7 Building resilient primary health care systems requires investments in health workforce

Strengthening health workforce capacity is vital to building resilient health systems that not only address the evolving health needs but also absorb shocks during health emergencies. Across LAC-7 countries, the availability of physicians, general medical practitioners, nurses, and midwives improved over the last two decades. But most LAC-7 countries continued to lag the OECD average in terms of health worker availability. In 2020, all LAC-7 countries experienced shortages in the density of physicians, nurses, and midwives. The gaps between the demand for and supply of health workers are projected to persist in all LAC-7 countries by 2030, with the projected gaps in health worker availability widening in the majority of LAC-7 countries. Considering these trends and projections, the chapter provides a review of the ways in which LAC-7 countries assess their current and future health workforce needs to help inform investment decisions to strengthen health workforce capacity.

Introduction

The COVID-19 pandemic underscored the centrality of investments in human resources for health (HRH) to ensure the evolving health needs of the population are met without interruptions even in the context of health emergencies.

An emerging body of evidence from OECD countries demonstrates that countries with a track record of investing in the HRH capacity of their PHC systems reaped benefits in the course of the COVID-19 pandemic. For instance, prior to the onset of the pandemic, Canada published a new pandemic preparedness plan, which tasked the PHC system with assessing and treating infected patients (Pan-Canadian Public Health Network, 2018[1]). In line with this pandemic plan, multi-disciplinary PHC teams played a key role in managing mild COVID-19 cases within community settings throughout the course of the pandemic. Another example comes from Austria, where multi-disciplinary PHC teams were tasked with the triage and registration of suspected COVID-19 cases, organised testing, and provided care for COVID-19 patients (Pichler, Frühwald and Burgmann, 2020[2]). Other innovative practices at national and sub-national level were also implemented across LAC-7 countries (see Chapters 4, 5, 6).

A key first step in informing efforts to scale up investments in strengthening HRH capacity is assessing current and future health workforce needs (Box 7.1). HRH assessments look at the interplay between demand for and supply of health workers. An oversupply of health workers can mean unemployment among qualified and trained stuff. It also means a waste of limited resources because training medical staff necessitates substantial investments. Conversely, an undersupply of health workers can result in unmet need for care, which is associated with adverse population health outcomes, declines in the quality of care and patient satisfaction. In recognition, efforts to assess HRH needs aim to understand actions needed to achieve a balance between the demand for and supply of health workers. These assessments can help inform policy decisions around the intake of students that will provide the basis for the future health workforce; examine the impact of retirement and immigration policies that influence the stock of available health workers; and assess the impact of HRH reforms.

The goal of this chapter is to review the landscape of health workforce in LAC-7 countries. The chapter starts by documenting the recent trends in the density of physicians, general medical practitioners, nurses, and midwives. This analysis is based on data gathered from OECD databases (OECD, 2022[3]), World Health Organization (WHO) National Health Workforce Accounts Database (WHO, 2021[4]) and official data sources. Next, the chapter turns its attention to assessing the future HRH needs in LAC-7 countries. Results are based on a novel OECD forecast of demand for and supply of health workers by 2030 using country-aggregated data extracted from publicly available datasets and government records. Motivated by the finding that most LAC-7 countries are projected to face widening gaps between the demand for and supply of health workers, the Chapter, then, switches its attention to a comparative assessment of the key features of HRH assessments in LAC-7 countries. Specifically, it looks at:

- the level of decentralisation of tasks and responsibilities associated with HRH assessments;
- data infrastructure and needs to facilitate economic assessment of labour market dynamics in the health sector; and
- methodologies deployed in LAC-7 countries to assess the demand for and supply of health workers.

Findings are generated based on semi-structured interviews with government officials and experts, as well as reviews of academic and grey literature including government reports and documents, and responses by experts to an OECD survey on HRH planning. While the reviews of the literature attempt to be as comprehensive as possible, there may be relevant studies or HRH assessments that may have been missed.

Box 7.1. Why assess current and future health workforce needs?

The COVID-19 pandemic renewed attention to the centrality of investing in health workforce as one of the vital strategies to strengthen the resilience of health systems

The COVID-19 outbreak took a staggering toll on the health workforce around the world. Globally, approximately 7%-11% of health professionals are estimated to have been infected with SARS-CoV-2 (Gómez-Ochoa et al., 2020[5]), with marked geographic differences in the burden of infections. Recently, the WHO estimated that, globally, 80 000 to 180 000 health and care workers lost their lives due to COVID-19 between January 2020 and May 2021, corresponding to about 2-5% of all attributable deaths in the same period (WHO, 2022[6]). Importantly, attributable mortality among health and care workers in the Americas region is estimated to account for more than half of the global death toll among health and care workers (WHO, 2022[6]). Investing in the health workforce is not only paramount to avoiding preventable loss of life, but also crucial to ensure the health needs of the population are met without risking interruptions even in the context of health emergencies.

Demographic, epidemiologic, socio-economic trends

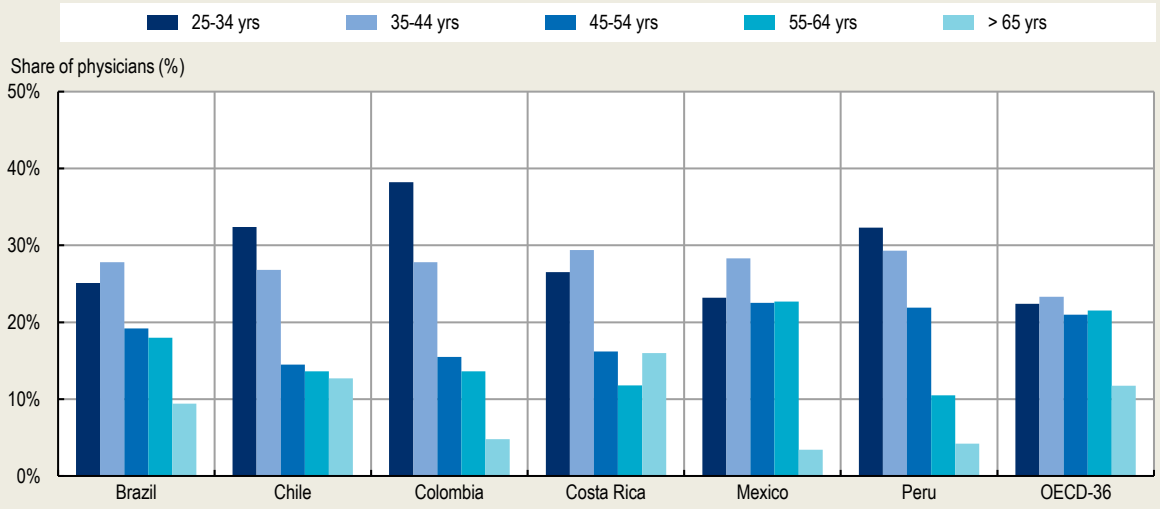
In recent years, all LAC-7 countries undergone profound evolutions in their population structures and demographic profiles (see Chapter 3). Thanks to substantial declines in mortality, driven particularly by declining mortality rates among young children, resulted in rapid population growth over the last two decades (World Bank, 2022[7]). All LAC-7 countries experienced declines in fertility rates, in conjunction with ageing populations (World Bank, 2022[7]). Over the last two decades, life expectancy and healthy life expectancy were rising in all LAC-7 countries until the advent of the COVID-19 pandemic (WHO, 2022[8]). Today, non-communicable diseases are the leading cause of death in all LAC-7 countries, with mortality attributable to cardiovascular disease, cancer, diabetes, and chronic respiratory disease make up 10%-16% of all-cause mortality (World Bank, 2022[7]).

Combined, changes in population structures and demographic profiles promise to have notable effects on health service provision, particularly the delivery of primary care services. In all LAC-7 countries, health needs are evolving in response to longer life expectancy and healthy life expectancy and the persistent burden of non-communicable diseases and chronic conditions. Without a robust emphasis on disease prevention, ageing populations will precipitate a rise in health expenditures. Together, these trends necessitate a significant shift in demand for health services, as well as the type and quality of care required to meet the population health needs. Deficits and shortages in health workforce will exacerbate the existing unmet needs and impact population health outcomes over time.

The profile of health workers is evolving

In all LAC-7 countries, health workforce is marked by a relatively young population compared to the general population (Figure 7.1). Today, the estimated proportion of physicians who are between 25 to 34 years of age ranges from 23% in Mexico to 38% in Colombia (WHO, 2021[4]).Similarly, in Brazil, more than one-third of physicians are estimated to be younger than 35 years of age (Scheffer, 2020[9]). Moreover, the COVID-19 pandemic further highlighted the importance of gender-sensitive approaches to inform the development of health workforce (OECD, 2021[10]; OECD, 2022[11]; OECD, 2020[12]). In addition to these changes, policies concerning the retirement and immigration of health workers influence the profile of health workers available in each country. Examining these changes in the profile of health workers is crucial to ascertain the challenges facing health workers and to help develop policies that influence their career choices and achieve a better match between job vacancies and individual preferences.

Figure 7.1. The share of physicians by age categories, the latest year



Notes: Data for Chile, Colombia and Costa Rica are for the year 2020. Data for Brazil are for the year 2018. Data for Mexico and Peru are for the year 2017. OECD-36 average is calculated based on data for the latest year available gathered for Australia, Austria, Belgium, Canada, Chile, Colombia, Costa Rica, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, Norway, Portugal, Korea, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Türkiye, United Kingdom, United States.
Source: WHO (2021[4]), WHO National Health Workforce Accounts Database, https://apps.who.int/nhwaportal/.

User expectations are shifting

There is substantial room for improvement in patient perceptions of PHC system performance in LAC-7 countries. One recent study found that in Mexico, only about 38% of patients who reported having a regular general practitioner (GP) or a place of care indicated that the GP quality was very good or excellent, whereas this figure stood at 32% in Brazil and 30% in Colombia (Macinko et al., 2016[13]). As LAC-7 countries are striving to improve the quality of care, they will need to respond to user expectations.

It takes time and resources to reap the benefits of interventions that aim to improve the availability and capacity of health workers

Broadly, the highly complex nature of many clinical functions means that health workers who are trained in one technical field cannot simply be redeployed in another technical area to fill the existing gaps. With this constraint in mind, effective HRH planning must ensure that the gaps between the need for and availability of skills are anticipated in time for corrective action to be taken.

Global and regional experiences demonstrate that countries have in their arsenal a large menu of policy options to invest in their health workforce, but it may take time to reap the benefits for these interventions. For instance, some countries may choose to focus on increasing the admissions in medical and nursing education; re-designing initial education and training programs to ensure that the future generation of health workers are armed with the right set of skills that are fit for practice; investing in continuous professional development to ensure the skillset of already practicing health workers reflect the latest developments in technological advancements and job requirements; and putting in place hiring and retention policies to ensure health worker availability across various communities (OECD, 2016[14]).

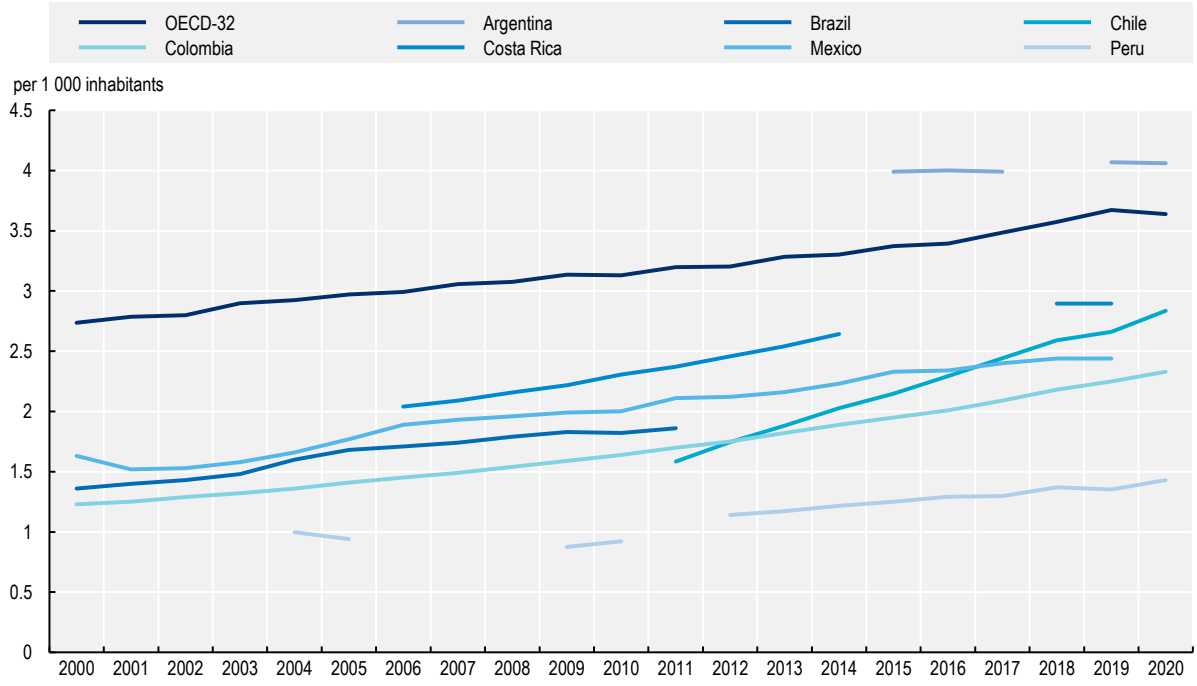
Alternatively, other strategies that can be deployed in a relatively short period either by expanding recruitment opportunities, introducing new categories in the health workforce (e.g. community health workers) or expanding the role of existing categories of health workers, offering flexible career opportunities and non-traditional programs that enable entry into the health workforce (e.g. recruitment programs for foreign trained health workers). While these types of strategies can offer a means to improve the availability of health workers in a relatively shorter period, they can also mean changes in the ways health services are provided and financed, and re-thinking regulations around professional education, quality standards and accreditation practices. Even when these policies are introduced in a relatively shorter period, available evidence demonstrates that it may take time for the beneficial effects of these policies to become observable on population health over time.

Notes: National experts from Mexico estimate that the proportion of practitioners is between 25 and 34 years of age corresponds to about 38%.

