The Impact of COVID-19 on Human Resources for Health and Policy Response

The Case of Five Latin American Countries

PAHO Pan American Health Organization
World Health Organization Americas

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Foreword

Let's act **together** to **protect** and **invest** in **health workers**

Health workers are one of the main pillars of resilient health systems and have proven critical to responding to the COVID-19 pandemic. The pandemic, in addition to exposing gaps in the availability of human resources for health (HRH), revealed the importance of having adequate information systems and measures to protect health workers and promote and ensure decent work.

2021 was declared the International Year of Health and Care Workers. To support countries in designing and implementing strategies to address health worker issues during the COVID-19 pandemic, the World Health Organization (WHO) Directorate of Human Resources for Health, alongside the Pan American Health Organization (PAHO) Subregional Program for South America, is promoting studies on the impact of COVID-19 on HRH in specific country cases, and subsequent policy responses. This study provides a standardized methodology and indicators to identify, analyze, and quantify the multifaceted impact of COVID-19 on HRH. In particular, the impact of the pandemic on working conditions, availability, national distribution, mental health, infection risk, and social well-being was assessed.

This multifaceted study was made possible thanks to participation by Bolivia (Plurinational State of), Chile, Colombia, Ecuador, and Peru, all member countries of the PAHO South American Subregion, in addition to contributions from the Andean Health Agency-Hipólito Unanue Agreement (ORAS-CONHU) and the Organization of American States. The study has contributed to the development of country capacities to identify

and analyze challenges associated with HRH. The resulting data and information provide new knowledge and perspectives for national dialogue and cross-country analysis to inform policy actions and facilitate coordination, creating a common resource for health throughout the Region. The study also strengthens analysis globally, providing information that can be used by WHO public goods and to create provisional guidance documents on COVID-19 response.

This study presents systematic policies and strategies adopted by participating countries to address HRH challenges stemming from COVID-19. The knowledge and lessons learned provide evidence and help establish policy priorities and objectives to protect and care for health workers throughout the Region. The study also highlights the need to increase investment in HRH as a priority strategy to strengthen the resilience of health systems and ensure continuity, optimal performance, and adequate access and coverage for the entire population.

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Michelle Guillou, Diana Hernández Hernández, and Mario Parada Lezcano collected and organized the case study information and documentation.

Acronyms and abbreviations

COVID-19	coronavirus disease 2019
EPS	health promotion authorities
EsSalud	health insurance
HIS	health information systems
HRH	human resources for health
ICU	intensive care unit
INEC	National Statistics and Census Institute, Ecuador
INS	National Institute of Health, Colombia
IPC	infection prevention and control
IPS	health care provider institutions
MoH	Ministry of Health
MoH Bolivia	Ministry of Health and Sports of Bolivia (Plurinational State of)
MoH Chile	Ministry of Health of Chile
MoH Colombia	Ministry of Health and Social Protection of Colombia
MoH Ecuador	Ministry of Public Health of Ecuador
MoH Peru	Ministry of Health of Peru
NGO	non-governmental organization
NHWA	National Health Workforce Accounts
OAS	Organization of American States
OECD	Organisation for Economic Co-operation and Development
ORAS-CONHU	Andean Health Agency-Hipólito Unanue Agreement
PAHO	Pan American Health Organization
PHC	primary health care
PPE	personal protective equipment
SARS-CoV-2	severe acute respiratory syndrome coronavirus 2
WHO	World Health Organization

Summary

Human resources for health (HRH)—with sufficient availability, equitable distribution, and adequate skills—are critical to achieving the goal of universal health. The COVID-19 pandemic had a major impact on the health of the population and put pressure on health systems, leading to disruptions worldwide, mainly due to insufficient worker availability. Globally, more than 115 500 health workers died from COVID-19 in the first 18 months of the pandemic, and one in four have experienced mental health problems due to high levels of stress, long shifts, and excessive workload, among other issues. These factors, in addition to conditions in employment contracts, led many health workers to consider leaving their jobs.

The countries of the Region of the Americas had scarce HRH to tackle the pandemic. All five countries in the study have a density of doctors and nurses per 10 000 population that is below the average for the Region and the critical threshold, estimated at 44.5 professionals per 10 000 population. Even before the COVID-19 pandemic, there were serious HRH problems in South America, as density hovered between 10.3 and 25.9 doctors and between 15.6 and 26.8 nurses per 10 000 population. An HRH shortage, inequitable distribution at the subregional level, job insecurity, the need to hold multiple jobs, inadequate training on new COVID-19 requirements, and the absence of development and planning policies are among the relevant factors. These problems became even more evident during the pandemic, which highlighted the limited availability of HRH, a critical element of COVID-19 response. The issue was further exacerbated as health workers isolated, fell ill, or died from COVID-19. In Bolivia (Plurinational State of) and Ecuador resistance to treating COVID-19 cases was observed among HRH who feared infection. Although the pandemic revealed health worker shortages and their vulnerability to the risks treating COVID-19 patients, it also led to new recruitment methods, rapid training, and protection for health workers enacted through new COVID-19 regulations.

While initiatives exist to assess the direct impact of the pandemic on health workers, a more comprehensive vision and approach is still lacking to understand the multifaceted impact of COVID-19 on HRH and the policies adopted by countries to address challenges. To increase knowledge about the impact of COVID-19 on HRH and subsequent policy response, the PAHO Subregional Program for South America, with technical and financial support from the World Health Organization (WHO) and coordination by the Human Resources for Health Unit, developed the case studies and prepared the report *Impact of COVID-19 on Human Resources for Health and Policy Response: The case of five Latin American countries*. This publication analyses the impact of COVID-19 on HRH health, occupational safety, and working conditions, as well as strategies and mechanisms used by these countries to recruit, maintain, and protect HRH to improve availability, training, well-being, remuneration, and funding. The case studies were developed using the following resources: a standardized methodology based on the WHO document *Health Workforce Policy and Management in the Context of the COVID-19 Pandemic Response:*

Interim guidance, 3 December 2020 to determine the multidimensional impact of the pandemic on HRH, including infections, deaths, mental health, work overload, and reassignment, among other matters; the multidimensional framework for measuring the impact of COVID-19 on HRH,[1] used to standardize the collection and analysis of impact information; and the health labor market framework,[2] an analytical framework to better understand the various policies and regulations that governments have introduced to manage HRH in the context of their response.

This report analyses the impact of COVID-19 on health workers and policy response in five areas: **1)** overall response strategy; **2)** estimates of HRH needs; **3)** measures to maintain or increase HRH; **4)** measures to protect and support HRH regarding occupational safety and health, infection prevention and control (IPC), training, and vaccination; and **5)** funding. The report presents systematic policies and strategies adopted by the participating countries to face HRH challenges caused by COVID-19. The knowledge gained and lessons learned provide evidence and help align priorities and objectives with protecting and caring for the HRH workforce throughout the Region, in addition to highlighting the need to increase investment in HRH as a priority strategy to strengthen the resilience of health systems and ensure continuity, optimal performance, access, and adequate coverage for the entire population.

1 World Health Organization. Weekly epidemiological update on COVID-19. Geneva: WHO; 2021. Available from: https://www.who.int/publications/m/item/weekly-epidemiological-update-on-covid-19---31-march-2021.

2 World Health Organization. Global strategy on human resources for health: Workforce 2030. Geneva: WHO; 2016. Available from: https://apps.who.int/iris/handle/10665/250368.

The impact of COVID-19 on human resources for health

Appropriate, reliable, and timely information is essential to measuring the impact of COVID-19 on HRH and, therefore, to planning and updating the response to health emergencies and allocating resources. This requires a health worker information and surveillance system to identify different diseases and risks. In the case of COVID-19, this information system involved regulating and conducting SARS-CoV-2 testing for health workers. The testing process varied between countries and depended on several factors, including funding, classification of COVID-19 as an occupational disease, availability of supplies to perform and process tests, and designation of a specific institution to ensure testing.

From the beginning of the pandemic until April 2021, between 3.27% and 12.62% of health workers in the countries included in this study were infected by SARS-CoV-2, the virus that causes COVID-19. Of these, between 0.20% and 1.97% died. The highest concentration of COVID-19 cases in Chile, Colombia, Ecuador, and Peru was observed among doctors and nurses. However, WHO estimates of COVID-19 infection and death rates suggest that official reporting mechanisms do not reflect the full magnitude of these events.

Policy response

The strategies used to address health workers' issues during the COVID-19 response fell under three areas of HRH health emergency response: **1)** preparing for initial response to the health emergency; **2)** strengthening HRH to increase response capacity in the health system; and **3)** reviewing and updating measures. Initial COVID-19 response planning varied across countries and included identifying health worker need, availability, and shortages, with the goal of increasing the response capacity of health systems. In the five countries, a combined deficit of 34 261 health team members was projected. However, as of December 2020, the additional combined health workforce hired and projected to respond to the pandemic in the five countries amounted to 74 326 people, equivalent to a budgeted or executed value of US$ 950 million. This demonstrates the effort the countries made to invest in HRH.

Ten measures were identified across the five countries to maintain or increase the availability of health workers given that, prior to the COVID-19 pandemic, there was already a shortage of HRH in key occupational groups and regional imbalances within countries. Policies aimed at facilitating hiring, deployment of additional staff, and redeployment of existing HRH in the five countries involved new or adjusted recruitment mechanisms (between 2.9% and 17.2%), temporary allocation from non-COVID-19 services to COVID-19 care (between 2% and 31.1%), and increased availability by adding domestic and foreign students and recent graduates. These three actions

were implemented in all five countries, and supplemented by workers coming out of retirement, volunteers, members of the armed forces, international cooperation, compulsory social service, and changes in work shifts. Countries established regulations to enact these initiatives and added specific economic incentives. The most arduous task ahead is to develop mechanisms to absorb newly hired HRH, reduce pre-pandemic gaps, and maintain improvements in terms and conditions of employment, such as wage increases, which in turn rely heavily on identifying adequate sources of funding. Mechanisms must also be identified to make HRH allocation more flexible to fill gaps in places with the most need, without creating precarious working conditions. Finally, strategies for intensive training in critical capacities must be developed, including continuing education starting from initial HRH skills, based on partnerships between academia, scientific organizations, and the health sector.

The countries in the study implemented ten measures to reduce the risk of infection and prevent and mitigate mental health disorders as a fundamental component of the pandemic response: ensuring personal protective equipment (PPE) availability and funding, which varied by country, designating an entity responsible for PPE acquisition; prioritizing more flexible and decentralized public procurement regulations according to need; strengthening IPC by implementing systematic testing that prioritizes HRH, with varying schedules according to country and guidelines for risk detection in HRH and training in COVID-19 diagnosis and management; improved working conditions, including bonuses and wage increases; providing life insurance for health workers (in Bolivia [Plurinational State of], Chile, and Peru); designating COVID-19 as an occupational disease for health workers (Chile and Colombia); identifying individuals in at-risk groups (which affected availability in some countries) based on age, comorbidity, pregnancy, and child care duties, while suspending their work activities and assigning them to tasks with lower risk of infection, such as telemedicine; implementing or bolstering mental health plans; prioritizing HRH in vaccination plans; and training HRH with skills required for the care of this new disease.

Countries also defined strategies to fund the additional cost of COVID-19 response measures. In Chile, Colombia, and Peru, existing resources were primarily used from the existing and general state budgets. In Ecuador, funds were supplemented by donations and credits from multilateral organizations. The main source of funding in Bolivia (Plurinational State of) was a redirected pre-pandemic World Bank loan. Investment focused on increasing the number of health workers to address deficits in certain occupational groups and unequal HRH distribution across regions. In many cases, wage increases, and incentives were linked to better working conditions. Other incentives were also offered to reduce regional disparities.

All the above required joint efforts between several entities within each country, especially ministries of health, education, labor, and finance. It is important to collect and analyze additional data to get a better idea of the impact of short- and long-term measures aimed at strengthening HRH during the COVID-19 pandemic.

Conclusions and challenges

Although the information collected represents a specific point in time, it is still important for establishing priorities and objectives to strengthen HRH during health emergencies and increase the resilience of health systems. The data and information provide new insights, especially for policy dialogue at the national level. As a result, this study informs on policy action and facilitates coordination between institutions both at the national level and across the Andean subregion of PAHO, serving as a common good for health that supports cross-country analysis. It also enhances global analysis, furnishing information that can be used by WHO public goods and to create provisional guidance documents on COVID-19 response.

Based on the findings of this study, and with the goal of supporting countries in designing and implementing strategies to address health worker issues during COVID-19 and other health emergencies, PAHO/WHO, alongside technical teams from ministries of health (MoH), promoted dialogue for policy development. During this process, five topics of interest were identified to broaden and produce HRH management policies, with all their challenges and lessons, within the framework laid out in the Plan of Action on Human Resources for Universal Access to Health and Universal Health Coverage 2018–2023, approved by the 56th PAHO Directing Council.

The following priorities were identified:

1. **Use of data and information analysis for HRH planning:** The countries included in the study had mechanisms in place before the pandemic for information use and analysis. HRH information systems were already in place in Chile, Colombia, Ecuador, and Peru. Information on numbers and tasks assigned to recruited staff was used to analyze Bolivia (Plurinational State of). Chile, Colombia, and Peru had existing methodologies to estimate HRH needs. In Chile, this process is carried out annually to determine funding necessary to reduce gaps. Finally, dedicated teams for HRH information use and analysis were already institutionalized in Chile, Colombia, and Peru. These resources were strengthened, and new ones created to address the health emergency.

   The following general tasks were identified for HRH data and information analysis:

   - Strengthen MoH governance over HRH information management to access information and integrate concepts.
   - Determine HRH information needs.
   - Adopt standardized definitions and terminology.
   - Move toward an integrated information system for HRH that includes the public and private sectors at the national and subnational levels and incorporates HRH knowledge, skills, and aptitudes, through interoperability of current sources.

- Install technology platforms and computer applications.
- Define variables and assumptions to include in the HRH estimation methodology in the event of a health emergency.

2. **Improve HRH availability and distribution at the subnational level:** Measures included HRH reassignment, economic incentives, and regional support during HRH open recruitment drives. As these actions were a result of the pandemic, their continuity depends on the duration of the health emergency declaration in each country. It must therefore be determined which measures to conserve and identify existing barriers preventing continuity, for example, recruitment methods or funding.

3. **HRH governance:** Major governance practices are evident in the five countries included in the study. Coordinated efforts to regulate and adapt objectives and agreements on HRH use and management between the health, education, labor, and finance sectors are noteworthy in the COVID-19 response. These actions were specifically designed to overcome existing obstacles that make it difficult to achieve enough health workers to care for the population during the health emergency. These measures are the result of joint work between national and local authorities and the public and private sectors. These experiences must be documented and examined further to be institutionalized, thereby improving comprehensive HRH governance, and making initiatives permanent instead of situational.

4. **HRH mental health:** A comprehensive package of measures implemented by the five countries to mitigate effects on mental health and increase HRH well-being during the COVID-19 pandemic was identified, highlighting the importance of HRH protection measures when ensuring and providing continuity to health care. The measures fall into different categories: **1)** mental health plans; **2)** life insurance; **3)** declaration of COVID-19 as an occupational disease; **4)** measures to reduce risk and improve wellbeing; and **5)** training. Although information exists on these implemented measures, there are no reports of their impact on HRH mental health. It is therefore essential to delve into which efforts have managed to improve mental health in order to determine best practices and reproduce actions in the other countries of the Region.

5. **Strategies for rapid HRH training:** Technology facilitates access to training but does not allow interaction with the instructor. Mechanisms must also be applied to evaluate acquired competencies, determine whether training objectives have been met, and provide certification for professional development. Finally, continuous HRH training and preparation for pandemic events must be put into place from the beginning of instruction. All of this requires joint work between academia and the ministries of health and education.

   Based on the conclusions of the study, cross-country dialogue produced the following actions:

- Experiences shared on strategies, approaches, and tasks related to the impact of COVID-19 on HRH and policies adopted by the countries.
- Evidence provided on HRH preparation for health emergencies and creating HRH management policies to make health systems more resilient.
- Main issues arising from this crisis identified and possible public policy actions discussed.
- Recommendations and public policy actions agreed upon at the subregional level.

The collaborative work between MoH technical teams to establish HRH strengthening policies can be replicated in other countries in our Region, enhancing a key component of advancing toward universal health.

Introduction

Health workers are on the forefront of the COVID-19 response and consequently face high exposure to different risks, including infection, fatigue, exhaustion, stress, harassment, physical and psychological violence, and even death. While efforts have been made to assess the direct impact of the pandemic on health workers, the focus has been on infections and deaths. However, global estimates of SARS-CoV-2 infection and COVID-19 death show that official reporting mechanisms do not capture the full magnitude of these events.

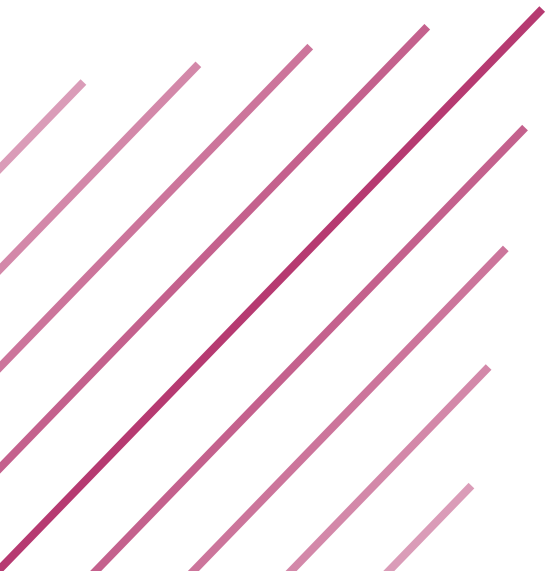
To provide a more comprehensive picture of the impact of COVID-19 on human resources for health (HRH), the World Health Organization (WHO) developed a standardized impact measurement framework *(1)*. This framework aims to provide a comprehensive understanding and approach to monitoring the impact of COVID-19 on health workers, as well as a set of standardized common indicators and relevant data sources to measure the multifaceted impact and synthesize the evidence. Five South American countries collaborated with the Pan American Health Organization (PAHO) and WHO for a comprehensive assessment of the impact of COVID-19 on HRH. Policies adopted to address existing challenges related to HRH deficit and measures to protect and support HRH were also reviewed. These efforts were particularly important to building the framework.

Health workers are a key element of building resilient health systems and have proven critical to the COVID-19 response. However, the pandemic highlighted problems such as HRH availability, lack of personal protective equipment (PPE), and inadequate working conditions. Health workers are at high risk of SARS-CoV-2 infection when providing health services due to lack or improper use of PPE, non-compliance with infection prevention and control (IPC) standards, or insufficient training. These factors, among other issues, reduce HRH availability.

After the Introduction, Part 1 of the report describes the sources and methods behind obtaining initial data and continues with a synthesis of the results observed in the five countries included in the study. Part 2 then presents chapters on each country; each chapter begins with a brief description of the country's health system and analysis of HRH conditions prior to the COVID-19 pandemic. Next is an assessment of the impact of COVID-19 on health workers, followed by a breakdown of policy response in five areas:

- Overall response strategy
- HRH needs estimates
- Measures to maintain or increase HRH
- Actions to protect and support HRH through occupational safety and health initiatives, IPC, training, and vaccination
- Funding

The final part of the report details conclusions and future actions for each country.



Part 1. Methodology and results

1. Methodology and data sources

When addressing the impact of COVID-19 on HRH and the resulting policy response, it is critical to document and understand the various policies and regulations that governments introduced to manage HRH and respond to the needs and challenges brought on by the COVID-19 pandemic. Comparing lessons learned, findings, innovative measures, and other information across countries helps build and expand the existing evidence base for health emergency response and develop human talent management policies to establish more resilient health systems.

To perform these case studies, WHO identified key assessment areas in its 2020 document *Health Workforce Policy and Management in the Context of the COVID-19 Pandemic Response: Interim guidance, 3 December 2020 (2)*. Other resources used to develop the study include the multidimensional framework for measuring the impact of COVID-19 on HRH *(1)*, used to standardize the collection and analysis of impact information, and the health labor market framework *(3)*, used as an analytical framework to better understand the various policies and regulations that governments have introduced to manage HRH as part of their response. The study aims to describe six essential areas of HRH policies and strategies that countries put in place to control and mitigate the COVID-19 pandemic and facilitate access to health care for the infected population. The six areas are described below.

1. **Impact of the pandemic on health workers:** WHO urges countries to introduce actions to protect HRH *(4)* due to the high risk of COVID-19 infection and the impact on their mental health. The latter is a result of the uncertainty of facing a new pathology and fear of exposing their own families to illness, as well as other factors such as work overload in locations with HRH shortages. Consequently, it is important to ascertain the number of infected and deceased health workers, with data disaggregated by sex, origin of infection, type of work performed, and most-affected areas. All analysis takes place in the context of the protective measures, risk prevention and occupational health policies, staff training, and work organization and management strategies established by each ministry of health (MoH).

2. **HRH planning and mobilization to address the pandemic:** HRH supply and demand must be determined in each country, in addition to methodologies to estimate additional health worker need for pandemic response. Data must be obtained on quantity, professional backgrounds, territories, and strategies (epidemiological and traceability tasks, primary health care [PHC], and care at higher levels of complexity).

3. **COVID-19 response measures:** The strategies that countries adopted to fill identified HRH gaps or maintain HRH availability must be studied, ascertaining whether these measures required regulatory changes.

4. **Funding for adopted measures:** involves determining the size of additional investment in HRH made by each country to respond to the pandemic, including the cost of specific risk prevention and occupational health protection measures.

5. **Organizational measures for infection protection and control and occupational safety and health:** Preserving the health of health workers is important, especially during epidemic health emergencies. It is fundamental to adapt existing occupational health policies to implement

biosecurity protocols, deliver necessary PPE in a timely manner, introduce changes in how work is organized to reduce the risk of infection, understand the impact that quarantine obligations for infected workers and their close contacts have on HRH availability, and prevent and mitigate mental health disorders in these workers.

6. **Lessons learned and remaining tasks:** almost a year after national emergency declarations came into force, the MoH of all five countries in the study were able to present a partial report covering HRH policies and strategies deployed to tackle the COVID-19 pandemic. This partial picture describes achievements and obstacles, interventions that were either applied or had little to no relevance, useful changes for responding to new epidemic outbreaks, and the feasibility of maintaining part of or all additional investment in health workers in the future. This analysis will produce valuable information on lived experiences, facilitating fruitful exchange and dialogue among countries.

It is vital to also examine the focus of national strategies introduced by each country to face the COVID-19 pandemic. Although approaches were modified during the course of the pandemic, several international publications documented basically two types of initial strategies for targeting resources:

1. Prioritizing early testing, tracing, and isolation of infected people and their close contacts, involving a major mobilization (and possibly strengthening) not only of epidemiological surveillance teams and laboratories, but also of the first level of health care.

2. Early prioritization of increased health system response capacity for people who became ill with COVID-19. This resulted in an initial allocation of additional resources and reorganization of health care aimed primarily at increasing critical beds and related health teams.

Countries had to meet the following criteria to be selected:

- Be member countries of the PAHO Subregional Program for South America and the Andean Health Agency-Hipólito Unanue Agreement (ORAS-CONHU).[3] This criterion is important, as member countries develop varying degrees of shared policies, particularly on HRH.

- The countries within this subregion must also express interest in documenting experiences and be willing to review and discuss their HRH measures related to the COVID-19 response.

In line with these criteria, initial measures and their subsequent evolution were analyzed in Bolivia (Plurinational State of), Chile, Colombia, Ecuador, and Peru to create the six areas of HRH policies and strategies mentioned above.

Each case study used a mixed approach with regard to information and data collection, including review of existing literature and publications, assessment of databases in health information systems (HIS) and HRH information systems, and secondary data analysis. The data were collected from several sources, mentioned below:

- WHO National Health Workforce Accounts (NHWA) data portal *(5)* for information on occupational group densities
- Information systems and monitoring databases in each country to obtain data on confirmed and probable COVID-19 cases and deaths among health workers
- Document review of policies adopted during the pandemic, including reports from MoH and other entities in the health, labor, education, and economy sectors

3 The Andean Health Agency-Hipólito Unanue Agreement (ORAS-CONHU) is a subregional integration organization whose objective is to coordinate and support the activities carried out by member countries, individually or collectively, to improve the health of their peoples. The ORAS-CONHU member countries and their ministers of health include Bolivia (Plurinational State of), Chile, Colombia, Ecuador, Peru, and Venezuela (Bolivarian Republic of).

- Information sent by the MoH to substantiate and supplement information on the impact of COVID-19 on health workers and other areas, as well as various policy responses.

These sources made it possible to document the impact of the COVID-19 pandemic in the selected countries from March 2020 to April 2021. However, the date of the latest information available by topic varies according to the country.

It must also be noted that there are some inevitable limitations in the results provided, due to the variability in availability of data sources across countries:

- The five countries in the study established an information system to track confirmed COVID-19 cases and deaths among HRH. The information collected in these systems have differing levels of public access.
- Publication frequency
- Disaggregation of information by occupational group at the subnational level and by sex, age, and source of infection

Moreover, to compare infection indicators against total HRH in the five countries, the latest total HRH figures available were used. As a result, estimates do not have the same base year.

The five countries disaggregated the information by the total number of infected and deceased HRH, while confirmed cases by occupational group were disaggregated in all countries except Bolivia (Plurinational State of). Colombia and Ecuador have a public website with continuously updated information on confirmed COVID-19 cases and deaths among health workers by region, occupational group, and age. Estimates of COVID-19 impact are based on 2017 data for Colombia and 2018 data for Ecuador.

In Chile, data on the impact of COVID-19 on HRH are shared through epidemiological reports *(6, 7)*. In these reports, more in-depth analysis compares HRH to the rest of the population by age, general health status, comorbidity, and frequency of COVID-19 testing. Data are also disaggregated by region and occupational group, with updated information on HRH availability. Although this methodology allows for more robust analyses, it would be useful to obtain the information on a more regular basis. Peru has detailed, continuous, open-access information on HRH availability in its Human Resources in Health Observatory (ORHUS). Bolivia (Plurinational State of) created the HRH Management and Administration Unit, which was vital to its efforts during the pandemic to collect HRH information. Until that point, the country did not have a comprehensive HRH information system, and instead relied on payroll data. The Integrated Epidemiological Surveillance System was also established at the national level to register suspected and confirmed COVID-19 cases, with digitization of epidemiological forms *(8)*. However, the information is not yet open-access.

Available information was sent in a draft to PAHO advisors by HRH focal points and MoH officials in each country. Based on the information contained in this document, validation meetings were organized to interpret and analyze data. Observations were then made and information was updated to produce the final document.

The analysis process enabled each country to identify the challenges associated with HRH and mechanisms to respond to these issues during the COVID-19 health emergency. The resulting data and information provide new insights, especially for policy dialogue at the national level. In a nutshell, this study provides information on policy actions and facilitates coordination between institutions both within each country and across the PAHO Andean subregion; accordingly, it is a common good for health that supports cross-country analysis. The study also strengthens analysis globally, providing information for WHO public goods and provisional guidance documents on COVID-19 response.

Although the information collected represents a specific point in time, it remains important for establishing priorities and objectives to strengthen HRH during health emergencies and increase the resilience of health systems, including:

- Using data and information analysis for HRH planning
- Improving HRH availability and distribution at the subnational level
- HRH governance
- HRH mental health
- Rapid HRH training strategies.

2. Synthesis of results

This section summarizes and highlights key findings from case studies exploring the relationship between COVID-19 and HRH in five South American countries (Bolivia [Plurinational State of], Chile, Colombia, Ecuador, and Peru). It analyses the impact of COVID-19 on HRH health, occupational safety, working conditions, and the policies adopted by countries between March and April 2021 to address these issues, as well as actions aimed at increasing HRH availability and training and improving response capacity. In an effort to support countries (especially policymakers, academia, and researchers) in designing and implementing strategies to address health worker issues during the COVID-19 pandemic and other health emergencies, this study aims to present and share experiences around policy planning and implementation to respond to challenges in Bolivia (Plurinational State of), Chile, Colombia, Ecuador, and Peru—member countries of the PAHO Andean subregion, the Andean Health Agency (ORAS), and the Organization of American States. The lessons learned, challenges arising from the impact of COVID-19 on HRH, and policies adopted by these countries all contribute to evidence on HRH preparedness and response during health emergencies, in addition to development of HRH management measures to make health systems more resilient.

2.1. The impact of COVID-19 on human resources for health

COVID-19 morbidity and mortality rates reduce HRH availability, which in turn affects the planning of response strategies to tackle the pandemic. Adequate, reliable, and timely critical information is essential to measure the impact of COVID-19 on HRH, create and update health emergency response, and allocate necessary resources. Accordingly, the extent of health worker shortages should be ascertained, and measures taken to maintain or increase availability by ensuring physical and mental protection and providing training and necessary equipment to prevent SARS-CoV-2 infection.

Between 3.27% and 12.62% of health workers in the countries included in this study were infected with SARS-CoV-2, and between 0.20% and 1.97% died.[4] **HRH availability decreased because health workers were forced to comply with isolation measures,[5] became ill, or died from COVID-19.** Table 1 summarizes the consolidated information included in the study on the impact of COVID-19 on HRH (it should be noted that countries submitted responses or published information on different dates). As of 10 December 2020, Colombia had the lowest HRH infection rate, calculated at 3.27%.[6] Conversely, Ecuador had the highest infection rate: 12.62% as of 2 April 2021.[7]

4 These values represent a period of exhaustive collection, analysis, and updating of information, to varying degrees across countries. Notes on updates are included where available, with the caveat that the information is not disaggregated to the same degree as during the study period.

5 For example, in Colombia, as of 10 December 2020, approximately 0.9% of confirmed cases among HRH were isolated, representing 0.03% of total HRH. See: Press Release No. 1007 issued on 10 December 2020 by the Ministry of Health and Social Protection of Colombia. Available from: https://www.minsalud.gov.co/Paginas/Van-364-mil-millones-girados-como-bonificacion-a-trabajadores-de-la-salud.aspx.

6 As of 28 April 2022, the infection rate had increased to 8.44%. See: Ministry of Health of Chile. Características del personal de salud confirmados y probables de COVID-19. Santiago, Chile: Ministry of Health; 12 January 2021. Available in Spanish from: https://www.minsal.cl/wp-content/uploads/2021/02/2021-01-21_Informe-PS-COVID-19.pdf.

7 It must also be noted that there are some inevitable limitations in the results provided due to inconsistencies in the availability of data sources across countries: For example, the latest available data in Peru indicate an infection rate of 22.48% in April 2021 -- higher than Ecuador's infection rate in the same month and year, despite the information only representing the public sector. See: Pan American Health Organization. Epidemiological update: coronavirus disease (COVID-19). Washington, D.C., PAHO; 2021. Available from: https://www.paho.org/en/documents/epidemiological-update-coronavirus-disease-covid-19-14-april-2021.

Chile had the lowest fatality rate (0.20% as of 3 January 2021), while Bolivia (Plurinational State of) had the highest (1.97% as of April 2021). These results may be affected by the frequency of viral testing of health workers, the country's community level infection rates, and HRH comorbidities and age. Another factor to bear in mind is that initial PPE shortages likely increased the rate of SARS-CoV-2 infection among HRH.

Public health decisions related to HRH require a health worker information and surveillance system to detect illnesses and determine risks. In the case of COVID-19, this information system involved regulating and conducting SARS-CoV-2 testing for health workers. The viral testing process varied between countries due to several factors, including funding, classification of COVID-19 as an occupational disease, availability of supplies to perform and process the tests, and designation of specific entities to assume responsibility for testing. For example, Chile and Colombia introduced a regulation to test for SARS-CoV-2 among HRH every 15 days and declared COVID-19 an occupational disease. In contrast, Bolivia (Plurinational State of) was not able to prioritize HRH testing due to lack of supplies to perform and process the tests.

Bolivia (Plurinational State of) had a confirmed case rate of 11.92% among all HRH in April 2021, with a case fatality rate of 1.97%. Confirmed COVID-19 cases among HRH represented an estimated 7.53% of the total number of cases in the population *(7)*, as of the cut-off date of the case report *(1)*.[8] Although this value may be underestimated[9] due to lack of follow-up with HRH COVID-19 cases, it is the highest proportion across the five countries.

Chile offers an example of the importance of developing policy decisions to implement SARS-CoV-2 testing. Of total HRH, 8.22% were affected by COVID-19 as of 3 January 2021, compared to 3.6% in the general population. In contrast, the number of tests performed on HRH was three times greater than for the general population *(9)*, demonstrating the focus placed on IPC. The HRH case fatality rate in Chile was 0.2%, well below the 2.7% rate in the general population. One possible explanation is better health conditions among HRH, with fewer comorbidities and lower average age compared to the general population *(9)*. Confirmed HRH cases represent 7.39% of total cases in the population of 3 January 2021, the second highest percentage in the five countries, only below Bolivia (Plurinational State of).

From the case of Colombia, we can infer that case fatality rates decreased (from 2.4% in April 2020 to 0.47% in April 2021) as clinical protocols, risk assessments, and PPE availability were established. Despite the number of confirmed HRH cases more than doubling in four months, the case fatality rate was 0.47% (with 103 deaths by December 2020 and 267 by 28 April 2021) *(10)*. The infection rate increase could be a result of the third wave of infection in the country, rising from 3.27% (10 December 2020) to 8.44% (8 April 2021) *(9)*. The information Colombia provided on transmission sources indicates that 62% of total health worker COVID-19 infections occurred after exposure while providing health services, as opposed to 19% from exposure in the community. The source of transmission also varies according to the occupational group, as more than 70% of cases in doctors, nurses,[10] and other occupational groups directly involved in COVID-19 treatment arose from exposure in the workplace. In contrast, health professionals in other occupational groups, such as psychology, chemistry, or pharmaceuticals had a higher rate of community infection *(10)*.

By 2 April 2021, the proportion of confirmed cases among HRH in Ecuador was 12.62% (the highest figure across the five countries); however, analysis showed that confirmed HRH cases represented 3.47% of cases in the general population (above only Colombia by about 2 percentage points). The HRH case fatality rate was 1.01%, five times

8 Calculated from total confirmed cases as of 13 April 2021 (N = 284 183); it should be noted that the date the country informed PAHO is unknown, so the cut-off date of the WHO epidemiological update was used.

9 This would be the situation if the number of confirmed cases was from a date prior to 13 April 2021; in that case, reported COVID-19 cases would be lower.

10 Includes professional and auxiliary nursing staff and other related occupational groups.

higher than in Chile (as of 3 January 2021) and double that of Colombia (as of April 2021). Similar to the situation worldwide, Ecuador had to ensure PPE availability by streamlining public procurement regulations and promoting decentralized purchasing at the health care center level.

There were 24 922 confirmed cases among public sector health workers in Peru by August 2020, representing 9.8% of public sector HRH. By April 2021, the country reported 57 901 confirmed cases in public sector HRH *(1)*; in other words, the proportion increased to 22.48% based on the latest available public sector HRH data (December 2020). The case fatality rate was 1.22% as of August 2020, with 305 deaths. By April 2021, 1,001 deaths were reported, or 1.73% of confirmed HRH cases *(1)*. By August 2020, 3.79% of confirmed COVID-19 cases in the total population had occurred among health workers. By April 2021, a slight decrease was observed, dipping to 3.47% *(1)*.

Table 1 contains figures showing the impact of COVID-19 on HRH.

Analysis of variations in the number of confirmed cases between different health worker occupational groups is essential to develop IPC guidelines aimed at determining which health workers have the highest risk of infection during health emergencies and resulting HRH deficits. The occupational groups with the most COVID-19 cases[11] in Chile, Colombia, Ecuador, and Peru were doctors and nurses:[12]

- **Chile:** 79.1% of total confirmed HRH COVID-19 cases are concentrated in three occupational groups: medical assistants (50.8%);[13] professional nurses (17.5%); and doctors (11.3%) *(9)*.
- **Colombia:** approximately 69.3% of total confirmed HRH COVID-19 cases are concentrated in four occupational groups: nursing assistants (31.5%); doctors (13.74%); administrative staff (13.2%); and professional nurses (10.9%) *(10)*.
- **Ecuador:** 88.5% of confirmed COVID-19 cases are concentrated in three occupational groups: doctors (48.7%); professional nurses (23.8%); and nursing assistants (15.7%) *(11)*.
- **Peru:** 63.6% of confirmed COVID-19 cases among health workers are concentrated in three occupational groups: technical assistants (31.6%); professional nurses (20.6%); and doctors (11.4%).[14]

The distribution of confirmed cases by occupational group and the infection rate[15] within that group are useful data to detect decreased availability of health professionals. For example, 11% of confirmed cases among HRH in Colombia were nurses. The figure was 17.5% in Chile. Considering the percentage of cases as a proportion of the total available workers in this occupational group, it becomes evident that nursing professionals are the most affected group in both countries (3.8% in Colombia and 13.6% in Chile). This implies decreased availability of nurses compared to other occupational groups, such as doctors or nursing assistants in Colombia or medical assistants in Chile.

In Ecuador, psychologists have the highest infection rate within their occupational group (31.5%), followed by doctors (14%), and dentists (12.4%). Similarly, in Peru, non-care workers have the highest occupational infection rate (13.51%). Given that psychologists, dentists, and non-care workers do not attend patients infected with

11 Bolivia (Plurinational State of) has no information at the occupational group level.

12 Includes professional and auxiliary nursing staff and other related occupational groups.

13 Medical assistants in dentistry, pharmacy, food, nursing, radiology and imaging, clinical laboratory and blood services, sterilization, and pathological anatomy. See: Decreto N.° 90/2015, del 15 de diciembre. Aprueba el reglamento para el ejercicio de las profesiones auxiliares de la medicina, odontología, química y farmacia y otras. Santiago, Chile: National Congress; 2015. Available in Spanish from: https://www.bcn.cl/leychile/navegar?idNorma=1099220.

14 Response submitted by the Ministry of Health of Peru to the questionnaire sent by PAHO for the purposes of this study, received on 21 October 2020.

15 The infection rate is the ratio of the number of confirmed cases per occupational group to the total available HRH in that occupational group.

SARS-CoV-2, this result requires further study, including analysis of transmission environments, health conditions, and age of these professionals, in addition to team composition and other factors.

Detailed information is not available in Bolivia (Plurinational State of), as the country does not have centralized monitoring of confirmed HRH cases.

Table 1. Impact of COVID-19 on human resources for health

	Bolivia (Plurinational State of)	Chile[3]	Colombia	Ecuador[7]	Peru[f]
Reporting date [a]	13 April 2021[e]	3 January 2021	10 December 2020[4]	2 April 2021	31 August 2020[g]
Confirmed HRH cases	21 410[e]	52 241	21 832[4]	11 507	24 922[g]
Total HRH	179 667[1]	635 609	666 727[5]	91 205[8]	249 459[9]
HRH infection rate [b]	11.92%	8.22%	3.27%	12.62%	9.84%
HRH deaths	421[e]	102	103[4]	116	305[g]
HRH case fatality rate [c]	1.97%	0.20%	0.47%	1.01%	1.22%
Confirmed cases in the general population	284 183[2]	706 921	1 392 133[6]	332 038	657 129[10]
HRH cases as a percentage of total confirmed cases in the general population [d]	7.53%	7.39%	1.57%	3.47%	3.79%

HRH: human resources for health.

Notes:

a Reporting date of responses or published information.

b HRH infection rate = confirmed HRH cases / total HRH.

c HRH case fatality rate = HRH deaths / confirmed HRH cases.

d HRH cases as a percentage of total cases = confirmed HRH cases / confirmed cases in the total population.

e The country's reporting date is unknown. The report cut-off date was used. See: Pan American Health Organization. Epidemiological update: Coronavirus disease (COVID-19) -14 April 2021. Washington, D.C.: PAHO; 2021. Available from: https://www.paho.org/en/documents/epidemiological-update-coronavirus-disease-covid-19-14-april-2021.

f Information on confirmed HRH cases and deaths and total HRH numbers apply to the public sector only.

g Response submitted by the Ministry of Health of Peru for the PAHO questionnaire for this study.

Sources:

1 Ministry of Health and Sports of Bolivia (Plurinational State of). Plan de vacunación contra el coronavirus COVID-19. La Paz: Ministry of Health and Sports; 2021. Available in Spanish from: https://oiss.org/wp-content/uploads/2021/04/PLAN-DE-VACUNA-COVID19.pdf.

2 Ministry of Health and Sports of Bolivia (Plurinational State of). Reporte N.° 394, 14 de abril del 2021. Reporte de COVID-19 en Bolivia. La Paz: Ministry of Health and Sports; 2021. Available in Spanish from: https://www.minsalud.gob.bo/es/5452-reporte-covid-19-1-099-nuevos-casos-9-221-pruebas-negativas-y-465-896-dosis-de-la-vacuna-contra-el-virus-fueron-aplicadas-hasta-la-fecha.

3 Ministry of Health of Chile. Informe epidemiológico, 12 de enero del 2021. Características del personal de salud confirmados y probables de COVID-19. Santiago, Chile: MoH Chile; 2021. Available in Spanish from: https://www.minsal.cl/wp-content/uploads/2021/02/2021-01-21_Informe-PS-COVID-19.pdf.

4 National Institute of Health. Boletín N.° 56, 10 de diciembre del 2020. COVID-19 en personal de salud en Colombia. Bogotá: INS; 2020. Available in Spanish from: https://www.ins.gov.co/Noticias/Paginas/coronavirus-personal-salud.aspx.

5 Observatory of Human Talent in Health Observatory of Colombia. Indicadores básicos. Bogotá: Ministry of Health. Available in Spanish from: https://www.sispro.gov.co/observatorios/ontalentohumano/Paginas/Indicadores.aspx. Data from 2017.

6 National Institute of Health. COVID-19 en personal de salud en Colombia. Reporte del 30 de abril del 2021. Bogotá: INS; 2020. Available in Spanish from: https://www.ins.gov.co/Noticias/Paginas/coronavirus-personal-salud.aspx.

7 National Directorate for Epidemiological Surveillance. Comportamiento de la COVID-19 en Ecuador. Quito: Ministry of Public Health: 2021. Available in Spanish from: https://www.salud.gob.ec/coronavirus-covid19-ecuador/.

8 National Statistics and Census Institute. Registro estadístico de recursos y actividades de salud, 2018. Quito: INEC; 2020. Available in Spanish from: https://www.ecuadorencifras.gob.ec/documentos/web-inec/Estadisticas_Sociales/Recursos_Actividades_de_Salud/RAS_2018/Principales_resultados_RAS_2018.pdf.

9 Ministry of Health of Peru. Observatory of Human Resources for Health under the Directorate General of Health Workers. Lima: DIGEP; 2020. Available in Spanish from: http://digep.minsa.gob.pe/. Data as of August 2020.

10 National Center for Epidemiology and Disease Prevention and Control. Situación actual "COVID-19" Perú. Lima: DGE, 2020. Available in Spanish from: https://www.dge.gob.pe/portal/docs/tools/coronavirus/coronavirus310820.pdf. Data as of 31 August 2020.

HRH job stability also affected availability. In Bolivia (Plurinational State of) and Ecuador there was resistance among HRH against caring for COVID-19 cases due to fear of getting infected and labor contract conditions, two factors that led to resignations. In Bolivia (Plurinational State of) there are three-month contracts (with the possibility of renewal) that did not incentivize workers to provide services despite putting their health at risk. The lack of PPE also exacerbated the problem, increasing the fear of infection.

The lack of PPE, poor working conditions, job instability, and failure to pay worker wages led to protests by HRH in all countries. Another factor leading HRH to protest national governments in Bolivia (Plurinational State of), Colombia, and Ecuador was legislation enacted to address the COVID-19 pandemic.

In Bolivia (Plurinational State of) there were protests against three guidelines in the Health Emergency Law: **1)** prohibition on "interrupting health services" in the event of strikes, protests, or demonstrations in the medical sector; **2)** recruitment of physicians who completed their studies outside the country; and **3)** intervention by the central government in the jurisdiction of local authorities when the latter were overwhelmed by the emergency.

In Colombia, Presidential Decree 538 (12 April 2020) required all health workers to be on call, causing protests claiming that the Decree did not take into account inadequate PPE availability *(12)*.

Article 25 of Ecuador's Humanitarian Support Law, specifically articles 10 and 40 of Executive Decree 1165 (5 October 2020), caused health workers to announce protests. Even though this law establishes a mechanism for official appointment of all HRH who worked during the COVID-19 health emergency, these appointments were to be made gradually according to need and budgetary availability *(13)*.

HRH have faced verbal aggression, discrimination, physical violence, and death threats outside the workplace and in their neighborhoods, as some considered them to be sources of COVID-19 transmission and, therefore, a risk to the community *(14)*.

2.2. Policy response

All five countries faced the COVID-19 health emergency with shortages of health workers in key occupational groups or with regional imbalances within the country. To make matters worse, many health workers complied with isolation measures, fell ill, or died from COVID-19, or suffered effects on their mental health, with precarious working conditions that negatively affected their availability.

Between March and December 2020, the five countries adopted several measures to maintain or increase HRH availability to address the health emergency. **Policies for health workers aim to facilitate recruitment and deployment of additional staff and redeployment of existing staff.** Examples include: creating faster recruitment pathways or recruiting freelancers, often through emergency legislation; reorganizing shifts; and reassigning tasks and workers within facilities or regions.

2.2.1. Overall strategy

Since January 2020, the five countries studied have been implementing measures and protocols aimed at strengthening health surveillance, screening, and border control. Once COVID-19 was labeled a pandemic and imported cases were detected, each country declared a health emergency and defined a legal framework to allow exceptional measures aimed at preparing health system response.

It is important to examine the focus of the strategy deployed by each country to tackle the COVID-19 pandemic, as each had different consequences on allocating resources and results. Although the focus changed during the course of the pandemic, international literature documented two types of strategies applied in the countries:

1. Prioritizing early testing, traceability, and isolation of infected people and their close contacts, involving large-scale mobilization (and possibly strengthening) not only of epidemiological surveillance teams and laboratories, but also of the first level of health care.

2. Prioritizing early responsiveness of the health system for people who became ill with COVID-19, resulting in an initial allocation of additional resources and reorganization of health care, aimed primarily at increasing critical care beds and related health teams.

All five countries prioritized the second strategy, focusing on increasing the responsiveness of the health system by increasing hospital capacity to care for people who became ill from COVID-19. This action added beds in intensive care, intermediate, and general wards, staffed with appropriate HRH. Additional actions included epidemiological surveillance, screening, border control, and establishing greater laboratory capacity.

In addition to these measures, Bolivia (Plurinational State of) also strengthened the entire health system at the national level. Resources were allocated to the first level of care, which covers 50% of contracted HRH. PAHO supported the Ministry of Health and Sports of Bolivia (Plurinational State of) (MoH Bolivia) in defining the groups and levels to be strengthened and gaps to fill based on projected need.[16]

Faced with the second wave of infections approximately four to five months after the beginning of the pandemic, the focus changed to prioritize the first strategy, strengthening testing, traceability, and isolation in the population through the first level of care in coordination with health workers already in the field. In Bolivia (Plurinational State of) the Active Community Surveillance Strategy was created, allocating more support and development to the first level of care *(8)*. In June 2020, Chile established the National Strategy for Testing, Traceability, and Isolation *(15)*. In September 2020, Peru opened 17 rapid temporary care centers for timely referral and care of COVID-19 cases *(16)*.

16 Response submitted by the Ministry of Health of Chile to the questionnaire sent by PAHO for the purposes of this study.

2.2.2. Improving the availability of human resources for health

2.2.2.1. Identifying HRH needs to address COVID-19

Prioritizing increased response capacity in the health system requires identifying additional health worker resources, among other steps. In all five countries, **HRH demand to meet COVID-19 needs was calculated according to planned response capacity** based on additional hospital beds and intermediate and intensive care units to handle a projected number of cases. In some countries, the reduced availability of health workers due to infection and death was taken into consideration. For these estimates, most countries used models developed by their MoH. In Bolivia (Plurinational State of), PAHO supported the MoH in defining occupational groups to strengthen COVID-19 response and estimate HRH needs. Chile used its model to negotiate the budget with the Ministry of Finance *(17)*.

The five countries projected a combined deficit of 34 261 health workers. Ecuador projected the lowest number (2850 health professionals or 3.12% of total HRH) *(18)*, while Chile projected the largest (17 439 health professionals, or 2.74% of HRH as of 30 November 2020).[17] Relative to total HRH, Colombia projected the lowest additional need (3608 health professionals, or 0.54% of total HRH) *(19)*, while Bolivia (Plurinational State of) had the greatest need for additional health workers (7484 health professionals, or 4.17% of total HRH).[18] Peru estimated an initial three month need of 2880 health professionals, representing 1.34% of public sector HRH as of March 2020 *(20)*. **Estimated need applied to the public health system, except in Colombia.**

In Peru and Bolivia (Plurinational State of) an initial three-month response was developed to attend cases with suspected, probable, and confirmed COVID-19 diagnosis in public facilities. Bolivia (Plurinational State of) required an additional 7628 HRH to attend 39 000 cases.[19] Importantly, COVID-19 cases far exceeded projections of HRH needed to meet the demand. As part of its initial response, Peru estimated a need for 2610 health professionals and 270 non-care professionals *(21)*.[20]

In Colombia and Chile, elements of the overall strategy designed to address COVID-19 were used to estimate the amount of HRH needed to meet demand during the pandemic. Chile's public sector regularly estimates the HRH deficit. The model and estimates calculated that 17 439 additional health workers were needed to properly equip and reinforce HRH.[21] Furthermore, these estimates also served as a basis for establishing necessary additional resources and the legal framework to apply care strategies defined in the plan of action for people with COVID-19. Although the response in Chile involved both the public and private sectors, HRH needs were projected only for the public sector.

Colombia also estimated the HRH availability and need. The availability of priority health workers was estimated at 435 547, including therapists, physicians, and nurses[22] who could care for people with COVID-19 *(20)*. Through the *Plan of Action for Health Services during the Containment and Mitigation Stages of the SARS-CoV-2 (COVID-19) Pandemic (21)* (which includes four phases according to the evolution of the pandemic), health worker needs and deficits by occupational group were estimated for each phase. A need for 85 345 health professionals and 3608 doctors specialized in adult and pediatric intensive care, internal medicine, anesthesiology, and general surgery was calculated.

The Ministry of Public Health of Ecuador (MoH Ecuador) used a health care model to estimate

17 Ibid.

18 Response submitted by the Ministry of Health and Sports of Bolivia (Plurinational State of) to the questionnaire sent by PAHO for the purposes of this study.

19 Ibid.

20 By December 2020, 44,207 health professionals had been hired in the public sector.

21 Response submitted by the Ministry of Health of Chile to the questionnaire sent by PAHO for the purposes of this study.

22 Includes nurses, nursing assistants, and other related occupational groups.

HRH requirements by number of patients served. This method projected a need to recruit 2850 new health professionals; to this end, the institution conducted an HRH optimization process, consisting of reducing administrative staff in favor of increasing care staff *(18)*.

Projections of HRH demand to meet COVID-19 needs in Chile and Colombia considered the negative effects of infection on worker availability and factored in higher risk groups such as pregnant women, the elderly, people with comorbidities, and caregivers of young children *(19)*. Estimates in Bolivia (Plurinational State of), Ecuador, and Peru did not consider these risk groups. Bolivia (Plurinational State of) saw a 30% to 40% reduction of HRH availability due to workers in these risk groups. As a result, new hires, estimated at 32%, did not cover the deficit increase generated by granting work leave to these groups.[23]

In Peru there was 14.9% drop.[24] Ecuador also observed an increased HRH deficit, although it was not quantified.[25]

2.2.2.2. Measures to maintain or increase human resources for health

Learning and documenting the strategies adopted by countries to meet health worker demand is essential, as well as determining whether these measures required regulatory changes to develop new policies to strengthen health systems. In this regard, **the five countries were observed to have established regulations to facilitate recruitment and deployment of additional workers and redeployment of existing workers.** The measures adopted are summarized below:[26]

- Faster and more efficient recruitment pathways, simplifying or eliminating procedures, and allowing more freelance contracts and direct recruitment. Bolivia (Plurinational State of) used these methods to hire 6777 workers out of a planned 7628 with funding from the World Bank. In Chile 19 027 were hired by August 2020. Ecuador hired 3087 workers by November 2020 and Peru hired 44 207 by December 2020 through a private system known as administrative service contracts (CAS-COVID). There has been no quantification of hiring in Colombia.

- Temporary assignments for HRH to exclusively attend COVID-19 cases. This strategy was used in all five countries and especially in Colombia (78 300 health professionals added, equivalent to 10.2% of total HRH), Ecuador (10 000 added by November 2020), and Peru (80 202 added by August 2020). Bolivia (Plurinational State of) reassigned 3600 workers. Chile has no available data. This action involved total or partial interruption of essential services and care not related to COVID-19, such as surgical interventions that could be rescheduled and appointments for patients with chronic diseases.

- Extended or modified work shifts with a corresponding increase in remuneration (Bolivia [Plurinational State of], Chile, Ecuador, and Peru). Only in the latter was the number of added health professionals quantified (11 662 as of August 2020).

- Recently graduated health workers or students nearing graduation were hired. Bolivia (Plurinational State of) hired recent graduates (220) and incorporated trainees (300). Chile hired students in their final semesters of schooling. Colombia allowed students studying health to graduate early (1523) *(22)* and Peru permitted advance completion of medical residencies in key specialties (5048 professionals incorporated as of August 2020) while also temporarily waiving degree requirements for those graduating in health-related careers to accelerate hiring.

23 Response submitted by the Ministry of Health and Sports of Bolivia (Plurinational State of) to the questionnaire sent by PAHO for the purposes of this study.

24 Response submitted by the Ministry of Health of Peru to the questionnaire sent by PAHO for the purposes of this study.

25 Response submitted by the Ministry of Public Health of Ecuador to the questionnaire sent by PAHO for the purposes of this study.

26 Responses submitted by the ministries of health of the aforementioned countries to the PAHO questionnaire for the purposes of this study. Data as of 2020.

- Expanded access to service mechanisms required for graduation. Chile suspended academic teaching so medical and dentistry professionals could focus on deployment and training (4000). Colombia increased available positions in the compulsory social service (2730) *(22)* and Peru expanded the rural and marginal urban health service, even allowing access for those who had studied abroad.

- Health professionals who completed their studies abroad were allowed to practice, either through expedited degree validation (Colombia), or without validation (Chile and Peru).

- International cooperation mechanisms allowed collaboration with teams of health professionals. In Colombia, the Office of the United Nations High Commissioner for Refugees (UNHCR) made 45 health professionals available in 16 departments of the country, and the United States Agency for International Development (USAID) recruited 105 health professionals for a period of six months *(23)*. Peru received support from 85 health professionals representing Ministry of Public Health of Cuba, and the nongovernmental organization (NGO) Médecins Sans Frontières sent seven specialized health professionals

- Retired health workers were allowed to return to practice. Colombia recruited pensioners under the age of 60. Chile allowed professionals released from duty to return to practice, as well as former officials who took advantage of the voluntary retirement bonus, eliminating legal restrictions and conditions. This included work shifts of up to 22 hours per week *(24)* for 1500 health professionals *(25)*.

