OECD Reviews of Health Systems

Monitoring Health System Performance in Peru

DATA AND STATISTICS

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Foreword

Peru's good economic performance in recent years, together with targeted social spending and health sector initiatives have yielded significant progress in improving population health and helped towards Peru's central health policy goal of providing effective health coverage to all its population. In common with other middle-income countries in the region, Peru is going through a demographic and epidemiological transition. There is a shift in importance from communicable diseases to non-communicable, especially in urban areas with significant increases in cancer, CVD and diabetes.

Measuring how the Peruvian health system is responding to these challenges requires a solid set of health sector statistics and indicators, underpinned by a robust health information system. The breadth and depth of data must be relevant and applicable to decision making at all levels of the health system, both to respond to national policy needs and benchmark Peru in a regional and global context.

This report assesses the current status and availability of Peru's routinely reported health sector data and statistics as well as the underlying data infrastructure. The report recommends improvements in the governance of the system and where to extend data coverage and strengthen comparability during the next phase in the development of Peru's health care system.

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Acronyms and abbreviations

CCNNS	*Cuentas Nacionales de Salud*	National Health Accounts
CENATE	*Centro Nacional de Telemedicina*	National Center of telemedicine
CVD		Cardiovascular disease
DGGDRHS	*Dirección General de Gestión y Desarrollo de Recursos Humanos en Salud*	General Directorate for Management and Development of Human Resources in Health
DIRESA	*Dirección Regional de Salud*	Regional health directorate
DISA	*Dirección de Salud*	Health directorate
ENAHO	*Encuesta Nacional de Hogares sobre Condiciones de Vida y Pobreza*	National household survey on life conditions and poverty
ENDES	*Encuesta Demográfica y de Salud Familiar*	Demography and family health survey
ENSUSALUD	*Encuesta Nacional de Satisfacción de Usuarios del Aseguramiento Universal en Salud*	National health care user satisfaction survey
EsSalud	*Seguro Social de Salud*	Social Health Insurance
GDP		Gross Domestic Product
HCQI		Health Care Quality Indicators
HIS-MINSA	*Sistema de Información de Salud*	Health Information System
HMN		Health Metrics Network
IADB		Inter-American Development Bank
IAFAS	*Instituciones Administradoras de Fondos de Asegutamiento en Salud*	Institutions for the Administration of Health Insurance Funds
IGSS	*Instituto de Gestión de Servicios de Salud*	
INEI	*Instituto Nacional de Estadística e Informática*	National Statistics and Informatics Institute
INS	*Instituto Nacional de Salud*	National Health Institute
IPRESS	*Instituciones Prestadoras de Servicios de Salud*	Health Care Providers

MEF		Ministry of Economy and Finance
MINSA	*Ministerio de Salud*	Ministry of Health
OGEI	*Oficina General de Estadística e Informática*	General Office of Statistics and Informatics
OGPPM	*Oficina General de Planeamiento, Presupuesto y Modernización*	General Office of Planning, Budgeting and Modernization
OGTI	*Oficina General de Tecnologías de la Informática*	General office of informatics
PESEM	*Plan Estratégico Sectorial Multiannual*	Strategic sectorial plan
PPP		Purchasing Power Parity
REFCON	*Sistema de Referencia y Contrareferencia*	System for references and contra-references
RENAES	*Registro Nacional de Establecimientos de Salud*	National Health Establishment Registry
RENIEC	*(Registro Nacional de Identificación y Estado Civíl*	National Identification Registry
SES	*Sistema Estadístico de Salud*	Statistical Health System
SHA		System of Health Accounts
SIS	*Seguro Integral de Salud*	Integral Health Insurance
SUNAT	*Superintendencia Nacional de Aduanas y de Administración Tributaria*	National Superintendence of Customs and Tax Administration
SUSALUD	*Superintendencia Nacional de Salud*	National Health Superintendence
UHC		Universal Health Coverage
WHO		World Health Organization

Executive Summary

The Peruvian health system is evolving. At the heart of this change is an ongoing commitment to reach universal health coverage (UHC). This translates into better access and financial protection, and contributes to better health outcomes. Yet, Peru faces challenges: the population continues to experience high rates of infectious diseases – alongside an increasing prevalence of non-communicable disease. The Peruvian health system, meanwhile, struggles with fragmentation and a lack of resources, which need to be tackled to create a modern and efficient system able to provide quality health services to the whole population.

To ensure that progress can be assessed and policy goals monitored, Peru needs relevant, timely and accurate data across the whole health sector and country. The nature and quantity of data collected must be relevant and applicable to decision making at each level of the health system. This requires a viable health information system serving the needs of national analysis and policy formulation for enhanced system performance, as well as contributing to a global public good of internationally comparable data.

The health system in Peru is characterised by a high degree of fragmentation and decentralisation, with implications for the efficient flow and collection of information. Each system or region produces its own set of indicators, primarily for internal purposes with differing definitions, aggregations and methodologies. There has been progress in central data collection and substantial amounts of data are produced in different areas of the health information system, but often in an irregular and fragmented fashion. National data, when available, are seldom produced and collected according to a single national standard, thus limiting the use of the data for national policy purposes. A national agency should have the authority to set standards and collect, process and disseminate data across all sub-schemes and geographical regions.

Peru's health statistics have typically focused on tracking inputs and counting activities, particularly on child and maternal health, and infectious disease surveillance. As the epidemiological burden shifts and there is a broader focus on system performance, a broader set of indicators are required. Current data, for example, are inadequate for monitoring coverage across sub-

schemes, i.e. who benefits from which services and who carries the burden of funding. In addition, to move beyond simply insurance and service coverage, Peru needs to increase the ability to monitor the quality of services across providers and geographical areas. Including more dimensions of quality of care into the monitoring of UHC would inform about the real difference in effective coverage across schemes.

All data dimensions reviewed in this study can improve in their detail, timeliness, adherence to definitions and standards, and coverage. Data on health care financing and spending, as well as data on physical and human resources, are fundamental for optimising resource allocation, formulating policies aimed at improving equity, and in combination with activity data, are a necessity for assessing efficiency. Robust and comprehensive activity statistics are vital to understand the volume of services produced by the health system, and, in combination with other data, to assess equity of utilisation. For example, a current priority of the Peruvian Government to better distribute financial, human and physical resources across all regions, particularly in primary health care, requires comprehensive data on all these dimensions for effective monitoring and evaluation.

That said, many of the foundations are in place to create an integrated system with a central data repository and a system of electronic health records. The implementation of a unique patient identifier with the ability to link different types of information across registries and over time is a clear objective. But further advances are hindered by a lack of infrastructure, equipment and human resources. Connectivity and speed of access to the health information system requires the strengthening and modernising of the underlying infrastructure.

As Peru develops its health information system it also has a clear opportunity to adopt best practices in health data governance. While encouraging the availability and use of personal health data for public interest purposes, it should promote the protection of privacy, personal health data and data security. Adherence to international recommendations encourages greater cross-country harmonisation of data governance frameworks so that more countries can use health data for research, statistics and health care quality improvement.

There is still a need to improve the quality of primary data reporting at the provider or institutional level and the interpretation and use of the information at the decision-making level. The ability to build robust indicators of quality is ultimately dependent on the quality of data originating in the local clinical environment. Peru needs to provide training and a structure for continuous education of relevant staff in coding standards to improve coding depth and quality of data. Health staff and management of individual providers must see

the value of the data for their own activities, for example by creating useful performance feedback relevant in their daily work.

Policy makers also need to make better use of the information system and integrate it into the decision making process. There is currently a disconnection between research, policy analysis and decision making. Peru should invest more in increasing the processing and dissemination of data. This way, activities in facilities across the country could be compared, and aggregated to obtain a true picture of how resources are being spent and how facilities are coping with providing health care. Ensuring that the health system is adequately supported by data should be a central priority for Peru and efforts to achieve this should be reaffirmed and a key component of future strategies.

Assessment and recommendations

Peru has achieved significant progress in recent years in improving the health of its population. At the core of this has been an ongoing commitment from successive governments to reach universal health coverage (UHC). This, combined with steady economic growth, has translated into better access and financial protection in the health system, and contributed to better health outcomes. But the Peruvian health system still faces significant issues around fragmentation and lack of resources, which need to be tackled to create a modern and efficient system able to respond to the needs of the whole population. Added to this, epidemiological and demographic shifts, such as population ageing and the gradual increase of chronic disease, are a test to the efficiency and quality of health care provision in any high or middle-income country.

Peru requires a viable and sustainable health information system to meet the challenges ahead

To ensure that these challenges can be bridged and that policy goals are achieved, it is vital to be able to adequately measure health system performance, including quality. The collection and use of a clear set of relevant, timely and accurate data across the whole health sector and country not only enables the primary purpose of national analysis and policy formulation for enhanced system performance, but also contributes to a global public good of internationally comparable data, by which Peru and other countries can confidently compare their health systems.

As such, Peru needs to put in place a viable health information system to ensure that operational and strategic decisions taken to improve the health and quality of life of the Peruvian population are founded on solid evidence. The nature and quantity of data collected must also be relevant and applicable to decision making at the various levels of the health system. Accurate, representative and timely data are therefore central to the assessment and improvement of the quality of care delivered to the Peruvian population.

An assessment of the current status and availability of Peru's routinely reported health statistics as well as the underlying data infrastructure shows

where it falls short in delivering necessary data to monitor and evaluate the Peruvian health system in a national and international context. This review of health statistics in Peru focuses on four health care system domains: health financing, physical and human resources, health care activities, and health service quality. Other health statistics domains, such as health status, risk factors and social determinants, are not part of this report. The baseline for assessing the Peruvian data is the range of standards developed for international reporting to international organisations, and more specifically to OECD. The recommendations aim to contribute to greater data coverage, comparability, and use of policy relevant indicators that can inform all stakeholders, both in Peru and globally.

Stronger management at the national level is needed to overcome fragmentation and decentralisation

A characteristic of the Peruvian health system, which Peru shares with many of its Latin American neighbours, is the vertical separation in the funding and provision of health services. With affiliation largely determined by employment status, each health sub-system covers a segment of the population (with some overlap), defining the benefit package, access and quality of the services available. In Peru, this broadly translates into four groups: *Seguro Integral de Salud* or SIS, the main public health insurance for vulnerable groups and covering almost half the population; EsSalud, the formal employment-based public insurance covering another quarter of the population; a smaller group of privately insured people; and a decreasing group of non-insured. This separation impacts on data systems, with numerous institutions collecting their own set of indicators, each established primarily for internal purposes with differing definitions, aggregations and methodologies. Nationally representative data remain limited and, when available, are seldom produced and collected according to a single national standard.

In addition, the health system, in common with many parts of the Peruvian public sector, has undergone a process of geographical decentralisation over recent years. These reforms aim at reducing the focus on the capital region of Lima and achieving a more needs-based resource allocation across the country, particularly to strengthen the Andean and Amazonian regions. While such policies can be beneficial to the performance of the health system, decentralisation has also contributed to the fragmentation, with responsibilities transferred to the regions and lines of communication and reporting between central institutions and the Regional Health Directorates (DIRESAs) stretched. All of which has implications for the efficient flow and collection of information.

Fragmentation and decentralisation are not *per se* definitive obstacles to a well-performing information system. While most OECD countries perhaps do not face the same degree of fragmentation and duplication of delivery that Peru faces, many of their health information systems do function across a multitude of schemes and with responsibilities split between central authorities and regions. To have a global overview of the health system, and translate information into relevant policy advice, MINSA (or a national agency) needs to regain the authority to set national standards and perform the collection, processing and dissemination of data across all sub-schemes and geographical regions. This needs to be backed up by the development of an adequate interoperable data platform.

The government needs to reaffirm its long-term vision and address some of the resource gaps

To a large extent many of the foundations for the Peruvian health information system are already in place. Since 2013, a plan has been established for a national health information system to be implemented. The plan provides an ambitious vision to create an integrated system with a central repository and system of electronic health records, and progress has been made in a number of aspects towards this goal.

The General Office of Informatics (*Oficina General de Tecnologías de la Informática*, OGTI) within MINSA has had the responsibility of developing national standards for registration and interoperability in order to support data collection and improve the comparability of data across the health system. Together with the national repository, the other fundamental part of the health reform is the roll-out of an integrated electronic health record system. The fact that 97% of the population is registered with a unique national ID number, and newborns are already given an ID number in the delivery room itself, also puts Peru in an advantageous position to ensure that all Peruvian's health records can become available electronically. The goal is that patient information can then become transferable across all institutions within the health system.

Challenges remain in the execution phase of the plan with the need for the government to clearly reaffirm this long-term vision and at the same time plug some of the resource gaps. All countries need to strike a balance between the best information system possible, and what can be reasonably achieved given limited resources. Therefore, while the build-up of the basic system is promising, Peru needs to be realistic in what data it asks for, by focusing on core sets of data for each domain. For example, Peru might prioritise the collection of strong human resource and hospital beds data over collecting data on availability and use of technical equipment.

Implementation in Peru has been hindered by a lack of infrastructure, equipment and human resources. Connectivity and speed of access to the health information system needs strengthening in order to modernise the information infrastructure. As of 2016, around 40% of the 8 200 MINSA health centres still had insufficient or no internet connection, which is an obvious barrier for the deployment of systems. Peru also faces a serious human resource gap. While this impacts primarily on the delivery of frontline services, there is a knock-on effect with a lack of both administrative and clinical staff being able to accurately code and report, i.e. assuring a sufficient level of data quality for an advanced information system.

The creation of a national agency for health information would set standards and define the level of information for national policy use

Much of the technical development and establishment of data standards has been under the responsibility of OGTI in MINSA, but the data and indicators collected within the various Directions of MINSA tend to be restricted to the "public" facilities. Information exchanges with EsSalud and in particular the private sector are often not subject to the same reporting requirements.

At the same time, the Health Superintendence, SUSALUD, backed by a greater degree of authority and legal power in its principal role to protect patient rights and promote quality of care, collects data right across the health sector and in various domains, both through administrative systems (such as SETI-IPRESS) and survey-based tools (e.g. ENSUSALUD). SUSALUD is a dynamic and ambitious institution and does an admirable job making health information accessible to the wider public in a user-friendly way. Since one of its roles is to monitor the use of resources available for health services and funds for the universal health insurance to ensure quality, timeliness, availability and acceptability of benefits, SUSALUD receives data from financing institutions and health care providers, both public and private. Typically this doesn't cover a comprehensive package of data, and only partly meet requirements of unified definitions and methodology to allow aggregation at the national level. SUSALUD currently has neither a regional spread nor the financial resources but, capitalising on its well established practices and good relationship with stakeholders could be a way to push towards stronger data governance and standards.

The current split in the various roles between MINSA (including internally) and SUSALUD could be better served with the development of a more all-encompassing national agency for health information, either within MINSA or outside the ministry. A number of OECD countries, including Mexico, have moved successfully in this direction. This would need to be an

agency with sufficient authority to collect and distribute data from all schemes and providers, regardless of legal status or government affiliation. It would ensure that the standards, definitions and methods are adhered to, and that all facilities across the country report to a single central agency. Such an authority would ensure the correct collection, processing and use of the information. In the absence of such an agency, a strengthening of current structures and a greater degree of information exchange between the various sub-schemes should be a minimum objective. The involvement of the various institutional partners (MINSA, EsSalud, SUSALUD, and others) in such an agency, or one of the existing institutions, would be for the Peruvian government and relevant stakeholders to explore further since their buy-in is important. Whichever direction is chosen, a gradual centralisation of data across schemes and regions should be achieved in the near future.

Provide strong health data governance to protect patients' privacy while supporting monitoring and research

Peru has an opportunity to accompany the development of a strong health information system with best practices in health data governance. In 2017, the OECD introduced a new Recommendation on Health Data Governance.[1] Governments adhering to this Recommendation will establish and implement a national health data governance framework to encourage the availability and use of personal health data to serve health-related public interest purposes while promoting the protection of privacy, personal health data and data security.

The Recommendation is structured according to twelve high-level recommendations calling for:

1. Engagement of stakeholders in the development of a national health data governance framework;
2. Co-ordination within government and co-operation among personal health data processors to encourage common data-related policies and standards;
3. Reviews of the capacity of public sector health data systems to serve public interests;
4. Clear communication to individuals about the processing of their personal health data;
5. The processing of personal health data by informed consent and appropriate alternatives;

6. Implementing review and approval procedures to process personal health data;
7. Transparency through public information about the processing of personal health data;
8. Maximising the development and use of technology for data processing and data protection;
9. Mechanisms to monitor and evaluate the impact of the national health data governance framework;
10. Training and skills development of personal health data processors;
11. Controls and safeguards within personal health data processors; and
12. Requiring that personal health data processors meet the expectations set out in the national health data governance framework.

These twelve recommendations set the conditions to encourage greater cross-country harmonisation of data governance frameworks so that more countries can use health data for research, statistics and health care quality improvement.

Adherents support trans-border cooperation in the processing of health data for purposes that serve the public interest. This includes:

- Engaging with relevant experts and organisations to develop mechanisms that enable the efficient exchange and interoperability of health data.

Adherents encourage non-governmental organisations to follow this Recommendation when processing personal health data for health-related purposes that serve the public interest.

Countries' progress toward the implementation of this recommendation will be routinely monitored by the OECD Council. To support countries in the implementation of the Recommendation, the OECD is developing an Implementation Guide.

Peru needs to broaden the scope of health information beyond inputs and activities and increase the use of data

Traditionally, Peru's information infrastructure has been characterised by a focus on counting inputs and tracking activities. Given Peru's historic disease profile, this has centred on child and maternal health, and infectious disease surveillance. This may have been appropriate in the light of previous priorities, but in line with a changing epidemiological burden and increased

focus on performance, new data need to be produced. This should cover a broader set of non-communicable diseases and services, bring in aspects of quality and patient outcomes, and collate more information on costs. Not just in the public system, but across the whole of the health sector.

Data currently produced within the Peruvian health information system are insufficient for monitoring effective coverage across sub-schemes, i.e. who benefits from which services, to what quality, and who carries the burden of funding. To answer this, and associated analysis of how much of these services are provided, by whom, when and where, requires more comprehensive and responsive information. However, this is only useful when data is comparable across the whole system and reported in a timely manner, so it can be accurate and representative. Ensuring that the health system is adequately supported by data should be a central priority for Peru and efforts to achieve this should be reaffirmed and a pillar in any forward-looking strategy.

Policy makers also need to make better use of the information system and integrate it into the decision making process. There is currently a disconnection between research and decision making and many key policies are not supported by an analysis of adequate data. Peru should invest more in increasing the processing and dissemination of data. A large number of data are currently available and needs to be shared and used in order to maximise its value. This process could take place in addition to their current reporting activities to their management. This way, data of activities in facilities across the country, could be compared and aggregated to obtain a true picture of how resources are being spent and how facilities are coping with providing health care.

Peru should enforce standard data reporting irrespective of the type of funding and provision

The capacity to implement national health policy is affected by the time and resources spent to comply with bureaucratic requirements. These requirements flow down to regional and local governments, as well as to all health service providers. SIS has two different types of information requirements: one to inform on production levels, so that health providers receive payment for services provided; and another for payment of its per capita agreements with the regional governments. MEF also has its own information requirements; mainly those associated with the results based budgeting. And then MINSA and SUSALUD also have their own information requirements that are generally linked to national statistics, monitoring and quality control. Heavy bureaucratic procedures combined with limited

resources and insufficient capacities at the subnational level, can impact on health service provision.

The different areas of the health information system illustrate a system capable of producing a substantial amount of data, but often in an irregular and fragmented fashion, with only partial coverage. This constrains the use of the data for any purpose other than possibly facility level management, and occasionally analysis at the level of a specific financing scheme. Peru should first try to create national compliance and integrate the data already produced, instead of aiming for too broader sets of data.

The survey instruments in place are currently often the only means of collecting regular data with national coverage. While survey data have many disadvantages such as periodicity and costs, these instruments are likely to play an important role in the future as well. Some types of data should preferably be transferred from survey-based collection to increased reliance on administrative data, for example for data on visits and discharges. But for collecting patient reported outcomes and experiences as measures of performance, which are currently developing in many OECD countries, Peru can benefit from its solid experience in surveying patients and its population.

Currently, the notion of public and private plays a large role in data collection. Data on resources and activities, but also quality of services, must become a national public good, to allow for monitoring of performance of the system as a whole. In collecting data in these domains, the legal status of the purchaser or the provider should be a variable, but not criteria for whether data submission is compulsory or not. For example, currently private facilities must register their staff in order to obtain accreditation, but staff changes thereafter are most often unreported.