Recent trends in health worker availability in LAC-7 countries suggest an expansion of the health workforce

Over the last two decades, the density of physicians improved in all LAC-7 countries, though in most LAC-7 countries, the density of physicians remained below the OECD average (Figure 7.2). In Argentina, the density of physicians remained relatively stable, with a modest increase from 3.2 to 4.1 physicians per 1 000 inhabitants from 2001 to 2020. In this period, Brazil also experienced an expansion in the availability of physicians, though estimates vary depending on the data source (Scheffer, 2020[9]). In Brazil, the number of physicians per 1 000 inhabitants increased from 1.4 in 2000 to 2.3 in 2019. In Chile, physician density increased substantially between 2010 and 2020, rising from 1.6 to 2.8 per 1 000 inhabitants. Costa Rica also experienced an increase in physician density, with the number of physicians increasing from 2 to 2.9 per 1 000 inhabitants from 2006 to 2019. In Colombia, the density of doctors nearly doubled from 2000 to 2020, with the number of physicians increasing from 1.2 to 2.3 per 1 000 inhabitants. Physician density in Mexico also increased markedly and reached 2.4 per 1 000 inhabitants in 2019 from 1.6 in 2000. In Peru, according to the data reported by the Ministry of Health (MoH) and regional governments, the number of physicians per 1 000 inhabitants rose from about 1.1 in 2000 to 1.4 in 2020. Despite these improvements, in most LAC-7 countries, the density of physicians remained below the OECD average of 2.79 per 1 000 inhabitants in 2000 and 3.64 per 1 000 inhabitants in 2020.

Figure 7.2. The number of practicing physicians per 1 000 inhabitants, various years



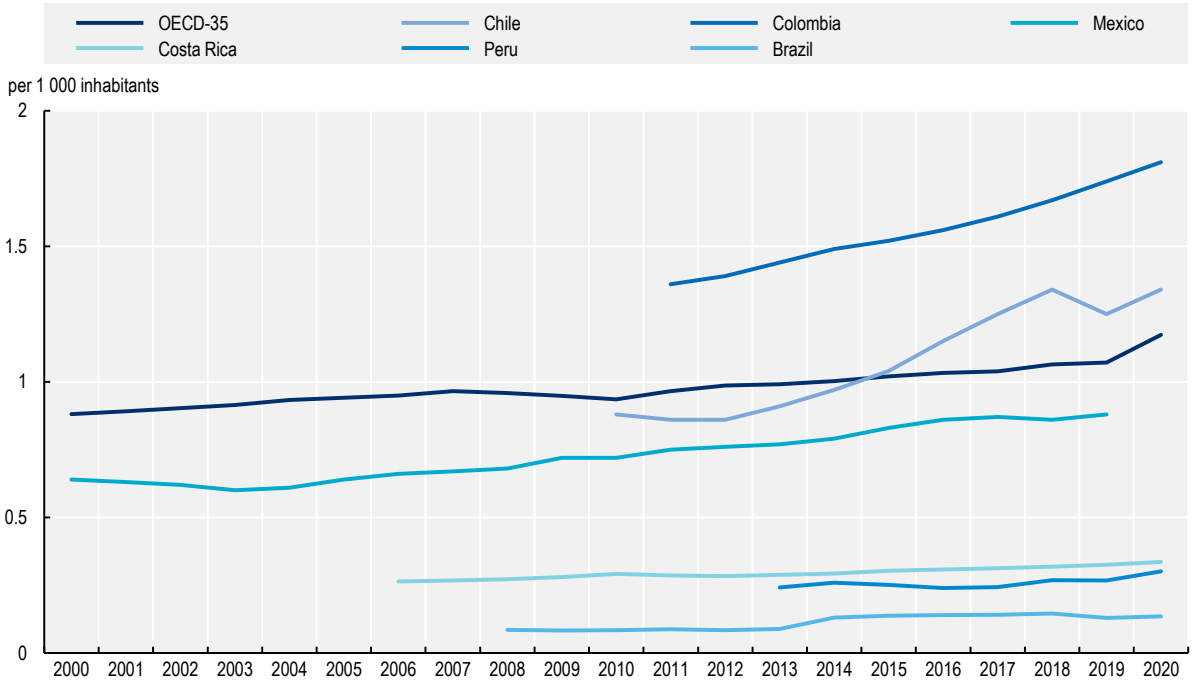
Notes: OECD-32 average is calculated based on data for the latest year available gathered for Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, United Kingdom, and the United States.

Source: Data on the number of practicing physicians per 1 000 inhabitants for all LAC-7 countries except Argentina, Chile, Costa Rica, and Peru were extracted from OECD (2022[3]), OECD Data. Data for Argentina, Chile and Costa Rica were taken from the WHO (2021[4]), National Health Workforce Accounts, https://apps.who.int/nhwaportal/. Data for Costa Rica correspond to information collected by the Social Security Funding and may not reflect all of the providers in the public and the private sector. Data for Peru were taken from the bibliographical series of human resources in health that were reported by regional governments and the Peruvian General Directorate of Health Personnel (2021[15]), http://digep.minsa.gob.pe/publicaciones/bibliografica.html.

There has also been an expansion in the density of general medical practitioners in many LAC-7 countries, though in many LAC-7 countries the density of general medical practitioners remains below the OECD average (Figure 7.3). Standardised information on the availability of general medical practitioners that can facilitate cross-country comparisons is sparse. Despite this, the extant data suggests improvements in the density of general medical practitioners in LAC-7 countries in the last two decades. From 2010 to 2020, Chile experienced an increase in the density of general medical practitioners from 0.9 to 1.3 per 1 000 inhabitants. Similarly, Colombia saw an expansion of its general medical practitioner capacity, with the number of practitioners increasing from 1.4 to 1.8 per 1 000 inhabitants from 2011 to 2020. While Mexico also experienced an increase in the density of general medical practitioners over the last two decades, this increase had a much smaller pace compared to Chile and Colombia. In Mexico, the density of general medical practitioners increased from 0.6 to 0.9 per 1 000 inhabitants from 2000 to 2019. Brazil also saw an increase in the number of practitioners that work at the PHC level, though these data are not directly comparable to those from Chile, Colombia and Mexico. According to data gathered from national data sources, in Brazil, the number of family and community doctors and physicians that work under the umbrella of Family Health Strategy programme and community physicians per 1 000 inhabitants increased from 0.08 in 2008 to 0.13 in 2020. For Costa Rica, data covers only primary health care physicians from 2007 to 2020. Costa Rica saw improvements in the density of PHC physicians. Between 2006 and 2020, the number of PHC physicians increased from 0.26 to 0.34 per 1 000 inhabitants. In Peru, the number of

PHC physicians per 1 000 inhabitants increased from 0.2 to 0.3 per 1 000 inhabitants from 2009 to 2020. Combined, these trends suggest that the density of general medical practitioners remained below the OECD average over the last two decades, where the number of general practitioners increased from 0.9 to 1.2 per 1 000 inhabitants from 2000 to 2020.

Figure 7.3. The number of general medical practitioners per 1 000 inhabitants, various years



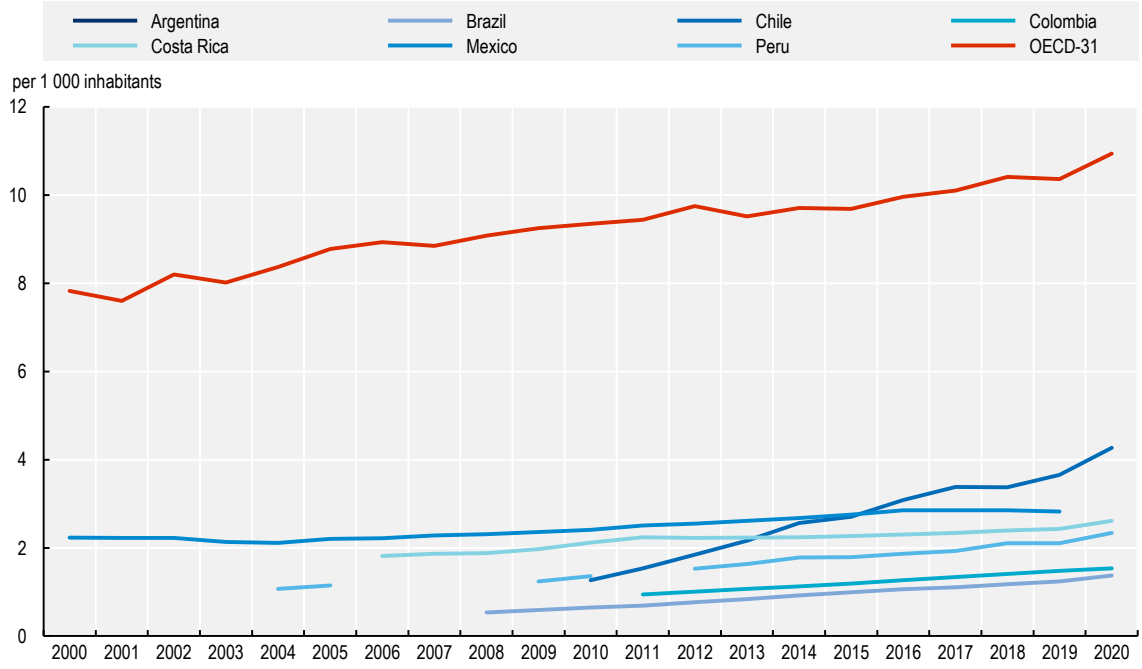
Notes: OECD-35 average is calculated based on data for the latest year available gathered for Australia, Austria, Belgium, Canada, Chile, Colombia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland, Türkiye, United Kingdom, and the United States. For Chile, Colombia and Mexico, as well as other OECD countries, general medical practitioners include general practitioners, district medical doctors, therapists, family medical practitioners, primary health care physicians, medical doctors (general), medical officers (general), medical interns or residents specialising in general practice or without any area of specialisation yet. Data for Chile covers the years from 2010 to 2020 (inclusive). Data for Colombia covers the years from 2011 to 2020 (inclusive). Data for Mexico covers the years from 2000 to 2019 (inclusive). Data for Brazil covers family and community doctors registered in the Federal Council of Medicine and doctors working in the Family Health Strategy for the years 2008 to 2020. For Costa Rica, data covers only primary health care physicians from 2007 to 2020. For the years prior to 2006, information on the number of primary health care physicians in Costa Rica were gathered using a different methodology, which prevents comparative assessment of historical trends. Data for Peru covers only primary health care physicians that were reported by regional governments and the MoH from the year 2014 to 2020.

Source: For Colombia, Chile and Mexico, data are extracted from OECD (2022[3]), OECD Data. For Brazil, data were extracted from (National Registry of Health Establishments in Brazil (2022[16]), http://tabnet.datasus.gov.br/cgi/tabcgi.exe?cnes/cnv/prid02br.def. For Costa Rica, data were obtained through national experts based on information from the Health Services Projection Directorate, Analysis and Projection Area of Historical Health Services (2006-21). Data for Costa Rica correspond to information collected by the Social Security Funding and may not reflect all of the providers in the public and the private sector. For Peru, data were taken from the bibliographical series of human resources in health, Peruvian General Directorate of Health Personnel (2021[15]), http://digep.minsa.gob.pe/publicaciones/bibliografica.html.

In LAC-7 countries, the density of nurses and midwives remained relatively stable over the last two decades though the density of nurses and midwives remained below the OECD average. (Figure 7.4). Information on the availability of nurses and midwives is sparser compared to data on physicians. Data gathered largely from national data sources in LAC-7 countries suggest that the density of nurses and midwives improved modestly in most countries. Specifically, in Argentina, historical data that tracks the number of nurses and midwives over time is largely unavailable. The existing datasets suggests that in

2004, the density of nurses and midwives stood at 0.5 per 1 000 inhabitants compared to 0.4 in 2001. In Brazil, the density of nurses and midwives has been on the rise, with an increase from 0.5 to 1.4 per 1 000 inhabitants from 2008 to 2020. Chile also experienced improvements in the density of nurses and midwives who are licensed to practice from 1.3 to 4.3 per 1 000 inhabitants from 2010 to 2020. Colombia also saw enhancements in the availability of nurses and midwives, but these improvements occurred at a much slower pace compared to Brazil and Chile. In Colombia, the density of nurses and midwives increased from 0.9 in 2011 to 1.5 in 2020 per 1 000 inhabitants. Costa Rica is another LAC-7 country that experienced steady improvements in the availability of nurses and midwives over time. From 2006 to 2020, the density of nurses and midwives increased from 1.8 to 2.6 per 1 000 inhabitants. Over the last two decades, Mexico achieved modest improvements, with the number of nurses and midwives increasing from 2.2 to 2.8 per 1 000 inhabitants from 2000 to 2019. Finally, in Peru, the density of nurses and midwives more than doubled in the last two decades, increasing from 0.9 to 2.3 from 2000 to 2020. While these trends generally point to improvements in the availability of nurses and midwives, it is important to note that the density of nurses and midwives remained below the OECD average in most LAC countries except Chile, where the OECD average increased from 7.8 to 10.9 per 1 000 inhabitants from 2000 to 2020.

Figure 7.4. The number of nurses and midwives per 1 000 inhabitants, various years

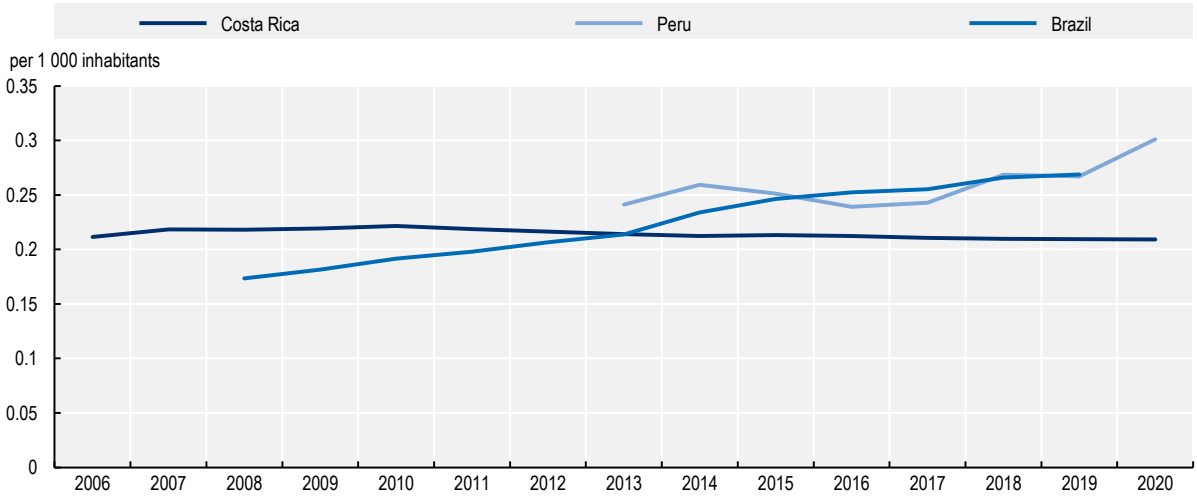


Notes: Data for Colombia and Mexico represents only nurses. OECD-31 includes Austria, Australia, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Slovenia, Spain, Sweden, Switzerland, United Kingdom. Data extracted from OECD (2022[3]) OECD Data reports the number of practicing nurses and midwives for each country expect Chile. For Chile, data reported in the graph above reports the number of nurses and midwives who are licensed to practice because this country currently does not report the number of practicing nurses and midwives to the OECD (2022[3]) OECD Data.

