). State of the World's Nursing (SOWN), includes nursing professionals, assistant nurses and undefined nursing staff, where data available.

The main challenge in Chile, Colombia and Peru is the unequal distribution of HRH in the regions within the country. For example, in 2017 the capital city of Colombia had 128.1 health professionals per 10 000 inhabitants, while Chocó, a department located in the west of the country, had 20.5 professionals per 10 000 inhabitants (MoH Colombia/OTHS, 2017). Similarly, Peru's capital city had 21.6 medical doctors per 10 000 inhabitants

in 2020, but Cajamarca, located in the north of the country, had 8.1 medical doctors per 10 000 inhabitants in the same year (MoH Peru, 2020a). In Chile there is also inequitable distribution between the public and private health sectors. In the Plurinational State of Bolivia and Ecuador, disparities are observed mainly in urban and rural areas, especially at the primary level of care in the former.

3 Methods and data sources



The discussion and analysis of the case countries are based on: interim guidance, developed by WHO in 2020 (*Health workforce policy and management in the context of the COVID-19 pandemic response*) (WHO, 2020b); the standardized impact measurement framework (WHO, 2021a); and the Health Labour Market Framework (WHO, 2016), used to analyse the various policies and regulations that governments have introduced to manage their HRH in the context of their response efforts.

Eligibility criteria of countries:

- ◆ Member countries of the PAHO Subregional Programme for South America and the Andean Health Organization.² This categorization is important since member countries develop to various extent common policies, notably related to the HWF.
- ◆ Countries, among this subregion, expressing interest on documenting and willingness to review and discuss their COVID-19 response with respect to the HWF.

Each country case study followed a mixed approach of information gathering and data collection: literature and desk review of existing documents; review of health information systems (HIS) and human re-

sources information system (HRIS) databases; and secondary analysis of data. Data were compiled from multiple sources:

- ◆ NHWA handbook (WHO, 2017), implementation guide (WHO, 2018) and Data Portal (WHO, 2021b);
- ◆ national HIS and surveillance databases for data on health worker infections and deaths;
- ◆ desk review of policies adopted during the pandemic, including reports and grey literature, obtained from MoH and service delivery agencies;
- ◆ MoH responses to the questionnaire of the interim guidance developed by WHO (WHO, 2020b) sent by PAHO/WHO for the purposes of this study.

It is important to note that inevitably there are some limitations in the results provided due to the variability in data availability and the data sources between countries.

The five countries in the study created an information system to track confirmed cases and deaths from COVID-19 among HRH. The data collected in these systems vary in terms of:

² The Andean Health Organization – Hipólito Unanue Agreement (ORAS-CONHU) is a subregional integration body, with the objective of coordinating and supporting the efforts made by member countries, individually or collectively, to improve the health of their peoples. Ministers of Health of the ORAS-CONHU member countries: Bolivia (Plurinational State of), Colombia, Chile, Ecuador, Peru and Venezuela (Bolivarian Republic of).

- ◆ public access to the information;
- ◆ frequency of publication; and
- ◆ disaggregation of data by occupational group, at the subnational level, by sex, age, and source of infection.

Additionally, in order to estimate infection indicators with respect to total HRH, the most recent available national data on total HRH were used; the estimates across the five countries do not therefore share the same base year.

The five countries collected data on total infections and deaths of HRH, whereas the disaggregation of data for confirmed cases by occupational group was observed in all countries except the Plurinational State of Bolivia. Colombia and Ecuador have a continuously updated website with publicly accessible data on confirmed cases of COVID-19 and deaths from COVID-19 among health workers. In addition, this information is disaggregated by region, occupational group and age. To estimate the impact of COVID-19 related deaths and infection among health workers we used data from 2017 and 2018, respectively.

In Chile, information is disseminated through epidemiological reports³ on the impact of COVID-19 among HRH, with a more in-depth analysis that includes comparison between HRH and the rest of the population in terms of age, general health status and comorbidity, frequency of COVID-19 detection tests, as well as analysis by region and occupational group, and additional updated information on the availability of HRH. Peru has detailed, continuous and readily accessible information about the availability of HRH through the Observatory for Human Resources in Health (ORHHUS). The Plurinational State of Bolivia has used the pandemic to take the decisive step of compiling data on HRH through the creation of the HRH Management and Administration Unit. Previously, it used payroll data instead of a comprehensive information system on HRH. Likewise, it has implemented the integrated system “COVID SIVE” for epidemiological surveillance to register suspected and confirmed cases of COVID-19, involving digitization of the epidemiological data. However, the information is not yet public.

3 Two reports: September 2020 (MoH Chile, 2020b) and January 2021 (MoH Chile, 2021a).

4 Impact of COVID-19 on human resources for health



The morbidity and mortality impact of COVID-19 has reduced the number of available health workers, which in turn affects the planning of response strategies to address the pandemic. In addition, global estimates of COVID-19 infections and deaths tend to suggest that official reporting mechanisms do not capture the full scale of infections and deaths (WHO, 2021c).⁴ **Appropriate, reliable and timely information is critical for measuring the impact of COVID-19 on HRH and thus for planning and updating the health emergency response, as well as for resource allocation.** It is therefore necessary to understand the extent of the reduction in the HWF and take measures to maintain or increase availability while safeguarding physical and mental health and providing training and equipment to prevent SARS-CoV-2 infections.

Between 3.27% and 12.62% of health workers have been infected by the virus, of which between 0.20% and 1.97% have died in the countries dealt with in this study.⁵ **The availability of HRH was reduced because workers had to go into isolation,⁶ became ill or died from COVID-19.** Table 2 summarizes the data on the impact of COVID-19 on HRH consolidated in the study; the dates on which each country returned its responses or published its information were different. Colombia had the lowest HRH infection rate (3.27% on 10 December 2020).⁷ Conversely, Ecuador had the highest rate (12.62% on 2 April 2021).⁸ Chile had the lowest COVID-19 case fatality rate (0.20% on 3 January 2021) and the Plurinational State of Bolivia the highest (1.97% in April 2021). These results could be affected by the periodicity of testing

of health workers, the level of community transmission in the country and the comorbidities and age of the HRH. Additionally, it must be borne in mind that the initial shortage of PPE may have increased infection among health workers.

Public health decisions in relation to HRH require an information and surveillance system for the HWF to identify different diseases and risks. **For COVID-19, this information system was linked to the regulation and implementation of tests for health workers.** The testing process varied between countries depending on several factors, including funding of tests, recognition of COVID-19 as an occupational disease, availability of inputs to perform and process the tests, and defining the institutions that should guarantee testing. For example, Colombia and Chile introduced regulations to test health workers every 15 days and to recognize COVID-19 as an occupational disease. By contrast, in the Plurinational State of Bolivia it was not possible to prioritize health worker testing due to inadequate inputs to perform and process the tests.

In Bolivia (Plurinational State of), confirmed cases as a proportion of the total number of health workers available in April 2021 was 11.92% with a COVID-19 case fatality rate of 1.97%. Confirmed COVID-19 cases among HRH as a proportion of confirmed cases in the total population was estimated at 7.53%, based on the cut-off date of the case report.⁹ Although this value may be underestimated¹⁰ due to the lack of follow-up of COVID-19 cases among HRH, it represents the highest proportion in the five countries.

4 This working paper estimates the global probable ranges of health care worker deaths due to COVID-19 using mixed analytical methods; this document on country case studies presents data reported by each of the countries in the study.

5 These values correspond to the period of comprehensive collection, analysis and information updates, which differs between countries. In the cases where this is available, update notes will be made, clarifying that the same level of disaggregation of the information is not available as that achieved during the study period.

6 For example, in Colombia, by 10 December 2020 approximately 0.9% of confirmed cases among health workers were in isolation which represents 0.03% of total HWF (INS, 2020).

7 As of 28 April 2021, the infection rate increased to 8.44% (INS, 2021a).

8 However, it is important to note that inevitably there are some limitations in the results provided due to the variability in data availability and the data sources from one country to another. For example, the most recent data on the infection rate available in Peru is 22.48% (April 2021), which is higher than the infection rate for Ecuador in April 2021, although this only corresponds to information regarding the public sector (PAHO/WHO, 2021).

9 Calculated from the total confirmed cases as of 13 April 2021, which corresponds to 284 183 (MoH Bolivia, 2021a), taking into account that the date of the country's report to WHO/PAHO is not known, so the cut-off date of the epidemiological update has been used (PAHO/WHO, 2021).

10 This case would occur if the number of confirmed cases is from a date prior to 13 April 2021, in which case the COVID-19 report would be lower.

The importance of policy decisions in relation to carrying out COVID-19 detection tests can be observed in the case of Chile, where 8.22% of total HRH were affected by COVID-19 on 3 January 2021, as opposed to 3.6% of the population at large. These figures should be set against the fact that the number of tests performed on health workers was three times higher than among the general population (MoH Chile, 2021a), thus demonstrating the emphasis placed on IPC. The COVID-19 case fatality rate among HRH was 0.2%, well below the 2.7% in the population at large. One possible explanation for this is the better health status of HRH, due to the fact that they are younger on average and have fewer comorbidities (MoH Chile, 2021a). Compared with confirmed cases in the total population, the proportion of cases among HRH was 7.39% on 3 January 2021, the second highest in the five countries. Only the Plurinational State of Bolivia had a higher proportion.

In Colombia, it may be inferred that as clinical protocols, risk assessments and the availability of PPE became established, COVID-19 case fatality rates declined (from 2.4% in April 2020 to 0.47% in April 2021) because despite more than double the number of confirmed cases among HRH in 4 months, the COVID-19 case fatality rate was 0.47% both in December 2020, with 103 deaths, and on 28 April 2021, with 267 deaths (INS, 2021a). The increase in the Colombian infection rate could have something to do with the third peak of infection in the country, increasing from 3.27% on 10 December 2020 to 8.44% on 28 April 2021 (INS, 2021a). Colombia has data on the source of transmission: of the total number of COVID-19 cases recorded among health workers, 62% developed an infection in the course of providing health services and 19% following exposure in the community. Likewise, it was observed that the source of transmission varied depending on the occupational group, because in more than 70%

of doctors, nursing personnel¹¹ and other occupational groups directly involved in treating COVID-19, the source of transmission was associated with the workplace. By contrast, occupational groups such as psychologists or pharmacists displayed a higher community infection rate (INS, 2020).

On 2 April 2021, the proportion of confirmed cases among health workers in Ecuador, expressed as a proportion of total HRH, was 12.62%, the highest of the five countries. But when looking at confirmed cases in HRH as a proportion of the total population, it was 3.47% – the lowest (Table 2). The COVID-19 case fatality rate among HRH was 1.01%, five times higher than in Chile (3 January 2021) and twice as high as in Colombia (April 2021). Regarding confirmed cases in the total population, confirmed cases among health workers accounted for 3.47% on 2 April 2021, surpassing Colombia by about 2 percentage points only (Table 2). In addition to worldwide shortages, Ecuador faced the challenge of guaranteeing the availability of PPE, streamlining public procurement regulations and decentralizing procurement at the health centre level (MoH Ecuador, 2020a).