The full implementation of the System of Health Accounts is key to providing accurate information on where financial resources are going

The provision of timely, accurate and detailed data on health care financing and spending according to standards and national priorities is vital for informed decision making. To date, Peru hasn't produced comparable estimates of current health spending. MINSA has taken the decision to report according to the System of Health Accounts 2011 (SHA, 2011) global framework. There is still a need to improve the quality of primary data reporting at the provider or institutional level and the interpretation and use of the information at the decision-making level.

Strengthening the governance structure and standards of reporting through the creation of a National Health Accounts Committee (to be approved by Supreme Decree) is an important step which needs to be seen through to its

conclusion. This will help guide the production of relevant data and in turn ensure a sustainable cycle of production and use. Despite the fact that the providers of information send their financial data as requested, not all comply in a transparent manner, and with the existence of differences in classifications. For this reason, a legal mandate should be established that insures that the type of information that is required is provided in a periodic, timely and verifiable manner.

The responsibility for production rests with the Office of Planning and Economic Studies (OPEE) within MINSA. A close collaboration with the National Statistical Institute (INEI) with regards to data use, discussions of methodological concepts and any possible future work on supplementary accounts is recommended. In addition, broader involvement, from other ministries, (such as the Ministry of Economy and Finance) and government agencies (both at the state and regional level) will increase the usefulness and cross-institutional authority of the reports.

Spending allocated by function, by disease and by region will help enhance the policy use

One of the main challenges is obtaining valid and reliable expenditure data according to established standards. The structure of the current data sources is highly dependent on the accounting systems used to collect and process financial information across the various subsystems, making it difficult to consolidate reporting and enhancing the fragmentary nature of the information. Administrative data records should be improved and standardised, to reduce diversification and differences between schemes and also within schemes. Information providers should be trained to reduce review periods and ensure better quality of information.

The use in the planning and policy-making process is linked to confidence in the figures produced. A wider dissemination of the health accounts could benefit and strengthen the various stages of the health accounts cycle. Further areas of development of the health accounts (by type of care, disease or condition and according to region) have been identified. This can further enhance the usability and impact. Regional governments in particular could be interested in health expenditures disaggregated by region for their own analyses and productivity comparisons. This should in turn lead to the provision of more accurate data.

The full implementation of the SHA 2011 framework requires sufficient capacity in addition to strong governance structures. Technical assistance from international organisations such as OECD and PAHO/WHO and the participation in international expert meetings and data collections can play an

important role, but ultimately ownership at the national level is key to ensure that the routine production and use of information is fully embedded.

Resources data should follow national standards and administrative sources should be strengthened

Timely and nationally representative data on physical and human resources is fundamental for resource allocation, formulation of policies aiming at improved equity, and in combination with activity data a necessity for assessing efficiency. Peru, not unlike many countries, experiences inequalities in the geographical distribution of resources as well as between health insurance schemes.

It is a current priority of the Peruvian Government to better distribute human and physical resources across all regions, through for example, the SERUM programme. However, these policy efforts must be supported by improvements in the available underlying data, to ensure that resources are directed to the places where resources are most scarce relative to population health needs. The ability to assess and monitor human resources, which constitute a large share of the total resources, is particularly important. The DGGDRHS has made progress through INFORHUS in compiling nationally representative human resources data, although comprehensiveness and timeliness needs to be improved.

Adequate data on the total number of staff by categories currently suffers from the inability to track migration. There are different ways of achieving this. The Bureau of Immigration and Naturalisation (DIGEMIN) could support improved quality of migration data. But the aim is not necessarily to understand how many leave or enter the country, but how many are available to the Peruvian health system. Improving links between a licence register and a provider register is an alternative approach.

A classification of professionals according to their work status is needed. While the licencing and recertification system is essential for patient safety, it can potentially also provide information for resources planning. Peru should strengthen compliance with recertification rules. Data on workplace for active staff could for example inform about human resources available by type of facility and sub-scheme. Today's information published by MINSA has adequate splits, e.g. in terms of geography, but lacks comprehensiveness. Peruvian data on health workforce resources is not specific in separating health professionals into practicing (working in direct contact with patients), professionally active (those practicing in addition to those not working directly with patients) and licensed to practice (which includes these two

groups and anyone who is qualified and licensed to exercise its profession but not currently part of the health work force).

In addition, data on primary health care (PHC) or first-line services, as well as maternal and child health services (MCHC) should be improved. Currently in Peru, a lot of data in this area of services is captured in surveys. But there is the potential to strengthen administrative data on both resources and activities which can be valuable for monitoring purposes. For example, clarifying staff categories working with these services, make them internationally comparable, and including all service providers, would complement survey data on access and use of PHC and MCHC services.

The regulatory framework for data collection on basic resources, for example on hospital beds and their use, needs to be strengthened. This could be achieved using RENIPRESS as the overarching platform for physical resource data of all sub schemes. Because physical resources generally, and more specifically investment in infrastructure, is dependent on several different ministries, the system cannot rely on reporting to funding institutions which do not have responsibility for monitoring the health sector. There needs to be timely access to consolidated, consistently defined and relevant data for the government body which has an oversight.

RENIPRESS could be the solution to many of the problems faced by Peru in regards to heath resources data. Although this platform was not externally available before the publication of this report, it promises to offer nationally representative data integrating all schemes of the health system. All facilities are required to input data on their human and physical resources, although an important challenge will be to ensure that these data is kept up to date. It is also fundamental that data from RENIPRESS are provided with enough level of granularity, in order to distinguish between specialties and professional categories, as well as to separate by gender, age groups and socio-economic categories.

Data on activities is widely collected but lacks consistency and visibility

Robust activity data is vital information to understand the volume of services produced by the health system, and in combination with other data, to assess, for example, efficiency and equity of utilisation. Data on health care activities such as number of consultations and discharges are collected by all schemes in Peru but this is done in very different ways hindering the compilation of aggregate data or comparisons across the country. This problem is not exclusive to Peru; across the Latin American region, nationally aggregated data is scarce, particularly on hospital aggregates and consultations.

Peru can do a lot more to disseminate already collected data on health activities. There has been progress in central data collection in both MINSA and SUSALUD. A lot of activity data exist, which could be published if a relatively limited amount of additional work was put into increasing comparability between the sources. This again requires that central government decides through which agency or institution this is organised. SUSALUD is currently the sole institution collecting and publishing activity indicators from across the health system. The comparability of these indicators is limited however, since not all indicators are submitted by all schemes.

For activities, data are sourced from both survey instruments and administrative systems, sometimes combining both for the reporting of a specific indicator. The survey data are not always part of a regular data collection but instead are collected every few years via one off studies or audits conducted to examine specific parts of the system. Increasing administrative data, in which activity data across a number of topics and areas is regularly collected, processed, published and used for policy purposes, should be a priority for Peru.

Health staff and management of individual providers must see the benefits of contributing with data. All kinds of data require an investment of time and energy to be adequately collected. In health facilities, data on activities is collected in addition to treating patients and must be organised so that it creates the least possible burden to staff. The system should also make professionals see the value of the data for their own clinical activities, for example by creating useful performance feedback relevant in their daily work.

The Peruvian Government, through its dedicated agencies at MINSA and INEI, must set the conditions to facilitate the sharing of data. These efforts should be supported by an strengthening of the legislative framework in regards to all areas of the information system. Current legislation does not place enough pressure on providers to provide data in a timely and comparable manner. The capacity to collect data already exists, and the priority must be to ensure that these data are effectively compiled and utilised.

Peru's ability to produce data on quality of services is dependent on the current development of its infrastructure

To expand Peru's successful universal health coverage approach beyond insurance and service coverage, i.e. to ensure that quality health care services are provided for all, Peru needs to increase the ability to monitor quality across providers and geographical areas. Currently quality is indirectly part of the UHC monitoring through the tracking of immunisations rates and similar coverage of services in primary health care. Including more dimensions of

quality of care into the monitoring of UHC would inform about real difference in effective coverage across schemes. The ongoing development work on the health information system will, if successful, enable Peru to build a firm foundation to collect data with a national coverage in terms of geography and insurance arrangement, and produce health care quality indicators which require personal identification and linkages between different care providers and administrations.

Peru's extensive survey data collection, in which many quality aspects of the Peruvian health system are already captured, is beneficial for this data domain. Even though the survey instruments provide a substantial amount of valuable information, many dimensions of medical quality require investment in administrative data systems. Current survey tools need to be complemented with administrative records with national coverage, and the developing health information system is a prerequisite for this.

The implementation of a unique patient identifier is needed to link different types of information across registries and over time, i.e. for the ability of different parts of the health system to read data the same way and communicate with each other. In this domain, Peru also needs to implement common definitions and terminology. For example, clinical information entered into a clinical records system in an EsSalud hospital must be possible to be read both in a SIS funded PHC facility and a national repository.

This is not merely a matter of implementing more advanced medical record systems. The data quality and ability to build robust indicators is ultimately dependent on coding practices in the local clinical environment. Peru also needs to provide training and a structure for continuous education of relevant staff in coding standards to improve coding depth and quality of data.

Finally, in addition to building data collection capacity, Peru needs to use the data by developing relevant quality indicators according to international standards. In doing so, it should be kept at a manageable level. For example, crude quality measurements of primary health care such as hospital admission rates by diagnoses can be developed relatively easy, with regular compilations by insurance scheme and geographical area. These estimates may not necessarily follow international standards for measuring these indicators in an initial phase but could help guide policy.

Key recommendations to strengthen the Peruvian information system

The Peruvian Health Information System is already able to collect a large amount of health indicators. However, a number of improvements are needed to increase the policy relevance, comparability and use of these data. The OECD's top priority recommendations are:

Strengthen data governance and accountability

- Create or repurpose an agency dedicated to overseeing standards, collection and dissemination across the entire health system. This institution should have real power to enforce compliance across all schemes, and be obliged to share the data with other stakeholders.
- Strengthen the legal framework regulating the health information system to facilitate data sharing via stricter regulations to ensure all schemes contribute to producing nationally representative indicators.
- Increase performance indicator availability to the general public, to foster accountability but also support patients to take informed choices.
- Build public trust in the information system by adhering to the OECD Recommendation on Health Data Governance.

Improve data collection procedures

- Improve training of staff members responsible for inputting data every time there is an update in IT systems to minimise lack of reporting or human error and increase quality.
- Deploy dedicated staff members such as programmers and IT specialists in order to ensure the adequate functioning of information technologies and electronic equipment used for data collection.
- Ensure that all health facilities are connected to the internet in order to submit and receive data, particularly remote health posts where other type of communication would be inefficient.
- Encourage health staff to contribute to regular data collection by building in dissemination (reporting back) of information relevant for both clinicians and provider management.

Increase data comparability and coverage

- Establish a standard minimum set of data that all financing schemes within the health sector must collect and submit to the national repository. This will mitigate the current data inconsistency between MINSA, EsSalud and private facilities.
- Impose compliance with standard definitions and compilation methodology that all schemes must adhere to when collecting and reporting their data. This is fundamental to enable data to be aggregated in order to obtain a nationally representative picture of the status of health care provision in the country.
- Include identification of service providing entity in all data reporting to the national level, regardless if the type of data is collected directly from providers to the national level or via administrations of schemes and regions. This enables data to be disaggregated and aggregated with a large degree of flexibility.

Key recommendations to strengthen the Peruvian information system *(cont.)*

Support policy design with relevant data

- Increase collection of administrative data on a regular basis, ensuring that data are processed quickly enough to be timely and relevant for policy discussions.
- Incorporate data collection exercises currently being carried out intermittently by consultants into the regular cycle of administrative data collection.

Increase the capacity for international benchmarking

- Adopt OECD standards in regards to indicators and definitions in order to produce data that can be compared with OECD member countries. This will contribute to the public good of internationally comparable data, but also make it possible to compare Peru with peer countries.
- Ensure national coverage of all main indicators. Currently, the fragmentation in the system compromises the calculation of aggregates, which negatively affects the potential for benchmarking between countries.
- Participate in international expert meetings and data collections. Exchange of information between national experts and data submissions which are subject to robust validation processes will benefit the overall quality of data for national and international purposes.

Note

1. See OECD Recommendation on Health Data Governance, http://www.oecd.org/els/health-systems/health-data-governance.htm, http://acts.oecd.org/Public/Info.aspx?lang=en&infoRef=C(2016)176.

Chapter 1

Introduction and overview of Peru and its health system

Peru has achieved significant gains in the health status of its population in recent years as its economy has expanded, although important gaps still exist compared to OECD countries. Peru is committed to extending effective health insurance coverage to all its citizens. At the same time, Peru faces challenges brought on by shifting demographic and epidemiological patterns as an ageing population with an increased burden of non-communicable disease requires more and better health services.

Faced with an acutely fragmented health system, Peru needs sufficient health information to ensure that informed sector-wide policies are developed to meet these challenges. Statistics compiled according to internationally agreed standards and definitions can assist Peru in measuring progress towards its system objectives. As such, an effective health information system with strong governance structures and privacy guidelines, delivering robust and standard data and indicators on health care resources, financing, activities and quality, is a pre-requisite.

1.1. Introduction

Peru has made important strides in improving the health of its population in recent years. This has been achieved on the back of sustained growth in the Peruvian economy in conjunction with targeted social spending and various health sector initiatives. Mortality rates, especially among infants, are lower than many other upper-middle-income countries and life expectancy has increased dramatically in recent decades, though remains lower than all OECD countries and more than five years below the OECD average. Reductions in poverty and inequality in Peru also compare favourably with other countries in the region, but again, levels remain high compared with countries of the OECD.

In common with many countries in the region, Peru is facing both demographic and epidemiological change with an ageing population and the resulting rise in non-communicable and chronic diseases with significant increases in cancer, cardiovascular disease and diabetes, especially in urban areas. With Peru's central health policy goal of providing effective health coverage to all its population, this brings to the fore genuine concerns over the efficiency and sustainability of the Peruvian health system. Gauging how the Peruvian health system is responding to these challenges requires solid monitoring and evidence-gathering based on a robust set of health sector statistics and indicators.

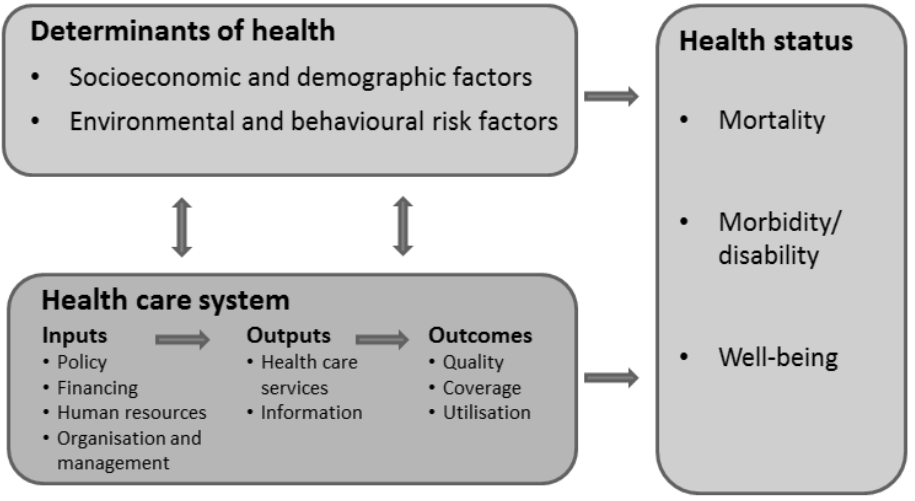
Health information systems play a vital role to ensure that the operational and strategic decisions taken to improve the health and quality of life of the Peruvian population are founded on solid evidence. The nature and quantity of data collected must also be relevant and applicable to decision making at the various levels of the health system. Accurate, representative and timely data are thereby central to the assessment and improvement of the quality of care delivered to the population.

The main objective of this report is to assess the current status and availability of Peru's routinely reported health statistics as well as the underlying data infrastructure. The study reviews the Peruvian health information system in terms of how it measures up in delivering the requisite data to meet both national policy purposes and allow international benchmarking in the areas of health care resources, activities, expenditure and quality. The report recommends improvements in data sources and methods to extend coverage and strengthen comparability in the development of international indicators. In doing so, it also assesses the current plans that have been set in motion in Peru to tackle some of the limitations in the system.

Figure 1.1 adapted from the Health Metrics Network (HMN) Framework and Standards for Country Health Information Systems (WHO, 2008) sets out the three main measurement domains for health information systems. The scope of this project is limited to assessing data and indicators pertaining to the health care system itself and the basis of measuring the performance of the system. As such, statistics related to the health status of the population (such as mortality and morbidity measures), and determinants of health (such as socio-economic or environmental factors), are not considered as part of this report.

In conducting the review, reference has been made to a number of existing frameworks and questionnaires on health information systems such as the OECD HCQI (Health Care Quality Indicators) Project on Strengthening Health Information Infrastructure and the short version of the HMN Assessment Tool for Country Health Information Systems. These have been adapted to the specific case of Peru and used through the course of the study; during the initial questionnaire, interviews and follow-up correspondence.

Figure 1.1. Domains of measurement for health information systems



Source: Adapted from WHO (2008), "Framework and standards for country health information systems/Health Metrics Network", http://apps.who.int/iris/bitstream/10665/43872/1/9789241595940_eng.pdf.

The study also draws on the various experiences of OECD countries in the development of their health information systems, and their reporting to international data collections which have resulted in greater harmonisation and standardisation at the international level. The scope of internationally comparable statistics has been expanded over time to cover other important dimensions of health system performance, notably the measurement of access and quality of care (through the launch of the OECD Health Care Quality Indicator project in 2002, which has since evolved into a regular data collection). An integral part of this review has been to collate Peruvian data across all these various domains according to a set of standard international indicators to assess how Peru measures up.

The rest of this introductory chapter provides a brief contextual overview of Peru, the health status of its population and its health care system. Chapter 2 reviews the health information systems in place in Peru, both in their current state but also in the context of the ongoing developments towards an integrated national health information system. The subsequent three chapters look more closely at issues of data availability and methodology across the following domains:

- Health expenditure and financing – by type of care, financing (including out-of-pocket payments) and provision.
- Resources in the health sector – both the health workforce (e.g. density and distribution of health care workers) and health equipment (e.g. hospital beds, medical technologies, etc.).
- Health care activities (e.g. hospital activities, outpatient consultations with doctors and dentists, vaccination and screening rates, diagnostic and surgical procedures);
- Quality of care (e.g. service effectiveness in primary care and hospital, and patient safety).

Specific, targeted recommendations on how to strengthen data systems and improve the collection, production and reporting of the various data and indicator domains are summarised at the end of each of these chapters.

1.2. Peru's economic development, population and geography

Peru is a diverse and multicultural country with a population of 31 million inhabitants. The country is divided into 25 departments and shares borders with Ecuador and Colombia to the north, Brazil to the east and Bolivia and Chile to the south. Geographical variation is large with the Pacific Ocean along the west of the country, the Andes mountain chain passing through the centre, and the Amazon jungle in the east. Population

density, ethnicity, language, and socio-economic differences are significant across the regions creating large variations in both development needs and the ability to provide public services. Rapid urbanisation is reinforcing a situation where most people live along the Pacific coast, while the mountains and rainforests are scarcely populated.

Peru has experienced stable and relatively high economic development in recent years such that since 2008 Peru has been classified as an upper-middle-income country by the World Bank. This transition has been driven both by domestic reform and resource-rich Peru benefitting from rising international commodity prices, although this latter effect has slowed down in recently and helped to dampen overall economic growth. The Peruvian economy is built primarily on agriculture, natural resources and the textile industry. Each of these sectors is of differing importance across the various regions, and exposed to very different global markets, contributing to the wide variation in wealth across the country.

Inequality in wealth is an intrinsic feature of Latin America and Peru is no exception, which is true for both regional and individual differences. Levels of GDP vary greatly by region with per capita income in the richest department (Moquegua) eight times higher than in the poorest (Apurimac). While years of strong economic development have seen poverty rates decrease, it remains a considerable problem. In 2015, 22% of the population were living in poverty (18%) or extreme poverty (4%), even if this is approximately half the rate compared to ten years ago. Urban and coastal areas are generally better off, with much lower poverty rates. Ethnicity follows the geographical divide in wealth with the indigenous population especially deprived, and also underserved in terms of public services such as education and health (INEI, 2014).