Source: For Colombia, Chile and Mexico, data are extracted from OECD (2022[3]) OECD Data. Data for Brazil were extracted from National Registry of Health Establishments in Brazil (2022[16]), http://tabnet.datasus.gov.br/cgi/tabcgi.exe?cnes/cnv/prid02br.def. Data for Brazil covers the following nursing categories: nurse, Stomach Therapist Nurse, auditor Nurse, community agent strategy nurse, family health strategy nurse, flight nurse, surgical centre nurse, intensive care nurse, occupational nurse, nephrologist nurse, neonatologist nurse, obstetric nurse, psychiatric nurse, childcare and paediatrics nurse, sanitary nurse, family health nurse, and other nurses. For Costa Rica, data were obtained through national experts based on information from the Health Services Projection Directorate, Analysis and Projection Area of Historical Health Services (2006-21). Data for Costa Rica correspond to information collected by the Social Security Funding and may not reflect all of the providers in the public and the private sector For Peru, data were taken from the bibliographical series of human resources in health, Peruvian General Directorate of Health Personnel (2021[15]), http://digep.minsa.gob.pe/publicaciones/bibliografica.html.

Over the last two decades, the number of PHC teams expanded rapidly in Brazil and Peru whereas the number of PHC teams remained relatively stable in Costa Rica (Figure 7.5). Brazil experienced a rapid expansion of PHC teams over the last decade, with the number of PHC teams per 1 000 inhabitants rising from 0.17 in 2008 to 0.27 in 2019. Similarly, in Peru, the number of PHC teams grew by 38% over the past decade, reaching 0.30 PHC teams per 1 000 inhabitants in 2020. In comparison, the number of PHC teams remained relatively stable in Costa Rica, standing at around 0.21 per 1 000 inhabitants between 2006 and 2020.

Figure 7.5. The number of PHC teams per 1 000 inhabitants, various years



Source: Data for Brazil is extracted for all types of PHC teams, National Registry of Health Establishments in Brazil (2022[16]), http://tabnet.datasus.gov.br/cgi/tabcgi.exe?cnes/cnv/prid02br.def. For Costa Rica, data were obtained through national experts based on information from the Health Services Projection Directorate, Analysis and Projection Area of Historical Health Services (2006-21). Data for Costa Rica correspond to information collected by the Social Security Funding and may not reflect all of the providers in the public and the private sector. For Peru, data were taken from the bibliographical series of human resources in health, Peruvian General Directorate of Health Personnel (2021[15]), Information on Human Resources in the Health Sector, http://digep.minsa.gob.pe/publicaciones/bibliografica.html.

Assessing the current and future HRH needs in LAC-7 countries is a complex process

General framework used by the OECD to assess current and future HRH needs in LAC-7 countries

Understanding the factors that influence the current and future HRH needs is a complex process. In recognition, as shown in Figure 7.6, the remainder of the chapter makes use of a general framework for a systematic assessment of the current approaches used by LAC-7 countries to understand the current and future HRH needs (Ono, Lafortune and Schoenstein, 2013[17]). This framework is also used to inform the development of the OECD forecasting model on health workforce needs in LAC-7 countries up to the year 2030 (Box 7.2).

This framework recognises that the current and future HRH needs are tightly linked with the organisation of the health system, and that policies to strengthen the resilience of the health workforce should not be made in isolation from the broader goals and objectives. In accordance with this framework, the supply of health workers refers to the total number of health workers with appropriate qualifications and skills who are willing to accept employment in the health sector and able to match with available vacancies. The

current and future supply is expressed a function of inflow and outflow of health workers, as well as the activities of the current stock of health workers (e.g. working hours) (Ono, Lafortune and Schoenstein, 2013[17]). In comparison, demand for health workers is considered as a combination of willingness and ability of all of the health care purchasers or funders in the health system to have health workers in place to deliver health care services. The current and future demand for health services, and health workers, is expressed as a function of a wide host of factors including demography, epidemiology, health service utilisation and care delivery models, and gross domestic product (GDP) and growth in health spending, as well as other health financing arrangements (e.g. health insurance coverage) and technological advancements (Ono, Lafortune and Schoenstein, 2013[17]).

Figure 7.6. General framework used by OECD analysis to examine current approaches used by LAC-7 countries to assess HRH needs

Source: Adapted from Ono, Lafortune and Schoenstein (2013[17]), "Health Workforce Planning in OECD Countries: A Review of 26 Projection Models from 18 Countries", https://doi.org/10.1787/5k44t787zcwb-en.

A number of challenges may hinder the application of this framework at the country level. In particular, the dearth of information on various drivers of demand for and supply of health workers makes it difficult to assess HRH needs accurately. On the supply side, data on inflow and outflow of health workers are not always readily available. Similarly, information on the current stock of health workers is often not collected. On the demand side, basic approaches that examine health worker to population ratios (e.g. physician-to-population ratios) do not typically impose heavy data requirements. Moreover, information on demographic variables like the age structure of the population is often available. However, other types of information such as health service utilisation by disease categories, as well as age and sex, is often not available in a systematic manner. Even when this information is available, it is not always straightforward to assess how current health care utilisation patterns will influence the current and future HRH needs.

Box 7.2. Methodology used by the OECD to forecast health workforce needs in LAC-7 countries

The OECD analysis provide estimates for the demand for and supply of health workers in LAC-7 countries from 2020 to 2030

The OECD analysis rests on a longitudinal dataset that was built by merging information from multiple publicly available datasets covering the years from 2000 to 2019. Health worker types included in the analysis are physicians, nurses, and midwives. This approach was taken with the recognition that the skill-mix across health professionals vary across LAC-7 countries, as well as the level of task shifting across different professionals. These considerations are particularly important in the context of the delivery of primary care services. The main outcome of interest is health worker density per 1 000 inhabitants. Country-aggregated data on health worker density was extracted from the OECD Data whenever possible. For countries where data were not available, information was gathered from the WHO National Health Workforce Accounts Database and national data sources.

Countries can deploy several approaches to assess their future health workforce needs, with each method offering a varying set of strengths and weaknesses. One approach to forecast health workforce needs is *needs-based forecasting of health workers.* Broadly, needs-based approaches attempt to ascertain the number of health workers that would be needed to achieve a pre-defined, desired level of health coverage goal identified by the researcher (e.g. skilled birth attendant benchmark, Sustainable Development Goal Composite Index etc.) (Scheffler, Herbst and Lem, 2016[18]). While needs-based approaches consider demographic factors in their framework, results generated by these approaches strongly depend on the ways in which the desired public health goal is defined. Moreover, these approaches rest on the assumption that meeting the desired level of health coverage does not come at the expense of the delivery of other health care services, and that health workers would be able to provide care not only for the desired services but across all other health domains (Scheffler, Herbst and Lem, 2016[18]).

Alternatively, countries can rely on *demand-based* approaches to quantify future health workforce needs. Demand-based approaches allow for incorporating demographic factors and dynamics around access to health care services. Importantly, demand-based approaches also shed light on the extent to which the broader economy can support expansion of the health workforce. These approaches assume that, even if the level of health care provision is below desirable levels, countries may be willing to exceed their existing ability to pay for the production of new health workers (Scheffler, Herbst and Lem, 2016[18]).

The OECD analysis presented in this chapter is based on a demand-based approach. In line with the general framework described earlier (Ono, Lafortune and Schoenstein, 2013[17]), the demand for health workers was expressed as a function of each country's demographic characteristics, the level of socio-economic development, and health care coverage. Findings from previous studies suggest that the demand for health care services rises with population ageing, which results an increased demand for health workers (Liu et al., 2017[19]; Scheffler, Herbst and Lem, 2016[18]; Scheffler et al., 2016[20]). Similar to earlier studies, in the OECD analysis, the demographic characteristics of the population was captured by using a variable that tracked the proportion of population 65 years and older (Scheffler and Arnold, 2018[21]). Data on this variable was extracted from the United Nations Population Department for the years covering 2000 to 2019, as well as projections up to 2030.

Earlier studies both from OECD countries and from low- and middle-income countries demonstrated that the level of economic development is another important predictor of demand for health workers (Scheffler and Arnold, 2018[21]; Liu et al., 2017[19]). Further, in many countries, health worker salaries and additional benefits account for a significant proportion of total health spending (ibid). In the OECD

analysis, the level of socio-economic development is captured by the level of national income up to the year 2030, expressed as real GDP per capita estimated generated by the United States Department of Agriculture Economic Research Service from 2000 to 2030 (USDA Economic Research Service, 2022[22]). Another important predictor of demand for health workers is the level of health care coverage (Ono, Lafortune and Schoenstein, 2013[17]). In OECD projections, the level of health care coverage is assessed by out-of-pocket (OOP) spending as share of total health expenditure. Previous studies suggested an inverse association between the level of OOP spending and demand for health service utilisation, which can result in lower demand for health workers (Liu et al., 2017[19]). Data on OOP spending as share of total health expenditure were extracted from the projections developed by the Institute of Health Metrics and Evaluation up to the year 2030.

On the supply side, several methodological approaches exist in the literature to forecast the future supply of health workers (Scheffler, Herbst and Lem, 2016[18]). In the OECD analysis, the supply of health workers is forecasted up to 2030 based on the historical growth rate for each health worker type in each country from 2000 to 2020. Compared to other analytical methods to forecast the supply of health workers such as ARIMA and moving average/distributed lag, quantifying supply through historical growth rates offer a relatively straightforward strategy with the least amount of data requirements (Liu et al., 2017[19]). This approach assumes that, without policy action, the supply of health workers in each country will continue to grow at pace equivalent the growth rate that was observed over the last 20 years.

The modelling framework used in the OECD analysis makes use of multiple imputation techniques to address missing historical values based on priors. The OECD forecasts of health worker density are based on generalised linear modelling techniques that consider time-invariant differences in the characteristics of countries. The model specifications include lags, because health workforce planning is typically carried out based on the budgets and resources available in previous years. The models incorporate uncertainty around estimates stemming from addressing missing values through multiple imputation, model selection and specification. Several sensitivity analyses were conducted to ascertain the highest performing models, including functional forms and model specifications.

The OECD forecasts have several limitations. First, the precision of the OECD projections relies on the validity of information extracted from publicly available data sources and administrative datasets. The OECD estimates do not consider the changes in health worker productivity over time, nor do they consider potential changes in the scope of practice for each type of health worker. Further, the OECD forecasts do not consider the potential impact of policies focusing on improving recruitment and retention rates among health workers, nor do they consider trends in migrations of health workers over time. However, differences in these factors may result in significant changes in the stock and distribution of health workers over time, which may increase or offset the need for health workers. The supply of health workers was projected based on historical growth rates, but this approach relies on assumptions around functional form, which may result in less accurate estimates compared to those generated using other methods. Additionally, the OECD projections do not account for the changes in the disparities in the distribution of health workers within each country over time. This means that even in countries where no deficit is estimated in the number of health workers by the OECD analysis, there may be challenges concerning the distribution of health workers within the country that are not observed in the analysis.

Assessing current and future HRH needs in LAC-7 countries

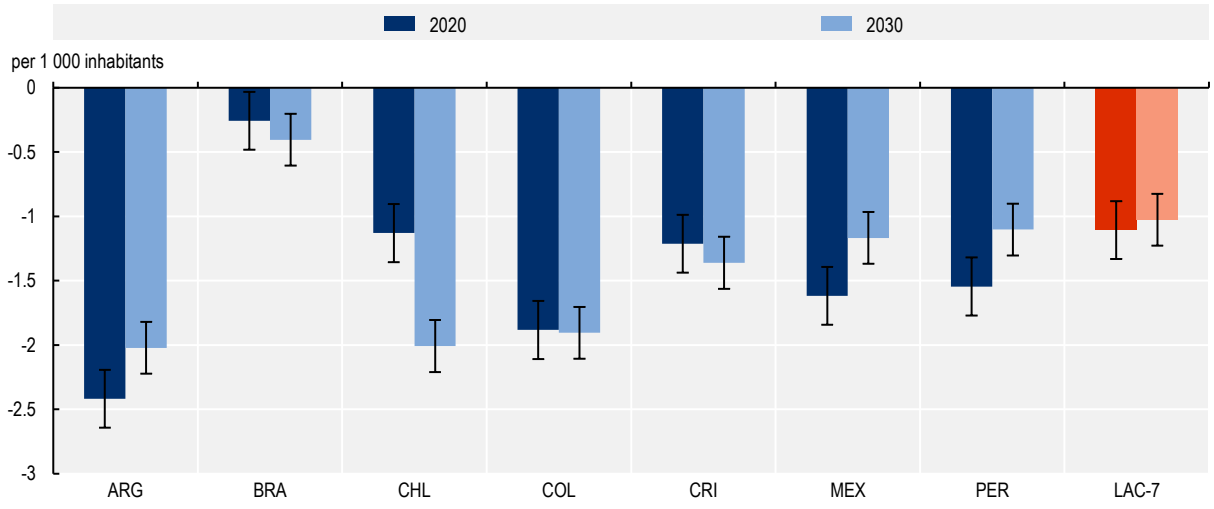
The OECD analysis suggests that, in 2020, in all LAC-7 countries, the demand for physicians, nurses and midwives was greater than their supply, resulting in a shortage for these health workers (Figure 7.7). The OECD analysis suggests that, in 2020, the shortage of physicians, nurses and midwives averaged at around 1.11 per 1 000 inhabitants across LAC-7 countries. Specifically, in 2020, the deficit of health worker density is the highest in Argentina (2.42 per 1 000 inhabitants), and the lowest in Brazil (0.26 per 1 000 inhabitants). After Argentina, Colombia has the highest estimated shortage in health workers, as measured by density of physicians, nurses and midwives. In 2020, in Colombia, the estimated shortage is 1.88 per 1 000 inhabitants. Further, the OECD analysis suggests that, in 2020, other LAC-7 countries also faced shortages in physicians, nurses and midwives. In Mexico, the estimated shortage in physician, nurse and midwife density is around 1.62 physicians, nurses, and midwives per 1 000 inhabitants, followed by Peru, Costa Rica and Chile where the estimated shortages in physicians, nurses and midwives averaged at 1.55, 1.21 and 1.13 per 1 000 inhabitants, respectively.