In August 2020 there were 24 922 confirmed cases among health workers in the public sector in Peru, representing 9.8% of public sector HRH in the same month. In April 2021, the country reported 57 901 confirmed cases in public sector HRH (PAHO/WHO, 2021), i.e. an increase to 22.48%, relative to the most recent public-sector HRH data from December 2020. The COVID-19 case fatality rate was 1.22% in August 2020, with 305 deaths. By April 2021, 1001 deaths had been reported, corresponding to 1.73% of confirmed cases among HRH (PAHO/WHO, 2021). In August 2020, health workers accounted for 3.79% of confirmed COVID-19 cases in the total population; in April 2021, this proportion had fallen slightly to 3.47% (PAHO/WHO, 2021).



11 This includes nursing professionals and assistants y other related occupational groups.

Table 2. Impact of COVID-19 on human resources for health

	Bolivia (Plurinational State of)	Chile (2)	Colombia	Ecuador (4)	Peru (5)
Date data provided (6)	13 April 2021 (1.a)	3 January 2021	10 December 2020 (3.a)	2 April 2021	31 August 2020 (5.a)
Confirmed cases among HRH	21 410 (1.a)	52 241	21.832 (3.a)	11 507	24 922 (5.a)
Total HRH	179 667 (1.b)	635 609	666 727 (3.b)	91 205 (4.a)	249 459 (5.b)
Infection rate, HRH (7)	11.92%	8.22%	3.27%	1.62%	9.84%
Deaths among HRH	421 (1.a)	102	103 (3.a)	116	305 (5.a)
COVID-19 case fatality rate in HRH (8)	1.97%	0.20%	0.47%	1.01%	1.22%
Total confirmed cases in the population	284 183 (1.c)	706 921	1 392 133 (3.c)	332 038	657 129 (5.c)
% of cases in HRH compared with total cases in the population (9)	7.53%	7.39%	1.57%	3.47%	3.79%

(1.a) PAHO/WHO (2021). Epidemiological update: Coronavirus disease (COVID-19). The date of the country report is not known, so the cut-off date of the report has been used.

(1.b) MoH Bolivia (2021b). COVID-19 vaccination plan; 14 March 2021.

(1.c) MoH Bolivia (2021a). Report No. 394, 2021.

(2) MoH Chile (2021b). Epidemiological report. Characteristics of health workers with confirmed and probable cases of COVID-19; 12 January 2021. The total for HRH corresponds to 30 November 2020.

(3.a) INS (2020). COVID-19 in health workers in Colombia.

(3.b) MoH Colombia/Observatory for Human Talent in Health in Colombia (OTHS) (2017). Data from 2017.

(3.c) INS (2021b), Report. COVID-19 in Colombia.

(4) MoH Ecuador (2021a). Behaviour of COVID-19 in Ecuador.

(4.a) INEC (2020). Statistical Register of Health Resources and Activities; 2018.

(5) The information on confirmed cases and deaths among HRH and total HRH relate solely to the public sector.

(5.a) MoH Peru (2020a). Response to the PAHO/WHO questionnaire.

(5.b) MoH Peru/Human Resources for Health Observatory (ORHUS) (2020).

(5.c) MoH Peru (2020b). Current COVID-19 situation in Peru.

(6) Date on which the country sent replies or published information.

(7) Infection rate in HRH = Confirmed cases in HRH/Total HRH.

(8) COVID-19 case fatality rate in HRH = Deaths among HRH/Confirmed cases among HRH.

(9) % cases in HRH over total cases = Confirmed cases in HRH/Confirmed cases in total population.

Analysing how confirmed cases with COVID-19 vary across occupational groups of health workers is important for the development of IPC guidelines, to identify health workers at increased risk of infection during health emergencies, and to estimate

the HRH deficit due to infection. **The highest concentration of COVID-19 cases in¹² Colombia, Ecuador and Peru was observed among doctors and nursing personnel:¹³**

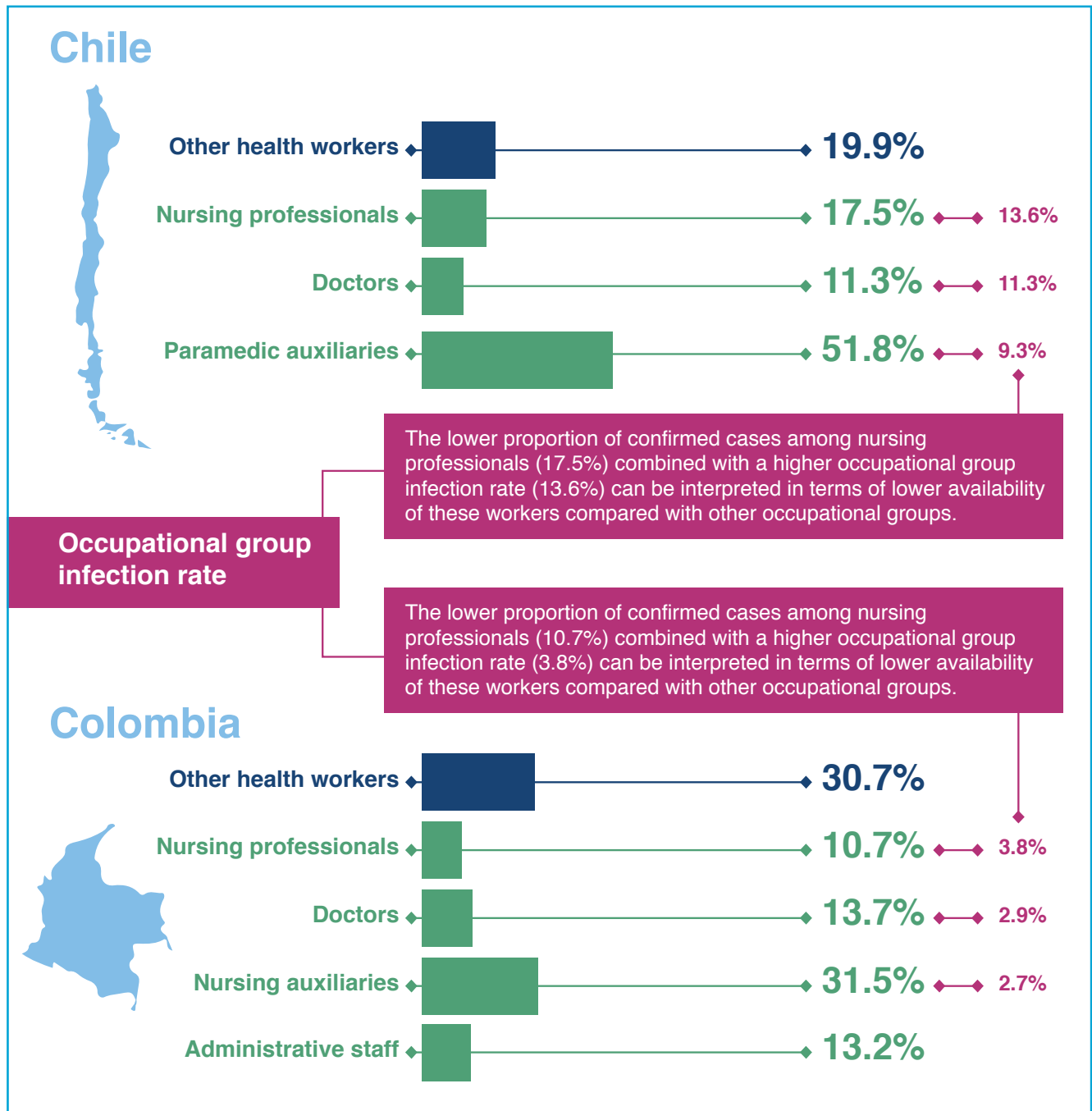
¹² The Plurinational State of Bolivia has no information by occupational profile.

¹³ Includes professionals and nursing assistants and other related occupational groups.

Chile: 79.6% of the total confirmed cases of COVID-19 in HRH were concentrated in three occupational groups: paramedic assistants¹⁴ (50.8%), nursing professionals personnel (17.5%) and doctors (11.3%). (MoH Chile, 2021a). [Box No. 1](#).

Colombia: 69.3% of the total confirmed cases of COVID-19 in the HRH were concentrated in four occupational groups: nursing assistants (31.5%), doctors (13.7%), administrative staff (13.2%) and nursing professionals (10.9%). (INS, 2020). [Box No. 1](#).

Box No. 1. Comparing distribution of confirmed cases by occupational group and occupational group infection rate

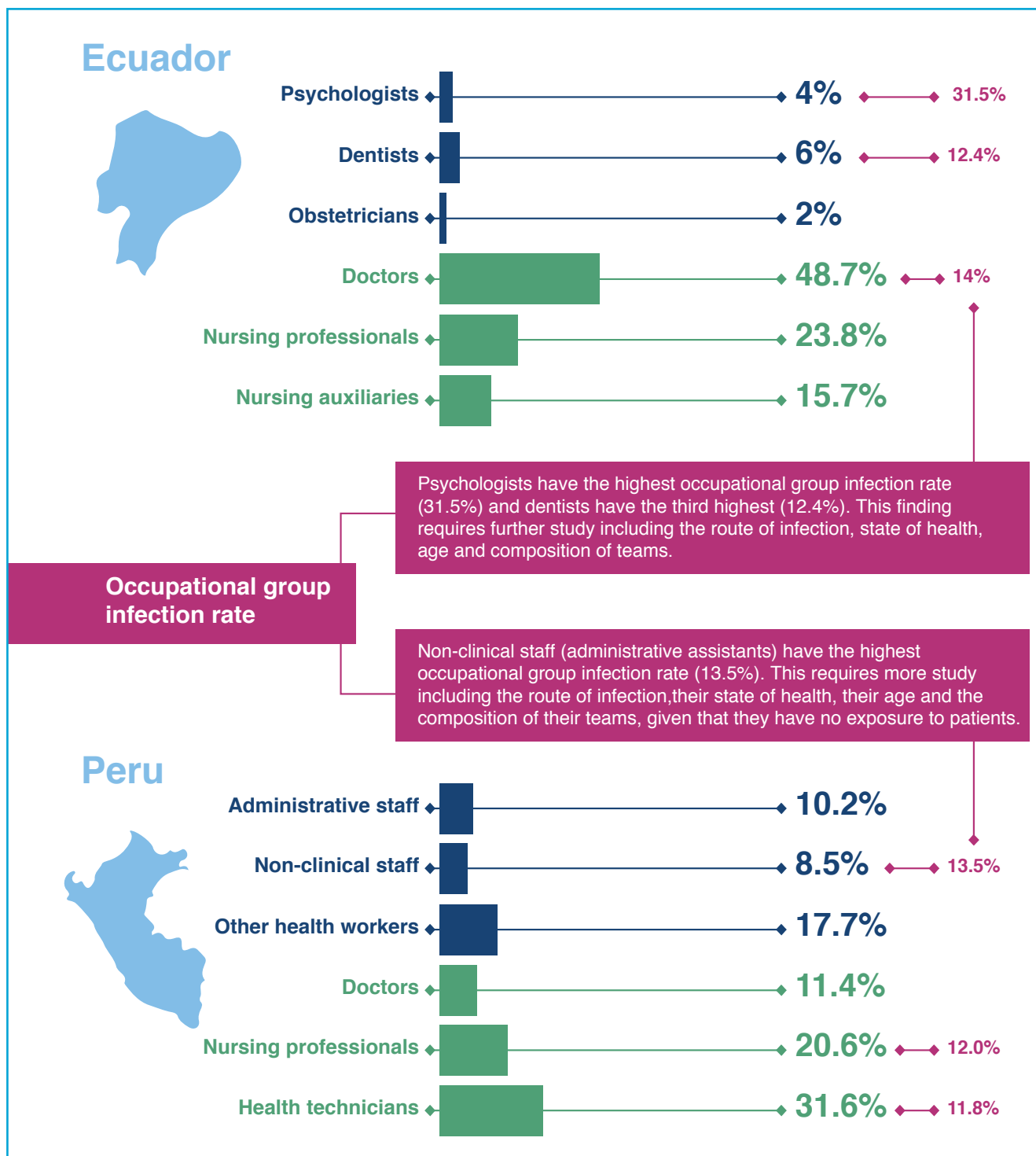


¹⁴ Corresponding to paramedic assistants in dentistry, pharmacy, nutrition, nursing, radiology and imaging, clinical laboratory and blood services, sterilization, pathological anatomy (MoH Chile, 2015).