- Support from health workers linked to the armed forces; in Colombia, this applied to retired professionals specifically, while Chile (according to information provided by the MoH Chile delegate at the 24 August 2021 meeting)

and Ecuador recruited officials still in active service (1523 as of November 2020).

- Agreements established with universities to allow volunteer work by recent graduates and students in health areas, as observed in Bolivia (Plurinational State of) (450 recent graduates) and Chile (1000 students).

- Interagency cooperation agreements signed between MoH Ecuador and higher education institutions, authorizing postgraduate doctors[27] to provide services as part of their training in hospitals in the Comprehensive Public Health Network and the Supplementary Network.

27 Doctors in specialization programs who must complete a total of approximately 20 000 training hours split between care and academic activities.

- The five countries used strategies to overcome unequal HRH distribution across regions. Bolivia (Plurinational State of) reassigned HRH from national programs such as telehealth and family and community health to territories with more COVID-19 cases, including Santa Cruz and Beni. Chile sent HRH support from the Metropolitan Region of Santiago to Antofagasta (in the north of the country) and Magallanes (extreme south). The Ministry of Health and Social Protection of Colombia (MoH Colombia) started a recruitment drive for regions with a shortage of HRH and adjusted health worker salaries in some regions to achieve necessary targets. In Ecuador, red alert epidemiological areas received support (Guayaquil, followed by Quito, and finally smaller cities). Peru formed mobile brigades to support critical areas, consisting of doctors, nurses, and other health professionals (332 from Peru and 85 from Cuba).

Notably, these measures were accompanied by specific economic incentives. Chile, Colombia, and Ecuador enacted one-time incentives (Colombia preceded Chile and Ecuador), while Peru provided monthly incentives from April 2020 to March 2021 *(26)*. More than 220 000 health workers in Chile benefited from incentives worth 200 000 Chilean pesos (CLP) (equivalent to US$ 272) *(27)*, including those in PHC, health services, and experimental health facilities. In addition, working hours were compensated at an extra 30% during the health emergency *(28)*. In Colombia, incentives targeted HRH that cares for people with suspected or confirmed COVID-19 diagnosis, estimated at 247 504 health workers *(29)*. Financial compensation ranges from 1 to 4.5 legal minimum monthly wages (US$ 259–1036) (*30*). Ecuador gave 325 787 public servants the equivalent of US$ 200, including PHC workers, among others *(31)*.

In Peru, a package of three types of bonuses *(32)* was established: workers with a COVID administrative service contract (CAS-COVID)[28] received a bonus of 720 soles (S/) (equivalent to US$ 200); health workers who care for patients with COVID-19 in establishments dependent on health insurance (EsSalud) received bonuses determined by EsSalud; and finally, third and fourth year medical residents specializing in intensive or emergency and disaster medicine and performing their rotations in prioritized health facilities received a monthly salary of S/ 3000 (equivalent to US$ 838).

Salary scale increases were also implemented in Bolivia (Plurinational State of) to attract HRH; in Colombia, only in those regions struggling to achieve required HRH numbers; and in Chile and Peru as an incentive to address the health emergency.[29]

The MoH in each of the five countries stated that the regulatory adjustments for these measures resulted in additional HRH in a short amount of time. Colombia reported that numbers were sufficient to operate the installed supplementary infrastructure. There is no information from Chile, Ecuador, or Peru on whether demand was met. According to available information, additional HRH did not meet demand in Bolivia (Plurinational State of).[30]

Joint efforts between MoH and ministries of education to quickly recruit undergraduate students, recent graduates, and specialists are noteworthy. Articulation between different segments of the health system was also observed, as was the case with the armed forces in Colombia and Ecuador.[31]

2.2.3. Protecting and supporting human resources for health

Reducing the risk of infection and preventing and mitigating negative mental health effects in health workers is fundamental to pandemic response. Exposure, compliance with isolation requirements, and illness are consequences of high infection

28 Type of private contract defined during the COVID-19 health emergency.

29 Responses submitted by the ministries of health of the aforementioned countries to the PAHO questionnaire for the purposes of this study. Data as of 2020.

30 Ibid.

31 Ibid.

rates among health workers that decrease the responsiveness of the health system by reducing HRH availability. Workers providing health services on the front line of care are a high-risk group vulnerable to infection and mental health disorders. The excessive pressure that caring for COVID-19 patients places on health workers requires multidimensional and integrated strategies to properly address the issue.

2.2.3.1. Occupational safety and health and infection prevention and control

Considering that more than half of infections among health workers occur in health facilities *(33)*, protective measures are essential to counteract the psychological pressure HRH face due to fear of contracting or transmitting the disease to their families. Protecting health workers is key to ensuring proper functioning of the health system.

The study found that in all five countries, **reducing the risk of infection for health workers, in addition to preventing and mitigating potential mental health disorders, is fundamental to pandemic response.** The measures adopted are summarized below:[32]

- PPE procurement and distribution to ensure its availability for health workers. The five countries established direct purchasing, identified funding sources, and designated officials responsible for procuring and distributing PPE. In Bolivia (Plurinational State of) the process was led by its MoH, which distributed materials to autonomous territorial entities and short-term social security entities. Chile placed its National Supply Center (Central Nacional de Abastecimiento) in charge of this task. Occupational risk managers in Colombia were responsible for procuring and providing PPE to HRH. Peru continuously reallocated resources to the health sector, including PPE procurement. The above measures notwithstanding, the five countries faced a shortage of PPE in the initial months of the pandemic and, as a result, it was difficult to achieve sufficient coverage for health workers. The unavailability of N95 type masks in Chile, Colombia, and Ecuador is a stark example of this deficit. Chile created guidelines to promote rational use of these resources, without jeopardizing HRH *(34)*. Peru created a monitoring committee for the allocation and use of PPE and other resources to care for COVID-19 patients in each health care provider institution *(35)*.[33]

- COVID-19 testing in all five countries, prioritizing HRH. Colombia and Chile implemented systematic testing every 15 days, based on risk assessments *(36, 37)*. Bolivia (Plurinational State of) issued a regulation to prioritize testing for HRH, reducing the wait time between testing and return to work activities; however, this measure could not be realized due to shortages of laboratory supplies.

- Risk groups identified according to pregnancy, age, and comorbidities. Health workers belonging to these risk groups in Chile, Ecuador, and Peru were exempted from caring for patients with COVID-19 and were reassigned to other tasks, especially telemedicine. Peru enacted this measure later than the other countries *(19, 38)*. Bolivia (Plurinational State of) saw a 30%–40% drop in HRH availability after identifying risk groups.

- Mental health plans developed with guidelines for workers, employers, and occupational safety and health entities in the five countries. This policy was enacted at different times: Ecuador and Colombia were first (in March 2020), followed by Chile (May 2020), and Peru (June 2020).

- COVID-19 designated as an occupational disease for HRH in Chile *(39)* and Colombia *(40)*.

- Life insurance policies created for HRH in Bolivia (Plurinational State of), Chile, and Peru *(41–43)*.

32 Ibid.

33 Ibid.

2.2.3.2. Training

Provisions for funding and HRH onboarding, training, and mentoring are critical tools in a health emergency, especially when there is no previous knowledge of how a disease develops, as was the case with COVID-19. Training is not only essential to attend and care for patients, but also to protect health workers and their families from the risk of infection.

The health sector has established practices for onboarding and field training, and its facilities serve as a part of that field. Informal training is common and is currently supported by technology that provides tools and content accessible at any time. The MoH responses to the questionnaire indicate significant use of distance learning and partnerships formed with academia and scientific societies to create appropriate content.

Among all their achievements, the five countries emphasized the importance of strengthening and equipping health workers with knowledge and skills on COVID-19 prevention and treatment, primarily through distance education or telemedicine using MoH technology platforms that predate the pandemic. This training reached a large percentage of HRH in Chile (69.3%) and Peru (60%). Training and psychological support for HRH in Bolivia (Plurinational State of) were used to mitigate fear of caring for people with COVID-19 and to address concerns about vaccination safety.

2.2.2.3. Vaccination

This section outlines how health workers were prioritized in national vaccination plans and country estimates of health workers needed to achieve vaccination targets. The information was collected from January to April 2021.

HRH training and availability are essential on two fronts during vaccination campaigns: health workers must first receive the vaccine and then administer it to the general population.

Vaccinating health workers was prioritized in the first stage of all five countries' vaccination plans; however, in Colombia, the sheer number of HRH meant that some had to be vaccinated in the second phase *(44)*.

Chile stands out for deploying nurses from its PHC network to perform mass vaccination as part of the national immunization plan.[34] They were supported by other health workers, including midwives and dental professionals, authorized to administer the vaccine, allowing the country to have the required HRH from the outset to implement the vaccination plan *(45)*. The other countries have other methods to achieve targets for vaccine administration: Bolivia (Plurinational State of) has 4000 three-person brigades *(46)*, Colombia has 70 000 people for vaccine administration *(47)*, Ecuador 8000 *(48)*, and Peru 25 000 *(49)*.

Bolivia (Plurinational State of), Colombia and Ecuador provided information on vaccination potential. The first calculated vaccination potential according to target population and by region. For example, in the Pando region, estimates indicated that it would take 7 hours to vaccinate 2587 health professionals, however, the number of workers needed to administer the vaccines was unknown; on the other hand, in La Paz it would take nine hours to vaccinate 49 901 health workers *(46)*. In Colombia, the number of vaccines administered per hour and modality were established according to whether vaccination was done in a health facility (≥42 doses in 7 hours) or through community outreach services (18 doses in 7 hours in urban areas and ≥12 doses in 7 hours in rural areas) *(47)*.

34 Includes nurses, nursing assistants, and other related occupational groups.

Phase 1 of Ecuador's vaccination plan calculated 60 522 doses per day, or 7565 doses per hour on average, administered by 630 vaccination teams nationwide, based on estimates of 12 doses per hour per team in an eight-hour workday, five days a week. In phases 2 and 3, ideally 120 906 doses per day would be administered, or 15 114 doses per hour on average, with 1259 vaccination teams nationwide each operating on the same schedule regarding doses, hours, and days per week *(48)*.

2.2.4. Funding

Countries defined strategies to fund the additional cost of COVID-19 response measures. As described earlier in this report, the five countries used varying methods to address the shortage of health workers needed to respond to the health emergency. These methods involved expanding investment in HRH, PPE, test kits, and health facilities, on top of wage increases and incentives.

Investments aimed at increasing HRH focus on occupational groups or inequitable distribution by region, as some HRH must be maintained after the pandemic to reduce gaps and contribute to universal access to health and universal health coverage. In many cases, wage increases and financial incentives involved improvements in working conditions, in addition to actions designed to reduce regional gaps within the country. Preserving these measures and continuing to enhance HRH distribution within the country should be considered. Efforts to fund PPE and test kits will guide future analyses in two aspects: understanding in which situations PPE deficits occur independently of health emergencies either generally or in regions within countries; and as a reference point to establish funding reserves for future health emergencies. It is therefore important to determine the size of additional HRH investment made by each country to respond to the pandemic, including the cost of specific risk prevention and occupational health protection regulations.

The study found that Chile, Colombia, and Peru mainly used existing resources in their ongoing and general state budget to fund the pandemic response. In Ecuador, funds were supplemented by donations and credit from multilateral organizations. The main source of funding in Bolivia (Plurinational State of) was a loan granted before the pandemic by the World Bank, with resources redirected according to need.[35]

In each country, joint work was required between ministries of health and the ministries of finance or economy to allocate credit and national budgets.

Table 2 contains available information on monetary resources allocated to recruitment to maintain or increase HRH for the care of COVID-19 patients.

Table 2. Funds allocated for recruitment of additional human resources for health

Country	Additional HRH	Value in US$
Bolivia (Plurinational State of)	7484 (projected)	8 543 777 (budgeted)
Chile	19 027 hired + overtime hours	253 955 686 (executed)
Colombia	3608 (projected)	No information
Ecuador	No information	43 492 222 (executed)
Peru	44 207 hired	649 900 457 (budgeted)

HRH: human resources for health; US$: US dollars.

35 Responses submitted by the ministries of health of the aforementioned countries to the PAHO questionnaire for the purposes of this study. Data as of 2020.

2.3. Analysis of strengths and challenges

This report provides a set of standardized indicators and relevant data sources to identify and quantify the multifaceted impact of COVID-19 on HRH. The standardized methodology applied to all countries was useful in detecting common issues that affected HRH during the pandemic and the ensuing policy response. Dialogue with countries throughout the study was key to collecting, understanding, and interpreting the information. Their participation while discussing results contributed to identifying HRH strategies, mechanisms, and challenges.

Although the information collected represents a specific point in time, it is still important for establishing priorities and objectives aimed at strengthening HRH during health emergencies and increasing the resilience of health systems. The various strategies and mechanisms put in place in the five countries to address HRH availability for COVID-19 response were centered on the three pillars of health emergency response:

- Preparation to provide initial response to the health emergency
- Strengthening HRH to increase response capacity in the health system
- Reviewing and updating measures

The information will be useful for countries as they review, maintain, or improve their emergency response, allowing them to exchange experiences and lessons learned during the policy dialogue process.

Health workers are an essential part of providing timely and quality health services. Policies must be put in place to pay them adequate salaries and protect their well-being. Starting with this premise, **the most important activity** is to generate mechanisms to absorb newly recruited HRH to reduce gaps countries faced before the COVID-19 pandemic and preserve working conditions, including wage increases, which in turn depends largely on identifying funding sources.

This was vital to reducing shortages at the PHC level in Bolivia (Plurinational State of), increasing the number of specialists in critical medicine and intensive care in Ecuador, and improving territorial distribution in Colombia and Peru. The need to strengthen coordination between the MoH and Ministry of Education in Chile to improve HRH availability and distribution was also detected as a key factor in responding in a timely manner to situations like the COVID-19 pandemic.

While information on HRH exists, tools are still needed to provide timely, complete, and detailed information to create incentives addressing resource scarcity, both generally and during health emergencies.

Bolstering mechanisms, tools, and regulations to develop telemedicine after the pandemic was also important in all five countries.

Every country also identified the need to improve working conditions, specifically job stability and social security to create healthy environments fostering good HRH performance and care for their mental health and well-being, with the goal of improving quality of life and work–life balance. Ecuador and Peru demonstrated that one way to overcome this challenge is by formalizing health careers.

Another challenge is to conserve provisions to facilitate purchasing of goods and services, guarantee the supply of medicines and PPE, streamline public procurement regulations, and decentralize processes, when necessary, as in the case of Ecuador.

These activities are a starting point for analyzing and developing shared policy guidelines among the countries participating in this case study.

2.4. Discussion of results

This study addresses mechanisms to increase, maintain, and protect HRH in Bolivia (Plurinational State of), Chile, Colombia, Ecuador, and Peru by improving availability, training, protection, well-being, remuneration, and funding to respond to the COVID-19 pandemic. Understanding the impact of infection and deaths on HRH has been useful for risk analysis and estimates of the HRH needed to respond to the pandemic. The value of this study is multifaceted. The results will help establish priorities and objectives aimed at strengthening HRH to improve the resilience of health systems. The analysis process has enabled countries to identify and examine HRH challenges and response mechanisms during the COVID-19 health emergency. The resulting data and information provide new insights, especially for policy dialogue at the national level, and facilitate coordination between institutions both within countries and across the PAHO Andean subregion. The study is a common good for health that supports cross-country analysis and contributes to the global perspective by furnishing information that can be used by WHO public goods and to create provisional guidance documents on COVID-19 response.

The report presents systematic policies and strategies adopted by the participating countries to face HRH challenges arising from COVID-19. The information and lessons learned provide evidence and help align policy priorities and objectives with protecting and caring for HRH throughout the Region. Emphasis was also placed on the need to improve investment in HRH as a priority strategy to strengthen the resilience of health systems, ensuring continuity, optimal functioning, access, and adequate coverage for the entire population.

First, the countries prepared an initial response to COVID-19, which involved **identifying health worker needs, availability, and shortages based on planned response in order to increase the capacity of the health system.** After planning, the five countries implemented sets of measures to increase or maintain HRH, including: **1)** recruiting workers through new or adjusted mechanisms; **2)** temporarily reassigning HRH from services not associated with COVID-19 care to care for COVID-19 patients; **3)** increasing HRH availability by incorporating domestic and foreign students and recent graduates, retired persons, volunteers, and members of the armed forces; **4)** engaging in international cooperation; **5)** enforcing compulsory social service; and **6)** adjusting work shifts.

Organizational measures were also needed to protect HRH by ensuring PPE availability and testing to strengthen IPC, creating guidelines for identifying risk among HRH, and providing training on COVID-19 diagnosis and management. All actions were accompanied by improvements in working conditions, including bonuses and wage increases, classification of COVID-19 as an occupational disease for health workers, and identification of risk groups by age, comorbidity, pregnancy, and caregiving duties for young children. Risk groups were instructed to cease activities at the beginning of the pandemic and later perform tasks with lower exposure to COVID-19, such as telemedicine or mental health plan implementation and improvement. Ultimately, this training produced new skills for the care of a hitherto unknown disease.

All actions required coordinated efforts between several entities within each country, especially ministries of health, education, labor, and finance. These institutions, within scope of their powers, designed new regulations and legislation to support various measures aimed at maintaining and protecting HRH.

Table 3 shows the strategies put in place to address HRH issues, organized into the three pillars of health emergency response: **1)** preparing an initial response to the health emergency; **2)** strengthening HRH to increase the response capacity of the health system; and **3)** reviewing and updating measures.

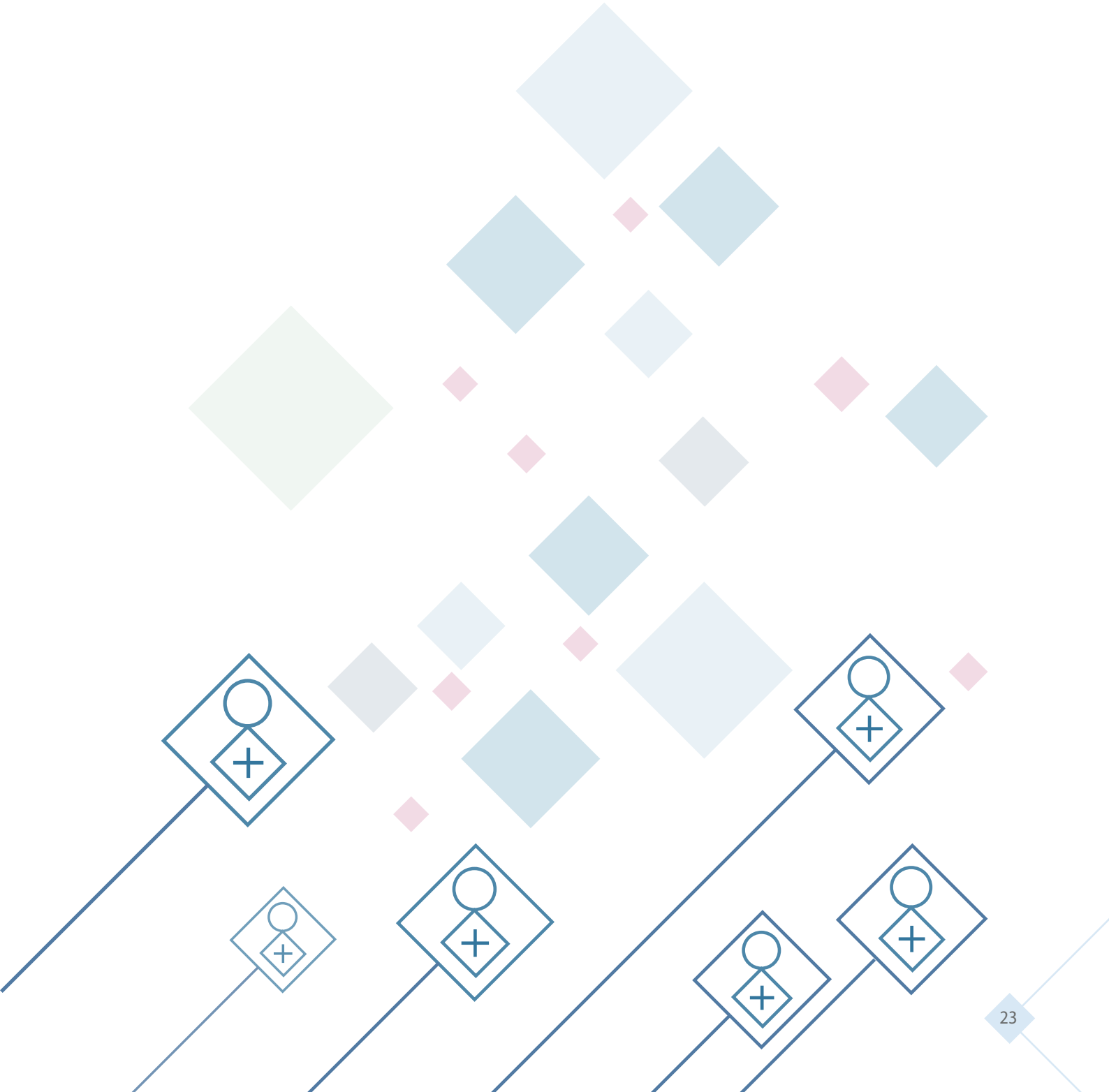
Table 3. Strategies and mechanisms to address human resources for health issues in response to COVID-19

Strategy	Implementation mechanism
Pillar 1. Prepare to provide an initial response to the health emergency	
Estimate HRH needs for the initial COVID-19 response	• The importance of an information system for follow-up of confirmed COVID-19 cases and deaths was identified in order to make estimates, detect risks for HRH, and design measures and policy responses. • The need to improve HRH identification contributed to efforts to strengthen existing HRH information systems and estimation methods. • At the outset, plans or strategies were structured to care for patients with suspected, probable, or confirmed diagnoses, prioritizing an expanded health system with more beds in intensive care units, intermediate care units, and general wards (type 2 strategy). • HRH needs were estimated according to the strategy. Health workers in risk groups, in isolation, and those who had fallen sick or died were also considered.

Strategy	Implementation mechanism
Pillar 2. Strengthen HRH to increase response capacity in the health system	
Increase availability of HRH caring for suspected, probable, or confirmed COVID-19 cases.	• Mechanisms were adopted to increase HRH capacity through regulatory adjustments, generally subject to the health emergency. • These mechanisms focused on hiring new workers and reassignment from other health services. • Various measures were coordinated between the MoH and ministries of education in each country concerning students, recent graduates, and those who had graduated abroad. • International cooperation was available as a resource. • Increased remuneration in regions with shortages and more social services positions with expanded access for recent graduates in health areas were among strategies used in some countries to improve regional HRH distribution. • The MoH and the ministries of economy and finance in each country had to work together to achieve sufficient HRH.
Improve working conditions	• Financial incentives such as extra or regular bonuses and higher remuneration were adopted. • Non-financial incentives, such as life insurance, were also included.
Define new HRH competencies for COVID-19 prevention and treatment	• Health workers received virtual training in prevention, control, diagnosis, and treatment of COVID-19, which in general led to greater HRH coverage, although there were failures in follow-up and validation of training.
Occupational safety and health	• Guidelines were applied to prevent COVID-19 infection in health facilities, including priority HRH testing on a regular basis. • Countries designed actions to mitigate the global PPE shortage, allocating resources for procurement and enacting mechanisms for efficient distribution among HRH. • In some countries, it was necessary to recognize COVID-19 as an occupational disease for health workers. • Health workers were assigned to risk groups according to age, comorbidity, pregnancy, and care for young children. Health workers belonging to these risk groups ceased providing care at the beginning of the pandemic and were reassigned to tasks with less exposure to COVID-19, such as telemedicine. • HRH mental health plans were bolstered.

Strategy	Implementation mechanism
Pillar 3. Review and update measures	
Maintain HRH availability	• Update of the response plan for the second wave of COVID-19, focusing on care for suspected, probable, or confirmed cases in PHC establishments (type 1 strategy). • Vaccination plan prioritizing HRH. • The amount of HRH needed to implement the vaccination plan in the country was calculated.

COVID-19: coronavirus disease 2019; HRH: human resources for health; MoH: ministry of health; PHC: primary health care; PPE: personal protective equipment.



Part 2.
Case studies

1. Plurinational State of Bolivia

Key points

- An estimated 11.92% of total HRH had confirmed cases of COVID-19, with a fatality rate of 1.97% (as of April 2021). However, cases are not monitored, which prevents understanding of behavior within the occupational groups *(1)*.[36]
- Confirmed COVID-19 cases among HRH made up an estimated 7.53% of confirmed cases in the total population as of November 2020 *(1, 7)*.
- In April 2020, the country estimated a need for 6700 workers based on the number of additional general ward and intensive care unit (ICU) beds to treat 39 000 cases. An initial three-month response was developed to attend suspected, probable, and confirmed COVID-19 cases in public facilities. Estimates indicated a need for 7628 additional HRH. It is important to note that COVID-19 cases far exceeded projections.[37]
- HRH belonging to risk groups were granted leave, reducing total availability by 30% to 40%. New hires, estimated at 32%, fell short of covering this gap.[38]
- As of October 2020, HRH availability grew due to the following actions: **1)** recruitment with World Bank funding (6777 people were hired out of a planned 7628); **2)** worker reassignment (3600 health workers); **3)** hiring of recent graduates (220); **4)** incorporation of volunteers (450); **5)** use of trainees (300); and **6)** extension of work shifts accompanied by increased pay.[39]
- To reduce HRH absence while waiting for SARS-CoV-2 test results, a regulation was issued to prioritize processing HRH testing. However, this measure could not be applied due to shortage of laboratory supplies.[40]
- In the first three months of the pandemic, due to PPE shortage, fear increased among HRH of attending confirmed COVID-19 cases, in some cases leading to refusal to provide care or work additional hours. Some workers even resigned from their positions. Training and psychological support helped to mitigate this issue and address concerns about vaccine safety.[41]

36 The country's reporting date is unknown; the report's cut-off date is used.

37 Response submitted by the Ministry of Health and Sports of Bolivia (Plurinational State of) to the questionnaire sent by PAHO for the purposes of the study. Data as of 2020.

38 Ibid.

39 Ibid.

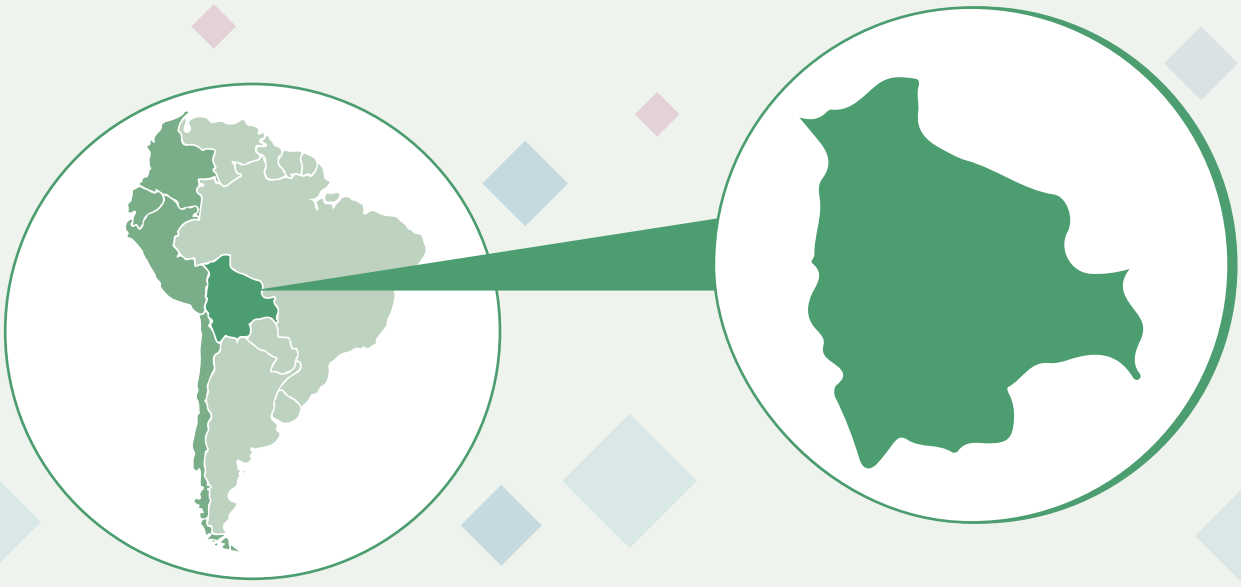
40 Ibid.

41 Ibid.

Future tasks and challenges

As of March 2021, 4000 COVID-19 vaccination brigades were scheduled to participate, and agreements were negotiated to acquire enough doses to vaccinate the entire population over 18 years of age. Mass vaccination was rescheduled for June due to vaccine shipment delays *(46)*.

- Extending workers hired during the pandemic will be difficult due to budgetary issues and reliance on temporary measures in effect only for the duration of the health emergency.
- Estimate HRH deficits by municipality, especially in PHC.
- Evaluate measures taken to improve the response to the second wave.



1.1. Country context

This section presents a brief description of the country's health system and an overview of the HRH situation before the COVID-19 pandemic.

1.1.1. Health system

The executive branch, through the Ministry of Health and Sports of Bolivia (Plurinational State of) (MoH Bolivia), defines the national health policy. Its mission as the governing health body is to promote and guarantee rights and responsibilities for the health of the Bolivian people. The MoH achieves this by regulating and executing policies on inclusion and access to comprehensive and intercultural health, without exclusion or discrimination, for families and communities through the Unified Health System (Sistema Único de Salud) with social participation and the Intercultural Community Family Health Policy (Política de Salud Familiar Comunitario Intercultural) *(50)*.

Bolivia (Plurinational State of) has a mixed health system made up of three independently funded health subsystems, each with its own establishments, with segregated access and type of care (Table 4):

1. **Ministry of Health (public sector):** provides coverage to 58.8% of the population and is funded by general taxes and employer contributions. It subsidizes the population without coverage from the other systems. It provides comprehensive health services for children under 5 years of age and women (Universal Maternal and Child Insurance, SUMI),[42] people over 60 years of age without Social Security coverage (Health Insurance for the Elderly),[43] and people with disabilities.

2. **Short-term social security:** provides coverage to 38.2% of the population; funded by contributions from the State, workers, and employers. The system is comprised of 16 health funds (national, oil, private banking, state banking, university insurance, roads, and employer-provided, among others). These funds are independently operated and managed. All are part of the first Social Security plan, created in 1956 and still maintained to this day.

3. **Private:** provides coverage to 3% of the population. Includes private for-profit insurers and non-profit organizations (such as the church and NGO) *(51)*.

The main sources of funding for the Bolivian health system are the State (51%), companies and employers (18.7%), households and out-of-pocket payments (28%), and non-reimbursable external sources or bank loans (2.3%) *(52)*.

Table 4. Distribution of health coverage by health subsystem among the insured population of the Plurinational State of Bolivia

Health coverage provider	Coverage (%)
Ministry of Health (public sector)	58.8
Short-Term Social Security	38.2
Private sector	3
Total	**100**

Source: Tejerina Silva H. Atención primaria de salud en Bolivia, Ecuador y Venezuela: ¿transición hacia la atención primaria integral? In: Atención primaria de salud en Suramérica. Rio de Janeiro: South American Institute of Government in Health, Union of South American Nations; 2015. Available in Spanish from: https://redeaps.org.br/wp-content/uploads/2019/07/livro_atencao_primaria_de_saude_2015_esp-2-1.pdf.

42 Established by Law N.º 2426, 21 November 2002, SUMI was created to provide comprehensive and free universal health benefits to pregnant women up to 6 months after childbirth and to children under 5 years of age.

43 Established by Law N.º 3323, 16 January 2006.

The public health subsystem is organized into three levels of care. The 342 municipal governments are responsible for managing the first and second levels of care that comprise the Integrated Health Service Networks (RISS), dedicated to providing more efficient, comprehensive, and effective services for the entire population. The nine departmental governments exercise leadership through the departmental health services (SEDES) and manage the third level of care.

According to 2019 figures from its National Institute of Statistics, Bolivia (Plurinational State of) had 3983 health care facilities, including 3610 at the first level of care in municipal health networks *(53)* (Table 5).

The country had developed a model of selective PHC with basic vertical maternal and child health, reproductive health, and disease control programs *(54)*. In 2006, a new model of family, community, and intercultural health was created to meet the needs and demands of individuals, families, and the community. Both models currently exist side by side *(55)*. Joint management decisions are made between municipal governments and communities through local health departments.

Table 5. Number of health facilities in the Plurinational State of Bolivia by type

Facility type	Number of facilities
Private centers	56
Health station	1193
Health center	2417
Basic hospital	238
General hospital	47
Specialized institute	32
Total	**3983**

Source: National Statistics Institute of Bolivia. Establecimientos de salud, según departamento y tipo de establecimiento, 1997-2019. La Paz: INE; 2020. Available in Spanish from: https://www.ine.gob.bo/index.php/registros-administrativos-salud/.

Table 6. Human resources for health availability in the Plurinational State of Bolivia by department

Department	HRH availability	Distribution (%)
La Paz	47 320	26
Oruro	8509	5
Potosí	12 782	7
Cochabamba	31 587	18
Chuquisaca	9500	5
Tarija	9179	5
Pando	2361	1
Beni	6971	4
Santa Cruz	51 459	29
Total	**179 667**	**100**

HRH: human resources for health.

Source: Ministry of Health and Sports of Bolivia (Plurinational State of). Plan de vacunación contra COVID-19. La Paz: Ministry of Health and Sports; 14 March 2021. Available in Spanish from https://oiss.org/wp-content/uploads/2021/04/PLAN-DE-VACUNA-COVID19.pdf. Data as of March 2021.

1.1.2. Human resources for health

The country established the Public Health Workers Statute in Supreme Decree 28909 *(56)*, which includes the rights, duties, and obligations of health workers, as well as provisions to guide their career paths, and ensure dignity and effective public service. Health worker career paths are described in the HRH management system *(57)*.

However, the national, departmental, and municipal levels have the authority to hire HRH based on specific characteristics and standards *(58)*. In other words, **the departments and municipalities are autonomous and have the authority to hire HRH under temporary contracts, which in many municipalities represents between 40% and 60% of all health workers.** This fragmented system decreases the effectiveness of regulation and governance, as HRH mainly answer to their specific employer.

As of March 2021, there were a total of 179 667 HRH, including the public and private sectors. More than 70% of HRH is concentrated in three departments: Santa Cruz (29%), La Paz (26%), and Cochabamba (18%) (Table 6); 21 350 HRH are in the public sector, with 6504 people (30%) at the first level of health care and 14 846 (70%) at the second and third levels of care.

As of 2015, **24% of total HRH were nursing assistants, 16% general practitioners, 8% medical specialty professionals, 4% nursing professionals, 8% other health professionals,**[44] **and 40% other positions.**[45] There were **4456 registered providers of Bolivian ancestral traditional medicine:** 1433 naturists, 490 midwives, and 2535 traditional doctors *(59)*.

Before the pandemic, there was already an undetermined national HRH deficit, especially specialists providing care in hospitals.[46] At the first level of care, problems were exacerbated by poor distribution of workers. One strategy for distributing workers to health centers and facilities in isolated areas or areas with unstable conditions is the compulsory rural social health service (Table 7).[47]

With 10.3 medical professionals and 15.6 nurses per 10 000 population, Bolivia (Plurinational State of) is below the Latin American and the Caribbean (LAC) average. This suggests a shortage of HRH.

Table 7. Comparison of doctor and nurse density per 10 000 population in the Plurinational State of Bolivia, Latin America and the Caribbean, and the Americas

Geographical scope	Doctors[a]	Nurses[d]
Plurinational State of Bolivia	10.3[b]	15.6[b]
Latin America and the Caribbean (33 countries)	29.8[c]	42.4[c]
Americas (35 countries)	28.3[c]	82.7[c]

Notes:
a Includes general practitioners and specialists at all levels of care.
b Data are for 2017. For more information, see: World Health Organization. WHO National Health Workforce Accounts Data Portal: Geneva: WHO. Available from: https://apps.who.int/nhwaportal.
c Ibid. Estimated 2018 data.
d Includes nursing professionals, nursing associates, and nursing staff, without indication availability by location.

44 Not defined as general practitioners, specialists, nursing professionals, or nursing assistants.

45 Human resources for health that perform non-care tasks.

46 Response submitted by the Ministry of Health and Sports of Bolivia (Plurinational State of) to the questionnaire sent by PAHO for the purposes of this study, received on 2 December 2020.

47 Part of medical, dentistry, and nursing rotations in all health sciences departments in public and private universities nationwide. It lasts three months, is ad honorem and is subject to supervision and monitoring by a joint commission responsible for its implementation, consisting of the Universidad Boliviana, the departmental health services (SEDES), and the MoH Bolivia. See: Andean Health Agency–Hipólito Unahue Agreement. Planificación y gestión de recursos humanos en salud en los países andinos. Lima: ORAS–CONHU; 2015. Available in Spanish from: https://www.observatoriorh.org/sites/default/files/webfiles/fulltext/2015/0_planificacion_rhus2015_oras_ops.pdf.

1.2. The impact of COVID-19 on human resources for health

The Government of Bolivia (Plurinational State of) first responded on 4 March by issuing Supreme Decree 4174 (2020), granting exceptional authority to health entities[48] to directly hire health workers and procure supplies and medicines, among other goods, for prevention, control, and care during the COVID-19 international public health emergency *(60)*. On 10 March 2020, the first two cases were identified. On 17 March 2020, Supreme Decree 4196 declared a national health emergency and imposed a nationwide quarantine, granting health workers in COVID-19 risk groups special leave to remain at home (workers with chronic diseases, people 60 years of age or older, pregnant women, or parents and guardians of children under 5 years of age). This measure included HRH *(61)*.

MoH Bolivia reported 21 410 COVID-19 infections among health workers;[49] 421 health workers died from COVID-19, but how many belonged to each occupational group remains undetermined *(1)*. The confirmed case infection rate among HRH (n = 21 410) was 11.92% as of April 2021, out of a total of 179 667 HRH; of confirmed HRH cases, the mortality rate was 1.97% *(1)*. Confirmed COVID-19 cases among HRH made up an estimated 7.53% of confirmed cases in the total population as of April 2021 *(1, 7)*.[50]

Lack of PPE and issues with working conditions were a concern among HRH. In April 2020, **the media reported HRH protests due to the lack of PPE.** Mass mobilizations began at the end of January 2021 and led to an indefinite health worker strike from 19 February to 10 April 2021 *(62)*. Subsequently, on 7 May 2021 a 24-hour strike was held. No further references to mobilizations were found *(63)*. Despite an initial attempt to forge an agreement, HRH rejected three stipulations in the Health Emergency Law: **1)** prohibition on interrupting health services in the event of strikes, protests, or demonstrations by doctors; **2)** authorization to hire doctors who completed their studies outside the country; and **3)** central government takeover of powers conferred to local authorities during overwhelming emergency situations. Additionally, and because these events occurred during the second wave of SARS-CoV-2 infections, HRH also requested the Government to declare a new complete lockdown to reduce the growing number of infections as health facilities again reached capacity. In February 2021, protests were also held due to non-payment of salaries. Finally, between April and July 2020, 12 attacks on health workers were recorded in the media stemming from fear that HRH are sources of COVID-19 transmission (see Table A1.7 in Annex 1).

1.3. Policy response

1.3.1. Overall COVID-19 response strategy

To address the pandemic, the national government had to adopt a strategy to improve the response capacity of patient care, including reinforcing the entire national health system by **increasing the number of ICUs and the number of general ward beds,** creating isolation centers, strengthening laboratory capacity, procuring supplies, medicines, and equipment, and recruiting HRH, both to guarantee specialized and quality care for patients affected by COVID-19[51] and to strengthen the first level, where 50% of contracted HRH were allocated.

The National Multiministerial and Multisectoral Command for leadership and governance was

48 Authority was granted to MoH Bolivia, autonomous territorial entities, and short-term social security entities.

49 Although the report's cut-off date is 13 April 2021, the country's reporting date to PAHO is unknown.

50 As the country's reporting date is unknown, the value indicated at the report cut-off date is used. As of 13 April 2021, there were 284 183 confirmed cases in the general population. For more information, see: Ministry of Health and Sports of Bolivia (Plurinational State of). Reporte N.° 394 de COVID-19 en Bolivia. La Paz: Ministry of Health and Sports: 14 April 2021. Available from: www.minsalud.gob.bo/es/5452-reporte-covid-19-1-099-nuevos-casos-9-221-pruebas-negativas-y-465-896-dosis-de-la-vacuna-contra-el-virus-fueron-aplicadas-hasta-la-fecha.

51 Response submitted by the Ministry of Health and Sports of Bolivia (Plurinational State of) to the questionnaire sent by PAHO for the purposes of this study, received on 2 December 2020.

formed on 22 March 2020.[52] The Command formulated the National COVID-19 Response Strategy in April 2020, consisting of four strategic lines under the purview of MoH Bolivia to face the pandemic *(64)*:

1. Diagnosis
2. Isolation of cases
3. Hospitalization of cases
4. Contact tracing.

During the pandemic, Supreme Decree 4257 (4 June 2020) introduced changes to strengthen leadership and technical capacities in MoH Bolivia and SEDES *(65)*. As part of this structuring, the HRH Management and Administration Unit was created.[53]

In September 2020, the plan for the post-lockdown period was adjusted with an Active Community Surveillance Strategy *(8)*, allocating greater support and development to the first level of care. The strategies in this plan include additional HRH to strengthen health services.

Although Bolivia (Plurinational State of) already had the National Health Information System – Epidemiological Surveillance (SIVE), jointly managed between the Agency for Electronic Government and Technologies and MoH Bolivia, COVID SIVE was expanded to the national level *(66)* with the goal of recording suspected and confirmed COVID-19 cases through digitization of epidemiological charts *(8)*.

With the exponential growth of COVID-19 cases nationwide, demand exceeded the health system supply, infrastructure, and HRH capacity, forcing non-essential services to be limited and 60% of hospital capacity to be allocated almost exclusively to patients with COVID-19. Consequently, there were reductions in vaccines, prenatal and postnatal checkups, children born in hospitals, outpatient visits in all specialties, hospitalizations, and elective surgeries. Dental services and child growth and development checkups were also suspended, among other services.[54]

1.3.2. Improving the availability of human resources for health

1.3.2.1. Identifying the needs of human resources for health to address COVID-19

The National COVID-19 Response Strategy (April 2020) estimated that **the HRH deficit was approximately 7484 health professionals** (Table A1.2); additional general ward and ICU beds were considered for worst case scenario projections, estimated at 39 000 total cases at that time, in addition to strengthening the first level of care. However, as of October 2020, figures reached 140 000 cases. **These HRH needs have not been funded.**[55]

Supreme Decree No. 4196 *(61)* (17 March 2020) **widened HRH gaps, leading to a 30%–40% decrease due to granting medical leave and exempting risk groups from service.**[56] Further compounding the problem was the initial fear of infection among HRH, with workers refusing to remain in the workplace longer than required and complaining of PPE shortages *(67)*.

There was no systematic collection of information on widened HRH gaps. Data from reports on capacity saturation in some public hospitals over a period of approximately three to four weeks, especially in the capital cities, revealed the following conditions:[57]

52 Ibid.

53 This HRH unit was created in La Paz with the aim of administering, managing, and developing HRH technical capacity by enforcing regulations that strengthen comprehensive and functional health networks to provide equitable, effective, and efficient services for the benefit of the population. For more information, see: Gobierno Autónomo Departamental de La Paz. Servicio Departamental de Salud de La Paz. La Paz: SEDES; 2020. Available in Spanish from: https://www.sedeslapaz.gob.bo/.

54 Response submitted by the Ministry of Health and Sports of Bolivia (Plurinational State of) to the questionnaire sent by PAHO for the purposes of this study, received on 2 December 2020.

55 Ibid.

56 Ibid.

57 Ibid.

- **Occupations with greater deficit:** doctors specializing in intensive care, critical medicine, and pulmonology, and licensed nurses.
- **Departments with the highest HRH deficit:**
  - Specialists: Beni and Pando.
  - With most cases: Santa Cruz, Cochabamba, and La Paz.

1.3.2.2. Measures to maintain or increase human resources for health

This section will examine the measures adopted to address HRH shortages in key occupations and regional imbalances, aggravated by infection and death among HRH and working conditions that negatively affected availability.

At the national level, the Government issued Supreme Decree No. 4174 (4 March 2020) *(60)*, granting special authorization to MoH Bolivia, autonomous territorial entities, and short-term social security entities, **to hire healthcare consultants,[58] for prevention, control, and care during the "international COVID-19 public health emergency."** Decisions were made to strengthen management for better network coordination for health services at the first level of care and enhance an ad hoc information system to report on laboratories, hospitals, and intensive care units. To meet these objectives, a technical commission led by MoH Bolivia was formed to define strategies to tackle the health emergency. A list of sentinel hospitals was drawn up for the care of patients with COVID-19, and an intervention plan was designed to reinforce HRH based on projections of infections, capacity, services, and gaps in the health sector. The main actions were to define the salary policy, manage resources, and fund salaries and benefits for workers in the Unified Health System, in accordance with specific national regulations, to ensure job stability. PAHO provided support to MoH Bolivia to define groups and levels in need of strengthening and gaps to close based on projected need.

In April 2020, MoH Bolivia took over equipment procurement and worker recruitment for COVID-19 patient care.[59] The existing Autonomy and Decentralization Law indicates these powers were originally conferred to municipalities and departments.

It is important to note that **Bolivia (Plurinational State of) did not have a comprehensive HRH information system, instead relying on regular worker payrolls for data,** which complicated monitoring of autonomous hiring at the departmental and municipal level. Considering the nature of the Bolivian system, the MoH was restructured to include an HRH Management and Administration Unit *(8)*.[60,61] Its main roles include guiding HRH management, coordinating actions to assist health workers in exercising their labor rights and fulfilling their work duties, and supervising the tasks carried out by SEDES workers.

The following mechanisms were adopted in Bolivia (Plurinational State of) to increase HRH availability:

- **Recruitment:** To address the COVID-19 pandemic, MoH Bolivia determined that additional HRH would have to be hired to strengthen hospital services nationwide. Consequently, US$ 25 664 925.22 was allocated to **hire a total of 7628 new workers** over a three-month span in the five intervention areas (see Table A1.1 in Annex 1): **1)** ICU; **2)** general wards; **3)** COVID-19 patient isolation centers; **4)** integrated health service networks (RISS); and **5)** community monitoring and surveillance brigades *(9)*.

58 Workers hired to provide services or work ad honorem.

59 Ibid.

60 This HRH unit was created in La Paz with the aim of administering, managing, and developing HRH technical capacity by enforcing regulations that strengthen comprehensive and functional health networks to provide equitable, effective, and efficient services for the benefit of the population. For more information, see: Gobierno Autónomo Departamental de La Paz. Servicio Departamental de Salud de La Paz. La Paz: SEDES; 2020. Available in Spanish from: https://www.sedeslapaz.gob.bo/.

61 Based on Decreto Supremo N.° 4257 (4 June 2020) and Resolución Ministerial N.° 0355 (23 July 2020). See: http://www.gacetaoficialdebolivia.gob.bo/edicions/view/1275NEC.

Supreme Decree No. 4224 (24 April 2020) authorizes the Agency for Health Infrastructure and Medical Equipment (AISEM) to manage and recruit HRH for the duration of the national health emergency *(68)*. Ministerial Resolution No. 0260 (12 May 2020) enabled MoH Bolivia to authorize direct hiring of health workers to contain the COVID-19 pandemic nationwide (Table A1.3 summarizes the legislation on HRH recruitment to address the pandemic).

Later, Ministerial Resolution No. 0344 (13 July 2020) empowered the MoH to authorize AISEM **to manage all health worker recruitment with funding from the World Bank**, foregoing traditional requirements to register health workers with MoH Bolivia.[62] In coordination with the World Bank, a quick and simple recruitment process was established using non-consultant services, in accordance with World Bank procurement rules and procedures.[63]

To operationalize HRH hiring in initial stages, MoH Bolivia formed a commission with members from the General Health Services Directorate to assist with intake of hiring requests from the different departments, review compliance with previously established requirements, and funnel documents to AISEM as the entity responsible for the hiring process, with technical support from PAHO. Various problems and administrative issues arose during the process, including payment for non-consulting services.

The interim minister of MoH Bolivia then introduced a change in the procedure to speed up recruitment times to respond to the emergency, eliminating the role of the Directorate General of Health Services in the hiring process. The ministerial representative in each department took over the responsibilities of assisting with intake of recruitment requests, reviewing compliance with previously established protocols, and funneling documents to AISEM as the entity responsible for the hiring process.

The Minister of Health, reinstated in her functions,[64] then ordered that the initial procedure be resumed with the participation of the Directorate General of Health Services commission. The commission returned to the tasks mentioned above.[65]

The HRH strategy for care during the COVID-19 pandemic resulted in 71 recruitment drives that hired total of 6777 health professionals and workers in the 9 departments of Bolivia (Plurinational State of) (Tables 8 and 9).

In total, MoH Bolivia hired 6777 new public sector workers nationwide[66] mainly in the urban

62 The World Bank facilitated reallocation of funds from previously approved hospital construction projects to HRH measures (see Table A1.6 in Annex 1).

63 Service contracts were established pursuant to the World Bank's non-consultant procurement procedure, no objection clause, and operational rules of the approved program. The implementation unit of the credit agreement directly invited professionals selected by health facilities, municipal autonomous governments, and departmental health services for a defined period of 90 days.

64 The minister of defense took over duties from the minister of health after she was diagnosed with COVID-19 in August 2020. See: Ministry of Health and Sports of Bolivia (Plurinational State of). Ministra de Salud retoma sus funciones tras "recuperación favorable" del coronavirus. La Paz, MoH Bolivia; 2020. Available in Spanish from: https://www.minsalud.gob.bo/4498-ministra-de-salud-retoma-sus-funciones-tras-recuperacion-favorable-del-coronavirus.

65 Due to the sheer number of workers required by departments and municipalities, individual claims made by health facilities, SEDES, or Municipal Autonomous Governments regarding their capacity and requirements based on the number of projected cases were not contained in a single report, but instead were updated as the analyses were developed. Each process covered several hospitals or even several municipalities in each department, and an intervention schedule was also created according to the evolution of the pandemic and establishment of intensive care units in health facilities.

66 Total number of HRH hired as of October 2020. The goal, however, was to hire 7628 new workers during the emergency.

Table 8. Human resources for health hired by department in the Plurinational State of Bolivia as of October 2020

Department	HRH hired (n)
Beni	668
Cochabamba	425
Chuquisaca	724
La Paz	1794
Oruro	837
Pando	452
Potosí	552
Santa Cruz	942
Tarija	377
Ministry of Health	6
Total	**6777**

HRH: human resources for health.

Source: Response submitted by the Ministry of Health and Sports of Bolivia (Plurinational State of) to the PAHO questionnaire for the purposes of this study, received on 2 December 2020.

Table 9. Human resources for health hired by occupational group in the Plurinational State of Bolivia as of October 2020

Occupational group	HRH hired (n)
Intensivists	95
Specialists	589
General practitioners	1736
Nurses	918
Nursing assistants	1478
Biochemists	146
Other professionals and technicians	453
Support staff	284
IT or communications	1078
Total	**6777**

HRH: human resources for health.

Source: Response submitted by the Ministry of Health and Sports of Bolivia (Plurinational State of) to the PAHO questionnaire for the purposes of this study, received on 2 December 2020.

and suburban areas of the capital cities, which were most affected by the pandemic. Initially, the response was not based on the number of inhabitants, but rather on the programming and management capacity of each department. Later, adjustments were made according to needs identified in each department and, finally, technical justifications stemming from the evolution and behavior of the pandemic.

In November 2020, after general elections ushered in a new administration, a rapid evaluation was performed to examine the mechanisms used to expand HRH for COVID-19 response. Afterwards, the decision was made to undertake an approach favoring greater stability by using funding from regular resources instead of international cooperation to hire workers. Subnational governments were authorized to use 2020 budget balances to hire workers to respond to the COVID-19 pandemic.

In the last quarter of 2020, there was a significant decrease in confirmed COVID-19 cases. The number of workers hired subsequently dropped by approximately 40%.[67]

- **Reassignment:** MoH Bolivia did not implement an HRH reassignment plan at each level of care;[68] however, during the term served by the interim minister of health, with help from departmental ministerial authorities, hospital support needs were identified that had not been considered during initial programming.

67 It is important to remember that this is an approximate estimate since departmental (9) and municipal (339) governments are authorized by the Autonomy Law to hire health services. The consequence of this is reflected in the multiple and varied temporary contract modalities, with the Ministry of Health exercising very little real monitoring and regulation.

68 Nevertheless, there were specific cases of decisions made by municipalities (which administer the first and second level of care) temporarily reassigning health workers locally.

Around 800 workers were initially redistributed from national programs (telehealth and Family and Community Health) to departments with the highest number of COVID-19 cases (Santa Cruz and Beni). At the first level of care, HRH were primarily reassigned to triage, isolation, contact tracing and community surveillance brigades, and hospitals to care for COVID-19 patients in ICUs. These activities fluctuated according to the behavior of the epidemic curve in each department. A total of 3600 people were reassigned.

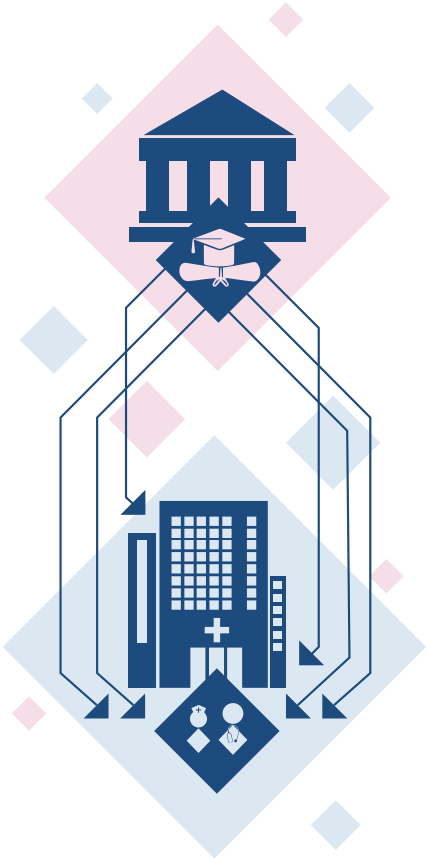
- **Extended shifts:** Estimates were made for professionals needed in ICUs and general wards based on projections of the number of infected health professionals, assessment of capacities and services, and gaps in the health sector. It was verified that the number of specialists, especially those providing intensive care for COVID-19 patients, did not meet requirements. In different National Health System facilities, **the workload of existing professionals therefore increased,** with work hours even doubling in some cases.