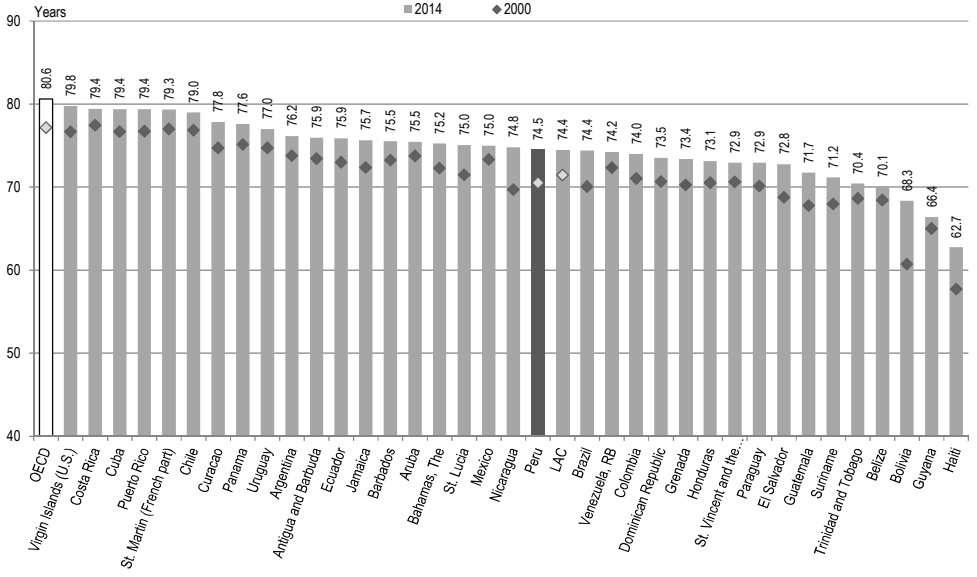
Even though unemployment is low, estimated at 4.2% in 2014 (World Bank, 2016), almost three-quarters of total employment is considered informal (INEI, 2014). This is high even by Latin American standards, although the growing economy has led to some reduction in the level in recent years. While the degree to which the economy is formalised has important implications for societal development and public policy overall, it is particularly relevant to the health sector since coverage in Peru has been traditionally organised and closely linked to an individual's employment status. Even if many recent initiatives to increase coverage are built around the economic and social status of the individual rather than employment situation, the structure of the economy directly affects the funding of the health system which, in turn, impacts on aspects of health equity such as access and financial protection.

1.3. The Peruvian health system and its performance

Health outcomes in Peru are improving rapidly, albeit rather unevenly across the regions

The Peruvian health system, in line with the country at large, has developed at a rapid pace over recent decades. This is borne out both in terms of health outcomes such as mortality rates and life expectancy but also in system measures, with substantial increases in population and service coverage. Life expectancy at birth increased rapidly by four years from 70.5 years in 2000 to 74.5 years in 2014 (Figure 1.2) and by more than 20 years since 1970. Infant mortality has decreased from 56.3 to 13.6 per 1 000 population since 1990, which is below the average in Latin America. Child mortality decreased in a similar fashion from 79.7 to 17.5, also below the regional average. In line with the Latin American region as a whole, Peru has considerably narrowed the gap to the average of OECD countries in terms of main health indicators, with Peru developing even faster than most of its neighbours.

Figure 1.2. Life expectancy in Latin American countries, 2000 and 2014



Source: OECD (2016), http://dx.doi.org/10.1787/health-data-en, and World Bank (2016) http://data.worldbank.org/.

The transition of Peru into an upper middle income country runs in parallel with a demographic transition brought about by the falling mortality rates and lower fertility rates. With an ageing population comes changing epidemiological patterns and an increasing prevalence of chronic diseases, such as diabetes and cancer. There is concern that Peru might be increasingly vulnerable to the "triple burden of diseases". In addition to the growing burden from non-communicable diseases, the country continues to experience persistent problems with communicable diseases and child health, e.g. Peru is still struggling to eradicate tuberculosis and malaria. The "third" disease burden, global pandemics, is a real and present threat to Peru. Dengue fever is increasing and tackling the Zika virus has been the latest infectious disease to which the government and the health system have had to devote considerable resources.

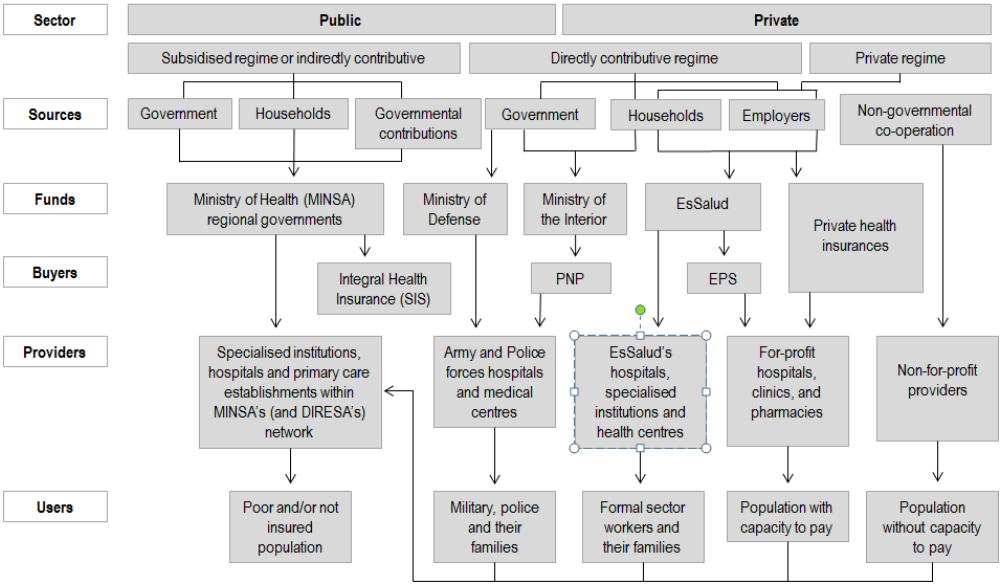
While Peru's health outcomes have seen general improvement, there continues to be a prevailing underperformance in social and health inequalities. Infant chronic malnutrition has decreased but is still at high levels in poor rural areas with 24 deaths per 1 000 live births, compared to the 16 deaths per 1 000 recorded in urban areas. These inequalities largely correlate with the social discrepancies and differences in quality and access to health services across the country. For example, Peru still has to reach full coverage in DTP vaccination rates, currently at 88% overall, with the Huancavelica region as low as 54.2% in 2012. In fact, after rapid improvements throughout the 1990s, when immunisation rates reached almost full coverage, they have since stagnated or fallen. Infant chronic malnutrition is also persistently high in some regions, especially in rural areas (INEI, 2014).

Fragmentation across the different health schemes is a prominent feature of the Peruvian health system

While more public resources may be needed to continue the path towards universal health coverage in Peru, what is equally important is to overcome the barriers associated with the fragmented financing and delivery of health care in the country. In Peru, the entire health system, including the organisation of health provision, human resources, monitoring and governance, is affected by how each of the financing schemes of the system is organised, which are in effect individual health sub-systems (Figure 1.3). Each scheme covers a segment of the population, with limited overlap, while still leaving a part of the population without any coverage. The affiliation to any one scheme largely dictates an individual's benefit package, and access and quality of the services available.

The largest scheme in terms of affiliates is the Integral Health Insurance (*Seguro Integral de Salud*, SIS), which was originally a government scheme focusing on maternal and child health care for the poor. This target population has been continually broadened to those in poverty lacking health insurance and later to non-poor vulnerable groups such as all children and pregnant women. Within SIS there are two regimes. The oldest and largest is the fully-funded insurance coverage for the poor. In an effort to expand coverage, a second subsidised or semi-contributory regime was established in 2007 for those previously ineligible. Such members are typically working non-poor, but with income levels below a certain threshold, and who are not covered by any other health insurance. While SIS is administratively separately from the Peruvian Ministry of Health (MINSA) and funded out of the general budget, its Director is appointed by the President following a recommendation by MINSA. SIS is also the primary funding source for all the regional health administrations' public health facilities. The separate Intangible Solidarity Health Fund (FISSAL) scheme is a special fund for high cost services and orphan diseases which are not covered under the SIS entitlement package.

Figure 1.3. Structure of the Peruvian health system



Source: Alcalde-Rabanal (2011), Sistema de salud de Perú, Salud Pública de México, Vol. 53:2.

The *Seguro Social de Salud*, or EsSalud, is the social health insurance scheme for Peru. Enrolment is compulsory for all employees and their family members except for people employed by companies below a certain threshold. The general contribution rate is 9% of the employee's salary although public sector employees' contributions are based on only 65% of their remuneration. Employers also contribute 4% of retirees' pensions. Even if membership is compulsory there are choices regarding contribution rates and entitlements. For example, it is possible to opt for a lower contribution rate while signing up for private insurance to cover some of the more frequent and low cost services. This was seen as a way to encourage the development of private health provision. However, mostly higher income members have opted for this arrangement, with the associated risk of increasing inequalities. EsSalud has its own network of health institutions, with a stronger emphasis on hospitals in urban areas compared to the "public" or SIS-funded provider network. Importantly, EsSalud is linked to the Ministry of Labour and Employment, albeit with separate governance and reporting structures compared to SIS. It is semi-autonomous from the government in that it is not funded through budgetary decisions but receives a share of official government revenues. EsSalud has a governing board with three employer representatives and three beneficiary groups.

There are also a number of other insurance arrangements for particular groups of the population. These include arrangements for members of the National Police Force and the Armed Forces with their own respective provider networks. Finally, there is also a small private insurance market.

The different groups of affiliates cannot automatically benefit from services in institutions belonging to another scheme, which means there is, to a greater or lesser extent, an overlap of service capacity and functions in any given geographical area. Because of the history and composition of beneficiaries, the different schemes have differences in the type and location of the services they provide. SIS is more focused on rural areas while EsSalud and the small private insurance schemes tend to have a more urban profile. While both SIS and EsSalud aim to provide all types of health services within their respective networks, in reality the publicly owned health facilities funded by SIS are predominantly primary health care providers; EsSalud services are more focused on hospital care. This effectively means that health insurance coverage means very different things depending on an individual's affiliation.

Taking also into consideration the various private providers, which are most prominent in the capital and major cities, and the more recent moves towards decentralised public provision (which is implemented differently across the regions), it is clear that the Peruvian health system is severely fragmented. This has consequences for the monitoring and governing of the

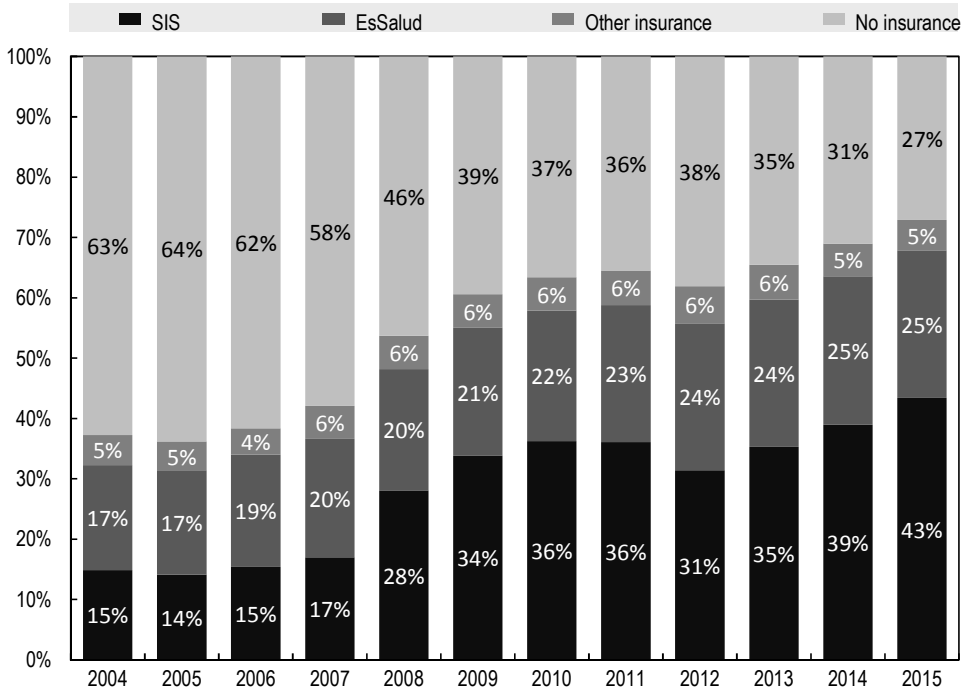
system as a whole, but also in constructing a health information system which can inform policy makers and the public on the performance of the system and the health status of the *whole* Peruvian population.

Coverage has increased due to explicit policy measures and economic growth

There has been a significant increase in both population and service coverage in Peru over the last decade. This is the result of broad political commitment to reach universal health coverage and has mainly benefited groups who were previously uninsured and are now eligible for SIS membership, e.g., a new simplified SIS scheme for the self-employed (*Nuevo Régimen Único Simplificado*, NRUS) was established in 2013. Figure 1.4 shows how the general increase in population coverage has been mainly due to the expansion of SIS. The number of EsSalud affiliates has also expanded due to rising formal employment and incomes in urban areas rather than any specific public policy. Historically, a large share of the urban population had formal employment leading to an affiliation with the compulsory insurance scheme. The effect of the recent development is that coverage in rural areas has overtaken coverage in urban areas. Approximately 30% of the urban population lack insurance coverage, while the level for the rural population is just above 20%.

That said, there are some uncertainties as to how many Peruvians are actually covered by health insurance – which highlights the issue of obtaining accurate information on the health system. Survey-based data from the National Statistics and Informatics Institute (*Instituto Nacional de Estadistica e Informatica*, INEI) reported 72.9% coverage in 2015. However, administrative data from the health superintendence (SUSALUD) showed much higher coverage at 80.6%. The biggest difference is in SIS affiliation which is considerably higher in the SUSALUD data. The lower estimate of SIS eligibility using survey data suggests perhaps some lack of awareness around entitlement and coverage. After recent expansion, it may be that not all eligible individuals are aware of their entitlements, which can potentially lead to under-utilisation in the section of the population which is generally most in need of health services.

Figure 1.4. Health insurance coverage in Peru, 2004-2014



Note: Other insurance includes persons with more than one insurance, private insurance and prepaid schemes.

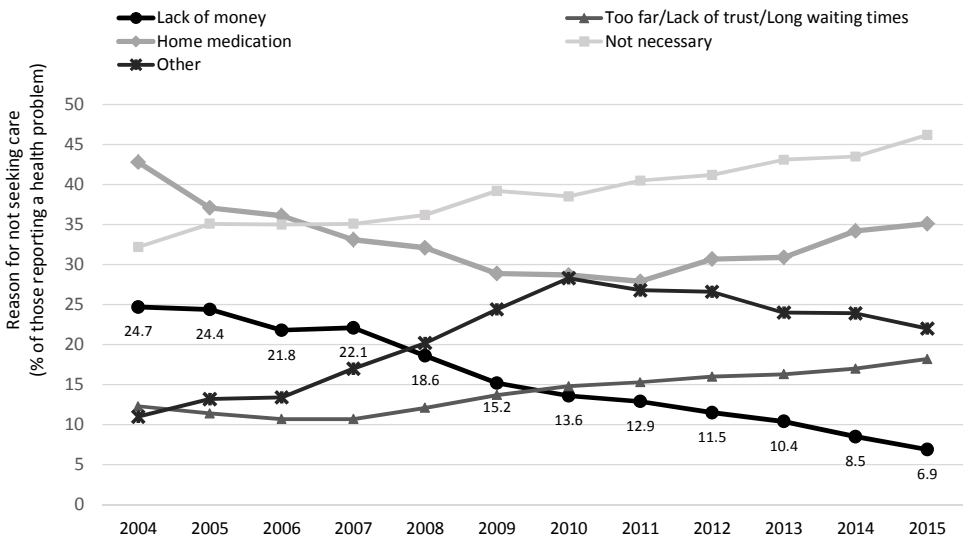
Source: INEI (2016), "Condiciones de Vida en el Perú", https://www.inei.gob.pe/media/MenuRecursivo/boletines/informe-tecnico-n02_condiciones-vida_octnovdic15.pdf.

Care in interpreting expanded coverage is also needed. Benefit packages can look different depending on the scheme; there is also a question mark as to what is offered in reality. While the government has been ambitious in expanding both service coverage and eligibility for the population under SIS, it is not taken for granted that this is fully implemented, or if the system is instead inducing rationing by means of access barriers and quality. To assess this, detailed and uniformly reported utilisation and care quality data is vital.

Indeed, the reasons stated by Peruvians for not seeking care are also an indication that expanded coverage may not be entirely meeting the needs of the population. The share of respondents stating "lack of money" as a reason for not seeking health care has steadily declined - a sign of both decreasing

poverty levels and expanded public services (Figure 1.5). On the other hand, the share of respondents citing accessibility issues or distrust in the system is on the rise, i.e. in spite of expanding services, expectations or demand is increasing even faster.

Figure 1.5. Reasons cited for not seeking care in Peru



Source: INEI (2016), "Condiciones de Vida en el Perú", https://www.inei.gob.pe/media/MenuRecursivo/boletines/informe-tecnico-n02_condiciones-vida_octnovdic15.pdf.

The Peruvian health system has also undergone moves to decentralise control

An important reform, which also has wide implications on the ability to collect national health information, is the decentralisation of the public administration. The health decentralisation reform started in 2002 as part of a wider decentralisation policy already taking hold in Peru, with new legislation to facilitate regional elections, define legal provisions for the separate levels of government, and regulate the budget process. In 2009, the Ministry of Economy and Finance (MEF) started transferring funds to the local authorities and a last step was taken in 2013 with the creation of the (now defunct) Institute for Health Services Management (*Instituto de Gestión de Servicios de Salud*, IGSS). The reform meant that ownership of health providers was moved from the central government (i.e. MINSA) to

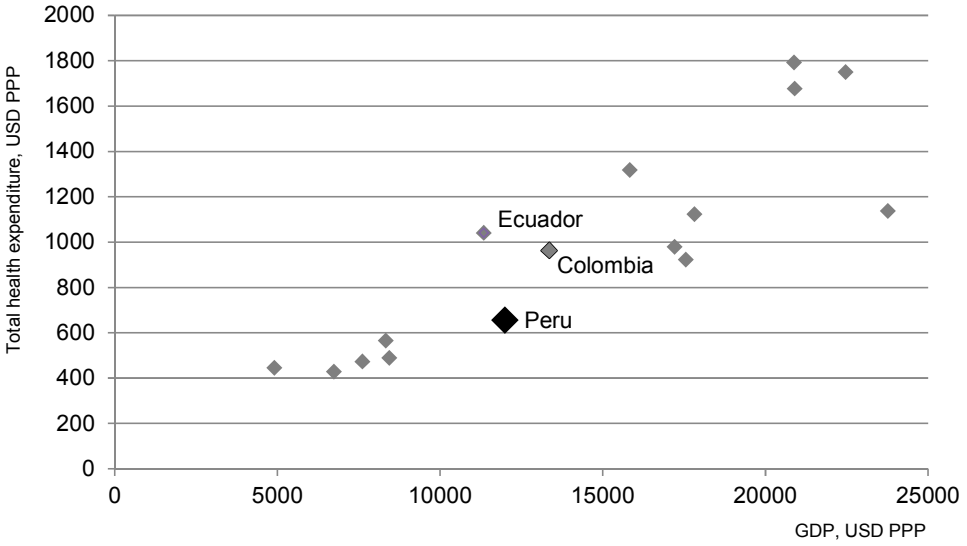
the 25 regional governments' health authorities (*Direcciones Regionales de Salud*, DIRESAS). The rationale was to improve responsiveness and efficiency by moving the responsibility of health service governance closer to the population. Local authorities would thereby be more directly accountable and in a better position to understand local needs. IGSS, however, was criticised by sections of the health system, who perceived the institution did not contribute positively to the decentralisation process and remained too focused on the Lima region. This led to its suppression in late 2016 and the return of its responsibilities directly to MINSA.

Several managerial aspects following the decentralisation reform still seem to be unresolved. The regions receive their funds directly from MEF but DIRESAS do not have full flexibility to respond to local needs since SIS is the core purchaser of services for its members. The current budgeting system is a mix between a traditional global budget approach and a developing results-based budgeting system within which national priorities and programmes can be funded and regions made accountable.

Peru allocates a relatively low level of economic resources to health compared to other Latin American countries

According to latest available estimates, Peru spent USD PPP 656 per capita on health in 2014 (World Bank, 2016), equivalent to 5.5% of GDP. Both the level of spending relative to its societal resources and the absolute amount are low in an OECD context. In fact, even compared to countries of similar wealth in Latin America, this level of resources appears low suggesting there is room for further investment. For comparison, Colombia and Ecuador both have similar levels of GDP but spend considerably larger amounts on health, USD PPP 962 and 1 040 per capita, or 7.2% and 9.2% of GDP, respectively (Figure 1.6). There has been a lack of information mapping financial resources to the various services and providers across the whole of the Peruvian health sector. The development of health financing and expenditure information using an international accounting framework is expected to help in this respect (see Chapter 3).

Figure 1.6. GDP (USD PPP) per capita and total current health spending in Latin America (excl. islands), 2014



Source: World Bank (2016), Open Data, http://data.worldbank.org/.