Ecuador: 88.5% of confirmed COVID-19 cases were concentrated in three occupational groups: doctors (48.7%), nursing professionals (23.8%) and nursing assistants (15.7%). (MoH Ecuador, 2021a). [Box No. 2.](#)

Peru: 63.6% of confirmed cases of COVID-19 in health workers were concentrated in three occupational groups: health care technicians (31.6%), nursing professionals (20.6%) and doctors (11.4%). (MoH Peru, 2020a). [Box No. 2.](#)

Box No. 2. Comparing distribution of confirmed cases by occupational group and occupational group infection rate



The combined analysis of the distribution of confirmed cases by occupational group and the infection rate within each occupational group¹⁵ can be useful to identify a lower availability of health workers in the occupational group.

For example, in the case of nurses: in Colombia, 11% of confirmed cases among all HRH were nurses, compared with 17.5% in Chile, but when the percentage of cases among nurses is considered as a proportion of the total available nurses, it is observed that nurses are the most seriously affected group in Colombia (3.8%) and Chile (13.6%), which translates into lower availability of nursing personnel compared with other occupational groups, for example doctors or nursing assistants in the case of Colombia and paramedic assistants in the case of Chile (INS, 2020; MoH Chile, 2021a).

In Ecuador, psychologists had the highest rate of occupational group infection (31.5%), followed by doctors (14.0%) and dentists in third place (12.4%) (MoH Ecuador, 2021a; INEC, 2020). Similarly, in Peru, non-health care personnel had the highest occupational infection rate (13.51%). (MoH Peru, 2020a; MoH Peru/ORHUS, 2020). Given that the work of psychologists, dentists and non-health care personnel does not involve treating COVID-19 patients directly, this finding requires further study, including the setting in which they became infected, their general state of health, their age and the composition of teams, among other factors. There are no data at this level of detail in the Plurinational State of Bolivia, as the country does not carry out public and centralized monitoring of confirmed cases among HRH.

HRH employment stability is also a factor affecting availability. In Ecuador (Ortega, 2020) and the Plurinational State of Bolivia (Molina, 2020), some health workers resisted treating COVID-19 cases out of fear of infection and because of their employment terms and conditions, which led to some resignations. In the Plurinational State of Bolivia, the existence of 3-month (renewable) contracts did not incentivize health workers to continue working in situations that endangered

their health (Molina, 2020). Of course, these issues were compounded by the shortage of PPE that heightened the fear of infection.

Lack of PPE, poor working conditions, job instability and inadequate remuneration also prompted HRH to mobilize in all the countries studied. Furthermore, national legislation enacted to deal with the COVID-19 pandemic was a further reason for demonstrations among health workers in Bolivia (Plurinational State of), Colombia and Ecuador.

In the Plurinational State of Bolivia health workers protested against three points in the Health Emergency Law: the ban on “the interruption of health services” in the form of strikes, protests or demonstrations in the medical sector; the possibility of recruiting doctors with overseas medical qualifications; and the assumption by central government of the powers of local authorities if the latter were overwhelmed by the emergency.

In Colombia, Legislative Decree 538 of 12 April 2020 (PoR of Colombia, 2020) made it mandatory for all health workers to report for duty, leading to protests from the HWF arguing that the decree failed to address the shortage of PPE.

The implementing regulations of Article 25 of the Humanitarian Support Act¹⁶ led to protests by health workers in Ecuador, because although the law established a mechanism for the long-term appointment of all health workers who had served during the COVID-19 health emergency, in practice they stipulated that these appointments would be made gradually, that the need for them should be justified, and that they would be contingent on funds being available.

In the five countries, health workers have had to face verbal aggression, discrimination, physical violence and death threats when leaving work and in the vicinity of their homes because they are considered to be a source of transmission of COVID-19 and therefore pose a risk to the community (Valdés et al., 2020).

¹⁵ The ratio between the number of confirmed cases by occupational group to the total HRH available in that occupational group.

¹⁶ Specifically Articles 10 and 40 of Executive Decree 1165 of 2020 (PoR of Ecuador, 2020).



5

Policy response



The five countries faced the COVID-19 health emergency with a shortage of health workers in key occupational groups or with regional imbalances within the country. These problems were exacerbated by the fact that a significant number of workers had to go into isolation, became ill or died from COVID-19, or experienced mental health impacts in precarious working conditions, thus further compromising the availability of health workers.

In the period from March to December 2020, all five countries implemented a range of measures to maintain or increase the availability of HRH to manage the health emergency and to reduce the risk of infection in health workers, in addition to the prevention and mitigation of mental health disorders. HRH workforce policies intended to facilitate the recruitment and deployment of additional personnel and the redeployment of existing personnel included creating faster recruitment pathways or permitting the hiring of freelancers, often on the basis of emergency legislation, reorganizing shift work, introducing task changes (role delegation and/or role substitution), and reassigning staff within facilities or between regions.

5.1 General strategy

Since January 2020, the five countries have implemented measures and protocols to strengthen health surveillance, screening and border controls. After COVID-19 was declared a pandemic and imported cases were reported, each country declared a COVID-19 health emergency. This generated the legal framework that allowed exceptional measures to be taken to prepare a health system response.

It is important to examine the main focus of the strategy deployed by each country to address the COVID-19 pandemic, since this has different implications for the targeting of resources and on pandemic management outcomes. Notwithstanding changes in emphasis as the pandemic developed, international literature indicates that countries implemented two types of strategy:

1. Prioritization of early testing, traceability and isolation of infected people and their close

contacts, involving significant mobilization (and eventually reinforcement) not only of epidemiological surveillance teams and laboratories, but also of the primary level of health care.

2. Early prioritization of efforts to boost the capacity of the health system to treat people with COVID-19, translating into an initial allocation of additional resources and reorganization of health care aimed mainly at increasing the number of critical beds and strengthening the corresponding health teams.

The five countries prioritized the second strategy, concentrating their efforts on increasing the response capacity of the health system to treat COVID-19 patients through expansion of hospital capacity, i.e. increasing the number of beds in intensive care units, intermediary care units and hospitalization, and strengthening the corresponding HRH. This strategy operated in tandem with epidemiological surveillance, testing, border control and increased laboratory capacity.

The Plurinational State of Bolivia further strengthened the entire national health system to ensure that resources were also allocated to the primary level of care, accounting for 50% of the HRH contracted (MoH Bolivia, 2020a). WHO/PAHO supported the MoH in defining the groups and levels to be strengthened, and the gaps that needed to be covered based on projected needs.

To deal with the second wave, approximately 4 to 5 months after the start of the pandemic, there was a change in emphasis as the first type of strategy was prioritized, i.e. strengthening of testing, traceability and isolation, involving primary health care in coordination with the health workers employed in the previous strategy. In the Plurinational State of Bolivia, the Active Community Surveillance Strategy was created, with increased support for and development of the primary level of care (MoH Bolivia, 2020b). In Chile the National Strategy for Testing, Traceability and Isolation was established in June 2020 (MoH Chile, 2020c). In Peru, 17 rapid temporary treatment centres were established in September 2020 for the timely isolation and treatment of COVID-19 cases (MoH Peru, 2020c).

5.2 Improving health workforce availability

5.2.1 Identifying COVID-19 workforce needs

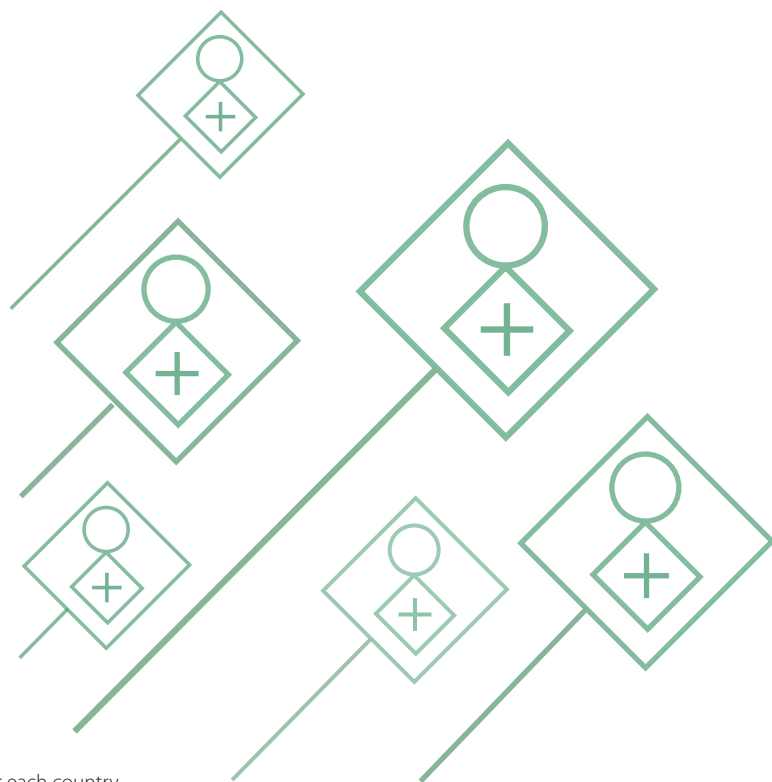
Prioritizing an increase in the response capacity of the health system implies additional resources, specifically health workers. In the five countries studied, **the need for health workers to address COVID-19 was calculated in terms of the planned response capacity**, taking into account the number of additional hospital beds and intermediate and intensive care units required to deal with the projected number of cases. In some countries, the reduction in the availability of health workers due to infections or deaths was also factored into these calculations. For these estimates, most of the countries used models that were developed by the MoH. In the case of the Plurinational State of Bolivia, PAHO/WHO supported MoH Bolivia defining the occupational groups to be strengthened for the COVID-19 response as well as estimating the need for health workers. In the case of Chile, the model has been used to negotiate the budget with the Ministry of Finance.