Figure 7.7 also suggests that, without effective policy action, the gaps between the demand for and supply of physicians, nurses and midwives is projected to persist in all LAC-7 countries by 2030. The OECD analysis suggests that the shortage of physicians, nurses and midwives will average at around 1.03 per 1 000 inhabitants across LAC-7 countries by 2030, a modest reduction compared to the estimated shortage in 2020.

Importantly, most LAC-7 countries are projected to experience widening shortages in the density of physicians, nurses, and midwives. As shown in Figure 7.7, Brazil is estimated to remain the LAC-7 country where the magnitude of the shortages in the density of physicians, nurses and midwives is the smallest. However, it is important to note that, without effective policy action, the estimated shortages in the density of health workers in Brazil is projected to grow by 2030, reaching to 0.40 per 1 000 inhabitants. Similarly, Chile is projected to have greater gaps in the demand for and supply of health workers compared to 2020, with the estimated shortage standing at 2.01 per 1 000 inhabitants. In Colombia and Costa Rica, the estimated shortages in the density of physicians, nurses and midwives are projected to reach 1.91 and 1.36 per 1 000 inhabitants, respectively.

In comparison, Argentina, Mexico and Peru are projected to narrow the gaps in the demand for and supply of physicians, nurses, and midwives by 2030, even though the estimated gaps will persist (Figure 7.7). Argentina is estimated to remain the LAC-7 country with the greatest shortages in physicians, nurses, and midwives in 2030. In 2030, the shortage of health workers in Argentina estimated to stand at around 2.02 per 1 000 inhabitants. This finding suggests that, while the magnitude of the shortage in health worker density is estimated to be smaller in 2030 compared to 2020, the gaps between the demand for and supply of physicians, nurses and midwives will persist. Similarly, in Mexico, the projected shortage in the density of physicians, nurses, and midwives in 2030 is projected to stand around 1.17 per 1 000 inhabitants, whereas this figure is estimated to reach 1.10 per 1 000 inhabitants in Peru.

Figure 7.7. Estimated shortage in physician, nurse, and midwife density in LAC-7 countries in 2020 and 2030



Notes: Shortage is defined as the difference between the supply of and the demand for physicians in the same year. Whiskers represent the standard deviation.

How do LAC-7 countries assess their current and future HRH needs?

Motivated by the earlier findings that the gaps between the demand for and supply of health workers will widen in most LAC-7 countries, the remainder of the chapter looks at the ways these countries assess their current and future HRH needs. Specifically, it looks at (1) level of decentralisation of tasks and responsibilities associated with HRH assessments; (2) data infrastructure and needs to facilitate economic assessment of labour market dynamics in the health sector; and (3) methodologies deployed in LAC-7 countries to assess the demand for and supply of health workers.

LAC-7 countries examine their HRH needs and formulate relevant policies in the context of varying degrees of decentralisation

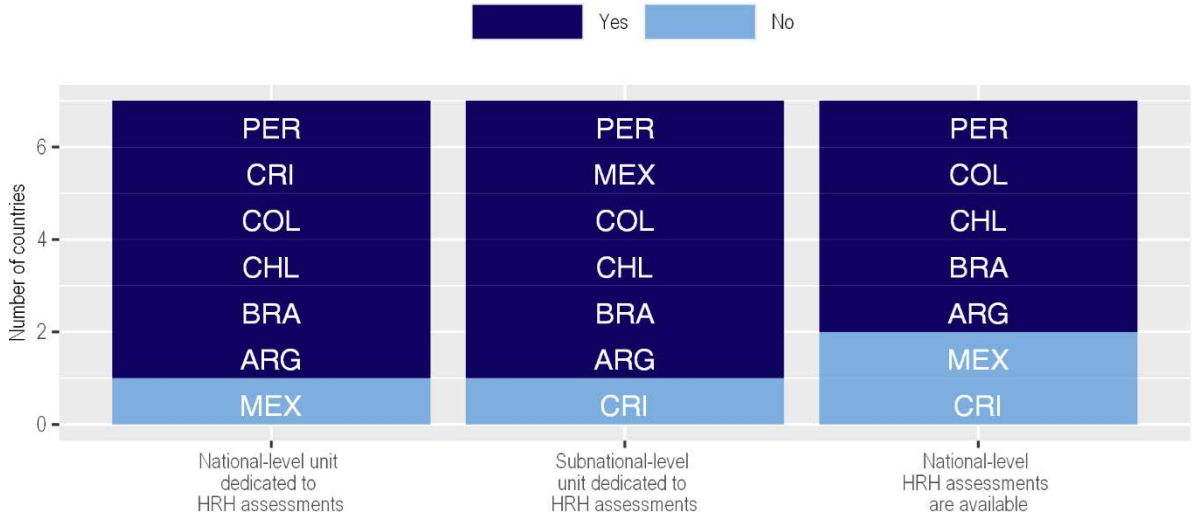
Assessments of the current and future HRH needs do not occur in a vacuum. The degree to which the roles and responsibilities shared between the national and subnational authorities may have important implications for the evaluation of HRH needs, and development and implementation of policies to strengthen HRH capacity. Decentralisation of the roles and responsibilities for assessing HRH needs to subnational authorities can improve accountability to local populations; improve the efficiency of tracking HRH needs at the community level; strengthen the effectiveness of supervision in service provision; and incentivise local governments to design and implement HRH policies that can promote greater retention of health workers in their communities. Yet, decentralisation does not guarantee improvements in the assessment of HRH needs and formulating policy responses. Decentralisation may require stronger co-ordination and co-operation across different levels of the government with a clear delineation of roles and responsibilities associated with HRH assessments. Alternatively, communities that lack technical capacity may not be able to carry out robust assessments of their own HRH needs. The remainder of this section explores these issues in the context of LAC-7 countries.

In most LAC-7 countries, national and subnational authorities are responsible for assessing current and future HRH needs

Most LAC-7 countries have in place national and subnational authorities tasked with understanding HRH needs, but national-level HRH assessments are not always available (Figure 7.8). In Argentina, the Directorate of Human Resources and Knowledge (*Dirección Nacional de Talento Humano y Conocimiento*) within the national MoH plays a stewardship role in the development and implementation of HRH policies, including promoting knowledge to inform the development of HRH and strengthen quality of care. In Brazil, the Secretariat of Labour and Education Management in Health was created in 2003 as part of the MoH in order to develop policies and strategies planning for HRH, including training and education programs. To date, HRH assessments have been developed with specific agreements with research institutions across Brazil, though many of these assessments are not publicly available. In Chile, the Planning Department within the Division of People Management in the MoH is responsible for collecting HRH-relevant data on a regular basis and for assessing HRH needs in the public sector. In Colombia, the Directorate for the Development of Human Talent in Health of the Ministry of Health and Social Protection (MOHSP) is tasked with developing and implementing HRH policies in accordance with Law 1 438 and Article 97 dated 2011. In Costa Rica, a unit within the MoH was created in 2019 to assess HRH needs. Currently, the country is in the process of building a blueprint for national HRH policy. In addition, the Social Security Fund (*Caja Costarricense de Seguro Social*, CCSS) carries out periodic assessments of HRH needs for its own network of providers based on data collected from 105 health areas and 29 hospitals. In Peru, the General Directorate of Health Personnel develops HRH policies and carries out monitoring and evaluation of existing HRH measures based on the 2017 Supreme Decree 008-2017-SA.

In comparison, Mexico is the only LAC-7 countries where the national MoH does not have a dedicated unit for assessing HRH needs. In lieu of a national department dedicated examining HRH needs, in Mexico, each network of health providers evaluate their own HRH needs through their own human resource departments including the Mexican Institute of Social Security (IMSS), Institute for Social Security and Services for State Workers, Medical services for oil industry workers, the Navy and the Army. The MoH also carries out HRH assessments, but these evaluations only include health facilities that service populations who are not affiliated with the IMSS.

Figure 7.8. Most LAC-7 countries have in place national and subnational authorities tasked with understanding HRH needs but national-level HRH assessments are not always available



Source: Results generated based on OECD review.

In most LAC-7 countries, subnational authorities also have the discretion to examine local HRH needs. In Argentina, the City of Buenos Aires and all 23 provincial-level MoHs except Salta, San Juan, Santa Cruz and Tucumán provinces carry out their own HRH planning and management within the local MoH departments. However, it is important to note that each province has their wage policies and contracting frameworks, which makes it more difficult to assess HRH needs using standardised approaches. Further, municipalities with large populations have human resource departments that are responsible for HRH planning. Similarly, in Brazil, 5 570 municipalities are tasked with examining their own HRH needs, along with the discretion to hire and fire health workers that work in their communities. Much like in Argentina, Brazilian municipalities offer different wage policies and service contracts, which complicates efforts to assess HRH needs using standardised methodologies. In Chile, municipalities are required to generate annual communal health plans that involve HRH assessments in accordance with Law 19.378 (Ministerio de Salud, 1995[23]). Upon completion, municipalities share their communal health plans with the directorates (*Dirección de Servicio)* within 29 geographic Health Services that combined comprise the National System of Health Services through a network of hospitals and primary health care centres. These directorates then communicate local HRH needs identified by municipalities to the MoH at the national level. In Peru, regional health directorates have departments dedicated to managing human resources at the local level, though these departments are not explicitly tasked with assessing HRH needs.

Several LAC-7 countries publish their recent works focusing on HRH assessments (Table 7.1). In Argentina, one 2015 analysis carried out jointly by the MoH, WHO and Andalusian School of Public Health provided projections focusing on specialist physicians up to the year 2025, with the aim of assessing current HRH needs and informing the formulation of policies to train new specialists in accordance with the needs of different provinces (MoH, WHO, Andulusian School of Public Health, 2015[24]). Subsequently, several reports were published in 2019 to look at the state of health workforce in the county, as well as training and practice in obstetrics care and nursing though these publications did not attempt to examine future HRH needs (Government of Argentina, 2019[25]). In Brazil, one example of a publicly available HRH assessment is a 2018 study conducted by the Osvaldo Cruz Foundation and the Faculty of Medicine in the Federal University of Minas Gerais as part of the Brasil Saúde Amanhã Initiative that aims to support the MoH in national long-term health policy development for the Unified Health System (Girardi et al., 2018[26]). In this study, the authors provided projections for the supply of specialities for services considered as high complexity (Girardi et al., 2018[26]). In Chile, the MoH produces annual reports that look at existing deficits in health workers, which are subsequently used to inform the Parliament's Budget Committee (Chilian Ministry of Health, 2018[27]). In addition, since 2010, three studies were commissioned to evaluate the deficit for several categories of health workers including medical specialists, GPs, and dentists. However, it is worth noting that these assessments did not involve private sector providers even though private providers play a crucial role in health service provision in the country. In Colombia, the Directorate for the Development of Human Talent in Health of the Ministry of Health and Social Protection and the Directorate of Epidemiology and Demography collaborated in a 2018 publication that provided a set of estimates on the supply of specialist physicians by different categories up to 2030, but this publication did no attempt to generate demand estimates (Government of Colombia, 2018[28]). In Peru, the MoH evaluated the supply of and demand for specialists in 2011 (Peruvian Ministry of Health, 2011[29]). Subsequently, in 2013, the MoH published an assessment of HRH regional goals from 2007 to 2015 (Peruvian Ministry of Health, 2013[30]). In Costa Rica, the MoH carried out a health workforce study jointly with the Pan American Health Organisation. In Mexico, one recent study published by the MoH examined the status of nursing in the country.

Table 7.1. Examples of publicly available HRH assessments from LAC-7 countries

Country	HRH assessment
Argentina	Analysis of geographic distribution of specialist physicians in Argentina (2015-25) (MoH, WHO, Andulusian School of Public Health, 2015[24])
Brazil	Assessing the supply and demand for priority medical specialties for services considered as high complexity for the Unified Health System (2018) (Girardi et al., 2018[26])
Chile	Study of Supply and Demand Gaps of Medical Specialists in Chile: Technical Collaboration World Bank – Government of Chile (2010). Determining gap in general practitioners and specialists according to the methodology of rates of use of medical and specialised benefits in Chile (2017). Determining gaps in general doctors, dentists, and specialists in the public health sector from 2020 to 2030 (2020)
Colombia	Estimating the supply of medical specialists from 1950 to 2030 (2018) (Government of Colombia, 2018[28])
Mexico	The Status of Nursing in Mexico (2018)
Peru	Need for medical specialists in health establishments in the Health Sector (2010) (Peruvian Ministry of Health, 2011[29]) Second Measurement of the Regional Goals of Human Resources for Health from 2007 to 2015 (2013) (Peruvian Ministry of Health, 2013[30])

Better understanding of current and future HRH needs requires further clarification of roles and responsibilities between different levels of government, supporting local communities in their efforts to assess their own HRH needs, and fostering closer co-ordination and co-operation across various stakeholders

Clarifying the roles and responsibilities across different levels of government with a clear structure of accountability can help support efforts to assess HRH needs. For instance, in 2020, Colombia took steps to clarify the roles and responsibilities around HRH planning across different levels of government. To do that, the MoHSP indicated in its latest technical report that HRH planning responsibilities are to be transferred to the 37 health secretariats as part of their four-year territorial plans in the health sector (MSPS, 2020[31]). Further, the MoH guidance indicated that the HRH planning should rest on data gathered through information management systems that track data on health worker availability and local health needs. Importantly, health secretariats were urged to examine their needs not only in the short term, but also make projections of needs within five- and ten-year horizons (MSPS, 2020[31]).

Addressing the existing gaps in the co-ordination and communication between different levels of government is also paramount to better understanding current and future HRH needs. One good practice example comes from Argentina. In Argentina, the Federal Observatory of Human Resources in Health (OFERHUS) was launched in 2016 in accordance with Resolution 1775/16 in order to foster co-ordination and collaboration between the national government and provinces to co-ordinate HRH policies (Government of Argentina, nd[32]). OFERHUS is meant to consolidate the network of provincial observatories that are responsible for evaluating and monitoring local trends in the health workforce (Government of Argentina, nd[32]). Importantly, one of the leading objectives of OFERHUS is to strengthen the local capacity to monitor and evaluate trends in health workforce in local communities, develop a baseline of information to assess HRH needs through assessments of the characteristics of health workers and their mobility (e.g. migratory trends).

Discrepancies in technical capacity can influence the ability of local communities to examine their own HRH needs and adopt relevant HRH policies. Previous studies point to notable differences across local communities within LAC-7 countries in terms of technical capacity and financial resources. For example, in Argentina, an estimated six-fold difference exists between the provinces with the highest and lowest per capita spending (Rubinstein et al., 2018[33]). To date, geographic areas with greater level of poverty experienced difficulties in attracting health workers. Similarly, in Brazil, previous studies documented substantial differences that persisted over time across geographic regions and municipalities in terms of their socio-economic development, the extent of poverty, level of health supplies, and availability of health personnel (Andrade et al., 2018[34]). Importantly, these factors have been shown to correlate with the pace with which local communities were able to adopt the implementation of large-scale PHC programs (Andrade et al., 2018[35]).