  Law 1298 (20 May 2020) was issued to cover the additional shifts in the expanded ICU services, approving double pay for workers assigned to COVID-19 care services, from the first level to ICUs *(69)* (see Table A1.4).[69]

- **Recently graduated health professionals: The interim Minister of Health relaxed requirements for hiring newly graduated professionals and assistants.** Initially, only doctors, nurses, and nursing assistants were mobilized as a palliative measure. Later, given the need for more HRH, especially in rural municipalities, a biministerial resolution issued by the ministries of education and health authorized the hiring of recent graduates to join active community surveillance brigades and provide support *(70)*. Authorization was also given to hire specialists in the process of obtaining their degrees to quickly cover added services and general ward beds; 220 specialists in their mandatory social service year were hired to provide services related to COVID-19 patient care.

- **Volunteers:** In October 2020, an agreement was established with public and private universities allowing graduates to volunteer for the COVID-19 response. **Approximately 450 people volunteered**.

- **Undergraduate students:** At the beginning of the pandemic, universities in the country decided to withdraw students studying health careers from health facilities out of fear of legal action from parents. This situation deepened the response capacity crisis in the health system. Subsequently, students in the final year of medical and other health sciences programs completed their community training in health centers and joined the community brigades. Approximately 300 students joined.



69 Initially, Decreto Supremo N.° 4204 (1 April 2020) regulated this issue. For more information, see: Decreto Supremo N.° 4204 (1 April 2020). During the national health emergency, health professionals are exempted from the General State Budget 2020. See: http://www.gacetaoficialdebolivia.gob.bo/normas/buscar/4204.

With adjustments to the COVID-19 action plan for the **post-lockdown period in September 2020, the Active Community Surveillance Strategy provided greater support and development for the first level of care.** This transition between plans did not quantitatively alter HRH programming, but rather allocated HRH to the first level of care, initially for case monitoring and contact tracing for people with COVID-19, with a more comprehensive approach that would allow essential services to recover.

Table 10 shows the quantified results of mechanisms used to increase HRH availability to address the COVID-19 emergency.

One problem that arose with new HRH hires was **delayed payment due to the following administrative issues:**

- Errors in the health professional activity reports, used to determine pay
- Delays in the submission of activity reports by the ministerial representative in each department
- Incorrect interpretation of health professionals' attendance forms
- Problems when coordinating payments between administrative, financial, and legal units

To mitigate these problems, **in-person training on compliance with payment procedures,** simplified formal requirements for payment, standardized processing of health worker attendance forms by administrative and financial AISEM departments, and increased administrative staff for payment processing were put in place to resolve HRH issues.

No direct economic incentives were granted, although above average salary scales were established. HRH salaries were determined according to responsibility, experience, and level of resolution in hospitals, transforming payment into an incentive for health professionals to address the pandemic. Salary levels were fixed based on expectations placed on professionals according to their area of intervention. In addition, Law No. 1298 (20 May 2020) *(69)* allowed specialists to work double shifts and receive double pay. There is no specific reference to economic incentives in the private sector.

1.3.3. Protecting and supporting human resources for health

Given the fact that HRH are on the forefront of health services, they constitute a high-risk group vulnerable to infection and mental health issues. Multidimensional and integrated strategies are required to adequately address this matter. This section describes actions that protect health professionals and ensure their safety.

1.3.3.1. Occupational safety and health and infection prevention and control

In March 2020, **paid leave for preventive quarantine** was granted to HRH belonging to the following groups: people with chronic illnesses; people over the age of 60; pregnant women; and fathers, mothers, or guardians of children under 5 years of age *(71)*. On average, the measure applied

Table 10. Human resources for health availability for care of patients with COVID-19 in the public health subsystem of the Plurinational State of Bolivia

Mechanism	HRH
Recruitment [a]	6777
Reassignment	3600
Recent graduates	220
Volunteers	450
Undergraduate students	300
Total	11 347

HRH: human resources for health.

Note:
a 6777 HRH were hired out of a planned 7628.

Source: Response submitted by the Ministry of Health and Sports of Bolivia (Plurinational State of) to the PAHO questionnaire for the purposes of this study, received on 2 December 2020. Data as of October 2020.

to approximately 35% of workers, with some variation between levels and departments. Percentages were lower in departments with younger workers. However, Supreme Decree 4245 (2020) *(72)*, which lifted the national health emergency declaration, abolished the measure on 1 June 2020, **forcing all HRH to return to their work duties** (Table A1.5 of Annex 1 lists the legislation on occupational safety and health and IPC).

MoH Bolivia issued the following nine COVID-19 pandemic management protocols regarding prevention, protection, and occupational safety:[70]

1. Diagnostic protocol
2. Patient management guidelines
3. COVID-19 guidelines
4. Procedural guidelines for handling corpses
5. Diagnosis and treatment guidelines
6. COVID-19 guidelines for sports facilities
7. Technical standard for biosafety procedures
8. Immune plasma
9. OBGYN protocol

MoH Bolivia issued a regulation prioritizing testing and epidemiological surveillance for health workers at the national and local levels to reduce absences due to test result wait times. However, this measure could not be applied due to shortage of laboratory supplies.

The following mechanisms were implemented to adjust services:

- Flowcharts indicating exclusive HRH entry and exit routes.
- Red, yellow, and green areas, as well as transition areas and proper signage established.
- Areas for PPE donning and doffing.
- Improved facilities with sinks and showers.
- Field training for workers on general biosafety and specific intensive care issues.
- Extended shifts to minimize entry and exit from intensive care services.

70 Initially, Decreto Supremo N.° 4204 (1 April 2020) regulated this issue. See: Decreto Supremo N.° 4204 (1 April 2020). During the national health emergency, health professionals were exempted from the General State Budget 2020. La Paz: Presidency of the Republic; 2020. Available in Spanish from: http://www.gacetaoficialdebolivia.gob.bo/normas/buscar/4204.

Supreme Decree No. 4217 (14 April 2020) *(41)* provided health and life insurance for health professionals and workers engaging in COVID-19 care. Insurance covers total and permanent disability or death in the amount of 100 000 bolivianos (BOB) (US$ 15 000) in both cases for workers caring for COVID-19 patients in health facilities, clinics, and other public subsectors funded by short-term and private social security systems in the national health system. Approximately 400 people benefited from this measure.

There were isolated and short-term instances of some municipalities reserving spaces in hotels or residences for HRH who, on a voluntary basis, preferred this temporary setup to their home. During the lockdown, several municipalities assigned buses to transport HRH.

HRH are particularly vulnerable to negative mental health effects, both because of the uncertainty of facing a new pathology and the concern of exposing their own families to illness. Work overload in locations with HRH shortage further complicated the issue. **Some HRH resigned or requested leave for fear of contracting the disease,**[71] largely due to PPE shortages throughout the country, which were exacerbated by delays in procurement processes and saturation of the world market. Given poor conditions in their contracts, workers in precarious jobs on short-term contracts (three months) preferred to quit instead of facing continued exposure to the virus. Virtual trainings were held to reduce fear among HRH of caring for COVID-19 patients, and to provide psychological support.

1.3.3.2. Training

Training activities for HRH hired for the public sector focused on updating knowledge, providing information, fostering understanding and attitude changes, and addressing HRH behaviors and habits. Training modalities included:

1. Virtual self-learning COVID-19 courses for all hired HRH on essential topics such as biosecurity, IPC, psychological support, and clinical management, among others. The PAHO Virtual Campus for Public Health platform also provides self-learning courses in a dynamic space that optimizes the training process through documents, presentations, videos, outlines, and evaluations.

2. Hybrid COVID-19 courses covering guidelines and protocols for care, as well as clinical management procedures.

Upon joining, additional HRH hired by MoH Bolivia in each hospital were onboarded and trained in each area (intensive care and hospitalization).

Out of 3038 HRH hired for isolation centers, network strengthening, and contract tracing and community surveillance brigades, **261 received training in the department of La Paz (seat of government), equivalent to 9%.** The rest of the workers were trained by SEDES. The resources included educational or research materials available for training and development, used for community surveillance brigades, network coordination support staff, and recovery centers in the departments of La Paz and Oruro. PowerPoint slides, videos, and schematics were primary resources presented through video conferencing platforms (Webex, Zoom, and Teams). Other modalities included chat, voice chat, audio and virtual group partnerships, in-person workshops, and on-the-job training.

In anticipation of a second COVID-19 wave, various computer platforms and applications for proper interaction became common practice, in most cases with the goal of facilitating virtual training sessions.

71 For example, a survey was carried out in the department of Oruro on knowledge, attitudes, and practices among health workers. The results showed that health workers were afraid, considered their work to be unsafe, and believed that they were potential vectors of transmission to their families. After health professionals in Beni resigned due to the lack of supplies and fear of the increase in COVID-19 cases, the Germán Busch Hospital, a sentinel center attending cases, was left with just 40% of its staff. The director of the hospital, Marco Rojas, reported a deficit of 74 professionals (24 physicians and 50 nurses) required to provide adequate care. See: Cuevas C. Médicos y enfermeras renuncian y dejan con 40% de personal al hospital centinela de Beni para COVID-19. La Razón; 9 May 2020. Available in Spanish from: https://www.la-razon.com/sociedad/2020/05/09/medicos-y-enfermeras-renuncian-y-dejan-con-40-de-personal-al-hospital-centinela-de-beni-para-covid-19/.

1.3.3.3. Vaccination

The goal of the vaccination plan in Bolivia (Plurinational State of) is to immunize 100% of the eligible population, or 7 435 481 people with 15 791 392 doses. Registration through an official website *(73)*, the Bolivia Segura-Unidos Contra la COVID-19 mobile application, or the toll-free telephone line 800–10-4110 is required to get the vaccine *(74)*.

Table 11 details the vaccination plan by phase, date, and target population.
To achieve these objectives, the Government agreed to obtain the following vaccines:

1. **Gamaleya:** 5 200 000 doses.
2. **Sinopharm:** 600 000 doses.
3. **AstraZeneca:** 5 000 000 doses.
4. **COVAX Mechanism for Global Access to COVID-19 Vaccines:** 92 430 doses from Pfizer and 4 898 962 doses from AstraZeneca.

In addition, **12 000 HRH were divided into groups of three to form 4000 brigades.** HRH training is essential on two fronts, as they must receive the vaccine and promote vaccination of vulnerable target populations. Training will focus on issues of primary concern, such as vaccine safety and possibility of adverse effects. As of 14 March 2021, 60% of scheduled virtual sessions on theory for proper surveillance and investigation protocols and information management in crisis situations had been held.[72] Virtual telehealth platforms, the National Health Information System, and PAHO were used for training.

Table 11. COVID-19 Vaccination Plan in the Plurinational State of Bolivia

Phase	Target population	Target (number of people)	Vaccination mode	Date
I	Stage 1: HRH	179 667	In service [a]	29 January to 31 March 2021
	Stage 2: people >60 years old	1 191 515	In service [a] Fixed posts [b] Mobile brigades [c]	April 2021
	Stage 3: people 18–59 years of age with chronic diseases	1 317 561	In service [a] Fixed posts [b] Mobile brigades [c]	April 2021
II	Healthy people aged 18–59	4 491 685	No information	From May to August 2021

HRH: human resources for health.

Notes:
a Vaccination within the health services network with vaccines that must be refrigerated at temperatures of 2 °C to 8 °C.
b Vaccination at fixed posts in accessible and busy locations: banks, food distribution centers, schools, churches, and parks. Vaccination in these locations must be announced previously to the target population and the necessary infrastructure assured since vaccines must be kept at low and ultra-low temperatures (–20 °C to –70 °C). Plans were made for 66 permanent posts in the 9 regions, equipped with ambulances and specialists, and 2 000 brigades with the capacity to vaccinate 200 000 people per day.
c Vaccination outside the health services network through mobile brigades complementing the work of health service networks by providing medical assistance, in locations and communities without vaccination centers; another plan is to take advantage of existing infrastructure in neighborhood fairs or other community activities.

Sources: Ministry of Health and Sports of Bolivia (Plurinational State of). Inmunización COVID-19: 2.120 profesionales en salud recibieron la primera dosis de la vacuna Sputnik. La Paz: Ministry of Health and Sports; 3 February 2021. Available in Spanish from: https://www.minsalud.gob.bo/5251-inmunizacion-covid-19-2-120-profesionales-en-salud-recibieron-la-primera-dosis-de-la-vacuna-sputnik-v and Ministry of Health and Sports of Bolivia (Plurinational State of): Bolivia pone en marcha la campaña de vacunación masiva contra la COVID-19 La Paz: Ministry of Health and Sports; 12 March 2021 Available in Spanish from: https://www.minsalud.gob.bo/5371-vacunacion-masiva-marcha.

72 The training covers vaccine safety and security, microplanning, and the information system: pre-registration census and electronic immunization registry, administration techniques, cold chain, surveillance of events allegedly attributable to vaccination or immunization, monitoring, evaluation, and virtual interpersonal and group education with target and non-target populations.

Vaccine administration in health facilities varied between the departments. La Paz and Santa Cruz had the highest availability and Pando the lowest.

By 12 April 2021, 447 717 total doses had been administered, ranging from first to second doses of vaccines from Gamaleya, Sinopharm, and AstraZeneca laboratories. Among vaccinated people, 302 991 were health workers or people with underlying conditions who received the first dose of the vaccine; 144 426 received the second dose *(75)*.

1.3.4. Funding

The Bolivia government allocated additional funding for pandemic response and mobilized fiscal[73] and international cooperation resources (Table 12). The total budgeted figure amounted to US$ 260 million to reinforce hospitals with equipment and supplies. The funding came in the form of external credit from three sources: the World Bank (90%), the Inter-American Development Bank (IDB), and the Andean Development Corporation.[74]

In April 2020, to comply with the HRH strengthening plan for emergency care, **7484 people were projected to be hired over a three-month span, requiring an approximate budget of US$ 25 043 668.08** (see Table A1.2 in Annex 1). This action was reevaluated in July 2020, with updated hiring projections of 7628 HRH distributed in multidisciplinary intervention teams for each area, with an estimated three-month cost of US$ 25 664 925.22 *(8)*.

It is important to keep in mind that funding was estimated based on a projection of 39 000 COVID-19 cases; however, the figure reached 283 084 cases by 13 April 2021 *(75)*.

Table 12. Financial planning for hiring human resources for health in the Plurinational State of Bolivia

Area of intervention	HRH	Three-month cost (BOB)	Three-month cost US$
Intensive care units	2461	3 835 289.65	11 505 868.95
Hospital and emergency	1989	2 135 246.94	6 405 740.82
Laboratory	42	56 828.57	170 485.71
COVID-19 Networks	188	252 045.92	756 137.76
Monitoring and epidemiological surveillance	2431	1 806 074.93	5 451 819.53
Isolation centers	479	390 486.73	1 171 460.20
Rapid Action Brigades	15	28 695.04	86 085.13
Institutional support	23	39 109.04	117 327.11
Total	**7628**	**8 543 776.82**	**25 664 925.22**

BOB: Bolivian boliviano (national currency); COVID-19: coronavirus disease 2019; HRH: human resources for health: US$: US dollars.

Source: Ministry of Health and Sports of Bolivia (Plurinational State of). Plan de contención, mitigación y recuperación post confinamiento en respuesta a la COVID-19. La Paz: Ministry of Health and Sports; 2020. Available in Spanish from: https://www.minsalud.gob.bo/component/jdownloads/?task=download.send&id=550&catid=30&m=0&Itemid=646. Data as of July 2020.

73 There was a decrease in tax collection as a result of the economic crisis that arose from prolonged lockdowns, leading to great difficulty in mobilizing additional resources, including to ensure salary payment for regular workers. Consequently, international cooperation resources were mobilized, mostly in the form of debt.

74 Response submitted by the Ministry of Health and Sports of Bolivia (Plurinational State of) to the questionnaire sent by PAHO for the purposes of the study, received on 2 December 2020.

1.4. Conclusions and challenges

Table 13 summarizes the availability, training, protection, well-being, and remuneration mechanisms used in Bolivia (Plurinational State of) to strengthen HRH and respond to the COVID-19 pandemic.

Table 13. Human resources for health strategies and mechanisms to respond to COVID-19 in the Plurinational State of Bolivia

Strategy	Implementation mechanism
Pillar 1. Prepare to provide an initial response to the health emergency	
Estimate HRH needs for the initial COVID-19 response	• In April 2020, Bolivia (Plurinational State of) estimated a need for 6700 workers based on the number of additional general ward and ICU beds projected to treat 39 000 cases. • An estimated 7628 required health professionals were planned to be hired over a three-month span for the care of suspected, probable, and confirmed diagnoses in public establishments. • In March 2020, the risk groups among HRH were defined to grant work leave, but given the resulting shortage of workers, this measure was abolished in June 2020. • Between March and June 2020, 35% of HRH took advantage of the work leave given to risk groups.
Pillar 2. Strengthen HRH to increase response capacity in the health system	

Increase HRH availability	• Mechanisms were used to increase HRH capacity, including:
	  • Increased hiring (6777 people as of October 2020)
	  • Reassignment of care workers from services not related to COVID-19 to services related to the care of the disease (3600 people as of October 2020)
	  • Recent graduates hired (220 people as of October 2020)
	  • Volunteer work by recent graduates (450 people as of October 2020)
	  • Undergraduate student internships (300 people as of October 2020)
	  • Extended shifts with increased pay.

Increase HRH availability for intensive care and inpatient units	• Increased hiring. • Reassignment of care workers from services not related to COVID-19 to services related to the care of the disease. • Extended shifts with increased pay.
Improved working conditions	• Health and life insurance (400 people as of October 2020). • Above average salary scales according to responsibility, experience, and resolution level in hospitals.
Define new HRH competencies for COVID-19 prevention and treatment	• Virtual self-learning courses on different COVID-19-related aspects, such as biosecurity, IPC, psychological support, and clinical management. • Hybrid training courses covering guidelines and protocols for care, as well as clinical management procedures for COVID-19 cases.
Occupational safety and health	• Modification of service to prevent COVID-19 infection in health facilities. • Priority viral testing for HRH, complicated by lack of supplies. • Measures regarding rest and transportation to increase well-being.

Strategy	Implementation mechanism
Pillar 3. Review and update measures	
Maintain HRH availability	• Plan for containment, mitigation, and post-lockdown recovery in response to COVID-19 with an active community surveillance strategy and more support and development allocated to the first level. The strategies in this plan include adding HRH to strengthen health services. • Vaccination plan prioritizing HRH.

COVID-19: coronavirus disease 2019; ICU: intensive care unit; IPC: infection prevention and control; HRH: human resources for health.

1.5. Pending actions

The progressive institutionalization of additional HRH is planned, as personnel contracts must be extended to continue to respond to COVID-19 for the next three to five years. There is also a projected transition from temporary contracts to contracts with more benefits and job stability.

Based on experiences during the first stage of the pandemic, when the weaknesses of the health system in general and HRH management in particular became evident, it will be necessary to review and adjust new HRH gaps and prioritize certain areas. This will enable projections of necessary HRH, especially at the municipal level, to strengthen the response capacity of the first level of care. This effort would require centralized management of HRH information.

The HRH response strategy falls under temporary regulations that depend on the duration of the emergency. Accordingly, work must be done to institutionalize strategies. Integrated HRH management under the leadership of a single authority is critical for greater efficiency.

In light of the second pandemic wave, the following implemented actions must also be reviewed:

1. Eliminate leave for HRH with risk factors, which significantly decreased the workforce. HRH should be instead reassigned to other functions such as telemedicine and administrative tasks.

2. Retrain first level HRH to not rely on additional HRH to perform containment and mitigation tasks, as there are no resources for hiring more workers specifically to deal with the COVID-19 response.

3. Absorb hired HRH; in accordance with the regulations in force, the Administration must assign responsibilities to each level of government to achieve more efficient use of resources. Municipal autonomous governments will gradually assume this responsibility as established in the Decentralization Law *(58)*.

2. Chile

Key points

- Chile has mechanisms in place to monitor and provide open information on confirmed COVID-19 cases among health workers by region, occupational group, age, and sex. These data show that 8.22% of total HRH were affected by COVID-19 as of January 2021, while 3.6% of the general population was affected. This contrasts with the fact that the number of viral tests performed on HRH is three times greater than on the general population, demonstrating the attention that has been given to IPC *(9)*.
- The HRH mortality rate is 0.195%, well below the figure of 2.7% for the general population. This can be explained by better health conditions, lower age, and fewer comorbidities among HRH *(9)*.
- Approximately 79.1% of total confirmed HRH COVID-19 cases are concentrated in three occupational groups: medical assistants (50.8%); nurses (17.5%); and doctors (11.3%) *(9)*.
- The infection rate by occupational group shows that nurses have the highest rate (13.65%), followed by doctors (10.81%), translating to lower availability among nurses compared to medical assistants *(9)*.
- The public sector has various methods and tools to estimate HRH shortages, which are then used to negotiate the budget allocated to medical professionals. These methods placed the HRH deficit at 17 439 people and set the stage for allocating additional required resources and establishing the legal framework to hire another 19 027 HRH; the term of these contracts depends on the duration of the health emergency.[75]
- The Medical College of Chile identified an 85% PPE shortage in March 2020 and 60% in April 2020. MoH Chile addressed this issue by acquiring and distributing PPE and establishing guidelines for rational use of these resources, without putting HRH at risk *(76)*.
- The HEROES study questionnaire was applied to 935 members of different health occupational groups and performance areas. The questionnaire found that the most frequently reported symptoms of depression were changes in appetite (38.6%), lack of energy and fatigue (37.3%), and sleep disruption (32.7%). In addition, 7% of this group reported having suicidal ideation *(77)*.
- The rollout of the training, which reached 69.3% of HRH, reflected a consistent plan and partnerships with academia to train HRH on relevant COVID-19 issues *(78–80)*.[76]
- The mass vaccination process is supported in the primary care network and in the National Immunization Plan, placing nurses in charge

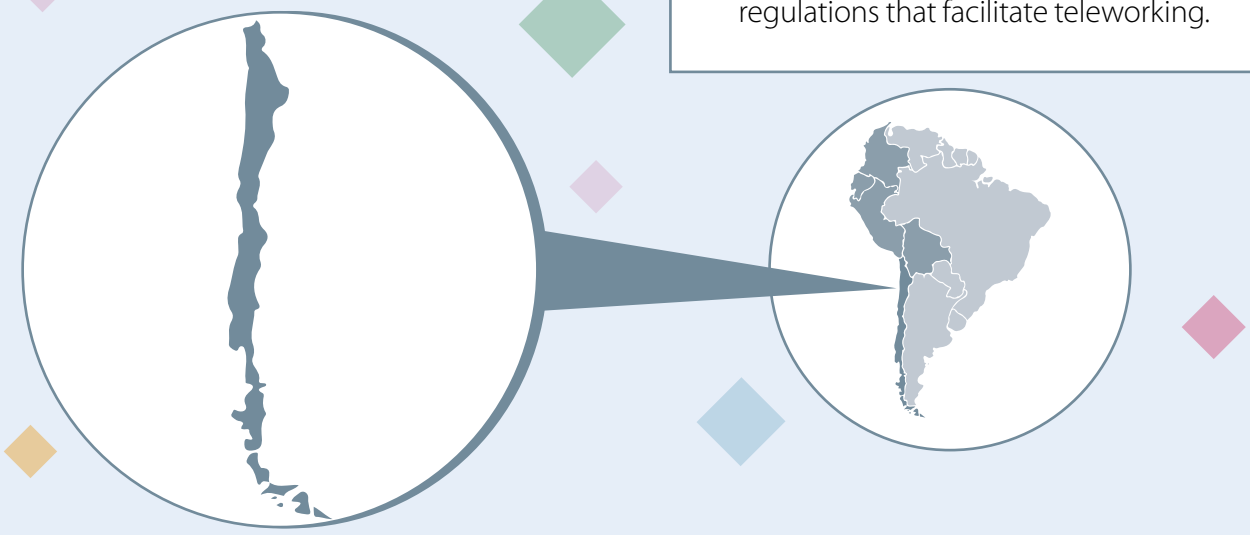
75 Response submitted by the Ministry of Health of Chile to the PAHO questionnaire for the purposes of this study, received on 11 November 2020.

76 Ibid.

of administering vaccines. Other health professionals, including midwives and dentists, were also given authorization to vaccinate, and a large number of doses were purchased. This allowed the country to gradually advance toward the goal set for the first quarter of 2021 of vaccinating 5 million people *(81)*.

Future tasks and challenges

- Absorb part of the HRH added through temporary hiring, keeping in mind that investment in infrastructure and equipment requires the incorporation of specialists.
- Encourage healthy environments for good HRH performance that promote mental health care and well-being, to improve quality of life and work–life balance.
- Strengthen coordination between the health and education sectors in Chile to improve HRH availability and distribution. This is key to responding in a timely manner to situations like the COVID-19 pandemic.
- Develop and enhance tools and regulations that facilitate teleworking.



2.1. Country context

This section presents a brief description of the country's health system and an overview of the HRH situation before the COVID-19 pandemic.

2.1.1. Health system

The Ministry of Health of Chile (MoH Chile) is the body that regulates and leads the entire health sector, formulating and controlling health policy. The MoH is divided into two undersecretariats *(82)*:

1. **Undersecretariat of Public Health:** a regulatory body that is responsible for the regional ministerial health secretariats (Seremi) in each of the 16 regions of the country.
2. **Undersecretariat of Healthcare Networks:** coordinates the 29 decentralized health services that in turn oversee public hospitals. Municipalities have authority over the first level of care.

The Seremi also are tasked with ensuring compliance with national standards, plans, and programs, as well as adapting these measures to the situation in each region; their role includes surveillance, inspection, and application of health sanctions. The Institute of Public Health (Instituto de Salud Pública) is the national laboratory that oversees public laboratories and all fields related to medicines, medical devices, occupational health, and vaccines, among other areas. Finally, the Superintendency of Health (Superintendencia de Salud) supervises insurance and health service providers.

Funding, financial protection, and health services in Chile are organized through two main subsystems: the National Health Fund (Fonasa) for the public sector, and the Institutions of Health Pensions (Isapres) for the private sector. Anyone can access any of the insurance schemes. Fonasa is a collective system that provides coverage regardless of health risks that a person may have, while the Isapres network provides plans with pricing based on risks or preexisting conditions. The Armed Forces and police have their own special networks. Each insurer, i.e., Fonasa, Isapres, and special schemes, has a particular fund that it uses to cover the expenses of its beneficiaries (Table 14).

Fonasa provides coverage to 75.2% of the Chilean population, including contributing beneficiaries and their dependents[77] and non-contributing beneficiaries, that is, people who are unable to pay in to the system (18% of the total population of the country). It is funded by 7% mandatory contributions from salaried persons or contributing beneficiaries, co-payments made by contributing beneficiaries who are able to pay,[78] and fiscal resources from the

Table 14. Distribution of the population with health insurance in Chile by health subsystem

Health insurance system	Population with health insurance (%)
National Health Fund	75.2
Health Pension Institutions	18.0
Special networks	6.8
Total	**100**

Source: National Health Fund. Boletín Estadístico 2017-2018. Santiago: FONASA; 2018. Available in Spanish from: https://www.fonasa.cl/sites/fonasa/documentos.

77 Dependents include spouses with disabilities, children and grandchildren under 18 years of age (children of already registered dependents), children and grandchildren over 18 years of age and up to 24 years of age, widowers, seniors over 65 years of age (parents and grandparents), dependents with indirect kinship (determined by the court), children and grandchildren outside the established age limits who are affected by disability and are dependent on the policy holder, and partners with a civil union agreement.

78 Contributing beneficiaries who are in income brackets C and D constitute 43.3% of all beneficiaries. For more information, see: Center for Epidemiology and Health Policy. Estructura y funcionamiento del sistema de salud chileno. Santiago: Universidad del Desarrollo; 2019. Available in Spanish from: https://medicina.udd.cl/centro-epidemiologia-politicas-salud/files/2019/12/ESTRUCTURA-Y-FUNCIONAMIENTO-DE-SALUD-2019.pdf.

State. The latter represents 58% of Fonasa's budget, intended to cover non-contributing beneficiaries who do not make co-payments *(83)*.

Fonasa provides two modes of care:

1. **Institutional care (MAI):** Medical services are provided to beneficiaries in public facilities, part of the National Health Services System that coordinates the 29 health services, distributed across 16 regions and regulated by the Undersecretariat of Healthcare Networks. The National Health Services System includes 196 public hospitals of varying levels of complexity and municipal PHC establishments, for a total of 2716 health centers across the country's 346 communes overseen by municipalities and divided into rural posts and clinics, urban clinics, and family health centers (CESFAM). The health service coordinates and articulates the entire public health care network[79] in its territory and, accordingly, promotes the operation of the Integrated Health Service Networks (RISS).

   PHC is the foundation of the Chilean public health system and was developed around the Comprehensive Family and Community Health Model (MAIS). This model is patient-centered and emphasizes caring for people throughout the life journey; it also promotes health and prevention, as well as monitoring, traceability, and financial coverage.

   PHC has primary emergency and high-capacity services for comprehensive and quality health care. PHC incorporates multiple professions with an intercultural and community approach. Except for rural posts,[80] the health team includes doctors and nurses, midwives, kinesiologists, psychologists, nutritionists, medical technology professionals, and occupational therapists. The CESFAM have the most professional diversity among their teams, with a higher level of complexity.

2. **Free choice (Modalidad de libre elección–MLE):** Beneficiaries of groups[81] B, C, and D can be attended in private facilities or by professionals through specific agreements. A care voucher can be purchased whose value depends on the registration level of the professional or establishment where the care is performed: 1, 2, or 3. As a result, the 72% of the total population registered to receive service in the public care network is less than the Fonasa beneficiary population (75.2%).

Isapres is a private health insurance network that covers 18% of the population. It is funded by a mandatory 7% contribution from salaried beneficiaries who are not part of Fonasa or the special insurance networks *(83)*.

Out-of-pocket spending accounts for 33.5% of total health expenses. This implies that 14.6% of the Chilean population spends more than 10% of its budget on out-of-pocket health expenses, compared to 7.8% of the population in LAC countries, indicating that vulnerable groups receive insufficient financial protection against the effects of health care costs on their income *(83)*.

Finally, public hospitals are able, within certain budgetary limits, to purchase services from the

79 This network is made up of the CESFAM, the Primary Emergency Care Service (SAPU), health reference centers (CRS), diagnostic treatment centers (CDT), public hospitals, and other establishments holding agreements with the corresponding health service to perform health actions.

80 Rural posts have higher level nursing technicians on permanent staff. Doctors and nurses working in more complex health centers make rounds at the posts.

81 Fonasa has four group categories:

Group A: people without resources and those with a single-family subsidy. This group receives treatment free of charge in hospitals and public clinics.

Group B: people whose monthly taxable income is less than or equal to CLP 276 000 and beneficiaries of Basic Solidarity Pensions fall under this group. Treatment is free of charge in hospitals and public clinics.

Group C Fonasa: people with a monthly taxable income greater than CLP 276 001 and less than or equal to CLP 402 960. These beneficiaries are responsible for a 10% copay in public hospitals. Those with three or more family dependents move to group B.

Group D Fonasa: people with a monthly taxable income greater than CLP 402 961. These individuals pay a 20% copay in public hospitals. Those with three or more family dependents move to group C. For further information, see: Dictamen 1482/2020. Imparte instrucciones respeto a la calificación del origen de la enfermedad COVID-19 que afecte al personal de establecimientos de salud y aquellos que han sido determinados como contactos estrechos. Santiago: Superintendency of Social Security; 2020. Available in Spanish from: https://www.suseso.cl/612/w3-article-589773.html.

private sector when they do not have specialized HRH or enough inpatient beds.

Private health care providers are comprised of clinics with inpatient and, in some cases, outpatient services; exclusively outpatient health centers with medical or dental services, laboratories, and/or radiology; and individual medical or dental providers.

In Chile, occupational accidents and diseases are covered by Law No. 16744 (23 January 1968) *(84)*, which establishes compulsory social security and mechanisms to prevent occupational accidents and diseases, provide medical care when accidents occur, rehabilitate the salaried person to recover his or her ability to work, and provide financial benefits to compensate for the worker's loss of income. Currently, insurance is financed entirely by the employer in the case of dependent salaried persons, or by the worker, in the case of self-employed individuals, through contributions proportional to salary, according to the activity and risk of each employer (between 0.93% and 3.4%). Mutual employers associations, delegated insurance administrators, and the Institute of Occupational Safety (ISL) administer insurance and perform other activities as defined by law.

2.1.2. Human resources for health

Based on the registry of Individual Health Providers managed by the Superintendency of Health, there was a total of 635 609 HRH in Chile as of 30 November 2020; 44.7% are medical assistants; 10.6% are psychologists; 10.5% nurses; and 8.6% doctors *(85)*.

According to data disaggregated by sex, as of 31 March 2019, 76% of HRH were women *(86)*. Finally, as of 31 December 2017, 55% of HRH were under 35 years old *(87)*.

According to the Department of People Management and Development, **a total of 202 289 people work in the public system** (as of 31 December 2019), of which 70 729 (35%) work in PHC services supervised by municipalities, and 131 560 (65%) at the health services level.[82] Although different policies have resulted in a 49% increase in HRH availability since 2013, the regions of the extreme north, the extreme south, and the center-south experienced historic difficulties in meeting necessary HRH targets, evidenced by lower health worker density and access among the population *(88)*.

In addition to a low density of nurses and doctors per 10 000 population nationwide compared to the countries of the Organisation for Economic Co-operation and Development (OECD) (Table 15), another critical HRH challenge in Chile is unequal distribution between the public and private health subsectors, and between territories. The average density of doctors in the public sector is 18.49 per 10 000 population, lower than the average for LAC countries (20 per 10 000 population) and OECD countries (35 per 10 000 population); however, when combining the public and private sectors, the density of doctors exceeds the average for LAC countries (26.4 per 10 000 population). The same phenomenon is seen among nurses. Public sector density (13.4 per 10 000 population) is lower than the LAC average (28 per 10 000 population) yet surpasses the average when the public and private sectors are combined (29.6 per 10 000 population).

Despite the trend of sustained improvement over the past 10 years, driven by HRH policies aimed at reducing regional distribution gaps, the density of medical personnel in the public sector remains uneven between regions, with a minimum of 13.3 (O'Higgins) and a maximum of 32.7 (Aysen) per 1000 Fonasa beneficiaries *(88)*.

82 Every year, the Department of People Management and Development under the Ministry of Health publishes a report on the state of HRH in the country, estimating deficits in each health service in the public health system. This report justifies the resources allocated to the Specialist Training Program.

Table 15. Comparison of doctor and nurse density per 10,000 population in Chile, Latin America and the Caribbean, and the Americas

Geographical scope	Doctors[a]	Nurses[d]
Chile	25.9[b]	26.8[e]
Latin America and the Caribbean (33 countries)	29.8[c]	42.4[c]
Americas (35 countries)	28.3[c]	82.7[c]

Notes:

a Includes general practitioners and specialists, from all levels of care.

b Data as of 2018. For more information, see: World Health Organization. WHO National Health Workforce Accounts Data Portal: Geneva: WHO. Available from: https://apps.who.int/nhwaportal. According to MoH Chile, this figure is 22.9. See: Ministry of Health of Chile. Brechas de personal de salud por servicios de salud y especialidad; April 2020. Santiago, Chile: MoH Chile; 2020. Available in Spanish from: https://www.minsal.cl/wp-content/uploads/2020/05/Glosa-01-letra-c-Brechas-del-Personal-de-Salud-por-Servicio-de-Salud-y-Especialidad-Anual.pdf.

c Data as of 2018. See: World Health Organization. WHO National Health Workforce Accounts Data Portal: Geneva: WHO. Available from: https://apps.who.int/nhwaportal.

d Includes nurses, nursing assistants, and nursing staff, without indication of availability by location.

e Data as of 2018. See: World Health Organization. WHO National Health Workforce Accounts Data Portal: Geneva: WHO. Available from: https://apps.who.int/nhwaportal. According to MoH Chile, this figure was 24.4 in 2016. See: Ministry of Health of Chile. Informe sobre brechas de personal de salud por servicio de salud. Santiago: MoH Chile; 2017. Available in Spanish from: https://www.minsal.cl/wp-content/uploads/2015/08/Informe-Brechas-RHS-en-Sector-P%C3%BAblico_Abril2017.pdf.

2.2. The impact of COVID-19 on human resources for health

The first government measure was issued on 22 January 2020 to launch the first phase of the COVID-19 Plan of Action, which contains six lines of action *(89)* divided into four phases *(90)*, covering training for laboratory professionals to process samples for suspected COVID-19 cases, additional infection control precautions, and training for additional workers on healthcare-associated infections (HAIs). On 5 February 2020, Decree No. 4 *(91)* declared a one-year health alert, granting extraordinary powers to the Executive Branch due to a "public health emergency of international scope" after the novel coronavirus outbreak.[83,84] This emergency declaration includes measures to increase the number of available health workers. The first imported case of COVID-19 was detected on 3 March and phase 4 began on 16 March with 201 confirmed cases. Decree No. 104 (18 March 2020) *(71)* declared a "constitutional state of emergency, due to public calamity, in the territory of Chile."

Between **3 March 2020 and 3 January 2021, 52 241 confirmed cases of COVID-19 were reported among health workers, including 102 deaths** *(9)*. This represents an **HRH infection rate of 8.22% as of January 2021; i.e., 52 241 confirmed cases out of a total of 635 609 HRH**, which is higher than the 6% figure reported on 13 September 2020 *(6)*. The mortality rate among confirmed health worker cases remained steady; 0.191% *(6)* as of September 2020 and 0.195% as of January 2021, with 102 deaths out of a total of 52 241 confirmed cases;[85] 4.9% of total confirmed HRH cases resulted in hospitalization, compared to 8.9% in the general population. Differences in the latter indicators can be explained by the fact that HRH tend to be individuals of active ages with a lower prevalence of comorbidities.[86] Finally, **HRH account for 7.39% of total national confirmed cases** (see Tables A2.1 and A2.2 in Annex 2).

83 The legal framework for the health alert and the extraordinary powers granted to the health authority is primarily contained in the Health Code. See: Ministry of Health of Chile. Decreto N.° 725. Código Sanitario. Santiago, Chile: MOH Chile; 11 December 1967. Available from: https://www.bcn.cl/leychile/navegar?idNorma=5595.

84 Amended by Decreto N.° 6 del 7/03/2020, Decreto N.° 19 del 06/06/2020, and Decreto N.° 24 del 19/07/2020.

85 The mortality rate in the total population is 2.7% (17 352/654 680). For more information, see: Ministry of Health of Chile. Informe epidemiológico. Características del personal de salud confirmados y probables de COVID-19. Santiago: MOH Chile; 12 January 2021 Available in Spanish from: https://www.minsal.cl/wp-content/uploads/2021/02/2021-01-21_Informe-PS-COVID-19.pdf.

86 Of total confirmed HRH cases, 17.5% (9149/52 241) reported at least one comorbidity, while the figure was 25.4% in the general population (166 525/654 680).

The three most populous regions of the country (Metropolitan Region of Santiago, Valparaíso, and Biobío) had the highest proportion of confirmed cases among health workers, with a combined 69.5% (see Table A2.3 in Annex 2).

Approximately 79.1% of total confirmed HRH COVID-19 cases were concentrated in three occupational groups: medical assistants[87] (50.8%); nurses (17.5%); and doctors (11.3%). Accordingly, these three professions had the highest infection rates within their occupational group; however, the figure was higher for nurses (13.65%) and doctors (10.81%). These data can be interpreted as lower availability of nursing professionals compared to medical assistants (9.35%) (see Table A2.4 in Annex 2).

Table 16. Infection rate by occupational group in Chile

Occupational group	HRH [a]	Confirmed HRH cases	Distribution of confirmed cases (%) [b]	Infection rate within occupational group (%) [c]
Nurses	66 967	9142	17.5	13.65
Medicine	54 775	5922	11.3	10.81
Medical assistants [d]	283 957	26 547	50.8	9.35
Kinesiologists	33 337	2537	4.9	7.61
Midwives	14 915	886	1.7	5.94
Medical technology professionals	17 064	928	1.8	5.44
Chemists and pharmacists	11 399	644	1.2	5.65
Occupational therapists	9057	506	1.0	5.59
Nutritionists	19 701	1027	2.0	5.21
Speech therapists	15 924	654	1.3	4.11
Dentistry	26 553	827	1.6	3.11
Psychologists	67 232	1740	3.3	2.59
Biochemists	3421	65	0.1	1.90
Other health workers [e]	10 983	400	0.8	3.64
Unidentified	324	416	0.8	N/A
Total	**635 609**	**52 241**	**100.0**	**8.22**

HRH: human resources for health; N/A: not applicable.

Notes:
a Registry of individual providers (mandatory) of the Superintendency of Health (SIS) as of 30 November 2020.
b Number of confirmed cases by occupational group out of total confirmed cases.
c Number of confirmed cases out of total health workers by occupational group.
d Medical assistants in dentistry, pharmacy, food, nursing, radiology and imaging, clinical laboratory and blood services, sterilization, and pathological anatomy. See: Ministry of Health of Chile. Decreto N.° 90. Aprueba reglamento para el ejercicio de las profesiones auxiliares de la medicina, odontología, química y farmacia y otras, y deroga Decretos N.° 261, de 1978, as well as Decreto N.°1.704, (1993). Santiago: MoH Chile; 15 December 2015. Available in Spanish from: https://www.bcn.cl/leychile/navegar?idNorma=1099220.
e People who work in acupuncture, contact lenses, cosmetology, homeopathy, dental laboratories, optics, podiatry, and naturopathy, according to Superintendency of Health definitions. See: Ministry of Health of Chile. Statistics of individual health providers. Santiago, Chile: SUS; 12 April 2019.

Source: Ministry of Health of Chile. Informe epidemiológico. Características del personal de salud confirmados y probables de COVID-19. Santiago: Ministry of Health of Chile; 12 January 2021. Available in Spanish from: https://www.minsal.cl/wp-content/uploads/2021/02/2021-01-21_Informe-PS-COVID-19.pdf.

87 Defined as medical assistants in the areas of dentistry, pharmaceuticals, food, nursing, radiology and diagnostic imaging, clinical laboratory and blood services, sterilization, and pathological anatomy according to Decreto N.° 90 (2015).

Disaggregated by sex, 75% of total confirmed HRH cases are women. By age group, it was observed that about three-quarters of confirmed cases are individuals under the age of 40 (see Table A2.4 in Annex 2). These figures are consistent with others indicating that, as of December 2017, 55% of HRH were under 35 years old *(87)*.

Lack of PPE and suboptimal working conditions were a concern among HRH. As a result, by the beginning of November 2020, calls for mobilization by HRH unions were reported in the media, with complaints of overwhelming working conditions due to strenuous hours, delayed delivery of PPE, low pay, and the scant 2021 health budget announced on 30 September 2020. Unions claimed that the budget was cut by 3.3% compared to 2020. The Government of Chile asserts the budget increased by 8.9%.[88]

Protests continued during the month of November 2020, exacerbated by the delay in authorizing payment of the COVID-19 Bonus, which relied on congressional approval, and finally, non-payment of the User Treatment Bonus,[89] suspended due to the impossibility of evaluating HRH during the pandemic. On 5 December 2020, MoH Chile reported an agreement on its website to pay the User Treatment Bonus and expand the health budget for the year 2021 *(92)* (see Table A2.10 in Annex 2).[90]

2.3. Policy response

2.3.1. Overall COVID-19 response strategy

The COVID-19 response strategy implemented in Chile prioritized strengthening of the hospital and emergency system during an initial intervention phase between February and June 2020, including measures to increase HRH availability and protect workers. **Combining critical bed units in public and hospitals** notably allowed MoH Chile to coordinate the availability of beds in the private sector *(91)*, but did not allow management of private HRH, as there is no legal framework granting this authority to MoH Chile.

On 22 January 2020, MoH Chile published Official Letter CP 1553 of 2020 on the COVID-19 outbreak alert and subsequent strengthening,[91] launching the first of four phases comprising the COVID-19 Plan of Action *(90)*. Initially, actions were aimed at strengthening epidemiological surveillance based on the definition of a suspected case,[92] as well as instituting universal surveillance at points of entry into the country and in health facilities, bolstering laboratory diagnostic capacity nationwide (with the Institute of Public Health as the national reference laboratory), enhancing the public and private care networks,[93] and improving communication with the community. HRH training focused on instructing laboratory professionals how to

88 Response submitted by the Ministry of Health of Chile to the questionnaire sent by PAHO for the purposes of this study, received on 11 November 2020.

89 Law N.° 20646 (2012) grants a bonus to technical, administrative, and assistant staff in health facilities based on improved user treatment. The bonus is granted to workers in the highest rated care services according to an evaluation instrument designed by the Undersecretariat of Healthcare Networks.

90 See Table A2.10 in Annex 2.

91 This document was updated by: Oficio CP N.° 2263 del 29/01/2020; Ordinario B51 N.° 276 del 30/01/2020; Ordinario C37 N.º 670 del 18/03/2020.

92 This definition was updated by: Ordinario B51 N.º 511 del 25/02/2020, Ordinario B51 N.º 656 del 02/03/2020, Ordinario B51 N.º 748 del 06/03/2020, Ordinario B51 N.° 895 del 18/03/2020, Ordinario B51 N.º 933 del 23/03/2020.

93 Strengthening actions included: 1) designating 50 reference hospitals in the country with critical patient units, ongoing IAAS program, and laboratory capacity; 2) reconverting basic, medium, and critical beds (approximately 1700 in total); 3) establishing five new hospitals for the critical respiratory disease season; and 4) injecting more than CLP 3 billion (US$ 4 079 677) into PHC support. For more information, see: Boletín Informativo N.° 2. *COVID-2019: Plan Acción Coronavirus del Ministerio de Salud*. Santiago, Chile: Ministry of Health; 17 March 2020. Available from: https://obtienearchivo.bcn.cl/obtienearchivo?id=documentos/10221.1/78996/3/BCN_Boletin_2_coronavirus_FINAL.pdf.

process case samples for suspected COVID-19 diagnoses, communicating precautions for infection control, and providing information on HAIs for new workers.

On 5 February 2020, Decree No. 4 *(90)*[94] was issued, declaring a one-year health emergency and granting the following extraordinary powers to MoH Chile, its agencies (Seremi and health services), and affiliated national entities (National Institute of Public Health, Superintendency of Health, Fonasa, and the Supply Center): directly hire workers; transfer workers or assign extraordinary work; purchase goods, services, or necessary equipment; coordinate distribution of medicines and PPE; coordinate critical bed units between the public and private care networks;[95] set maximum prices for private health supplies and services; provide health residences to isolate people with COVID-19; and expedite hospital construction.

The second phase of the COVID-19 Plan of Action began on 6 March 2020, strengthening follow-up protocols for travelers[96] and contact tracing for confirmed cases.[97] Additionally, more exceptional powers were granted to the Undersecretaries of Public Health and Care Networks, Seremi, and the public health services *(94)*.

On 15 March 2020, phase 3 of the COVID-19 Plan of Action began. The next day, with 201 confirmed cases, phase 4 was launched, preparing the country's hospital system,[98] placing restrictions on mobility, instituting flexible working hours, and encouraging telework for State officials. Decree No. 104 (18 March 2020) *(71)* declared a constitutional state of emergency, due to public calamity, in the entire territory of Chile.[99]

On 24 March 2020, Resolution No. 203 empowered the Undersecretary of Healthcare Networks of MoH Chile to coordinate all public and private care centers in the country *(95)*. A few days later, Resolution No. 156 (1 April 2020) incorporated private providers into the health services network to establish centralized management of critical beds for patients with COVID-19, including facilities affiliated with the Armed Forces and police. This resolution also enabled public and private providers to increase the available number of beds.[100]

Based on the WHO guidelines and recommendations on strengthening surveillance activities to identify patients with COVID-19, MoH Chile established the National Strategy for Testing, Traceability, and Isolation (TTA) in June 2020. The measure applies to all health institutions: Seremi, health services, and private health providers *(15)*.

Before June 2020, in some territories, PHC centers provided monitoring, education, and specific COVID-19 prevention for the population with their own recommendations and resources.[101] Starting in the month of June that year, arrangements were made for PHC teams to handle COVID-19 diagnosis and isolation and contract tracing, taking advantage of installed capacity and relationships with the territories and their communities *(15)*. At the same time, Resolution No. 419 established health residences to control the spread of COVID-19 *(96)*.[102]

94 Amended by: Decreto N.° 6 del 7/03/2020, Decreto N.° 19 del 06/06/2020, Decreto N.° 24 del 19/07/2020.

95 Further specified by Resolución N.° 203 del 24 de marzo del 2020. See: Ministry of Health of Chile. Resolución N.° 203. Dispone medidas sanitarias que indica por brote de COVID-19. Santiago: Ministry of Health; 24 March 2020. Available in Spanish from: https://www.bcn.cl/leychile/navegar?idNorma=1143703.

96 Through the following documents: 1) *Protocolo de identificación y seguimiento para viajeros que provienen de países con transmisión local de COVID-19* (6 March 2020); 2) *Protocolo de detección de viajeros en puertos;* 3) *Protocolo de detección de viajeros en aeropuertos;* and 4) *Protocolo de detección de viajeros en pasos fronterizos terrestres*. The latter three are dated March 2020.

97 Through the document *Protocolo de identificación y seguimiento para viajeros que provienen de países con transmisión local de COVID-19* of 6 March 2020.

98 Actions included creation of a CLP 220 billion fund for health measures and enabling a field hospital, six health care posts, and the services of the flagship Hospital Sargento Aldea. See: Ministry of Health of Chile. COVID-19: Plan de acción coronavirus del Ministerio de Salud. Santiago, Chile: Ministry of Health; 17 March 2020. Available in Spanish from: https://obtienearchivo.bcn.cl/obtienearchivo?id=documentos/10221.1/78996/3/BCN_Boletin_2_coronavirus_FINAL.pdf.

99 Later extended by Decreto N.° 269 (18 June 2020) and by Decreto N.° 646 (12 December 2020).

100 These measures included: 1) making intermediate and basic care more complex, that is, allocating the bed to a more complex level of care; 2) unblocking existing beds; 3) installing new critical beds; and 4) postponing elective surgeries, if no risk was posed to the patient.

101 To date, these initiatives have not been systematized. Consequently, their reach and impact cannot be measured.

102 For more information on health residences, see: Ministry of Health of Chile. Residencia sanitaria. Santiago: Ministry of Health; Available in Spanish from: https://www.minsal.cl/residencias-sanitarias/.

In July 2020, the capacity of home hospital care in several health services was expanded nationwide as an MoH Chile strategy to relieve hospitals that were at capacity.

2.3.2. Improving the availability of human resources for health

2.3.2.1. Identifying HRH needs to address COVID-19

MoH Chile conducted a study in response to the pandemic that focused on the need to equip and strengthen HRH according to different care strategies defined in the COVID-19 Plan of Action. The study was used to negotiate necessary budgetary resources with the Ministry of Finance. To estimate HRH needs, an adapted version of the methodological guide for pre-investment assessments of public hospital construction and standardization was used,[103] with several instruments related to the HRH field *(97–99)*. HRH needs estimations according to defined care strategies are presented in Table 17.

MoH Chile emphasizes that strengthening planning as a line of work prior to the health emergency, with a focus on demand, allowed more appropriate reactions and guidance for both direct hiring and procurement of services, according to the needs of each health service.[104]

2.3.2.2. Measures to maintain or increase human resources for health

This section will examine the measures adopted to address HRH shortages and regional imbalances in key occupations, aggravated by infection and death among workers and labor conditions that negatively affected availability.

The following initiatives were established to increase HRH availability in line with guidelines issued by MoH Chile and enacted through

Table 17. Additional human resources for health requirements in Chile according to strategy in the COVID-19 Plan of Action

Strategy	On-call staff	Daytime staff	Estimated total
Conversion of beds to higher level of complexity [a]	5220	485	5705
Set-up of new beds	3652	875	4527
Reinforcement of support units [b]	1272	238	1510
24/7 home hospitalization	0	700	700
Reinforcement of the Emergency Medical Care Service (SAMU)	312	0	312
Reinforcement of hospital emergency units	4666	0	4666
Centralized emergency unit (Santiago Metropolitan Region)	16	3	19
Total	**15 138**	**2301**	**17 439**

Notes:
a Beds converted to a higher level of care.
b Refers to laboratory, pharmacy, pathological anatomy, and diagnostic imaging units, among others.

Source: Ministry of Health of Chile. Experiencia de Chile: La respuesta a COVID-19 desde los recursos humanos de salud. Presentación de la división de gestión y desarrollo de las personas del ministerio de salud de chile. Pan American Health Organization webinar, Subregional Program for South America. Santiago: Ministry of Health; 2020. Available in Spanish from: https://www.campusvirtualsp.org/sites/default/files/3_chile.pdf.

103 Methodology assessed and validated by the Ministry of Finance, taking into account that once worker deficits are defined, the associated budget must be estimated.

104 Response submitted by the Ministry of Health of Chile to the questionnaire sent by PAHO for the purposes of this study, received on 11 November 2020.

legislation (see Table A2.5 in Annex 2 for a summary of the legislation):

- Decree No. 4 (5 February 2020)[105] *(91)* granted powers to MoH Chile, Seremi, and the health services to contract directly during the health emergency without meeting other requirements, in accordance with the provisions of Article 10 of Decree No. 725 (1967) *(100)*. Ordinary Resolution No. 715 (20 March 2020) defined three hiring mechanisms: **1)** special direct government contracts; **2)** the Labor Code; and **3)** procurement of 24/7 patient care services *(101)*. As of August 2020, MoH Chile strategies had recruited 19 027 additional people to work in hospitals, distributed as follows:
  - **Special direct government contracts:** 18 897 for public hospitals; 79% were assigned to care tasks. Of this group, 32% were health technicians and 22% were nurses (Table 18)
  - **Recruitment under the Labor Code:** 130 people.
- New contract terms were adjusted to the duration of the health emergency, although it remains unknown if contracts were full-time or stipulated a fixed number of hours in each case.
- Decree No. 4 (5 February 2020) authorizes MoH Chile, Seremi, and the health services to transfer workers between agencies or establishments through developmental assignments *(91)*.

  Central management reassigned public sector workers between regions, with support reallocated from the Metropolitan Region of Santiago to the regions of Antofagasta (north of the country) and Magallanes (extreme south). There are no centralized records of the number of health worker reassignments, as they were planned according to the local situation of each health service and the behavior of the pandemic. However, information was shared indicating that non-COVID-19 health services were interrupted, including elective surgeries and routine doctor appointments (Table 19).