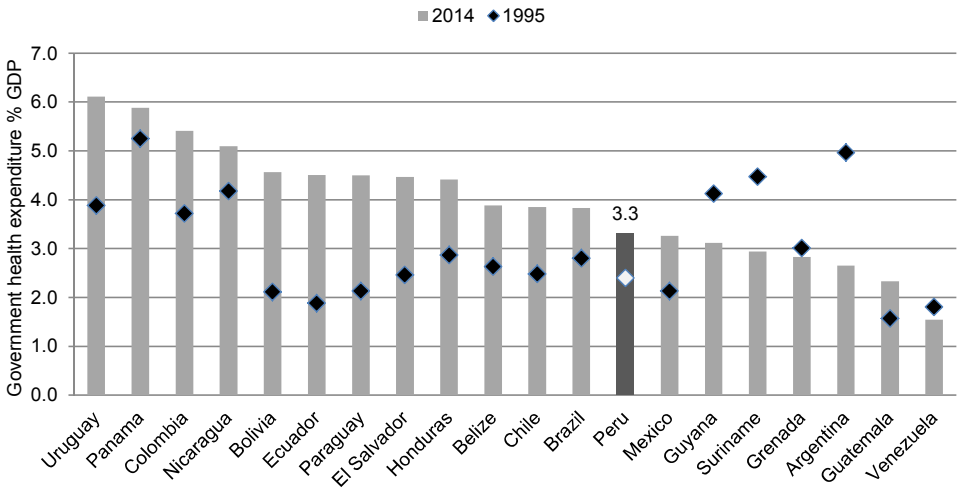
There are large differences in the public/private split of health financing across Latin American countries, as well as how much is financed through out-of-pocket (OOP) spending. In Ecuador, the estimated share of OOP to total health expenditure is 48.4% while in Colombia it is only 15.4%. In Peru, OOP as a share of total health spending was estimated at 31% in 2014 (MINSA, 2015a), which is around the average for mainland Latin America. This share has been shrinking since 2008 due to substantial increases in public and private pre-paid funding, which is a result of the policies put in place to attain universal health coverage. In addition, the uninsured part of the population is shrinking, and the difference in OOP between SIS affiliates and the uninsured has decreased significantly. In 2012, the uninsured paid 3½ times more OOP for health services than SIS affiliated, compared to almost 12 times more in 2004 (MINSA, 2015b).

There is, however, still progress to be made to ensure all Peruvians can access services without financial hardship. An analysis of 2012 household consumption data found that 5.4% of the population in Peru experienced catastrophic expenditures[1] due to health care needs (Seinfeld and Besich, 2014). This result is in line with an older study, which compared 12 Latin American countries. The results show Peru being a mid-performer compared

to its neighbours, with 5.1% catastrophic expenditure, compared to 0.4% in Costa Rica and 14.4% in Chile, with the other countries within this range (Knaul, 2011).

Peru spent a modest 3.3% of GDP on health from public sources in 2014, equivalent to USD PPP 398 per capita per year. This is relatively low compared to the 5.4% for Colombia and 4.5% for Ecuador (Figure 1.7), and an OECD average of 6.5%. Over time, Peru has increased spending on health, but not more than other countries have done generally, in spite of its universal health coverage ambitions.

Figure 1.7. Government health expenditure as share of GDP in Latin America (excl. islands), 1995-2014



Source: WHO (2017), Global Health Expenditure Database, http://www.who.int/health-accounts/ghed/en/.

Peru is expanding human resources in the health system but faces issues of retention and unequal distribution

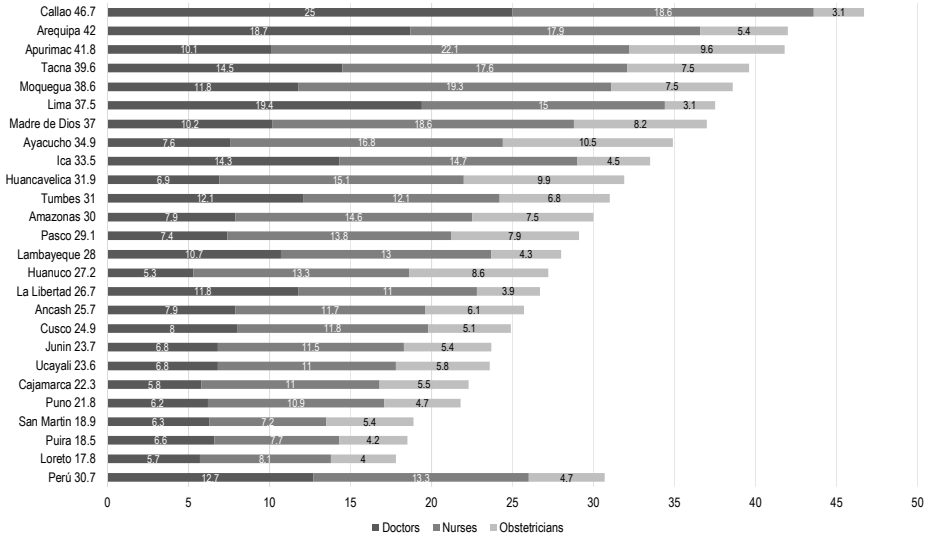
The expansion of health system resources in Peru is reflected in the educational capacity of medical schools, with graduation numbers substantially increasing. The actual number of practicing physicians is difficult to accurately estimate due to reporting gaps (see Chapter 4). Peru reported 1.3 practicing medical doctors per 1 000 population in 2016 (DGGDRH, 2016). This is less than half the OECD average but not dissimilar to countries of similar income. For example, Colombia and Brazil

have comparable levels (1.7 and 1.8 respectively) while very few countries in Asia have the same density of physicians.

However, Peru, like many countries, has a very unequal geographical distribution of medical professionals (Figure 1.8). The actual situation is probably worse than that suggested by official numbers since unreported private physicians are predominantly practicing in the more affluent areas. The implementation of INFORHUS, the National Registry of Health Personnel, which allows for the monitoring of the supply of different specialisations and medical professions, such as nurses and midwifes, is a reaction to the weak managerial and planning capacity of human resources in the country.

While there is educational capacity to provide an adequate supply of both doctors and nurses, attracting medical staff to jobs in the public sector and especially in rural areas remains challenging. Migration of health professionals to other countries is also contributing to shortages in the health workforce in Peru. In 2010, 78% of medical students and 67% of nursing students expressed a wish to practice their profession abroad after the completion of the university programme (Jiménez, 2015). Exactly how many professionals choose to work in either the private sector or move abroad remains largely unknown due to the aforementioned gaps in information on human resources for health.

Figure 1.8. Health human resources density per 10 000 population by region, 2016



Source: DGGDRH (2016).

The availability of physical resources (e.g. hospital beds and medical equipment) shows a similar pattern to those of human resources when compared internationally. The country reports 1.6 beds per 1 000 population, which is in line with other Latin American countries but low by OECD standards, even taking into account policies to reduce bed numbers in many European countries in recent years. Colombia and Ecuador have a similar ratio of beds to population while Chile and Mexico have somewhat higher levels. However, the geography of the country, and the fragmentation of its health system, means that the average number provides little information about the access and availability of hospital resources for any given location or individual in Peru.

Health service utilisation and quality is quite between population groups

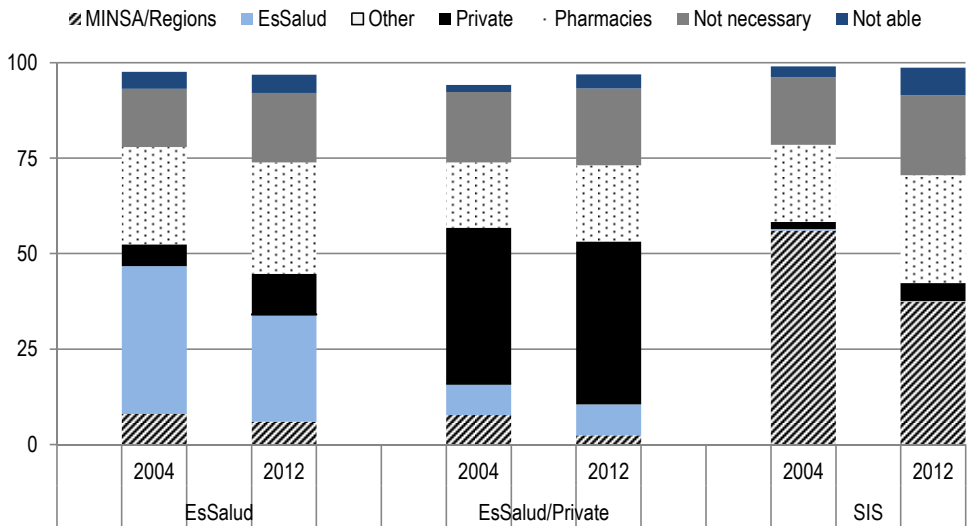
Coverage of maternal and child health services has improved considerably over recent decades, as might be expected with a country moving into the upper-middle-income bracket. The share of deliveries attended by skilled health staff is now 90%, while 97% of pregnant women receive prenatal care during pregnancy. However, immunisation rates remain below 90% and still slightly below the average for Latin American countries; for example Pol3 immunisation is reported to be 87% of all one-year-olds compared to 88% in Latin America as a whole. There are also signs of vaccination rates moving in the wrong direction. The DPT coverage rate was reported to be 98% in 2000 and was down to 90% in 2015.

Data from the National Household Survey (INEI, 2014) show an increase in the perceived need for health care up from 51% of the population in 2004 to above 60% after 2010. However, for those reporting health care needs, the share who actually seeks care has remained constant over time at around 30%. Thus, with growing “need” and a constant proportion seeking care, activity levels have increased over time. According to survey data, the reported number of visits to public facilities in the preceding four weeks increased 10% since 2014. The equivalent figure for EsSalud facilities reveals a 14% increase. However, the largest increase occurred in the private sector, predominantly funded through out-of-pocket payments. Visits to private facilities increased 150% and visits to pharmacies 70%, indicating that the expansion of universal health coverage has not keep pace with the increase in demand for health services among the population.

Since different population groups have access to different parts of the health system, average utilisation numbers provide only limited insight. The Government of Peru publishes important disaggregated data by socio-economic groups (measured by consumption levels) and health scheme

affiliation. In 2012, a similar share of beneficiaries in the two main schemes, SIS and EsSalud, made use of formal health care; 42.3% of SIS members and 44.7% of EsSalud members (Figure 1.9). There were, however, large differences in how they chose providers, beyond the fact that the two groups are assigned different facilities. Less than two-thirds of EsSalud beneficiaries sought care in facilities actually belonging to EsSalud. Instead almost a quarter of EsSalud patients turned to an alternative private provider and 13% to the public facilities. Of the patients covered by SIS, 88% used public facilities and only two percent in private alternatives. This reflects several aspects of the Peruvian health system. One is that there are many more public facilities, and the fact that EsSalud beneficiaries can benefit from these. EsSalud patients are also generally better off, and therefore have a wider set of options open to them since they can to a larger extent afford private alternatives.

Figure 1.9. Health seeking behaviour by insurance affiliation



Note: Totals are less than 100% because "multiple" and "traditional health care" are omitted.

Source: MINSA (2015).

The stratification of the population into insurance schemes which affects health care seeking behaviour is reinforced by the fact that lower socio-economic groups are insured in the SIS scheme. In the lowest consumption quintile of the population the share of patients seeking health care by type of ownership of the facility has not changed considerably. While there has been

an increase of visits to private facilities, it remains at very low levels. The predominant and prevailing point of service remains a public facility followed by a pharmacy. In the top quintile of consumption however, health seeking behaviour has changed considerably. In 2004, 13.6% of people in this upper group with a health condition reported that they had visited a public institution and 18.1% an EsSalud facility. In 2012, the corresponding numbers dropped to 8.9% and 13.2%. Visits to private facilities on the other hand, almost doubled from 11.7 to 20.4% (MINSA, 2015).

The reasons stated for not seeking health services mirror the expansion of SIS services across the country, but also indicate that quality and content of available services has not developed as quickly. The share reporting lack of money as the primary reason for not seeking health care has fallen from 24.6% to 11.4% in 2012, with the decrease primarily in rural areas. The number of respondents who cite distance to the facility as a reason has also fallen. At the same time, low trust and failed treatment as well as lack of time have increased as stated reasons for not seeking care.

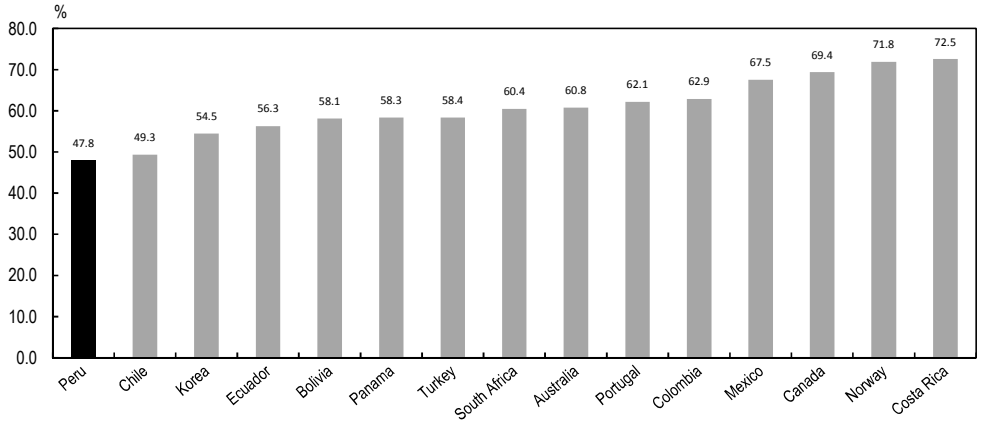
Utilisation data indicates that although health care consumption has increased in all population groups, inequalities persist, or have increased. The lack of a uniform information system makes it difficult to assess the type of services provided to the different groups of patients. This is true for both comparisons of diagnoses and procedures, i.e. volume of type of services across groups, but also the quality of care.

It is notable that health care utilisation data described in this section is based solely on survey data. There is no comprehensive source of administrative data on coverage of basic services, e.g. number of out-patient visits or hospital activity such as discharge data per diagnosis. Generally, available administrative data is of limited use because it covers only part of the system, e.g. private hospital activity is not covered by public registers. Therefore, there is no possibility to analyse health care consumption by different types of care or diseases across the whole population. MINSA has its Health Information System (HIS-MINSA), which records basic activities from both outpatient and hospital facilities, including child health services. The system is based on monthly reporting and is accessible also for facility managers, and thereby serves its purpose as a useful management tool. But it is limited to public facilities and therefore of limited use for overall system monitoring and policy (see Chapter 5). Information about service quality is also scarce (see Chapter 6). In common with activity and coverage data, indicators of service quality are patchy and often only reported by parts of the system, typically public hospitals reporting to the National Health Institute (*Instituto Nacional de Salud*, INS). However, national patient satisfaction surveys provide some insight into system performance.

Public confidence in the Peruvian health system is low

The general perception of the health system among the Peruvian population is one of a lack of trust. Low confidence in the system (Figure 1.10) can be a reflection of the fragmented system with a duplication of services and lack of clarify regarding entitlements, rather than how users perceive the actual quality of services received. This lack of confidence is also reflected in the growing share of privately funded services sought outside the SIS and EsSalud systems. It is unclear which specific factors are leading to this decrease in trust and the consequent increase of private health care services, but in many OECD countries such observations are often driven by a lack of responsiveness and long waiting times in the public sector rather than discontent with the quality of provided services *per se*.

Figure 1.10. Confidence in the health system, Peru and selected countries



Note: Data for "confidence in health systems" show the percentage of people responding "yes" to the question "Do you have confidence in health care or medical systems?".

Source: Gallup Organisation (2015), Gallup World Monitor (database).

Reforms for enhanced efficiency and more effective public spending

Peru may appear to be performing reasonably well to efficiently improve the health of its population, illustrated by the fact that life expectancy relative to general societal resources (GDP) or what is spent on health in the country is higher than that achieved by comparable countries. The health sector is only part responsible for this development. The inherent features of the Peruvian system with its severe fragmentation lead to a loss of efficiency, with duplication of health services, resources distributed

according to scheme affiliation rather than need, and unnecessary transaction costs as a result of separate information and administration systems. While difficult to change the fundamental features of the system, several reforms are already being implemented in the country.

One way that Peru is trying to bridge the structural rigidity of the system and make better use of available resources without having to reform the managerial structure, is through service exchange agreements (*convenios*) which allow patients to make use of services provided by other funding schemes, so-called *intercambios*. Until recently, both SIS and EsSalud only funded services from their respective provider network. This prohibited patients using facilities which were not owned or contracted by their own insurance. SIS increasingly contracts providers beyond the publicly-owned facilities and through these arrangements SIS beneficiaries have access to a larger choice of providers. The scope of this arrangement is still marginal, making up only 1.3% of the SIS budget in 2015. It is also not an open market system, in which providers are contracted on equal terms independent of ownership and can compete for SIS patients based on price and quality.

The much needed and potentially resource-saving *intercambios* highlight the need to promote a standard architecture for the information flow and interoperability across the system. To avoid double counting and secure the quality of information, the same information must flow from providers to purchasers, regardless of which insurance scheme or provider network is financing or providing services.

Results-based budgeting (*Presupuestos por Resultados*, PpR) is also winning ground in Peru. Until recently both budgeting and reimbursement systems were organised in a traditional way by which historical budgets were adjusted on an annual basis. PpR does not mean Peru is funding its public facilities by any measure of health outcome, or even output or case-based measurement. Instead it is driven by reform in central government budget formulation, from input-based to results-based budgeting, forcing each public sector to formulate output targets and base their budget request on cost estimations of each activity. This forces the health system to focus on what should be provided to meet population needs, rather than on what physical resources are available. From an efficiency perspective in Peru, this has several opportunities. One is that health administrations and providers are forced to focus on what and how much is produced and at what the cost is per service. This makes comparisons across the different sub-systems possible, even if patient- and case mix differ. It can potentially open up a more transparent and effective purchasing of services resulting in a better allocation of resources.

1.4. Health system developments highlight the need for an enhanced health information system

Many of the current developments and reforms outlined above require an improved health information system in order to be effective. The introduction of PpR builds on the very idea that government is informed about what is conducted at facility level, and that the inputs required for these outputs are properly accounted for. One of the prerequisites for PpR to be effective is that it builds on a proper accounting of costing and activity. On the other hand, it can act as a catalyst by increasing demand for improved data availability.

The need for quality measurements and data stretches beyond just the government's requirements to steward the system and make budget priorities. One of the potentially effective tools to mitigate inefficiencies due to fragmentation and duplication of services is increased use of *intercambios* or similar arrangements. These build to a potentially increasing extent on individual patients' active choice, depending how entitlements are given to participants of different schemes. With the currently limited information on quality of care, choices are difficult to make in an informed way. While public benchmarking is already available and rather advanced in some data areas (e.g. HR), data has to be made available at a much larger scale about which entitlements people have, where services are available, and what quality can be expected. The difference in coverage measured between administrative sources and survey data suggest that some people are unaware of their entitlement to public services via the SIS scheme.

1.5. Conclusions

Peru has achieved significant progress in its efforts towards universal health coverage in recent years. It has expanded coverage through the expansion of SIS, and geographical decentralisation has been put in place in an attempt to address inequalities across regions. However, these developments have also put stress on the system, and the provision and quality of services has perhaps not improved at the same pace as coverage and need. Decentralisation has, on occasion, proved limited in its capacity to maintain strong and effective institutions, necessary to put policies and interventions in place. For more detailed information on the quality and characteristics of the health system, please refer to the OECD Review of the Peruvian health system (OECD, 2017).

In order to ensure that the process towards population coverage and decentralised governance continues without jeopardising adequate health care quality, financial safety and efficient and strong institutions, a well-

functioning health information system is paramount. Such system(s) enable adequate monitoring and evaluation of health policies and the most efficient use of resources. In addition, it will put patients and other stakeholders at the centre of the health system, able to make their own choices and decisions through the transparent and effective dissemination of information.

Note

1. Catastrophic expenditure is generally defined as household out-of-pocket spending on health care exceeding a certain threshold (typically 40%) of non-food household expenditure, although the exact definition can vary between studies.

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Chapter 2

The Peruvian health information system

Unlocking the value of health data to improve the accessibility, efficiency and quality of health services is dependent on information systems with the strength and capacity to deliver. This requires a strategic plan with clear objectives, strong processes and standards, underpinned by solid governance, privacy safeguards and sufficient investment. The more advanced and integrated an information system, the better use of data in decision making and planning.