In recognition of these discrepancies, it is vital to provide support to local communities that lack the sufficient scale, technical and financial capacity to assess their own HRH needs and formulate policy options. For instance, in Colombia, the recent MoH guidance noted that certain health secretariats may have limited technical capacity to carry out their own HRH assessments. Further, the MoH suggested that health secretariats utilise HRH management tools like the WHO Workload Indicators of Staffing Need (WISN) application as a way to examine the changing dynamics in the local health workforce, even though the MoH guidance did not lay out a consistent methodology to investigate HRH needs in local settings (MSPS, 2020[31]). Importantly, these guidelines suggested that results generated by WISN application can help determine the optimal strategies addressing HRH needs; examining priorities in terms of allocating new staff, transferring existing staff; identifying health facilities with the greatest needs, and therefore, narrowing inequities in the distribution of health workers across health facilities and geographic regions. However, it is important to note that the extent to which these guidelines are implemented by local authorities remains unknown. Another good practice example comes from Peru. Following the 2013 assessment of regional HRH goals up to 2015, the MoH published in 2014 a set of technical guidance notes were published to lay out methodological approaches that can be used to calculate HRH gaps at primary, secondary and tertiary care.

Addressing HRH needs is one area that requires collaboration and co-ordination between different stakeholders at the national level. Typically, the number of trainees that are planned to be admitted to higher education institutions is under the purview of Ministries of Health (MoEs). HRH policies that entail an expansion of professional training and education capacity in the health sector necessitates close collaboration and co-operation across several stakeholders. To date, several LAC-7 countries put in place mechanisms to foster cross-sectoral collaboration. For instance, in Colombia, in accordance with Law 1 164 Article 4 dated 2007, HRH policies have ben guided by recommendations formulated through the National Council for Human Talent in Health (NCHT). As an advisory body, the NCHT is comprised of the MoE, MoH, public and private training institutions, representatives from providers and insurer associations, as well as student representatives in health training programs. Similarly, in Mexico, the Inter-institutional Commission on Training of Human Resources for Health (CIFRHS) for health workforce planning and supervision of the National Medical Residences Program. Currently, CIFRHS is a consulting, advising and technical support body that links the MoH and MoE to co-ordinate on medical education.

In recent years, LAC-7 countries made notable improvements in the availability of information that can facilitate assessments of HRH needs but further advancements are needed in terms of enhancing the scope and quality of data

Designing effective HRH policies requires high-quality and comprehensive data that can be used for monitoring the health labour market dynamics and evaluating the impact of HRH policies. Global experiences underscore the centrality of investments in information systems that provide reliable and up-to-date information on HRH that can help monitor the trends in the health workforce and the evolution of labour market dynamics. Through descriptive analyses of HRH trends over time and space in the variation of the characteristics of the health workforce, countries can identify the areas of concern like demand, compensation, market structure, interactions between demand and supply and distribution of health workforce and can help inform further investigations and policy development. Complementing descriptive analyses, data can also be used to examine the impact of specific HRH policies on outcomes.

A wide range of resources can be used to facilitate assessments of current and future HRH needs (Box 7.3). Typically, administrative datasets offer a range of useful information, including personnel records of employers, accreditation, age, gender, speciality, and geographic location. The main advantages of administrative data sources are that they typically include clear definitions for health worker types and capture the vast majority of health workers. They can also provide information on the type of health care level in which the health worker is working (e.g. hospitals, PHC clinics). However, administrative sources come with certain caveats. Administrative datasets may offer varying levels of data quality, reflecting the

methodological used to collect and process data. Moreover, they typically provide information on a limited number of areas, because they are typically collected for administrative purposes rather than data analysis. Data collected through surveys are another crucial source of information. One of the biggest advantages of surveys is that they typically offer a richer range of variables (e.g. their jobs, their families, and the characteristics of where they live), which help enable controlling for other factors when assessing the impact of policies. Administrative and survey data are not complete on their own, however, it is useful to explore avenues that can help link information gathered through both administrative and survey data.

Box 7.3. Data needs for HRH planning

Strengthening data availability and technical capacity can facilitate diagnoses of HRH challenges and identify policy options that are best fit to address the underlying drivers of challenges in each context

Building HRH datasets that report information on the number of health workers and their basic characteristics is a good starting point. Policy makers who are considering strengthening efforts to assess HRH needs will benefit from understanding potential sources of data that can be used (Lopes, Almeida and Almada-Lobo, 2015[36]). It may not be possible to collect all of the information listed below, however, improvements in the availability of data on health workforce facilitates more comprehensive assessments of current and future HRH needs.

- Inflow of PHC workers: number of new graduates from training programs, attrition rates, immigration of foreign-trained health worker, re-entry rates, retirement, career changes, emigration
- Outflow of PHC workers: retirement, resignation, emigration, leave (e.g. maternity, paternity, study, sabbatical, sickness leave), career reorientation, attrition rates, mortality
- PHC workforce characteristics: age, gender, working hours, skill mix
- Deficits in PHC workforce: vacancy rates, socio-economic and geographic imbalances in the distribution of PHC workers
- Demographic characteristics: age, gender, residence, migration, disability
- Epidemiology and morbidity: trends in the burden of diseases
- Health and care utilisation and unmet needs: ambulatory, hospital, primary and long-term care utilisation by age and gender, number of occupied beds, number of surgeries, screenings, consultations
- Inequities: inequalities in access to health care services between different subgroups of the population
- Economics: GDP, GDP growth, health expenditure, health expenditure growth
- Skill mix: capacity-building policies, alternative service delivery modes, licensing regulations, professional roles/deployment, recruitment/retention strategies, immigration policies, remuneration types/rates, capacity building
- Productivity: occupational participation rates, occupational employment rates, employment projections, vacancy rates, turn-over rates, wages, productivity growth, alternative career options
- Employment status: full-time, part-time, full-time equivalent (FTE), average hours worked, direct patient hours, no longer practicing, not licensed to practice in jurisdictions
- Novel models of care: empirical evaluations of the effect of novel models of care (e.g. the use of telemedicine in PHC care)
- Technological advancements: empirical evaluations of the effect of substitution between PHC workers and emerging and technologies (e.g. artificial intelligence and robotics)

Strengthening the existing information systems is vital to ensure that HRH assessments are based on timely and accurate information

In recent years, all LAC-7 countries made strides to strengthen their information infrastructure, which resulted in a notable expansion data that can facilitate HRH assessments (Table 7.2). In Argentina, the *Sistema Integrado de Información en Salud Argentino* is the main online platform that provides access to the main registry of health workers called the Federal Network of Health Professional (*La Red Federal de Registros de Profesionales de la Salud – REFEPS*). REFEPS collates information on health worker characteristics across professional registries in all provinces (MoH, 2022[37]). In accordance with Resolution 604/2005 of Mercosur, the Single Record of the Health Professionals (Ficha Única del Profesional), information on health worker characteristics is harmonised, including personal identification, training and registration records, specialisations and residency (MoH, 2022[37]). Experiences from OECD countries demonstrates how strengthening the existing data infrastructure on HRH can help improve assessments of current and future health workforce needs (Box 7.4).

In Brazil, municipalities report the number of health workers working in their communities in the National Registry of Health Establishments (CNES), which is processed by Informações de Saúde (TABNET) and other data sources each month. In Chile, the Superintendence of Health was established in 2004, which is responsible for maintaining a regularly updated registry of accredited institutional and individual health workers in accordance with their professions and specialisations. In Colombia, the *Registro Único Nacional del Talento Humano en Salud* (ReTHUS) database is a key source of information for calculation of workforce indicators (e.g. numbers, density, etc). In Costa Rica, the *Sistema Nacional de Recursos Humanos en Salud* (SINARHUS) was established in 2012 through the Health Services Directorate to collect information on health workers both in the public and the private sectors. This database is operated by the HRH unit within the MoH and serves a data platform to facilitate analyses of HRH needs and planning. Since 2019, the HRH unit within the MoH is making efforts to strengthen SINARHUS. In Mexico, the General Directorate of Health Information (*Dirección General de Información en Salud*, DGIS) within the MoH operates an HRH registry with the information of the number of health workers by category (e.g. doctors, nurses etc.) in the public sector. In addition, an HRH platform called the *Sistema de Información Administrativa de los Recursos Humanos de Enfermería* (SIARHE) was created in 2006. This digital platform focuses specifically on the nursing personnel through more than 30 variables collected across the different providers in the Mexican health system. This platform is estimated to include data for more than 90% of the nursing workforce. In Peru, the National Registry of Health Personnel (INFORHUS) was created in 2013 accordance with Legislative Decree 1 153, with the aim of gathering up-to-date information on HRH. In its first year, INFORUS reported data annually, and since 2015 data are available on a monthly basis.

Table 7.2. Example databases and professional registries that may be used to facilitate HRH assessments in LAC-7 countries

Country	Database and professional registries
Argentina	La Red Federal de Registros de Profesionales de la Salud (REFEPS)
Brazil	National Registry of Health Establishments (CNES)
Chile	Registro Nacional de Prestadores Individuales de Salud
Colombia	Registro Único Nacional del Talento Humano en Salud (ReTHUS)
Costa Rica	Sistema Nacional de Recursos Humanos en Salud (SINARHUS)
Mexico	HRH registry operated by the General Directorate of Health Information (*Dirección General de Información en Salud*, DGIS) in the MoH Sistema de Información Administrativa de los Recursos Humanos de Enfermería (SIARHE)
Peru	Registro Nacional de Personal de la Salud (INFORHUS)

Box 7.4. Forecasting physician supply in Denmark using time-series and regression analyses

The main objective of Danish efforts to assess HRH needs is to monitor the trends in the health workforce and determine training quotas needed to meet future needs. Workforce needs for physicians, dentists, clinical dental technicians, and dental hygienists are regularly assessed by the Danish Health Authority using a time-series and regression-based analysis framework covering both short term (i.e. 3-5 years) and long term (i.e. 25 years) (SEPEN, 2021[38]). The results from these analyses are disseminated to the relevant stakeholders in order to provide opportunities for dialogue that can help share admissions, training process and facilitate a more equitable distribution of specialisations and residencies (SEPEN, 2021[38]).

Denmark relies on a wide range of data suppliers to asses needs in the health workforce including the Authorisation Register managed by the Danish Patient Safety Authority that collates information on licensed to practice health workers; Occupation Register managed by the Danish Statistical Office, which generates information through the tax information and social security services; reports on human resources provided by hospitals, Danish Statistical Office, and five Danish regions, which are responsible for health care delivery in local communities (SEPEN, 2021[38]).

In addition to collecting data on demographic characteristics, Danish authorities also rely on information about the consumption of health care services gathered through both health workers and organisations from the regions to assess demand for health workers (SEPEN, 2021[38]). On the supply side, the Danish authorities collect data on head count, qualifications, medical specialists, and age and retirement status. At the aggregate level, data on the level of unemployment and the geographic distribution of the health workforce are also collected. In addition, data on foreign-born health workers are available for all registered professions. To track outflow of physicians and nurses, Denmark relies on the OECD database, as well as qualitative data gathered from various stakeholders (SEPEN, 2021[38]).

Yet, LAC-7 countries do not consistently use readily available data sources to assess their HRH needs. In Argentina, the databases that provide information on health workforce are mainly used for diagnostic purposes and policy design, but they are not used for systematic assessments of HRH needs. In Brazil, CNES data on health worker availability was utilised by the MoH to inform the development and implementation of several PHC national initiatives that aimed to improve the availability of health workers in geographic areas that are considered as underserved (Özçelik et al., 2021[39]).In Chile, the national registry of health workers is an essential source of information used in the HRH assessments. In Peru, INFORHUS is used both by the national MoH and regional authorities to assess HRH needs.

Data on health workers that are employed in the private sector are often unavailable due to the lack of reporting requirements for private providers. The dearth of data on the availability of health workers in the private sector undermines efforts to assess HRH needs particularly in countries where private providers play a crucial role in service provision. For instance, in Argentina, approximately 57% of health workers are employed in the private sector or in the National or Provincial Social Insurances. Despite this, there is limited capacity to gather information about health workers beyond the public system, coupled with the reluctance from the private providers in terms of sharing information. In Brazil, the current legislation requires that all health facilities are registered such that CNES database can provide data on all providers in the public and private sector. The accuracy of information provided in the CNES database is also validated. In Peru, HRH-relevant information systems have not yet fully integrated data on private providers.

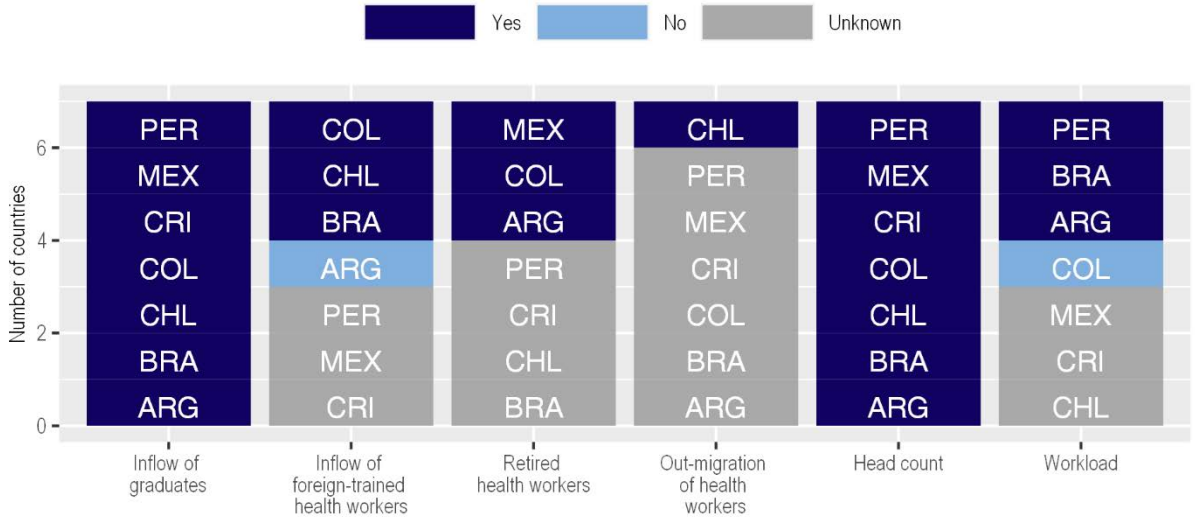
These information systems can be further strengthened by minimising delays in data entry. For instance, in Argentina, provincial MoHs regularly upload information on health workers into their regional registries, which are, then, collated in the REFEPS. However, this process is undermined by delays in updating the

databases by provinces and municipalities (MoH, 2022[37]). In Colombia, all health workers are obligated to register in ReTHUS in order to work in the health sector. However, given the diversity of employment modalities of the health workforce there are difficulties standardizing and collecting data on mobility, location by geographic area and type of facility, and income. Similar delays are reported in Mexico and Peru in terms of timely update of HRH relevant databases.