Table 18. Distribution by occupational group of additional human resources for health hired in public hospitals in Chile

Occupational group	Number of hires
Care	14 856
Social workers	37
Health assistants	192
Biochemists	55
Drivers	41
Dental surgeons	11
Nurse midwives	23
Nurses	4143
Speech therapists	78
Kinesiologists	1606
Midwives	303
Surgeons	1429
Nutritionists	121
Psychologists	91
Pharmaceutical chemists	60
Health technicians	6111
Medical technologists	504
Occupational therapists	51
Non-care workers	4041
Administrative staff	664
Assistants	2893
Other professionals	207
Other technicians	277
Total	**18 897**

Source: Response submitted by the Ministry of Health of Chile to the questionnaire sent by PAHO for the purposes of this study, received on 11 November 2020, from the database of the Human Resources Information System (SIRH) administered by MoH Chile as of August 2020, and the National Registry of Individual Providers as of July 2020.

105 Measures were supplemented by others in Decreto N.° 6 (6 March 2020), Decreto N.° 19 (6 June 2020), and Decreto N.° 24 (19 July 2020).

Table 19. Postponed non-COVID-19 essential care in Chile

Type of care	Services postponed in August 2020 relative to August 2019
Elective surgeries	179 406 (–44% compared to 2019)
Doctor appointments	3 548 484 (–44% compared to 2019)

Source: Response submitted by the Ministry of Health of Chile to the questionnaire sent by PAHO for the purposes of this study, received on 11 November 2020.

- Professionals and establishments directly contracted through exclusive service agreements *(25)*.[106]
- Ministry of Chile, Seremi, and the health services authorized to perform special tasks *(91)*; ordinary working day extended to nights, Saturdays, Sundays, and holidays, in accordance with article 66 of Legislative Decree No. 29 (2004) *(102)*.
- Directors of health services offered professionals released from duty the possibility to return to care up to 22 hours per week *(24)*. Applied to doctors, dentists, biochemists, and pharmacists who, after 20 years of service in hospitals, are exempted from on-call service, according to the regulations of their health career. These professionals, once released from on-call shifts, retain their position, and generally perform non-care services. Approximately 1500 doctors nationwide (about 8% of the total doctors working in public hospitals) fell under this category.
- Changes in work schedules and shift systems as necessary to ensure optimized care capacity; in this process, varied start times, shifts on days off, or 24-hour shifts can be established, among other measures *(24)*.
- State workers who took advantage of the voluntary retirement bonus[107] temporarily hired for the duration of the health emergency, without applying the legal prohibitions and conditions normally requiring return of the bonus in such cases *(91)*. It is of course important to remember that these individuals may belong to an at-risk group, and as a result, their protection must be guaranteed *(24)*.
- Students in the sixth year and above in medical school and students in the seventh semester and above in nursing, obstetrics and childcare, medical technology, kinesiology, and psychology programs were hired *(91)*.
- Ordinary Resolution No. 714 (20 March 2020) addressed to the Association of Medical Schools and the Association of Dental Schools, instructed doctors and dentists in training and assignment rotations[108] and sixth- and seventh-year medical interns to be available to the director of their corresponding health service, suspend their studies, and remain with their tutors, depending on priority care needs in the facility *(103)*. **Doctors in specialty training financed by the State make up a group of more than 4000 health professionals** in public establishments.
- Doctors licensed abroad whose degree has not been validated or authorized in Chile hired and allowed to practice *(91)*.
- Doctors hired who obtained their degree abroad and had the degree revalidated, even

106 Law N.° 20909 (2016) prohibits working additional hours after signing a full-time agreement to provide services in a public health establishment.

107 Law N.° 20612 (23 March 2012), Law N.° 20707 (12 December 2013), Law N.° 20921 (15 June 2016), and Law N.° 20986 (19 January 2017) stipulate a bonus for officials in MOH Chile and affiliated agencies. Eligible officials must be women who turned 60 or men who turned 65 between July 2010 and June 2014 and retired voluntarily.

108 In 1955, Decree N.° 17615 created a program known as the training and assignment rotation for doctors and general dentists with medical degrees. Initially focused on service in rural or isolated areas, it was then expanded to urban areas with high levels of instability and insufficient access to health. The rotation is voluntary and includes a six-year assignment phase, after which the State funds the professional's three-year specialist training. Doctors and dentists who accept the assignment and training rotation are hired by a public health establishment, both during the assignment period (in PHC) and the training period (mainly in hospitals).

if they had not yet passed the Single National Medical Examination (Examen Único Nacional de Conocimientos de Medicina) *(91)*.

- Extraordinary measures to fill vacancies in public sector health facilities *(24)*. For clinical staff, legal holidays, administrative leave, and professional development assignments were suspended. Directors must fill all vacancies due to medical leave or preventive quarantines by hiring health workers through direct public contracts, in all patient care units. The measure also applies to support teams that ensure the proper functioning of patient care units. These actions were primarily to grant overtime hours and, secondly, to recruit replacement workers through direct contracts. These instructions overturned previous guidance from MoH HRH policy, which encouraged management teams to address vacancies by reducing medical leave, thereby eliminating the possibility of replacement.

In March 2020 an initiative was put in place recommending that the country's health services create incentives for replacements and new hires, and to encourage overtime hours for existing HRH. Accordingly, **an incentive mechanism was put into effect for the duration of the health emergency that increased hourly wages by 30%.** The directors of health services had authorization to apply this incentive, determining percentages and eligible HRH according to their budgets *(104)*.

In December 2020, an agreement with the seven health unions of the Public Sector Bureau resulted in Law No. 21306 (31 December 2020), which **granted a special one-time COVID-19 health emergency bonus worth CLP 200 000 (US$ 272)** (see Table A2.6 in Annex 2) **to the more than 220 000 health professionals in service, paid in January 2021**.[109] Eligible HRH included workers in PHC, health services, experimental health facilities, and Seremi contractors and staff.[110]

109 For more information, see: Ministry of Health of Chile. Presidente Piñera anuncia promulgación de bono para personal de la salud por pandemia de COVID-19. Santiago: Ministry of Health; 2020. Available in Spanish from: https://www.minsal.cl/presidente-pinera-anuncia-promulgacion-de-bono-para-personal-de-la-salud-por-pandemia-de-covid-19/.

110 According to the Ministry of Health of Chile, working groups are being organized to identify and include other health workers involved in COVID-19 care who, due to their type of contract or interpretation of the regulation, did not initially receive the COVID bonus.

The COVID-19 pandemic highlighted HRH recruitment problems in remote geographical areas. In some cases, it was necessary to send health teams managed by centralized entities to these locations. MoH Chile and the Civil Service carried out joint efforts *(105)* to support the process, offering positions through the online portal "I serve my country" (*"Yo sirvo a mi país"*) *(106)* to promote recruitment and selection in different healthcare facilities; however, there is no record of how people who registered on the platform were later hired.[111]

2.3.3. Protecting and supporting human resources for health

HRH are a high-risk group, vulnerable to infections and negative mental health effects due to being on the front line of care in health services. Multidimensional and integrated strategies are required to properly address this issue. This section describes the activities that have been implemented in Chile to protect and ensure the safety of health workers.

2.3.3.1. Occupational safety and health and infection prevention and control

On 22 January 2020, HRH were instructed to comply with standard precautions for infection control in health care while attending suspected or confirmed COVID-19 cases and taking samples *(108)*.

On 5 February 2020, MoH Chile announced a sum of more than CLP 10 billion (US$ 13 598 924) for PPE procurement *(108, 109)*. On 18 March an additional investment of CLP 28 billion (US$ 38 076 987) was made *(110)*. The Supply Center, part of the National Health Services System, used these funds to purchase PPE on the international market and deliver it to regions with the greatest need *(111)*. These actions were accompanied by donations of alcohol from liquor companies *(112)*, and donations from the Government of the People's Republic of China *(113)*. Nevertheless, MoH highlighted deficits, more pronounced in some regions than others, in the initial stages.

On 3 April 2020, Memo C37 No. 2 (2020) *(34)* issued instructions on rational use of PPE when not directly attending to patients. Additional precautions are only used when dealing with patients with a suspected or confirmed diagnosis. Rational use includes the use of aprons, eye protection, gloves, and surgical masks *(114)*. N95 masks are reserved only for higher risk procedures and extended use; i.e., continued use without removal or replacement.

The shortage of PPE was corroborated through four online surveys conducted by the Medical College in health facilities. The first survey was launched on 30 March 2020; 85% of the responses reported the lack of some type of PPE, while 75% specifically mentioned N95 masks. The same was reported in 60% of responses to the fourth survey, conducted on 27 April. The greatest need was for N95 masks, indicated in 50.6% of responses *(76)*.

Subsequently, on 29 April 2020, MoH Memo No. 005 (2020) *(115)* instructed health services on a protocol for reprocessing N95 and FFP2 masks, if necessary, adapted from recommendations issued by the Food and Drug Administration of the United States (FDA) in 2020. The memo stated that this procedure only applies to exceptional cases when there is a lack of a guaranteed supply chain, determined by the local authority.

On 23 May 2020, a donation of 15 tons of PPE was received from private Chinese entrepreneurs, as part of the "China Helping Chile" (*"China Ayuda a Chile"*) *(116)* campaign launched by the Chilean embassy that country through a US$ 2.7 million investment. The State of Israel also donated 1.5 tons of PPE on 10 July 2020 *(117)*.

On 12 March 2020, MoH Chile issued general IPC recommendations for care in PHC facilities during pandemics *(118)*. The recommendations cover COVID-19 infection prevention measures for patients, the community, and health workers, and biosecurity instructions to protect the health of health workers, among other subjects.

111 Response submitted by the Ministry of Health of Chile to the questionnaire sent by PAHO for the purposes of this study, received on 11 November 2020 and supplemented on 3 December 2020.

Resolution No. 182 (17 March 2020) *(66)* defines remote work for HRH risk groups, including workers returning from abroad, pregnant women, fathers or mothers caring for children under 18 years of age who cannot attend daycare or school due to closures, people over the age of 60, and individuals under quarantine orders.

Resolution No. 156 (1 April 2020)[112] *(119)* states that each health facility must apply measures designed to protect health workers, with strict compliance with the MoH PPE use protocol. Facilities must also notify the MoH Department of People Management and Development daily about infected workers and workers at high-risk of infection due to contact, in accordance with the protocol established in Ordinary Resolution No. 670 (18 March 2020) *(120)*. This protocol includes five guidelines with checklists developed by the HAI Control and Prevention Unit of the MoH Department of Quality and Safe Care:

1. Compliance with standard and additional precautions.
2. HAI prevention training for workers.
3. Proper conditions in units to care for patients with suspected or confirmed COVID-19 diagnosis.
4. Flow of patient circulation in facilities.
5. Ambulance transfer for patients with suspected or confirmed COVID-19 diagnosis.

Ordinary Resolution No. 1218 (23 April 2020) *(121)* communicated the following MoH recommendations on HRH management to the directors of the public and private systems and the Armed Forces to promote safe patient care and protect health workers from risks:

- Organize shifts
- Separate circulation flows
- Assemble daytime teams in 14-day rotations (duration of the isolation period in the event of SARS-CoV-2 infection)
- Bolster digital health for the population and assign workers in preventive isolation to these tasks
- Adjust schedules
- Apply teleworking options when in-person care is not required
- Assess the possibility of providing transportation and accommodations for workers
- Implement a local plan of action on mental health for HRH

These recommendations were supplemented by Ordinary Resolution No. 2124 (8 July 2020) *(122)*, which instructed the Seremi and directors of health services to study HAI outbreaks during the COVID-19 pandemic among patients and health workers in public and private health facilities.

On 27 April 2020, the Superintendency of Social Security declared COVID-19 to be an occupational disease for health workers in health facilities *(84)*, in compliance with Law No. 16744 (1968), which establishes rules on occupational accidents and diseases *(39)*.

The MoH granted life insurance to all 235 000 public health system officials on 1 June 2020, including workers who care for patients and those in support or administrative roles in public hospitals and PHC establishments *(42)*. The insurance was valid retroactively from the beginning of the pandemic until 31 December 2020. On 19 December 2020, the MoH signed an agreement with insurers to extend benefits until 31 March 2021 *(123)*. The Ministry of Justice granted the same benefits to all 1100 officials in the Legal Medical Service on 11 June *(124)*. The life insurance policy established with the insurance companies pays CLP 7 200 000 (US$ 9900) per professional, to be disbursed to the surviving beneficiary (Table A2.7 of Annex 2 summarizes the legislation on occupational safety and health and HRH well-being).

112 Repealed on 16 February 2021.

The MoH Department of Epidemiology is the entity responsible for viral testing and epidemiological surveillance for the nationwide population, including follow-up for health workers with COVID-19 with mandated reporting through the EPIVIGILA system. The 16 Seremi make up the territorial network under the MoH Undersecretariat of Public Health. Their roles include epidemiological surveillance in each region, carried out jointly with the MoH.

On 10 May 2020, MoH Chile began to use to use rapid immunoglobulin G and immunoglobulin M tests for HRH. The idea was to increase testing capacity to monitor health professionals and apply safety measures in health facilities *(37)*. Antibody tests are performed every 15 days on workers in high-risk units *(125)*.

According to the 12 January 2021 Epidemiological Report *(9)*, 6 549 852 SARS-CoV-2 tests (using the reverse transcription polymerase chain reaction [RT-PCR] technique) had been administered as of 3 January, of which 593 988 (9.1%) were performed on HRH. This means that 0.93 examinations per person have been performed for those in the Individual Health Providers Registry maintained by the Superintendency of Health, compared to 0.31 examinations per person in the general population; **i.e., three times more tests have been performed on HRH. The number of tests per person was higher for doctors (1.32) and nurses (1.42).**

HRH are particularly vulnerable to negative mental health effects, both because of the uncertainty of facing a new pathology and the concern of exposing their own families to illness. Work overload in locations with HRH shortage further complicates the issue.

Several countries in the Region of the Americas participate in the HEROES COVID-19 pandemic study, which addresses the mental, behavioral, and social health issues experienced by health professionals in different contexts (hospitals, primary care centers and residences, and others) *(126)*. This is a longitudinal study following a sample of health professionals in each country for two years. In Chile, the team of researchers coordinating the study is from the University of Chile School of Public Health. To date, two preliminary reports have been published *(77, 127)*.

The nine-item Patient Health Questionnaire (PHQ-9) was given to **935 health professionals** from different occupational groups and performance regions between 19 May and 2 July 2020. **The questionnaire found that the most frequently reported depressive symptoms are changes in appetite (38.6%), low energy and fatigue (37.3%), and sleep disturbances (32.7%).** These symptoms appeared more frequently among health professionals than in the general Chilean population, according to observations used to validate the study. In addition, 7% of this group reported suicidal ideation. These findings highlight the importance of comprehensive mental health care for health workers involved in the COVID-19 emergency.

On 21 April 2020, the University of Chile published a document for the COVID-19 Social Roundtable *Mental Health during Pandemics (128)*, indicating that health workers should be included among population risk groups in pandemic mental health plans, in line with preexisting mental health experiences and guidelines for emergency and disaster situations. Accordingly, the *SaludableMente* Plan *(129)* was launched on 1 June 2020, aimed at risk prevention and mental health care for the population, including health workers. The plan consists of an expert roundtable and digital platform that offer help, answer questions, and provide recommendations, within the framework of the Digital Hospital *(130)*. The work carried out as part of this plan generated a report titled *General Mental Health Considerations for Health Workers during Pandemics*, with guidelines for updating health care plans of action *(131)*.

In March, April, and May 2020, the Medical College published guidelines and recommendations for health workers and their directors. The material covered health protection issues, in particular mental health. The publication was developed in collaboration with the University of Chile School of Public Health and various intensive medicine, infectology, neurology, and psychiatry associations, among other organizations. It can be accessed on the website of the Medical College *(132)*, along with information on course offerings and trainings.

Finally, management teams and directors of health services and hospitals are responsible for organizing work in hospital units, with the goal of balancing workload and preventing burnout. The MoH meets periodically with these teams when issuing protocols and instructions to understand difficulties at the local level.

MoH Chile identifies vacancies and determines the impact of the health emergency on this issue, both in the private and public subsystems. Initial observations indicated that, during the first year of the pandemic, approximately 15 000 members of the public subsystem applied for leave; 10 000 did so due to mental health issues.

2.3.3.2. Training

A 20-hour online course was created for 2000 additional people, on top of the 66 638 people receiving ongoing HAI training *(78)*.

In March, the MoH, in partnership with intensive care medicine and emergency medicine associations, funded and facilitated training for 28 000 officials working in intensive care, PHC, emergency medicine, and other hospital units through the Digital Hospital platform *(79)*. The training focused mainly on doctors, nurses, and kinesiologists. Another set of training was launched for anesthesiologists, in partnership with the Chilean Anesthesiology Association.

Three remote care units or "cells" were also established for the Digital Hospital in the areas of intensive care, nursing, and kinesiology, with the aim of providing 24/7 tutorial care support for workers in health network facilities.

In June 2020, after the launch of the National Strategy for Testing, Traceability, and Isolation *(15)*, the **University of Chile recruited and trained more than 1000 student volunteers in health programs** to aid PHC centers in the Metropolitan Region of Santiago with monitoring and traceability *(80)*.

Health services and Seremi HRH and final year medical interns received training through the Annual Health Services Training Programs and the Distance Learning Program *(133)*, covering subjects related to COVID-19, oxygen therapy, invasive and non-invasive mechanical ventilation, standard precautions, and HAI. As of 30 September 2020, 104 541 people had been trained through distance learning, including 299 in hybrid sessions and 4400 in in-person sessions.[113] Table 20 summarizes the tools and their scope; 69.3% of public sector HRH received training (140 240/202 289 people).

The MoH points out that distance learning is advantageous because it allows asynchronous learning and flexible hours, which in turn makes

113 Response by the Ministry of Health of Chile to the questionnaire sent by PAHO for the purposes of this study, received on 11 November 2020.

Table 20. Human resources for health training in Chile

Tool	Number of people trained
Permanent HAI training[1]	2000
Digital Hospital[2]	28 000
University of Chile[3]	1000
SIAD[4]	104 541
Hybrid learning[4]	299
In-person training[4]	4400
Total	**140 240**

HAI: healthcare-associated infections; SIAD: distance learning system.

Sources:
1 Ministry of Health of Chile. Preparación y respuesta frente a COVID-19 en Chile. Santiago: Ministry of Health; 2020. Available in Spanish from: https://www.senado.cl/appsenado/index.php?mo=tramitacion&ac=getDocto&iddocto=8266&tipodoc=docto_comision.
2 Ministry of Health of Chile. Hospital Digital capacita a más de 28 mil profesionales en cuidado de pacientes COVID-19. Santiago: Ministry of Health; 2020. Available in Spanish from: https://www.minsal.cl/hospital-digital-capacita-a-mas-de-28-mil-profesionales-en-cuidado-de-pacientes-covid-19/.
3 University of Chile. U. de Chile recluta a más de mil estudiantes para hacer seguimiento y trazabilidad de pacientes con COVID-19. Santiago: UC Chile; 2020. Available in Spanish from: https://www.uchile.cl/noticias/164912/u-chile-convoca-a-su-comunidad-para-hacer-seguimiento-y-trazabilidad.
4 Response submitted by the Ministry of Health of Chile to the questionnaire sent by PAHO for the purposes of this study, received on 11 November 2020.

training compatible with work shifts and provides continuity to patient care. However, interaction with instructors occurs only through forums and not directly. As a result, questions are not answered during class time. Distance learning held through the Digital Hospital program does not quantify participants nor determine their geolocation; additionally, short videoconferences do not have minimum hours requirements or final assessments and therefore do not lead to job promotions or pay increases.[114]

There are two tools that favor training development and participation *(134)*:

1. State and territorial administrations have a legal obligation to devote 1% of tax revenue to train public officials.
2. Civil service career regulations require training as a criterion for job promotion.

2.3.3.3. Vaccination

The MoH vaccination policy began gradually and progressively, in step with the number of doses arriving in the country. The first phase began on 24 December 2020, with the first 154 050 doses reserved for HRH[115] in critical patient units in nine regions. First doses were administered to public sector HRH, senior citizens in long-term residences, and the National Minors Service in seven regions.

On 28 January 2021, the second phase of the vaccination plan was launched,[116] becoming a mass vaccination program from 3 February onward. The goal of the second phase was to vaccinate approximately 5 million people in priority high risk groups during the first quarter of 2021, and 80% of the country's target population, about 15 million people, in the first half of that year.

114 Public sector HRH statutes define criteria for moving up the salary ranks and career promotions. One requirement is that participants must complete a minimum number of training hours and pass a final assessment.

115 As of 20 January 2020, 154 050 doses of the BNT162b2® vaccine had been received in four batches from Pfizer and BioNTech Laboratories.

116 At that time, 2 million doses of Sinovac vaccines were received (see: Government of Chile. Presidente recibe primer cargamento de casi 2 millones de vacunas Sinovac contra el Covid-19: "Es un día de alegría, y de esperanza porque, después de tanto dolor, sufrimiento, privaciones y angustias, vemos la luz al final del túnel". Santiago: Government of Chile; 28 January 2021. Available in Spanish from: https://www.gob.cl/noticias/presidente-recibe-primer-cargamento-de-casi-2-millones-de-vacunas-sinovac-contra-el-covid-19-es-un-dia-de-alegria-y-de-esperanza-porque-despues-de-tanto-dolor-sufrimiento-privaciones-y-angustias-vemos-la-luz-al-final-del-tunel), followed by another equal batch on 31 January (see: Gobierno de Chile: Llega a Chile segundo cargamento de Sinovac con casi 2 millones de vacunas. Santiago: Government of Chile; 31 January 2021. Available in Spanish from: https://www.gob.cl/noticias/llega-chile-segundo-cargamento-de-sinovac-con-casi-2-millones-de-vacunas/).

The following priority groups were identified:

- Health workers not vaccinated in the first phase. As of 19 February, all health workers had received the first dose.
- Individuals with comorbidities.
- People in long-term residences (includes long-term senior facilities, National Minors Service centers, and people with physical and mental disabilities).
- People 60 years of age and above.
- People working in education.
- Essential State employees.

To reach these targets, more than 2500 vaccination centers were set up nationwide in sports stadiums, public squares, educational centers, and PHC centers (the country's National Immunization Plan has traditionally operated in the latter) *(135)*. The five regions with the largest number of vaccination establishments were Metropolitan Region of Santiago, Maule, Valparaíso, Biobío, and O'Higgins. Not only nurses and nurse technicians were authorized to vaccinate, but also other health professionals such as midwives and dentists *(136, 137)*.

As of 17 December 2020, signed and pending contracts allowed access to the following vaccines *(81)*:

1. 10 million doses from Pfizer–BioNTech.
2. 20 million annual doses from Sinovac for the next 3 years *(138)*.
3. 10 million doses from AstraZeneca–Oxford, Janssen–Johnson & Johnson, and the COVAX Mechanism for Global Access to COVID-19 Vaccines.

On 24 December 2020, Resolution No. 1138 *(139)*[117] approved the technical-operational guidelines for vaccination against SARS-CoV-2, providing the general framework for the vaccination campaign with the following considerations (see Table A2.8 in Annex 2, which summarizes the legislation on SARS-CoV-2 vaccination):

- Vaccine safety
- Cold chain
- Information system
- Social communication
- HRH training
- Monitoring and oversight
- Inventory control
- Monitoring and verification of coverage
- Campaign organizing.

Training focuses on managing post-vaccination reactions. The planning document on vaccination against SARS-CoV-2 *(85)* establishes guidelines for the vaccination process and indicates that HRH should wear PPE, maintain proper distancing and protective measures, avoid crowds, wash/disinfect their hands at specific times, and follow the recommendations in the Safe Vaccination Guide *(140)*.

2.3.4. Funding

Countries have adopted different mechanisms to address the shortage of health workers and respond to the health emergency. These actions have led to significant increases in funding for HRH, PPE, test kits, and health facilities.

The Government of Chile funded the additional cost of COVID-19 response measures intended to protect HRH and increase their availability and wages, reallocating resources already budgeted by MoH Chile and assuming special powers.

On 11 March 2020, initial measures were adopted to face the winter months. CLP 7 billion (US$ 9 519 247) was allocated for municipalities to hire workers and acquire supplies in preparation for the COVID-19 response; this involved an advance of funds already allocated to municipalities, but redirected for different purposes *(141)*. In the same vein, training expenses executed as of 30 June amounted to CLP 313 679 000 (US$ 522 791) of a

117 Supplemented by Resolution N.° 136 (10 February 2021). Available in Spanish from: https://www.minsal.cl/wp-content/uploads/2021/02/RES.-EXENTA-N-136_.pdf.

total budget of CLP 6 808 731 000 (US$ 9 083 041). These funds already were included in the annual training budget earmarked for the health services and MoH and were simply redirected to cover priority COVID-19 pandemic efforts. Finally, before 19 March 2020, an investment of CLP 38 billion (US$ 51 675 911) was announced to purchase PPE. It is not entirely clear if this investment was financed with MoH resources; if this were the case, the investment would be categorized accordingly.

On 19 March 2020, Decree No. 333 (19 March 2020) *(142)* enacted a special measure to make 2% of the annual State budget available to the MoH. The maximum amount available was CLP 1 185 640 409 680 (US$ 1 635 001 092), part of the announced package for the economic emergency plan *(143)* (see Table A2.9 in Annex 2).

This extraordinary measure supplemented a CLP 220 billion (US$ 299 176 328) fund created to implement health measures starting on 16 March 2020, the launch date of phase 4 of the COVID-19 Plan of Action *(144)*.

According to data provided by the MoH, an additional budget of CLP 184 276 055 000 (US$ 253 955 686) was set aside for hiring and overtime expenses in the public sector, funded with resources provided by the Ministry of Finance for the health emergency. Additional funds were also assigned to purchase PPE, although the amount was not specified.[118]

Finally, the COVID Bonus granted to health workers by Law No. 21306 (2020) *(28)* had a fiscal cost of CLP 44.48 billion (US$ 60 488 014), although the source of the funding is unknown.

2.4. Conclusions and challenges

Table 21 summarizes the strategies and mechanisms used in Chile to improve HRH availability, training, protection, well-being, and remuneration to respond to COVID-19.

Table 21. Strategies and mechanisms used in Chile to address human resources for health issues in response to COVID-19

Strategy	Implementation mechanism
Pillar 1. Prepare to provide an initial response to the health emergency	
Estimate HRH needs for COVID-19 response	• An HRH planning study was performed focusing on the need to equip and strengthen these workers according to the different care strategies defined in the COVID-19 Plan of Action; an adapted version of the methodology guide applied to hospital pre-investment assessments was used. • The study estimated a need for 17 439 additional HRH. • These results were used to negotiate the budget with the Ministry of Finance.

118 Response submitted by the Ministry of Health of Chile to the questionnaire sent by PAHO for the purposes of this study, received on 11 November 2020.

Strategy	Implementation mechanism
Pillar 2. Strengthen HRH to increase response capacity in the health system	

Increase availability of HRH caring for suspected, probable, or confirmed COVID-19 cases	• 19 027 people were added through the direct recruitment mechanism.
	• The following mechanisms were also established, although their scope is unknown:
	  ◦ Worker transfers.
	  ◦ Professionals and establishments directly contracted through exclusive service agreements.
	  ◦ Arrangements for special work.
	  ◦ Professionals released from duty authorized to return to care for patients.
	  ◦ Changes in work schedules and shift systems.
	  ◦ Temporary contracts for the duration of the health emergency for former officials who had taken advantage of the voluntary retirement bonus
	  ◦ Students hired from sixth year or above in medical school, and students in the seventh semester or above in nursing, obstetrics and childcare, medical technology, kinesiology, and psychology.
	  ◦ Doctors and dentists in the cycle of assignment and training, and sixth and seventh year medical interns made available to their corresponding health service director.
	  ◦ Doctors licensed abroad and whose degree has not been validated or authorized allowed to practice in Chile.
	  ◦ Doctors who have obtained their degree abroad and have had it revalidated, even if they have not yet passed the Single National Medical Examination (Examen Único Nacional de Conocimientos de Medicina) allowed to work.
	  ◦ Special measures to replace absent workers.

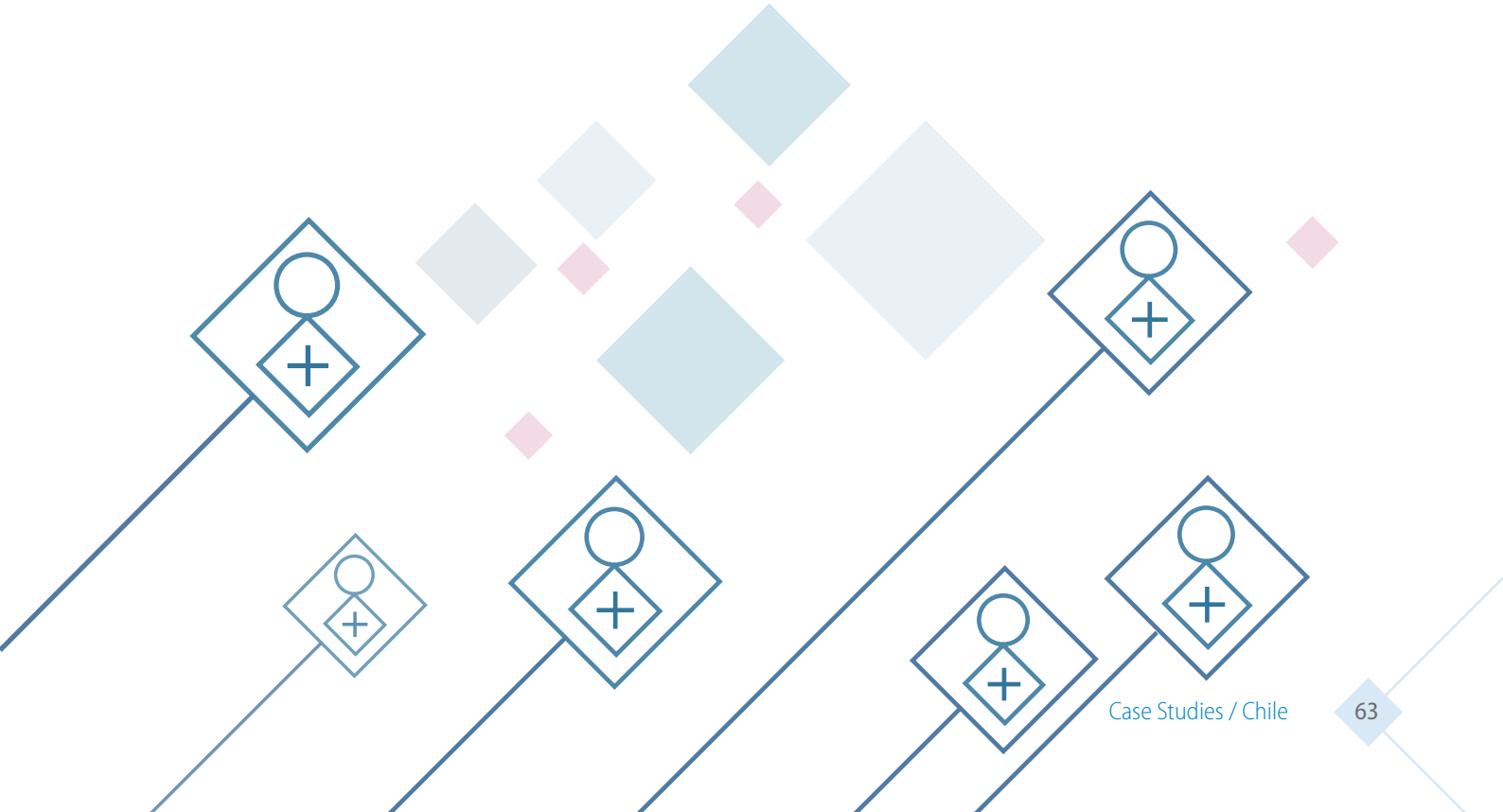
Improved working conditions	• Life insurance for all HRH in the public sector, from the beginning of the pandemic until 31 March 2021. The insurance covers 235 000 public health sector officials (data as of June 2020).
Define new HRH competencies for COVID-19 prevention and treatment	69.3% of public sector HRH were trained through the following initiatives: • Increased permanent HAI training (2000 people) • Digital Hospital (28 000 people as of April 2020) • University of Chile (1000 people) • Distance learning system (104 541 people as of 30 September 2020) • Hybrid learning (299 people as of 30 September 2020) • In-person sessions (4400 people as of 30 September 2020).
Occupational safety and health	• Guidelines for preventing COVID-19 infection in health facilities (January 2020), especially through rational use of PPE (April 2020). • Diagnostic tests for HRH every two weeks (May 2020); three times the number performed on the general population. Focus placed on doctors and nurses. • COVID-19 designated as an occupational disease for health workers (April 2020). • Remote work defined for HRH included in risk groups: health workers returning from abroad who must comply with quarantine; pregnant women; mothers or fathers caring for children under 18 years of age who are unable to attend kindergarten or school due to closures; people 60 years of age and above; and individuals under quarantine orders (March 2020). • Mental health plan (June 2020).

Strategy	Implementation mechanism
Pillar 3. Review and update measures	
HRH needs for vaccination	• According to Decree No. 6 (2010), public care network establishments are responsible for implementing the vaccination schedule indicated in the National Immunization Program. • Resolution No. 136 (2021) authorized other health professionals with required skills to administer vaccines.
Create incentives for HRH	• CLP 200 000 (US$ 272) COVID-19 bonus for all public sector HRH in December 2020.

CLP: Chilean pesos; COVID-19: coronavirus disease 2019; HAI: healthcare-associated infections; HRH: human resources for health; PPE: personal protective equipment.

2.5. Pending actions

- HRH who joined during the pandemic period should be permanently hired, considering not only the large investment in infrastructure and equipment to strengthen healthcare network, but also the investment in skills development and the incorporation of specialists.
- Care for the mental health and well-being of civil servants, considering the stress caused by the pandemic, in order to improve quality of life, and work–life balance. These are important factors that promote healthy environments for good performance.
- Strengthen integration between the health and education sectors in different areas to facilitate HRH availability and distribution; this is essential to providing a timely response to situations like the COVID-19 pandemic.
- Promote tools and regulations that facilitate teleworking, considering the continuity this type of work lends to certain activities.
- Compile all HRH data in a single large information system, incorporating public and private health subsystems to enhance decision-making.



3. Colombia

Key points

- As of December 2020, a total of 21 832 confirmed cases of COVID-19 were reported among health workers, including 103 deaths (3.27% of HRH). This negatively affected HRH availability.
- At the beginning of the pandemic, 7.7% of confirmed cases in the total population were HRH cases. This proportion later decreased to 1.56% by December 2020.
- As clinical protocols, risk assessments, and PPE availability have increased, infection rates have declined.
- Of the total confirmed COVID-19 cases among health workers, 62% developed an infection after exposure while providing health services and 19% after exposure in the community.
- The country estimated the shortage of health workers in each phase of the COVID-19 response strategy and found a lack of doctors specializing in adult and pediatric intensive care, internal medicine, anesthesiology, and general surgery in almost all phases. A shortage of 6304 health workers was estimated (with an additional 1.5% among priority workers).
- Six strategies were used to expand HRH capacity: **1)** reassigning health workers (16% of total HRH); **2)** hiring new workers in priority occupational groups; **3)** recruiting retired persons from the military and the national police; **4)** reincorporating retired HRH; **5)** temporarily authorizing HRH from the Compulsory Residency Social Service; and **6)** including students in the final year of health programs.
- To address health worker safety and security issues, the country provided technical guidance, training, and PPE, in addition to adopting regulations to systematically test health workers, recognize COVID-19 as an occupational disease, and purchase PPE to ensure HRH safety.
- The need was identified to train and hire additional workers to carry out the COVID-19 vaccination plan. The country launched its vaccination campaign with an installed capacity of 7000 people administering 100 000 vaccines per day. The goal is to reach 70 000 people administering 200 000 vaccines per day.

Future tasks and challenges

- Ensure HRH availability for the COVID-19 response.
- Improve working conditions: job stability and social security for health workers serving in various health care provider institutions (IPS) nationwide, as well as providing training and the latest information.
- Implement continuous training based on three pillars: standardized content for quick and easy learning; a technological platform to guarantee nationwide distribution (including rural and remote locations); and monitoring.
- Strengthen and apply telehealth and telemedicine in more territories after the pandemic
- Update information on communication and risk training.

3.1. Country context

This section presents a brief description of the country's health system and an overview of the HRH situation before the COVID-19 pandemic.

3.1.1. Health system

The General System of Social Security in Health (SGSSS)[119] is based on two insurance mechanisms: the subsidized regime administered by the government and the contributory regime administered mostly by private health promotion entities (EPS).

The contributory system is designed for salaried persons, retirees with pensions, and the self-employed, covering all formal and independent workers who are able to pay. The subsidized system covers those who cannot make contributions to the health system. Approximately 92.4% of the Colombian population is covered by SGSSS, distributed between the subsidized system (44.8%), the contributory system (43.7%), and the special systems (4%).[120]

Membership in the SGSSS contributory system is mandatory and is managed by the EPS. Those who are eligible obtain health insurance coverage through the Mandatory Health Plan. The EPS funnel contributions to the *Solidaridad y garantía* fund, also known as the General System of Social Security in Health Resources Administration (ADRES).

The latter returns to the EPS amounts equivalent to the contribution of each person adjusted for risk and the number of current members, according to capitation rates. Health services are provided by IPS. Many of these IPS are associated with EPS. The National Health Superintendency (Supersalud), a State agency that is independent from the Ministry of Health and Social Protection (MoH Colombia), performs oversight on behalf of the EPS.

People who can access private health insurance and afford their out-of-pocket expenses fund the private sector.

In 2016, MoH Colombia implemented the Comprehensive Health Care Policy (PAIS), consisting of two parts: a strategic component that establishes long-term priorities; and an operational component, the Comprehensive Health Care Model (MIAS). Resolution No. 3280 (2 August 2018) establishes a model that covers everything from curative medicine to disease prevention and health promotion, through comprehensive health care methods *(145)*. MIAS also focuses on PHC to provide a preventive and holistic model of care that is community and patient oriented, addressing related issues in addition to the disease itself. In short, PAIS is the national health policy. MIAS is the model by which policies are applied. Comprehensive health care routes are a component of MIAS, which defines how the health system agents must thoroughly address the health needs of individuals, families, and communities. The relationship described between EPS and IPS is part of a more general decentralized structure, involving administrative units including municipalities, departments, and districts. Colombia is a centralized state, which assigns public health functions to departments,[121] districts, and municipalities according to their management capacity, population, and resource availability. The MoH is the regulatory and governing body, responsible for issuing rules and technical regulations to manage, organize, and monitor the health system, including finances and relations between different entities.

At the subnational level, departments, districts, and municipalities are responsible for health promotion activities, overseeing actions in the interest

119 The SGSSS, established by Law N.° 100 (1993), has been reformed by different regulations, in particular Law N.° 1122 (2007) and Law N.° 1438 (2011). The public health component was enacted by Law N.° 9 (1979); Law N.° 10 (1990) defined the decentralized model, and Law N.° 715 (2001) established powers and a decentralized financial structure. In addition, Law N.° 1164 (2007) regulates HRH conditions. These standards were accompanied by Law N.° 1751 (2015) (Ley Orgánica de Salud) and Plan Nacional de Desarrollo (Ley N.° 1753, 2015).

120 These data correspond to 2018, the latest available year.

121 Departments are sets of municipalities that handle the administrative responsibilities of smaller municipalities and supervise larger municipalities to optimize functionality. They verify and monitor the health conditions of the population and properly manage the allocated funding.

of public health, funding collective health activities, controlling and supervising the health services plan, and ensuring quality services.

Occupational hazard managers are a group of public and private companies that are part of the general occupational risks system. They are responsible for covering the expenses arising from occupational accidents and illnesses *(146)*. As of August 2019, private occupational hazard managers constituted 51% of the affiliated companies, which cover 76.35% of salaried people. The rest fall under the public occupational hazard entity *(147)*.

The general occupational hazard system is based on the employer's duty to assign all their workers to occupational hazard managers. These entities are responsible for advising and providing technical assistance to the employer to develop prevention programs, providing medical care and rehabilitation to salaried workers who are injured or sick as a result of their work, and paying workers any owed compensation.

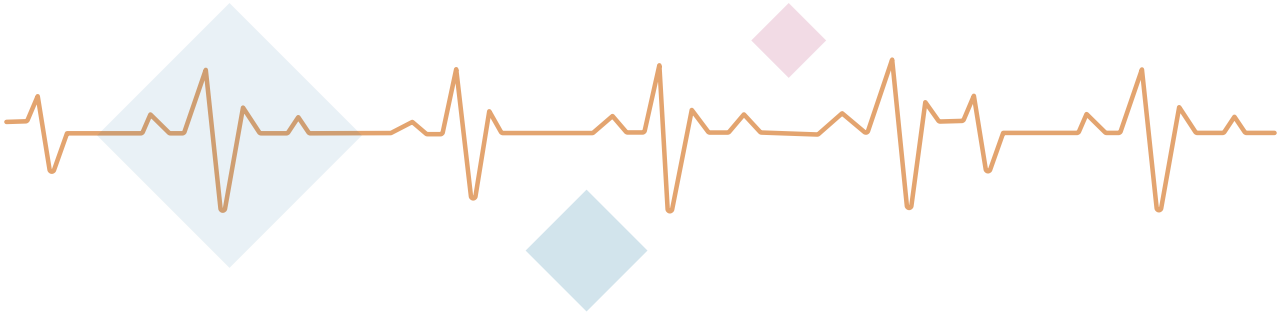
3.1.2. Human resources for health

HRH dynamics stem from a complex network of relationships between various actors and systems or markets (insurance and service providers, education, pharmaceuticals, technology, medical suppliers, etc.). Recognizing and understanding this dynamic and interdependent relationships between markets and their agents is critical to defining HRH policy and strategies in any segmented and decentralized health network, including the Colombian system *(148)*.

Health care is provided by self-employed professionals and IPS (public, private, and mixed providers). Most HRH work in IPS with various types of contracts. Public health services are organized according to the country's territorial decentralization structure; public IPS exist at the national, departmental, district, and municipal levels. The interaction between health worker supply and demand is therefore affected by the specific situation of each territory and the criteria of each IPS.

In Colombia, there were 666 727 total registered health workers in 2017.[122] In general, the country's HRH is young: 47.9% of the estimated available HRH were under 35 years of age, while 14.1% were over the age of 49 *(148)*. There is a high percentage of women among health workers, and women are the majority in all health professions and occupations (except medicine, which has more women at the assistant level). Similar percentages are observed among nurses: in 2018, 89% were women, 46% were under 35 years old, and 55% had received training abroad *(6)*.

2018 data show a density of 21.8 doctors per 10 000 population and 13.3 nurses per 10 000 population (more information in Table A3.4 in Annex 3). The doctor density in Colombia is higher than in LAC (20 per 10 000 population) but lower compared to OECD countries (35 per 10 000 population in 36 countries) (Table 22). Colombia also has nurse density below that of both LAC (28.1 per 10 000 population) and OECD countries (88.4 per 10 000 population). These data reveal a shortage of HRH.



122 Most updated data from the MoH Observatory of Human Resources in Health. For more information, see: Observatory of Human Resources in Health of Colombia. Indicadores básicos. Bogotá: Ministry of Health and Social Protection. Available in Spanish from: https://www.sispro.gov.co/observatorios/ontalentohumano/Paginas/Indicadores.aspx.

Table 22. Comparison of doctor and nurse density per 10 000 population in Colombia, Latin America and the Caribbean, and the Americas

Geographical scope	Doctors [a]	Nurses [d]
Colombia	21.8[b]	13.9[e]
Latin America and the Caribbean (33 countries)	29.8[c]	42.4[c]
Americas (35 countries)	28.3[c]	82.7[c]

Notes:
a Includes general practitioners and specialists, from all levels of care.
b Data as of 2018. See: World Health Organization. WHO National Health Workforce Accounts Data Portal: Geneva: WHO. Available from: https://apps.who.int/nhwaportal/. According to Colombia's Ministry of Health and Social Protection, this figure was 20.1 as of 2017. See: Ministry of Health and Social Protection of Colombia. Observatory of Human Resources in Health. Available from: https://www.sispro.gov.co/observatorios/ontalentohumano/Paginas/Indicadores.aspx.
c Data as of 2018. See: World Health Organization. WHO National Health Workforce Accounts Data Portal: Geneva: WHO. Available from: https://apps.who.int/nhwaportal/.
d Includes nursing professionals, nursing associates, and nursing staff, without indication of availability by location.
e Data as of 2018. See: World Health Organization. WHO National Health Workforce Accounts Data Portal: Geneva: WHO. Available from: https://apps.who.int/nhwaportal/. According to Colombia's Ministry of Health and Social Protection, this figure was 12.6 as of 2017. See: Ministry of Health and Social Protection of Colombia. Observatory of Human Resources in Health. Available from: https://www.sispro.gov.co/observatorios/ontalentohumano/Paginas/Indicadores.aspx.

Doctor and nurse density (35.1 per 10 000 population) show levels below the recommended critical threshold of 44.5 per 10 000 population considered necessary for a high level of coverage of essential health services, as described in the Sustainable Development Goals *(149)*. Although the critical threshold of 44.5 skilled professionals per 10 000 population does not represent a planning target for countries, it was used as an approximate minimum threshold for health worker availability.

Variations in health worker density were also observed between regions in Colombia. Unequal health worker distribution, along with the HRH shortage nationwide were important factors in designing the COVID-19 policy response.

Colombia has 170 hospital beds per 100 000 population (2017 data) *(150)*, higher than the average for upper-middle income countries in the Andean subregion (166 hospital beds per 100 000 population) *(150)*. The number of ICUs registered in the country is 10.5 per 100 000 population (2017 data) *(150)*, close to the subregional average for the group of upper-middle income countries (10.24 per 100 000). However, Colombia has fewer ICU beds compared to OECD countries (12 beds per 100 000 population in 12 countries) *(150)*.

3.2. The impact of COVID-19 on human resources for health

The first case of COVID-19 in Colombia was detected on 6 March 2020. As a preventive measure, Resolution No. 380 introduced restrictions on entry into the country *(151)*. After identifying nine imported cases, MoH Colombia issued Resolution No. 385 on 12 March 2020, declaring a national health emergency *(153)*. Colombian Presidential Decree No. 417 (17 March 2020) declared a national state of emergency. These were the first guidelines for a policy response that led to a 10% increase in ICU capacity, identification of isolation areas for confirmed cases, and implementation of direct procurement as a preferred form of hiring, among other provisions.

From 6 March to 10 December 2020, a total of 21 832 confirmed cases of COVID-19 were reported among health workers, including 103 deaths. By 10 December 2020, the health worker infection rate was 3.27% (21 832 infected people out of a total of 666 727) *(10)*, with a mortality rate of 0.47% of confirmed health worker cases (103 deaths out of a total of 21 832 infected people) *(10, 153)*. As of 24 April 2020, health worker infections were 7.7% of confirmed cases in the total population (see Table

A3.1 in Annex 3), later decreasing to 1.56% by December 2020. Similarly, the case fatality rate among health workers as a proportion of total case fatality in the general population decreased to 0.27% from 2.1% at the onset of the health emergency (see Table A3.2 in Annex 3).

More than 60% of confirmed cases among health workers are concentrated in three regions of the country: Antioquia (31%), Valle del Cauca (17%), and Bogotá D.C. (13%).

Of total confirmed health worker cases, 62% acquired the infection after exposure associated with providing health care services, and 19% after exposure in the community; 3% were imported cases, and 16% had unknown epidemiological links (Table 23). The source of transmission also varies by occupational group. Table A3.3 in Annex 3 shows an example of the health worker infection rate by type of transmission in 13 selected occupational groups. More than 70% of doctors, nurses, nursing assistants, and other occupational groups directly involved in caring for COVID-19 patients (e.g., respiratory therapy) became infected after workplace-associated exposure. In contrast, other occupational groups, such as psychologists or pharmaceutical chemists had a higher rate of community-transmitted infection.

SARS-CoV-2 infection rates vary among different occupational categories. About 69% of confirmed cases among health workers are concentrated in four occupational groups (Table 24): **1)** nursing assistants (32%); **2)** doctors (14%); **3)** administrative staff (13%); and **4)** nurses (11%). Although nurses are fourth on the list, a look at the number of confirmed cases as a proportion of total HRH by occupational category reveals a different picture. In particular, nurses had the highest rate of workplace infection;[123] 3.8% of nurses have been infected with SARS-COV-2, followed by doctors (2.9%), and nursing assistants (2.7%). Combined analysis of the distribution of confirmed cases as a proportion of total confirmed HRH cases, and number of cases by occupational group as a proportion of total available workers in that group is useful in understanding how more cases may affect HRH availability during the COVID-19 response. For example, nurses represent 11% of total confirmed HRH cases, but when observing the percentage of cases (3.8%) as a proportion of the total workers available in this occupational group, it becomes evident that they are the most affected. This can be interpreted as a lower availability of nursing professionals compared to other occupational groups (i.e., doctors or nursing assistants) in the health workforce.

Table A3.5 in Annex 3 shows the distribution by occupational group in the last available data year (2017). Registered nurses represent approximately 9% (62 184 people) of total registered health workers (666 727), while nursing assistants (254 104) and doctors (103 026) represented 38% and 15% of total HRH, respectively.

Table 23. Distribution of cases in Colombia among human resources for health by source of transmission

Transmission classification	Number of confirmed cases	Percentage
Workplace associated	13 533	62
Community transmission	4141	19
Imported	49	3
Undetermined	3374	16
Total	**21 832**	**100**

Source: National Institute of Health. Boletín N.° 56/2020 (10 December). COVID-19 en personal de salud en Colombia. Bogotá: INS; 2020. Available in Spanish from: https://www.ins.gov.co/Noticias/Paginas/coronavirus-personal-salud.aspx. Data as of 10 December 2020.

123 The infection rate within an occupational group is the number of confirmed cases represented as a percentage of the total number of persons in that group.

Table 24. Infection rate by occupational group in Colombia

Occupational group	Confirmed HRH cases[a]	Distribution of confirmed cases (%)[b, c]	Infection rate within occupational group (%)[d]
Nursing assistants	6880	32	2.7
Doctors	2987	14	2.9
Administrative staff	2878	13	
Nurses	2386	11	3.8
Other health workers	6701	31	
Total	**21 832**	**100**	

HRH: human resources for health.

Notes:

a Data as of 10 December 2020. See: National Institute of Health. Boletín N.° 56, 10 diciembre 2020. COVID-19 en personal de salud en Colombia. Bogotá: INS; 2020. Available in Spanish from: https://www.ins.gov.co/Noticias/Paginas/coronavirus-personal-salud.aspx.

b Number of confirmed cases by occupational group out of total confirmed cases. See: Boletín N.° 56/2020, 10 diciembre 2020. COVID-19 en personal de salud en Colombia. Bogotá: National Institute of Health; 2020. Available in Spanish from: https://www.ins.gov.co/Noticias/Paginas/coronavirus-personal-salud.aspx.

c Imported and undetermined transmission is not included. Total HRH per occupation. See: Observatory of Human Resources in Health of Colombia. Indicadores básicos. Bogotá: Ministry of Health and Social Protection. Available in Spanish from: https://www.sispro.gov.co/observatorios/ontalentohumano/Paginas/Indicadores.aspx.

d The infection rate within the occupational group is calculated as the ratio of the number of confirmed cases to the total available workers in that group.

Differences in infection rates between occupational groups may be related to the structure of organizational COVID-19 response teams within the health facility, in addition to age and other factors. More analysis is needed to explain the causes of this behavior.

PPE shortages and working conditions caused concern among HRH in Colombia, leading to protests between April and June 2020, as reported in national media. There were specific mobilizations in cities, including doctors from Apartadó Hospital (20 April 2020), who complained about non-payment of salaries and lack of PPE from occupational hazard managers. Health workers from San Vicente de Paul Hospital in Santa Rosa de Cabal (Risaralda) reported a lack of PPE and an inadequate contract formalization due to being hired by third parties *(154)*. Health worker unions also organized protests (21 April 2020). The General Labor Confederation Union reported inadequate working conditions, particularly long shifts, lack of job stability, and delayed payment of wages *(155)* (see Table A3.12 in Annex 3).

In June 2020, mobilizations took place to denounce "labor outsourcing," and delayed or outstanding payroll payments *(156)*. Colombian Presidential Decree No. 538 (2020) *(12)*, which declared mandatory service for all health workers, caused protests by health workers, who claimed that the measure did not address the lack of adequate PPE.

3.3. Policy response

All five countries faced the COVID-19 health emergency with shortages of health workers in key occupational groups or with regional imbalances within the country. Increased health worker infection rates, mental health impacts, and poor working conditions also adversely affected availability, as workers complied with isolation measures, became ill, or died.

Between March and December 2020, the five countries adopted several measures to maintain or increase HRH availability to address the health emergency. Policies for health workers aimed to facilitate recruitment and deployment of new staff and redeployment of existing staff. Examples include creating faster recruitment pathways or hiring freelancers, often based on emergency legislation, reorganizing shifts, and reassigning workers or tasks within facilities or across regions.

3.3.1. Overall COVID-19 response strategy

Colombia began closely monitoring people infected with SARS-CoV-2 in early January 2020 to determine the country's risk level. On 28 February, the country declared a high risk and permanently activated the unified command post of the national disaster risk management unit.

On 4 March 2020, MoH Colombia presented the National Plan for Coronavirus Control *(157)*, expanding screening for travelers from nine countries, strengthening care capacity in IPS, expanding short-term diagnostic capacity in five laboratories located across the country, and increasing announcements on prevention measures for the population.

On 12 March 2020, the MoH issued Resolution No. 385 *(152)*, declaring a national health emergency. The COVID-19 response strategy in Colombia prioritized reinforcing the hospital and emergency system during the first wave of the pandemic between March and June 2020. The initial provisions of Colombian Presidential Decree No. 417 (17 March 2020) *(158)* included estimates on expanded ICU capacity and HRH needs.

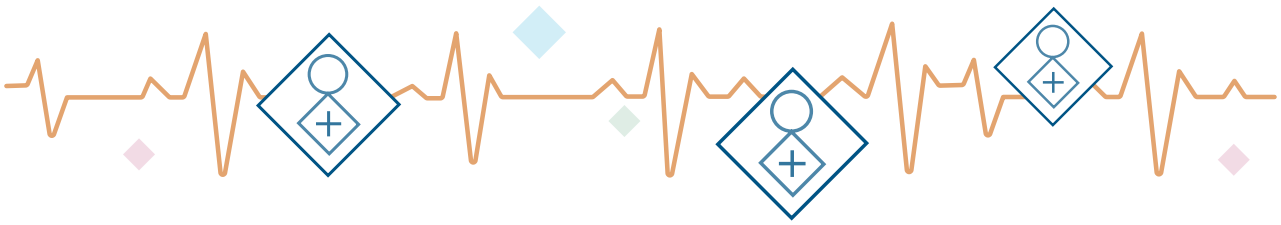
MoH Resolution No. 536 (31 March 2020) prepared and adopted the first version of the *Plan of Action for Providing Health Services during the Containment and Mitigation Stages of the COVID-19 Pandemic (159)*. The plan included specific roles for each General System of Social Security in Health (SGSSS) entity in the system, under the supervision of the National Superintendency of Health and the MoH. Among its objectives, this version of the plan included expanding installed capacity and ensuring health worker availability. Four different hypothetical frameworks were developed, depending on the behavior of the pandemic; for each phase, available capacity and required capacity to move to the next phase were estimated, with subsequent indications for health workers.