Health information in Peru is impacted by fragmentation across sub-systems and the lack of a clear leader with cross-sector authority. Health sector reform has targeted the strengthening of the health information system with the establishment of a central repository and an interoperable electronic health record system. Some of the prerequisites are in place; 97% of Peruvians have unique IDs, guidelines and standards have been established and technical innovations have been developed. Overall success is dependent on cross-stakeholder buy-in, and continued government commitment.

2.1. Introduction

The effective production of relevant and timely data on resources, activities and quality across the health care sector constitutes a significant health system objective, and the extensive use of such data is a key factor in the enhancement of health system performance. Data to measure, monitor and compare performance are central to the assessment and improvement of both the health of populations and the quality and efficiency of health care systems. Regional, national and international reporting of health care indicators is also very much dependent upon the strength and capacity of health information systems and infrastructure (OECD, 2013).

The more advanced and integrated information system that is being advocated and developed, throughout all service delivery sub-systems in the country, ultimately the better use of the data. While all OECD countries are investing in their health data infrastructure, there are significant cross-country differences in data availability, quality and use, with some countries demonstrating significant progress and innovative practices in data governance; others may be falling behind with insufficient data and restrictions that limit access to and use of data (OECD, 2015).

As with many aspects of the Peruvian health care system, the health information system is highly fragmented across the various sub-systems and suffers from a lack of co-ordination between the central administrations and the regions. SIS, EsSalud, the health systems of the military and police force, as well as the private health sector all generate their own banks of data and indicators to greater or lesser extents. Other national institutions, such as INEI and INS, also play a role in the collection and dissemination of national health information. This makes it inherently difficult to compare different population segments and obtain a comprehensive national picture about health care performance as a solid base for decision making. That said, weaknesses in the system are well-recognised and a plan of action has been developed with the aim of establishing an integrated health information system and individual electronic health records.

This chapter analyses how the Peruvian health information system is currently structured, together with its shortcomings. It describes the roles of the most important institutions within the health information system, the type of data each institution handles and the sources from which these data are gathered. The chapter then assesses the progress in the development of the health information system in Peru as part of the ongoing reform process.

2.2. Structure of the Peruvian health information system

Health information systems operate across all the various affiliated schemes, by the different stakeholders and at all levels of the Peruvian health care system, both regionally and nationally. Mirroring the financing and delivery of health care to the population, they operate in a fragmented way, limiting the integration and compatibility of health care data, which is indispensable for policy decision making. This section describes the current structure of the Peruvian health information system, including some of the successful ways that different health information systems have been integrated in recent years as part of the ongoing development towards a national health information system.

MINSA has a steering role within the national health information system, but its stewardship is weakened by fragmentation and decentralisation

While MINSA has overall responsibility for the management and development of the national health information system through the production, analysis, publication and use of health information, it has lacked the political authority related to the collection of a core set of nationally representative information with regards the decentralised regions and other subsystems, such as EsSalud. That said, MINSA's information infrastructure covers a diverse and broad range of health system inputs and activity data.

To date, the collection of activity data at MINSA facilities has centred on its Health Information System (*Sistema de Información de Salud*, HIS-MINSA) which has been in use for around 20 years to record outpatient activities and can be processed and consulted by health personnel (MINSA, 2016a). HIS-MINSA is a mandatory reporting system used in all first level public facilities that provide basic care services (covering approximately 70% of the country's medical centres), as well as second and third level providers under the authority of MINSA and regional governments. HIS-MINSA is the source of information on outpatient care activities, recording attendances, epidemiological surveillance in terms of morbidity, and preventive and health promotion activities. In line with its original focus on maternal and child health, vaccination services, antenatal and child health check-ups are also reported. This information is reported by MINSA health establishments (before the 10th of each month) on a monthly basis; but due to the absence of any statutory requirements, it is not reported by EsSalud or other subsystems, thus limiting its use in terms of national reporting. The different subsystems each report their own set of indicators, with varying degrees of timeliness and coverage (see separate sections below).

Besides HIS-MINSA, MINSA is also responsible for a number of other information systems (Box 2.1).

Box 2.1. Additional information systems administered by MINSA

- • **System for vital facts** (*Sistema de hechos vitales*) – an online platform providing information about births, enabling knowledge about population growth tendencies.
- • **System for disability** (*Sistema de discapacidad*) – provides statistical information about people with disabilities that receive health care services.
- • **Integrated system for emergency services** (*Sistema integrado de egresos de emergencia*) – provides statistical information about patients attending emergency services for use as a management instrument for regional government and MINSA health establishments.
- • **Geographic information system** (*Sistema de información geográfica*) – involves the regional governments' health authorities (DIRESAs) through its networks and establishments to provide information on sources of contamination and exposed population. It is used as a tool for spatial analysis and diagnostics in order to establish health intervention priorities according to geographic considerations. The system attempts to obtain a diagnostic about the health situation at a national level by identifying the population at risk, the distribution of health care resources and the location of epidemiological risk areas.

Source: MINSA (2016), "Estadística", http://www.minsa.gob.pe/index.asp?op=6#Estadística.

For second- and some third-level MINSA facilities, SIS-GalenPlus[1] is an information system developed both for internal hospital management as well as central statistical and financial reporting, for example, the systematic reporting of indicators of chronic malnutrition in children[2] (Gestión en Salud, 2016). SIS-GalenPlus is used by health establishment staff as well as DIRESA staff and other health micro-networks for health information management. The application is designed as an integrated information system to improve the efficiency of service processes and decision making by hospital management. Indeed, the user guide claims that facilities transitioning to SIS-GalenPlus from older registration tools can achieve potential efficiency gains by "increasing the supply of care by 40% using the same resources, and decreasing activities that do not add value to the care process" (USAID, 2014).

SIS-GalenPlus is primarily a hospital management system enabling staff to manage resources and processes in-house. Hospitals use the system for bed management across the different departments and to schedule surgeries and outpatient appointments, in theory leading to a more patient-centred and efficient system able to respond to the needs of patients and relatives. Its

main advantage is in reducing duplication in data collection across departments which hampers care co-ordination and quality of care. The system also facilitates the process of prescribing drugs (e.g. it is common that prescriptions are issued in paper form and later digitised at the pharmacy) and setting up appointments, saving patients' time. This is made possible by including a more complete set of modules such as admissions, external consultation or prescribing, although this is dependent on individual hospitals ensuring that that the whole application is well integrated.

The Instituto Nacional de Salud Del Niño-San Borja was one of the first and foremost hospitals to use SIS-GalenPlus, developing its own IT solutions alongside for internal resource and financial management (Box 2.2). There have been some issues regarding the wider use of SIS-GalenPlus, the degree of success of its implementation across regions has been varied. The system was planned to be rolled out across Lima in 2016 with linkage between institutions. However, as of July 2016, only eight hospitals out of the 34 MINSA hospitals in Lima were using SIS-GalenPlus with only one hospital in Lima linked to the network and health centres.

In addition to SIS-GalenPlus, third level health establishments (the larger and specialised hospitals) have their own Hospital Management Systems (SGH – *Sistema de Gestión Hospitalaria*). Such systems allow staff to create electronic clinical records for patients integrating a number of modules to cover a variety of areas, such as admissions, external consultation or emergencies, in a similar way to SIS-GalenPlus. Notably, a standard although basic hospital management system is in use in EsSalud facilities, providing interoperability across the EsSalud hospital network and potentially with other systems.

In general, performance across the Peruvian hospital sector has suffered in the past from the lack of an appropriate and widely available hospital management and reporting system. In most cases, tools have not been developed in parallel with a view to integrating information and allowing the patient to be followed through the health system. Modules had tended to be developed in an isolated way and not linked, which has limited resource management and rapid decision making. Although more recent developments in informatics in Peru have improved this, and there are ongoing efforts to ensure interoperability and integration between all levels of provider establishments (from basic care facilities to specialised hospitals) through a national data repository (see Section 2.3), there continue to be major information gaps between facility levels and the various sub-systems.

Box 2.2. Management systems at the Instituto Nacional de Salud Del Niño-San Borja (INSN)

INSN is a specialised medical facility providing care to children and adolescents from across Peru. Specialties include cardiology and cardiovascular surgery, complex neonatal surgery, neurosurgery, burns units and bone marrow transplantation. The hospital consists of 300 beds and 1 100 staff with 98% of the patients affiliated to SIS.

As of July 2016, INSB had been using SIS-GalenPlus for two years, replacing a manual management system and is among the most advanced institutions in developing various IT management solutions. The system in use consists of a number of modules monitoring and scheduling medical care in a linked way across the different units – outpatient care, emergency care, admissions, imaging services, etc. For example, MINSA can access the information in real time to see availability of beds by ICU, cardiology, etc.

An operational management tool (*Tableo de Gestion*) developed in-house recently which together with SIS-GalenPlus and inter-operable across the different modules has led to increased efficiency in monitoring bed occupation and waiting lists. Alongside SIS-GalenPlus is a budget monitoring system (covering both direct resources and transfers from SIS) for internal daily monitoring and weekly reporting to MINSA. The reporting consists of actual spending against budgets and compares INSB with other hospitals in Lima.

The tools developed at INSN has been recognised as a best practice within the framework of Act No. 27806 Law on Transparency and Access to Public Information and as part of the National Strategy for Electronic Government to Improve Public Administration processes to make them more efficient and transparent. INSN is the first public sector health care institution to use the SIS-GalenPlus system together with an Operational Management tool to provide transparent information with real-time updates for all internal users. Via a web site, external users can access information about activity levels and availability of resources.

The statistical tables and reports can be accessed online from the information registered directly from the hospital's SIS-GalenPlus database and the standard public administrative systems. This platform is implemented on web technology which facilitates its accessibility, in addition to being free to use and replicable at the national level, for those health facilities that use the SIS-GalenPlus.

Source: Authors' meeting with INSN, 12th July 2016.

Some specialised institutions have also developed a number of complementary reporting and notification systems in use across the health sector. For example, NOTI, managed by the National Center for Epidemiology, Prevention and Control of Diseases is a system for mandatory epidemiological reporting across all sub-systems; and NetLab co-ordinates test results from all national and regional reference laboratories.[3] NetLab allows patients and authorised staff across MINSA facilities to access results uploaded to the platform. Another example is SISMED, which collates information on stocks and dispensing of drugs

across pharmacies of health establishments including hospitals and specialised institutes at the national level. As part of the move towards a national electronic clinical system, the integration of these systems at the various levels of care is a key part of the health information vision of MINSA.

In addition to the information systems listed in Box 2.1, some specific directorates within MINSA operate a number of other observatories and registries that cut across the health system, such as:

- Pharmaceutical product observatory (*Observatorio de Productos Farmacéuticos*), under the General Directorate of Drugs and Medicines (DIGEMID), is an informatics platform handling price information of pharmaceuticals included in the current medicines registry, and sold at all private and public pharmacies in Peru (MINSA, 2016c).
- General Directorate of Infrastructure, Equipment and Maintenance (*Dirección General de Infraestructura Equipamiento y Mantenimiento*) is in charge of assisting the health authorities in the regions (DIRESAs) and in Lima (DISAs) in auditing physical resources in their facilities. The stock of medical equipment is measured and assessed according to stated priorities. This comes under a national plan to improve the quality and availability of physical resources.[4]
- The National Center for Epidemiology, Prevention and Control of Diseases (*Centro Nacional de Epidemiología, Previsión y Control de Enfermedades* – NCEPC) has the responsibility for disease surveillance in Peru (MINSA, 2016d). The Epidemiologic Cancer Monitoring System (*Sistema de Vigilancia Epidemiológica del Cáncer del Perú*) has been developed by NCEPC in collaboration with the National Neoplastic Disease Institute (*Instituto Nacional de Enfermedades Neoplásicas*) (MINSA, 2016e). Data from the hospital cancer registries under the responsibility of hospitals' epidemiology and environmental health departments is submitted via an online platform (MINSA, 2013a). The system enables the integration of cancer care information for both public and private health establishments. The data provides the following: patient details (age, sex, region); diagnostic information (date; clinic, topographic or histologic diagnose); and treatment information (date; state at last consultation). In addition, the Metropolitan Lima Cancer Registry (*Registro de Cáncer de Lima Metropolitana*) is a population-based registry collecting systematic and continuous data

including all new cancer cases of patients residing within the Metropolitan Lima area (MINSA, 2013b).

- National register of health care workers (*Registro Nacional del Personal de la Salud*) is a systematic and integrated health human resources registry providing detailed information about the health care workforce at the national, regional and local level (MINSA, 2016f). INFORHUS is the informatics application of the registry, designed for the collection, processing, reporting and auditing of the health care workforce data. INFORHUS has been praised for ensuring timely and relevant information but is limited by its MINSA-SIS only coverage, although versions of the software exist for the National Penitentiary Institute (INPE), and the Army and Air Force.

Peru has made important advances in tele-health and on-line registration

In recent years, there have been some noteworthy achievements in information and communication technologies in Peru. A number of tools have been developed that have the potential to improve the quality, security, efficiency and productivity of health services. They have also been innovations to improve prevention and promotion activities within the public health field (Curioso, 2015). In 2011, an agenda for digital information in Peru was created, establishing an online government platform to enable citizens to access information related to different public services (*Plan del Gobierno Electrónico*). In the health care sector, the General Office of Statistics and Informatics (*Oficina General de Estadística e Informática*, OGEI) within MINSA has developed norms and directives for information systems, creating a conceptual framework in accordance with the international guidelines developed by the WHO and the International Organization for Standardization. OGEI has implemented several digital systems benefitting the Peruvian population (Box 2.3).

Box 2.3. Digital health information technologies developed in Peru

- **Online birth registration**: directly after delivery, the health professional attending a new birth enters online the ID of the mother, together with information about the new-born, such as birth weight and fingerprint. By immediate registration, the ID of the new-born is generated faster enabling immediate affiliation into SIS and other benefit programmes. Importantly, it is not restricted to MINSA health establishments, but includes all EsSalud, armed forces, and private health establishments across all the regions.
- **GeoMinsa** is a platform based on Google Maps showing users the location, as well as the services offered, by all health care providers in Peru. It also enables the user to find all the contact details, as well as the fastest way to access the facilities.
- **Cuida tu Salud Móvil** is a public health campaign consisting of sending text messages to registered users in order to promote healthy lifestyles. The text messages contain recommendations to prevent cancer, information about the importance of physical activity, nutrition, and the dangers of tobacco, alcohol and other substances.
- **TeleHealth**: Peru has achieved remarkable progress in terms of telehealth, led by the National Telehealth Plan (Plan Nacional de Telesalud), which was developed by a national telehealth commission (MINSA, 2016g). By using information and communication technologies to build up a telehealth system, health professionals can gain a greater accessibility to offer consultation, education and disease diagnosis of patients in rural and isolated areas. This way, a solution to the health needs of vulnerable population groups can be achieved through remote health services, thus surpassing geographical barriers as well as covering the health care human resource gaps seen in rural areas of Peru.
- **Online medical appointment**: a service offered to patients who already have a medical record within a MINSA health establishment and who require another appointment. Patients can schedule a new appointment easier, avoiding long waiting times at the facilities.

Source: Curioso (2014), "eSalud en Perú: implementación de políticas para el fortalecimiento de sistemas de información en salud", *Rev PanamSaludPublica*, Vol. 35 (5/6), pp. 437-441.

SIS generates significant data concerning the costs and provision of health services

SIS, in its capacity as a financing scheme covering more than 40% of the population in Peru plays a vital role in developing statistical information on activities, costs and quality. Using standardised information models, SIS collects information on its affiliated members and their families; income and expenses of members and their beneficiaries, contributions and disbursements for the provision of services to all health care providers (*Instituciones Prestadoras de Servicios de Salud*, IPRESS) within the SIS

network. Some private providers, where *convenios* are in place, as well as some charities, are also part of the collection process.

In order to track services provided by its facilities, SIS requests all providers to complete a standard FUA (*Formato Único de Atención*), which generates information in a standardised way on the care provided by the institution. The FUA includes administrative information, diagnostics, exams, inputs, physician identifiers for each hospitalisation, consultation, surgery, etc. It contains a unique identification number and is used as a source of information for internal electronic registries within SIS as well as for validation of services and proof of payment for services provided. National standards are used to guide providers on how equipment, procedures and medications should be recorded. Since the number of procedures and cases are extensive, the evaluation of each FUA is automated and is the base for payment of provider claims.

Many indicators gathered by SIS are produced for their own internal monitoring and evaluation. Indicators ranging from child and maternal health to the prevention of chronic conditions, for example, monitoring and reporting on obesity rates are compiled. These data are submitted on line by both providers (as well as patients) in all 1 800 hospitals and facilities connected to SIS. Primary verification by diagnosis, gender and duplication of information is done through the Patient ID. Data submission by facilities is done on a monthly basis and it is often done manually – however, some providers are beginning to use the web-based electronic reporting system (SIA-SIS) for this purpose. Box 2.4 shows some of the indicators that SIS gathers and reports to SUSALUD.

SIS evaluates and reports the level of quality of provider services, as well as the satisfaction of its beneficiaries (SIS, 2016). The evaluation of the health services is made according to a set of quality standards agreed to under the agreements or contracts with each health care provider. Importantly, the specific roles of the institutions involved follow the protocols established by MINSA and a CPT[5]-based classification is used to register and bill activities. The overall goal of SIS is to have a system linked with patient-related information to make care co-ordination possible and be able to describe a comprehensive care pathway.

Box 2.4. Indicators gathered and reported by SIS

- **Insured population**: by sex, age group, geographical region, socio-economical quintile and type of affiliation regime.
- **Billed health care services**: by sex, age group, geographical region, provider, type of health care worker (physician, dentist, obstetrician, nurse, psychologist or other), type of consultation (ordinary, referral, emergency), level of care (health post, health centre, regional hospital or national hospital/specialised institution) and common diagnostics.
- **Services attended by users**: sex, age group, geographical region, type of consultation (ordinary, referral, emergency), type of financing (total public financing or partial public financing), for example labour services would include the following information: normal or caesarean, type of financing, geographical region and level of care.
- **Economic transfers**: ordinary resources (capitation, PSE transfers, fees (according to tariff, pre-liquidation tariff or no tariff), and complementary services), directly collected funds (according to tariff or no tariff), transfers to EsSalud for exchange of service provision, determined resources and donations.

Source: SIS (2016).

Over time EsSalud has developed its own independent health information and reporting systems

EsSalud, subordinated to the Ministry of Labour, is independent from MINSA and has thus developed its own information system and reporting protocols. That said, EsSalud does have certain reporting obligations to SUSALUD. The hospital management system in use in EsSalud facilities is a basic platform but is nevertheless standard across all facilities. It is mainly focused on reporting the production of hospital activities. For administration and financial management, a SAP-based reporting system is used which is not wholly compatible with the standardised reported by SIS and other public entities as required by the Ministry of Economy and Finance (MEF).

EsSalud reports a range of general health care statistics to both MINSA and SUSALUD. This includes data on the number and characteristics of affiliates, health professionals (by category/profession) and administrative staff, activities like primary care consultations, emergency care cases, hospitalisations, surgical interventions, childbirths, dentist services, laboratory analyses, special procedures and treatments, as well as main financial indicators (EsSalud, 2016). Some diseases and activities such as infections, acute diarrhoea and epidemics, as well as maternal and child health and vaccinations are mandated to be reported to MINSA. Moreover, a group of indicators on activities, quality and performance have to be reported to SUSALUD each month through an on-line interface (*Indicadores de*

Desempeño).[6] All providers within the EsSalud network report all the indicators on a weekly basis and the statistics are consolidated via a platform called the statistical health system (*Sistema Estadístico de Salud*, SES). The standard CPT coding system required for procedure level data, as set out in the IEDS (see Section 2.3), is to be implemented for these purposes.

EsSalud facilities also have their internal management systems for performance evaluation, but these tend to be rather rudimentary. Hospital departments are ranked against each other according to the data mentioned above. Data standards are guided by the central management unit, but do not follow either national or international standards. If ranked as "bad", this simply means the variable is worse than compared with the same month of the previous year (e.g. hospitalisation took longer than the same month of previous years).

One important source of patient information generated by EsSalud is the National Socioeconomic Survey of Access to Health of EsSalud Affiliates (Encuesta *Nacional Socioeconómica de Acceso a la Salud de los Asegurados de EsSalud*). The survey comprises a sample of 25 000 EsSalud affiliated households at the national level, providing robust information about the 29 health care networks and over 200 health care centres in the country. The survey gathers statistics about morbidity, external consultation, hospitalisation, surgical interventions and chronic diseases.[7]

In 2013, EsSalud also established the national centre for telemedicine (*Centro Nacional de Telemedicina*, CENATE), an accomplishment that brings medical care and expertise to remote areas of Peru (EsSalud, 2015). This is a positive step towards ensuring equality of access and quality of care in all geographical regions, as it is approached as a centralised effort. Thanks to CENATE, health professionals in rural and remote areas can receive specialised assistance regarding imaging diagnostics or external consultations, through tele-radiology and teleconsultation respectively. 23 035 tele-radiology assistances were performed in 2014, as well as 259 teleconsultations with 11 health establishments throughout the country. This numbers are likely to increase as the CENATE gains more experience and attention. The radiology images are stored in the Institutional system for medical imaging (*Sistema Institucional de Imágenes Clínicas*). Telemedicine is not only a priority for EsSalud but also for MINSA and the Peruvian health system in general. Telemedicine can be a very efficient way of maximising access and quality of care and addressing human resources shortages. This initiative by EsSalud is in parallel with similar interventions by MINSA-SUSALUD. In addition, good e-health capacity requires better interconnectivity and IT equipment, which consequently are beneficial for a timely and integrated health information system. Box 2.5 describes other information systems specific to EsSalud.