Taking all five countries in the aggregate, a deficit of 34 261 additional health workers was projected.¹⁷ Ecuador calculated the lowest deficit of 2850 health professionals (3.12% of total HRH) (MoH Ecuador, 2020a) and Chile the highest with 17 439 (2.74% of HRH on 30 November 2020) (MoH Chile, 2020d). Regarding total HRH, Colombia had the lowest estimate of additional needs (0.54% of total HRH or 3608 health professionals) (MoH Colombia, 2020a) and the Plurinational State of Bolivia the highest (4.17% of total HRH or 7628 health care professionals) (MoH Bolivia, 2020a). Peru estimated an initial need for 2880 health professionals over 3 months (1.34% of the HRH in the public sector in March 2020) (MoH Peru, 2020d). **With the exception of Colombia, the estimates were applicable to the public sector of the health system.**

In Peru and the Plurinational State of Bolivia, an initial response was prepared to deal with suspected,

probable and confirmed cases of COVID-19 in public health facilities over an initial period of 3 months. In the latter, a need for 7628 additional health workers was calculated, to treat 39 000 cases. However, COVID-19 cases far exceeded HWF projections (MoH Bolivia, 2020a). In the initial Peruvian response, it was calculated that 2610 health professionals and 270 non-health care professionals would be needed (MoH Peru, 2020d).¹⁸

In Colombia and Chile, elements of the general strategy to address COVID-19 were used to estimate the HWF needed to respond to the pandemic. In particular, the Chilean public sector periodically estimates the HRH deficit. The model and estimates were used as a basis for estimating the staffing need of 17 439 (MoH Chile, 2020d), and as a support to have additional resources to strengthen the HWF according to the various health care strategies in the COVID-19 action plan. Although the Chilean response covered both the public and private sectors, HWF needs were estimated only for the public sector. Meanwhile, Colombia estimated the availability and need for health workers. The availability of prioritized health workers was estimated at 435 547, including therapists, doctors and nurses capable of treating COVID-19 patients.



¹⁷ This value correspond to the sum of all calculated values of HRH deficit for each country.

¹⁸ However, by December 2020, a total of 44 207 health professionals had been hired in the public sector (MoH Peru/ORHUS, 2020).

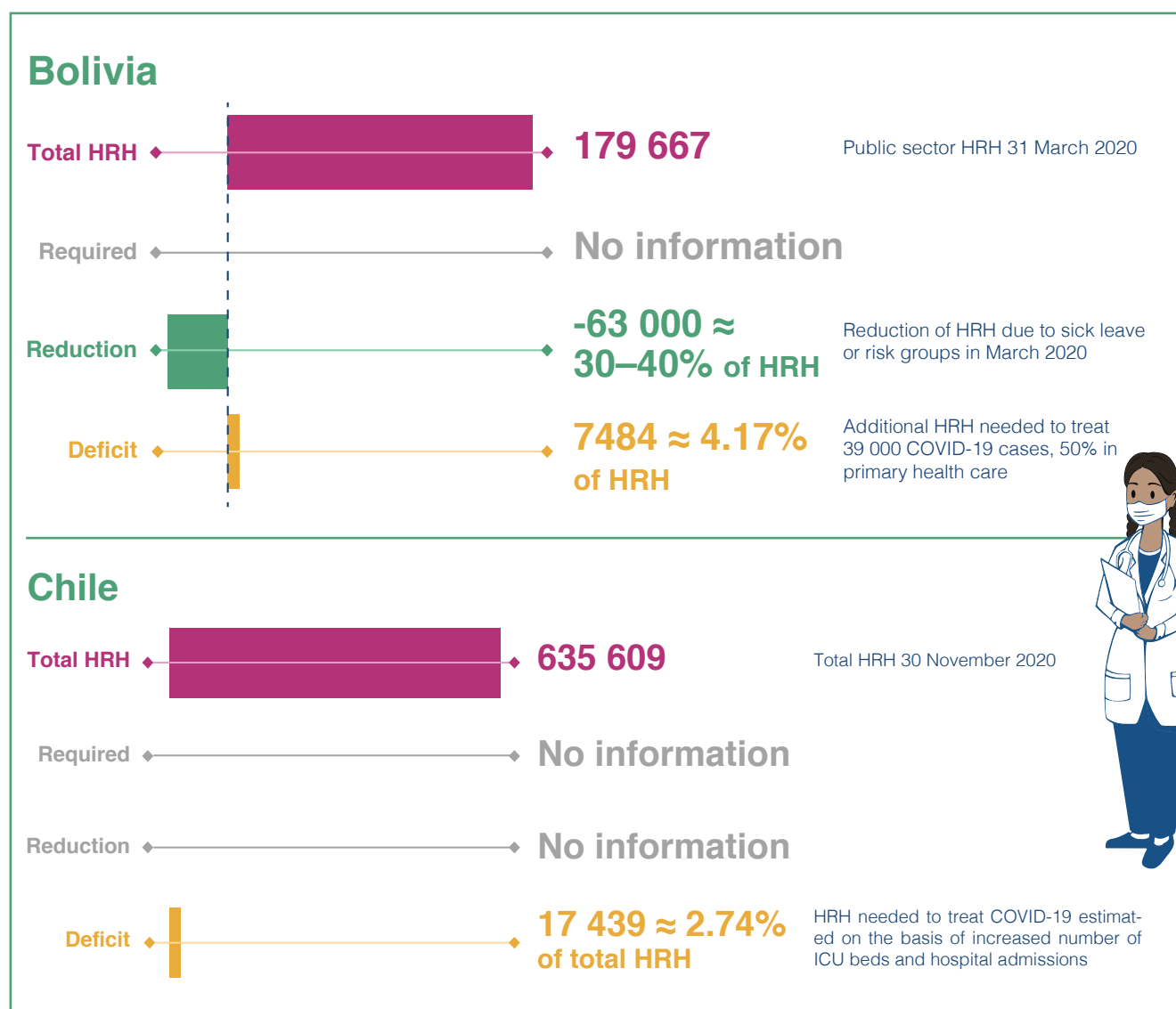
Through the action plan for the provision of health services during the containment and mitigation stages of COVID-19, which comprised four phases depending on the evolution of the pandemic, HRH requirements were also estimated in terms of deficit by occupational group during each phase. It was thus estimated that a total of 85 345 health workers would be required in phase IV. In this phase, the shortage of specialist doctors (adult and paediatric intensive care, internal medicine, anaesthesiology and general surgery) was estimated at 3608 (MoH Colombia, 2020a).

The MoH Ecuador estimated HRH requirements on the basis of the number of patients treated, and accordingly it planned to hire 2850 additional

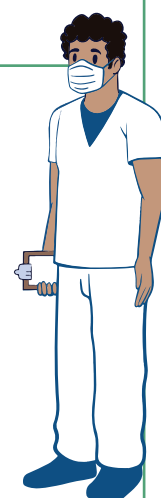
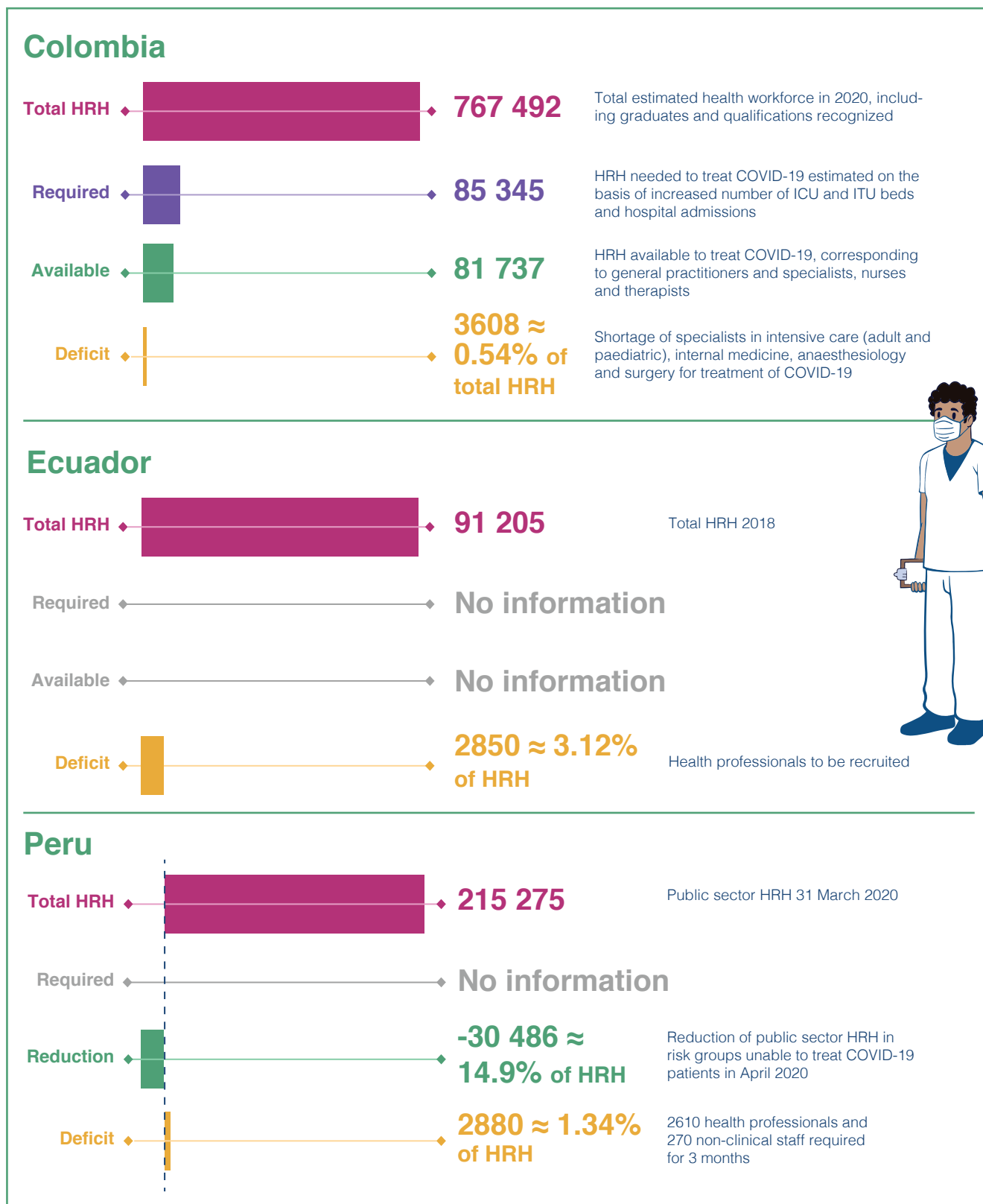
health workers. To this end it launched a process to streamline institutional HRH, i.e. reducing the number of administrative staff and boosting the number of clinical staff (MoH Ecuador, 2020b).