Assessing supply of health workers in LAC-7 countries will require investments in mechanisms that track the inflow and outflow of health workers in health labour markets and assessing the stock of health workers

Figure 7.9 depicts the selected supply side factors included in the HRH assessments in LAC-7 countries in accordance with the general framework used in this Chapter. This figure point to gaps in current attempts at evaluating supply side factors. In terms of inflow of health workers in the health labour market, all LAC-7 countries incorporate data in their HRH assessments in terms of the inflow of graduates, though only Colombia, Chile and Brazil systematically monitor the inflow of foreign-trained health workers. With regards to outflow of health workers from the health labour market, information systems are available in Colombia and Argentina to track retired health workers but only Chile appears to track the out-migration of health workers. With respect to the understanding the stock of health workers, all LAC-7 countries track head counts, but only Brazil, Peru and Argentina collect information on health workers' workload. In OECD countries, data that tracks the supply of health worker were incorporated into models that aimed to predict the expected resource requirements to manage the COVID-19 pandemic (Box 7.5).

Figure 7.9. Selected supply side factors included in the HRH assessments in LAC-7 countries



Source: Results generated based on OECD review.

Box 7.5. Canada's Health System Capacity Planning Tool incorporates up-to-date data on health workers to support measurement of health systems needs to manage COVID-19 pandemic

The Health Systems Capacity Planning Tool uses up-to-date information on health workers to support health system planning in response to the COVID-19 pandemic

The Canadian Institute for Health Information (CIHI) is an independent, non-profit organisation that is tasked with providing comparable and actionable information that can help inform the development and implementation of policies relevant to health workforce and facilitate the monitoring and evaluation of ongoing activities (CIHI, 2021[40]). Specifically, the Health Workforce Database includes up-to-date information on the supply and distribution of 30 groups of health care professionals. For these providers the Health Workforce Database collects information on health workers demographic characteristics, educational background, and employment and migration status.

In response to the COVID-19 pandemic, the CIHI also developed an interactive excel-based called Health System Capacity Planning Tool, with the aim of informing decision-makers in terms of the expected demand on health care resources and supply shortfalls related to the COVID-19 pandemic (CIHI, 2021[40]). It was developed with input from modelling experts and various stakeholders in the health system, as well as potential users to forecast surge in demand for health care services due to the COVID-19 pandemic. To date, more than 75 organisations used the tool to help inform their decisions around pandemic response, including Ministries of Health, federal agencies, and public health units (CIHI, 2021[40]).

To model the spread of SARS-CoV-2, this tool was designed as compartmental model that groups the population into various categories that is in line with the progression of SARS-COV-2 infections, including susceptible, exposed, infected, and recovered categories (CIHI, 2021[40]). Importantly, available information on the supply of health workers is a critical input to the model. Based on the input data, the model yields predictions on the number of new daily COVID-19 cases, the number of individuals requiring treatment in critical care and non-critical care beds with or without a ventilator, while estimating the demand for health care resources and personal protective equipment required to protect health workers (CIHI, 2021[40]).

Inflow of health workers in health labour markets

In most LAC-7 countries, the inflow of health workers into the health labour markets is monitored primarily through the inflow of new graduates. In Argentina, the MoH monitors the number of graduates but there is currently no mechanism to monitor the inflow of health professionals who were trained abroad. In Chile, the Planning Department in the MoH utilises data collated from the National Registry of the Superintendence of Health to monitor the number of health workers, which includes information gathered from universities on the number of annual admissions and graduates for each type of health worker. In Colombia, the MoHSP guidelines indicate that the inflow of health workers is accounted for by monitoring the number of graduates from training programs and workforce migration (MSPS, 2020[31]). In Peru, current efforts to assess supply of health workers do not consider the inflow of health workers.

Keeping up-to-date information on the number of foreign-trained health workers also helps improve the accuracy assessments to understand current and future HRH needs. The size of the foreign-trained health workforce is estimated to vary across LAC-7 countries, though studies suggest that these countries increasingly rely on health workers who were trained abroad. One recent study estimated that foreign-trained health workers represent about 6% of the health workforce in Chile and around 5% in Argentina (de Vries, Steinmetz and Tijdens, 2016[41]). Similarly, Colombia is receiving a growing number of health workers from other countries (Carpio and Santiago Bench, 2015[42]). Costa Rica is another LAC-7 country

that is increasingly relying on foreign-trained health workers over the last three decades, particularly in provinces outside of the Great Metropolitan Area (Carpio and Santiago Bench, 2015[42]). Much like in many other countries, foreign-trained health workers are required to validate their degree through the University of Costa Rica – the main state university. One recent study showed that approximately 88% of all those who apply to practice medicine in Costa Rica are trained in Cuba, Venezuela, Nicaragua, and Mexico (Salazar Sánchez, Cordero Solis and López Dávila, 2021[43]).

It is crucial to assess the impact of reliance on foreign-trained health workers on health system performance over time. In most LAC-7 countries, the impact of increased reliance on foreign-trained health workers on health system performance remains largely unknown. One exception comes from Brazil. In recent years, Brazil explicitly increased its reliance on foreign-trained doctors to narrow the short-term gaps in the availability of doctors that work in typically underserved communities. Specifically, Brazil rolled-out a large-scale PHC programme in 2013, called the More Doctors Program, which relied heavily on the recruitment of foreign-trained doctors. At its height in 2015, Brazil recruited more than 15 000 physicians through this Program, primarily from Cuba (Silva et al., 2018[44]). A growing body of studies has evaluated the impact of this Program on health system performance. These studies suggested that this Program was associated with improvements in the number of PHC consultations and declines in hospitalisations due to health conditions considered sensitive to the availability of health care personnel (Hone et al., 2020[45]; Özçelik et al., 2020[46]), though results in terms of its impact on mortality remains mixed (Bexson et al., 2021[47]).

Better understanding the inflow of health workers in health labour markets can also help improve surge capacity in the context of health emergencies. For example, during the COVID-19 pandemic, in Chile, students who were at the final stages of obtaining their medical qualifications were hired to help cope with the additional pressure on the health system (WHO, 2021[48]). In Colombia, more than 1 500 medical students were allowed to graduate ahead of their graduation schedule (WHO, 2021[48]). Similarly, in Peru, medical residency requirements in selected specialities were eliminated and degree procedures were temporarily halted for medical graduates (WHO, 2021[48]).

Outflow of health workers in health labour markets

The OECD review suggests that LAC-7 countries have in place mechanisms to monitor the flow of health workers outside of their health labour markets but more evidence is needed to better understand the main drivers of exit from the health workforce. Broadly, outflow of health workers occurs due to retirement, attrition from the workforce before reaching the retirement age (e.g. career shift) and emigration. In Argentina, the MoH routinely crosschecks information available in REFEPS with other information systems to identify the health workers who retired, left the health job market earlier than the retirement age, as well as deceased health workers. In Colombia, the most recent MoH technical guidance for national territories indicates that HRH assessments in the next five and ten years should consider the patterns in the outflow of health workers, including retirement, mortality, and migratory flows. In Mexico, HRH assessments carried out by local health secretariats consider retirement patterns and deaths, but not other types of outflows of health workers in the health labour markets. In Chile, in 2014, the MoH started to collect information on the migration of physicians and nurses.

The current efforts to monitor the outflow of health workers in health labour markets will be further strengthened by gathering new evidence that investigates the main drivers of attrition across different types of health workers in order to develop policies that can stem attrition rates. For instance, in Peru, where accurate and timely information on the outflow of health workers is not available, two recent studies pointed to considerable desire for out-migration among early career health workers. One 2008 study found that about 38% of medical interns at the San Marcos National University had intentions to migrate (Jimenez, Michelle et al., 2015[49]). In a subsequent study, in 2010, one University Census of students attending private and public universities in the country found that about 78% of medical students expressed their intention to migrate after completing their studies (Jimenez, Michelle et al., 2015[49]). Further evidence is needed to better assess the main drivers of attrition from the workforce across all LAC-7 countries.

Better understanding the trends in the outflow of health workers can also facilitate the rapid development of HRH policies that can help scale up the availability of health workforce during health emergencies. During the COVID-19 pandemic, many LAC-7 countries relied on retired health workers to limit the disruption in service provision. For instance, in Colombia, retired health workers under the age of 60 were allowed to return to service as part of a broader strategy to address the deficits in health worker availability in the public sector during the COVID-19 outbreak (WHO, 2021[48]). In Chile, approximately 1 500 additional health workers who had been previously released from duty were re-deployed in the health workforce during the COVID-19 outbreak (WHO, 2021[48]). Similar to Colombia, in Chile, re-deployment of health workers who previously exited the health workforce was an explicit component of the broader strategy to address the health emergency. Further, in Chile, the assessment of HRH needs associated with the COVID-19 pandemic relied on the periodic estimates of the HRH needs in the country and included both the public and private sectors (WHO, 2021[48]).

Stock of health workers

Broadly, HRH assessment aim to estimate the current stock of health workers either by tracking head counts, quantifying FTEs, or measuring both. FTEs refer to standardised measure of the workload of health workers with respect to the workload of full-time health workers. While calculating FTEs is considered a more accurate measure of the current and future supply of health workers compared to head count measures, the former requires more time and resources to collect the required data. Recently, in some OECD countries, FTEs were used in the assessment of HRH needs in the context of the COVID-19 pandemic (Box 7.6).

Box 7.6. Mullan Institute State Hospital Workforce Deficit Estimator

In the United States, the Health Workforce Deficit Estimator was developed as an online tool for policy makers at the State and Federal levels to consider different strategic options to ensure sufficient levels of health workers hospitals are available to meet the surge in demand for health care services due to the COVID-19 pandemic (George Washington University, 2021[50]). The Health Workforce Deficit Estimator was developed with support by the Health Resources and Services Administration of the United States Department of Health and Human Services.

Specifically, the Health Workforce Deficit Estimator generates estimates for a 30-day period concerning physicians and nurses trained and experienced in providing care in intensive care units (ICU), physicians focusing on hospital care for patients in non-ICU, health workers who are trained to assess and treat patients with pulmonary disease, including the management of ventilators, and pharmacists (George Washington University, 2021[50]). Importantly, users of the Health Workforce Deficit Estimator can use this tool to plan for two types of scenarios: non-surge and surge. In this way, the users can consider the additional resources needed to transition to surge capacity staffing levels.

To estimate deficits in different health worker categories as a measure of demand for health care services, the tool relies on a methodology that quantifies the case load to derive the number of FTEs required. Subsequently, the number of FTEs are compared against data on supply of health workers in, including attrition rate (George Washington University, 2021[50]). Next, the tool categories States in accordance with the level of estimated deficit, measured as having sufficient number of health workers for every profession under three types of demand scenarios (e.g. low, mean, high). Finally, the number of health workers that can provide care for non-COVID19 patients are calculated, as well as the average number of patients each provider is expected to provide care (George Washington University, 2021[50]).

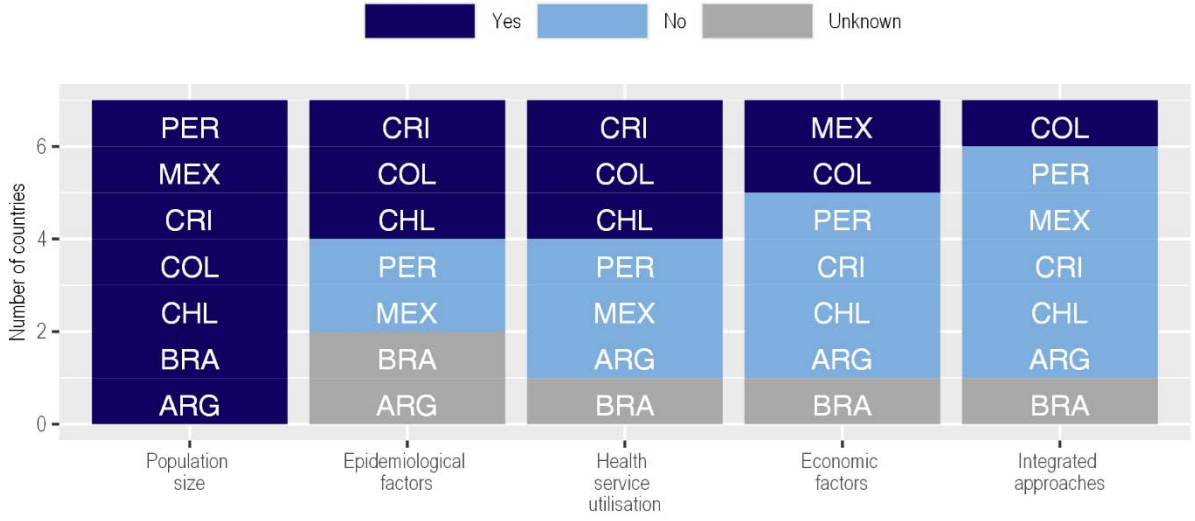
LAC-7 countries primarily collect information on the head count of different types of health workers with limited data that can help quantify FTEs. For instance, in Brazil and Colombia, the stock of health workers is tracked solely through head counts, whereas data on workload are not collected. In Argentina, REFEPS collates information on workload or hours worked, though provinces do not always update this information on a regular basis, and data do not always meet minimum quality standards. Further, considerable fragmentation across various information systems makes it difficult to estimate the current stock of health workers who are actively providing health care services. This is particularly worrisome in Argentina, because a considerable proportion of health workers engage in dual practice.

Compared to other LAC-7 countries, Peru collects data on a wider range of variables that can help better understand time spent on various tasks and procedures by each occupational category in PHC and hospital settings. For instance, information is collected to track the number of hours spent on provision of services covered by the Essential Health Coverage Scheme (PEAS) (Peruvian Ministry of Health, 2014[51]). The MoH technical guidance for calculating human resource gaps at the PHC level indicates that information is gathered to calculate the number of hours each occupational category should allocate across medical assistance, administrative and training activities. For instance, this guidance indicates that at the first level of care, about 82% of the workload of surgeons should be allocated to PEAS-relevant care, compared to 74% for nurses, while the remainder of the time can be allocated to administrative and training activities (Peruvian Ministry of Health, 2014[51]).