Box 2.5. Health information systems within EsSalud

- **Institutional system for medical imaging** (*Sistema Institucional de Imágenes Médicas*) – established in 16 facilities as a technical tool to view, manage, centralise and distribute medical images. Patient referrals and response times are reduced, and diagnoses are timelier. This system also enables physicians to diagnose more precisely in co-operation with specialists from CENATE.

- **System for information on allowances** (*Sistema de Información de Subsidios Web*) – developed to register and process allowances for lactation, burials, maternity and temporal inability to work. Designed to be compatible with EsSalud's other systems to facilitate maintenance and integration.

- **System for registering patient complaints** (*Sistema de Registro Informático de Intervención Defensoría*) – established to improve the quality of health care services. It enables fast management of consultations, complaints, suggestions and claims from affiliates. It also assists in detecting repetitive right violations in order to take preventive measures. Furthermore, it contributes to EsSalud's advocacy for its beneficiaries by generating statistical reports, as well as a management support tool with information by provider network, hospitals, institutes, departments, areas and health care services.

- **Biometric identification of insurees** (*Identificación Biométrica de Asegurados*) – validates the identification of insured patients using biometric readers in order to reduce the risks of impersonation.

- **On-line system for medical appointments** (*Sistema de Citas Web*) – developed as a pilot of EsSalud en Línea to unify the insured patient's information and decrease waiting times for medical appointments. Transfer time of patient information has decreased and information exchange between EsSalud and SUSALUD has reduced from ten to three days.

- **Information system for management agreements** (*Sistema de Información de Acuerdos de Gestión*) – consolidates the statistics and generates pertinent information in order to evaluate EsSalud's performance at a national level.

Annex 2.A1 provides a list of EsSalud's operating health information systems (including four in production).

Source: EsSalud (2015), 2014 Memoria del Seguro Social de Salud., http://www.essalud.gob.pe/transparencia/pdf/memoria/Essalud_Memoria2014.pdf.

National health data is collated by other important stakeholders within the Peruvian health information system

Several other important stakeholders are engaged in generating health data within the Peruvian health care system. INEI is a crucial institution for the Peruvian health information system, responsible for producing statistical information on demographic development and vital health statistics. Among the most important sources are the national household survey on life conditions and poverty (ENAHO), the demography and family health survey (ENDES) and the national health care user satisfaction survey in conjunction with SUSALUD (ENSUSALUD) (see Box 2.6). The public health information network, under the responsibility of MINSA, manages the production, analysis, publication and use of this information.

Another player in the collection and dissemination of public health information in Peru is INS. Among its numerous responsibilities concerning the regulation, promotion, and diffusion of public health research, INS also collects information in the area of food and nutrition and disease surveillance. Their network of centres carries out the nutritional survey (*Estado nutricional por etapas de vida en la población peruana*) in collaboration with INEI and CENAN (*Centro Nacional de Alimentación y Nutrición*) to obtain comprehensive and population-wide data on overweight and obesity.[8] This is closely linked to the ENAHO survey with INEI calculating the sample size and selecting households from the ENAHO sample while INS carries out the survey. A principal area of work on disease surveillance is centred on the submission of data on communicable diseases such as Zika virus, Denge and Chikungunya from the network of testing laboratories. Much of this information is not available to the public due to data confidentiality and privacy issues. Other public health data such as vaccination rates, maternal and infant health, as well as smoking prevalence and alcohol consumption remain under the responsibility of MINSA.

Box 2.6. Main surveys within the Peruvian health information system

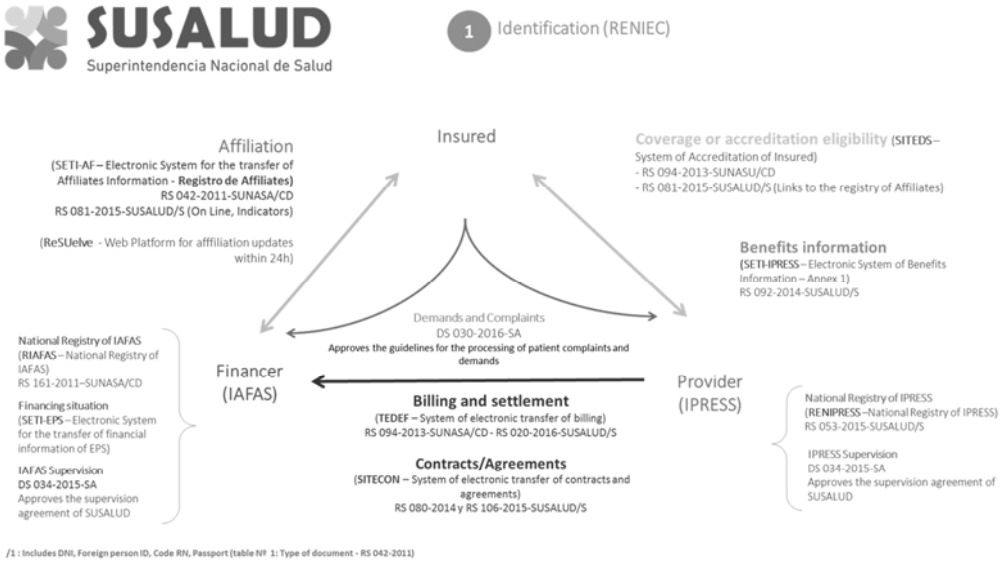
- **National household survey on life conditions and poverty** (*Encuesta Nacional de Hogares sobre Condiciones de Vida y Pobreza,* ENAHO) – is a continuous statistical study performed on an annual basis. It generates indicators about the evolution of poverty, well-being and living conditions within households. It also measures the reach of social programmes and is used as a source of information for both public and private institutions and research. This survey has enabled INEI to monitor living conditions in Peru since 1995. Importantly, ENAHO is used for estimating out-of-pocket (OOP) spending within the Peruvian health care system. However, because of a slight difference in terms of the target population/objective of the survey, the level of OOP is slightly underestimated. It is possible to directly compare with the direct sources/data and the value of ENAHO estimates on OOPs. MINSA estimates the OOP themselves, but an idea is to work with INEI through the committee.
- **Survey on demography and family health** (*Encuesta Demográfica y de Salud Familiar*, ENDES) – is one of the most important statistical investigations in terms of maternal and infant health. It is conducted by INEI in a continuous manner in the framework of the global programme of demography and health surveys known as MEASURE. ENDES is carried out by directly interviewing inhabitants in selected households. In 2013, ENDES included a sample of 27 945 households in Peru, in which 23 500 fertile women (between 15 and 49 years of age) were interviewed. The objective of ENDES is to provide information on the demographic dynamics and health status of mothers and children under 5 years of age in Peru. ENDES provides information about reproductive and infant health, prevalence and use of contraceptives, care during pregnancy and childbirth, immunisations, prevalence of certain diseases within the infant population, weight and length of children under 5 years of age and their mothers as well as pregnant women, and knowledge about ways to prevent HIV/AIDS and domestic violence.
- **National health care user satisfaction survey** (*Encuesta Nacional de Satisfacción de Usuarios del Aseguramiento Universal en Salud*, ENSUSALUD) – evaluates the degree of satisfaction of users receiving health care services. The survey measures a series of aspects related to multiple agents in health care provision. This survey has been performed since 2014 to evaluate health care services within 24 departments of Peru. ENSUSALUD is performed by visiting 181 health establishments upon which almost 25 000 users of outpatient services are interviewed. The survey contains five different questionnaires targetting different groups; outpatient patients, clinical facility staff, insurance office clients, pharmacy customers and management and administrative staff in clinics. Interviews are also performed with directors of hospitals, physicians and nurses who work outside of Lima, insurance offices within the hospital and patients who go from public hospitals to self-medicate at private pharmacies. ENSUSALUD is carried out by INEI on SUSALUD's request and it represents the whole country, including providers from the whole system (SIS, EsSalud, military/police forces and private), which enables possibilities to cross information. Information gathered includes: general perception of outpatient consultation quality and perception of access time & opportunity (waiting times and consultation time in minutes). ENSUSALUD allows a comparison of performance indicators of health care services in different regions and different subsystems; such as accessibility of hospitals, amount of physicians, quality of consultations, waiting time data by type of insurance scheme or type of provider etc.

Source: INEI (2013) and INEI (2016).

SUSALUD plays a key role in mandating the delivery of national information from health care providers and insurers

In 2013, the National Health Superintendence (*Superintendencia Nacional de Salud,* SUSALUD) was created with a mission to protect the health-related rights of all Peruvians.[9] SUSALUD is a public institution responsible for registering, authorising and monitoring all institutions administering pre-paid health funds (*Instituciones Administradoras de Fondos de Asegutamiento en Salud*, IAFAS) as well as health service providers (*Instituciones Prestadoras de Servicios de Salud*, IPRESS). In this capacity, SUSALUD collects and disseminates information from all health-related sub-sectors in Peru, and therefore is responsible for a number of key information systems (Figure 2.1 and Box 2.7).

Figure 2.1 The information systems of SUSALUD



Source: SUSALUD (2016), http://www.susalud.pe.

SUSALUD plays an important and effective role in health system surveillance, since it is mandated by law to supervise the four main sub-sectors of the Peruvian health care system (SIS, EsSalud, Army and Police Forces and the private sector), both at the health care provider and insurer level. SUSALUD has the authority to impose sanctions; from written warnings and/or monetary fines to temporary/permanent closure of particular services or the whole entity. All IPRESS and the IAFAS are

obliged by law to deliver technical and bio-statistical information to SUSALUD. SUSALUD monitors the quality, timeliness, availability and transparency of the information generated or obtained according to the legal framework in place. RENIPRESS is a clear example of the effective role of SUSALUD in integrating the information from all sub-systems together in addition to providing patients with the necessary information to know which establishments are best prepared to provide care.

As an independent agency charged with enforcing and protecting patient rights, SUSALUD is also involved in communication around health system concerns, citizen participation, promotion, information dissemination, and pursuing patient complaints. SUSALUD thus has two clear and valuable distinctions from other health agencies in Peru: first, SUSALUD is unique in the Peruvian health sector with an all-encompassing view of health system transformation; and second, SUSALUD acts for the whole population, regardless of coverage affiliation.

In its capacity as a patients' rights and protection agency, SUSALUD has established important tools to ensure patient representation within the Peruvian health care system: the ENSUSALUD national patient satisfaction survey captures the views of 25 000 patients across all sub-systems (see Box 2.6); and in-hospital representation of patients and efforts to improve health literacy among the population, including through increasing user participation. Seven regional patient groups now exist, which are reported as effective at strengthening the patient voice. SUSALUD is also working with patient complaints, and has now an established complaints management system. The number of patient complaints and positive feedback registered online is increasing, which suggests that users are finding some utility in the system. Each hospital in Lima and Ica region also has SUSALUD delegates stationed within the hospital to support patient liaison, and complaint management. SUSALUD is expected to further decentralise its activities.

Box 2.7. Information systems managed by SUSALUD

- **Register of affiliates to a health insurance scheme**. SUSALUD manages the Register according to RS 042-2011-SUNASA/CD and RS 081-2015-SUSALUD/S. This Register is available for searching with the ID number (DNI) of any person via the website or smartphone app (SUSALUD Contigo). All affiliates registered by SUSALUD are validated by the National Registry of Identification and Civil Status (RENIEC).

- **RENIPRESS**, the National Registry of Institutions of Health Services Provision. Previously the *Registro Nacional de Establecimientos de Salud* (RENAES) with responsibility moving from MINSA to SUSALUD. A web-based platform generating a unique code for each health establishment, both public and private. All health care provider institutions are requested to register and provide information about their infrastructure, human resources, equipment and management practices. The information provided is verified by the relevant DIRESA which grants the health establishment with the corresponding accreditation. By the end of 2016, more than 20 000 health care centers, both public and private, were registered at RENIPRESS.

- **RIAFAS**, the National Registry of Institutions for the Administration of Health Insurance Funds (*Instituciones Administradoras de Fondos de Aseguramiento en Salud, IAFAS*). Any person can search this Registry and is available at: http://portales.SUSALUD.gob.pe/web/portal/consulta-de-iafas.

- **SETI-IPRESS**, Electronic Information Transfer System (*Sistema Electrónico de Transferencia de Información Prestacional*). SUSALUD manages a wide range of information (health resources, ambulatory care, emergencies, hospitalisation, births, institutional surveillance events, surgeries) from public and private institutions through SETI-IPRESS, approved by Resolución de Superintendencia N 092-2014-SUSALUD/S:

- **TEDEF** – Electronic Billing Information Transfer System (*Sistema para la Transferencia electrónica de la facturación*) SUSALUD tracks information about billing, through TEDEF, according to RS 094-2013-SUNASA/CD and RS 020-2016-SUSALUD/S, and more information is available at: http://portales.SUSALUD.gob.pe/web/cdi/tedef.

- **SITEDS** (System of Accreditation of Insured Persons): Supports health providers by connecting to the relevant insurance organisation and providing information about the insurance status and eligibility of patients. This is done at three levels: identity of the insured, entitlements, and pertinence of the services provided.

- **SITECON** (System of Contracts and Agreements): This system supports the transmission of information regarding contracts and agreements signed between IAFAS (Insurers) with IPRESS (public or private health establishments) registered in RENIPRESS.

Source: SUSALUD (2016), http://www.susalud.pe.

Some important cross-cutting measures exist within the Peruvian health information system

In addition to INEI surveys and SUSALUD administrative records providing information across the whole health care sector in Peru, there are also some important developments in health information linkage which pave the way for the wider health information reform process.

Through the general office of informatics (*Oficina General de Tecnologías de la Informática*, OGTI) at MINSA, standards of registration and interoperability are being developed and implemented for the integration of the different health information systems in Peru. Information exchange between institutions within the health care system in Peru is incipient, but an important feature in this regard is the web-based interface with data from the National Registry of Identity and Civil Status (*Registro Nacional de Identificación y Estado* Civil, RENIEC). This system processes data such as resident population by department, province and district (including eligibility to vote), inscription after childbirth, marriage and death, as well as indicators from INEI surveys such as ENAHO and ENDES (RENIEC, 2016). An agreement has been made with RENIEC in order to validate the identity of health care users through the national identity document (*Documento Nacional de Identidad*) (INS, 2012), although it is yet not possible to follow each patient across sub-systems.

Even if agreements for the exchange of data between institutions exist, and despite are dependent on the obligations for health care providers to remit information to SUSALUD, these agreements are not currently sufficient to meet the requirements to track patients between sub-systems. SETI-IPRESS should provide the necessary conditions for a tracking analysis by patient, in effect an individual-level registry system with health care providers under an obligation to report this information to SUSALUD. Additionally, the connection with RENIEC will enable further analyses, including subjects regarding survival rate, which has important implications for quality indicators.

2.3. Reforms to enhance the performance of the Peruvian health information system

Peru has over recent years implemented some far-reaching reforms of the health system to attain universal health coverage and raise quality of services, as described in Chapter 1. As part of the health system reform, Peru has embarked on a comprehensive list of measures to construct a national health information system. Guidelines to develop a comprehensive and integrated health information system were outlined under a proposed

mandate (Consejo Nacional de Salud, 2013),[10] which has four key components; the implementation of a set of data standards, the development of a national data repository, a national plan for telemedicine and the development of a system of electronic health records (Box 2.7). This section looks at this reform process and how it aims to enhance the performance of the Peruvian health information system.

To put the overall health sector reforms into action, a strategic sectorial plan for the period 2016-2021 (*Plan Estratégico Sectorial Multianual 2016-2021*, PESEM) was formulated. The plan, approved in July 2016, set out a conceptual model and three overarching strategic objectives, namely 1) improving the health of the population 2) extending health insurance coverage of the population; and 3) improving the governance of the health system for the benefit of the population. The third objective includes the development of an integrated health information system (Figure 2.2).

As outlined in the previous section, each health sub-system currently produces and stores its own information. Consequently clinical information does not follow the individual patient and national monitoring of the system is fragmented. The unique national health information repository (REUNIS) is an information system intended to enable stakeholders to have a national base for the exchange of all transactions between the diverse actors of the health care system and is expected to re-enforce MINSA in its steering role over the health care sector, as well as acting as a mechanism for strengthening the various reform measures across the health sector that require the support of information technology and resources. To safeguard individual privacy concerns, the information collected being statistical and concerning activities related to health, it should be non-personalised and anonymous.

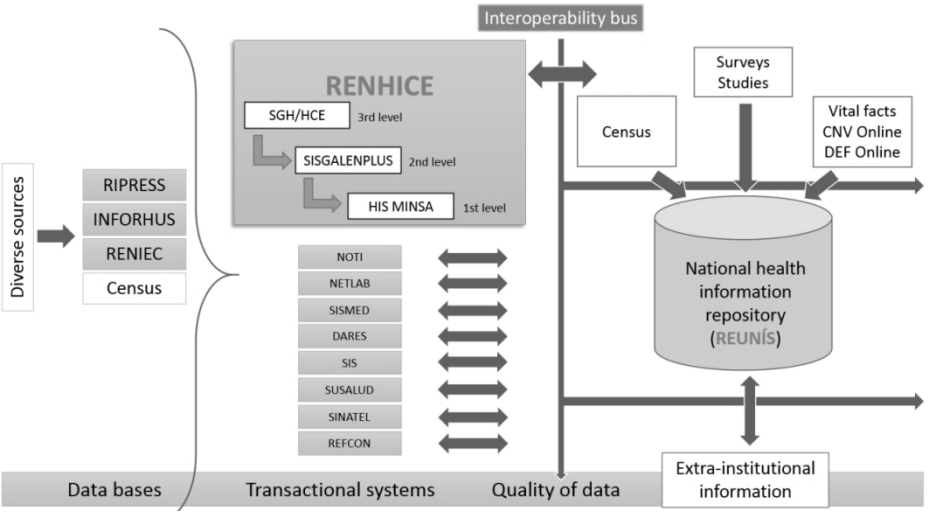
For the operation and fulfilment of REUNIS objectives set out above, all public facilities attached to MINSA, EsSalud, the Armed Forces and the National Police health systems as well as private health service providers will be requested to submit the information requested by the MINSA. As such, OGEI will be responsible for progressively establishing the technological infrastructure and data management of REUNIS.

Box 2.7. Four key components in the construction of an integrated health information system in Peru

- **Implementation of health data standards** (*Identificaciones Estándares de Salud, IEDS*) in order to establish health data norms such that all systems speak the same language. There are eight IEDS standards:
  - Medical procedures catalogue (10 000 different inpatient and outpatient procedures linked to ICD10),
  - Pharmaceutical products coding,
  - Patient identification based on their ID number,
  - National registry of health facilities,
  - Classification of service producing unit (service at the health centres, for example internal medicine),
  - Registry of health care workers,
  - Medical episodes related to a single pathology, person & site,
  - Identification of financing sources.
- **Development of a national health information repository** (*Repositorio Único Nacional de Información en Salud*, REUNIS) to collect information of all subsystems in order to develop statistical information.
- **Development of further telehealth services and online registration of live-births**. New-borns are given a certificate and unique ID code (*Código Único de Identificación*, CUDI which ends with the ID number). The framework law of Telesalud was passed on 2nd April 2016. Several projects are already ongoing with gradual implementation. This initiative was originally focused towards rural areas and low capacity health centers but with the new law telesalud services are to be implemented in all health centers.
- **Promotion and development of electronic health records**. A transactional platform and multisectorial system in order to implement a national registry of electronic health records, where there will be only one health record per patient – the model defined is a distributed electronic health record.

Source: Consejo Nacional de Salud (2013).

Figure 2.2. Structure of an integrated health information system in Peru



Source: OGTI.

Foundations for an improved health information system in Peru

At the base of the health information system is the need to connect many of the existing databases, such as INFORHUS (the health personnel database), RENIEC (the national ID registry) and the various census instruments (children, women, beneficiaries of social programmes etc.), and link the provider specific reporting systems from the three levels of care (namely HIS MINSA, SIS-GalenPlus and SGH/HCE) in an platform called RENHICE (see Figure 2.2). Provisional information will be integrated in RENHICE as a national health record; with the national statistical information centralised in a national health information repository (REUNIS). The interoperability bus is furthermore based on standards that will feed the national health information repository. This will allow for analysis and knowledge management; such as for example working with cubes, dashboards, observatories, and webpages for information, geo-reference information systems and other information requirements.