3.3.2. Improving the availability of human resources for health

3.3.2.1. Identifying HRH needs to address COVID-19

Resolution No. 779 (20 May 2020) formalized the COVID-19 strategy, indicating necessary first steps to increase installed capacity and ensure HRH availability. In June of that year, MoH Colombia published the essential health workforce planning guidelines that were adopted to implement the COVID-19 response *(37)*. First, priority occupational groups were established: doctors specialized in intensive care, internal medicine, anesthesiology, general surgery and general medicine; nurses; respiratory therapists; physiotherapists; and nursing assistants. Approximately 435 547 health professionals in these occupational groups were estimated to be available (see Table A3.6 in Annex 3), representing approximately 57% of total HRH,[124] according to 2019 data. Graduates and degrees validated in that year and in 2020 bring the total to 767 492 health professionals for 2020.

Half of the workers in these occupational groups were made available to attend to COVID-19 patients, while the rest continued to care for patients with other health problems. Numbers of available health workers in selected occupational groups were also adjusted due to isolation, illness, and death as a result of SARS-CoV-2 infection.



124 Calculated based on a preliminary estimate of 767 492 HRH for 2020, as reported by the Ministry of Health and Social Protection in comments on preliminary documents.

In each phase, required health workers in occupational groups were estimated based on HRH makeup by type of health service:

- For every 10 ICU beds there is an assigned health team comprised of doctors (one specialist and one general practitioner), two nurses, two therapists, and five nursing assistants divided in three shifts over the course of 24 hours.
- For every 10 intermediate care beds there is a health team of doctors (a specialist and a general practitioner), one nurse, two therapists, and three nursing assistants distributed in three shifts over 24 hours.
- For every 20 general ward beds there is a health team made up of doctors (a specialist and a general practitioner), a nurse, a therapist, and three nursing assistants divided in three shifts over 24 hours.

This facilitated identifying HRH requirements in each of the four phases according to occupational group and department:

- **Phase 1:** 45 667 health professionals required in priority occupational groups. No shortage was identified at the national level, but there was a shortage of specialists in 12 departments.
- **Phase 2:** 58 890 health professionals required in priority occupational groups. A shortage of 595 specialists was detected nationwide in 27 departments, in addition to a lack of therapists in 9 departments.
- **Phase 3:** 72 116 health professionals required in priority occupational groups. A nationwide shortage of 2101 specialists was observed across 33 departments, along with a shortage of therapists in 18 departments.
- **Phase 4:** 85 345 health professionals required in priority occupational groups. A nationwide shortage of 3608 specialists was identified across 33 departments, along with a shortage of therapists in 22 departments.

The estimated shortage highlights the lack of doctors specializing in adult and pediatric intensive care, internal medicine, anesthesiology, and general surgery in almost all phases and departments.

3.3.2.2. Measures to maintain or increase human resources for health

The *Plan of Action for Providing Health Services during the Containment and Mitigation Stages of the COVID-19 Pandemic (22)*, presented on 20 May 2020, **provided guidance on organizing and deploying HRH.** HRH were organized into the following teams: telementoring; detection and alert;[125] first-, second-, and third-line response; and multidisciplinary teams *(37)*. The multidisciplinary teams were formed to avoid interruptions of health services *(160)*.

Accordingly, the country planned HRH expansion and reallocation strategies. Seven strategies were used to expand HRH capacity: **1)** reassigning health workers from other health services to COVID-19-related care; **2)** recruiting workers for priority occupational groups; **3)** incorporating retired persons from the military and national police; **4)** rehiring HRH pensioners (under 60 years of age); **5)** temporarily authorizing HRH in compulsory social service; **6)** including health program students in their final year; and **7)** expediting validation from the National Ministry of Education to allow workers who studied abroad to practice medicine in the country. At the community level, municipalities were responsible for identifying individuals and community leaders who can be linked to multidisciplinary teams as community health managers.

125 HRH were arranged in strategic locations throughout the hospital emergency area. These health workers are responsible for monitoring people with respiratory symptoms and providing information. They are usually nursing assistants under the supervision of a health professional.

A total of 78 300 workers were reassigned (16% of total HRH, public and private sectors). By occupational category, 40% of health workers who do not attend patients were reassigned, followed by 22% of nurses, 12% of doctors, and 12% of nursing assistants (Table 25).

Unequal HRH distribution nationwide posed difficulties for finding workers in some regions. Two important strategies helped overcome this challenge:

- MoH Colombia held open HRH recruitment drives across the country to find additional workers for priority occupational groups in different regions (Table 25). This provides an example of coordinated efforts between regional and national authorities to find and mobilize health workers. Each departmental health directorate and IPS fulfills their duty to find required health workers; however, when options are exhausted, MoH Colombia opens a national recruitment drive. Until October 2020, this mechanism was useful in supporting regions to meet HRH needs.
- Regions that were hiring HRH were forced to adjust the salaries of these occupational groups to achieve targets.

Colombian Presidential Decree No. 538 (12 April 2020) *(12)* calls for all available and trained workers, in particular practicing HRH and health students,[126] to sign up for different stages of the response. The decree also authorized universities to allow early graduation for final year undergraduate and postgraduate students specializing in medicine. According to data as of June 2020, approximately 1523 doctors and specialists graduated early to

Table 25. Human resources for health availability for COVID-19-related care in Colombia

Strategy	HRH
Reassigned health workers [a]	78 300 (16%)
New hires [b]	Four emergency HRH recruitment announcements
Retired persons involved in the COVID-19 response	N/A
Compulsory social service students [c]	2730
Early graduates to increase labor supply [d]	1523
Doctors	1328
Specialists	195
Total [e]	**82 553**

COVID-19: coronavirus disease 2019; N/A: data not available; HRH: human resources for health.

Notes:
a Reassignments and measures taken from essential services not related to COVID-19 to strengthen the COVID-19 pandemic response.
b Resolución N.° 628. The announcements are available on the Convocatorias THS COVID-19 microsite. See: Ministry of Health and Social Protection of Colombia. Resolución No. 628/2020 (24 April): Por la cual se definen los criterios, el procedimiento y las fases del llamado al talento humano en salud para reforzar o apoyar a los prestadores de servicios de salud durante la etapa de mitigación de la pandemia por Coronavirus Covid-19. Bogotá: Ministry of Health; 2020. Available in Spanish from: https://www.minsalud.gov.co/Normatividad_Nuevo/Resoluci%C3%B3n%20No.%20628%20de%202020.pdf.
c Medicine (1200 positions), nursing (1300 positions), and bacteriology (230 positions). See: Ministry of Health and Social Protection of Colombia. Resolución No. 778/2020 (21 May). Por la cual se dictan disposiciones relacionadas con el Servicio Social Obligatorio en el marco de la emergencia sanitaria derivada de la pandemia por COVID-19. Bogotá: Ministry of Health and Social Protection. 2020. Available in Spanish from: https://normativa.colpensiones.gov.co/colpens/docs/resolucion_minsaludps_0778_2020.htm.
d Early graduates. These figures do not reflect recruitment. See: Ministry of Health and Social Protection of Colombia. Boletín de prensa No.° 527. Gobierno Nacional y Ascofame diseñaron curso multidisciplinario para manejo de pacientes COVID-19. Bogotá: Ministry of Health and Social Protection; 2020. Available in Spanish from: https://www.minsalud.gov.co/Paginas/Gobierno-Nacional-y-Ascofame-disenaron-curso-multidisciplinario-para-manejo-de-pacientes-covid-19--.aspx.
e The sum of a, c, and d.

126 Students in their final year of undergraduate studies, graduate students, and graduates of health programs.

increase the supply of health workers in different regions of the country *(22)*.

The government added another 2730 spots in the Compulsory Social Service[127] for students of medicine (1200), nursing (1300), and bacteriology (230) for a period of between 6 and 12 months. These HRH were temporarily licensed and assigned to support vulnerable populations or health facilities serving patients with confirmed COVID-19 diagnoses.

Alongside these strategies, Colombia received international cooperation for its COVID-19 response. For example, in cooperation with the United States Agency for International Development (USAID), the country hired 34 three-person teams (consisting of a doctor, nurse, and nursing assistant) for six months, and three people to support the Directorate of Promotion and Prevention for three months. This made it possible to provide technical recommendations to territories, health institutions, and HRH. UNHCR also made 45 health professionals available in 16 departments of the country (see Table A3.7 on legislation supporting efforts to maintain or increase HRH).

Colombia established a temporary incentive for health workers caring for patients with suspected or confirmed COVID-19 diagnosis during the health emergency. The estimated target population was 247 504 health professionals *(30)*, representing 37% of total HRH, of which 239 800 from 190 occupational groups have already benefited *(161)*. This is a unique incentive ranging from 1 to 4.5 times the current legal monthly minimum wage, calculated according to base income, contributions, academic level, and assessed risk of viral exposure (see Table A3.8 on legislation that supports HRH incentives).

3.3.3. Protecting and supporting human resources for health

HRH are a high-risk group, vulnerable to infections and negative mental health effects due to being on the front line of care. Multidimensional and integrated strategies are required to properly address this issue. This section describes the activities that have been implemented in Colombia to address the protection and safety of health workers.

3.3.3.1. Occupational safety and health and infection prevention and control

In Colombia, protecting and supporting health workers was one of the objectives included in the *Plan of Action for Providing Health Services during the Containment and Mitigation Stages of the SARS-CoV-2 Pandemic* (COVID-19, Version 1) enacted by Resolution No. 536 (31 March 2020) *(159)*. A summary of the legislation on IPC and occupational safety and health can be found in Annex 3.

To ensure adequate resources for PPE availability and access, the country adopted a multi-layered strategy, with direct participation from the central government and all occupational hazard managers. Prior to formalizing the plan of action, the central government signed a pre-contractual agreement on 25 March 2020 to procure PPE at a cost of 5.999 billion Colombian pesos (COP) (US$ 1 680 000). On 31 March, the MoH adopted Resolution No. 500 (31 March 2020), requiring 7% of funds to be allocated to PPE acquisition and instructing occupational hazard managers to perform promotion and prevention activities *(162)*. Colombian Presidential Decree No. 538 (12 April 2020) *(12)* reinforced this strategy, placing occupational hazard managers in charge of funding and delivering PPE to their affiliates, with associated costs reimbursed by ADRES.

The same decree exempted health workers with specific risk factors from service, such as pregnant women, parents caring for young children, caregivers of the elderly or disabled, and people with chronic illnesses.

Occupational hazard managers were also directly involved with viral testing and epidemiological surveillance at the national and local levels. Their responsibilities were not limited to prevention or

127 In Colombia, the Compulsory Social Service is a requirement to become a qualified health professional.

promotion activities but were extended to screening and diagnosis initiatives as well. The GPSG04 Guide (31 March 2020) *(164)* highlighted the importance of testing health workers to contain and mitigate the pandemic. The recommendations contained in this guide were included in Resolution No. 666 (12 April 2020) *(165)*, which clearly defined the duty of employers and contractors to report to EPS and occupational hazard managers; the latter two, in turn, were instructed to provide support for detection, risk assessment, and prevention. Finally, Resolution No. 779 (20 May 2020) *(36)* established priority access for health workers to testing and care in case of exposure to SARS-CoV-2. All costs arising from these activities were borne by the occupational hazard managers, as established in Colombian Presidential Decree No. 676 (19 May 2020) *(40)*. **The decree also recognized COVID-19 as a direct occupational disease for health workers** and established the role of the IPS to ensure the safety of health workers by funding and co-funding PPE. The decree also **prioritized testing health workers every 15 days[128] according to risk assessments** and clarified that the cost would be borne by occupational hazard managers. Acknowledging COVID-19 as a direct occupational disease implied recognizing the risk factors associated with the work environment, without the need to demonstrate a causal relationship between the factors and the disease. Colombian Presidential Decree No. 676 (19 May 2020) *(40)* directly applied existing regulations on recognizing occupational accidents and diseases from Law No. 1562 (2012) *(165)* and Law No. 776 (2002) *(166)* that required the direct link between the disease and the risk factor to be demonstrated. By maintaining existing economic benefits, alongside a temporary benefit equivalent to 100% of the contributory base salary as set forth in the provision, including COVID-19 as a direct occupational disease promoted and improved access to procedures.

The IPC strategy was complemented by training on PPE use and access. The 2020 GPSG04 Guide *(163)* and the 2020 GIPS20 Guide *(167)*, adopted in late March 2020, were specifically designed to ensure IPC training and COVID-19 specific measures, including proper use of PPE.

During the COVID-19 health emergency, health workers have experienced increased workload, shortages of medical supplies, and long working hours in closed, dry environments with artificial lighting, among other issues. These factors cause

128 Includes health workers in emergency rooms, COVID-19 hospital units, intensive care units, and intermediate care units.

anxiety in HRH and affect their mental health. The MoH and the Ministry of Labor developed the GPSG03 Guide (30 March 2020) **for occupational hazard managers and health workers to prevent and mitigate mental health problems** in those working with COVID-19 patients *(168)*. The guideline covers management and leadership actions, including timely and adequate updates on the health emergency and measures to allow tasks to be transferred between workers (consequently increasing stress for those who were engaged in less stressful activities and had more flexible schedules), among other measures. The recommendations also detailed actions for occupational hazard managers in their preventive and support duties. In future studies, it will be essential to understand the extent to which these recommendations were implemented (see Table A3.9 in Annex 3).

3.3.3.2. Training

As of October 2020, approximately 20%[129] **of priority HRH for COVID-19 mitigation and control had received training on COVID-19-related issues. The country identified areas for health worker training,** such as the correct use of PPE, prevention, and patient management skills. The training was led by scientific associations from the health sector and academia, as well as public sector authorities such as the MoH, the National Learning Service, and PAHO.[130] This type of training is advantageous because it allows information on certifications and registered HRH groups to be tracked and compiled, while providing access to training for different regions nationwide. However, there are also certain disadvantages: access is difficult in geographical areas with little connectivity, and student assessments are based on written exams that do not allow workplace performance to be measured (more information on HRH training in Table A3.10).

3.3.3.3. Vaccination

Health workers were prioritized in the first and second stages of vaccination. **Identifying health workers for vaccination through IPS registries was a challenge;** for example, at the beginning of February 2021, only 76% of the 426 IPS with ICU had uploaded the necessary data for their HRH to be vaccinated *(169)*.

The National COVID-19 Vaccination Plan is aimed at 70% of the population 16 years of age and older, excluding pregnant people and including regular migrants, to achieve herd immunity.[131] The plan was developed with the contribution of 87 organizations and 45 citizens, plus 430 comments. The following steps were taken to reach the target population by February 2021:

1. **COVAX Mechanism for Global Access to COVID-19 Vaccines:** 20 million doses for 10 million people.
2. **Pfizer:** 10 million doses purchased for 5 million people.
3. **AstraZeneca:** 10 million doses for 5 million people.
4. **Janssen:** 9 million doses for 9 million people.
5. **Moderna:** 10 million doses for 5 million people.
6. **Sinovac:** 2.5 million doses for 1.25 million people.

Colombia purchased 61.5 million doses for 35.25 million people from these sources.

The vaccination plan is divided into two phases. **The goal of the first phase of vaccination is to reduce COVID-19-related mortality and the incidence of severe cases and protect HRH.** Health workers were classified into the first-, second-, and third-line health services, including logistical support staff. The first phase is divided into three groups:

129 111 318 health workers were trained. The percentage (20%) was calculated based on the availability of health workers from the priority occupational groups (435 547 people).

130 The courses are offered virtually and are free. Links to the training activities can be found on the MoH Colombia website: https://www.minsalud.gov.co/salud/publica/PET/Paginas/Formacion-Continua-del-THS.aspx.

131 At least 35 734 649 of 51 049 498 Colombians according to 2021 projections. For more information, see: Ministry of Health of Colombia. Boletín de Prensa N.° 294. IPS deben fortalecer su red de vacunación. Bogotá: Ministry of Health and Social Protection; 2021. Available from: https://www.minsalud.gov.co/Paginas/IPS-deben-fortalecer-su-red-de-vacunacion.aspx.

- **Group 1:** health workers who work directly with COVID-19 patients, taking into account high exposure and levels of infection, and those who work with people over 80 years of age. 1 691 366 people are estimated to be in this group.
- **Group 2:** population between 60 and 79 years and second- and third-line health workers. This group includes 7 192 701 people.
- **Group 3:** population aged 16 to 59 years with comorbidities and preschool, basic primary, basic secondary, and middle school teachers. The number of people to be vaccinated was not defined.

The objective of the second phase is to reduce infection in the general population to achieve herd immunity. In this phase, target populations are divided into two groups:

- **Group 4:** people with care tasks in institutions, those in high-risk occupations and locations, and populations at risk of outbreaks. Includes 4 910 000 people.
- **Group 5:** population between 16 and 59 years without comorbidities; begins with the 50 to 59 years segment and continues successively until reaching the 16 to 19 years segment. This group includes approximately 17.5 million people.

It is the job of the EPS to establish which phase and group a person belongs to and communicate with them to arrange an appointment; the MoH also designed the Mi Vacuna COVID19 application to inform the population, consisting of three parts and functions *(170)*:

1. *"Me informo"*: users can ask questions on the national COVID-19 vaccination plan, priority criteria, and informed consent.
2. *"Me consulto"*: users can find their stage in the vaccination program.
3. *"Me postulo"*: users apply and enter additional data according to related criteria if they do not agree with their assigned stage.

Training HRH to administer vaccines

The MoH proposed different vaccination tactics according to the particular characteristics of each territory and the priority population; **the performance of the vaccinator was also evaluated each day depending on the vaccination strategy:**

- **Institutional, through scheduled appointments:** ≥42 doses/7 hours.
- **Urban outreach clinics:** ≥18 doses/7 hours.
- **Rural outreach clinics:** ≥12 doses/7 hours.

As of February 2021, the country has an installed capacity for 7000 vaccinators to administer 100 000 vaccines daily. Additional health workers will be trained to reach **the goal of 70 000 vaccinators administering 200 000 vaccines per day** *(47)*. Departments and districts will have to expand recruitment processes to achieve the necessary HRH *(171)*.

Health worker deployment training began on 10 January 2021 with a 48-hour virtual course taught by instructors from the National Learning Service *(172)*. As of 14 January 2021, more than 71 000 HRH were registered for training, distributed among different occupational groups (nursing assistants, nurses, doctors, dentists, public health assistants, and bacteriologists) *(173)*. A second call opened on 4 February 2021 *(174)*. Starting in the third week of February, the School of Nursing of the National University of Colombia (Universidad Nacional de Colombia) also trained 6000 nurses from different regions through a 48-hour asynchronous virtual course.[132]

Implementation of the vaccination plan began on 20 February 2021; by 1 March 2021, 149 133 doses *(175)* had been administered.

132 See: Semana. Vacunación: así avanza la capacitación del personal médico en Colombia. Semana; 18 February 2021. Available from: https://www.semana.com/educacion/articulo/vacunacion-asi-avanza-la-capacitacion-del-personal-medico-en-colombia/202132/.

3.3.4. Funding

Colombia's health system is decentralized and organized into different administrative levels (municipalities, departments, and regions). The IPS are the main entities providing health services to the population and the main actors involved in recruitment, salaries and incentives for health workers, safety and IPC procedures, and facilities administration. Although the IPS are where health supply and demand meet, they are contracted by the EPS, whose role is to insure the population. The National Superintendency of Health exercises an oversight role and defines which organizations can qualify as EPS by imposing certain requirements, including infrastructure, capital, number of users, functionality, and coverage. The EPS funnel contributions to the *Solidaridad y garantía* fund, also known as the General System of Social Security in Health Resources Administration (ADRES). This fund reimburses the EPS with amounts equivalent to the contribution of each person, adjusted for risk and the number of current members.[133]

Some of the financial measures contained in the policy response to COVID-19 addressed the relationship between EPS and IPS, especially since IPS funding depends on EPS policy and funding. The goal is to avoid interrupting health services and ensure that the private health sector commits to previous obligations with its members, while taking necessary steps to address the COVID-19 pandemic, coordinating and integrating public and private institutions, and creating a stable funding mechanism between EPS and IPS.

The first step was not to redirect the health budget from other services, but rather increase the availability of resources to strengthen the response of the health system. Colombian Presidential Decree No. 417 (17 March 2020) established the Emergency Fund *(158)*, with the express purpose of mitigating the impact of COVID-19 on the general economy, providing social protection to the most vulnerable people, and allocating resources to address the health emergency. Colombian Presidential Decree No. 444 (21 March 2020) *(176)* placed the Emergency Fund under the Ministry of Finance and Public Credit. The fund consists primarily of available resources from the Savings and Stabilization Fund and the Territorial Pension Fund.

The MoH applied Resolution No. 535 (31 March 2020) *(177)* through ADRES, allowing available funding sources[134] to be used for contracting with the IPS, injecting direct liquidity into the health

133 This mechanism grants cross-subsidies between the EPS.

134 To ensure comprehensive patient care, after implementing the National Development Plan 2018–2022, services not covered by the Capitation Payment Unit were authorized to be funded with the ceiling or maximum budget transferred by ADRES, depending on the funding source of the payment. Resolution N.° 535 (31 March 2020) authorized comprehensive funding with available resources. For more information, see: Resolución 535/2020, del 31 de marzo. Por la cual se establecen las condiciones para el manejo integrado de los recursos de la unidad de pago por capitacion y los presupuestos máximos a cargo de las entidades promotoras de salud. Bogotá: Ministry of Health and Social Protection; 2020. Available in Spanish from: https://www.minsalud.gov.co/Normatividad_Nuevo/Resoluci%C3%B3n%20No.%20535%20de%202020.pdf.

system. Resolution No. 618 (17 April 2020) *(178)* extended capitation reimbursement to health services not previously included at a cost of COP 2.17 billion (US$ 756 000).[135] Additionally, the mechanism for portfolio purchasing was stipulated between EPS and IPS, allowing ADRES to take over payment of EPS debts with hospitals, with EPS obligated to return these funds *(171)*. Resolution No. 731 (7 May 2020) *(179)* addressed direct contracting between EPS and IPS. EPS were required to maintain payments to the IPS for fixed plans, while, in the case of variable plans, EPS were required to make a 20% advance payment to IPS, ensuring a stable flow of resources (see Table A3.11 in Annex 3 on the legislation supporting the funding measures).

Developing and executing these funding strategies helped provide necessary resources to fund medical services, support health workers, and purchase supplies required by private sector affiliates.[136]

At this stage, it is difficult to quantify the direct effect of this funding strategy on recruitment, working conditions, and compensation, given the decentralized and articulated nature of the Colombian health system. More research is therefore required. However, the funding strategy highlights contributions that supported the safety and security of health workers, including direct acquisition of PPE, full reimbursement for occupational hazard managers for purchasing and distributing PPE, and recognition of incentives. Prior to formalizing the plan of action, the central government signed a pre-contractual agreement on 25 March 2020 to procure PPE at a cost of COP 5.999 billion (US$ 1 680 000). On 8 April 2020, PPE acquired by the national government effectively began to be distributed primarily to HRH working for administrators of the subsidized regime. Colombian Presidential Decree No. 538 (12 April 2020) *(12)* authorized ADRES to reimburse occupational hazard managers for delivery of PPE to their members. On 6 October 2020, the temporary economic incentives for HRH were formalized. ADRES was responsible for transferring resources from the available fund of over COP 452 million (US$ 126 777).

As the COVID-19 pandemic unfolded, ongoing dialogue and collaboration between the government and organizations representing the health workforce led the government to address concerns about PPE and health workers. The MoH has disbursed back pay for payrolls in at least a few critical regions; for example, in Santander, COP 9 billion (US$ 2 520 000) of PPE and COP 9.4 billion (US$ 2 632 000) in bonuses were distributed among health workers. In addition, COP 31.2 billion (US$ 8 736 000) was allocated for payroll *(180)*. In Antioquia, COP 20.94 billion (US$ 5 863 000) was allocated for HRH bonuses covering 13 000 people and COP 79 billion (US$ 22 120 000) has been transferred to meet payments owed by the state's social enterprises health services to HRH *(181)*.

3.4. Conclusions and challenges

The following factors are key to monitoring the impact of COVID-19 and reacting quickly to better prepare health workers:

- Collecting data to assess the initial situation
- Identifying problems affecting health workers
- Developing necessary skills and training
- Enacting regulations and policies to facilitate recruitment and deployment of additional workers and redeploy existing workers

Table 26 summarizes the strategies used in Colombia to respond to the COVID-19 pandemic by addressing health worker issues.

135 The estimated future cost of expanding and simplifying the inclusion requirement reimbursed by the Training Payment Unit was approximately COP 4.7–5.2 billion (US$ 1 316 000–1 456 000).

136 Response submitted by the Ministry of Health and Social Protection of Colombia to the PAHO questionnaire for this study, received on 14 October 2020.

Table 26. Strategies and mechanisms used in Colombia to address human resources for health issues in response to COVID-19

Strategy	Implementation mechanism
Pillar 1. Prepare to provide an initial response to the health emergency	
Estimate HRH needs for the initial COVID-19 response	The HRH planning strategies already available to the country were useful in identifying necessary occupational categories and health worker supply (based on specific assumptions related to the health emergency). These strategies were also coordinated with the National Ministry of Education to generate specific training processes. Data on confirmed cases of COVID-19 among HRH.
Pillar 2. Strengthen HRH to increase response capacity in the health system	
Increase availability of HRH for care of cases with suspected, probable, or confirmed COVID-19 diagnosis	The Plan of Action helped organize the different HRH recruitment and reassignment strategies to minimize the potential HRH deficit and respond to the health emergency. Eight strategies were used to increase HRH capacity: **1.** Reassigning health workers (16% of total HRH) **2.** Hiring in priority occupational groups **3.** Reincorporating retired people from the military and national police **4.** Facilitating the return of HRH pensioners **5.** Temporarily authorizing HRH serving in the compulsory social service **6.** Incorporating final year health program students **7.** Expediting National Ministry of Education validation processes **8.** International cooperation: the country hired 105 health professionals through USAID and 45 through UNHCR.
	The regions, which traditionally hire HRH, had to adjust the salaries and rates of the priority occupational groups to reach necessary workforce targets. Coordinated efforts between regional and national authorities were made to mobilize health workers through national MoH recruitment calls.
Define new HRH competencies for COVID-19 prevention and treatment	Strengthening training in new COVID-19 competencies for HRH (approximately 20% of priority HRH for COVID-19 mitigation and control have been trained in COVID-19-related topics). Telehealth and telemedicine are valuable options for improving people's access to care and reducing infections. Related administrative actions accelerated and facilitated use.
Occupational safety and health	Recommendations to prevent occupational exposure to COVID-19 in health facilities, including testing health workers, acting in the event of exposure, ensuring PPE, and providing training.
	• COVID-19 designated as a direct occupational disease for health workers. • HRH prioritized in vaccination plans.

Pillar 3. Review and update measures	
Identify HRH related actions	Consensus and coordinated action with scientific associations and health unions.
Incentives for health workers	Temporary incentives for health workers to care for patients with suspected or confirmed COVID-19 diagnosis for the duration of the emergency (the target is 230 000 HRH, of which 61 288 have already received the incentive).

COVID-19: coronavirus disease 2019; HRH: human resources for health; PPE: personal protective equipment; UNHCR: United Nations High Commissioner for Refugees; USAID: United States Agency for International Development.

3.5. Pending actions

- Ensure the availability of HRH for inpatient services in ICU, intermediate care, and low complexity hospitalization. This is accompanied by job stability and social security for health workers in the different IPS in the country, as well as improved working conditions and financial incentives.
- Implement continuous training based on three pillars: **1)** standardized content for quick and easy learning; **2)** a technological platform to ensure nationwide distribution (including rural and remote locations); and **3)** oversight.
- Provide guidance on the use of telehealth and telemedicine after the pandemic, as they are valuable options for improving people's access to care. It is therefore necessary to document experiences and generate evidence so that the progress achieved during the pandemic becomes permanent.
- Strengthen outpatient care models with telehealth, telemedicine, and home care for all situations, not only care related to COVID-19, consisting of HRH organized in multidisciplinary teams. These options offer benefits that facilitate decongesting outpatient and emergency services, streamlining costs, and improving quality timely care to increase quality of life.
- Provide up-to-date information on communication and risk training.
- Streamline health services for users of the system.
- Apply a comprehensive health care policy and model nationwide through comprehensive health care routes.
- Monitor resources allocated to strengthen public supply at the national level.
- Reach an optimal technical level in the territories to achieve timely implementation of recommendations and guidelines for territorial coverage. If there are delays in recruitment, lack of resources, and nonexistent delivery networks at the local level, it will be impossible to implement strategies and perform follow-up.

4. Ecuador

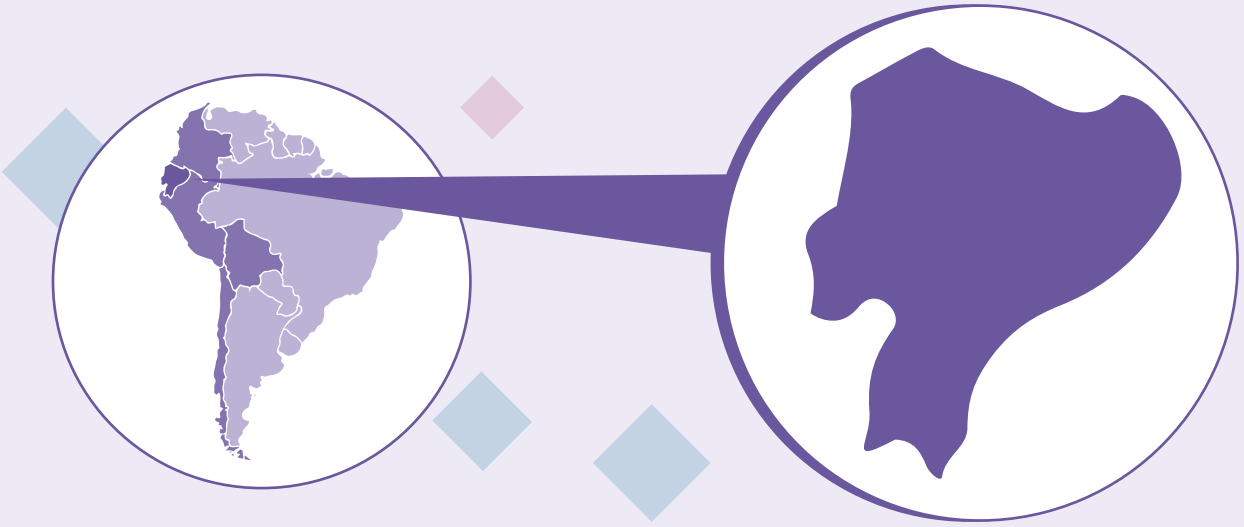
Key points

- Of total HRH, 12.2% had confirmed cases, with a mortality rate of 1.02% (as of March 2021). 88.5% of confirmed HRH groups are concentrated in three occupational groups, according to available information: doctors (48.7%); nurses (23.8%); and nursing assistants (15.7%). Psychologists were the occupational group with the highest rate of infection (31.5%), while dentists were in third place (12.4%). Considering these professionals do not attend patients infected with SARS-CoV-2, this finding requires further study. 14% of doctors had confirmed cases, followed by nurses (11%) and nursing assistants (10.4%).
- The Ministry of Public Health performed an HRH optimization process, reducing administrative staff in favor of increasing care staff.
- According to the Ministry of Public Health, hiring of an additional 2850 professionals was planned.
- In the first months of the pandemic, the HRH deficit grew due to COVID-19 infection and people in risk groups adopting teleworking (older people and people with chronic diseases).
- The following mechanisms were used to increase HRH availability: **1)** direct hiring (3087 as of November 2020); **2)** reassignments (10 000 as of November 2020); **3)** support from the Armed Forces (1523 as of November 2020); **4)** interagency cooperation agreements; and **5)** increased hours during first wave shifts for nurses and nursing assistants (from 12 hours a day to 24 hours).
- Article 25 of the Organic Humanitarian Support Law seeks to ensure the stability of HRH who have worked during the COVID-19 health emergency with temporary contracts or appointments by granting permanent positions. The law's regulations limited the scope of the action, so full implementation was not possible due to the high cost of hiring health professionals to face the pandemic.
- At the beginning of the pandemic, there was a shortage of PPE due to the lack of N95 and surgical mask suppliers.
- Measures were put in place to improve the working conditions and well-being of health workers, with protocols, guidelines, and telecare prioritizing mental health.

- To comply with the vaccination plan, 8000 members of the vaccination staff receive continuous training and administer 80 doses daily in each vaccination unit.
- In Ecuador, protests took place over worker dismissal, unpaid wages, compensation for the death of health workers who were heads of household, and regulations of the Organic Humanitarian Support Law.

Future tasks and challenges

- Decrease the risk of infection among HRH.
- Standardize treatment for COVID-19 patients in the public and private sectors.
- Decentralize PPE purchasing.
- Reduce the HRH deficit, particularly of specialists in critical medicine and intensive care.



4.1. Country context

This section presents a brief description of the country's health system and an overview of the HRH situation before the COVID-19 pandemic

4.1.1. Health system

The Ministry of Public Health (MoH Ecuador) is the leading authority in the system and directs the entities providing health services. The Ministry regulates these entities by granting operating permits to public or private health companies and prepaid medicine services. The Office of the State Comptroller General is responsible for overseeing public spending in hospitals and medical units. This body examines and assesses the financial, administrative, and operational management of the entities in which the State is a stakeholder *(182)*.

The health system is divided into two subsystems, each of which serves specific populations, and has separate funding and health facilities with segregated access and type of care:

1. **Public:** includes the Ministry of Public Health (MoH Ecuador), the Ministry of Economic and Social Inclusion (MIES), municipality health services, and social security institutions including the Ecuadorian Social Security Institute (IESS), Armed Forces Social Security Institute, and National Police Social Security Institute. In 2010, the MoH covered about 51% of the Ecuadorian population *(183)*. The MIES and the municipalities have health programs and facilities that also provide care to the uninsured population. Social security institutions cover their salaried members who are workers in the formal economy, including farmers, the armed forces, and the police. According to 2014 figures, this subsystem covered 46.7% of the population *(184)*. It is funded by general tax contributions (70%) that subsidize the population without social security coverage, and social security contributions from workers and employers (30%).

2. **Private:** includes for-profit entities (hospitals, clinics, dispensaries, clinics, pharmacies, and prepaid medicine companies) and civil society and social service non-profit organizations. Private insurance and prepaid medicine companies cover approximately 3.3% of the population, in the middle- and upper-income strata *(184)*. In addition, there are about 10 000 private medical offices, generally equipped with basic infrastructure and technology, located in the main cities. Patients usually make direct out-of-pocket payments when receiving care in these facilities.

Table 27 shows that most health facilities in the country are in the public sector.

The MoH is organized through the basic health establishments (ES), classified depending on their level of complexity as A, B, or C. The ES classified as type A have only doctors and nurses, type B facilities have dentistry, obstetrics, general medicine, and pediatrics, and type C have maternity, hospitalization, laboratories, and rehabilitation.

To bolster PHC, the integrated health care (MAIS) model was updated in 2012. This model has a family, community, and intercultural approach, and its

Table 27. Number and distribution of health facilities by health subsystem in Ecuador

Subsystem	Facilities	Distribution (%)
Public sector	3321	79.7
Private for-profit sector	614	14.7
Private non-profit sector	230	5.5
Total	**4165**	**100**

Source: National Statistics and Census Institute. Registro estadístico de recursos y actividades de salud, 2018. Quito: INEC; 2020. Available in Spanish from: https://www.ecuadorencifras.gob.ec/actividades-y-recursos-de-salud-2018/.

regulations guarantee the right to health and the protection of the population.

4.1.2. Human resources for health

Based on the MAIS care model, health is one of the pillars for sustainable human development in Ecuador. Its approach is centered on health promotion and prevention. The changes involved hiring new health professionals. In 2013 the MoH initiated the Human Resources for Health Education, Training, and Certification Project with the single project code (CUP) 123200000.0000.374537, articulated through the Tripartite Interagency Cooperation Agreement No. 20130605 signed on 23 July 2013 between MoH Ecuador, the Ministry of Higher Education, Science, Technology and Innovation, and the Institute for Promotion of Human Talent to administer the Human Resources for Health Scholarship Program. The program aims to strengthen the human resources in the MoH through education, training, and certification with a focus on the MAIS.

Through this program, MoH Ecuador awarded 4365 scholarships to train PHC specialists and technicians with a committed investment of US$ 190 756 215.21. The Ministry transferred these resources in a timely manner to the Institute for Promotion of Human Talent.

By 2018, 91 205 health professionals were available, mainly concentrated in the public sector (Table 28). Doctors represent 43.8% of available HRH *(185)*.

In 2018, there were 23.4 doctors per 10 000 population *(185)*, above the LAC average (20 per 10 000 population), but far from the OECD average (Table 29). In 2018 there were 24.7 nursing staff (professionals and assistants) per 10 000 population *(185)* very close to the LAC average, but again very far from the average in OECD countries.

However, in 2014, there was a shortage of specialists and distribution between urban areas (29 specialists per 10 000 population) and rural areas (5.4 per 10 000 population) was uneven *(186)*.

4.2. The impact of COVID-19 on human resources for health

On 29 February 2020, the first case of COVID-19 in Ecuador was confirmed. Through Ministerial Agreement 00126–2020 (11 March), MoH declared a health emergency and authorized the direct contracting of goods and services required to overcome the emergency *(187)*. The National Emergency Operational Committee (COE) was activated, led by the Vice President of the Republic

Table 28. Composition of human resources for health by subsystem in Ecuador

Occupational group	Public sector (%)	Private sector (%)	Available HRH	Distribution by occupational group (%)
Medical workers	74.08	25.93	39 908	43.8
Nurses	83.60	16.40	24 751	27.1
Nursing assistants	67.63	32.37	17 350	19.0
Obstetricians	90.27	9.73	2296	2.5
Dentists	92.57	7.43	5318	5.8
Psychologists	83.10	16.90	1582	1.7
Total			**91 205**	**100.0**

Source: National Statistics and Census Institute. Registro estadístico de recursos y actividades de salud, 2018. Quito: INEC; 2020. Available in Spanish from: https://www.ecuadorencifras.gob.ec/documentos/web-inec/Estadisticas_Sociales/Recursos_Actividades_de_Salud/RAS_2018/Principales_resultados_RAS_2018.pdf. Data as of 2018.

Table 29. Density of doctors and nurses per 10 000 population in Ecuador

Geographical scope	Doctors [a]	Nursing staff [b]
Ecuador	23.4[1]	25.1[2c]
Latin America and the Caribbean (33 countries)	29.8[2]	42.4[2]
Americas (35 countries)	28.3[2]	82.7[2]

Notes:
a Includes general practitioners and specialists at all levels of care.
b Includes nursing professionals, nursing assistants, and other nursing staff, without indication of availability by location.
c Includes nursing professionals and assistants.

Sources:
1 National Statistics and Census Institute. Registro estadístico de recursos y actividades de salud, 2018. Quito: INEC; 2020. Available in Spanish from: https://www.ecuadorencifras.gob.ec/documentos/web-inec/Estadisticas_Sociales/Recursos_Actividades_de_Salud/RAS_2018/Principales_resultados_RAS_2018.pdf. Data as of 2018. (According to the WHO National Health Workforce Accounts Data Portal, this figure was 22.2 as of 2017). For more information, see: World Health Organization. WHO National Health Workforce Accounts Data Portal. Geneva: WHO; Available from: https://apps.who.int/nhwaportal/.
2 World Health Organization. WHO National Health Workforce Accounts Data Portal. Geneva: WHO; Available from: https://apps.who.int/nhwaportal/.
3 World Health Organization. WHO National Health Workforce Accounts Data Portal. Geneva: WHO; Available from: https://apps.who.int/nhwaportal/. (According to the National Statistics and Census Institute of Ecuador, this figure was 24.7 as of 2018). See: National Statistics and Census Institute. Registro estadístico de recursos y actividades de salud, 2018. Quito: INEC; 2020. Available in Spanish from: https://www.ecuadorencifras.gob.ec/documentos/web-inec/Estadisticas_Sociales/Recursos_Actividades_de_Salud/RAS_2018/Principales_resultados_RAS_2018.pdf.

and technical pandemic response roundtables in coordination with the decentralized autonomous governments (GAD). On 16 March 2020, Executive Decree No. 1017 *(188)* declared a nationwide state of emergency due to the COVID-19 pandemic.

Between 29 February 2020 and 2 April 2021, a total of 11 507 confirmed cases of COVID-19 were reported among health workers, including 116 confirmed and probable deaths. The HRH infection rate was 12.6% as of 2 April 2021 (11 507 confirmed cases out of a total of 91 205 HRH) and included doctors, nurses, nursing assistants, midwives, dentists, and psychologists *(11, 185)*. The health worker mortality rate was 1.01% *(11)*.

In addition, 58.1% of the confirmed cases among the HRH were concentrated in three regions of the country: Guayas (24.3%), Pichincha (23.5%), and Manabí (10.3%).

Of confirmed HRH cases, 85% were concentrated in three occupational groups: doctors (48.7%); nurses (23.8%); and nursing assistants (15.7%). According to MoH Ecuador, epidemiological surveillance actions and timely attention to cases at all levels of care deteriorated due to the impact of infection on HRH, which reduced their availability in the network of hospital services and PHC.[137]

A look at the number of confirmed cases as a proportion of total HRH by occupational category reveals a different picture. Psychologists represent 4.3% of confirmed HRH cases but have the highest infection rate of all the occupational groups (31.5%). Dentists have the third highest rate (12.4%) although they represent only 5.7% of cases. Considering that these professionals do not attend patients infected with SARS-CoV-2, these findings require further study; for example, the figures may be the result of lower availability, but it would be necessary to analyze this information alongside sources of transmission (workplace or community). Further analysis by occupational group reveals that 14% of doctors had confirmed cases of COVID-19, followed by nurses (11%), and nursing assistants (10.4%) (Table 30).

The lack of remuneration and job stability caused concern in Ecuador, leading to mobilizations reported in the media (see the section on Mobilizations and Attacks in Annex 4). One controversial topic was the government's decision not to renew contracts in all ministries in May 2020 *(189)*. In the

137 Response submitted by the Ministry of Public Health of Ecuador to the questionnaire sent by PAHO for the purposes of this study, received on 31 December 2020.

Table 30. Infection rate by occupational group in Ecuador

Occupational group	Number of confirmed cases [a, 1]	Distribution of total HRH confirmed cases (%)	HRH[2] availability (%)	Infection rate within occupational group (%)
Medical workers	5602	48.7	39 908	14.0
Nurses	2734	23.8	24 751	11.0
Nursing assistants	1809	15.7	17 350	10.4
Obstetricians	204	1.8	2296	8.9
Dentists	660	5.7	5318	12.4
Psychologists	498	4.3	1582	31.5
Total	**11 507**	**100.0**	**91 205**	**12.6**

Note:
a Includes doctors, nurses and nursing assistants, obstetricians, dentists, and psychologists. Data as of 31 April 2020.

Sources:
1 National Directorate for Epidemiological Surveillance. Comportamiento de la COVID-19 en Ecuador. Quito: Ministry of Public Health: 2021. Available in Spanish from: https://www.salud.gob.ec/coronavirus-covid19-ecuador/.
2 National Statistics and Census Institute. Registro estadístico de recursos y actividades de salud, 2018. Quito: INEC; 2020. Available in Spanish from: https://www.ecuadorencifras.gob.ec/documentos/web-inec/Estadisticas_Sociales/Recursos_Actividades_de_Salud/RAS_2018/Principales_resultados_RAS_2018.pdf.

health sector, 2279 administrative staff HRH contracts were eliminated, corresponding to 2.8% of the MoH payroll. This was part of an HRH optimization process *(190)*, to reduce expenditures by 10% to 15% *(189)*. In response, protests were organized at the Santo Domingo General Hospital. On 25 May 2020, protests were scheduled in Quito by workers' confederations and unions representing health professionals and workers *(191)*. In August, mobilizations were held in Guayaquil *(192)*.

Another recurring theme in the media were unpaid doctor salaries in the months of July, August, and September 2020 in the country's three main cities. This included postgraduate medical students, who in June had been granted salaries that they did not receive before the pandemic.

In August 2020, health unions also announced a lawsuit against the State seeking compensation on behalf of the orphans and widows of 120 doctors who died during the pandemic while treating COVID-19 patients in public health facilities.

Finally, in October and November, health professionals and workers announced political and legal actions and protests, including a hunger strike, to repeal articles 10 and 40 of the Humanitarian Support Law *(13)*. Although this law includes mechanisms for permanent appointments for all HRH who worked during the COVID-19 health emergency, its regulations limited application and established that appointments would be made gradually according to need and budgetary availability (see Table A4.5 in Annex 4).

4.3. Policy response

4.3.1. Overall COVID-19 response strategy

Once the first positive SARS-CoV-2 case was identified in Ecuador, the MoH, in conjunction with all authorities involved, identified the need to reorganize health services and develop contingency plans that would allow health facilities to be prepared in all areas to care for patients with a suspected or confirmed diagnosis.[138]

On 28 February 2020, the MoH published the Operational Guidelines for Response to Coronavirus COVID-19, which applies to public and private companies. These guidelines arranged for the comprehensive public health network and the supplementary health network to optimize the process of reception, intake, and care of patients with COVID-19, with special attention given to the safety of patients with diseases other than COVID-19, and the decongestion of spaces in the national health system. This strategy helped organize 27 sentinel public hospitals and expand the network of laboratories for sampling.[139]

After the health emergency was declared, **second and third level MoH health facilities** optimized their spaces to create areas for the exclusive management and treatment of patients with COVID-19. This process also demanded compliance with all operational requirements to achieve proper functioning in all areas; **this increased the need for human resources**, health equipment, medical supplies, and devices, among other inputs. MoH was able to carry out the necessary actions through various sources of funding and donations to strengthen services, **which served mainly to expand capacity in hospitals, intensive care, and emergency areas.[140]**

Ecuador's COVID-19 Preparedness and Response Plan was established, led by the MoH and developed with a consultative and participatory approach.[141] This plan defines actions to contain and mitigate the impact of the health crisis on the population. It includes operational guidelines for COVID-19 response in the areas of governance, promotion, epidemiological surveillance, quality, and health service delivery. This strategic plan was developed based on objectives set by WHO for the global public health response to COVID-19, and was centered on 10 pillars (see Table A4.1 in Annex 4).

The mobile health care service was established, deploying contingents throughout pre-hospital care services and mobile health units.

The COE developed management and care protocols for different specialties and levels of care, with public and private institutions subject to compliance and constant reporting.[142]

138 Response submitted by the Ministry of Public Health of Ecuador to the questionnaire sent by PAHO for the purposes of this study, received on 31 December 2020.

139 Ibid.

140 Expanded care: as of November 2020, 142 hospitals were available for COVID-19 care (118 from the MoH, 24 from the IESS). In March there were 1019 hospital beds and 217 for COVID-19 ICU. By 16 November there were 1998 hospital beds and 488 for COVID-19 ICU, in addition to 635 ambulances nationwide with another 21 donated ambulances. Initially, 400 samples were processed daily. By November 2020 3000 PCR tests were processed per day, increasing detection of people with early stage COVID-19. By November 2020, there were 1940 health facilities at the first level of care attending 80% of the population's health problems and 720 832 visits by neighborhood medical brigades that provide care for vulnerable and priority patients nationwide. These data come from responses by the Ministry of Public Health of Ecuador to the questionnaire sent by PAHO for the purposes of this study, received on 31 December 2020.

141 When developing the plan, participatory processes were considered important for public policies. Consequently, a virtual consultation process was established between MoH Ecuador and PAHO, in addition to working sessions with representatives from Indigenous, Afro-descendant, and Montubio peoples and nationalities, as well as other social actors, who identified priorities for the response mainly in the areas of communication and education. A matrix proposal for consolidating the information was developed, and the content of the plan was defined and laid out along with validations from health authorities, with the technical assistance of the "Planifica Ecuador" Secretariat. Subsequently, the Central Office of Planning and Strategic Management proposed a methodology to carry out validation workshops for Ecuador's COVID-19 Preparedness and Response Plan, convened on 24 April 2020. Finally, technical feedback was requested from PAHO to strengthen health actions. For more information, see: Ministry of Public Health of Ecuador. Ayuda Memoria: acciones del Ministerio de Salud frente a la pandemia. Quito: Ministry of Public Health; 2020.

142 Response submitted by the Ministry of Public Health of Ecuador to the questionnaire sent by PAHO for the purposes of this study, received on 31 December 2020.

4.3.2. Improving the availability of human resources for health

4.3.2.1. Identifying the needs of human resources for health to attend patients with COVID-19

To estimate HRH requirements, MoH Ecuador used the health care model based on number of patients served.[143] According to the MoH, 2850 new professionals were projected to be hired *(190)*. The IES methodology uses the number of consultations and the minimum structure required in type A health clinics (facilities with only doctors and nurses), as reported by the National Subdirectorate of Human Talent Management.

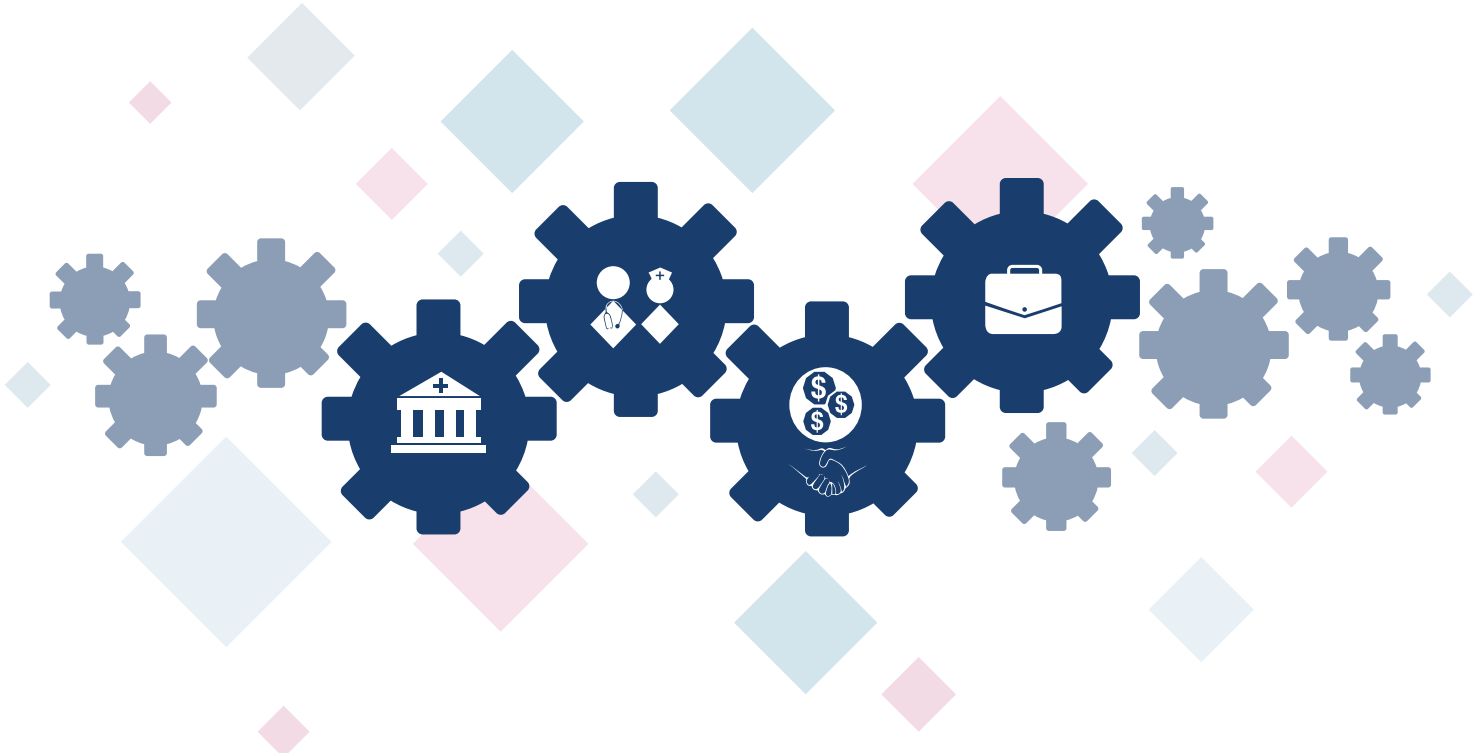
In the first months of the pandemic, an increased HRH deficit was observed due to SARS-CoV-2 infection and workers in risk groups adopting teleworking (older people, pregnant people, and people with chronic diseases).

4.3.2.2. Measures to maintain or increase human resources for health

This section will examine the measures adopted to address HRH shortages in key occupations, as well as regional imbalances, aggravated by infection and death among HRH and working conditions that negatively affected availability.

Between March and December 2020, the five countries adopted several measures to maintain or increase HRH availability to address the health emergency. Policies for health workers aim to facilitate recruitment and deployment of new staff and redeployment of existing staff, including: **1)** creating faster recruitment pathways or allowing more contracts for the self-employed,[144] methods produced by emergency legislation; **2)** reorganizing shifts; **3)** introducing task changes; and **4)** reassigning staff within facilities or between regions.

The following is a summary of the strategies designed and adopted by Ecuador to maintain and



143 Ibid.

144 Refers to independent contractors who provide services through third parties without obtaining the status of employee. For more information, see: International Labour Organization. Statistical definition and measurement of dependent "self-employed" workers. 20th International Conference of Labour Statisticians. Geneva: ILO; 2018. Available from: https://www.ilo.org/wcmsp5/groups/public/---dgreports/---stat/documents/meetingdocument/wcms_636042.pdf.

increase the availability of HRH to address the health emergency, based on methods to comprehensively increase response capacity and provide quality care.