The projections of health workers needed to respond to COVID-19 assumed that the availability of personnel would be negatively affected by the increase in infections among health workers and workers within risk groups such as pregnant women, older people and health workers with comorbidities. The percentage of risk groups among health workers affected the availability of HRH in Bolivia (Plurinational State of), Ecuador and Peru. For example, in the Plurinational State of Bolivia it further reduced the availability of HRH from by 40%

Box No. 3. HRH planning for policy response



Box No. 4. HRH planning for policy response



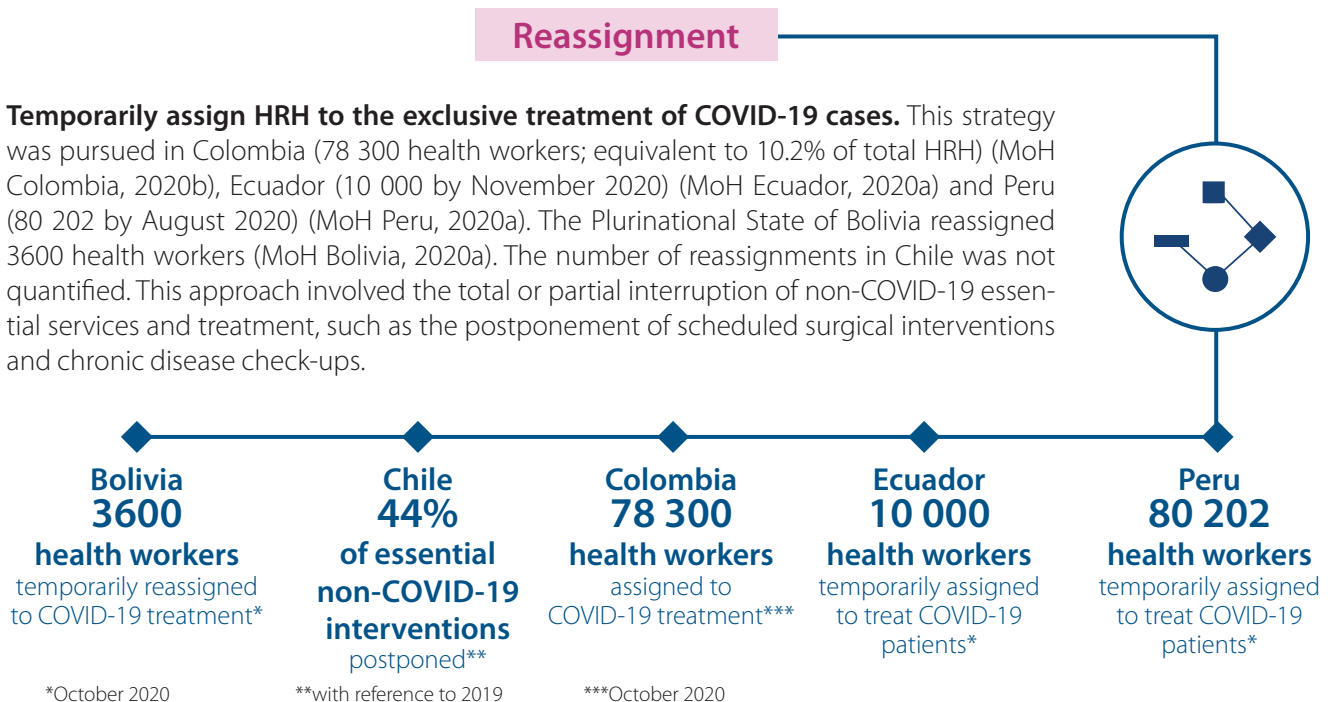
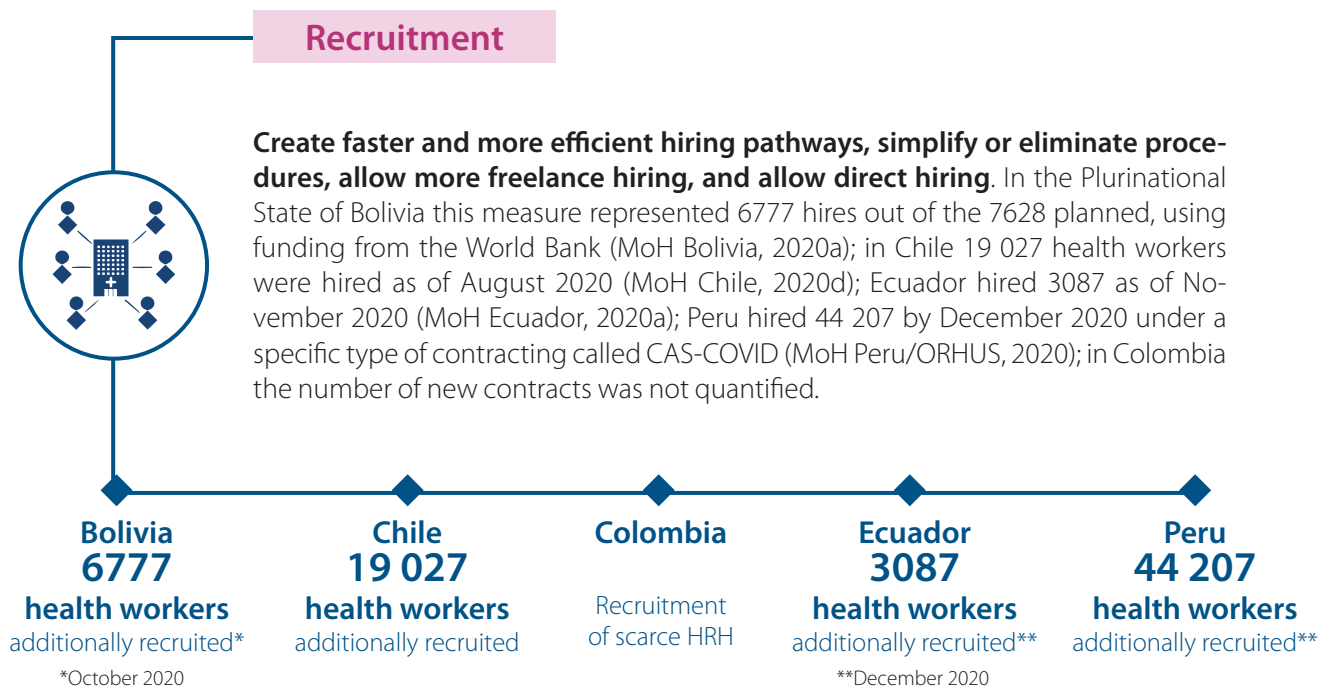
(up from 30%) so that new hires, estimated at 32%, did not cover the higher deficit due to absences among risk groups (MoH Bolivia, 2020a). In Peru the reduction of health workers due to risk groups

was 14.9% (MoH Peru, 2020a). In Ecuador, the HRH deficit was observed to increase but was not quantified (MoH Ecuador, 2020a).

5.2.2 Measures to maintain or increase human resources for health

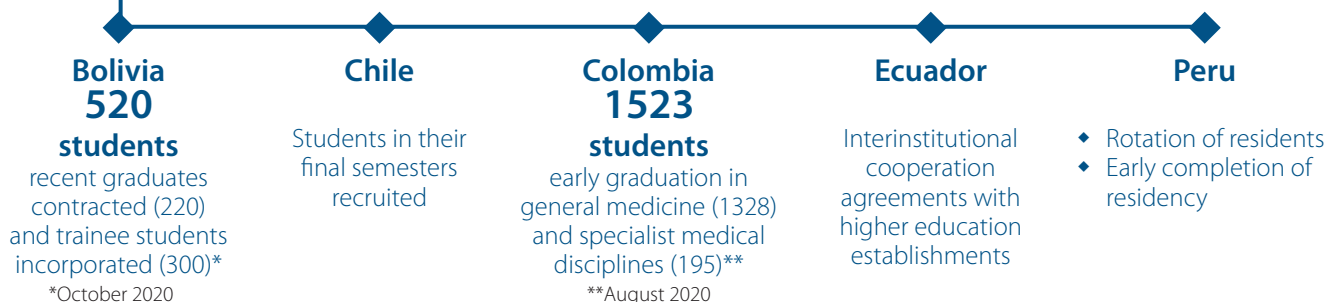
It is important to know and document the strategies adopted by the various countries to meet the need for health workers, and to understand whether these measures required regulatory changes

to develop new HWF policies with a view to strengthening health systems. **The five countries developed regulations to facilitate the hiring and deployment of additional personnel and the redeployment of existing personnel.** The various measures can be summarized as follows:



Students

Employ recently qualified professionals or students about to graduate. The Plurinational State of Bolivia took steps to facilitate the hiring of 220 recent graduates and incorporate 300 trainee students into the workforce (MoH Bolivia, 2020a). Chile hired students in their final stages of medical qualification (MoH Chile, 2020d). In Colombia 1532 medical students were permitted to graduate ahead of schedule (MoH Colombia, 2020c), while in Peru medical residency requirements in key specialities were terminated early (5048 residents as of August 2020) and degree procedures were temporarily eliminated for medical graduates in order to expedite their entry into the workforce (MoH Peru, 2020a).



Work shifts

Expand or modify work shifts with corresponding pay increases in Bolivia (Plurinational State of), Chile, Ecuador and Peru. Only Peru has quantified this strategy, applicable to 11 662 health professionals as of August 2020 (MoH Peru, 2020a).



Expand access to the service mechanisms required for graduation. In Chile, academic attendance was suspended to prioritize treatment by doctors and dentists in the appointment and training cycle (measure applicable to 4000 graduates) (MoH Chile, 2020d). In Colombia the number of places available in the Mandatory Social Service was expanded (2730 graduates) (MoH Colombia, 2020d). Peru facilitated access to SERUMS,¹⁹ even for practitioners who had pursued their medical studies abroad (MoH Peru, 2020a).

Community service



19 Rural and Urban Marginalized Service.

Foreign qualifications



Facilitate the entry into practice of health professionals who studied medicine abroad, either by expediting validation of their qualifications as in Colombia (MoH Colombia, 2020b), or by dispensing with validation altogether, as in Chile (MoH Chile, 2020d) and Peru (MoH Peru, 2020a).

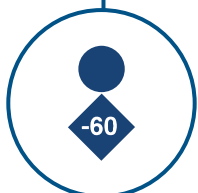


International cooperation

Accept teams of health professionals through international cooperation mechanisms. In Colombia, the United Nations Refugee Agency made 45 health professionals available in 16 regions of the country, and 105 health professionals were hired through the US Agency for International Development for 6 months (MoH Colombia, 2020b). Peru received support from the Cuban MoH in the form of 85 health professionals, and Médecins Sans Frontières provided 7 specialist health professionals (MoH Peru, 2020a).



Retirees



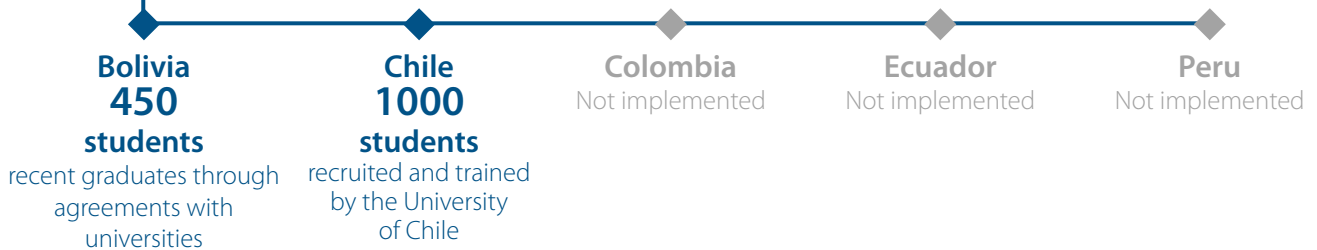
Allow retired health professionals to return to practise. In Colombia, this measure applied to pensioners under the age of 60 (MoH Colombia, 2020b). In Chile, it included both former officials who had availed themselves of the voluntary retirement bonus (in which case prohibitions and conditions established by law were not applied) and professionals released from duty who were allowed to return to perform treatment functions, including shifts for up to 22 hours per week (MoH Chile, 2020e), thus yielding an additional 1500 health professionals (MoH Chile, 2020f).