Assessments of demand for health workers in LAC-7 countries can benefit from looking at trends in population size and structure, health service utilisation, economic growth, and health spending, as well as adopting integrated approaches that consider multi-disciplinary teams

Figure 7.10 depicts the demand supply side factors included in the HRH assessments in LAC-7 countries in accordance with the general framework used in this Chapter. This figure suggests that there is substantial room for improving assessing demand-side factors. The good news is that all LAC-7 countries incorporate some measure of population size into their assessments. However, epidemiological factors are only considered in assessments from Costa Rica, Colombia and Chile. Only three LAC-7 countries consider health service utilisation patterns in their assessments of demand side factors. Moreover, only Mexico and Colombia consider economic factors. Finally, none of the LAC-7 countries applies integrated approaches that go beyond HRH assessments focusing on single professions. The remainder of this section provides a more in-depth assessment of the selected demand side factors.

Figure 7.10. Selected demand side factors included in the HRH assessments in LAC-7 countries



Source: Results generated based on OECD review.

Population size, epidemiological factors, health service utilisation

Understanding the demand for health workers can be a daunting task in comparison to assessing the supply of health workers (Ono, Lafortune and Schoenstein, 2013[17]). Approaches to estimating the demand for health workers vary. Relatively straightforward approaches include considering expected growth in population size. Whereas, more complicated methods may involve incorporating factors beyond demographic characteristics, such as morbidity and epidemiological characteristics, health care service utilisation patterns, organisation of care, economic growth, trends in health expenditures and salaries. The choices around estimating the demand for health workers come with important caveats. On one hand, straightforward methodologies can be applied with relative ease, because they do not impose substantial data requirements. On the other hand, these methods fall short of alluding to the optimal health worker density in a given area that can meet the needs of the population, nor do they consider factors other than population growth in determining the current and future demand.

The LAC-7 countries primarily rely on estimated trends in the size of their populations to calculate the demand for health workers, while only a few countries consider epidemiological factors and health service utilisation in their assessments. For instance, in Argentina, the 2015 study noted that demand for health workers is a function of demographic, epidemiological factors, as well as health service utilisation, service delivery models and economic growth and growth in health spending (MoH, WHO, Andulusian School of Public Health, 2015[24]). However, this publication relied only on projections for population growth to assess demand in comparison to the base year 2014 (MoH, WHO, Andulusian School of Public Health, 2015[24]). The study, then, considered three scenarios for estimating demand based on different assumptions around population growth for 100 000 inhabitants. For each speciality, the first scenario considered a 1% decline in demand; the second scenario looked at unchanged demand, and the third scenario considered a 1% increase.

In Chile, demand for health workers is assessed regularly based on the density of health workers over time, measured as the ratio of different health worker types to the population. Health worker densities are also compared against international benchmarks set by the WHO, as well as cross-country comparisons against other OECD countries to assess the existing deficits in health worker availability. In Chile, one study focused on GPs and medical specialists in the public sector. This study analysed the supply of and demand for GPs and specialist physicians based on a model that relied on the utilisation rates of selected health care services. Supply was determined using the stock and flow method at the time of the study and

future projections covering the next five and 15 years. The third study focusing on GPs and specialist physicians and dentists in the public system was recently commissioned to quantify the gap between demand and supply for health care providers in a period of 10 years.

In Brazil, the 2018 study notes that demand for and supply of health workers are influenced by a number of factors including changes in fertility and mortality, patterns of morbidity and disability, technological advancements and advent of new treatments, cultural and social changes, as well as HRH policy interventions (Girardi et al., 2018[26]). In Colombia, the MoHSP guidelines indicate that efforts to estimate demand for health workers should include department-level information on demographic factors (e.g. age and sex distribution of the service area), trends in morbidity, health service utilisation and delivery models (MSPS, 2020[31]). In Costa Rica, demand projections are carried out by the CCSS using data from the National Institute of Statistics and Censuses and the Actuarial Directorate. These projections consider the age distribution of the population and health service utilisation such as the use of hospital beds and operating rooms. In Mexico, the need for creating a new vacancy is decided separately by each health provider network based on the construction of new health facilities and budget availability.

Economic factors

Economic growth and spending allocated to health are important determinants of investments in the health workforce. As shown in Chapter 7, there are marked differences in financial resources allocated to health across LAC-7 countries. Despite the importance of these factors, HRH assessments in most LAC-7 countries do not always take into account prospects for economic growth and health expenditure. Whereas in some OECD countries, HRH assessments are conducted as part of economy-wide workforce planning efforts, which includes considerations around future economic growth (Box 7.7).

Box 7.7. Workforce planning in Finland as an economy-wide assessment of workforce needs

In Finland, HRH planning is part of an economy-wide effort to assess workforce needs

In Finland, the government Institute for Economic Research and the National Board of Education are tasked with producing long-term demand forecasts for 28 industries and occupational groups for a projection horizon of 15 years, including health workforce, using a general equilibrium macroeconomic model (SEPEN, 2021[38]). This work is supported by a coalition of four ministries including the Ministry of Employment and the Economy, Ministry of Finance, Ministry of Education and Culture, and Ministry of Social Affairs and Health (Ono, Lafortune and Schoenstein, 2013[17]). In addition to this effort, Health Regional councils make efforts to generate forecasts relevant to future health workforce and educational needs.

Efforts to estimate the supply of and demand for health workers are carried out using a wide range of data sources. At the individual-level, data on the supply of health workers include headcounts, age, gender, place of residence, place of practice, active workforce, retirement age and medical specialisation (SEPEN, 2021[38]). At the aggregate level, Finland also tracks the geographic flow of professionals. To assess the demand for health workers, forecasts take into account not only the demographic data and trends, and integrates estimates on the expected changes in GDP and health expenditures in the future (Ono, Lafortune and Schoenstein, 2013[17]).

Finland relies on several strategies to address shortages in the health workforce. For instance, in remote areas with GP shortages, tasks are shifted from physicians to nurses (SEPEN, 2021[38]). Additionally, training quotas are fine-tuned based on results produced by forecasting studies, and admissions for training opportunities are adjusted in accordance with local needs to cover underserved locations. Other strategies to attract health workers to be deployed in underserved areas include salary benefits and freedom of working time (SEPEN, 2021[38]).

Remuneration is another crucial factor in understanding the dynamics in the health workforce. In the health sector, remuneration refers to the price of labour offered through formal payments (e.g. salary, capitation payment, pay-for-performance) in the public or private sector for services rendered (McPake, Anthony and Ijeoma, 2014[52]). For employers, the level of remuneration can influence decisions around how many and what mix of health professionals to hire. For health workers, the level of remuneration not only provides an incentive for the decision to become a health worker, retention and migration, but also further influences the type of speciality (e.g. physician, nurses and midwives), the location of medical practice, job satisfaction and choices around dual practices. Broadly, the literature points to a positive association between the level of remuneration and the availability of health workers. In addition, other forms of payment (e.g. housing allowance) have been shown to influence health worker decisions over their career path (McPake, Anthony and Ijeoma, 2014[52]).

Integrated approaches to assessing HRH needs

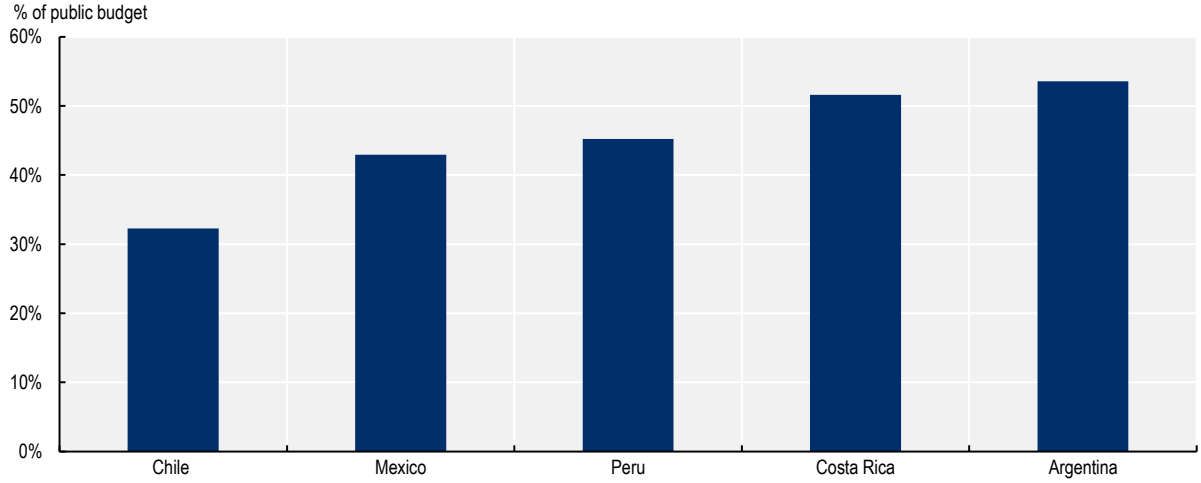
The OECD analysis suggests that HRH assessments in LAC-7 countries focus on single professions. Yet, integrated approaches that focus on examining the current and future needs for multi-disciplinary teams can help understand the influence of interactions across different health worker types on health system performance. Earlier chapters demonstrated that, in most LAC-7 countries, PHC teams that are comprised of health workers across multiple disciplines provide primary care services (see Chapter 3). To date, a growing body of evidence demonstrated that the expansion of PHC teams in many LAC-7 countries have been associated with enhanced health system performance, as measured by declines in mortality rates (Pesec et al., 2017[53]). Given the centrality of multi-disciplinary PHC teams in service provision, it is crucial to deploy more integrated approaches to assessing HRH needs that go beyond single professions. For instance, in Brazil, one recent micro-simulation study quantified that a decline in the coverage of Family Health Strategy teams due to several policies would yield, on average, a 13.2% increase in under-5 mortality rates, and nearly 100 000 premature deaths by 2030 (Francesconi et al., 2020[54]).

One crucial barrier to adopting integrated approaches is the lack of reliable and real-time information on the availability of multi-disciplinary teams at the local level. As shown earlier in this Chapter, in many LAC-7 countries, longitudinal information on the number of multi-disciplinary teams remains unavailable. One good practice example comes from Brazil. In Brazil, municipalities are provided financial incentives to report the number of PHC teams in their communities on a monthly basis. Information provided by municipalities are then used by the MoH to inform the design of large-scale programs with HRH components. For example, recently, the More Doctors Programs made use of data on the number of PHC teams in order to identify the communities that were considered *underserved* for its programmatic purposes (Özçelik et al., 2021[39]).

Sufficient and predictable financial resources must be made available to scale up investments in HRH in LAC-7 countries

Expenditure on human resources for health represent a considerable proportion of spending in the public sector, though there is substantial cross-country variation (Figure 7.11). In Peru, the share of health budget in the public sector allocated to the workforce grew steadily in recent years, increasing from 39.3% in 2015 to 45.2% in 2021. Similarly, in Mexico, the financial resources allocated to the health workforce averaged at 43% from 2015 in 2021. In comparison, in Chile, the public resources allocated to health workforce remained relatively stable between 2015 and 2020, averaging at around 32.8% of the total health budget in the public sector. Information on the level of subnational resources dedicated to the health workforce is more sparse but available evidence suggests that regional and socio-economic disparities exist across local communities in terms of their ability to allocate resources to the local health workforce. For instance, in Brazil where 5 570 municipalities have the discretion to directly hire and fire health workers, the share of expenditure from municipal governments increased from 25.5% in 2003 to 32.2% in 2016, whereas the federal government's share in total public health expenditure declined from about 50% to 40.8% (Massuda et al., 2018[55]).

Figure 7.11. Share of health budget in the public sector allocated to health workforce, various years



Notes: This figure represents the share of health budget in the public sector allocated to health workforce for countries that data were made available to the OECD. For Costa Rica, data point is for the year 2019. Data points for Argentina and Chile is from the year 2020. Data for Mexico and Peru are from the year 2021. In Argentina, data reported in the graph represent information gathered from 12 provinces.
Source: For Costa Rica, data extracted from Ministerio de Salud Costa Rica (2019[56]), Health Accounts Report Period 2017-2019, https://www.ministeriodesalud.go.cr/index.php/noticias/noticias-2019/186-costa-rica-presenta-primer-informe-de-cuentas-de-salud. For Peru, data taken from Ministry of Economy and Finance (2022[57]), Budget, Public Sector, Health Function and Health Personnel 2015-2021, https://apps5.mineco.gob.pe/transparencia/Navegador/Default.aspx. Data for Mexico are extracted from Méndez Méndez and Guerrero (2020[58]), Presupuesto para salud 2021: Prioridad en la creación de plazas médicas, https://ciep.mx/presupuesto-para-salud-2021-prioridad-en-la-creacion-de-plazas-medicas. For Argentina, and Chile, relevant information was provided by national experts.

Conclusions

This chapter presented an overview of the current landscape of health workforce in LAC-7 countries. First, it showed that the density of physicians, nurses and midwives in most LAC-7 countries improved over the last two decades, though they continued to lag average health worker densities across OECD countries in the same period. Next, the chapter found that all LAC-7 countries faced shortages in the density of physicians, nurses, and midwives at the outset of the COVID-19 pandemic, measured as the difference in the supply of and demand for health workers. Results from a novel OECD forecast demonstrated that, without effective policy action, the estimated deficits in health worker availability in 2020 are expected to worsen in most LAC-7 countries by 2030. Motivated by these findings, the chapter next examined the ways in which LAC-7 countries assess their current and future health workforce needs. It found that most LAC-7 countries do not assess their HRH needs systematically in regular intervals even though data sources that can facilitate these assessments are broadly available.