- **Direct hiring:** MoH Ecuador reported the following hiring figures that strengthened HRH (see Table A4.3 in Annex 4):

  - 537 health professionals, including community doctors and interns and nurses to bolster critical areas.
  - From July to December 2020, 417 professionals linked to the mobile health care service were hired.
  - In June 2020, 1395 health professionals were hired nationwide in the public sector.
  - In the city of Quito, there were 7005 health professionals before the pandemic. Today, there are 7743 working in the seven hospitals of the capital. Primarily doctors and nurses were hired.
  - In March 2021, rapid response teams (ERR) were hired nationwide, comprised of epidemiologists, general practitioners, and nurses, and distributed according to different needs across the country. These teams were funded by the IDB Project.[145]

- **Reassignment of workers:** During the pandemic, health workers were reassigned, and essential services were partially and temporarily interrupted. Professionals such as outpatient doctors, dentists, and obstetricians have supported triage, handwashing awareness campaigns, or telemedicine for patients with suspected COVID-19 symptoms. These professionals mainly belonged to risk groups, including pregnant women, the elderly, and people with chronic diseases or disabilities. Sampling teams were also formed and worked both inside and outside facilities in outreach clinics. In Guayaquil, **workers from the first level of care were mobilized to support hospitals.** Reassignments were planned by health centers; there was no order given by a centralized authority. Table 31 shows, as an example, the case of the Ecuadorian Social Security Institute (IESS) and farmers (Table 31).

  Additionally, doctors and nurses performing one-year service in rural areas were transferred from their posts to other areas of the country to support COVID-19 care. Areas classified as red alert zones received support. Workers were first reassigned to Guayaquil; later, as cases in that city dropped, workers were sent to Quito and then to smaller cities.

Table 31. Human resources for health reassignment for the IESS corresponding to farmers

Occupational group	HRH reassigned to care for COVID-19 patients	Distribution by occupational group (%)
Nursing assistants	735	33.4
Health services assistants	1	0.0
Nurses	44	2.0
Doctors	776	35.2
Obstetricians	16	0.7
Dentists	631	28.6
Total	**2203**	**100**

HRH: human resources for health.

Source: Response submitted by the Ministry of Public Health of Ecuador to the questionnaire sent by PAHO for the purposes of this study, received on 31 December 2020.

145 Response submitted by the Ministry of Public Health of Ecuador to the questionnaire sent by PAHO for the purposes of this study, received on 31 December 2020.

An estimated 10 000 health professionals were reassigned.

Centers at the first level of care are being reinforced to extend care hours and to support treatment of non-COVID-19 patients.

- **Support from the Armed Forces:** 1523 health professionals from the Armed Forces were brought in to support public network health teams, and military tents were set up to attend COVID-19 cases and serve as sentinel hospitals. There were 78 military health units across the three levels of care in the health system (Table 32).
- **Interagency cooperation agreements:** in order to increase HRH availability, a total of 12 interagency cooperation agreements were signed with higher education institutions (IES)[146] from January to August 2020, processed by the National Directorate for Standards in Human Resources for Health (see Table A4.2 in Annex 4). Through these regulatory and specific agreements with higher education institutions, postgraduate residents[147] provide services in the comprehensive public health network and supplementary network hospitals. Within the framework of the Humanitarian Support Law, postgraduate medical residents are considered doctors in hospital roles and sign an occasional service contract for the duration of their postgraduate studies with the MoH or the Ecuadorian Social Security Institute (IESS) and their respective supplementary networks. For remuneration purposes, they are classified as general practitioners providing hospital services *(193)*.
- **Shift changes:** nurses and nursing assistants were reassigned in 24-hour shifts during the first wave of infections. Later, the existing schedule before the pandemic of 12 daytime hours, 12 nighttime hours, and 3 hours of rest was resumed. Doctors were arranged in 24-hour shifts every four days with a contingency team in case of sick leave, with care specialists organized into 8-hour shifts while remaining on call in case of emergency. HRH in the supplementary network alternated periods of 7 days on and 7 days off. Administrative staff was encouraged to telework and later gradually start in-person work.

Table 33 shows the mechanisms put in place based on available information.

On 22 June 2020, the Organic Humanitarian Support Law was issued to combat the COVID-19 health crisis. To ensure HRH stability, Article 25 of

Table 32. Support from Ecuadorian Armed Forces human resources for health during the health emergency

Branch	Military health professionals	Military health units		
		First level	Second level	Third level
Army	829	47	7	N/A
Navy	447	9	3	N/A
Air Force	247	6	4	N/A
AF Joint Command	N/A	1	N/A	1
Total	**1523**	**63**	**14**	**1**

AF: Armed forces; N/A: data not available.

Source: Response submitted by the Ministry of Public Health of Ecuador to the questionnaire sent by PAHO for the purposes of this study, received on 31 December 2020.

146 The agreements signed with the IES are not for professionals to provide services in the public sector, but rather for training third level students. The purpose of signing these agreements is to train fourth-level students, that is, postgraduate students engaging in professional practice. In other words, this is practical training to apply knowledge gained in their years of medical specialization. It is worth mentioning that the MoH is not providing funding to IES as part of these agreements.

147 Refers to doctors completing their specializations, involving approximately 20 000 hours of required training between care and academic activities.

this law established, as a one-time exception, that **health workers with a provisional or temporary contract who provided services in any position during the COVID-19 health emergency** in a comprehensive public health network center or its respective supplementary networks, will win public bids and be immediately granted permanent positions. Due to budgetary constraints, this law could not be fully enforced, so provisions were applied based on justified contracting need and budgetary availability.

4.3.3. Protecting and supporting human resources for health

HRH are a high-risk group, vulnerable to infections and negative mental health effects due to being on the front line of care in health services. Multidimensional and integrated strategies are required to properly address this issue. This section describes actions in Ecuador that address health worker protection and safety.

It is important to highlight that Ecuador is in the process of developing HRH policy through the Ecuador National Health Council Human Resources Commission (CONARHUS), with the goal of strengthening HRH qualification while creating job stability and higher wages, according to roles and responsibilities. As part of this process, CONARHUS is advocating for the Health Career Law to become an organic law and fall under the Civil Service and Administrative Career Law *(194)*.

4.3.3.1. Occupational safety and health and infection prevention and control

Testing and epidemiological surveillance at the national or local level: As of 2 April 2021, 42 064 tests had been performed on HRH in Ecuador (Table 34), of which 52.3% were performed on doctors *(11)*.

At the beginning of the pandemic, there was a shortage of PPE due to the lack of N95 and surgical mask suppliers. In addition, the vast majority of 70% alcohol gel suppliers do not market the substance as a registered medical product, despite being classified as such, which made procurement difficult for MoH Ecuador.

Table 33. Availability of human resources for health to care for patients with COVID-19 in Ecuador

Mechanism	HRH
Number of hires	3087
Strengthening of critical areas [a]	537
Mobile health care services [b]	417
National public sector	1395
Hospitals in Quito [c]	738
Reassignments	10 000
Armed Forces support	1523
Total	**14 610**

HRH: human resources for health.

Notes:
a Health professionals such as community doctors and interns and nurses to bolster critical areas.
b From July to December 2020.
c Health professionals in the seven hospitals in the capital.

Source: Response submitted by the Ministry of Public Health of Ecuador to the questionnaire sent by PAHO for the purposes of this study, received on 31 December 2020.

Table 34. Viral testing performed on human resources for health in Ecuador by occupational group

Occupational group	Tests performed on HRH	Distribution (%)
Doctors	22 019	52.3
Nurses	8903	21.2
Nursing assistants	5536	13.2
Obstetricians	780	1.9
Dentists	2727	6.5
Psychologists	2099	5.0
Total	**42 064**	**100.0**

HRH: human resources for health.

Source: National Directorate for Epidemiological Surveillance. Comportamiento de la COVID-19 en Ecuador. Quito: Ministry of Public Health: 2021. Available in Spanish from: https://www.salud.gob.ec/coronavirus-covid19-ecuador/.

All staff members in health institutions have had to strictly comply with safety measures and guidelines issued by the MoH, the Ministry of Labor, and the IESS for COVID-19 prevention and control when working in person (see Table A4.4 in Annex 4).

On 22 May 2020, the Ministry of Labor published an action guide for COVID-19 prevention and control during in-person work to reduce the risk of exposure to SARS-CoV-2.

HRH are particularly vulnerable to negative mental health effects, both because of the uncertainty of facing a new pathology, and the concern of exposing their own families to illness. Work overload in locations with HRH shortage further complicates the issue. In Ecuador, there was high risk of deteriorating mental health among the population in isolation and health workers: "It has been demonstrated that health workers in the public sector (nurses, doctors, nursing assistants, case reporters, etc.) experienced additional stressors during the COVID-19 outbreak due to the risk of becoming infected and infecting others."[148] The following measures were enacted to protect and preserve HRH mental health:

- Burnout prevention protocol.
- Protocol for mental health telecare during the COVID-19 pandemic.
- Protocol for preventing psychosocial risk in operational and administrative partners in the context of the COVID-19 pandemic.
- Protocol for preventing psychosocial risks related to COVID-19.
- Operational guidelines for mental health intervention in the health emergency.
- Protocol for the strategic operationalization of mental health in emergencies.
- Protocol for emotional assistance in crisis and grief situations.
- Psychological first aid and psychosocial support guide.

Crisis communication and health promotion and prevention actions were also endorsed. This resulted in 46 551 emotional relief[149] referrals for doctors, nurses, paramedics, radio dispatchers, drivers, and other administrative health workers that fostered effective care and self-care for health workers treating COVID-19 patients. Telehealth groups for emotional relief were organized for prehospital care responders, **benefiting 633 people.** Finally, 120 users received care through telehealth.

4.3.3.2. Training

This section describes trainings, target audiences, and topics discussed:

- Training on proper PPE use and infection control for doctors in educational facilities managed by the Ministry of Education, as well as doctors working in detention centers, zone coordinators, and epidemiological surveillance specialists at the first level of care.
- Training on psychological first aid for properly delivering news, dealing with grief, and the approach to the COVID-19 crisis for 1500 responders (doctors and medical assistants, emergency medical technicians, Emergency Regulation Center staff, and 171 hotline workers).[150]
- 949 health professionals trained in the specialization of emergency and disaster psychology.
- Awareness campaign on proper use of PPE, handwashing, monitoring health units to check PPE and medicines inventory to ensure supervision and management systems for strengthened IPC.
- Development of a workshop on psychological first aid and care and self-care for health workers

148 Response submitted by the Ministry of Public Health of Ecuador to the questionnaire sent by PAHO for the purposes of this study, received on 31 December 2020.

149 Emotional relief: A psychological and physical process during sessions to regulate the body and allow users to talk about their lived experiences or pent-up emotions resulting from the health emergency. For example: openly writing down memories of traumatic events; writing down problems or experiences; talking about these issues in a group after the event or after completing work tasks; making stories or short films; confronting fears. For more information, see: Ministry of Public Health of Ecuador. Guía de primeros auxilios psicológicos y apoyo psicosocial para primeros respondientes. SARS-CoV-2/COVID-19. Quito: Ministry of Public Health; 2020. Available from: https://www.salud.gob.ec/wp-content/uploads/2020/07/GU%C3%8DA-PAP-COVID-19_2020.pdf.

150 171 is a toll-free line for scheduling medical appointments and other services. For more information, see: Ministry of Public Health. Comunicado: Habilitada línea gratuita 171 para agendamiento de citas médicas y otros servicios. Quito: Ministry of Public Health; 2021. Available from: https://www.salud.gob.ec/comunicado-habilitada-linea-gratuita-171-para-agendamiento-de-citas-medicas-y-otros-servicios/.

in the context of the COVID-19 pandemic; 1357 professionals (doctors, medical assistants, radio dispatchers, and drivers) were trained.

- Advanced Continuing Education Course on emergency and disaster psychology; 949 clinical psychologists, psychiatrists, and medical assistants were trained.
- Workshop on sources and health effects of psychosocial risks for all prehospital care and mobile unit workers. By 27 October 2021, 1000 professionals had been trained.
- Continuing education for health professionals to strengthen awareness of international COVID-19 response protocols.

No data are available on the percentages of health workers that were trained; however, each health institution observed the need to improve continuing education and offer permanent training to ensure an efficient and prepared staff for managing crisis situations. Health workers have received training through virtual and in-person sessions with extreme and practical biosecurity measures. The MoH held training in each district; however, no updates have been provided by the Farmer Social Security body.

4.3.3.3. Vaccination

The Ecuador COVID-19 Vaccination Plan 2020–2021 *(195)* targeted 60% of the country's total population, that is, 10.5 million people across three phases.

The phases of this vaccination plan are described below:

- **Phase 0 (pilot plan):** carried out between January and February 2021 in the 24 provinces of the country. This phase included 6570 people, including 264 residents and care staff in senior citizen facilities, and 6306 **doctors caring for COVID-19 patients across the entire health network** (ICU, emergency care, hospitals, and respiratory triage). The estimated duration of this phase was 6 weeks.
- **Phase 1:** included 1 815 635 people, including 104 577 HRH, people over 65, police and law enforcement officers, teachers, people with disabilities between the ages of 18 and 65, firefighters, and waste collectors. The estimated duration of this phase was 12 weeks; 6 for the first dose and 6 for the second dose, assuming that all the necessary doses were available. This implies **60 522 doses per day, or 7565**

doses per hour on average, administered by **630 vaccination teams nationwide**, based on estimates of 12 doses per hour per team in an eight-hour workday, five days a week.

- **Phases 2 and 3:** includes people born in the country and residents between 18 and 65 years old. In each phase, half of this population was served. The estimated duration of this phase was 16 weeks; 8 for the first dose and 8 for the second dose, assuming that all the necessary doses were available. This means that **120 906 daily doses** had to be administered, equivalent to 15 114 doses per hour on average, by **1259 vaccination teams nationwide**, based on estimates of 12 doses per hour per team in an eight-hour workday, five days a week.

To meet plan targets, there are 10 000 vaccination posts distributed as follows:

1. 2000 MoH vaccination posts
2. 1000 IESS, police, and Armed Forces posts
3. 7000 private network posts.

Additionally, 8000 HRH were trained to administer vaccines. All participate in continuous training through university networks and platforms.

In March 2021, the National Government, through MoH Ecuador, managed to acquire vaccines from the following pharmaceutical companies and organizations:

1. **Covax Facility Initiative:** 7 057 200 doses (agreement already signed in March 2021).
2. **COVAX Mechanism for Global Access to COVID-19 Vaccines:** 4 000 000 doses.
3. **AstraZeneca UK Limited:** 5 041 650 doses (agreement already signed in March 2021).
4. **Pfizer–BioNTech:** 1 999 725 doses (agreement already signed in March 2021).
5. **Novavax–Serum Institute:** to be determined.
6. **Johnson & Johnson–Janssen Cilag:** 1 000 000 doses.
7. **Moderna GMBH:** 3 000 000 doses.
8. **Sinopharm:** 2 000 000 doses.
9. **Cansino Biologics:** 3 000 000 doses.
10. **Gamaleya Center:** to be determined.
11. **Sinovac:** to be determined.

On 8 March 2021, a donation of 20 000 doses was received from the Government of Chile and reserved for health workers *(196)*.

By 10 April 2021, 274 160 people had been vaccinated with the first dose and 183 300 with the second. According to the schedule, 100% of HRH in public and private network health facilities nationwide were to be vaccinated by 30 March 2021.

4.3.4. Funding

A budget was established for each of the pillars of Ecuador's COVID-19 Preparedness and Response Plan, detailed in Table 35.[151]

Table 35. Budgeting by pillar of Ecuador's COVID-19 Preparedness and Response Plan

Pillar	Budget required (in US$)	Budget available (in US$)
1	15 000	0
2	770 000	260 000
3	172 690	0
4	68 000	0
5	6 822 240	0
6	18 954 598.09	0
7	441 830 672.61	118 610 308.08
8	0	0
9	21 042 100	0
10	3 581 805.65	389 760
Total	493 257 106	119 260 068

Source: Ministry of Public Health of Ecuador. Plan de preparación y respuesta del Ecuador ante la COVID-19. Quito: Plataforma Gubernamental de Desarrollo Social; 2020. Available in Spanish from: https://www.corteconstitucional.gob.ec/index.php/seguimiento-1-20-ee-y-2-20-ee/1-derecho-a-la-salud/3820-plan-msp,-preparacio%CC%81n-y-respuesta-covid-19-mayo-2020/file.html.

151 Details of the objectives and pillars of Ecuador's COVID-19 Preparedness and Response Plan can be seen in Table A4.1 in Annex 4.

The following funding sources were used for pandemic response:

- The existing and investment budget of MoH Ecuador and other executing entities allocated from the General State Budget (PGE).
- Donations in kind delivered directly to the MoH or other entities directly involved in plan execution.
- Reallocation of PGE resources within different institutions.
- Additional funds obtained from credits from multilateral organizations, cash donations, and any other financial resources that must be registered in the National Treasury unified account.

The first two sources are managed directly by the MoH, while the last two must be coordinated and managed alongside the Ministry of Economy and Finance and the Planifica Ecuador Technical Secretariat.

The MoH allocates resources for existing expenditures and new investments. The following are proposed criteria for prioritizing spending authorizations in the context of the pandemic:

- Payment of wages to medical, technical, and emergency response support workers.
- Purchase of PPE, medications, test kits, medical devices, and equipment needed to address the emergency.
- Increase in infrastructure to expand health care for citizens.
- Payment of medical referrals.

As of 23 December 2020, the allocated amount for HRH was US$ 49 220 222.10, specifically to tackle the health emergency (Table 36).[152]

International cooperation: Ecuador has received more than US$ 25 million in PPE, ambulances, mechanical ventilators, X-ray machines, and viral tests (polymerase chain reaction [PCR]), among other supplies, from donations from more than 12 countries including Germany, United States of America, Italy, and the People's Republic of China; 23 private companies, 9 NGOs, 5 UN agencies, and 4 development agencies also made donations.

Table 36. Budget allocation and execution for human resources for health in Ecuador

Item	Allocated	Executed
Thirteenth salary payment	3 133 391.78	2 735 628.33
Fourteenth salary payment	1 175 014.91	1 049 441.26
Personal service contracts	36 847 161.90	34 401 479.75
Geographical bonus	838 460.40	782 115.60
Employer contributions	3 648 396.82	3 323 877.18
Reserve fund	1 609 711.96	1 197 891.26
Compensation for unused vacation leave upon dismissal	2 008 084.33	1788.34
Total	**49 260 222.10**	**43 492 221.72**

Source: Response submitted by the Ministry of Public Health of Ecuador to the questionnaire sent by PAHO for the purposes of this study, received on 31 December 2020.

152 Response submitted by the Ministry of Public Health of Ecuador to the questionnaire sent by PAHO for the purposes of this study, received on 31 December 2020.

The Government of Chile, as mentioned above, donated 20 000 doses of the Sinovac vaccine.

Donations worth US$ 1.05 million were also received for non-COVID-19 strategies, including sexual and reproductive health device kits, insect repellent for the fight against Zika, vitamins, and antiretroviral drugs.

4.4. Conclusions and challenges

Table 37 summarizes the strategies and mechanisms used in Ecuador to improve HRH availability, training, protection, well-being, and wages to respond to COVID-19.

Table 37. Human resources for health strategies and mechanisms for COVID-19 pandemic response in Ecuador

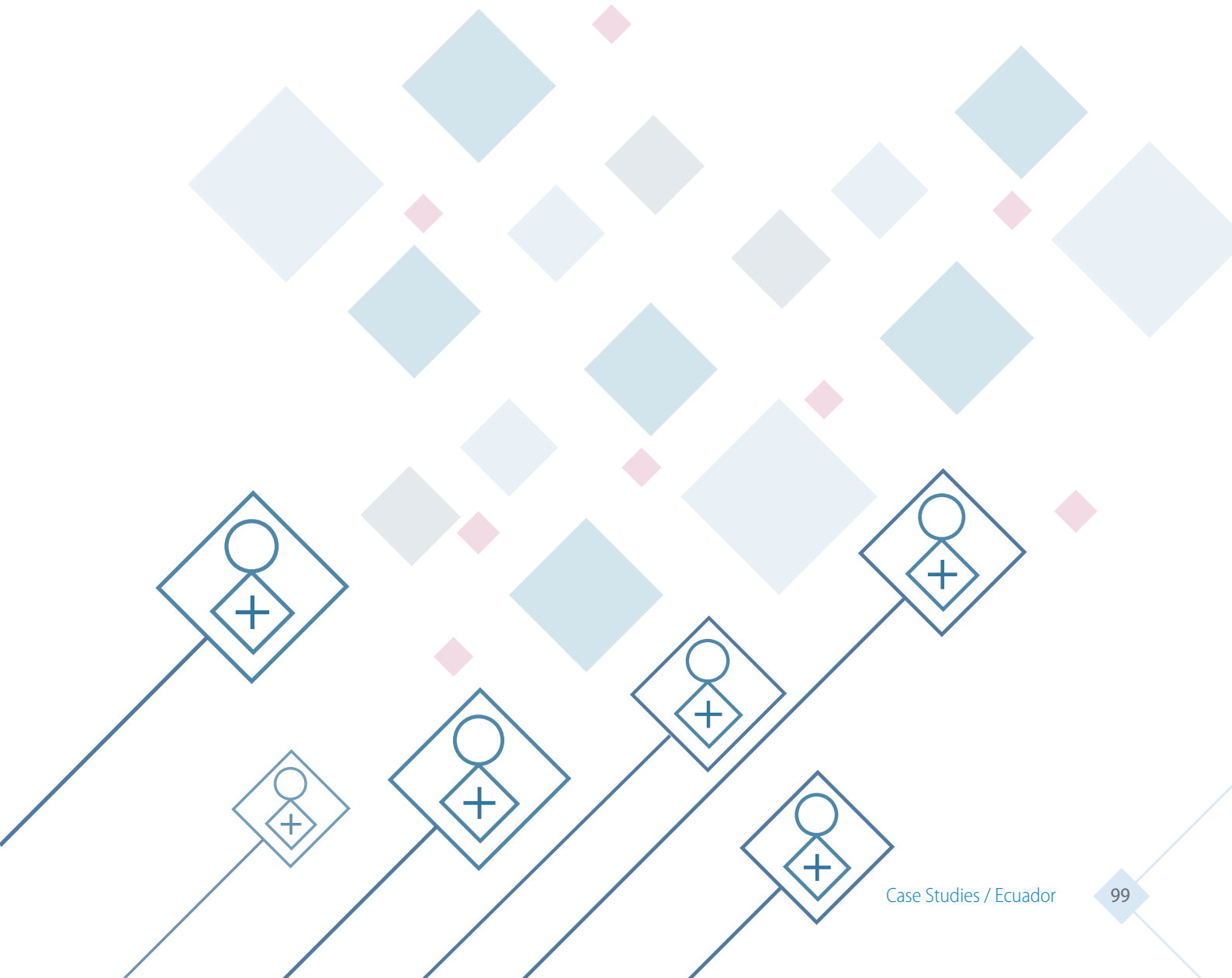
Strategy	Implementation mechanism
Pillar 1. Prepare to provide an initial response to the health emergency	
Estimate HRH needs for the initial COVID-19 response	• MoH Ecuador issued operational guidelines for the response to COVID-19, arranging facilities for the care of patients with COVID-19, while preserving the safety of patients with other diseases. This strategy helped create 27 sentinel public hospitals and expand the network of laboratories for sampling. • To estimate HRH requirements, the National Subdirectorate of Human Talent Management estimated the amount of care and the minimum structure required in type A health clinics according to the number of patients treated at the IESS and based on the MoH health care model. • In the first months of the pandemic, an HRH deficit was observed due to exemption of workers in risk groups (older people, people with chronic diseases), teleworking, and COVID-19 infection.
Pillar 2. Strengthen HRH to increase response capacity in the health system	
Increase availability of HRH caring for suspected, probable, or confirmed COVID-19 cases	The following mechanisms increased HRH capacity: • Direct contracting (3087 people as of November 2020) • Reassignments (10 000 people as of November 2020) • Support from Armed Forces (1523 people as of November 2020) • Interagency cooperation agreements • Shift changes.
Improved working conditions	• Article 25 of the Organic Humanitarian Support Law establishes that health workers who have provided services during the COVID-19 health emergency through a provisional or temporary contract will immediately be granted a permanent position. Regulations limited the scope of the law, so full implementation was not possible due to the high cost of hiring health professionals to face the pandemic.

Strategy	Implementation mechanism
Define new HRH competencies for COVID-19 prevention and treatment	• Training for doctors on epidemiological surveillance, proper use of PPE, and infection control. • Psychological first aid training (1500 doctors, medical assistants, emergency medical technicians, Emergency Regulatory Center staff, and hotline 171 workers). • Awareness campaign on proper use of PPE, handwashing training, monitoring health units to check PPE and medicines inventory to ensure supervision and management systems for strengthened IPC. • Workshop on psychological first aid and care and self-care for health workers in the context of the COVID-19 pandemic. 1357 professionals (doctors, medical assistants, radio dispatchers, and drivers) were trained. • Advanced continuing education course on emergency and disaster psychology. 949 clinical psychologists, psychiatrists, and medical assistants were trained. • Workshop for all prehospital care and mobile unit workers on sources and health effects of psychosocial risks; as of 7 October 2020, 1000 people had been trained. • Continuing education for health professionals to strengthen awareness of international COVID-19 response protocols.
Occupational safety and health	• Burnout prevention protocol. • Protocol for mental health telecare during the COVID-19 pandemic. • Protocol for preventing psychosocial risks related to COVID-19. • Protocol for the strategic operationalization of mental health in emergencies. • Protocol for emotional aid in crisis and grief situations. • Psychological first aid and psychosocial support guide. • Crisis communication and health promotion and prevention actions. • Protocol for preventing psychosocial risk in operational and administrative partners related to COVID-19 care. • Operational guidelines for mental health intervention in the health emergency.
Pillar 3. Review and update measures	
Maintain HRH availability	• Vaccination plan prioritizing HRH.

COVID-19: coronavirus disease 2019; HRH: human resources for health; MoH Ecuador: Ministry of Public Health of Ecuador; PPE: personal protective equipment.

4.5. Pending actions

- Reduce the risk of infection among HRH, ensure the supply of medicines and PPE, streamline public procurement regulations, and decentralize purchasing. Expand ongoing training on personal hygiene and PPE use.
- Standardize treatment for COVID-19 patients in the public and private sectors.
- Reduce the HRH deficit. This would also help decrease work overload and extended work shifts.
- Apply strategies to strengthen the intensive care competencies of other professionals during health crises to alleviate the deficit of specialists in critical medicine and intensive care.
- Form teams that allow for greater articulation of information and response in each of the IESS branches.
- Publish the National Policy on Human Resources for Health Development.
- Encourage and support the enactment of the Health Career Law.
- Publish the Interministerial Agreement on the technical standard for HRH planning in the comprehensive public health network.



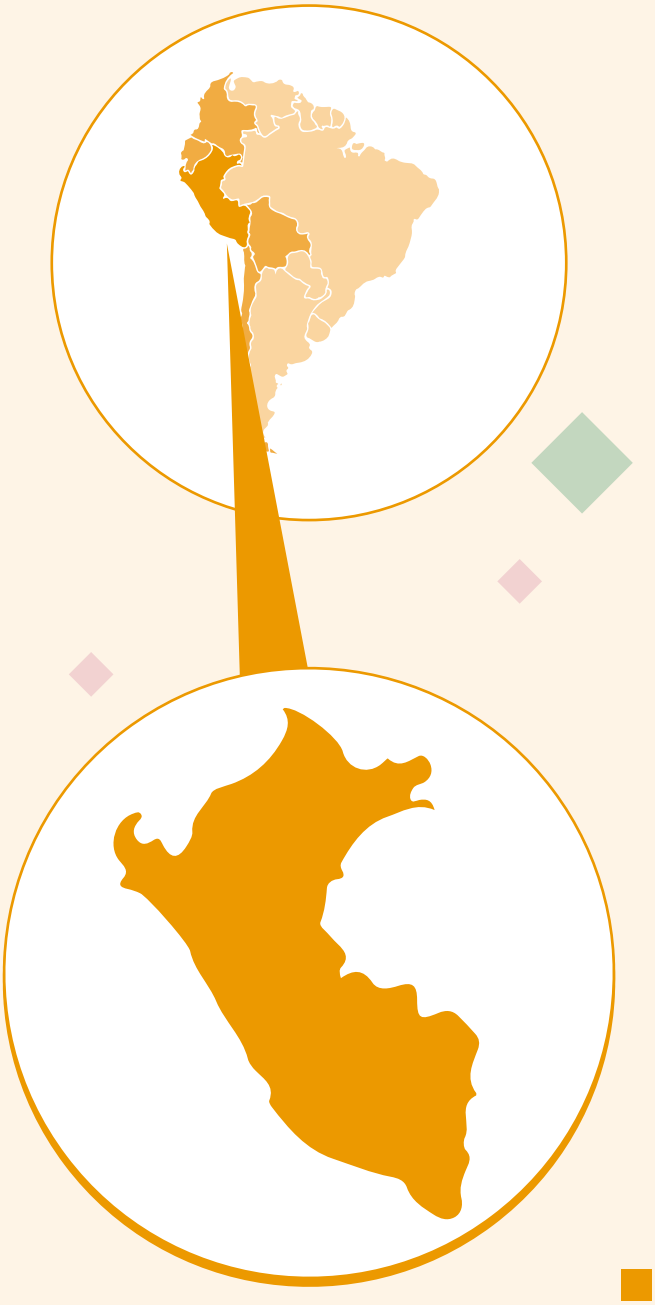
5. Peru

Key points

- The country was already allocating a budget to reduce the health workforce gap; however, the COVID-19 pandemic gave even more urgency to the situation and increased the need for specialists.
- Peru prepared an initial response in March 2020 to attend suspected, probable, and confirmed COVID-19 cases in public establishments for a period of three months, estimating a need for 2610 health professionals and 270 non-care professionals.
- Risk groups were identified among HRH to be exempted from attending COVID-19 cases (14.9% of all HRH), which reduced the number of available workers; 43% of at-risk health workers were concentrated in the Lima region, representing 17.9% of the area's HRH before the pandemic. By occupational group, 13% of doctors and 12% of nurses were at risk.
- Different mechanisms were used to increase HRH availability: **1)** eliminating hiring requirements and increasing wages through the administrative service contracts in the context of COVID-19 (CAS-COVID) (44 207 people as of December 2020); **2)** reassigning workers (80 202 people as of August 2020); **3)** incorporating students about to complete their training (5048 people as of August 2020); **4)** extending shifts (11 662 people as of August 2020), hiring professionals who graduated abroad, temporarily relaxing restrictions on professional practice for these individuals; and **5)** taking advantage of international cooperation (92 people as of December 2020).
- There were difficulties in implementing prevention measures due to the lack of testing and scant protection resulting from PPE shortages. The latter was a significant item in COVID-19 response funding and merited the creation of a monitoring committee for the allocation and use of PPE and other resources for COVID-19 care in each IPS.
- Expanded management committees and training and occupational safety units implemented measures to improve working conditions and the well-being of health workers, take care of their mental health, and provide food and rest.
- By January 2021, there were 9200 people dedicated to vaccination. This figure is expected to reach approximately 18 000; 25 000 teams of professionals are expected to be trained for COVID-19 vaccination.

Future tasks and challenges

- Continue to employ workers hired during the pandemic and maintain improvements in working conditions.
- Increase the budget to have more spots for training specialists.
- Formalize health careers in order to improve working conditions.
- Develop a plan to close HRH gaps and establish regulations to foster more equitable territorial distribution.



5.1. Country context

This section presents a brief description of the country's health system and an overview of the HRH situation before the COVID-19 pandemic.

5.1.1. Health system

The Ministry of Health of Peru (MoH Peru) is the national health authority and, consequently, the governing body of the system. The National Superintendency of Health (Susalud) also oversees organization of the entire system, sharing with MoH Peru various responsibilities in health policy management. The health system is composed of three sectors based on funding and insurance schemes, described below:[153]

- **Public sector:** the **subsidized or indirect contributory regime that covers 59.8% of the population with comprehensive health insurance** (SIS),[154] funded by State resources, household contributions, and donations from intergovernmental cooperation. The SIS subsidizes services for the population living in conditions of poverty and the uninsured in extreme poverty in exchange for a recovery fee. Services are provided through the network of MoH facilities, hospitals, and specialized public institutes.

- **Private sector: covers 4.7% of the insured population.** Funded by family contributions that directly pay professional fees, private entities,[155] or private Iafas care plans through insurance companies, prepaid medicine accounts, and self-funded insurance. Within the private sector there is also a varied group of non-profit civil associations. Most provide first level services and often receive funding from external partners, internal donors, government, and households *(197)*.

- **Mixed or direct contributory sector:** social security in health system; 98% of total funding comes from direct and mandatory employer contributions, covering 35.3% of the insured population. Two entities provide services: EsSalud[156] and the health provider entities (EPS). EsSalud offers health services in its own facilities; however, after the Social Security in Health Modernization Law was enacted in 1997, the private sector began to sell personal services to EsSalud through the EPS. The salaried population can therefore choose to receive EsSalud services or join an EPS, which provides less complex care through contracted private services and refers greater complexity care to EsSalud.

This regime also encompasses the health units managed by the Ministries of the Interior and Defense, including the three military institutions and the National Police *(197)*, funded by the State and supplementary contributions from its members, who have their own service networks.

Table 38 shows the distribution of the insured population in Peru by health subsystem.

In conclusion, health services are provided through five subgroups of providers or IPS:

1. Public providers funded by the SIS under MoH Peru and regional governments.
2. Private for-profit providers giving services directly to households and EsSalud through EPS.
3. Private non-profit providers, mainly through international cooperation.
4. EsSalud providers.
5. Armed Forces and police hospitals and medical centers.

153 Insurance is managed through the institutions that administer funds for health insurance (lafas).

154 The SIS is the funding institution responsible for providing health insurance to the population under the indirect contributory system.

155 Refers to specialized and non-specialized private clinics, medical and polyclinic centers, medical and dental offices, laboratories, diagnostic imaging services, and health establishments of some mining, oil, and sugar companies. Informal providers of traditional medicine are also included. For more information, see: Alcalde-Rabanal JE, Lazo-González O, Nigenda G. Sistema de salud en Perú. Salud Publica Mex. 2011;53(2):243-254. Available in Spanish from: https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0036-36342011000800019.

156 The Law on Universal Insurance (Ley de Aseguramiento Universal) and its regulations designate EsSalud as an institution administering funds for health insurance. For more information, see: El Peruano. Ley N.° 29344/2009, del 9 de abril. Lima: Congress of the Republic of Peru; 2009. Available in Spanish from: https://leyes.congreso.gob.pe/Documentos/Leyes/29344.pdf.

There is also a mixed service provider network that, although it is state-owned, operates as if it was a private network. It is a public–private partnership administered by the Metropolitan Municipality of Lima and later extended to other cities across the country through a network of solidarity hospitals.

Private health facilities account for 60.8% of all establishments. Public facilities are managed by the MoH or the regional governments; 97% are first-level facilities *(198)*. The private sector has six third-level establishments, while the MoH and regional governments manage 34 establishments of this category. This explains why the public segment has the largest proportion of HRH (76.4%).[157] Additionally, EsSalud purchases services from private institutions through the EPS, supplementing 1.7% of the available infrastructure (Table 39).

The model of family and community based comprehensive health care (MAIS-BFC) has been in place since 2011 and was developed with a focus on prevention and promotion at the first level of care, advocating for detection of risk factors at the community level and a series of interventions for each stage of life. By January 2020, 40.4% of total HRH in the public sector worked in the 7992 establishments at the first level of care, a sign of how effective the application of the MAIS-BFC health model has been.

The MAIS-BFC model was supplemented by the model of comprehensive life cycle health care model for families, individuals, and the community (MIC), established by Ministerial Resolution No. 030 (27 January 2020) *(198)*. The idea is to move toward a model that considers health as a dynamic process with interventions beyond the care of specific diseases *(198)*.

In Peru's decentralized health system, the national level sets general policies and frameworks, and regional governments are responsible for implementation through the regional health directorates

Table 38. Distribution of the insured population by health subsystem in Peru

Segment	Insurance	Coverage (%)[a]	
Public	Comprehensive health insurance	59.9	59.9
Mixed	EsSalud	30.9	35.3
	EPS	2.8	
	Army lafas	0.1	
	Air Force lafas	0.1	
	Navy lafas	0.1	
	Police lafas	1.3	
Private	Insurance companies	2.4	4.7
	Prepaid medicine companies	2.1	
	Self-insurance	0.2	
	Total	**100**	**100**

EPS: health care provider; lafas: institutions administering funds for health insurance.

Notes:
a Calculated based on the total population covered by some form of health insurance, not the total population of the country.

Source: Alcalde-Rabanal JE, Lazo-González O, Nigenda G. Sistema de salud en Perú. Salud Publica Mex. 2011;53(2):243–254. Available in Spanish from: https://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0036-36342011000800019.

157 There are 328 423 HRH in Peru, of whom 249 459 worked in the public sector as of August 2020. See: Ugarte Taboada C. Gestión de recursos humanos para la salud en los tiempos de COVID-19. Lima: Ministry of Health; 2020. Available from: http://orasconhu.org/portal/sites/default/files/21%20webinar%20Peru%20Gestion%20de%20RHUS%20EN%20COVID%20MINSA.pdf.

Table 39. Distribution of health facilities by health subsystem and levels of care in Peru

Subsystem	Level of care					
	1	2	3	Uncategorized	Total	Percentage
Private	7894	283	6	5641	13 824	60.8
Public (MoH Peru and regional governments)	7992	143	34	78	8247	36.3
Mixed (EsSalud)	276	57	11	34	378	1.7
Other	244	5	4	37	290	1.3
Total (number and percentage)	**16 406 (72.1)**	**488 (2.1)**	**55 (0.2)**	**5790 (25.5)**	**22 739**	**100.0**

Source: Resolución 030/2020 del 27 de enero. Aprueba el documento técnico Modelo integral de cuidados por curso de vida para la persona, familia y comunidad (MIC). Lima: Ministry of Health; 2020. Available in Spanish from: https://cdn.www.gob.pe/uploads/document/file/496394/resolucion-ministerial-030-2020-MINSA.pdf.

(Diresa). The decentralization process involved the 25 regional governments taking on a series of powers and roles, including managing state health services in their respective areas, subject to MoH policy guidelines and regulations.

5.1.2. Human resources for health

In 2014, the MoH conducted studies on HRH deficits at all levels of care, determining that health worker gaps existed before the pandemic *(199)*.

In 2018, HRH policy guidelines were approved for the period 2018–2030 *(200)*. Objectives were established to strengthen MoH leadership at the intersectoral and multisectoral levels, achieve sufficient HRH numbers by reducing regional imbalances, bolster HRH skills, and improve working conditions.

The Peruvian health system has **a total of 328 423 workers,** of which 76.4% are in the public sector; of these, 65.4% are women *(201)*.

The density of doctors in Peru is low, with 13 per 10 000 population. The density of nurses (24 per 10 000 population) is close to that of the LAC average (28 per 10 000 population), although far from the OECD average (88 per 10 000) (Table 40). These indicators demonstrate a shortage of qualified health workers in the country. With 33.3 professionals per 10 000 population in the core groups (doctors, nurses, midwives) in 2018, Peru did not reach the threshold of 44.5 recommended by WHO to achieve universal access to health *(149)*.

Across departments, there are significant differences in doctor density (see Table A5.2 in Annex 5), with 20 in Lima, 22.5 in Callao, and 20.75 in Moquegua, all above the LAC average (see Table A5.3 in Annex 5).

Nevertheless, the public health system experienced a 27% growth between 2013 and 2018; this demonstrates that actions were taken to increase coverage to meet the needs of the population *(202)*.

Table 40. Comparison of doctor and nurse density per 10 000 population in Peru, Latin America and the Caribbean, and the Americas

Geographical scope	Doctors [a]	Nurses [d]
Peru	15.2[b]	18.1[c, e]
Latin America and the Caribbean (33 countries)	29.8[c]	42.4[c]
Americas (35 countries)	28.3[c]	82.7[c]

Notes:

a Includes general practitioners and specialists at all levels of care.

b Updated response submitted by the Ministry of Health of Peru to the questionnaire sent by PAHO for the purposes of this study, received on 31 March 2021. Based on data obtained from the National Registry of Health Workers. See: Ministry of Health of Peru. Información de Recursos Humanos en Salud del Ministerio de Salud y Gobiernos Regionales. Lima: Ministry of Health; 2020. Available in Spanish from: https://app.powerbi.com/view?r=eyJrIjoiOTE3ZmEwODMtMmFlMy00ZDA4LTg5ZGEtMGMzZDBjNmU2ZTMxIiwidCI6ImI3ZDJiMWZkLWU3NjMtNDY5ZS05NjE5LWM5M2I3MmEyYzUwMyJ9&pageName=ReportSection59d61fb40feb0d4a46db.

c 2018 estimate. See: World Health Organization. WHO National Health Workforce Accounts Data Portal. Geneva: WHO; Available from: https://apps.who.int/nhwaportal/.

d Includes nurses, nursing assistants, and other nursing staff, without indication of availability by location.

e According to the WHO National Health Accounts Data Portal, this figure was 24.4 in 2018.

5.2. Impact of COVID-19 on human resources for health

The first confirmed COVID-19 case in Peru was identified on 5 March 2020. Six days later, Supreme Decree No. 008 declared a health emergency,[158] defining national control and prevention measures and border control *(203)*. On 14 March, Emergency Decree No. 010 established the plan of action and the list of goods and services required to face the health emergency. An initial estimate of HRH recruitment needs was then made to strengthen the response capacity of the public health system (for a period of three months), as well as PPE purchases to meet health worker needs and SARS-CoV-2 tests *(20)*.[159] Supreme Decree No. 044 (15 March 2020) *(204)*[160] declared a national state of emergency and extended the powers of MoH Peru to cover all public, private, and mixed health networks and their workers to ensure protection of people, goods, and places, with the power to establish special services based on duration or nature of the emergency. This includes redistributing the workers available nationwide; in fact, it was necessary to send specialized professional delegations to certain regions of the country *(205–210)*.

Between 5 March and August 2020, 24 922 confirmed cases of COVID-19 were reported among health workers (out of a total of 249 459 workers), including 305 deaths. This represents a **health worker infection rate of 9.8%** as of August 2020, with a mortality rate of 1.22%.

Among health workers, 63.6% of confirmed COVID-19 cases are concentrated in three occupational groups: care technicians (31.6%);[161,162] nurses (20.6%); and doctors (11.4%). Notably, care professionals[163] represent 15.5% of cases; however, they constitute a broad group of diverse professions. Confirmed COVID-19 cases decreased the country's ability to respond to the health emergency, as some workers were absent due to illness or isolation requirements, increasing the shortage of HRH. To better illustrate this situation, Table

158 The health emergency period was extended by Supreme Decrees 020, 027, and 031 (2020), and 009 (2021).

159 This decree includes National Institute of Health, Social Security in Health (EsSalud), and MoH and regional government health establishments nationwide as part of the plan of action; it does not include private sector IPS.

160 Specified by Supreme Decrees 045 and 046 (2020) and extended by Supreme Decrees 051, 064, 075, 083, 094, 116, 135, and 146 (2020).

161 Response submitted by the Ministry of Health of Peru to the questionnaire sent by PAHO for the purposes of this study, received on 21 October 2020.

162 The term "care technicians" covers a wide range of occupations that perform care.

163 It includes professionals such as obstetricians, dentists, sanitary engineers, veterinarians, nutritionists, psychologists, chemists, pharmaceutical chemists, medical technicians, social workers, specialized technicians, and unspecified care professionals.

A5.1 in Annex 5 shows HRH availability in Peru by occupational group. Nurses represent 17.16% of health workers,[164] and doctors, 12.67%. When analyzing the rate of infection by occupational group, a different distribution emerges, as non-care workers (administrative assistants, 13.51%) have the highest rate of occupational infection.[165] Considering that patient care is not included in their job duties, further study is necessary to understand this information; for example, analysis of the data considering possible sources of transmission (workplace or community) (Table 41). Further analysis of occupational groups finds that nurses comprised 12% of confirmed cases, followed by care technicians (11.78%), care professionals[166] (10.03%), biologists (9.02%), and doctors (9.01%).

The lack of PPE and suboptimal working conditions caused concern among HRH in Peru, leading to protests in April 2020, especially in Lima, demanding an increased health sector budget, compliance with PPE delivery requirements, special monthly bonuses for all health workers *(211)*, job stability, and salary increases based on training and performance. Strikes were also organized, first in some public hospitals, and growing into a national strike on 26 and 27 August 2020. A doctor strike began on 13 January 2021 and lasted for more than two weeks (see Table A5.19 in Annex 5).

Table 41. Infection rate by occupational group in Peru

Occupational group	Number of confirmed cases [c]	Distribution of confirmed cases among total HRH (%)	Infection rate by occupational group (%) [d]	HRH availability
Care technicians	7868	31.6	11.78	66 806
Nurses	5137	20.6	12.00	42 819
Care professionals [a]	3865	15.5	10.03	38 548
Doctors	2848	11.4	9.01	31 615
Administrative staff	2540	10.2	5.68	44 741
Non-care workers [b]	2117	8.5	13.51	15 674
Biologists	277	1.1	9.02	3070
Care assistants	270	1.1	4.36	6186
Total	**24 922**	**100.0**	**9.99**	**249 459**

HRH: human resources for health.

Notes:

a Includes professionals such as obstetricians, dentists, sanitary engineers, veterinarians, nutritionists, psychologists, chemists, pharmaceutical chemists, medical technicians, social workers, specialized technicians, and unspecified care professionals.

b Staff who do not care for patients, including administrative staff, drivers, and cleaning staff, among others.

c Response submitted by the Ministry of Health of Peru to the questionnaire sent by PAHO for the purposes of this study, received on 21 October 2020.

d Calculations based on September 2020 information from the HRH Observatory of the Directorate General of Health Workers (Observatorio de RHS de la Dirección General de Personal de la Salud). See: Ministry of Health of Peru. Observatorio de RHS de la Dirección General de Personal de la Salud. Lima: DIGEP; 2020. Available from: http://digep.minsa.gob.pe/.

164 Information on the total available HRH only exists for the public sector.

165 The infection rate within an occupational group is the number of confirmed cases represented as a percentage of the total number of persons in that group.

166 It includes professionals such as obstetricians, dentists, sanitary engineers, veterinarians, nutritionists, psychologists, chemists, pharmaceutical chemists, medical technicians, social workers, specialized technicians, and unspecified care professionals.

5.3. Policy response

5.3.1. Overall COVID-19 response strategy

The initial strategy to face the pandemic, enacted by Emergency Decree No. 026–2020-MINSA (15 March) *(27)*, involved only the public sector hospital subsystem. However, after declaring a state of emergency, measures were extended to the entire national health system, that is, public, private, and mixed institutions. Ministerial Resolution No. 095 (18 March 2020) approved the national plan for strengthening health services and containing COVID-19, through reorganization and readjustment of health services *(212)*. Through this national plan, the MoH defined care protocols at all levels, including home care and community interventions. All public, private, armed forces, and national police institutions must be part of the strategy, and must establish containment areas according to resolution capacity, accessibility, and availability of resources. Three lines of progressive care were projected in MoH public establishments, starting with the primary care network.

Finally, regional governments were requested to establish their own plans of action, within the framework defined at the national level.

On 30 March 2020, the MoH assigned rapid response teams (ERR) to home epidemiological and laboratory surveillance for suspected COVID-19 cases. These teams were made up of three people from existing staff: a professional with knowledge in epidemiology, a laboratory professional, and a driver *(213)*.

On 23 July 2020, a change was introduced in the Peruvian health system governance, establishing centralized management of hospital beds and ICUs in all public, private, and mixed IPS and law enforcement facilities. Protocols were defined for requesting and assigning beds for patients with COVID-19, on top of procedures for transferring patients and organizing the referral and counter referral process. Public and private lafas were also instructed to pay for transfer of their members *(214)*.

Rapid temporary care centers (CRAT) were set up beginning on 17 September in nine districts of the northern area of Lima, for timely discharge and care of COVID-19 cases, as part of strategies deployed at the first level of care to address COVID-19 *(16)*.

Given the imminent arrival of the second wave of COVID-19 in Peru, a preparation and response plan was approved on 9 November 2020, identifying the need to strengthen MoH leadership, improve timely diagnosis, strengthen epidemiological surveillance and health care, equip and train HRH, and expand communication to inform the population and contribute to reducing of impact of the second wave *(215)*.

5.3.2. Improving the availability of human resources for health

5.3.2.1. Identifying the needs of human resources for health to address COVID-19

Emergency Decree No. 010 (March 2020) *(20)* approved the *Plan of Action, Surveillance, Containment, and Care of COVID-19 Cases in Peru and the list of goods and services required for the health emergency*, with the goal of reducing the impact of COVID-19 on the health system. Actions were put in place for the care of suspected, probable, or confirmed cases; i.e. epidemiological surveillance, case investigation, contact tracing, care, organization of health services, laboratory surveillance, and diagnostic support in MoH, EsSalud, and National Institute of Health facilities, over a period of three months. A need for 2610 health professionals was estimated, including general practitioners, specialists, nurses, and technicians, in addition to 270 workers to perform non-care tasks (drivers and computer technicians).

From 1 April 2020 onwards, health workers belonging to risk groups were identified and immediately exempted from work activities *(216)*. MoH therefore had to calculate the increased HRH deficit based on the absence of at-risk health workers, a group that includes people over 60 years of age, people with comorbidities, and women who are pregnant or have young dependent children. These

conditions preclude providing care for patients with COVID-19. By August 2020, the total number of at-risk public-sector HRH was estimated at 30 486 people, representing 14.9% of available workers under the MoH and regional government systems. When these figures are broken down **by occupational group**, administrative staff (33%) and care technicians (27%) have the highest percentage of at-risk workers, **followed by doctors (13%), and nurses (12%)** (see Table A5.4 in Annex 5).

A total of **43% of at-risk health workers were concentrated in the Lima region, representing 17.9% of the area's HRH before the pandemic.** In Arequipa, this deficit was more than 19% of the total of 8131 workers, demonstrating the difficulties that some territories may have had in ensuring sufficient numbers to address the pandemic.

5.3.2.2. Measures to maintain or increase human resources for health

This section examines the measures adopted to address HRH shortages in key occupations, as well as regional imbalances, aggravated by infection and death among HRH and working conditions that negatively affected availability.

Beginning in March 2020, the five countries adopted several measures to maintain or increase HRH availability to address the health emergency. Policies related to HRH aim to facilitate recruitment and deployment of new staff and redeployment of existing staff, including: **1)** creating faster recruitment pathways or allowing more self-employed contracts, often enacted through emergency legislation; **2)** reorganizing shifts; **3)** reassigning tasks; and **4)** reallocating staff within facilities or between regions.

By the end of August 2020, the MoH had deployed the following mechanisms nationwide to address the pandemic (Table A5.12 summarizes the legislation supporting these mechanisms):

- In June 2020, a new contracting method called the COVID-19 administrative service contract (CAS-COVID) was launched for people in public service hired by the State at both centralized and decentralized levels. This process is based on the administrative service contracts regulated by Legislative Decree No. 1057 (2008), which defined an improved salary scale to facilitate recruitment *(217)*. By December 2020, 2885 people had been recruited through the CAS-COVID process. In the public sector, 44 207 health workers had been recruited through the CAS-COVID process by the December 2020 cutoff date. This represents a 20.5% increase in public sector HRH, compared to the 215 275 workers available in MoH and regional government facilities in March 2020.
- One strategy that countries implemented to increase HRH for the care for patients with COVID-19 was temporary reassignment between levels or within the same level, and between territories. Some practices became commonplace, such as postponing surgeries without causing harm, and suspending chronic illness checkups, and essential health services *(104)*. In Peru, the initial COVID-19 response strategy involved reinforcing HRH in hospitals. In January 2020, 40.4% of HRH were concentrated in primary care, so workers were reassigned from the first level of care to levels of greater complexity. **Budgets and health workers were also reallocated from essential services not related to COVID-19 to COVID-19 care, resulting in a partial interruption of the former**, especially outpatient consultations, and strategic programs including immunizations and anemia prevention and elective surgeries. Patients with pathologies other than COVID-19 were released from hospitals. By the end of August, a total of 80 202 people had been redeployed, representing 37% of available public sector HRH according to March 2020 figures. These workers were primarily care technicians (36%), nurses (26%), other care workers (17%), and doctors (16%) (see Table A5.7 in Annex 5). The regions of Lima, Cajamarca, La Libertad, Piura, Arequipa, and Cusco account for 50% of reassignments by August 2020 (see Tables A5.7 and A5.8 in Annex 5).
- The rural and urban health service (SERUMS) was extended to graduates of foreign universities

(218),[167] regardless of foreign or domestic status. This measure relaxed registration requirements, allowing those in positions outside of their geographical area to offer their services anywhere. Workers included in risk groups due to age, comorbidity, pregnancy, or child care duties were not allowed to participate. **SERUMS-I 2020 students were assigned to care for vulnerable populations.**

- 11 662 public sector HRH provided supplementary services (overtime hours). Through this process, a contracted worker could provide additional services outside their normal working hours in their facility or others; in the latter case, the requirement to establish an agreement between facilities was waived *(219)*.
- For the duration of the health emergency, professional associations, in coordination with the MoH, temporarily authorized health workers trained abroad to practice without revalidating their degrees *(26)*.
- Rotations were expanded for medical residents in the third or fourth year of intensive or emergency and disaster medicine, extending their training to priority health facilities nationwide during the health emergency. A special monthly bonus of S/ 3000 (US$ 837.5) was authorized *(220)*.
- In emergency situations, residents were authorized to rotate to facilities other than those assigned at the beginning of their programs *(220)*.
- Legislative Decree No. 1512 (2020) authorized early graduation for medical residents in the final year of specialties or subspecialties pertaining to emergency and disaster medicine, infectious and tropical disease, family and community medicine, intensive medicine, pediatric intensive medicine, internal medicine, pediatric pulmonology, and pulmonology, to increase care for patients with COVID-19. MoH Peru will hire these doctors through the CAS process. Ministerial Resolution No. 311 (2020) included legal medicine, geriatrics, anesthesiology, and cardiology *(221)*.
- Internships in health careers were progressively resumed by 15 August 2020, and a stipend and health insurance were granted to students *(222)*.
- The bachelor's degree requirement for care workers in public establishments and law enforcement agencies was temporarily eliminated; the only condition is to later complete requirements for graduation. Medical students will have six months after the end of the health emergency to fulfill qualification procedures and pass the national board examination when appropriate *(222)*.

167 Resolución Ministerial 215/2020, del 21 de abril. Amended in May by Resolución Ministerial N.° 258 and again in June by Resolución Ministerial N.° 446.

- Professionals with degrees earned abroad are exempted from revalidation of the degree for the duration of the health emergency. They are also given a period of six months after the end of the health emergency to comply with revalidation requirements and pass the national board examination *(222)*.

- The National Registry of Health Workers INFORHUS computer application was improved to obtain timely, updated, and strategic information from HRH managed by MoH and regional governments to support decision-making.

- Peru also accepted cooperation from the Ministry of Public Health of Cuba, which sent 85 health professionals to four regions with the greatest need. The Government of Peru covered the costs of the support provided by the Cuban Brigade. The MoH also received support from Médecins Sans Frontières. The NGO sent five doctors and two nurses to intervene primarily in the Amazonas region.