Volunteers



Accept volunteering by recent graduates and medical students through agreements with universities, as in the Plurinational State of Bolivia with 450 recent graduates (MoH Bolivia, 2020a) and Chile with 1000 students (MoH Chile, 2020d).



Armed forces

Support from health professionals serving in the armed forces, specifically in Colombia as regards retired medical personnel (MoH Colombia, 2020b), and in Chile²⁰ and Ecuador, with regard to personnel still in service. In Ecuador represented 1523 additional health workers by November 2020 (MoH Ecuador, 2020a).



Sign interinstitutional cooperation agreements with higher education institutions, for example in Ecuador where arrangements were made to enable postgraduate doctors²¹ to provide services as part of their training in hospitals in the Comprehensive Public Health Network and the Complementary Network (MoH Ecuador, 2020a).

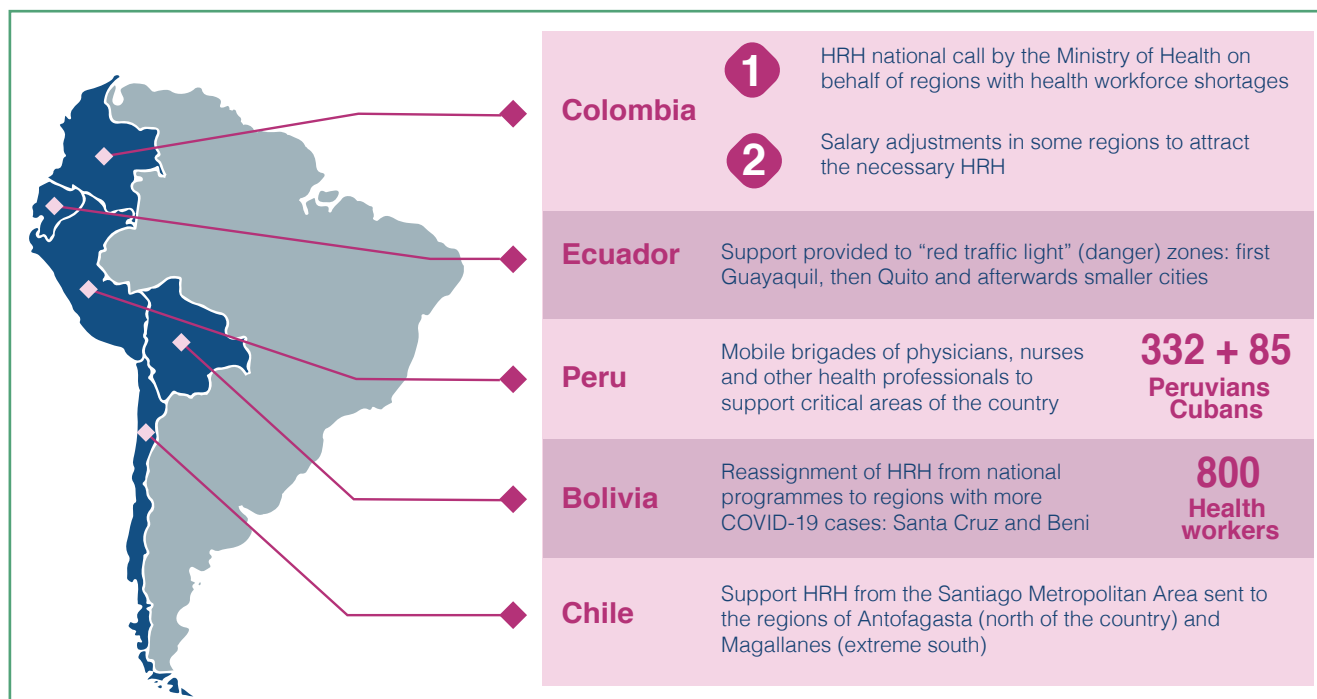
The five countries resorted to a range of strategies to address uneven distribution of HRH between regions. The Plurinational State of Bolivia reallocated HRH from national programmes such as Telehealth and Family and Community Health to regions with a higher incidence of COVID-19 cases, such as Santa Cruz and Beni (MoH Bolivia,

2020a). Chile sent HRH support from the Santiago Metropolitan Region to the regions of Antofagasta (in the north of the country) and Magallanes (in the extreme south) (MoH Chile, 2020d). In Colombia, the MoH appealed on behalf of regions with a shortage of HRH, in addition to making salary adjustments in some regions to attract the necessary HRH (MoH Colombia, 2020b). Ecuador provided support to “red traffic light” regions: first Guayaquil, then Quito, and finally small cities (MoH Ecuador, 2020a). Peru created mobile brigades of doctors, nurses and other health professionals (comprising 332 Peruvians and 85 Cubans) to support critical areas of the country (MoH Peru, 2020a).

²⁰ According to information given by the MoH Chile delegate in meeting held on 24 August 2021.

²¹ This refers to doctors who are specializing, who in their training programmes must accumulate approximately 20 000 hours of training split between health care and academic study (MoH Chile, 2020f).

Box No. 5. Strategies to address uneven distribution at the subnational level



These measures were accompanied by specific economic incentives. In Chile, Colombia and Ecuador, these incentives were granted on a one-off basis, earlier in Colombia and later on in Chile and Ecuador, whereas in Peru incentives were provided on a monthly basis between April 2020 and March 2021 (PoR of Peru, 2020). The target population beneficiaries of these incentives in Chile were more than 220 000 health workers (MoH Chile, 2020g) including primary health care workers, health services workers and staff at pilot scheme health establishments, with an incentive of 200 000 Chilean pesos (US\$ 272) (National Congress Chile, 2020), in addition to an increase of up to 30% in the hourly remuneration rate by way of a health emergency incentive (PAHO/WHO, 2020). In Colombia, the target population is estimated to be 247 504 health workers treating confirmed or suspected COVID-19 patients (MoH Colombia, 2020e). The incentive was worth between 1 and 4.5 times the current legal monthly minimum wage (equivalent to US\$ 259–1036) (MoH Colombia, 2020f). The amount of the incentive in Ecuador is US\$ 200 for 325 787 public sector workers, including primary health care workers, among others (Infobae, 2021).

In Peru, a package of three types of bonuses was implemented, with the following intended recipients (Huamán, 2020): for health workers associated with the CAS-COVID scheme,²² a bonus worth 720 sols (US\$ 200); for medical personnel treating COVID-19 patients at health facilities under the Health Insurance (EsSalud) scheme, the value of the bonus being determined by EsSalud; and for third- and fourth-year resident doctors specializing in intensive medicine or emergency and disaster medicine, with rotations at prioritized health establishments, a monthly bonus worth 3000 sols (US\$ 838).

The Plurinational State of Bolivia increased salary scales to attract HRH (MoH Bolivia, 2020a). In Colombia, salary scales were increased only in regions experiencing difficulties in obtaining the required numbers of HRH (MoH Colombia, 2020b). In Chile (MoH Chile, 2020d) and Peru (MoH Peru, 2020a), salary scales were adjusted as a health emergency incentive mechanism.

The MoH in each country states that it successfully enlisted additional HRH to address the health emergency within a relatively short period of time by

²² Particular type of contract during the COVID-19 health emergency.

means of regulatory adjustments that paved the way for the measures listed above. MoH Colombia says that the numbers achieved have been sufficient to staff the additional infrastructure created during the health emergency (MoH Colombia, 2020b). The MoH of Chile, Peru and Ecuador have made no comment regarding sufficiency. The Plurinational State of Bolivia, however, continues to experience a shortfall, according to information currently available (MoH Bolivia, 2020a).

On the other hand, we have witnessed remarkable coordination between the ministries of health and education to facilitate the expedited availability of medical students, specialists and recent graduates. Likewise, different segments of the health system have coordinated among themselves, and with the armed forces in Chile, Colombia and Ecuador.

5.3 Measures to protect and support human resources for health

Reducing the risk of infection in health workers, in addition to the prevention and mitigation of mental health disorders in this occupational group, is a fundamental component of the response to the pandemic. High rates of infection among health workers decreased the response capacity of the health system by reducing the availability of HRH, either because health workers have been exposed and subsequently placed in isolation or because they have become ill. Being at the forefront, health workers are a high-risk group vulnerable to infection and mental health disorders. This excessive pressure that COVID-19 puts on health care workers requires multidimensional and integrated strategies to address adequately.

Section 5.3.1 shows how countries have addressed the issue of protection and safety of health workers through technical guidance; COVID-19 testing; procurement of PPE; IPC training; monitoring of mental health; and response to health and safety at work issues. Section 5.3.2 looks at the area of HWF training. Section 5.3.3 looks at prioritization of health workers in national vaccination plans.

5.3.1 Health and safety at work and infection prevention and control

Taking into account that more than half of infections in health workers occur in health facilities (IADB, 2020), protection measures are essential to counteract the psychological pressure on HRH due to the fear of contracting or transmitting the disease to their families. The protection of health workers is thus key to ensuring the functioning of the health system.

The study observed that **reducing the risk of infection in health workers, in addition to the prevention and mitigation of mental health disorders in the health workforce, has been a fundamental component of the response to the pandemic in the five countries.** The relevant measures adopted are summarized below:

Procurement and distribution of PPE with access guaranteed for health workers. To this end, the five countries have decreed the possibility of direct procurement, specifying sources of funding and the officials responsible for PPE procurement and distribution. In the Plurinational State of Bolivia the responsible entities are the MoH, the autonomous territorial entities and the short-term social security entities (MoH Bolivia, 2020a). In Chile, the National Supply Centre (Cenabast) is responsible (MoH Chile, 2020d). In Colombia, labour risk administrators are responsible for procuring and providing PPE to HRH (MoH Colombia, 2020b). In Peru, resources have been continuously reallocated to the health sector, including for procurement of PPE (MoH Peru, 2020a). This contrasts with the shortage of PPE that the five countries faced in the first months of the pandemic and the consequent difficulty of ensuring sufficient coverage for health workers. The shortage was particularly acute as regards N95 type masks in Chile, Colombia and Ecuador. In Chile, guidelines were established to promote the rational use of these resources, without putting HRH at risk (MoH Chile, 2020h). Peru successfully established a surveillance committee for the allocation and use of PPE and other resources to treat COVID-19 in each health service provider institution (MoH Peru, 2020e).

Administration of COVID-19 detection tests in the five countries, with priority given to HRH. In Colombia (MoH Colombia, 2020g) and Chile (MoH Chile, 2020i), routine tests were performed every 15 days in accordance with risk assessment. In order to reduce the duration of HRH absences due to delays in obtaining test results, the Plurinational State of Bolivia issued regulations specifying priority testing for HRH, but this measure could not be implemented in practice owing to a shortage of laboratory inputs (MoH Bolivia, 2020a).