References

Andrade, M. et al. (2018), “Brazil’s Family Health Strategy: factors associated with programme uptake and coverage expansion over 15 years (1998–2012)”, *Health Policy and Planning*, Vol. 33/3, pp. 368-380, https://doi.org/10.1093/heapol/czx189. [34]

Bexson, C. et al. (2021), “Brazil’s more doctors programme and infant health outcomes: a longitudinal analysis”, *Human Resources for Health*, Vol. 19/1, https://doi.org/10.1186/s12960-021-00639-3. [47]

Carpio, C. and N. Santiago Bench (2015), *The Health Workforce in Latin America and the Caribbean: An Analysis of Colombia, Costa Rica, Jamaica, Panama, Peru, and Uruguay*, The World Bank, https://doi.org/10.1596/978-1-4648-0594-3. [42]

Chilian Ministry of Health (2018), *Informe sobre brechas del personal de salud en los servicios de salud y estado de situación de los recursos humanos de salud en Chile. Subsecretaría de Redes Asistenciales*, https://www.senado.cl/site/presupuesto/2018/cumplimiento/Glosas%202018/tercera%20subcomision/16%20Salud/2135%20Salud.pdf (accessed on May 31 2022). [27]

CIHI (2021), *CIHI's Annual Report 2020-2021*, https://www.cihi.ca/sites/default/files/document/cihi-annual-report-2020-2021-en.pdf (accessed on 11 July 2022). [40]

de Vries, D., S. Steinmetz and K. Tijdens (2016), "Does migration 'pay off' for foreign-born migrant health workers? An exploratory analysis using the global WageIndicator dataset", *Human Resources for Health*, Vol. 14/1, https://doi.org/10.1186/s12960-016-0136-5. [41]

Francesconi, G. et al. (2020), "Mortality associated with alternative policy options for primary care and the Mais Médicos (More Doctors) Program in Brazil: forecasting future scenarios", *Revista Panamericana de Salud Pública*, Vol. 44, p. 1, https://doi.org/10.26633/rpsp.2020.31. [54]

George Washington University (2021), *State Hospital Workforce Deficit Estimator*, https://www.gwhwi.org/estimator-statehospital.html (accessed on 11 July 2022). [50]

Girardi, S. et al. (2018), *Study of supply and demand for medical specialities that are priority for conditions considered high complexity for SUS*, https://saudeamanha.fiocruz.br/wp-content/uploads/2018/04/GIRARDI-et-al-DIMENSIONAMENTO-OFERTA-E-DEMANDA-ESPECIALIDADES-MEDICAS-PRIORITARIAS-PARA-SERVICOS-ALTA-COMPLEXIDADE.pdf (accessed on 22 May 2022). [26]

Gómez-Ochoa, S. et al. (2020), "COVID-19 in Health-Care Workers: A Living Systematic Review and Meta-Analysis of Prevalence, Risk Factors, Clinical Characteristics, and Outcomes", *American Journal of Epidemiology*, Vol. 190/1, pp. 161-175, https://doi.org/10.1093/aje/kwaa191. [5]

Government of Argentina (2019), *Obstétricas Formación y Ejercicio: Estado de situación en Argentina*, https://www.argentina.gob.ar/sites/default/files/obstetricas._ejercicio_y_formacion_2019.pdf (accessed on 20 May 2022). [25]

Government of Argentina (nd), *Observatorio Federal de Recursos Humanos en Salud*, https://www.argentina.gob.ar/salud/oferhus/que-es-oferhus (accessed on 31 May 2022). [32]

Government of Colombia (2018), *Estimación de oferta de médicos especialistas en Colombia 1950-2030*, https://www.minsalud.gov.co/sites/rid/Lists/BibliotecaDigital/RIDE/VS/ED/GCFI/estimacion-cantidad-especialistas-medicas-septiembre-2018.pdf (accessed on 30 May 2022). [28]

Hone, T. et al. (2020), "Impact of the Programa Mais médicos (more doctors Programme) on primary care doctor supply and amenable mortality: quasi-experimental study of 5565 Brazilian municipalities", *BMC Health Services Research*, Vol. 20/1, https://doi.org/10.1186/s12913-020-05716-2. [45]

Jimenez, Michelle et al. (2015), *Analysis of the Health Care Labor Market in Peru*, World Bank, https://openknowledge.worldbank.org/handle/10986/21625 (accessed on 29 May 2022). [49]

Kroneman, M. (ed.) (2018), "Transition to universal primary health care coverage in Brazil: Analysis of uptake and expansion patterns of Brazil's Family Health Strategy (1998-2012)", *PLOS ONE*, Vol. 13/8, p. e0201723, https://doi.org/10.1371/journal.pone.0201723. [35]

Kruk, M. et al. (2018), "High-quality health systems in the Sustainable Development Goals era: time for a revolution", *The Lancet Global Health*, Vol. 6/11, pp. e1196-e1252, https://doi.org/10.1016/s2214-109x(18)30386-3. [59]

Liu, J. et al. (2017), "Global Health Workforce Labor Market Projections for 2030", *Human Resources for Health*, Vol. 15/1, https://doi.org/10.1186/s12960-017-0187-2. [19]

Lopes, M., Á. Almeida and B. Almada-Lobo (2015), "Handling healthcare workforce planning with care: where do we stand?", *Human Resources for Health*, Vol. 13/1, https://doi.org/10.1186/s12960-015-0028-0. [36]

Macinko, J. et al. (2016), "Gaps In Primary Care And Health System Performance In Six Latin American And Caribbean Countries", *Health Affairs*, Vol. 35/8, pp. 1513-1521, https://doi.org/10.1377/hlthaff.2015.1366. [13]

Massuda, A. et al. (2018), "The Brazilian health system at crossroads: progress, crisis and resilience", *BMJ Global Health*, Vol. 3/4, p. e000829, https://doi.org/10.1136/bmjgh-2018-000829. [55]

McPake, B., S. Anthony and E. Ijeoma (2014), *Analyzing Markets for Health Workers: Insights from Labor and Health Economics*, https://openknowledge.worldbank.org/handle/10986/18780 (accessed on 15 January 2022). [52]

Méndez Méndez, J. and A. Guerrero (2020), *Presupuesto para salud 2021: Prioridad en la creación de plazas médicas*, https://ciep.mx/presupuesto-para-salud-2021-prioridad-en-la-creacion-de-plazas-medicas (accessed on 15 December 2021). [58]

Ministerio de Salud (1995), *LEY 19378 Establece Estatuto de Atencion Preimaria de Salud Municipal`*, https://www.bcn.cl/leychile/navegar?idNorma=30745. [23]

Ministerio de Salud Costa Rica (2019), *Health Accounts Report Period 2017-2019*, https://www.ministeriodesalud.go.cr/index.php/noticias/noticias-2019/186-costa-rica-presenta-primer-informe-de-cuentas-de-salud (accessed on 15 December 2021). [56]

Ministry of Economy and Finance (2022), *Budget, Public Sector, Health Function and Health Personnel 2015-2021*, https://apps5.mineco.gob.pe/transparencia/Navegador/Default.aspx (accessed on 8 January 2022). [57]

MoH (2022), *Red Federal de Registros de Profesionales de la Salud (REFEPS)*, https://sisa.msal.gov.ar/sisa/#sisa (accessed on 1 June 2022). [37]

MoH, WHO, Andulusian School of Public Health (2015), *Análisis de la distribución geográfica de médicos especialistas en la República Argentina*, https://docs.bvsalud.org/biblioref/2018/05/884869/2015_ops_ms_arg_eadp_demo_medica_argentina-1.pdf (accessed on 31 May 2022). [24]

MSPS (2020), *Viceministerio de Salud Pública y Prestación de Servicios. Dirección de Desarrollo del Talento Humano en Salud. 2020. Planificación de Talento Humano en Salud en el Territorio. Orientaciones para el fortalecimiento del Talento Humano en Salud.*. [31]

National Registry of Health Establishments in Brazil (2022), *Human Resources*, http://tabnet.datasus.gov.br/cgi/tabcgi.exe?cnes/cnv/prid02br.def (accessed on 8 June 2022). [16]

OECD (2022), *Gender Equality in Peru: Towards a Better Sharing of Paid and Unpaid Work*, OECD Publishing, Paris, https://doi.org/10.1787/e53901b5-en. [11]

OECD (2022), *OECD Data*, https://data.oecd.org/ (accessed on 11 July 2022). [3]

OECD (2021), *Gender Equality in Chile: Towards a Better Sharing of Paid and Unpaid Work*, OECD Publishing, Paris, https://doi.org/10.1787/6cc8ea3e-en. [10]

OECD (2020), "Women at the core of the fight against COVID-19 crisis", *OECD Policy Responses to Coronavirus (COVID-19)*, OECD Publishing, Paris, https://doi.org/10.1787/553a8269-en. [12]

OECD (2016), *Health Workforce Policies in OECD Countries: Right Jobs, Right Skills, Right Places*, OECD Health Policy Studies, OECD Publishing, Paris, https://doi.org/10.1787/9789264239517-en. [14]

Ono, T., G. Lafortune and M. Schoenstein (2013), "Health Workforce Planning in OECD Countries: A Review of 26 Projection Models from 18 Countries", *OECD Health Working Papers*, No. 62, OECD Publishing, Paris, https://doi.org/10.1787/5k44t787zcwb-en. [17]

Özçelik, E. et al. (2021), "Assessing the performance of beneficiary targeting in Brazil's More Doctors Programme", *Health Policy and Planning*, Vol. 36/2, pp. 149-161, https://doi.org/10.1093/heapol/czaa137. [39]

Özçelik, E. et al. (2020), "Impact of Brazil's More Doctors Program on hospitalizations for primary care sensitive cardiovascular conditions", *SSM - Population Health*, Vol. 12, p. 100695, https://doi.org/10.1016/j.ssmph.2020.100695. [46]

Pan-Canadian Public Health Network (2018), *Canadian Pandemic Influenza Preparedness: Planning Guidance for the Health Sector*, https://www.canada.ca/content/dam/phac-aspc/migration/phac-aspc/cpip-pclcpi/assets/pdf/report-rapport-02-2018-eng.pdf (accessed on 11 May 2022). [1]

Peruvian General Directorate of Health Personnel (2021), *Information on Human Resources in the Health Sector*, http://digep.minsa.gob.pe/publicaciones/bibliografica.html (accessed on 8 June 2022). [15]

Peruvian Ministry of Health (2014), *Guía Técnica para la Metodología de Cálculo de las Brechas de Recursos Humanos en Salud para los Servicios Asistenciales del Primer Nivel de Atención*, https://www.minsa.gob.pe/Recursos/OTRANS/08Proyectos/2021/PIM-SS-2021_norma-10.pdf (accessed on 7 June 2022). [51]

Peruvian Ministry of Health (2013), "Segunda Medición de las Metas Regionales de Recursos Humanos para la Salud Perú 2007 - 2015", *Online Report*, https://docs.bvsalud.org/biblioref/2018/06/885008/i-15-segunda-medicion-de-las-metas-regionales-de-recursos-human_rBChN49.pdf (accessed on 31 May 2022). [30]

Peruvian Ministry of Health (2011), *"Necesidad de Médicos Especialistas en Establecimientos de Salud del Ministerio de Salud y Gobiernos Regionales, año 2010*, https://cdn.www.gob.pe/uploads/document/file/391079/Necesidad_de_m%C3%A9dicos_especialistas_en_establecimientos_de_salud_del_sector_salud20191017-26355-186rcta.pdf (accessed on 7 June 2022). [29]

Pesec, M. et al. (2017), "Primary Health Care That Works: The Costa Rican Experience", *Health Affairs*, Vol. 36/3, pp. 531-538, https://doi.org/10.1377/hlthaff.2016.1319. [53]

Pichler, R., C. Frühwald and S. Burgmann (2020), *New routine in primary care: Experiences from an Austrian PHC center during the COVID-19 crisis*, https://improvingphc.org/blog/2020/06/11/new-routine-primary-care-experiences-austrian-phc-center-during-covid-19-crisis (accessed on 11 May 2022). [2]

Rubinstein, A. et al. (2018), "Making Universal Health Care Effective in Argentina: A Blueprint for Reform", *Health Systems & Reform*, Vol. 4/3, pp. 203-213, https://doi.org/10.1080/23288604.2018.1477537. [33]

Salazar Sánchez, L., J. Cordero Solis and A. López Dávila (2021), "The process for recognizing of foreign medical degrees in Costa Rica: a statistical survey for the past 15 years", *GMS Journal for Medical Education*, Vol. 38/7, pp. 1-14, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8675375/. [43]

Scheffer, M. (2020), *Demografia Médica no Brasil 2020*. [9]

Scheffler, R. and D. Arnold (2018), "Projecting shortages and surpluses of doctors and nurses in the OECD: what looms ahead", *Health Economics, Policy and Law*, Vol. 14/2, pp. 274-290, https://doi.org/10.1017/s174413311700055x. [21]

Scheffler, R. et al. (2016), *Health Labor Market Analyses in Low- and Middle-Income Countries : An Evidence-Based Approach. Directions in Development--Human Development*, http://hdl.handle.net/10986/25137 (accessed on 15 March 2022). [20]

Scheffler, R., R. Herbst and C. Lem (2016), *Health Labour Market Analysis in Low- and Middle-Income Countries*, https://openknowledge.worldbank.org/bitstream/handle/10986/25137/9781464809316.pdf?sequence=2&isAllowed=y (accessed on 15 January 2022). [18]

SEPEN (2021), *Mapping of National Health Workforce Planning and Policies in the EU-28*, https://healthworkforce.eu/wp-content/uploads/2021/02/D4_Final-study-report_EB-02-20-972-2A-N.pdf (accessed on 11 July 2022). [38]

Serje, J. et al. (2018), "Global health worker salary estimates: an econometric analysis of global earnings data", *Cost Effectiveness and Resource Allocation*, Vol. 16/1, https://doi.org/10.1186/s12962-018-0093-z. [60]

Silva, E. et al. (2018), "Cost of providing doctors in remote and vulnerable areas: Programa Mais Médicos in Brazil", *Revista Panamericana de Salud Pública*, pp. 1-7, https://doi.org/10.26633/rpsp.2018.11. [44]

USDA Economic Research Service (2022), *International Macroeconomic Data Set*, https://www.ers.usda.gov/data-products/international-macroeconomic-data-set/ (accessed on 15 May 2022). [22]

WHO (2022), *Global Health Observatory: Healthy Life expectancy (HALE) at birth (years)*, https://www.who.int/data/gho/data/indicators/indicator-details/GHO/gho-ghe-hale-healthy-life-expectancy-at-birth (accessed on 12 May 2022). [8]

WHO (2022), *The Impact of COVID-19 on Health and Care Workers*, https://apps.who.int/iris/bitstream/handle/10665/345300/WHO-HWF-WorkingPaper-2021.1-eng.pdf?sequence=1&isAllowed=y (accessed on 12 May 2022). [6]

WHO (2021), *Impact of COVID-19 on human resources: the case of Plurinational State of Bolivia, Chile, Colombia, Ecuador and Peru. Overview of findings from five Latin American countries*, World Health Organisation, https://apps.who.int/iris/bitstream/handle/10665/350640/9789240039001-eng.pdf?sequence=1&isAllowed=y (accessed on 29 May 2022). [48]

WHO (2021), "National Health Workforce Accounts Data Portal", *WHO National Health Workforce Accounts Data Portal*, https://apps.who.int/nhwaportal/ (accessed on 10 April 2021). [4]

World Bank (2022), *World Development Indicators*, http://databank.worldbank.org (accessed on 12 May 2022). [7]