Table 42 shows the available information on these mechanisms. The main difficulty in recruiting additional health workers was the shortage of national supply, especially specialist doctors and nurses.[168]

Emergency Decree No. 026 (March 2020) *(26)* included special bonuses for State health workers during the health emergency, extended until 31 December 2020 by Emergency Decree No. 069 of 2020 *(223)*. **Decree No. 068 (4 April 2020) established the amount of S/ 720 (US$ 201) for the monthly special bonus,** and outlined criteria for identifying beneficiaries and determining eligibility among workers in the public sector and EsSalud. As of July 2020, 64.7% of public sector health workers had received the bonus *(32)*. The measure was renewed in February 2021 for the months of February and March, with a value of S/ 1440 (US$ 402) for March *(224)*.

A special non-remunerative monthly bonus was also created for effective work performed by care workers in EsSalud establishments until the end of the health emergency, with an increase of the amount allocated in Emergency Decree No. 026 *(26)*. The amount budgeted for the bonus increased from S/ 28 418 400 (US$ 7 933 470) in March to S/ 78 757 873 (US$ 21 986 573) in September *(225)*. This measure was renewed in February 2021 only for the month of March by Emergency Decree No. 022 *(226)*. A summary of public sector bonuses can be found in Table A5.9 in Annex 5 (see Tables A5.10, A5.11, and A5.13 in the same annex).

Table 42. Human resources for health availability in Peru to attend to patients with COVID-19 in the public health subsystem

Mechanism	August 2020	December 2020
Recruited through CAS-COVID[1]	26 952	44 207
Reassigned[2]	80 202	N/A
SERUMS (2020 – I)[2]	5048	N/A
Supplementary services provided by the pre-pandemic workforce (overtime)[2]	11 662	N/A
International cooperation[2]	92	92

CAS-COVID: COVID-19 response service administration contract; COVID-19: coronavirus disease 2019; N/A: data not available; SERUMS: rural and urban health service.

Sources:

1 Ministry of Health of Peru. Observatorio de RHS de la Dirección General de Personal de la Salud. Lima: DIGEP; 2020. Available from: http://digep.minsa.gob.pe/.

2 Responses submitted by the Ministry of Health of Peru to the questionnaire sent by PAHO for the purposes of this study, received on 21 October and 3 December 2020.

168 Responses submitted by the Ministry of Health of Peru to the PAHO questionnaire for this study, received on 21 October 2020, p. 16.

Finally, in March 2020, Emergency Decree No. 026 *(26)* established a state subsidy for EsSalud to fund work disability payments for health workers diagnosed with COVID-19.

All regulations related to recruitment, remuneration, bonuses, insurance, PPE, and education and training come from the central level. Decentralized authorities make decisions on limited remunerative, health worker distribution, and training issues.

MoH Peru created mobile units made up of doctors, nurses, and other health professionals, both from Peru (332 professionals) and Cuba (85 professionals), to support critical areas in the country with the most severe worker shortages.

5.3.3. Protecting and supporting human resources for health

HRH are a high-risk group, vulnerable to infections and negative mental health effects from providing health services. Multidimensional and integrated strategies are required to properly address this issue. This section describes the actions in Peru to address health worker protection and safety.

5.3.3.1. Occupational safety and health and infection prevention and control

After the declaration of the health emergency on 11 March 2020, MoH Peru issued guidelines to protect health workers (see Table A5.14 in Annex 5), providing PPE as part of efforts to ensure occupational safety and health. After PPE was purchased, the IPS were held responsible for delivery. PPE donations were also received (see Table A5.17 in Annex 5). However, there was a still a deficit until July, notably in PHC and in some regions such as Loreto and Piura. Rural areas were more affected than urban areas.

Health facilities must provide training on proper PPE use *(227)*. In May 2020, an oversight committee was formed in each IPS to manage PPE and COVID-19 care, promoting accountability in PPE use, estimating needs, mitigating PPE shortages, and reporting irregularities *(36)*. In June, protocols for the use of face masks were applied *(228)*, and in July, Technical Health Standard No. 161 on PPE use was issued.

Regarding IPC, in March 2020, oversight of COVID-19 patient care and monitoring of symptoms were defined as actions to promote prevention and timely detection for health workers *(227)*. As mentioned previously, HRH were assigned in April to risk groups according to age, comorbidities, pregnancy, or child care duties, and their work activities suspended *(216)* (see Tables A5.4, A5.5, and A5.6 in Annex 5). In May, it was determined that these HRH would be reassigned to tasks with no exposure, including telemedicine *(38)*. Ministerial Resolution No. 375, issued by the MoH in June, strengthened prevention measures, prioritized the timely detection of COVID-19 in health workers, and instructed health facilities to apply infection control measures. In May, the decision was made to perform weekly viral testing on rapid response team (ERR) workers *(213)*.

HRH are particularly vulnerable to negative mental health stressors, both because of the uncertainty of facing a new pathology, and the concern of exposing their own families to illness. Work overload in locations with HRH shortage further complicates the issue.

In Peru, expanded management committees and units dedicated to training and occupational safety constantly enhanced the knowledge and skills needed to maximize worker safety, including mental health and psychosocial support, physical safety, and stress and substance use monitoring.[169]

Emergency Decree No. 032 (25 March 2020) *(43)* also granted life insurance for workers hired through the CAS process, later extending these benefits in April to all workers who perform care work in public facilities *(229)*. By July 2020, 56.6% of health workers had received life insurance benefits *(32)*.

169 Response submitted by the Ministry of Health of Peru for the PAHO questionnaire for this study, received on 21 October 2020.

The following actions were also taken increase the well-being of these workers:

- Modified working hours and rotating schedules in areas dedicated to care of patients with COVID-19 and other pathologies, as well as hospital wards and outpatient areas.
- Counseling provided by in-hospital mental health units to prevent burnout. In April 2020, psychosocial accompaniment teams for health workers were formed *(230)*, aimed at detecting exhausted workers and granting them personalized attention and rest.
- Humanitarian teams were placed in charge of the protocol related to deaths.
- Scheduled periods for food and rest, with expansion of dining services, staff bedrooms, and rest areas.
- 10% more staff scheduled whenever possible to attend to exceptional situations.[170]

On 5 June 2020, the Mental Health Plan *(231)* was approved in the context of the COVID-19 pandemic, including mental health promotion actions aimed at the national population and focusing on specific groups, including health workers.

It is important to note that on 18 June 2020, Law No. 31025 recognized COVID-19 as an occupational disease for health workers *(232)*.

5.3.3.2. Training

Training for health workers involved different strategies, both virtual and in-person, by various actors in the health system (information in Table A5.15). Among these efforts, the COVID-19 emergency telemedicine course for health workers taught by the National School of Public Health stands out. By July 2020, this course had been taught to more than 14 000 registered participants *(233)*. Alongside the MoH, the Medical College of Peru also launched a free virtual course for health professionals titled Mental Health Care in the Context of COVID-19 to strengthen technical competencies in mental health care, including self-care *(234)*. When workers were reassigned to other regions, they were also given training in disaster risk management, health response organization, and COVID-19 red alert measures by the Directorate General of Disaster Risk Management and National Defense in Health, a division of MoH Peru *(205, 235)*. Viral testing through the Covid Maskaq mobile laboratory *(236)* has also been strengthened.

According to MoH Peru, **as of September 2020, 60% of health workers in the public system had**

170 Ibid. There is no information on the outcome of this measure.

received training from the National School of Public Health, in the form of virtual courses, the MoH Peru telehealth platform, and ICU internships. The MoH also highlighted the massive advantages provided by these educational resources, although no assessment was done to determine if there was any real improvement among workers.[171]

5.3.3.3. Vaccination

Peru's vaccination plan was drawn up by the MoH alongside its directorates general (see Table A5.16 on legislation for HRH vaccination). The first version, dated 20 October 2020 *(49)*, targeted an estimated 22.2 million people across three phases, out of a total population of 32.7 million *(237)*. **The first phase included health workers from the public and private sectors,** approximately **328 423 people**, according to MoH *(238)*. To avoid confusion, it was specified on 4 February 2021 that any person who provides health services, regardless of their employment and contractual status, would be included *(239, 240)*.

The Government of Peru, as of 14 February 2021, had arranged for vaccines to be acquired from the following sources *(241)*:

- **Sinopharm:** 38 million total doses, of which the first 300 000 arrived in the country on 7 February 2021. The next 700 000 arrived on 13 February 2021.
- **AstraZeneca:** 14 million doses, which arrived in the second half of 2021.
- **Pfizer:** 20 million total doses, of which 250 000 arrived in March 2021, and 300 000 in April.
- **COVAX Mechanism for Global Access to COVID-19 Vaccines:** 13.2 million doses arrived through this mechanism; 117 000 from Pfizer and 400 000 from AstraZeneca in the first quarter of 2021.

The MoH reported on 26 October 2020 that **it would train 25 000 teams of professionals for immunization** against COVID-19 *(242)*. **Beginning on 23 November 2020, 12 477 health professionals were trained**, of which 7004 were assigned to vaccination and 5473 to monitoring the vaccination campaign. These workers were from the MoH, the military health system, EsSalud, the National Police of Peru, and the Lima Metropolitan System of Solidarity (Sisol), joining nursing staff who were trained in vaccination for a two day in-person workshop in December 2020 *(243)*, alongside Army staff providing support during COVID-19 vaccination *(244)*. **By January 2021, there were 9200 people assigned to the vaccination plan. This figure is expected to reach 18 000** *(245)*. Workers in health establishments and directorates were also trained in the management of solid waste produced by COVID-19 vaccination, as well as identifying and classifying waste to safeguard public and environmental health *(246)*. Finally, in January 2021, more than 4000 health professionals received training on timely reporting of events supposedly attributable to vaccination or immunization (ESAVI) *(247)* (Table 43).

The first phase of the national COVID-19 vaccination plan was launched on Tuesday, 9 February 2021, with the goal of vaccinating 396 258 people. According to data collected by the MoH through the vaccine distribution website *(248)*, 46.92% of the target population had been vaccinated as of 23 February 2021. **On 21 February 2021, the target of vaccinating 141 375 health workers with the first dose was reached**. Workers in ICUs and emergency services related to COVID-19 were prioritized *(249)*.

5.3.4. Funding

Countries have adopted different mechanisms to address the shortage of health workers and respond to the health emergency. These actions have led to significant increases in funding for HRH, PPE, test kits, and health facilities.

171 Ibid.

Table 43. Training for the COVID-19 vaccination plan in Peru

Training topic	Workers trained as of January 2020
Vaccination	7004 health professionals Information on nurses unavailable 9200 total people assigned to vaccination tasks
Vaccination campaign monitoring	5473 health professionals
Vaccination support	10 000 members of the Armed Forces
Solid waste management	No information
ESAVI identification	4000 health professionals

ESAVI: events supposedly attributable to vaccination or immunization.

Sources: Ministry of Health of Peru. Minsa inicia capacitación a profesionales que se encargarán de la vacunación contra la COVID-19. Nota de prensa, 23 de noviembre de 2020. Lima: Ministry of Health; 2020. Available in Spanish from: https://www.gob.pe/institucion/minsa/noticias/315688-minsa-inicia-capacitacion-a-profesionales-que-se-encargaran-de-la-vacunacion-contra-la-covid-19; Ministry of Health of Peru. Digesa capacita a profesionales en gestión y manejo de residuos sólidos para vacunación contra la COVID-19. Press release, 24 November 2020. Lima: Ministry of Health; 2020. Available in Spanish from: https://www.gob.pe/institucion/minsa/noticias/315792-digesa-capacita-a-profesionales-en-gestion-y-manejo-de-residuos-solidos-para-vacunacion-contra-la-covid-19; Ministry of Health of Peru. Digemid capacitó a profesionales de la salud para notificación de eventos adversos relacionados a vacunas COVID-19. Press release, 25 January 2021. Available in Spanish from: https://www.gob.pe/institucion/minsa/noticias/326295-digemid-capacito-a-profesionales-de-la-salud-para-notificacion-de-eventos-adversos-relacionados-a-vacunas-covid-19.

Table 44. Funding the additional cost of measures for human resources for health in Peru's public subsystem

Item	Soles	US$
Additional HRH hiring through the CAS-COVID-19 process up to December 2020 [1]	2 328 001 638	649 900 457
Personal protective equipment [2]	100 000 000	27 721 400
Extension and strengthening of existing community mental health services [2]	18 903 784	5 240 383.60
Special bonus of S/ 720 (US$ 201) granted to 156 025 public sector health workers [1]	919 501 422	256 694 147

CAS-COVID: COVID-19 response service administration contract; HRH: human resources for health; US$: US dollars; S/: soles.

Sources:
1 Response submitted by the Ministry of Health of Peru to the questionnaire sent by PAHO for the purposes of this study, received on 31 March 2021. Data as of December 2020.
2 Response submitted by the Ministry of Health of Peru to the questionnaire sent by PAHO for the purposes of this study, received on 21 October 2020. Data as of August 2020.

The Government of Peru funded the additional costs generated by the pandemic using different mechanisms described below, in accordance with the special powers granted in the health emergency decrees (Table 44) (see also Table A5.18 in Annex 5):

- Direct transfers made by the Ministry of Economy and Finance
- Contingency funds used to transfer items in the fiscal year 2020 public sector budget
- Health sector entities authorized to reallocate economic resources from different items to finance budgetary measures related to the COVID-19 pandemic.

Challenges related to HRH funding and availability during the pandemic originated from health workforce gaps prior to COVID-19 in Peru, which in turn were caused by preexisting funding issues. Budgets were previously reserved for medical residencies, which resulted in insufficient specialist training.[172]

172 Response submitted by the Ministry of Health of Peru to the questionnaire sent by PAHO for the purposes of this study, received on 21 October 2020.

5.4. Conclusions and challenges

Table 45 summarizes the availability, training, protection, well-being, and remuneration strategies and mechanisms used in Peru to strengthen HRH and respond to the COVID-19 pandemic.

Table 45. Human resources for health strategies and mechanisms for COVID-19 pandemic response in Peru

Strategy	Implementation mechanism
Pillar 1. Prepare to provide an initial response to the health emergency	
Estimate HRH needs for the initial COVID-19 response	• Need to hire 2610 health professionals and 270 non-care professionals to provide care for suspected, probable, and confirmed cases in public establishments for a period of three months. • Beginning in April 2020, it was determined that it was necessary to identify health workers belonging to risk groups for immediate exemption from work activities. • As of August 2020, 30 486 public sector health workers (14.9%) were in the risk groups. • Administrative staff (33%) and care technicians (27%) are the groups with the highest percentage of people at risk, followed by doctors (13%) and nurses (12%).

Strategy	Implementation mechanism
Pillar 2. Strengthen HRH to increase response capacity in the health system	

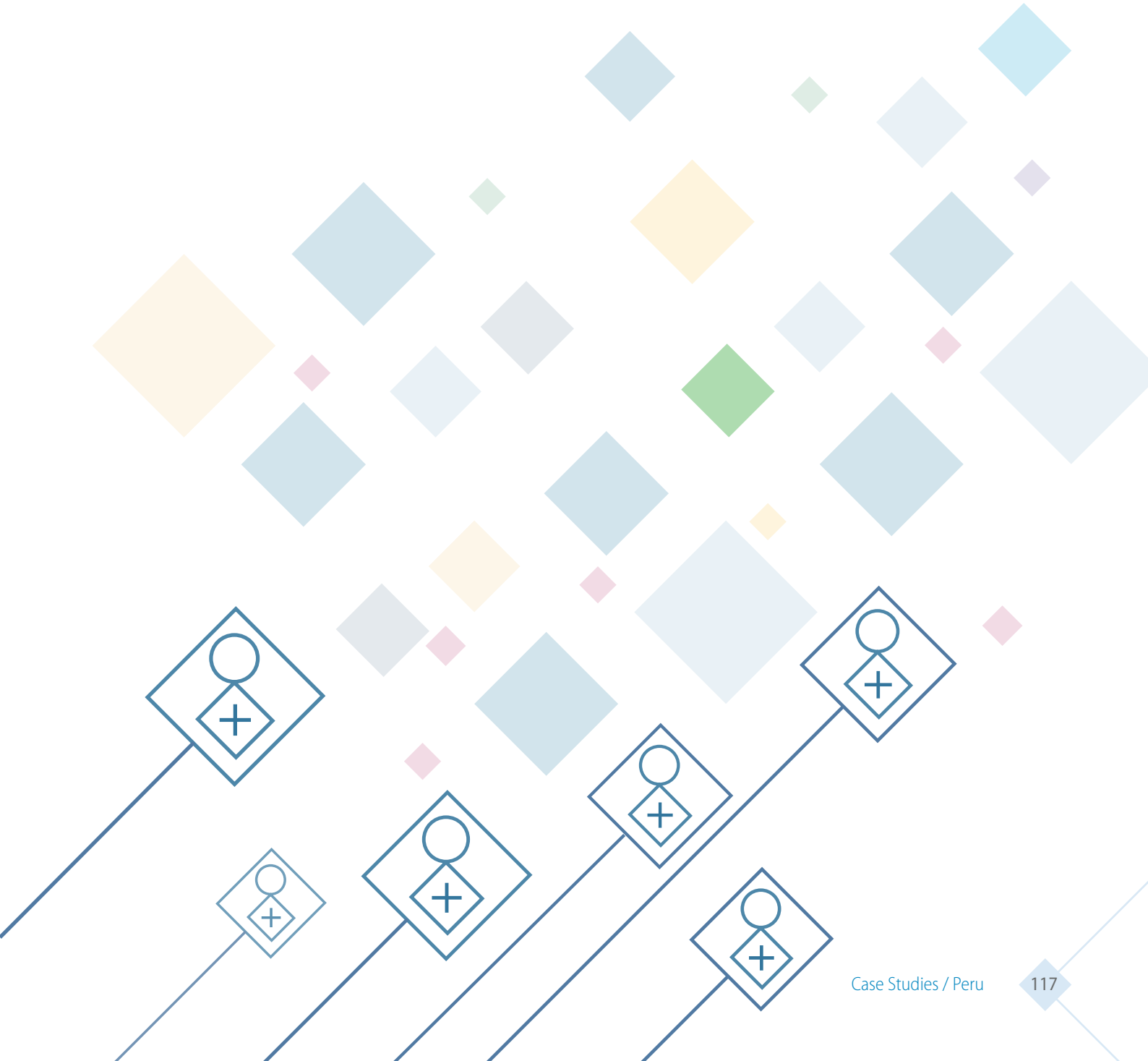
Increase availability of HRH caring for suspected, probable, or confirmed COVID-19 cases	• The following mechanisms were used to increase HRH capacity:
	  ◦ Hiring requirements eliminated (CAS) (41 322 people as of December 2020) and increased wages (CAS-COVID) to attract more recruits (2885 as of December 2020)
	  ◦ Care workers reassigned from non-COVID-19 tasks to COVID-19 care (80 202 as of August 2020)
	  ◦ Workers in the process of completing training in SERUMS, medical residencies and internships incorporated (5048 as of August 2020)
	  ◦ Supplementary services (overtime) by workers who were already providing services in facilities before the COVID-19 pandemic (11 662 as of August 2020)
	  ◦ Foreign or domestic professionals who studied abroad authorized to practice without degree validation
	  ◦ International cooperation (92 people as of December 2020).

Increase HRH availability for intensive care and inpatient units	• Intensive specialists assigned to cover more ICUs, with the support of doctors from other specialties. • Centralized management from MoH Peru of hospital beds and ICUs in all public, private, and mixed health facilities.
Improved working conditions	• Life insurance (as of July 2020, 56.6% of HRH in the public sector had received this benefit). • COVID-19 bonus of S/ 720 per month (64.7% of public sector HRH were recipients as of July 2020).
Define new HRH competencies for COVID-19 prevention and treatment	• Training for health workers on prevention, control, diagnosis, and treatment of COVID-19. • Teletraining for health workers on the use of PPE and ICT.
Occupational safety and health	• Guidelines for preventing SARS-CoV-2 infection in health facilities, including the importance of HRH testing, PPE, and training. • Weekly testing for rapid response teams. • COVID-19 recognized as a direct occupational disease for health workers. • Risk groups identified by age, comorbidities, pregnancy, and child care duties. Individuals in these categories were immediately exempted from care tasks and reassigned to lower exposure activities, such as telemedicine. • Symptoms monitored. • Mental health plan created. • Measures centered on food and rest to promote well-being.
Pillar 3. Review and update measures	
Maintain HRH availability	• Response plan for the second wave of COVID-19. • Vaccination plan prioritizing HRH. • Extension of the COVID-19 bonus.

COVID-19: coronavirus disease 2019; HRH: human resources for health; ICT: information and communication technologies; ICU: intensive care unit; PPE: personal protective equipment; SARS-CoV-2: severe acute respiratory syndrome coronavirus 2; SERUMS: rural and urban health service .

5.5. Pending actions

Most of the measures were put in place to address the COVID-19 health emergency. It is therefore necessary to create a plan to maintain the public sector workforce hired during the COVID-19 outbreak, through a recruitment or appointment process that allows redistribution where necessary and that maintains improvements in working conditions. The lack of budget has made this task even more challenging. This is the main obstacle to fulfilling commitments made before the pandemic, such as third stage salary increases *(250)*. This factor is indispensable considering that HRH is the most important resource to ensure timely and quality health service. They must be protected with proper wages and policies to ensure the well-being of HRH. One way to achieve this is to officially regulate the health career pathway. Finally, HRH gaps must be closed, both in terms of numbers and skills.

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Annexes

Annex 1. Plurinational State of Bolivia

Additional human resources for health indicators

Table A1.1.
Estimation of new human resources for health hires by intervention area in health services in the Plurinational State of Bolivia

Area of intervention	HRH quantity
Intensive care units	2461
Hospital and emergency	1989
Laboratory	42
COVID-19 care networks	188
Monitoring and epidemiological surveillance	2431
Isolation centers	479
MoH institutional support	38
Total	**7628**

COVID-19: coronavirus disease 2019; HRH: human resources for health; MoH: Ministry of Health.

Source: Response submitted by the Ministry of Health and Sports of Bolivia (Plurinational State of) to the questionnaire sent by PAHO for the purposes of this study, received on 2 December 2020. Data as of July 2020.

Table A1.2.
Financial planning for hiring human resources for health in the Plurinational State of Bolivia

Area of intervention	HRH	Three-month cost (BOB)	Three-month cost (US$)
Intensive care	2066	67 598 628.00	9 854 027.41
Hospital and emergency	1720	41 633 076.00	6 068 961.52
Diagnostics and laboratories	42	1 169 532.00	170 485.71
SEDES and REDES	177	5 375 607.00	783 616.18
Contact tracing and community surveillance	3000	49 316 400.00	7 188 979.59
Isolation centers for suspected and positive cases	474	6 490 065.00	946 073.62
National COVID-19 care team	5	216 255.00	31 524.05
Total	**7484**	**171 799 563.00**	**25 043 668.08**

BOB: bolivianos (national currency); HRH: human resources for health; REDES: unit of health service networks; SEDES: departmental health services; US$: US dollars.

Source: Response submitted by the Ministry of Health and Sports of Bolivia (Plurinational State of) to the questionnaire sent by PAHO for the purposes of this study, received on 2 December 2020. Data as of April 2020.

Human resources for health legislation

Recruitment

Table A1.3.
Legislation for human resources for health recruitment in the Plurinational State of Bolivia

Date	Description	Area	Regulation
24 April 2020	Authorized the Agency for Health Infrastructure and Medical Equipment to manage and recruit HRH for the duration of the national health emergency.	Recruitment	Supreme Decree No. 4224
12 May 2020	MoH Bolivia authorized the direct hiring of health worker consultant services to contain the COVID-19 pandemic nationwide.	Recruitment	Ministerial Resolution No. 0260

MoH Bolivia: Ministry of Health and Sports of Bolivia (Plurinational State of); HRH: human resources for health.

Remuneration

Table A1.4.
Legislation on human resources for health remuneration in the Plurinational State of Bolivia

Date	Description	Area	Regulation
21 May 2020	Specialists were authorized to work double shifts and receive double salary.	Remuneration	Law No. 1298 (2020)

Occupational safety and health and infection prevention and control

Table A1.5.
Legislation on occupational safety and health and infection prevention and control for human resources for health in the Plurinational State of Bolivia

Date	Description	Area	Regulation
17 March 2020	Declared a nationwide health emergency and quarantine. Special leave to remain at home was granted to workers, including HRH, with underlying illnesses, persons over 60 years of age, women who are pregnant or on maternity leave, and parents or guardians of children under 5 years of age.	Infection prevention and control	Supreme Decree No. 4196
14 April 2020	Insurance provided for COVID-19 health professionals and workers. Insurance coverage includes total and permanent disability or death, for the sum of BOB 100 000 (US$ 15 000) in both cases.	Occupational safety and health	Supreme Decree No. 4217
1 July 2020	Lifted the national health emergency declaration and required HRH to return to their work duties.	Infection prevention and control	Supreme Decree No. 4245

BOB: bolivianos (national currency); COVID-19: coronavirus disease 2019; HRH: human resources for health; US$: US dollars.

Funding

Table A1.6.
Legislation on human resources for health funding in the Plurinational State of Bolivia

Date	Description	Regulation
13 July 2020	MoH Bolivia authorized the Agency for Health Infrastructure and Medical Equipment to use funding from the World Bank to hire all health professionals.	Ministerial Resolution No. 0344

Protests and attacks

Table A1.7.
Compiled media reports on human resources for health protests and attacks on human resources for health in the Plurinational State of Bolivia

Date	Description	Area
2 April 2020	Doctors from Cochabamba and Santa Cruz demanded, under threat of protest, that the Government resolve the lack of PPE.[1, 2]	Protest
7 April 2020	The report narrates the reluctance of HRH to attend COVID-19 cases from the moment the first case was registered, which becomes a problem for health services; for example, the country's first case of COVID-19 was denied hospitalization. Doctors in hospitals where the coronavirus has circulated have self-isolated without objective justification. The association of intensive care physicians has warned that its members would not be able to treat COVID-19 patients. Private clinics have also refused to care for these patients. In all these cases, the lack of biosecurity conditions and equipment was given as the cause of refusing treatment.[3]	Protest
30 April 2020	HRH mobilize, claiming lack of protective equipment and other medical supplies. Among the complaints is a shortage of body bags.[4]	Protest
30 January 2021	The Medical College of Bolivia announced a 24-hour general strike in rejection of the COVID-19 Health Emergency Law, which included the following guidelines that HRH considered harmful: • Prohibition on interruptions of health services due to strikes, protests, or demonstrations in the medical sector. • Recruitment of doctors who completed their studies outside the country. • Intervention by the central government in the jurisdiction of local authorities in the event that the latter are overwhelmed by the emergency. The organization also called for a return to a strict quarantine due to the number of deaths caused by the second wave of COVID-19.[5]	Protest

Date	Description	Area
1 February 2021	The Medical College of Bolivia decided to suspend the general strike after a meeting with the Government, in which the latter agreed to include proposed changes in the Health Emergency Law.[6, 7]	Protest
2 February 2021	Doctors demanded that a total quarantine be declared in Santa Cruz due to the uptick in COVID-19 cases, as the region had 75% of all cases.[8]	Protest
6 February 2021	Despite various adjustments agreed upon between the Government and the Medical College in the Health Emergency Law passed by parliament on 4 February, the regional colleges rejected the agreement, encouraging non-compliance and threatening strikes.[9]	Protest
9 February 2021	HRH in Santa Cruz began a 48-hour strike, demanding a mandatory quarantine to curb the pandemic.[10]	Protest
19 February 2021	Outside a hospital in La Paz, health workers demanded payment of their salaries.[11, 12]	Protest
22 February to 19 March 2021	On 19 February 2021, HRH began an indefinite strike, accompanied by protests against the Health Emergency Law.[13–26]	Protest
7 April 2020	A doctor reported that neighbors would not let her enter or leave her house for fear of being infected by SARS-CoV-2.[27]	Attacks
31 July 2020	• A survey conducted on attacks on HRH in Bolivia (Plurinational State of) found that, out of 184 responses, 77.2% reported being the victim of some type of aggression, especially women. Most of the attacks were directed at doctors (72%) in healthcare centers and on the way to and from work. The most common types of hostility were verbal aggression, followed by discrimination, physical violence, and death threats. In 8.3% of cases a police escort was required, but only 42% of cases were reported to the police. Of the people surveyed, 94% know of other HRH affected by similar situations. • 12 attacks on HRH were reported in the regions of Cochabamba (5), La Paz (2), El Alto (2), Beni (1), Oruro (1), and Santa Cruz (1) between April and June 2020.[28]	Attacks

COVID-19: coronavirus disease 2019; HRH: human resources for health; PPE: personal protective equipment; SARS-CoV-2: severe acute respiratory syndrome coronavirus 2.

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24 Agencia EFE. Personal sanitario boliviano hace una numerosa caravana contra ley sanitaria. Swissinfo.ch; 24 March 2021. Available in Spanish from: https://www.swissinfo.ch/spa/coronavirus-bolivia_personal-sanitario-boliviano-hace-una-numerosa-caravana-contra-ley-sanitaria/46477474.

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Annex 2. Chile

Additional human resources for health indicators

Table A2.1.
Human resources for health confirmed cases as a percentage of total confirmed cases in Chile

Number of confirmed cases in the total population		Number of HRH confirmed cases		HRH cases as a percentage of total confirmed cases	
09/13/20[1]	01/03/21[2]	09/13/20[1]	03/01/21[2]	09/13/20[1]	01/03/21[2]
492 135	706 921	37 510	52 241	7.62%	7.39%

HRH: human resources for health.

Sources:
1 Ministry of Health of Chile. Informe epidemiológico, 25 de septiembre del 2020. Características del personal de salud confirmados con COVID-19. Santiago: Ministry of Health; 2020. Available in Spanish from: https://www.minsal.cl/wp-content/uploads/2020/09/Personal-de-Salud-Covid-3092020.pdf.
2 Ministry of Health of Chile. Informe epidemiológico, 12 de enero del 2021. Características del personal de salud confirmados y probables de COVID-19. Santiago: MoH Chile; 2021. Available in Spanish from: https://www.minsal.cl/wp-content/uploads/2021/02/2021-01-21_Informe-PS-COVID-19.pdf.

Table A2.2.
Human resources for health deaths as a percentage of total deaths in Chile

Number of deaths in the total population		Number of HRH deaths		HRH deaths as a percentage of total deaths	
09/13/20[1]	01/03/21[2]	09/13/20[1]	01/03/21[2]	13/09/20[1]	01/03/21[2]
12 245	17 352	72	102	0.59%	0.59%

HRH: human resources for health.

Sources:
1 Ministry of Health of Chile. Informe epidemiológico, 25 de septiembre del 2020. Características del personal de salud confirmados con COVID-19. Santiago: Ministry of Health; 2020. Available in Spanish from: https://www.minsal.cl/wp-content/uploads/2020/09/Personal-de-Salud-Covid-3092020.pdf.
2 Ministry of Health of Chile. Informe epidemiológico, 12 de enero del 2021. Características del personal de salud confirmados y probables de COVID-19. Santiago: MoH Chile; 2021. Available in Spanish from: https://www.minsal.cl/wp-content/uploads/2021/02/2021-01-21_Informe-PS-COVID-19.pdf.

Table A2.3.
Distribution of confirmed human resources for health cases in Chile by region

Region	Accumulated cases as of 09/13/20[1]		Accumulated cases as of 01/03/21[2]	
	HRH	Distribution by region (%)	HRH	Distribution by region (%)
Santiago Metropolitan Area	23 065	61.5	26 961	51.6
Valparaíso	3303	8.8	4753	9.1
Biobío	2081	5.5	4611	8.8
Libertador General Bernardo O'Higgins	1511	4.0	2120	4.1
Maule	1092	2.9	1941	3.7
Los Lagos	575	1.5	1833	3.5
Araucanía	570	1.5	1720	3.3
Magallanes y la Antártica Chilena	564	1.5	1371	2.6
Antofagasta	1040	2.8	1266	2.4
Ñuble	719	1.9	1235	2.4
Coquimbo	869	2.3	1099	2.1
Tarapacá	631	1.7	1024	2.0
Arica y Parinacota	494	1.3	724	1.4
Los Ríos	91	0.2	666	1.3
Atacama	260	0.7	352	0.7
Aysén del General Carlos Ibáñez del Campo	13	0.0	146	0.3
Unidentified	632	1.7	419	0.8
Total	**37 510**	**100.0**	**52 241**	**100.0**

HRH: human resources for health.

Sources:
1 Ministry of Health of Chile. Informe epidemiológico, 25 de septiembre del 2020. Características del personal de salud confirmados con COVID-19. Santiago: Ministry of Health; 2020. Available in Spanish from: https://www.minsal.cl/wp-content/uploads/2020/09/Personal-de-Salud-Covid-3092020.pdf.
2 Ministry of Health of Chile. Informe epidemiológico, 12 de enero del 2021. Características del personal de salud confirmados y probables de COVID-19. Santiago: MoH Chile; 2021. Available in Spanish from: https://www.minsal.cl/wp-content/uploads/2021/02/2021-01-21_Informe-PS-COVID-19.pdf.

Table A2.4.
Distribution of confirmed human resources for health cases in Chile by sex and age group

Age group (years)	Male	Female	Total
18-19	30	157	187
20-24	1021	4799	5820
25-29	3253	11 085	14 338
30-34	3211	8924	12 135
35-39	1833	4867	6700
40-44	984	2916	3900
45-49	680	2211	2891
50-54	644	1671	2315
55-59	539	1272	1811
60-64	380	670	1050
65-69	149	271	420
70-74	79	74	153
75-79	33	23	56
≥80	26	19	45
Unidentified			420
Total	**12 862**	**38 959**	**52 241**
Distribution by sex	**25%**	**75%**	**100%**

Source: Ministry of Health of Chile. Informe epidemiológico, 12 de enero del 2021. Características del personal de salud confirmados y probables de COVID-19. Santiago: Ministry of Health; 2021. Available in Spanish from: https://www.minsal.cl/wp-content/uploads/2021/02/2021-01-21_Informe-PS-COVID-19.pdf.

Human resources for health legislation

Recruitment and reassignment

Table A2.5.
Legislation on human resources for health recruitment and reassignment in Chile

Date	Description	Area	Regulation
5 February 2020	MoH Chile, Seremi, and the health services are granted the following powers: • direct recruitment of workers on a temporary basis to address emergencies, without the need to meet other requirements • transfer of necessary workers from other agencies or establishments, through service commissions • arrangements for special work; i.e., after normal work hours, at night, or on Saturdays, Sundays, and holidays • temporary hiring of former officials for the duration of the health emergency who have taken advantage of the voluntary retirement bonus, without applying the legal prohibitions and conditions normally requiring return of the bonus in such cases • hire students who are in the sixth year and above in their medical studies and students in the seventh semester and above in nursing, obstetrics and pediatrics, medical technology, kinesiology, and psychology studies[a] • doctors licensed abroad and whose degree has not been validated authorized to be hired and practice in Chile • doctors hired who have validated their degree obtained abroad, even if they have not yet passed the National Medical Examination.	Recruitment and reassignment	Decree No. 4 (2020)[a]
20 March 2020	Establishes measures for professionals in the assignment and training cycle and medical interns.	Reassignment	Judgement No. 714 (2020)
20 March 2020	Specifies that three hiring mechanisms can be used: 1) hiring via lump sum contracts; 2) hiring via the labor code; and 3) purchase of 24/7 patient care services.	Recruitment	Judgement No. 715 (2020)
20 March 2020	Supplementing Decree No. 4 (2020), gives the following instructions to health services directors: • provide for professionals released from duty to perform extra care work, including shifts, for a total of up to 22 hours per week • modify work schedules and shift systems to the extent required to ensure optimized care capacity; establish varied start times, shifts on days off, or 24-hour shifts, among other measures • contract professionals and establishments directly through exclusive service agreements • apply extraordinary measures to fill vacancies.	Recruitment and reassignment	Judgement No. 718 (2020)

MoH Chile: Ministry of Health of Chile; Seremi: regional ministerial health secretariats.

Notes:
a Amended by: Decreto 6 del 7/03/2020, Decreto 19 del 06/06/2020, Decreto 24 del 19/07/2020.

Incentives and remuneration

Table A2.6.
Legislation on human resources for health incentives in Chile

Date	Description	Area	Regulation
29 December 2020	Special COVID-19 health emergency bonus of CLP 200 000 (US$ 272)	Incentives	Law No. 21306 (2020)

CLP: Chilean pesos; COVID-19: coronavirus disease 2019; US$: US dollars.

Occupational safety and health, infection prevention and control, and well-being

Table A2.7.
Legislation on occupational safety and health and infection prevention and control for human resources for health in Chile

Date	Description	Area	Regulation
22 January 2020	Establishes that care for suspected or confirmed cases will be carried out in compliance with standard precautions for infection control in health care, including: • hand hygiene • use of PPE • prevention of punctures and cuts with sharp objects • respiratory hygiene and cough and sneeze etiquette • handling of equipment, waste, and patient clothing • use of clinical material and medical devices reprocessed in accordance with current high-level regulations on sterilization and disinfection.	Occupational safety and health	Official Letter CP No. 1553 (2020)
17 March 2020	Defines the remote work procedure for HRH in risk groups: • health workers returning from abroad that must comply with quarantine • pregnant women • parents and caregivers of children under the age of 18 • people 60 years of age and above • those under quarantine order.	Infection prevention and control	Resolution No. 182 (2020)
18 March 2020	Reporting protocol with five-item checklist: • compliance with standard and additional precautions • HAI prevention training for workers • unit arrangements for the care of suspected or confirmed COVID-19 cases • patient flow in the facility • ambulance transfer for patients with suspected or confirmed COVID-19 diagnosis.	Infection prevention and control	Judgement No. 670 (2020)

Date	Description	Area	Regulation
1 April 2020	Orders each facility to implement measures to protect its health workers, with strict compliance with the PPE use protocol issued by the Ministry of Health.	Occupational safety and health	Resolution No. 156 (2020)
3 April 2020	Instructions for optimizing PPE use: • PPE is not to be used when not directly caring for patients • additional precautions are only used when dealing with patients with suspected or confirmed COVID-19 diagnosis, including hand hygiene and use of aprons, gloves, eye protection, and surgical masks • N95 masks are only to be used for higher risk procedures • extended use of surgical masks, N95 masks, FFP2 or equivalent masks, face shields, and waterproof gowns is recommended, that is, continuous use without removal or replacement • disinfection for the reuse of face shields.	Occupational safety and health	Memo C37 No. 2 (2020)
23 April 2020	Recommendations on HRH management for COVID-19-related care provided to the directors of the public system, the private system, and the Armed Forces, focusing on safety in patient care and protection from risks for health workers.	Occupational safety and health	Judgement No. 1218 (2020)
27 April 2020	Based on Law No. 16744 (1968), the Social Security Superintendency declared COVID-19 to be an occupational related disease for workers in health facilities.	Occupational safety and health	Opinion No. 1482 (2020)
29 April 2020	Health services instructed to reprocess N95 and FFP2 masks in special and exceptional situations.	Occupational safety and health	Memo No. 005 (2020)
1 June 2020	Life insurance for all care and non-care HRH, covering 235 000 people working in the public sector; this insurance was valid retroactively from the beginning of the pandemic until 31 December 2020.	Well-being	Not available
8 July 2020	Instructions for studying HAI outbreaks in the COVID-19 pandemic.	Occupational safety and health	Judgement No. 2124 (2020)
19 December 2020	Life insurance coverage extended until 31 March 2021.	Well-being	Not available

COVID-19: coronavirus disease 2019; HAI: healthcare-associated infections; HRH: human resources for health; PPE: personal protective equipment.

Vaccination

Table A2.8.
Legislation on human resources for health vaccination in Chile

Date	Description	Regulation
24 December 2020	Approved the technical-operational recommendations for vaccination against SARS-CoV-2 on vaccine safety, cold chain, information systems, social communication, training, supervision, control, inventory, monitoring and verification of coverage, and campaign organization.	Resolution No. 1138 (2020)
3 September 2020	Supplements Resolution No. 1138 (2020): • included foreigners residing in the country in the target population • authorized all health workers with the necessary skills to administer vaccines and provide quick response to post-vaccination reactions in the event of a shortage of vaccination staff.	Resolution No. 136 (2021)

SARS-CoV-2: severe acute respiratory syndrome coronavirus 2.

Funding

Table A2.9.
Legislation on human resources for health funding in Chile

Date	Description	Regulation
19 March 2020	Allocated up to 2% of the annual State budget to the Ministry of Health. The maximum amount available is CLP 1 185 640 409 680 (US$ 1 635 001 092), under the Economic Emergency Plan package.	Decree No. 333 (2020)

CLP: Chilean pesos; US$: US dollars.

Protests and attacks

Table A2.10.
Compiled media reports on human resources for health protests and attacks on human resources for health in Chile

Date	Description	Area
9 November 2020	Call for HRH to mobilize on 12 and 13 November 2020 to denounce overwhelming working conditions, low wages, and the precarious 2021 health budget, with a cut of 3.3% compared to 2020.[1, 2]	Protest
16 November 2020	Call to HRH to mobilize on 18, 19, and 20 November 2020 against the lack of response by the Government, breach of the promise to pass a law in Congress to grant a COVID-19 bonus, and finally, non-payment of the User Treatment Bonus, suspended due to the impossibility of assessing HRH during the pandemic.[3, 4]	Protest
22 November 2020	Call for HRH to hold an indefinite national strike starting on 23 November 2020 to protest the lack of concrete responses to demands. The strike involved more than 60 000 workers throughout the country.[5, 6]	Protest
12 January 2021	Attacks by family members of deceased persons refusing to accept that they are not allowed to approach the body occur daily in different hospitals around the country. As a result, HRH decided to mobilize in favor of more security.[7]	Attacks and protests

COVID-19: coronavirus disease 2019; HRH: human resources for health.

Sources:

1 TeleSURtv.net. Convocan a paro médico contra recortes en Salud en Chile. TeleSURtv.net; 9 November 2020. Available in Spanish from: https://www.telesurtv.net/news/chile-paro-nacional-sector-salud-protesta-contra-gobierno-20201109-0020.html.

2 Carranza Jimenez DC. Trabajadores de la salud protestan en Chile por falta de recursos para su sector. AA.com.tr; 13 November 2020. Available in Spanish from: https://www.aa.com.tr/es/mundo/trabajadores-de-la-salud-protestan-en-chile-por-falta-de-recursos-para-su-sector/2042162.

3 DiarioUchile. Trabajadores de la salud anuncian extensión y radicalización del paro. DiarioUchile; 16 November 2020. Available in Spanish from: https://radio.uchile.cl/2020/11/16/trabajadores-de-la-salud-anuncian-extension-y-radicalizacion-del-paro/.

4 Rico Barrera SM. Chile reclama mayor presupuesto para la atención en salud. Consultorsalud.com; 17 November 2020. Available in Spanish from: https://consultorsalud.com/chile-reclama-mayor-presupuesto-atencion-salud/.

5 DiarioUchile. Nacional e indefinido: Trabajadores de la salud inician paralización este lunes. DiarioUchile; 22 November 2020. Available in Spanish from: https://radio.uchile.cl/2020/11/22/nacional-e-indefinido-trabajadores-de-la-salud-inician-paralizacion-este-lunes/.

6 Rico Barrera SM. 60 mil médicos en Chile están en paro indefinido. Consultorsalud.com; 24 November 2020. Available in Spanish from: https://consultorsalud.com/60-mil-medicos-chile-entraron-paro-indefinido/.

7 Aguilar Córdoba A. Médicos y enfermeras denuncian constantes agresiones de familias de pacientes con COVID-19 en Chile. AA.com.tr; 12 January 2021. Available in Spanish from: https://www.aa.com.tr/es/mundo/m%C3%A9dicos-y-enfermeras-denuncian-constantes-agresiones-de-familias-de-pacientes-con-covid-19-en-chile/2107515.

Annex 3. Colombia

Additional human resources for health indicators

Table A3.1.
Human resources for health cases as a percentage of total cases in Colombia

	04/24/20	10/01/20	11/12/20	12/10/20	04/28/20
Number of cases in the total population	3977	835 339	1 174 012	1 392 133	2 824 626
Number of HRH cases	306	10 154	19 732	21 832	56 270
HRH cases as a percentage of total cases	7.69	1.22	1.68	1.57	1.99

HRH: human resources for health.

Source: National Institute of Health. COVID-19 en personal de salud en Colombia. Bogotá: INS; 2020. Available in Spanish from: https://www.ins.gov.co/Noticias/Paginas/coronavirus-personal-salud.aspx.

Table A3.2.
Human resources for health deaths as a percentage of deaths in Colombia

	04/24/20	10/01/20	11/12/20	12/10/20	04/28/20
Number of deaths in the total population	189	26 196	33 491	37 995	72 725
HRH deaths	4	68	99	103	267
HRH deaths as a percentage of deaths in the total population	2.12	0.26	0.30	0.27	0.37

HRH: human resources for health.

Source: National Institute of Health. COVID-19 en personal de salud en Colombia. Bogotá: INS; 2020. Available in Spanish from: https://www.ins.gov.co/Noticias/Paginas/coronavirus-personal-salud.aspx.

Table A3.3.

Distribution of HRH cases in Colombia by source of transmission and occupational group

Occupational group	Number of cases by occupational group	Workplace related cases	Percentage of workplace related cases	Community cluster	Percentage of cases in the community cluster	Other sources of transmission	Percentage of cases from other sources of transmission
Nursing assistants	6880	4918	71	999	15	963	14
Doctors	2987	2147	72	410	14	430	14
Administrative staff	2878	1338	46	1033	36	507	18
Nurses	2386	1751	73	290	12	345	15
Psychology	299	96	32	136	45	67	23
Pharmacists	195	77	39	86	44	32	17
Respiratory therapists	165	132	80	11	7	22	13
Surgical assistants	153	114	75	14	9	25	16
Advanced radiology and diagnostic imaging technicians	127	90	71	20	16	17	13
Advanced pre-hospital technicians	64	44	69	8	13	12	18
Epidemiology and public health	63	48	76	11	17	4	7
Social workers	62	28	45	23	37	11	18
Biomedical engineers	42	10	24	25	60	7	16
Other health workers	5531	2740	50	1075	19	1716	31
Total	**21 832**	**13 533**	**62**	**4141**	**19**	**3423**	**19**

Source: National Institute of Health. COVID-19 en personal de salud en Colombia. Boletín N.° 74, 28 de abril del 2021. Available in Spanish from: https://www.ins.gov.co/Noticias/Paginas/coronavirus-personal-salud.aspx. Data as of 10 December 2020.

Table A3.4.

Comparison of doctor and nurse availability according to various sources of information in Colombia

Occupational group	Total number of NHWA (year)[a]	Density per 10 000 population according to NHWA (year)	Total number according to the Observatory of Human Talent in Health (MoH Colombia) (year)[1]	Density per 10 000 population according to the Observatory of Human Talent in Health (MoH Colombia) (year)[b]	Average density per 10 000 population in LAC[2] (33 countries)	Average density per 10 000 population in the OECD[2] (36 countries)
Nurses	70 042 (2019)	13.91 (2019)	62 184 (2017)	12.2 (2017)	28	88
Nursing assistants	275 228 (2018)	55.42 (2018)	255 591 (2017)	49.9 (2017)	N/A	N/A
Doctors	108 499 (2018)	21.85 (2018)	103 026 (2017)	20.25 (2017)	20	35

LAC: Latin America and the Caribbean; MoH Colombia: Ministry of Health and Social Protection of Colombia; NHWA: National Health Workforce Accounts; OECD: Organisation for Economic Co-operation and Development; N/A: data not available.

Notes:

a The latest data available for nurses are from 2019. World Health Organization. WHO National Health Workforce Accounts Data Portal. Geneva: WHO. Available from: https://apps.who.int/nhwaportal/.

b The density of doctors and nurses per 10 000 population was calculated based on the total population of Colombia: 50 882 891 in the year 2018. National Administrative Department of Statistics. Censo Nacional de Población y Vivienda, 2018. Bogotá: DANE; 2018. Available in Spanish from: https://www.dane.gov.co/index.php/estadisticas-por-tema/demografia-y-poblacion/censo-nacional-de-poblacion-y-vivenda-2018.

Sources:

1 Observatory of Human Talent in Health of Colombia. Indicadores básicos. Bogotá: Ministry of Health; 2017. Available in Spanish from: https://www.sispro.gov.co/observatorios/ontalentohumano/Paginas/Indicadores.aspx. Does not include specialties.

2 Organisation for Economic Co-operation and Development. Health at a Glance: Latin America and the Caribbean 2020. Paris: OECD; 2020. Available from: https://www.oecd.org/health/health-at-a-glance-latin-america-and-the-caribbean-2020-6089164f-en.htm.

Table A3.5.

Total human resources for health distribution by occupational group and educational level in Colombia

Assistants	Administrative assistants	4193
	Nursing assistants	254 104
	Dental assistants	29 590
	Public health assistants	1746
	Pharmaceutical assistants	22 352
Technicians	Prehospital technicians	518
	Cytohistology technicians	150

Advanced technicians	Prehospital care technicians	2206
	Advanced cytohistology technicians	1201
	Advanced open-source diagnostic and therapeutic management technicians	33
	Senior radiodiagnostic and radiation therapy technicians	111
	Advanced radiology and diagnostic imaging technicians	3545
	Advanced radiation therapy technicians	145
	Advanced pharmaceutical technicians	23 791
University professionals	Bacteriologists	22 828
	Nurses	62 184
	Physiotherapists	29 483
	Speech therapists	11 694
	Surgical assistants	10 775
	Doctors	103 026
	Nutritionists and dieticians	8089
	Dentists	49 247
	Optometrists	5506
	Pharmaceutical chemists	7397
	Occupational therapists	6969
	Respiratory therapists	5844
	Subtotal	323 042
	Total	**666 727**

Source: Observatory of Human Talent in Health of Colombia. Core indicators. Bogotá: Ministry of Health; 2017. Available in Spanish from: https://www.sispro.gov.co/observatorios/ontalentohumano/Paginas/Indicadores.aspx. The number of HRH with postgraduate education is not specified.

Table A3.6.

Priority human resources for health for COVID-19 patient care in Colombia

Occupational group	Total
Specialists [a]	6875
General practitioners	75 676
Nurses	59 358
Therapists [b]	33 397
Assistants	260 241
Total	**435 547**

Notes:
a Total number of specialists in adult and pediatric critical care, internal medicine, anesthesiology, and general surgery.
b Total professionals in physiotherapy and respiratory therapy.

Source: Ministry of Health and Social Protection of Colombia. Estimaciones de disponibilidad, requerimientos y brechas de talento humano en salud – THS– para la atención COVID-19 en unidades de cuidado intensivo, cuidado intermedios y hospitalización de baja complejidad. Bogotá: Directorate of Human Resources for Health Development; 2020. Available in Spanish from: https://www.minsalud.gov.co/sites/rid/Lists/BibliotecaDigital/RIDE/VS/TH/estimaciones-thcovid19.pdf.

Human resources for health legislation

Recruitment and reassignment

Table A3.7.
Legislation on human resources for health recruitment and reassignment in Colombia

Date	Description	Area	Regulation
24 and 28 March 2020	Multidisciplinary health teams are established to ensure continuity in PHC: • Protection for vulnerable at-risk groups • EPS are responsible for organizing and implementing multidisciplinary health teams; departmental and municipal directorates are responsible for monitoring.	Recruitment and reassignment	Resolutions No. 502 and 521 (2020)
12 April 2020	Open recruitment drive for health workers: • All HRH practicing or studying; students in their final year of undergraduate studies, graduate students, and graduates of health programs • Universities can allow early graduation for undergraduate (final year) and graduate students in clinical areas • HRH must be trained.	Recruitment	Colombian Presidential Decree No. 538 (2020)
24 April 2020	The resolution, adopted by MoH Colombia, establishes criteria, procedures, and schedules for national recruitment According to the *Plan of Action for Health Services during the Containment and Mitigation Stages of the COVID-19 Pandemic*,[1] the regional health department supports the HRH search. If necessary, the MoH will hold a national recruitment drive.	Recruitment	Resolution No. 628 (2020)
19 May 2020	Temporary license to practice for HRH serving in the Compulsory Social Service The additional spots in the Compulsory Social Service are distributed as follows: 1200 openings in medicine, 1300 in nursing, and 230 in bacteriology, with defined assignment locations and tasks.	Recruitment	Colombian Presidential Decree No. 778 (2020)
20 May 2020	Formalized the health response strategy adopted to face the SARS-CoV-2 (COVID-19) pandemic in Colombia and created an advisory committee to guide policy decisions.	Recruitment	Resolution No. 779 (2020)

COVID-19: coronavirus disease 2019; EPS: health promotion entities; HRH: human resources for health; PHC: primary health care.

Sources:
1 Plan de acción para la prestación de servicio de salud durante las etapas de contención y mitigación de la pandemia por SARS-CoV-2 (COVID-19). Bogotá: Ministry of Health and Social Protection; 2020. Available in Spanish from: https://www.minsalud.gov.co/Ministerio/Institucional/Procesos%20y%20procedimientos/PSSS01.pdf.

Incentives and remuneration

Table A3.8.
Legislation on human resources for health incentives and remuneration in Colombia

Date	Description	Area	Regulation
11 July 2012 17 December 2002	• Recognition of occupational accident and occupational disease if a causal relationship with occupational risk factors is demonstrated. • Temporary disability benefits are equivalent to 100% of contributory base salary.[1, 2]	Existing regulation on legislative and administrative provisions for social protection	Articles 3 and 4 of Law No. 1562 (2012) and Article 3 of Law No. 776 (2002)
12 April 2020	Temporary economic recognition as a proportion of the average taxable base income of each occupational group. This is not a salary factor; it can be requested only once.	Incentives	Colombian Presidential Decree No. 538 (2020)
6 October 2020	Formalized temporary HRH benefits. ADRES is responsible for transfer of funds. Available resources: • COP 452 777 000 000 • 247 504 health professionals, assistants, and others working in epidemiological surveillance, representing 37.1% of total HRH.[a] • 61 288 HRH beneficiaries (equivalent to COP 94 781 000 000),[3] that is 24% of 247 504 HRH have received the bonus. Regulation of the National Medical Residency System, with recognition of more than 5000 medical residents; 3297 residents also benefited from the credit scholarship program in 2019. The compensation will be three payments of the current minimum wage (approximately COP 2 650 000).[4]		Resolution No. 1774 (2020)

ADRES: Resources Administrator for the General System of Social Security in Health; COP: Colombian pesos; HRH: human resources for health.