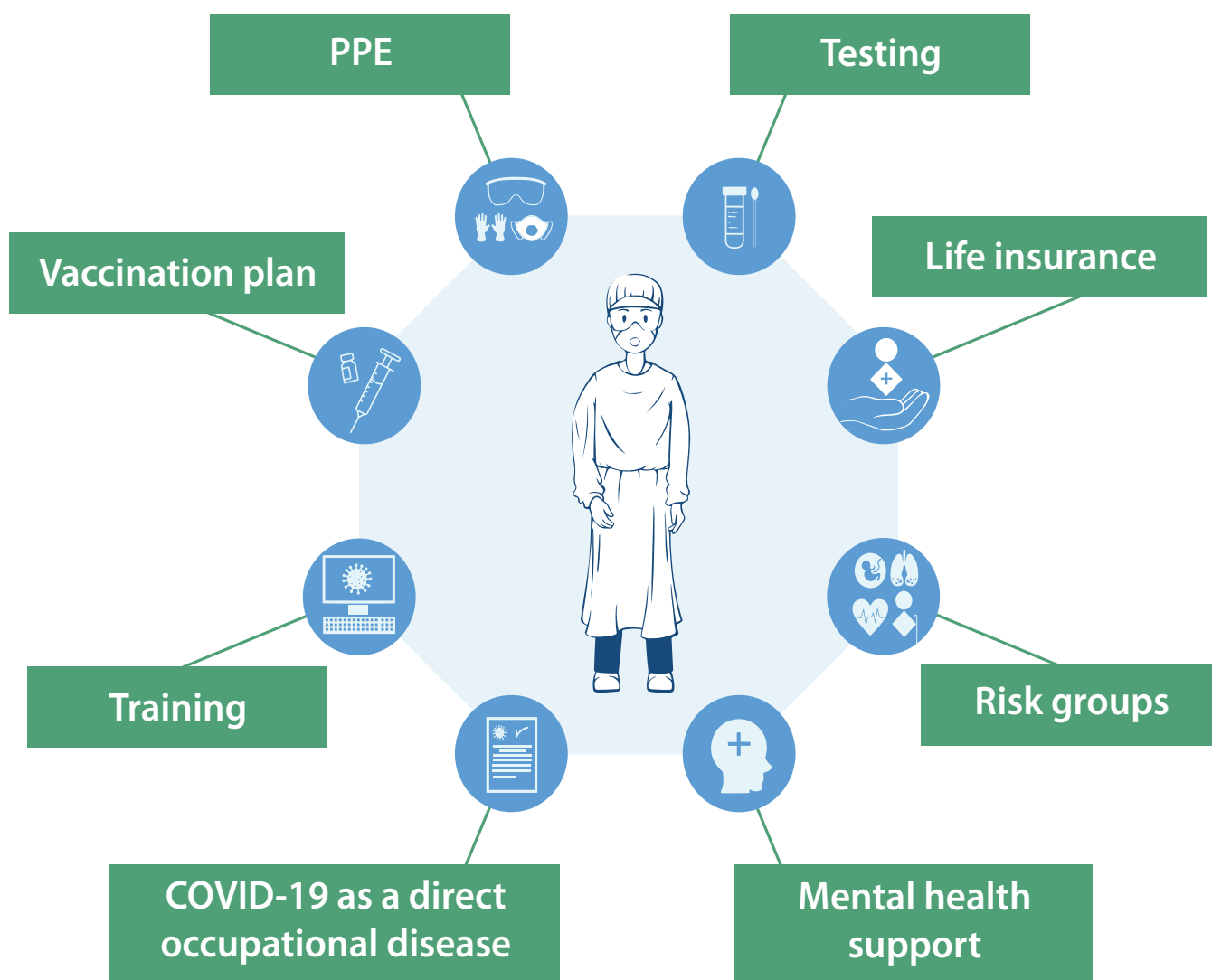
Identification of risk groups by pregnancy, age and comorbidity. In Chile (MoH Chile, 2020j), Ecuador (MoH Ecuador, 2020a) and Peru (MoH Peru, 2020f), workers in these categories were assigned to tasks other than clinical care of COVID-19 patients, specifically telemedicine. Peru implemented this system later on. In the Plurinational State of

Bolivia the availability of HRH decreased by 40% (up from 30%) (MoH Bolivia, 2020a).

Mental health plans in the form of guidelines and directives for workers, employers or national entities responsible for health and safety at work. This policy was implemented at different stages: early on in Ecuador (MoH Ecuador, 2020a) and Colombia (MoH Colombia, 2020b) (March 2020) and later in Chile (May 2020) (MoH Chile, 2020d) and Peru (June 2020) (MoH Peru, 2020a).

Recognition of COVID-19 as an **occupational illness** for HRH in Chile (SUSESO Chile, 2020) and Colombia (Ministry of Labour Colombia, 2020).

Life insurance for HRH in Bolivia (Plurinational State of) (Ministry of Government Bolivia, 2020), Chile (MoH Chile, 2020k) and Peru (MEF Peru, 2020).



5.3.2 Training

Provisions for funding and deployment of induction, training and mentoring policies for HRH are critical tools in a health emergency, particularly in the absence of previous experience of the development of a disease, as with COVID-19. These tools are essential for the treatment and care of patients and also have the important function of mitigating the risk of infection to health workers and their families.

The health sector is noted for the existence of induction and training practices in the field and at health care establishments, which are themselves clinical fields. Informal training is therefore frequent and currently relies on technology that provides asynchronously accessible tools and content. The responses to the questionnaire from the MoH demonstrate a significant use of distance learning and the forging of partnerships with academia and scientific societies for the creation of appropriate content.

Among their achievements, the five countries stress the importance of successfully delivering or strengthening HWF knowledge and skills with regard to the prevention and treatment of COVID-19, through training delivered mainly via distance learning technology or telemedicine platforms that existed at health ministries prior to the pandemic. The training has reached a large proportion of HRH in Chile (69.3%) (MoH Chile, 2020d) and Peru (60%) (MoH Peru, 2020a). In the Plurinational State of Bolivia, training and psychological support were used to mitigate health workers' fear of treating COVID-19 cases and to address concerns around vaccination safety (MoH Bolivia, 2021b).

5.3.3 Vaccination

This section looks at the prioritization of health workers in national vaccination plans (NVPs) and/or official documents and at country estimates of health workers needed to achieve the targets of vaccination in the NVP. The information was collected between January and April 2021. Vaccination is indispensable for an available and

well-trained HWF. Health workers must be vaccinated themselves, while simultaneously being tasked with implementing the vaccination plan for the population as a whole.

The vaccination of health workers was prioritized in the NVPs of each of the five countries during the first phase, but in Colombia it was extended into the second phase in view of the numbers involved.

The Chilean vaccination plan is noteworthy for its use of nursing personnel²³ from the primary care network and the national immunization plan as a platform for mass vaccination, supplemented by other health professionals such as midwives and dentists licensed to perform vaccinations. Thus the required HRH were available to implement the vaccination plan right from the very start (MoH Chile, 2021b). The other countries all had plans to ensure a sufficient number of vaccinators: 4000 health workers working in three-person brigades in Bolivia (Plurinational State of) (MoH Bolivia, 2021b), 70 000 in Colombia (MoH Colombia, 2021), 8000 in Ecuador (MoH Ecuador, 2021b) and 25 000 in Peru (MoH Peru, 2020g).

The Plurinational State of Bolivia, Ecuador and Colombia have data on vaccination capacity. In the Plurinational State of Bolivia, capacity to vaccinate was established with reference to the target population and the region, so that in the case of vaccination for HRH in the Pando region, it was estimated that it would take 7 hours to vaccinate 2587 health workers, whereas in La Paz it would take 9 hours to vaccinate 49 901 health workers (MoH Bolivia, 2021b).

In Colombia, the number of vaccinations per hour and the vaccination modality was established, depending on whether the vaccine was administered in a health care setting (≥ 42 doses/7 hours) or outside a health facility (18 doses/7 hours in urban areas and ≥ 12 doses/7 hours in rural areas) (MoH Colombia, 2021).

In Ecuador, phase 1 of the vaccination plan envisaged an average of 60 522 doses per day and 7565

²³ Includes nursing professionals and assistants and other related occupational categories.

Box No. 6. HRH planning for vaccination plan

		Vaccinations per day	Vaccinators
Bolivia	HRH were trained and given mental health support to address fears around vaccine safety and occurrence of adverse effects	N.A.	12 000 in 4000 brigades
		Existing capacity <i>March 2021</i>	
Chile	Vaccinators <ul style="list-style-type: none"> ◆ Primary health care network ◆ National immunization plan ◆ Midwives and dentists authorized to administer vaccines 	+200 000	+2500 Vaccination centres
		Existing capacity <i>28 May 2021</i>	
Colombia	Daily vaccinator performance <ul style="list-style-type: none"> ◆ Through scheduled appointments: ≥ 42 doses/7 hours ◆ Urban outreach: ≥ 18 doses/7 hours ◆ Rural outreach: ≥ 12 doses/7 hours 	+200 000	44 344 20 000 more in training
		Existing capacity <i>24 April 2021</i>	
Ecuador	10 000 vaccination centres <ul style="list-style-type: none"> ◆ 2000 MoH vaccination centres* ◆ 1000 police and military IESS centres** ◆ 7000 private network vaccination centres <p style="text-align: right;">* Ministry of Public Health ** Ecuadorian Social Security Institute</p>	121 000	1259 Vaccination teams
		Forecast capacity <i>January 2021</i>	
Peru	HRH trained in <ul style="list-style-type: none"> ◆ Vaccination ◆ Vaccination support ◆ Vaccine campaign monitoring ◆ Solid waste management ◆ Identification of ESAVI* <p style="text-align: right;">* Events supposedly attributable to vaccination or immunization</p>	N.A.	9200 9000 more trained
		Existing capacity <i>January 2021</i>	

doses per hour, administered by 630 national vaccination teams, assuming 12 doses per hour per team in an 8-hour workday, 5 days a week; phases 2 and 3 envisaged an average of 120 906 doses per day or 15 114 doses per hour, administered by 1259 vaccination teams nationwide, again assuming the same doses and workdays per week for each team (MoH Ecuador, 2021b).

5.4 Financing

Countries had to define strategies to finance the additional cost of the measures to respond to COVID-19. As discussed in previous sections, the

five countries sought different solutions to address HWF deficits in responding to the health emergency. In doing so, they increased investments in HRH, PPE, test kits, health facilities, and better pay and incentives.

Investment was focused on boosting the number of health workers to target deficits in certain occupational groups or the uneven distribution of the HWF between regions. Some of these additional HRH will need to be retained after the pandemic to close gaps and thus contribute to universal access and health coverage. In many cases, the salary improvements and incentives were bound up with

better working conditions, and incentives were also made available to reduce regional disparities. Although these measures can help to improve the distribution of HRH within the country, challenges remain as to their sustainability after the pandemic. The value of funding PPE and test kits serves as a model for future analysis in two respects: to gain an understanding of the particular situations in which shortages of PPE are ongoing and independent of a health emergency generally or in certain regions within the country; and as a reserve value benchmark for health emergency funding. It is therefore important to know what additional investment each country has made in HRH to respond to the pandemic, including the cost of specific occupational health protection and risk prevention measures.

The study found that, in funding their response to the pandemic, Chile, Colombia and Peru used mainly existing resources from the current and investment budgets of the general state budget. Ecuador supplemented this with grants and loans from multilateral organizations. The main funding source in the Plurinational State of Bolivia was a World Bank loan that had been made available before the pandemic and was repurposed.

In order to gain access to national budget resources and credits, **a joint effort was required on the part of each national MoH and Ministry of Finance/Economy.** Table 3 summarizes the available data on the monetary resources that were allocated to maintain or increase HRH to manage COVID-19, in terms of new hires.