Information will also come from other systems such as NOTI (the mandatory reporting of epidemic diseases), NETLAB (laboratory reporting system network), SISMED (stocks and dispensing of pharmaceuticals, medical devices and other medical non-durables in both quantities and values), DARES (supply and warehousing), SIS (integral health insurance system), EsSalud (social health insurance system), SINATEL (telemedicine system) and REFCON (references and counter-references system).The

health records and the statistical information will be further enriched by survey information (from ENAHO and ENDES), censuses (one every ten years; with the next one in 2017) and vital statistics (for example, information about live births from CNV). In RENHICE, it will be registered which provider (provided they use electronic health records) the patient visits. If the patient then goes to another provider, information from previous visits will be visible. Patients will thus be able to request information from all the medical centres where services have been provided. All subsystems and all levels of care will be included. The platform however does not include health information, but only patient information; that is, where they have received care and electronic address (health information is stored with each health facility).

Roadmap towards an integrated operability platform for the electronic health records

The new HIS-MINSA being rolled-out is expected to be at the core of the electronic medical record system and act as an interoperable web-based platform allowing the registering of patient consultations (registering anaemias, allergies, physical examinations, diagnoses, laboratory exams solicitation, as well as medical prescriptions). This will allow patient information to be accessed in real time (online visualisation of the medical record), thus enabling appropriate medical action (diagnoses and/or treatments). HIS-MINSA is composed of several modules that each allow for the provision of information covering specific aspects, e.g. referrals, prescriptions or admissions. Through an interoperability layer, HIS-MINSA will enable communication with other web-based platforms such as the national ID register (RENIEC) and the register of health workers (INFORHUS), as well as allowing an exchange of information with Telehealth or the online medical appointment system. Efforts have been initiated in recent years to integrate these tools with the national ID numbers and enable paperless medical visits. As of July 2016, around 40% of establishments had been migrated to the new web-based system with three regions having completed implementation.

However, the successful roll-out is hampered by the lack of human resources, infrastructure, and equipment with a significant gap needing to be plugged. Just in terms of personnel to ensure the quality of primary data – capacity in both clinical and administrative staff needs to be strengthened. Connectivity and speed of access to the health information system requires strengthening in order to modernise the information infrastructure. According to MINSA sources, around 50% of the 8 200 MINSA facilities had no internet access or connections often operating at very low speeds which obviously becomes a barrier for the deployment of systems.

A pilot project (*Proyecto de Inversión Pública*, PIP) started with the aim of developing an interoperability platform in Lima to connect with regional nodes of the information systems in Junín and Puno, which in turn are connected to regional hospitals. This project has the support of the Inter-American Development Bank (IADB), which has agreed to help with national deployment. The successful implementation is a key factor to improving connectivity.

The American electronic health co-operation network (*Red Americana de Cooperacion en Salud Electronica*) formed by the IADB is another welcome initiative of which Peru is a member. This network is meant to exchange experiences in developing electronic medical records at the Latin American level, including implementation between different states.

2.4. Conclusions

Previous assessments of the health information system in Peru have pointed to the need for a long-range national vision and a comprehensive national plan for integrating or scaling up successful programmes. The challenge has been to pull together the diverse systems to serve the entire Peruvian population. That way, a more coherent and comprehensive basis for decision making can be created. As well as monitoring performance and improving quality of health services across providers, it is essential for enhanced cost control.

To an extent, the reform process put in place since 2013 is on the right track to meet these challenges, setting out to create an integrated health information system with a central repository and electronic health record system. Progress has been made in certain aspects along this route with the establishment of norms and standards, and the development of the regulatory framework.

The foundations for an integrated health information system are already there; regulations, standards and norms that oblige the various entities (providers and financial institutions) to send information are in place – and the platforms needed are being developed. However, implementation is hampered by the lack of infrastructure, equipment and human resources. Connectivity and speed of access to the health information system needs strengthening in order to modernise the information infrastructure, and a shortfall in health personnel is a serious issue. Out of the original estimates of 16 billion soles needed to implement the programme, a gap of around 50% remained in 2016.

A fundamental part of the health reform which, among other objectives, aims to integrate the health information system is the roll out of RENHICE

and REUNIS. As an integrated transactional platform, RENHICE will bring together the different tools currently being used for health facility management and collection of routine indicators. These are different for each of the three levels of care and the success of RENHICE will be very dependent on its capacity to integrate the information from each of the three levels. This information, together with data coming from the bespoke systems within the health system will become part of a national repository (REUNIS). Once this is accomplished, the information will be readily available for patients, administrators and policy makers. The Peruvian health information system, through initiatives such as RENHICE/REUNIS, is on the right track towards an integrated HIS and the government should recommit must now ensure its adequate implementation and monitoring.

Together with this national repository, the other fundamental part of the health reform is the roll out of an integrated electronic health record system. 97% of the population is registered with a unique national ID number, and those being born are currently given an ID number in the delivery room itself. This puts Peru in a very advantageous position in order to ensure that all Peruvian's health records are available electronically and are, ideally, transferable across institutions within the health system.

The challenge remains in the implementation phase of the plan with the need to consolidate the responsibilities under a new or expanded agency (within MINSA), and ensure the involvement of all stakeholders. Although OGTI is in charge of information systems within MINSA, the collection and dissemination of information by MINSA is too often confined to the "public" sector while SUSALUD has cross-sector authority to oblige and if necessary sanction providers and financial institutions if compliance with reporting requirements is not adhered to. SUSALUD has already gained the trust of stakeholders and public across the health system and can play a significant role in improving collection, availability and interoperability of data, particularly on activities, quality and resources.

The different information systems, observatories and registries across the Peruvian health sector provide a wide range of health data and indicators. To date, the focus of Peru's information infrastructure has, however, been on tracking activities, reporting on child and maternal health, and infectious disease surveillance. But as epidemiological burdens change and there is an increased emphasis on health system performance, new data need to be produced, including prevalence of non-communicable diseases, quality and patient outcomes, and more information on costs. A key task is to set standardised data and indicators to be collected across all health schemes and providers – it is important for any agency is to make better linkages between data and research and decision making based on empirical evidence.

The issues around the current lack of interoperability across the health sector have been echoed by INS, who point to the added value of their own databases (or "dashboards") when linked with demographic and socio-economic information (via ENAHO and ENDES, for example). This acknowledges the enormous advantage of compatible databases being made widely available for research and policy needs and the sharing of vital information under an interoperability framework. As of now, integration can only be done by health centres with information often limited to SIS-funded and army/police health service providers. In the case of INS, for example, the existing structure limits the potential to receive data across sectors and regions and become a body that monitors and supervises a list of selected conditions and diseases in line with national priorities across the whole health care system.

Another example of integration concerns human resource information which is high on the policy agenda. It will be interesting to see how INFORHUS combines with attempts at HIS integration, particularly with attempts to integrate EsSalud and private providers through the repository of human and physical resources data, RENIPRESS.

Notes

1. https://www.youtube.com/watch?v=E0dh2_0gBqI SIS-GalenPlus was developed as part of the MEASURE Evaluation by USAID, before being transferred to MINSA.
2. http://gestionensalud.medicina.unmsm.edu.pe/?tool=sis-galenplus.
3 The National Network of Laboratories in Public Health is made up of 24 regional laboratories and the national reference laboratory of the INS.
4. http://www.minsa.gob.pe/pees_dgiem/documentos/doctecplanequipdeess.pdf.
5. Current Procedural Terminology: A classification to describe medical, surgical and diagnostic services.
6. http://www.essalud.gob.pe/indicadores-de-desempeno/.
7. http://www.essalud.gob.pe/downloads/encuesta_socio_conomica/archivo/Encuesta%20Socio%20Economica%20EsSalud%202015.pdf
8. http://www.portal.ins.gob.pe/en/component/rsfiles/preview?path=cenan%252FVigilancia%2Bde%2BIndicadores%2BNutricionales%2BB%252FVIN%2BENAHO%2BPOBLACION%2B2013-2014%2B220116.pdf.
9. Decreto Legislativo N° 1158
10. Propuesta de mandato de política 4.10.

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Annex 2.A1

ESSALUD'S health information systems

Administrative systems

01 Sistema de Registro Informático de Intervención Defensorial (RIID)*
02 Sistema de Registro de Incidentes Adversos (REGINCIAD)
03 Sistema de Procesos Judiciales (SISPROJ)
04 Sistema Integral de Administración Documentaria (SIAD)
05 Sistema de Información de Selección de Personal (SISEP)*
06 Sistema de Subsidios (RISC)
07 Sistema Único de Planilla de Pagos (SUPAC)
08 Sistema de Información de Acuerdos de Gestión (SIAG)*
09 Sistema de Gestión de Convocatorias (SGC)
10 Sistema de Trámite de Asuntos Judiciales (SITAJ)
11 Sistema de Cobranzas y Recuperaciones (SISCOR)
12 Sistema de Gestión Normativa (SIGNOR)
13 Sistema de Registro de Facturas que realiza el proveedor vía web (REGFACT)
14 Sistema de Gestión de Proyectos Informáticos (REDMINE)
15 Sistema Integrado Patrimonial Contable (SIPC)
16 Sistema SAP (Finanzas y Logística)
17 Sistema del Programa de Voluntariado (SPV)
18 Sistema de Guías de Remisión (GREMISION)

Health care provision systems

01 Sistema de Referencias y Contrareferencias (SIRyC)
02 Sistema de Gestión de Servicios de Salud (SGSS)
03 Sistema de Gestión Hospitalaria (SGH)
04 Sistema de Certificados de Incapacidad Temporal para el Trabajo 4 (CITT 4)
05 Sistema de Gestión de Incapacidades (SIGI)
06 Sistema de Aviso de Accidentes de Trabajo (SAAT)
07 Sistema de Información Gerencial (NSIG)
08 Sistema Estadístico de Salud (SES)

09 Sistema de Registro Hospitalario de Cáncer (REGCAN)
10 Sistema de Información Centralizada Gerencial (SICG)
11 Sistema de Disponibilidad de Camas
12 Sistema de Vigilancia Perinatal (SVP)
13 Sistema Institucional de Imágenes Médicas

Insurers systems

01 Sistema de Subsidios (SISUB)*
02 Sistema de Pagos SUNAT
03 Sistema SUSALUD
04 Sistema de Aseguramiento (SAS)
05 Sistema Integral de Salud (SIS)
06 Sistema de Actos Administrativos de Aseguramiento (SACAD)
07 Sistema Integrado de Aseguramiento (SIA)
08 Sistema Acredita (Internet, Intranet)

Chapter 3

Health expenditure and financing in Peru

Accurate, timely and comprehensive estimates of financing and spending on health care over time are vital for a clear understanding of resource allocations and drivers in the context of current planning strategies and future sustainability. Adherence to a standard international framework can serve both national policy requirements as well as benchmarking against countries in a regional and international setting.

Peru recognises the current limitations of its information and is making significant progress in transitioning to the System of Health Accounts 2011 international framework. It is planned that regular health accounts will be produced from 2017 onwards. While the governance structure is being strengthened, improvements in terms of technical capacity, and the expansion and development of data sources and methodology are key requirements to enhance the information base for decision makers. Increased internal co-operation across agencies and institutions due to the fragmented financing and delivery of health services is also necessary.

3.1. Introduction

In developing key inputs for policy making in the health care sector, the regular production of National Health Accounts (NHA) is an important milestone in the provision of sound evidence on health financing and resource allocations. At the national level, timely and accurate estimates of spending can assist in monitoring health system objectives, such as the reduction of the financial burden on households and progressing towards achieving universal health coverage, or assessing the impact of health system and financing reforms. Knowing how much is spent on what type of health care, where, by whom and for whose benefit is essential in determining a more sustainable, equitable and efficient allocation of available resources. Furthermore, linking of health accounts data with non-financial information (such as activity or outcome data) can provide information on aspects of productivity and efficiency in the health system. From an international perspective, the production of methodologically sound health expenditure and financing data according to recognised standards and definitions as set out, for example, in the System of Health Accounts 2011 (SHA 2011) is seen as important in benchmarking total health spending and its components against other countries. In addition, monitoring changes over time and how patterns differ from other countries is essential for a better understanding of the health system. In order to achieve such goals, strong governance structures, sufficient capacity and sustainable production processes are all required.

This chapter reviews the development of the Peruvian national health accounts (*Cuentas Nacionales de Salud*, CCNNS), assessing the evolving governance structure and compilation of the accounts as well as the dissemination and use of the information in the policy making and budgetary processes. The chapter also evaluates the ongoing process towards SHA 2011 reporting and how this aims to meet the international standards set out in the health accounting framework. A set of recommendations about how each of these stages might be further strengthened is provided.

Based on an assessment of the provisional SHA 2011 estimates, a set of key health spending financing and expenditure indicators are presented and discussed. It should be emphasised that the SHA 2011 data are preliminary figures and require further refinement.

3.2. The System of Health Accounts 2011

While the production of NHA has a long history (France and the United States have produced health expenditure accounts for many decades), the

development of a standard international framework is relatively new. The System of Health Accounts (OECD, 2000) was first published in 2000 by the Organisation for Economic Co-operation and Development (OECD) and over subsequent years a large number of high-income countries harmonised their health care reporting according to this standard. The Producer Guide (WHO, World Bank and USAID, 2003), drew heavily on the concepts and definitions of the OECD manual, was geared more to the needs of low- and middle-income countries and introduced additional dimensions around sources of financing and beneficiaries.

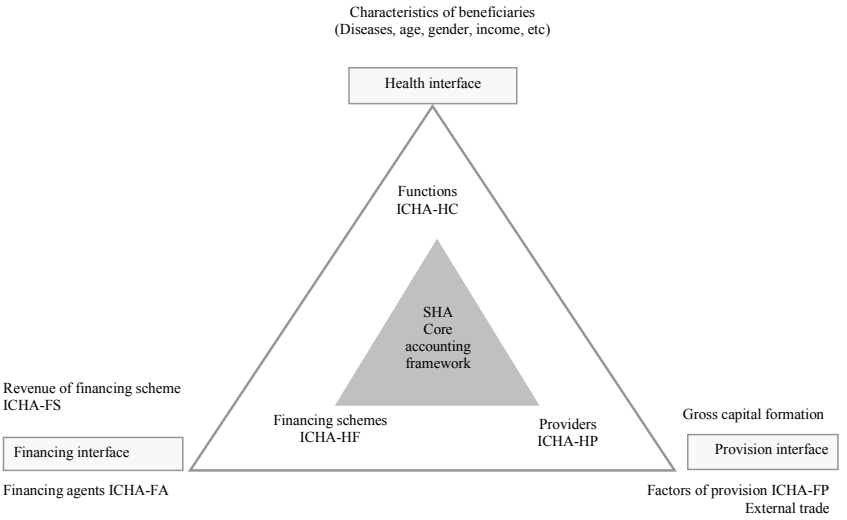
A global accounting framework to monitor the flow of funds through the health system

Experience built up over ten years or so, coupled with a need to respond better to key health policy questions and to adapt to evolving health care financing and delivery mechanisms around the globe, led to the development of a revised version of the framework by OECD, European Commission and WHO. With the development of a global standard, A System of Health Accounts 2011 (SHA 2011, OECD, Eurostat and WHO, 2017) has provided new impetus for many more countries to implement and institutionalise health accounts.

SHA 2011 comprises a set of dimensions, and corresponding classifications, that enable the systematic tracking of the flow of resources in a country's health system (Figure 3.1). SHA 2011 takes into account both public and private sector activities in health and provides key inputs into the design, implementation, and evaluation of health policies.

The principle aggregate of health accounts, namely current health expenditure, encompasses all final consumption expenditures for activities whose primary purpose is to restore, improve, and maintain health during a defined period of time. This definition applies regardless of the type of the institution or entity providing or paying for the health activity. In addition, health expenditures are comparable across time and space, allowing evaluation of changes in health expenditures over the years and of differences in experience among different geopolitical entities.

Figure 3.1.The core and extended accounting framework of SHA 2011



Source: OECD, Eurostat and WHO (2017).

Many lower and middle-income countries have experienced a stop-start approach to SHA institutionalisation, often lacking the necessary political commitment and resources needed to sustain the process (Yazbeck, 2016). Weaknesses often result from a failure to ensure the necessary capacity and retain sufficient expertise for regular production. Moreover, the significant role of external agencies and consultants in the production process has often led to ad-hoc and infrequent production of health accounts without the full sense of national ownership. While external support and financing may be needed to kick-start the process, a long-term strategy is still required to ensure that ultimate ownership rests with the relevant national authorities.

3.3. The development of health accounts in Peru

MINSA has been at the forefront of developing health accounting in Peru over more than 20 years

The development of the CCNNS in Peru started in 1994 as part of MINSA's "Health Service Strengthening Programme" (*Programa de Fortalecimiento de Servicios de Salud*), culminating in the study "Analysis of Health Sector Financing, 1992-1995" (MINSA and IADB, 1996).[1] In the following year, a follow-up study "Financing of the Health Sector, 1995-

1996" (MINSA, 1998) was produced under the "Capacity Building Project" (*Proyecto Generación de Capacidades*).

In 1998, work started on a Health Satellite Account closely aligned to the System of National Accounts,[2] to provide consistency and continuity with national economic and financial statistics. It was the responsibility of MINSA and MEF to provide the relevant information regarding the Health Satellite Account and the CCNNS. As part of this work, under the Sectorial Restructuring Operational Plan of the Health Services Strengthening Program, the design of the CCNNS was re-examined and the production of the 1995-1996 Health Satellite Accounts by the working group (MINSA with the support of IADB) helped identify information needed to improve and progressively expand the CCNNS.

Subsequently, under the framework of the Co-operation Program between MINSA and PAHO/WHO, the frameworks were extended and the criteria for building medium-term series were harmonised. Improvements were made by incorporating the management of financial flows, the pharmaceutical market and the allocation of expenditure according to various functions deemed a priority at the national level,[3] to produce a series of consistent accounts – published as "National Health Accounts, Peru 1995-2000" (MINSA and PAHO/WHO, 2004).