Notes:
a In 2017, there were an estimated 666 831 HRH. See: Observatory of Human Resources for Health of Colombia. Indicadores básicos. Bogotá: Ministry of Health and Social Protection. Available in Spanish from: https://www.sispro.gov.co/observatorios/ontalentohumano/Paginas/Indicadores.aspx and Andean Health Agency-Hipólito Unanue Agreement Operativización de la Política y el Plan Andino de Recursos Humanos de Salud 2018-2022: informe final. Lima: ORAS – CONHU; 2019. Available in Spanish from: http://www.orasconhu.org/portal/sites/default/files/file/webfiles/doc/POLITICA_ANDINA_DE_RECURSOS_HUMANOS_EN_SALUD.pdf.

Sources:

1 Ley No. 776 del 17 de diciembre de 2002. Por la cual se dictan normas sobre la organización, administración y prestaciones del Sistema General de Riesgos Profesionales. Bogotá: Congress of the Republic of Colombia; 2002. Available in Spanish from: https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=16752.

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3 Ministry of Health and Social Protection of Colombia. Minsalud entrega balance de pagos de bonificaciones al talento humano. Boletín de Prensa N.° 852. Bogotá: Ministry of Health and Social Protection; 21 October 2020. Available in Spanish from: https://www.minsalud.gov.co/Paginas/Minsalud-entrega-balance-de-pagos-de-bonificaciones-al-talento-humano.aspx.

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Occupational safety and health, infection prevention and control, and well-being

Table A3.9.
Legislation on occupational safety and health and infection prevention and control for human resources for health in Colombia

Date	Description	Area	Regulation
March 2020	The document *Biosecurity Guidelines to Prevent Occupational Exposure to COVID-19* is developed, aimed at health professionals: • Stresses the importance of testing health workers • Actions for health professionals in case of exposure to COVID-19. • Lists types of PPE by activity • Highlights the need for training on proper PPE use • Contains tools to address PPE shortages. • Stigmatization (guideline for communication). • Report on work accident procedures mandated for OHMs.	Occupational safety and health	GPSG04 Guide 2020
March 2020	Communication guidelines to avoid COVID-19 stigma.	Well-being	GPSG04 Guide 2020
31 March 2020	*Plan of Action for Providing Health Services during the Containment and Mitigation Stages of the SARS-CoV-2 (COVID-19) Pandemic:* • Prevent cross transmission in health institutions • Protect high risk groups • Guarantee biosecurity and PPE conditions for all health workers • Guarantee supplies, medicines, and other elements necessary for patient care • Redirect the use of installed capacity to patients with SARS-CoV-2 (COVID-19) infection • Expand installed capacity to mitigate saturation • Improve HRH availability.	Infection prevention and control	Resolution No. 536 (2020) (PSSS01, version 1)
31 March 2020	While it applies only to public occupational hazard managers, employers are responsible for worker safety. OHMs conduct prevention activities. 7% of resources must be allocated to PPE acquisition and promotion and prevention activities.	Infection prevention and control	Resolution No. 500 (2020)

Date	Description	Area	Regulation
30 March 2020	• Treatment for mental wellness and stress management for HRH. • OHMs are responsible for implementing procedures in their preventive and support roles.	Well-being	GPSG03 Guide 2020
	• Free national hotline for ongoing counseling for ICU staff (AMCI Intensive Support Network). In 11 weeks of operation, more than 500 calls were received and 70 ICU1 specialists contributed.	Well-being	
12 April 2020	Guidance for proper use of PPE by health professionals at work and at home.	Occupational safety and health	GPSG04 Guide 2020
12 April 2020	• Private OHM are responsible for funding and delivering PPE to their affiliates. • PPE costs will be reimbursed by ADRES.	Infection prevention and control	Colombian Presidential Decree No. 538 (2020)
24 April 2020	Biosecurity protocol for COVID-19 management. Employer or contractors have the following obligations: • Inform EPS and occupational risk insurance companies of suspected and confirmed COVID-19 diagnoses • Receive support from the occupational risk insurance company when identifying and assessing risks, and promote health and disease prevention actions alongside EPS • Request assistance and technical advice from occupational risk insurance companies • Provide employees with PPE that must be used to fulfill work duties performed for the employer.	Occupational safety and health	Resolution No. 666 (2020)
19 May 2020	COVID-19 recognized as a direct occupational disease for health workers, including administrative, cleaning, surveillance, and support staff.	Occupational safety and health	Colombian Presidential Decree No. 676 (2020)
19 May 2020	OHM must bear the costs of testing and diagnosis.	Infection prevention and control	Colombian Presidential Decree No. 676 (2020)
20 May 2020	HRH given priority for SARS-CoV-2 testing (every 15 days).	Infection prevention and control	Resolution No. 779 (2020)

ADRES: Resources Administrator for the General System of Social Security in Health; EPS: health services entities; HRH: human resources for health; ICU: intensive care unit; OHM: occupational hazard managers; PPE: personal protective equipment.

Source: Ministry of Health and Social Protection of Colombia. La AMCI fortalece capacidades del talento humano en salud. Boletín de Prensa N.° 501. Bogotá: Ministry of Health and Social Protection; 21 July 2020. Available in Spanish from: https://www.minsalud.gov.co/Paginas/La-AMCI-fortalece-capacidades-del-talento-humano-en-salud.aspx.

Training

Table A3.10.
Human resources for health trained in Colombia

Institution	Trained health workers
ASCOFAME, SENA, PAHO, and virtual Ministry of Health seminars[1]	• 83 991 people by 30 July 2020. • 111 318 people as of 21 October 2020: Training in COVID-19-related topics for 14.65% of total HRH dedicated to COVID-19 mitigation and containment.
Free virtual training by ASCOFAME[2]	• Multidisciplinary team-building course taken by 37 000 professionals, of whom 16 000 (43%) received certification. • Clinical laboratory strengthening and training; 17 facilities have laboratories that process diagnostic tests. • Continuous implementation of courses for PHC professionals, and other courses focusing on self-care and chronic patient caregivers.
Free virtual training[3]	• ASCOFAME, ACOFAEN, AMCCI, SENA, PAHO, University of Antioquia, CES University, the Colombian Association of Scientific Societies (ACSC), the Cardiovascular Foundation, and IETS. • 95 000 people by 31 August 2020. • 47 000 people (49%) received intensive care training.
ACMI[4]	• Creation of a free national hotline for ongoing counseling for ICU staff (AMCI Intensive Support Network). • In 11 weeks of operation, more than 500 calls were received, and 70 ICU specialists contributed.
Training for workers to inform and guide the population on COVID-19	Training on prevention, mask wearing, handwashing, isolation notifications, and identifying signs of COVID-19: • 150 people (helpline 192) • 220 people (Colombian Family Welfare Institute hotline).

ACMI: Colombian Association of Internal Medicine; ACOFAEN: Colombian Association of Nursing Schools; ASCOFAME: Colombian Association of Medical Schools; IC: intensive care; ICU: intensive care units; IETS: Institute for Health Technology Assessment; PAHO: Pan American Health Organization; PHC: primary health care; SENA: National Learning Service.

Sources:

1 Ministry of Health and Social Protection of Colombia. Minsalud entrega balance de pagos de bonificaciones al talento humano. Boletín de Prensa N.° 852. Bogotá: Ministry of Health and Social Protection; 21 October 2020. Available in Spanish from: https://www.minsalud.gov.co/Paginas/Minsalud-entrega-balance-de-pagos-de-bonificaciones-al-talento-humano.aspx.

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3 Ministry of Health and Social Protection of Colombia. Colombia entra en una nueva fase de aislamiento. Boletín de prensa N.° 662. Bogotá: Ministry of Health and Social Protection; 31 August 2020. Available in Spanish from: https://www.minsalud.gov.co/Paginas/Colombia-entra-en-una-nueva-fase-de-aislamiento.aspx.

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Funding

Table A3.11.
Legislation on human resources for health funding in Colombia

Date	Description	Legislation
17 March 2020	• Emergency Relief Fund (FOME) introduced • COP 7.3 billion transferred to MoH Colombia and ADRES • Direct contracting introduced	Colombian Presidential Decree No. 417 (2020)
21 March 2020	• FOME is constituted as a fund attached to the Ministry of Finance and Public Credit created mainly with available resources from FAE and FONPET • Resource supply to address health emergencies • Financial aid for the most vulnerable people	Resolution No. 444 (2020)
31 March 2020	Resources transferred from ADRES to EPS according to the maximum capitation value per number of members	Resolution No. 535 (2020)
17 April 2020	• EPS authorized to use leftover balances as current assets for payment to IPS • Immediate liquidity of COP 1.6 billion	Resolution No. 619 (2020)
17 April 2020	• Debt relief for ADRES, territorial entities, and EPS • CONFIS approved health services not previously included in the capitation reimbursement (COP 2.17 billion) • The requirements for inclusion in the capitation system were simplified (estimated cost: COP 4.7–5.2 billion)	Resolution No. 618 (2020)
7 May 2020	• EPS-IPS contracts • EPS required to maintain payments to IPS for fixed plans • EPS must make a 20% advance payment to IPS for variable plans	Resolution No. 731 (2020)

ADRES: Resources Administrator for the General System of Social Security in Health; CONFIS: High Council for Fiscal Policy; COP: Colombian pesos. EPS: health promotion entities; FAE: Savings and Stabilization Fund; FOME: Emergency Relief Fund; FONPET: National Territorial Entities Pension Fund; IPS: health care provider institutions; MoH: Ministry of Health and Social Protection.

Protests and attacks

Table A3.12.
Compiled media reports on human resources for health protests and attacks on human resources for health in Colombia

Date	Description	Area
13 April 2020	• Protests in response to Colombian Presidential Decree No. 538 (2020) that announced mandatory service[1]	Protest
20 April 2020	• Apartadó Clinic reports unpaid salaries and lack of PPE from the OHM • San Rafael de Leticia Hospital in Amazonas reports a lack of PPE • San Vicente de Paul Hospital in Santa Rosa de Cabal (Risaralda) reported a PPE shortage and lack of contract formalization[2]	Protest
21 April 2020	• Simon Bolivar Hospital[3]	Protest
21 April 2020	• Unpaid wages • Lack of PPE[4] • Complaints of job instability	Protest
25 June 2020	• Repeal of Law No. 100 (1993) • Contracting is done through outsourcing to third parties • Unpaid wages[5]	Protest
	• 242 attacks against medical missions (as of 30 September 2020); an increase of 63% compared to the same period in 2019.[6] • 38% of attacks against health professionals occurred in a pandemic related context, due to either accusations of medical negligence or discrimination for being considered a source of transmission.	Attacks

OHM: occupational hazard managers; PPE: personal protective equipment.

Sources:
1 Portafolio. Sector salud convoca a plantón por decreto 538. Portafolio; 13 April 2020. Available in Spanish from: https://www.portafolio.co/economia/sector-salud-convoca-a-planton-por-decreto-538-539838.
2 Confidencial Colombia. Las protestas del personal de la salud en Colombia. Confidencial Colombia; 20 April 2020. Available in Spanish from: https://confidencialcolombia.com/lo-mas-confidencial/salud-medicos-protestas/2020/04/20/.
3 Arias Bonfante D. Personal de la salud protesta por mejores condiciones para atender pandemia. RCN Radio; 21 April 2020. Available in Spanish from: https://www.rcnradio.com/bogota/personal-de-la-salud-protesta-por-mejores-condiciones-para-atender-pandemia.
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Annex 4. Ecuador

Additional human resources for health indicators

Table A4.1.
Objectives and pillars of Ecuador's COVID-19 Preparation and Response Plan

Objectives	Pillars
Decrease and stop transmission, prevent outbreaks, and slow the spread	**Pillar 1.** Coordination, planning, and monitoring at the national level through a multisectoral mechanism for COVID-19 response.
	Pillar 2. Risk communication and community participation through a crisis communication plan, alongside COVID-19 prevention and preparedness strategies.
	Pillar 3. Surveillance, rapid response teams, and daily case investigation with information disaggregated by province and canton.
	Pillar 4. Entry points designated by the country and with updated and operating contingency plans.
	Pillar 5. National laboratories with the capacity to manage larger volumes of case samples for suspected diagnoses.
Provide optimal care for all patients, especially those with severe symptoms	**Pillar 6.** Revised and improved infection prevention and control (IPC) practices. Goals include: • Less than 10% of health professionals with COVID-19. • 100% of health workers trained in IPC.
	Pillar 7. Manage COVID-19 cases while maintaining regular health services.
	Pillar 8. Operational support and revised logistical aspects in key areas such as supply purchasing or payment to workers.
Minimize the impact of the pandemic on health systems, social services, and activities.	**Pillar 9.** Maintain essential health services during the COVID-19 outbreak.
	Pillar 10. Psychosocial care to preserve the mental health of the population. Goals include: • 100% of HRH involved in the COVID-19 response participating in containment and discharge activities at least every 15 days. • 70% of HRH involved in the COVID-19 response trained in psychological first aid and self-care. • 50% of first level HRH involved in the COVID-19 response trained in emergencies.

COVID-19: coronavirus disease 2019; HRH: human resources for health; IPC: infection prevention and control.

Source: Ministry of Public Health of Ecuador. Plan de preparación y respuesta del Ecuador ante la COVID-19. Quito: Plataforma Gubernamental de Desarrollo Social; 2020.

Table A4.2.
Interagency cooperation agreements in Ecuador

N.°	Agreement	Higher education institutions	Signing date
1	Framework convention for interinstitutional cooperation between the Ministry of Public Health and Escuela Politécnica Estatal del Carchi.	Escuela Politécnica Estatal del Carchi	01/23/2020
2	Framework convention for interinstitutional cooperation between the Ministry of Public Health and Universidad San Francisco de Quito.	Universidad San Francisco de Quito	01/23/2020
3	Specific interinstitutional cooperation convention between the Ministry of Public Health and the Pontificia Universidad Católica del Ecuador on medical specialties.	Pontificia Universidad Católica del Ecuador	02/13/2020
4	Specific interinstitutional cooperation convention between the Ministry of Public Health and the Universidad del Azuay for development of the third cohort of the family and community medicine program.	Universidad del Azuay	02/19/2020
5	Framework convention for interinstitutional cooperation between the Ministry of Public Health and the Universidad de las Fuerzas Armadas.	Universidad de las Fuerzas Armadas	02/27/2020
6	Framework convention for interinstitutional cooperation between the Ministry of Public Health and the Escuela Politécnica del Litoral.	Escuela Politécnica del Litoral	03/05/2020
7	Framework convention for interinstitutional cooperation between the Ministry of Public Health and the Universidad Central del Ecuador.	Universidad Central del Ecuador	03/20/2020
8	Framework convention for interinstitutional cooperation between the Ministry of Public Health and the Universidad San Gregorio de Portoviejo.	Universidad San Gregorio de Portoviejo	04/10/2020
9	Specific interinstitutional cooperation convention between the Ministry of Public Health and the Pontificia Universidad Católica del Ecuador.	Pontificia Universidad Católica del Ecuador	04/10/2020
10	Framework convention for interinstitutional cooperation between the Ministry of Public Health and the Instituto Superior American College.	Instituto Superior American College	04/10/2020
11	Specific interinstitutional cooperation convention between the Ministry of Public Health and the Pontificia Universidad Católica del Ecuador for development of the third cohort of the family and community medicine program.	Pontificia Universidad Católica del Ecuador	04/25/2020
12	Framework convention for interinstitutional cooperation between the Ministry of Public Health and the Universidad Iberoamericana del Ecuador.	Universidad Iberoamericana del Ecuador	08/27/2020

Human resources for health legislation

Recruitment and reassignment

Table A4.3.
Legislation on human resources for health recruitment and reassignment in Ecuador

Date	Description	Area	Regulation
12 March 2020	Through Ministerial Agreement 00126–2020 (11 March), the Ministry of Public Health declared a health emergency and authorized the direct contracting of goods and services required to overcome the emergency. The National Emergency Operational Committee (COE) was activated, led by the Vice President of the Republic and technical pandemic response roundtables in coordination with the decentralized autonomous governments.	Recruitment	Ministerial Agreement No. 126 (2020)
22 June 2020	Article 25 of the Organic Law on Humanitarian Support established that health workers who have worked during the COVID-19 health emergency with an occasional contract or temporary appointment will be immediately granted a permanent position. Regulations limited the scope of the law, so full implementation was not possible due to the high cost of hiring health professionals to face the pandemic.	Recruitment	Organic Law on Humanitarian Support

Occupational safety and health and infection prevention and control

Table A4.4.
Legislation on occupational safety and health and infection prevention and control for human resources for health in Ecuador

Date	Description	Area	Regulation
3 May 2020	Guidelines issued for the return to in-person public service work, such as continued teleworking, special days, and the creation of a plan for a progressive return to in-person work.	Occupational safety and health	Ministerial Agreement No. 117 (2020)

Protests and attacks

Table A4.5.
Compiled media reports on human resources for health protests and attacks on human resources for health in Ecuador

Date	Description
28 April 2020	Fifty HRH protested outside the Eugenio Espejo public hospital in Quito, demanding personal protective equipment, increased health budgets, job stability for health workers, reinstatement of dismissed workers in the sector, and SARS-CoV-2 testing.[1]
20 May 2020	At the General Santo Domingo Hospital, reserved for treating patients with pathologies other than COVID-19, doctors and administrators held a sit-in to protest the dismissal of 15 people who worked in administration and financing.[2]
22 May 2020	Reacting to the decision to end the contracts of 2279 people in the administrative staff, representing 2.8% of the Ministry of Public Health payroll to reduce spending by 10% to 15%, mobilizations were scheduled on 25 May 2020 by confederations and unions representing health workers and professionals.[3,4]
20 July 2020	A group of graduate students in health programs who had earned scholarships protested due to a three-month cancellation of the subsidy agreed in their contracts.[5,6] It should be clarified that, according to the Ministry of Public Health, the reason the subsidies were unpaid was because the graduate students had not submitted the documentation required for processing.
3 August 2020	A group of health workers and professionals mobilized in Guayaquil due to the dismissal of 200 HRH during the COVID-19 health emergency. These HRH had worked during the peak infection period.[7]
19 August 2020	The health unions announced that they would file a lawsuit against the State to demand compensation for the orphans and widows of 120 doctors who died during the pandemic while attending to patients with COVID-19 in public health facilities.[8]
25 August 2020	Doctors mobilized in Guayaquil due to unpaid wages, claiming that there were approximately 5000 health professionals nationwide who had not received their salaries for two months.[9]
15 September 2020	Hundreds of graduate program doctors mobilized in the three main cities of the country due to delays beginning in July 2020 in approved salary payments. Before the pandemic, doctors in graduate programs carried out unpaid internships in public hospitals.[10]

Date	Description
1, 12, 19, 20, and 27 October 2020 13 and 30 November 2020	Legislators, professionals, and health workers announced political and legal actions along with protests, including hunger strikes, to repeal articles 10 and 40 of the Organic Law on Humanitarian Support. Despite the fact that this law establishes measures for permanent HRH positions to all who worked during the COVID-19 health emergency, its regulations limit application and only provide for gradual appointments according to need and budgetary availability.[11–17]

COVID-19: coronavirus disease 2019; HRH: human resources for health.

Sources:

1 Agencia EFE. Personal sanitario protesta por falta de equipos de protección en Ecuador. Primicias: 28 April 2020. Available in Spanish from: https://www.primicias.ec/noticias/sociedad/personal-sanitario-protesta-equipos-proteccion-ecuador/ https://www.primicias.ec/noticias/sociedad/personal-sanitario-protesta-equipos-proteccion-ecuador/.

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Annex 5. Peru

Additional human resources for health indicators

Table A5.1.
Human resources for health availability in Ministry of Health of Peru and regional governments according to occupational group in Peru

Occupational group	August 2020[1]	Proportion (%)[1]	December 2020[2]	Proportion (%)[2]
Care professional	116 052	46.52	118 232	46
Doctors	31 615	12.67	32 309	13
Nurses	42 819	17.16	43 635	17
Obstetrics	17 578	7.05	17 716	7
Dentistry	5460	2.19	5226	2
Biology	3070	1.23	3193	1
Sanitary engineering	191	0.08	186	0
Veterinary	372	0.15	326	0
Nutrition	2053	0.82	1999	1
Psychology	3472	1.39	3832	1
Chemistry	85	0.03	87	0
Pharmaceutical chemistry	3258	1.31	3211	1
Specialist technicians	282	0.11	3904	2
Medical technology	3793	1.52	1808	1
Social work	1791	0.72	280	0
Unspecified health care professional	213	0.09	520	0
Administrative staff	13 823	5.54	13 694	5
Care technician	66 806	26.78	72 220	28
Administrative staff	30 918	12.39	30 401	12
Care assistant	6186	2.48	7636	3
Administrative assistant	15 674	6.28	15 383	6
Total	**249 459**	**100.00**	**257 566**	**100**

Sources:

1 Ministry of Health of Peru. Directorate General of Health Workers. Lima: DIGEP; 2020. Available in Spanish from: http://digep.minsa.gob.pe/. Data as of August 2020.

2 Response submitted by the Ministry of Health of Peru to the questionnaire sent by PAHO for the purposes of this study, received on 31 March 2021. Data as of December 2020.

Table A5.2.

Density of doctors, nurses, and obstetricians per 10 000 population by department in Peru

Department	Density of doctors	Density of nurses	Density of obstetricians	Total density
Piura	8.21	10.19	5.30	23.71
Loreto	8.22	10.53	5.28	24.04
San Martín	8.88	11.22	7.13	27.22
Ucayali	9.40	14.14	6.74	30.28
La Libertad	12.93	13.33	4.25	30.51
Cajamarca	8.12	15.15	7.28	30.55
Lambayeque	12.95	16.77	5.01	34.73
Ancash	10.51	17.03	7.56	35.11
Cusco	12.29	16.82	6.85	35.95
Amazonas	9.23	17.69	9.68	36.60
Ica	14.28	17.84	4.58	36.71
Puno	9.79	19.19	8.00	36.99
Tumbes	12.76	17.26	7.24	37.25
Junín	11.23	18.97	8.50	38.70
Madre de Dios	13.18	21.11	8.46	42.75
Arequipa	18.30	21.11	5.30	44.70
Pasco	13.09	20.63	11.07	44.80
Callao	22.43	18.90	3.63	44.95
Lima	21.57	19.98	4.07	45.63
Huánuco	9.69	22.99	14.05	46.73
Tacna	18.30	21.46	7.25	47.01
Ayacucho	10.46	24.23	13.96	48.65
Moquegua	20.75	29.57	9.75	60.08
Huancavelica	13.99	28.66	18.72	61.37
Apurímac	15.18	33.01	14.21	62.40
Peru	15.20	18.07	6.13	39.39

Source: Ministry of Health of Peru. Directorate General of Health Workers. Lima: DIGEP; 2020. Available in Spanish from: http://digep.minsa.gob.pe/. Data as of December 2020.

Table A5.3.
Density of doctors per 10 000 population by department in Peru, 2013–2020

Department	2013	2014	2015	2016	2017	2018	2019	2020
Amazonas	6.2	7	7.3	7.6	7.9	9.1	9.1	9.2
Ancash	7.5	8.2	8.2	7.9	8.6	8.4	8.9	10.5
Apurímac	9.2	10.2	10.3	10.3	11.2	12.3	12.9	15.2
Arequipa	14.7	16.4	17.4	18.3	17.7	17.6	18.7	18.3
Ayacucho	6.8	7.1	7	7.7	8	8.5	8.5	10.5
Cajamarca	5.5	5.8	5.5	5.7	6.2	6.5	6.6	8.1
Callao	21.7	23.7	24.5	15.5	25.4	22.5	24.4	22.4
Cusco	7.9	8.6	8.4	8	8.6	10	10.6	12.3
Huancavelica	7.7	7.4	7.2	6.9	8.1	9.1	8.7	14.0
Huánuco	5.7	5.8	5.9	5.5	6.1	6.6	6.8	9.7
Ica	12.6	12.7	13.8	14.3	15	15.3	16.4	14.3
Junín	6.4	6.7	6.6	7	7.8	8.4	9.8	11.2
La Libertad	9.5	9.9	11.2	12.1	11.8	11.7	12.4	12.9
Lambayeque	10	10.3	10.7	10.8	10.6	11.6	12.8	13.0
Lima	17.8	17.9	18.3	20.3	18.9	20.5	18.9	21.6
Loreto	4.8	5.2	5.1	5.8	6.2	7.2	7.4	8.2
Madre de Dios	11.1	12	10.8	10.6	0.9	11	11.8	13.2
Moquegua	11.8	11.3	11.9	12	13.4	15.2	16.4	20.8
Pasco	8.9	7.5	7.4	7.7	8.2	10.6	9.8	13.1
Piura	6.1	6.5	6.6	6.7	7	7.2	7.5	8.2
Puno	5.8	6.4	6.3	6.3	6.8	7.2	7.4	9.8
San Martín	5.5	5.7	6.3	6.2	6.4	7.6	7.7	8.9
Tacna	13.7	14.2	14.6	14.6	15.8	16.2	16.2	18.3
Tumbes	9.3	10.4	11.6	12.2	11.8	12.6	11.9	12.8
Ucayali	6.8	7.2	7.3	6.9	7.8	8.3	9.1	9.4

Source: Ministry of Health of Peru. Directorate General of Health Workers Lima: DIGEP; 2020. Available in Spanish from: http://digep.minsa.gob.pe/. Data as of December 2020.

Table A5.4.

Estimate of public subsystem human resources for health in COVID-19 risk groups, by occupational group in Peru

Group	August 2020[a]	Distribution (%)[b]	December 2020[c]	Distribution [c]
Doctors	3829	13	3834	12
Nurses	3623	12	3733	12
Biologists	195	1	200	1
Other health care workers	3488	11	3600	12
Care technicians	8363	27	9470	30
Care assistants	956	3	9050	29
Administrative staff	10 032	33	1205	4
Total	**30 486**	**100**	**31 092**	**100**

Notes:

a Response submitted by the Ministry of Health of Peru to the PAHO questionnaire for this study, received on 21 October 2020. Data as of August 2020.

b Calculations based on August 2020 data from the Observatory of Human Resources for Health under the Directorate General of Health Workers. See: http://digep.minsa.gob.pe/.

c Response submitted by the Ministry of Health of Peru to the questionnaire sent by PAHO for the purposes of this study, received on 31 March 2021. Data as of December 2020.

Table A5.5.

Estimate of public subsystem human resources for health in COVID-19 risk groups, in Peru by department

Department	HRH belonging to risk groups (as of August 2020)[a]	Distribution by department (%)	HRH by department (as of March 2020)[b]	Percentage of HRH at risk [b]
Lima	13 122	43	73 481	17.9
Arequipa	1576	5	8131	19.4
Junín	1387	5	8676	16.0
Puno	1361	4	7457	18.3
La Libertad	1326	4	8918	14.9
Callao	1274	4	8591	14.8
Ica	1111	4	6037	18.4
Ancash	967	3	7628	12.7
Cusco	962	3	7951	12.1
Piura	960	3	9719	9.9
Lambayeque	855	3	6557	13.0
Cajamarca	748	2	8841	8.5
Loreto	674	2	7167	9.4
Ayacucho	656	2	6488	10.1
Huánuco	534	2	5650	9.5
Tacna	485	2	2521	19.2
San Martín	481	2	5755	8.4
Ucayali	433	1	4321	10.0
Apurímac	342	1	5552	6.2
Huancavelica	291	1	4494	6.5
Amazonas	216	1	3874	5.6
Moquegua	206	1	1872	11.0
Pasco	206	1	1857	11.1
Tumbes	190	1	1959	9.7
Madre de Dios	123	0	1178	10.4
Total	**30 486**	**100**	**214 675**	**14.2**

HRH: human resources for health.

Notes:

a Response submitted by the Ministry of Health of Peru to the PAHO questionnaire on this study, received on 21 October 2020. Data as of August 2020.

b Calculations based on August 2020 data from the Observatory of Human Resources for Health under the Directorate General of Health Workers. For more information, see: http://digep.minsa.gob.pe/.

Table A5.6.
Estimate of public subsystem human resources for health in COVID-19 risk groups, in Peru by department

Department	HRH belonging to risk groups (as of December 2020)	Distribution by department (%)	HRH by department (as of December 2020)	Percentage of HRH at risk
Lima	13 258	43	86 813	15.3
Arequipa	1619	5	11 840	13.7
Junín	1395	4	11 650	12.0
Puno	1393	4	10 700	13.0
La Libertad	1367	4	10 339	13.2
Callao	1284	4	10 042	12.8
Ica	1127	4	9494	11.9
Piura	1026	3	9444	10.9
Ancash	1007	3	8975	11.2
Cusco	980	3	8540	11.5
Lambayeque	873	3	8015	10.9
Cajamarca	759	2	7663	9.9
Loreto	707	2	7465	9.5
Ayacucho	693	2	7438	9.3
Huánuco	561	2	7249	7.7
San Martín	504	2	7061	7.1
Tacna	498	2	6251	8.0
Ucayali	427	1	5418	7.9
Apurimac	359	1	5406	6.6
Huancavelica	290	1	4559	6.4
Amazonas	219	1	3453	6.3
Moquegua	216	1	2637	8.2
Pasco	210	1	2574	8.2
Tumbes	195	1	2440	8.0
Madre de Dios	125	0	2100	6.0
Total	**31 092**	**100**	**257 566**	**12.1**

HRH: human resources for health.

Source: Response submitted by the Ministry of Health of Peru to the questionnaire sent by PAHO for the purposes of this study, received on 31 March 2021. Data as of December 2020.

Table A5.7.

Reassignment (temporary) of human resources for health between public subsystem levels for the care of patients with COVID-19, in Peru by occupational group

Occupational group	Number of reassignments [a]	Distribution by occupational group (%) [b]
Care technicians	28 481	36
Nurses	20 640	26
Care professionals	13 822	17
Doctors	12 919	16
Administrative staff	2051	3
Care assistants	1706	2
Biologists	583	1
Total	**80 202**	**100**

Notes:

a Response submitted by the Ministry of Health of Peru to the questionnaire sent by PAHO for the purposes of this study, received on 21 October 2020. Data as of August 2020.

b Calculations based on August 2020 data from the Observatory of Human Resources for Health under the Directorate General of Health Workers. For more information, see Directorate General 0f Health Workers: http://digep.minsa.gob.pe/.

Table A5.8.

Reallocation (temporary) of human resources for health between public subsystem levels for the care of patients with COVID-19, in Peru by department [a]

Department	Number of people [b]	Distribution by department [c]
Lima	19 171	24
Cajamarca	4987	6
La Libertad	4367	5
Piura	3901	5
Arequipa	3703	5
Cusco	3616	5
Puno	3558	4
Loreto	3380	4
Ancash	3206	4
Huánuco	3018	4
Junín	2989	4
Ayacucho	2890	4
Apurímac	2888	4
Amazonas	2402	3
Ucayali	2208	3
Callao	2054	3
San Martín	2036	3
Ica	1945	2
Huancavelica	1919	2
Lambayeque	1919	2
Tacna	1275	2
Tumbes	892	1
Pasco	698	1
Moquegua	692	1
Madre de Dios	488	1
Total	**80 202**	**100**

Notes:

a Figures represent workers by region transferred from non-COVID-19 care to COVID-19 care. For example, in Lima, 19 171 health workers went from doing outpatient work to treating patients with COVID-19.

b Response submitted by the Ministry of Health of Peru to the questionnaire sent by PAHO for the purposes this study, received on 21 October 2020. Data as of August 2020.

c Calculations based on August 2020 data from the Observatory of Human Resources for Health under the Directorate General of Health Workers. See: Directorate General of Health Workers: http://digep.minsa.gob.pe/.

Table A5.9.

Budget transferred to hire human resources for health through the CAS-COVID process in Peru

Regulation	S/	US$
DU 065-2020	95 221 467	26 582 660
DU 087-2020	279 220 461	77 949 045
DU 102-2020	127 248 808	35 523 626
DU 125-2020	278 182 768	77 659 356
DS 400-2020	144 490 564	40 336 949
Total	**2 328 001 638**	**649 900 457**

CAS-COVID: administrative service contract in the context of COVID-19; DU: emergency decree; DS: supreme decree; S/: soles; US$: United States dollars.

Source: Ministry of Health update received on 31 March 2021 with December 2020 data.

Table A5.10.

Budget transferred to fund the COVID Bonus in Peru

Transfer document	S/	US$
142-2020-EF	18 701 423	5 220 814
203-2020-EF	10 040 400	2 802 945
210-2020-EF	88 438 399	24 689 053
237-2020-EF	81 371 520	22 716 216
282-2020-EF	13 040 640	3 640 512
299-2020-EF	101 208 960	28 254 168
348-2020-EF	104 075 280	29 054 349
394-2020-EF	96 626 160	26 974 803
399-2020-EF	100 694 880	28 110 654
424-2020-EF	106 348 320	29 688 906
428-2020-EF	61 466 400	17 159 370
DU 020-2021	137 489 040	38 382 357
Total	**919 501 422**	**256 694 147**

S/: soles; US$: United States dollars; EF: Ministry of Economy of Finance; DU: single decree.

Source: Ministry of Health update received on 31 March 2021 with December 2020 data.

Table A5.11.
Bonuses for public subsystem human resources for health in Peru

Bonus	Value	Associated regulation
Special bonus until 31 December 2020 for State health workers with administrative service contracts (CAS) during the health emergency. Directors and administrative staff are excluded, with the exception of those in charge of epidemiological surveillance tasks.	S/ 720 (US$ 200)	• Emergency Decree No. 026–2020-SA (15 March 2020) • Supreme Decree No. 068–2020-EF (4 April 2020) • Emergency Decree No. 069–2020-SA (17 June 2020)
Special non-remunerative bonus for care workers providing effective COVID-19 care in health insurance (EsSalud) establishments. Monthly bonus in effect until the end of the health emergency.	EsSalud is authorized to determine the value	• Emergency Decree No. 026–2020-SA (15 March 2020) • Emergency Decree No. 113–2020-SA (19 September 2020)
Special monthly bonus of S/ 3000 (US$ 838) medical residents currently in the third or fourth year of intensive medicine or emergency and disaster medicine specialties and performing rotations in priority health facilities.	S/ 3000 (US$ 838)	Emergency Decree No. 039–2020-PCM (16 April 2020)
Remuneration for additional health services performed outside working hours in the same health establishment by care technicians and health care assistants caring for patients with suspected or confirmed COVID-19 diagnosis. The bonus is valid for the months of February, March, and April of the indicated year in health establishments at the first, second, and third level of care managed by MoH Peru and regional governments.	S/ 12 per hour (US$ 3.13)	Emergency Decree No. 020–2021 (17 February 2021)
Special bonus for COVID-19 infection risk exposure, in the months of February and March of the indicated year, for workers in MoH Peru and regional government establishments.	February: S/ 720 (US$ 201) March: S/ 1440 (US$ 402)	• Emergency Decree No. 020–2021 (17 February 2021) • Supreme Decree No. 027-2021-EF (24 February 2021)
Special non-remunerative bonus for care workers providing effective COVID-19 care in EsSalud establishments in the month of March 2021.	EsSalud is authorized to determine the value	Emergency Decree No. 022–2021 (22 February 2021)

CAS: administrative service contracts; COVID-19: coronavirus disease 2019; EsSalud: health insurance; MoH Peru: Ministry of Health of Peru; S/: soles; US$: United States dollars.

Source: Table created based on analysis of the regulations.

Human resources for health legislation

Recruitment and reassignment

Table A5.12.
Legislation on human resources for health recruitment and reassignment in Peru

Date	Description	Area	Regulation
14 March 2020	HRH hired to strengthen the response capacity of the public health system in the following areas for three months: • Epidemiological surveillance, case investigation, and contact tracing. • Patient care and health services organization. • Laboratory surveillance and diagnostic support.	Recruitment	Supreme Decree No. 010-2020-SA[a]
15 March 2020	Temporary authorization granted for foreigners to practice health services.	Recruitment	Emergency Decree No. 026–2020-SA
15 March 2020	MoH Peru given authority over all public, private, and mixed health entities, as well as civil servants and workers, with the power to assign them to special services based on duration or nature of the health emergency, including nationwide application of all measures regarding technical matters and workers.	Reassignment	Supreme Decree No. 044-2020-PCM
1 April 2020	MoH Peru authorized to transfer public and private health workers to any region of the country.	Reassignment	Supreme Decree No. 012-2020-SA
6 April 2020	Recruitment and hiring of additional HRH to attend COVID-19 cases, including the Rural and Urban Health Service (SERUMS).	Recruitment	Ministerial Resolution No. 180-2020-MINSA
11 April 2020	Creation of the Special COVID Service (SERVICER) for Peruvian and foreign health workers. In effect for the duration of the COVID-19 emergency, and subject to the administrative service contract (CAS) process.	Recruitment	Emergency Decree No. 037-2020-PCM
16 April 2020	• Hiring of workers through the CAS process to serve in rapid response and clinical follow-up teams. • Expansion of rotations for doctors and third- or fourth-year residents specializing in intensive or emergency and disaster medicine to serve in priority health establishments for the duration of the national health emergency. • Supplementary service shift extensions for up to 12 hours and up to 8 shifts per month to increase the health service supply, including medical residents.	Recruitment	Emergency Decree No. 039-2020-PCM
20 April 2020	SERUMS regulations modified and extended to foreigners or citizens who graduated from universities abroad. This measure relaxed registration requirements, allowing those in positions outside of their geographical area to offer their services anywhere. Workers included in risk groups due to age, comorbidity, pregnancy, or child care duties were not allowed to participate.	Recruitment	Ministerial Resolution No. 215-2020-MINSAb

Date	Description	Area	Regulation
5 May 2020	To increase human resource capacity, multidisciplinary teams in intensive care units were reorganized with support staff from other disaster services.	Reassignment	Ministerial Resolution No. 254-2020-MINSA
11 May 2020	• Final year medical residents[c] specializing in fields required for the care of patients with COVID-19 may conclude their training early and be hired by MoH Peru through the CAS process. • In emergency situations, residents were authorized to rotate to facilities other than those assigned at the beginning of their programs.	Recruitment	Legislative Decree No. 1512 (2020)[d]
13 May 2020	MoH Peru authorized to hire workers through the CAS process to provide COVID-19 prevention, control, diagnosis, and treatment services. Workers exempt from recruitment tender requirements.	Recruitment	Emergency Decree No. 055-2020-EF
2 August 2020	• On 15 August 2020, health career internships were progressively resumed, and a stipend and health insurance granted to students. • The requirement of a bachelor's degree was temporarily eliminated to hire care workers in public establishments and law enforcement agencies. Only those who had already graduated were required to show proof. Medical students have six months after the end of the health emergency to fulfill qualification procedures and pass the national board examination when appropriate. • Professionals with degrees earned abroad are exempted from revalidation of the degree for the duration of the health emergency. They are also granted a period of six months after the end of the health emergency to comply with revalidation requirements and pass the national board examination.	Recruitment	Emergency Decree No. 090-2020
17 February 2021	Shift extensions for health professionals for the months of February, March, and April in first level of care health facilities categorized as I-3 and I-4, as well as comprehensive intervention teams at the first level of health care or in temporary isolation and monitoring centers managed by MoH Peru and regional governments	Recruitment	Emergency Decree No. 020-2021

CAS: administrative service contracts; COVID-19: coronavirus disease 2019; MoH Peru: Ministry of Health of Peru; HRH: human resources for health; SERUMS: rural and urban health service.

Notes:
a This decree includes National Institute of Health, Social Security in Health (EsSalud), and MoH and regional government health establishments nationwide as part of the plan of action.
b Amended by Resolución Ministerial 258–2020-MINSA (6 May 2020) and 446–2020-MINSA (26 June 2020).
c Specialties or subspecialties of emergency and disaster medicine, infectious and tropical disease medicine, family and community medicine, intensive care, pediatric intensive medicine, internal medicine, pulmonology, and pediatric pulmonology.
d Ministerial Resolution No. 311 (2020) incorporated legal medicine, geriatrics, anesthesiology, and cardiology.

Incentives and remuneration

Table A5.13.
Legislation on human resources for health incentives and remuneration in Peru

Date	Description	Area	Regulation
15 March 2020	• Special bonus for State health workers with administrative service contracts (CAS) during and up to one month after the conclusion of the health emergency. • Special non-remunerative bonus for care workers providing effective COVID-19 care in health insurance (EsSalud) establishments. Monthly bonus in effect until the end of the health emergency.	Remuneration	Emergency Decree No. 026–2020-SA
31 March 2020	Approved the cost/hour calculation for payment for additional services performed by health professionals, including shifts and care procedures.	Remuneration	Ministerial Resolution No. 143-2020-MINSA
4 April 2020	Established a value of S/ 720 (US$ 201) for the monthly non-remunerative bonus, benefiting health workers who provide COVID-19 care. Directors and administrative staff are excluded, with the exception of those in charge of epidemiological surveillance tasks.	Remuneration	Emergency Decree No. 068-2020-EF
11 April 2020	Participants in the Special COVID Service granted certification for hours served in the Rural and Urban Health Service (SERUMS).	Incentive	Emergency Decree No. 037-2020-PCM
16 Apr 2020	Special monthly bonus of S/ 3000 (US$ 838) for third- or fourth-year medical residents specializing in intensive medicine or emergency and disaster medicine and performing rotations in priority health facilities.	Remuneration	Emergency Decree No. 039-2020-PCM
19 June 2020	Improved reference salary scale for public sector health professionals and technicians hired through the CAS process. This contracting process is called CAS-COVID-19.	Remuneration	Ministerial Resolution No. 420-2020-MINSA

Date	Description	Area	Regulation
17 February 2021	• Payment for additional health services performed outside of working hours in the same health establishment by health care technicians and assistants to care for patients with suspected or confirmed COVID-19 diagnosis during the months of February, March, and April of the indicated year, in first, second, and third level of care establishments managed by the Ministry of Health and regional governments. • Special bonus for risk of exposure to COVID-19 during the months of February and March of the indicated year for the following eligible health workers in MoH Peru and regional government establishments: ◦ Health care professionals, technicians, and assistants involved in diagnosis, treatment, and management of patients with suspected or confirmed COVID-19 diagnosis, differentiated triage and home visits, psychosocial accompaniment teams for workers, community mental health centers, or corpse handling. ◦ Workers performing epidemiological surveillance, patient sampling, home visits for patients receiving outpatient care, admission or maintenance tasks, cleaning, or dispatch and delivery of equipment and supplies in health facilities reserved for COVID-19 care. ◦ Rapid response team drivers.	Remuneration	Emergency Decree No. 020-2021
22 February 2021	Special non-remunerative bonus for care workers providing effective COVID-19 care in EsSalud establishments in the month of March 2021.	Remuneration	Emergency Decree No. 022-2021

CAS: administrative service contracts; COVID-19: coronavirus disease 2019; EsSalud: health insurance; MoH Peru: Ministry of Health of Peru; S/: soles; US$: United States dollars.

Occupational safety and health, infection prevention and control, and well-being

Table A5.14.
Legislation on occupational safety and health and infection prevention and control for human resources for health in Peru

Date	Description	Area	Regulation
14 March 2020	Purchase of personal protective equipment (PPE) for health workers.	Occupational safety and health	Supreme Decree No. 010-2020-SA
25 March 2020	• Life insurance for workers hired through the administrative service contract (CAS-COVID) process.	Well-being	Single Decree No. 032–2020-SA

29 March 2020	• Prevention and timely detection measures for health workers:
	  ◦ Training in the use of PPE
	  ◦ Delivery of PPE
	  ◦ Monitoring of care for patients with COVID-19
	  ◦ Monitoring of symptoms
	• Recommendations for PPE use according to the user.
		Occupational safety and health
		Infection prevention and control
			Ministerial Resolution No. 139-2020-MINSA[a]

1 April 2020	• Each public and private facility must ensure that PPE is provided to health workers. • The National Health Resources Supply Center (CENARES) made responsible for ensuring supply and distribution of PPE. • Determines which workers belong to risk groups in order to suspend their work activities. • Establishments must ensure sufficient and quality food and washing of uniforms. • Established a 6-hour workday and mental health care actions.	Occupational safety and health Infection prevention and control Well-being	Supreme Decree No. 012-2020-SA
6 April 2020	Creates proper working conditions: • PPE delivery • Performance of SARS-CoV-2 testing • Monitoring of physical and mental symptoms • Technical guidelines on mental health care for health workers.	Occupational safety and health Testing Well-being	Ministerial Resolution No. 180-2020-MINSA
12 April 2020	Life insurance extended to all workers providing care in public facilities.	Well-being	Single Decree No. 037-2020
16 April 2020	Establishes locations for lodging workers and assigns sample processing to the National Institute of Health to reduce exposure to transmission.	Well-being	Emergency Decree No. 039-2020-PCM
5 May 2020	Direct procurement of PPE.	Occupational safety and health	Ministerial Resolution No. 252-2020-MINSA[b]

Date	Description	Area	Regulation
5 May 2020	• Implemented separate areas for COVID-19 care to reduce exposure for health workers. • Excludes workers in risk groups due to age, comorbidities, or pregnancy from multidisciplinary and response teams, assigning them to other tasks. • Established weekly testing for multidisciplinary teams.	Infection prevention and control Testing	Ministerial Resolution No. 254-2020-MINSA
13 May 2020	CENARES authorized to acquire PPE.	Occupational safety and health	Emergency Decree No. 055-2020-EF
24 May 2020	A Monitoring Committee for Personal Protective Equipment Assignment and Use was created in each IPS to promote responsibility in PPE use, estimate needs, mitigate PPE shortages, and report irregularities.	Occupational safety and health	Ministerial Resolution No. 316-2020-MINSA
5 June 2020	• Mental health plan that defines actions to promote mental health for health workers, among other groups.	Well-being	Ministerial Resolution No. 363-2020-MINSA
9 June 2020	• Strengthened prevention measures and prioritizes the timely detection of COVID-19 in health workers. • Established infection control measures for health facilities.	Infection prevention and control	Ministerial Resolution No. 375-2020-MINSA
12 June 2020	Life insurance for care and administrative workers involved in COVID-19-related work, funded by the Ministry of Health, effective between 30 April 2020 and 30 April 2021.	Well-being	Ministerial Resolution No. 387-2020-MINSA
18 June 2020	Recognized COVID-19 as a direct occupational disease for health workers.	Occupational safety and health	Law No. 31025 (2020)
30 June 2020	Protocols for all health workers and the community on the use of face shields.	Occupational safety and health	Ministerial Resolution No. 447-2020-MINSA
2 July 2020	Approved Technical Health Standard No. 161 for the use of PPE by IPS workers.	Occupational safety and health	Ministerial Resolution No. 456-2020-MINSA

COVID-19: coronavirus disease 2019; IPS: health care provider institutions; PPE: personal protective equipment; SARS-CoV-2; severe acute respiratory syndrome coronavirus 2.

Notes:

a Amended by ministerial resolutions 193–2020-MINSA, 209–2020-MINSA, 240–2020-MINSA, 270–2020-MINSA, 375–2020-MINSA, and 839–2020-MINSA.

b PPE procurement regulated by ministerial resolutions 264–2020-MINSA, 276–2020-MINSA, 284–2020-MINSA, 292–2020-MINSA, 299–2020-MINSA, 301–2020-MINSA, 304–2020-MINSA, 310–2020-MINSA, 323–2020-MINSA, 329–2020-MINSA, 332–2020-MINSA, 333–2020-MINSA, 336–2020-MINSA, 349–2020-MINSA, 355–2020-MINSA, 356–2020-MINSA, 359–2020-MINSA, 373–2020-MINSA, 376–2020-MINSA, 380–2020-MINSA, 390–2020-MINSA, 393–2020-MINSA, 399–2020-MINSA, 407–2020-MINSA, 411–2020-MINSA, 416–2020-MINSA, 429–2020-MINSA, 432–2020-MINSA, 695–2020-MINSA, and 038–2021-MINSA.

Training

Table A5.15.
Legislation on HRH training in Peru

Date	Description	Regulation
4 March 2020	Launch of the PAHO virtual course on COVID-19.	
12 March 2020	Virtual course on surveillance, preparation, and response to the risk of COVID-19 begins, developed by MoH Peru.	
1 April 2020	ENSAP conducts short-term training for health workers on COVID-19 prevention, control, diagnosis, and treatment.	Supreme Decree No. 012-2020-SA
6 April 2020	Teletraining for health workers on PPE use and ICT.	Ministerial Resolution No. 180-2020-MINSA
September 2020	By this time, 60% of public sector health workers had been trained through ENSAP, teleSalud, and ICU internships.	

ENSAP: National School of Public Health; ICT: information and communication technology; ICU: intensive care unit; MoH Peru: Ministry of Health of Peru; PAHO: Pan American Health Organization; PPE: personal protective equipment.

Vaccination

Table A5.16.
Legislation on human resources for health vaccination in Peru

Date	Description	Regulation
19 June 2020	Creation of the Multisectoral Working Group, whose objective is to explore, manage, and seek funding to acquire COVID-19 vaccines.	Ministerial Resolution No. 418-2020-MINSA
3 September 2020	Approved technical health standard NTS No. 165-MINSA/2020/INS: research and development of vaccines against infectious diseases.	Ministerial Resolution No. 686-2020-MINSA
20 October 2020	*National COVID-19 Vaccination Plan.*	Ministerial Resolution No. 848-2020-MINSA
29 January 2021	High-level advisory team created to provide recommendations to MoH Peru on ethical criteria and considerations when making decisions on prioritizing groups to be vaccinated during the National COVID-19 Vaccination Plan.	Ministerial Resolution No. 139-2021-MINSA
30 January 2021	Created the National Universal COVID-19 Vaccination Registry, defined as a data bank intended to improve the response capacity of MoH Peru when implementing the National COVID-19 Vaccination Plan.	Emergency Decree No. 009–2021-SA
4 February 2021	Modified the vaccination phases of the *National COVID-19 Vaccination Plan* and specified the inclusion of any person providing health services, regardless of the process through which they were hired.	Ministerial Resolution No. 161-2021-MINSA
5 February 2021	Approved the National Universal COVID-19 Vaccination Registry.	Ministerial Resolution No. 183-2021-MINSA
9 February 2021	Included the President of the Republic in phase I of the *National COVID-19 Vaccination Plan*.	Ministerial Resolution No. 194-2021-MINSA
9 February 2021	Insurance policy against possible liabilities derived from the use of SARS-CoV-2 vaccines.	Ministerial Resolution No. 198-2021-MINSA
24 February 2021	Approved the first update of the National Universal COVID-19 Vaccination Registry: phase I of the *National COVID-19 Vaccination Plan*.	Ministerial Resolution No. 281-2021-MINSA

Cooperation and donations

Table A5.17.
Legislation on cooperation and donations to increase and protect human resources for health in Peru

Date	Description	Regulation
21 May 2020	Created a brigade of 85 health professionals, doctors, and nurses, specializing in intensive care, internal medicine, pulmonology, epidemiology, and other fields, to support the public health system COVID-19 response in priority regions of Peru.	Framework convention and specific agreement between the Ministries of Health of the Republic of Peru and the Republic of Cuba
25 May 2020	Donation of 7000 KN95 masks from AstraZeneca, Andean Region.	Ministerial Resolution No. 317-2020-MINSA
16 June 2020	Donation of 100 800 masks, 20 064 2019-nCoV RNA test kits (PCR-fluorescence probing), and 5 ventilators from the Alibaba Foundation in cooperation with the Jack Ma Foundation.	Ministerial Resolution No. 397-2020-MINSA
16 June 2020	Donation of 100 packages of surgical masks from the foreign organization Direct Relief.	Ministerial Resolution No. 398-2020-MINSA
2 July 2020	Donation of 250 000 units of surgical masks from Compañía Fidelidad.	Ministerial Resolution No. 445-2020-MINSA
8 July 2020	Donation of medical devices and PPE from PAHO for distribution in the province of Ramón Castilla, department of Loreto.	Ministerial Resolution No. 471-2020-MINSA

Funding

Table A5.18.
Legislation on human resources for health funding in Peru

Date	Description	Regulation
11 March 2020	First special budget of S/ 100 000 000 (US$ 27 752 127).	Emergency Decree No. 025 SA
15 March 2020	• Provided a budget of S/ 90 000 000 (US$ 25 125 000) for the special bonus granted to CAS health workers. • Provided a budget of S/ 28 418 400 (US$ 7 933 470) for the special non-remunerative bonus for effective work performed by EsSalud health workers. • Established a State subsidy for EsSalud to fund disability payments for workers diagnosed with COVID-19.	Emergency Decree No. 026–2020-SA
18 March 2020	Created the Ate Vitarte Emergency Hospital Executive Unit to contract goods, services, and workers.	Emergency Decree No. 032 SA
18 March 2020	Calculated a six-month staffing cost projection of S/ 10 768 548 (US$ 3 006 220) for the ICU and hospitalization implementation plan at the second level of care, prioritizing 378 people per environment.	Ministerial Resolution No. 095 MINSA
16 April 2020	Funding for the implementation of rapid response teams and clinical follow-up teams.	Emergency Decree No. 039 PCM
13 May 2020	• Budget management instructions and mechanisms for the transfer of financial resources. • Authorization to establish care centers and temporary isolation centers at the national level. Resources allocated from the Ministry of Economy and Finance amounting to S/ 392 340 946 (US$ 109 528 514) to fund these centers. • Resources from the Ministry of Labor and Employment Promotion worth S/ 14 000 000 (US$ 3 908 333) allocated to EsSalud.	Emergency Decree No. 055 EF

CAS: administrative service contracts; EsSalud: health insurance; S/: soles; US$: United States dollars.

Protests and attacks

Table A5.19.
Compiled media reports on human resources for health protests and attacks on human resources for health in Peru

Date	Description	Area
18 April 2020	Health workers at the San Cayetano Hospital in Lima protest the lack of protection and demand payment of outstanding wages.[1]	Protest
24 April 2020	Health workers at the Villa El Salvador Emergency Hospital demand better working conditions.[2]	Protest
4 May 2020	Health workers from the Hipólito Unanue National Hospital in Lima mobilize due to the lack of PPE and being forced to work even when experiencing COVID-19 symptoms.[3]	Protest
13 May 2020	Doctors from the Guillermo Almenara Irigoyen Hospital in Lima demand the resignation of Victor Zamora, the Minister of Health, and Fiorella Molinelli, the executive president of EsSalud, for their management of the coronavirus crisis.[4]	Protest
16 June 2020	Doctors mobilize to demand PPE and payment of bonuses.[5]	Protest
26 and 27 August 2020	48-hour strike to demand an increase in the health sector budget, PPE delivery, and better working conditions.[6, 7]	Protest
30 September 2020	Protest due to lack of supplies and unstable working conditions.[8]	Protest
25 November 2020	Health workers demand a salary increase.[9]	Protest
13–29 January 2021	General strike by doctors demanding more medical equipment, salary adjustments, and an increased health sector budget.[10–12] Hunger strike.[13]	Protest
April 2020	Physical assault against the health team at the San Juan de Lurigancho Health Care Center in Lima.[14]	Attacks
27 May 2020	Assault on doctors who arrive in Talara to care for COVID-19 patients.[15]	Attacks

COVID-19: coronavirus disease 2019; EsSalud: health insurance; PPE: personal protective equipment.

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