Box No. 7. Financial strategies to respond to COVID-19

Bolivia
US\$ 25.7 million in the form of an external credit from the World Bank to recruit HRH
Peru
<ol style="list-style-type: none"> 1. Direct transfers from Ministry of Economy and Finance 2. Transfers from the contingency reserve 3. Authorization to use resources from other parties
Chile
<ol style="list-style-type: none"> 1. Reallocation of existing resources in Ministry of Health budget 2. Ministry of Economy resources to recruit HRH and pay overtime
Ecuador
Spending priority criteria
<ol style="list-style-type: none"> 1. Salaries of HRH involved in emergency care 2. Procurement of PPE, medicines, test kits, medical devices 3. Strengthen infrastructure to expand medical treatment 4. Payment of medical referrals
Colombia
<ol style="list-style-type: none"> 1. Creation of the emergency mitigation fund (FOME) with recourse to other funding 2. Incorporate sources of funding into recruitment 3. ADRES* purchases a package of services from Health Promotion Bodies (EPS) on a post-payment 4. Guaranteed timely payment by EPS to health service providers 5. Ministry of Health has paid commitments in arrears to HRH in critical regions
*Administradora de los Recursos del Sistema General de Seguridad Social en Salud in Spanish

Table 3. Funding for additional human resources for health

Country	Additional HRH	Amount in US\$	
Bolivia (Plurinational State of)	7628 projected (1)	8 543 777	Budgeted (1)
Chile	19 027 hired + overtime (2)	253 955 686	Executed (2)
Colombia	3608 projected (3)	No information	
Ecuador	No information	43 492 222	Executed (4)
Peru	44 207 hired (5)	649 900 457	Budgeted (5)

(1) MoH Bolivia (2020b). Community surveillance strategy: plan for containment, mitigation and post lockdown recovery in addressing COVID-19.

(2) MoH Chile (2020c). Response to the PAHO/WHO questionnaire.

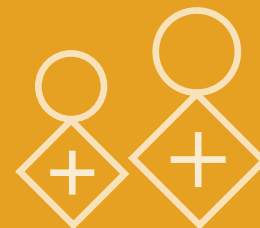
(3) MoH Colombia (2020a). Estimations of availability, requirements and gaps in human talent for health for COVID-19 care in intensive care units, intermediate care and hospitalization of low complexity.

(4) MoH Ecuador (2020a). Response to the PAHO/WHO questionnaire.

(5) MoH Peru/Human Resources for Health Observatory (ORHUS) (2020). Information on Human Resources for Health from the Ministry of Health and Regional Governments.



6 Discussion on strengths and challenges



This paper provides a common set of standardized measurement indicators and pertinent data sources to identify and quantify the multifaceted impact of COVID-19 on the HWF. **Using a standardized methodology across the countries was useful to identify common issues affecting the HWF during the pandemic and the policy response.** In addition, dialogue with countries was key to collecting, understanding and interpreting the information. Their engagement during the discussions of the results was useful for identifying HWF strategies, mechanisms and challenges during the pandemic.

Even though the information collected shows a snapshot in time, it is relevant in 2021 and is useful to build policy actions towards strengthening the HWF during health emergencies and increasing health system resilience. **The different strategies and mechanisms identified in the five countries to address HRH in the response to COVID-19 were also connected to the three pillars for response to health emergencies:**

- ◆ preparedness for the initial response;
- ◆ strengthening of HRH to boost response capacity of the health system; and
- ◆ review and updating of measures.

This will be useful for countries to revise, maintain or improve their emergency response, since they will be able to exchange experiences and lessons learned during the process of policy dialogue.²⁴

Health workers are a key element in delivering a timely and quality health service, and accordingly they need to be protected through an adequate salary and welfare policy. Recognizing this, the biggest challenge is to develop mechanisms to absorb the newly recruited HRH to reduce pre-pandemic gaps and maintain improvements in their terms and conditions of employment, such as pay increases, which in turn largely depend on identifying adequate sources of funding. The specific challenge facing the Plurinational State of Bolivia is to reduce the shortage of HRH at the primary health care level. In Ecuador, the challenge is to address the shortage of specialists in critical medicine and intensive therapy, and in Colombia and Peru to ensure the equitable distribution of the HWF throughout the national territory. In Chile, the need to strengthen coordination between the MoH and the Ministry of Education to facilitate the availability and distribution of HRH has been identified as a challenge, given that this is a key factor in responding to emergencies in a timely way.

²⁴ This document will inform the policy dialogue among the five countries.

Although data on HRH are available, the challenge is to develop instruments that provide real-time, comprehensive and detailed information to incentivize efforts to address shortages, both structural and during health emergencies.

The strengthening of mechanisms, tools and regulations to develop telemedicine in the post-pandemic period is considered important in the five countries.

In addition, **all five countries identify the need to improve working conditions in terms of job stability and social security**, and to promote a working environment that safeguards health workers' mental health and well-being, thus enhancing

their quality of life and work-life balance. In Peru and Ecuador, the validation of health careers is seen as one way to meet this challenge.

Another identified challenge is that of maintaining provisions to facilitate the procurement of goods and services, guarantee the supply of medicines and PPE, introduce greater flexibility in public procurement regulations and decentralize as necessary, as in Ecuador.

These challenges are a good starting point for the analysis and development of shared policy guidelines among the countries participating in this case study.



7 Discussion of results



This study addressed the mechanisms used by Bolivia (Plurinational State of), Chile, Colombia, Ecuador and Peru to increase, maintain and protect HRH, in terms of their availability, training, protection, welfare, remuneration and financing, with a view to managing the COVID-19 pandemic. Understanding the impact on infection and deaths among health workers has been useful for HRH risk and needs analyses when responding to the COVID-19 pandemic. The value of this study is multiple, and its results will help to align priorities and objectives in strengthening HRH towards improving health systems resilience. The process of conducting the analysis has boosted country capacity to identify and analyse HWF challenges and country mechanisms to respond to the challenges of the COVID-19 health emergency. The resulting data and information provide new insights for

policy dialogue at national level. As a result, policy actions are informed and coordination among institutions inside the country and within PAHO's Andean subregion enabled – a common good for health that supports intercountry analysis. Further, it contributes to the global perspective by informing WHO public goods and interim guidance documents on the COVID-19 response.

This study offers a systematization of the policies and strategies adopted by the participating countries to face the challenges created by COVID-19 in the area of HRH. The information and lessons learned contribute to provide evidence and align policy priorities and objectives around the protection and care of the HWF of the entire region, and highlight the need to improve investment in HRH, as a priority strategy to strengthen resilience of health systems, ensuring continuity, optimal functioning, access and adequate coverage to the population.

Firstly, the countries made preparations for an initial response to COVID-19, which included identifying the need for, availability of and deficits in health workers based on the planned response, with a view to increasing the capacity of the health system. Based on this planning, the five countries implemented packages of measures to increase or maintain HRH, including: recruitment of personnel

through novel hiring mechanisms or adjustment of existing mechanisms; temporary allocation of HRH from non-COVID-19 services to treatment of COVID-19 patients; increased availability of HRH through recourse to national and foreign students and recent graduates, retirees, volunteers, and the armed forces; international cooperation; mandatory social service; and shift changes.

Moreover, HRH had to be protected through organizational measures guaranteeing the availability of PPE and strengthening IPC, via testing, issuance of guidelines to identify HRH risk, and the provision of training in the diagnosis and management of COVID-19. This was accompanied by improvements in working conditions such as bonuses and pay increases, the recognition of COVID-19 as an occupational disease for health workers, the identification of risk groups by age, comorbidity, pregnancy and childcare, who then discontinued their activi-

ties and switched to work less exposed to COVID-19 such as telemedicine, and the implementation or strengthening of mental health plans. Finally, through training, new competencies were defined for the treatment of a new disease.

All of the above required a coordinated approach by various entities within each country, specifically the ministries responsible for health, education, labour and the economy. Each of these, acting within its remit, developed new regulations and legislation to support implementation of the range of measures to maintain and protect HRH.

Table 4 illustrates the strategies used to address HRH-related aspects, organized into the three pillars for response to health emergencies: preparedness for the initial response; strengthening of HRH to boost response capacity of the health system; and review and updating of measures.

Table 4. Strategies and mechanisms to address HRH in the response to COVID-19 in the five countries studied

Strategy	Implementation mechanism
Pillar 1: Preparedness for initial response to health emergency	
Estimation of HRH needs for initial COVID-19 response	<ul style="list-style-type: none"> ◆ The importance of an information system for monitoring confirmed and deceased COVID-19 cases was identified in order to perform estimates, identify the risks to HRH and identify measures and policy responses. ◆ The need to better identify HRH helped to strengthen existing information systems and HRH estimation methods. ◆ A plan or strategy was initially structured to treat suspected, probable and confirmed cases, prioritizing the strengthening of the health system in terms of availability of ICU or ITU beds and hospitalization (type 2 strategy). ◆ HRH needs were estimated based on the designed strategy, also taking into account the existence of risk groups among health workers, and isolating, sick or deceased personnel.

Strategy	Implementation mechanism
Pillar 2: Strengthening of HRH to boost response capacity of the health system	
Greater availability of HRH to treat suspected, probable and confirmed cases of COVID-19	<ul style="list-style-type: none"> ◆ Mechanisms were used to increase HRH capacity, supported by regulatory adjustments, usually subject to the health emergency. ◆ These mechanisms focused mainly on the hiring of new personnel and reassignment from other health services. ◆ Various measures related to students, recent graduates and overseas graduates were used, involving coordination between the ministries of health and education in each country. ◆ Likewise, there was access to international cooperation. ◆ In some countries, in order to improve the regional distribution of HRH, remuneration was increased in regions with HRH shortages, more posts were created and access to social services for recent medical graduates was facilitated. ◆ To ensure sufficient availability of HRH, coordination was necessary between the ministries of health, the economy and finance in each country.
Better working conditions	<ul style="list-style-type: none"> ◆ Financial incentives were used such as extra or regular bonuses and recognition of higher remuneration. ◆ Additional non-financial measures such as life insurance.
Develop new training for HRH to prevent and treat COVID-19	<ul style="list-style-type: none"> ◆ Training on prevention, control, diagnosis and treatment of COVID-19 for health workers via virtual platforms, which in general has promoted wider outreach to HRH, although there have been issues with monitoring and recognition of the training.
Health and safety at work	<ul style="list-style-type: none"> ◆ Guidelines to prevent COVID-19 infection in health care facilities, including the importance of regular, priority screening for HRH. ◆ Actions by the various countries to mitigate the global shortage of PPE, so that resources were allocated to procure PPE and mechanisms established to efficiently distribute PPE among HRH. ◆ In some countries it was necessary to recognize COVID-19 as an occupational disease for health workers. ◆ Identification of risk groups by age, comorbidity, pregnancy and care for young children to initially cease activity and subsequently perform activities with less exposure to COVID-19, e.g. telemedicine. ◆ Reinforcement of the mental health plan for HRH.
Pillar 3: Review and updating of measures	
Maintain availability of HRH	<ul style="list-style-type: none"> ◆ Updating of the response plan for the second wave of COVID-19, placing greater emphasis on the care of suspected, probable and confirmed cases through primary health care facilities (type 1 strategy). ◆ Vaccination plan prioritizing HRH. ◆ Identification of HRH necessary to implement the national vaccination plan.



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