In 2008, the CCNNS for 2001 to 2005 were produced by MINSA-WHO/PAHO with the Economic and Social Research Consortium (CIES) and, being compatible with the previous series, were published together as the "National Health Accounts Peru 1995-2005".[4]

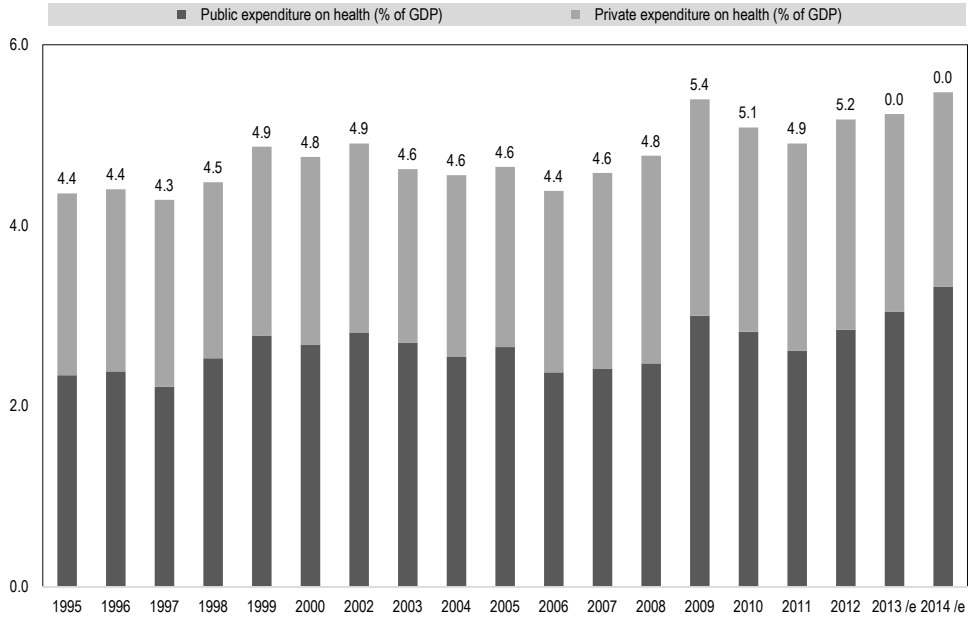
Peru is moving towards SHA 2011 reporting through international support

In 2015, the most recent study "National Health Accounts Peru 1995-2012" was published, providing a continuous time-series of health spending estimates. This study was produced by the Health Economic Studies Functional Unit (*Unidad Funcional de Estudios Económicos en Salud*) within the General Office of Planning and Budget (OGPPM) of MINSA.[5]

In the same year, MINSA, with the support of PAHO/WHO, commissioned a "Technical study to evaluate the harmonisation of the structure of the Peruvian health accounts with the System of Health Accounts (SHA 2011)"[6] to assess the information gap arising from the application of SHA 2011 methodology in the development of health accounts in Peru.[7] This study used the information from the 2011 and 2012 CCNNS to construct SHA 2011-based accounts and assess the level of disaggregation feasible at disease and sub-national level. At the same time,

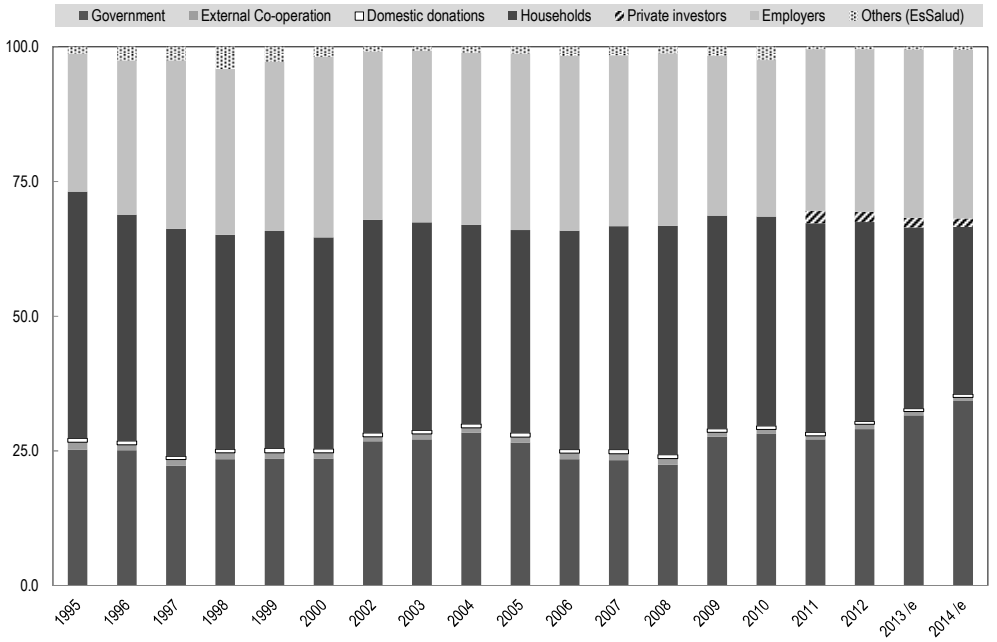
CCNNS for 2013 and 2014 were estimated based on an update of the 2012 CCNNS using the same methodology (Figure 3.2). Estimates for 2014 indicate that health spending in Peru accounted for around 5.5% of GDP, having averaged around 4.7% of GDP over the period 1995-2010. The share accounted for by public provision (e.g. MINSA, the regions and EsSalud) has gradually increased in recent years to reach an estimated 61% of total spending in 2014. CCNNS provides detailed information on the financing of health. With the recent expansion of coverage to SIS affiliates, the share of total health financing from government revenues increased from around 22% in 2008 to an estimated 34% in 2014 (Figure 3.3).

Figure 3.2. Health expenditure as a share of GDP, Peru, 1995-2014 (according to the CCNNS)



Source: OPEE-OGPPM-MINSA.

Figure 3.3. Structure of health care financing, Peru, 1995-2014 (according to CCNNS)

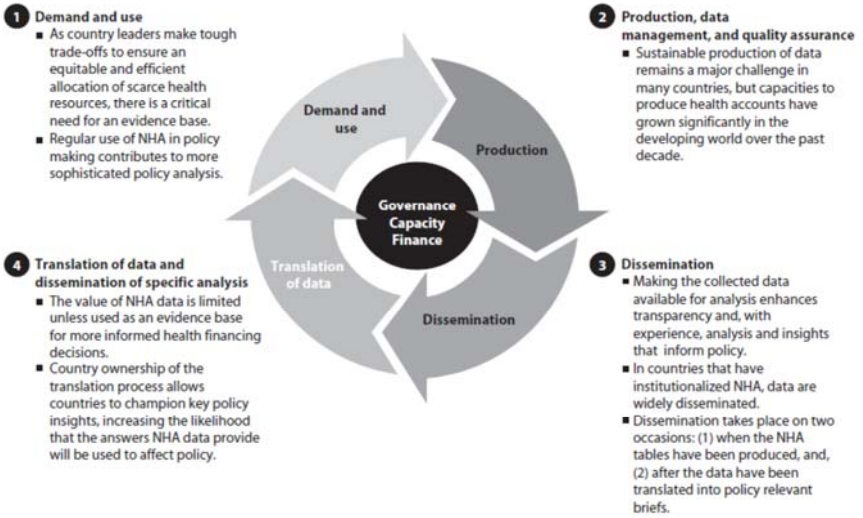


Source: OPEE-OGPPM-MINSA.

3.4. The governance of health accounts production in Peru

Experience from countries has shown that successful institutionalisation of health accounts requires a full cycle of activities beyond the simple production process. In this way, the accounts respond to, as well as inform, the policy making and budgetary cycles. The framework (Figure 3.4) developed by the World Bank (Maeda, 2012) points to three elements that are essential in the cycle: governance structure, capacity and financing.

Figure 3.4. Framework for institutionalisation of National Health Accounts



Source: Maeda (2012).

The governance structure provides a mechanism to engage key stakeholders in the various steps of the cycle – from production through to demand and use, and back again. The governance of health accounts production is a key component towards a successful and sustainable process and the link towards the effective use of expenditure and financing information in the policy arena. The governance model is determined by a number of factors such as the level of available financing, institutional capacity and the location of resources and technical expertise. The various legal and budgetary frameworks put in place are also important in maintaining a strong organisational and governance structure.

Four different types of governance models have been identified (Box 3.1). The first three models are government mandated, with one or several steps in the institutionalisation cycle possibly outsourced to external bodies, such as academic institutions or independent research agencies. The unique feature with the fourth model is the lack of ownership by government of any of the steps in the institutionalisation cycle.

Box 3.1. Models of governance frameworks for NHA production and use

1. Ministry of Health-led model whereby NHA production is mandated and owned by the Ministry, and data is translated and used by the Ministry
2. Ministry of Health-led but with multi-sectoral collaboration whereby NHA production is mandated and owned by the Ministry, and data is translated and used by multi-sectoral teams.
3. Multi-sectoral model whereby production is mandated and used by a multi-sectoral government agency, such as a statistical office
4. Independent research agency model. NHA are produced by an independent body with limited contact to government.

Source: Maeda (2012).

Various models have been adopted by OECD countries, in the sense that no one model fits all. The United Kingdom, Norway, Poland and Germany house the production in national statistical offices (with varying degrees of political independence); albeit the link with ministries of health is usually strong. Other governance models either demand responsibility within the ministry itself (e.g. in France, Spain and Mexico) or in a closely aligned technical health agency (e.g. in Canada and Australia). Finally, countries like Korea and many non-OECD countries out-source health accounts production to academic or non-governmental agencies where there is resident expertise. In all cases, the success of the production cycle is dependent on appropriate capacity at each stage to produce and apply the health accounts. The final factor is adequate long-term financing put in place, often with the appropriate legal basis, to ensure the sustainability of the whole process.

MINSA is responsible for the production of health expenditure information but broader stakeholder support is crucial

In Peru, the governance structure fits closest to the second of these models: MINSA leads the production of CCNNS with the support of national and international organisations, while counting on multi-sector collaboration, according to the needs of the health sector.

The production of economic information in Peru has evolved over time. In a macro-economic context, the National Accounts (*Cuentas Nacionales*) were formerly produced by the Central Reserve Bank of Peru (BCRP) in collaboration with INEI. INEI is now responsible for producing the National Accounts of Peru within its National Accounts Directorate. As such, this

directorate is also responsible for the calculation of the economic activity of health as a service sector within the National Accounts framework.

However, the production of CCNNS rests firmly under the responsibility of MINSA – deemed necessary to provide more detail of the financing and consumption of health care services in response to the specific policy needs of the health sector. Currently, an 18-year time series of financial information from the perspective of expenditure on health services and goods is available, which is planned to be updated to the SHA 2011 standard methodology.

MINSA has taken the lead in production with the support of various organisations, but without managing to permanently institutionalise the process. Health accounts production has been established through a number of Ministerial Resolutions with the creation of a Health Economic Studies Functional Unit (*Unidad Funcional de Estudios Económicos en Salud*), initially in a temporary capacity, and as part of the General Office of Planning and Budget (*Oficina General de Planeamiento y Presupuesto*, OGPP).[8]

In February 2016, as part of the Structural Reform of MINSA, and set out under the new manual for the Regulation of Organization and Functions (ROF),[9] one of the functions of the new Office of Planning and Economic Studies (OPEE) within OGPPM was the management and compilation of health accounts and health sector financing information based on an analysis and investigation of the national health system.

Establishment of the proposed National Health Accounts committee should lead to wider institutional support

At the same time, through a Ministerial Resolution, it had been proposed that a Working Group on Health Accounts be created under the leadership of MINSA, and in co-operation with INEI and other private and public institutions. This group would have as objective the implementation of "a standardised methodology" for National Health Accounts production in Peru and, building on the financial and statistical information, the review and validation of the information produced, so that the results can be made available and integrated into the decision-making process. However, the formation of this Working Group was reviewed following the change of government in July 2016. The scope of the resolution was subsequently amended through a proposed Supreme Decree with the establishment of a National Health Accounts Committee in the process of approval.

3.5. The production process for the Peruvian health accounts

This section describes the production cycle in place to collect data and compile the health accounts in Peru, including an indication of the timelines and resources (human and other) used, as well as resources employed (databases, internal software) to extract, link and store data.

OPEE plans, co-ordinates, and carries out the various activities necessary for the production of health accounts, namely: requests for official information from institutions and agencies; production of tables covering the financing, expenditure, insurance and utilisation of health services; initial review of the indicators; validation of the results in collaboration with the various entities of the health sector; and publication and dissemination of results.

With the proposed creation of a National Health Accounts Committee (subject to Supreme Decree), the members of the group will oversee the implementation of the methodology and provide support in the production process even if OPEE and OGPPM continue to lead and co-ordinate the multi-sectoral collaboration with regards the health accounts. The establishment of a committee can provide an opportunity to formalise or legally establish co-operation between the various institutions that provide information for the regular production, validation, diffusion, and use in the different decision-making levels of the health sector.

The Peruvian health system necessitates a broad range of different data sources to produce a comprehensive estimate of health spending

OPEE relies on administrative records from various public institutions linked to MINSA, notably SIS) and SUSALUD. In addition, information is provided by the decentralised body of MINSA, the National Centre for Supply of Strategic Health Resources (CENARES).[10]

Other key governmental entities involved in the provision of information include:

- Ministry of Economy and Finance, via the Offices of Public Budget and Public Accountability
- Social Health Insurance (EsSalud), Ministry of Labour
- Health Services for Armed Forces, Ministry of Defence
- Health Service for the National Police of Peru, Ministry of the Interior

- Peruvian Agency of International Cooperation (APCI), Ministry of External Relations
- National Superintendence of Banking, Insurance and Private Pension Fund Administrators (SBS)
- The Metropolitan System of Solidarity (SISOL) of the Municipality of Metropolitan Lima
- National Superintendence of Customs and Tax Administration (SUNAT)

INEI is also an important provider of official statistics, such as macroeconomic indicators, GDP and consumer price indices, in addition to being responsible for the National Household Survey on Conditions of Living and Poverty (ENAHO), which is the main source for the estimation of household health expenditure in the CCNNS. Other economic and health surveys (e.g. ENDES) are also used to validate estimates.[11]

While the provision and production of data necessary for the health accounts has not been subject to any direct legal instrument, this should be better established in the coming years, e.g. under Peru's e-government strategy (*Plan del Gobierno Electrónico*). That said, source information collected by INEI for ENAHO, or key public financing data from the Integrated Financial Administration System (*Sistema Integrado de Administración Financiera*, SIAF) of the Ministry of Economy and Finance (MEF), or the National Fund for Financing State Business Activity (*Fondo Nacional de Financiamiento de la Actividad Empresarial del Estado,* FONAFE) are mandated. During the updating of the CCNNS each institution is responsible for the information sent to MINSA, and has had the opportunity to approve figures before final publication.

The principle sources of data used in the estimation of total spending on health are:

- Databases from the Budget Execution of Income and Spending at the different governmental levels of MEF – Integrated Financial Management System (SIAF)
- Budget Evaluation of EsSalud
- National Household Survey – ENAHO of INEI
- Information on Investments and Loans of the private providers and insurers (SUSALUD)
- Financial Information of Private Insurance (SBS)

Of these, the MEF's Integrated Financial Management System (SIAF), EsSalud's financial reporting and the National Household Survey (ENAHO) are the most important sources of information and are analysed in more detail below.

MEF is the principal source of expenditure information for public entities

As the executive institution responsible for fiscal policy and translating government priorities into programmes, actions and budget appropriations, the information systems of MEF play a key role. The information recorded in its SIAF database follows the institutional structure of the public budget and is organised by level of government (National, Regional and Local), by sector (Health, Defence, Interior, Regional Governments, etc.), by agency and by Executing Unit (UE). The agencies remain under the responsibility of the sector and the Executing Units under the agencies. Table 3.1 displays the sectors and agencies that carry out activities related to "Health" by level of government.

Table 3.1. Sectors and agencies carrying out activities related to the health function by level of government

Level of government / Sector / Agency		
National	07: INTERIOR	007: Ministry of Interior
		011: Ministry of Health (MINSA)
	11: HEALTH	131: National Institute of Health (INS)
		134: Superintendencia Nacional de Aseguramiento en Salud
		135: Integral Health Insurance (SIS)
		136: Instituto Nacional de Enfermedades Neoplásicas – INEN
		137: Instituto de Gestión de Servicios de Salud
		011: Ministry of Health (MINSA)
		131: National Institute of Health (INS)
		134: Superintendencia Nacional de Aseguramiento en Salud
		135: Integral Health Insurance (SIS)
		136: Instituto Nacional de Enfermedades Neoplásicas – INEN
	13: AGRICULTURE	013: Ministry of Agriculture and Irrigation
	26: DEFENCE	026: Ministry of Defence
Regional	98: REGIONAL COMMONWEALTH	001: REGIONAL COMMONWEALTH OF APURIMAC-AYACUCHO-HUANCAVELICA
	99: REGIONAL GOVERNMENT	440: Regional Government of Amazonas
		441: Regional Government of Ancash …
		…
		463: Regional Government of Lima
		464: Regional Government of La Provincia Constitucional del Callao

Source: MEF, SIAF database.

While in the case of MINSA, it is clear that the main function comes under health; for other sectors (e.g. Interior, Defence, etc.) this is not the case and health is a secondary function. For the regional governments, there are health units (Regional Health Management Directorates, hospitals and networks) but also the other sectors under their care (Education, Labour, etc.).

The budget of the institutions is organised according to:

- Source of financing: in the case of the Health sector there are the ordinary transfers (*Recursos Ordinarios,* RO) from the Treasury, direct payments from patients and other persons (*Recursos Directamente Recaudados*), donations and transfers, which is the source for the Executing Units (UE) receiving transfers from SIS, funds coming from internal and external credits and special funds that come from the *Canon*[12] and other similar funds.
- Budget Categories: these can be grouped into three broad categories: 12 categories linked to results-based budgeting (*Presupuesto por Resultados,* PpR), Central Actions and non-results-based budget allocations. Table 3.2 shows the categories linked to the health function.

Table 3.2. Budget categories related to the health function

Code	Description
0001:	Articulated Nutritional Program
0002:	Maternal and Neonatal Health
0016:	TB-HIV / AIDS
0017:	Metaxenic Diseases and Zoonoses
0018	Non-communicable Diseases
0024	Cancer Prevention and Control
0051	Prevention and Treatment of Drug Use
0068	Vulnerability Reduction and Disaster Emergency Response
0104	Reduction of Mortality by Emergencies and Medical Emergencies
0129	Prevention and Management of Secondary Health Conditions in Persons with Disabilities
0131	Control and Prevention in Mental Health
0135	Improving Military Capacities for Defence and National Development
9001	Central Actions
9002	Non-Product Budget Allocations

Source: MEF, SIAF database.

These categories can then be further disaggregated into activity (current expenditure) or project (investments), generic expenditure (wages, pensions, goods and services, investments) and specific expenditure that is a sub-category of generic expenditure.

SIAF is an open access database and key agents within the system also have access to an MS Excel-based dataset – known as "the Cube"– which has all the SIAF information, and can generate a variety of tables for analysis and monitoring.

EsSalud has developed its own financial reporting system

All public entities use SIAF, apart from EsSalud. As an autonomous public entity, EsSalud is not required to use these systems. In its place, EsSalud introduced a SAP-based management system to ensure transparency in resource management. This system requires frequent and expensive updates and there have been ongoing discussions regarding moving to a system similar to SIAF. Indeed, the sharing of technology between MEF and EsSalud could allow savings in EsSalud's IT expenditure as well as leading to more compatible systems with the benefits for supplementary tasks such as health accounts production.

Currently, EsSalud's financial information is published via its portal (http://www.essalud.gob.pe/institutional-statistics/) with total budget information available to two levels of disaggregation, which are equivalent in terms of structure to "generic" and "specific" in the public budget. In its Annual Report, EsSalud regularly publishes tables on income, expenditure and investment with the last published year (at time of writing) corresponding to 2013.

In the case of income, the table provides the different sources of financing. For disbursements, as with the budget, disaggregation is by broad categories and grouped together as a single institution. Both the approved budget and the executed budget amounts are provided in the relevant tables.

The capital expenditure table has the same structure as the budget, that is, broad categories showing the amount budgeted and executed. However, the information that is generated in the allocation and execution is based on the Gross Value of Production and allows the information to be broken down by regions and by establishments (hospitals and networks).

The National Household Survey (ENAHO) is insufficient to meet future needs

ENAHO has been used consistently throughout the production of CCNNS for estimating the component of household spending on health, but lacks the necessary detail to provide a detailed breakdown by function. Overreliance on information from household budget surveys (HBS) to measure out-of-pocket spending on health should generally be avoided when constructing health accounts (Rannan-Eliya and Lorenzoni, 2010).

Weaknesses in the HBS can be related to sampling errors (e.g., non-representative, non-responses and seasonal variations) and non-sampling errors (e.g., survey design and recall periods). Data should be reconciled with information such as administrative sources for co-payments or revenue information from the provider side (e.g. income tax declarations, cost structure statistics). While administrative data come with their own problems, they are generally considered more reliable. In most cases, a triangulation of different data sources is highly recommended to measure out-of-pocket payments.

Increased coverage and alignment of new data sources on providers and financing will bring benefits

In summary, the main challenges remain in obtaining standard, timely, detailed and quality data. The structure of the data is highly dependent on the accounting systems used to collect and process financial information across the various subsystems, making it difficult to consolidate reporting and enhancing the fragmentary nature of the information. For example, in the case of the Armed Forces and Police health care systems, the information sent directly for the health service tends not to be in accordance with public accountability standards (as established by MEF). Administrative data records should be improved and standardised (including EsSalud), since there is currently too much diversification and variability between the subsystems and also within the subsystems.

Importantly, SUSALUD is now responsible for the database of health care providers (IPRESS) and the institutions financing health care (IAFAS); both of which should provide improved data availability for estimation and analysis. On the administrative side, the roll-out of SETI-IPRESS should provide information on the flow of health benefits at a nominal/patient level, which may serve as a basis for then estimating expenditures for any country subsystem. It should also be noted that SUSALUD already receives financial data from SIS and private providers (EPS). SUSALUD is also active in improving survey instruments. The annual survey, ENSUSALUD, which, for example, measures the satisfaction of users of outpatient consultations across all providers at national and regional level, also incorporates indicators of health spending by users, which could be evaluated according to different social variables and demographics.

Reconciliation with other data sources, especially for private spending, would increase the robustness of health spending estimates

Many OECD countries start from a financing perspective to construct multi-dimensional accounts before using additional information to eventually extend reporting to supplementary dimensions, such as revenues, factors of health provision or capital investment. Alternatively, countries rely on provider-side statistics and then distribute revenues according to financing and functions. A third approach – frequently referred to as "top-down" approach – uses existing aggregate information of health spending for different institutional units and disaggregates this to the level required in the health accounts. Often the most promising approach is a mixture of the different methods, for example, when spending information from financing schemes are reconciled with revenue data from health providers. While the CCNNS currently differ from the SHA framework in their structure and detail, the compilation is most closely aligned with the first approach, that is, with a strong focus on information from the financing side.

A challenge with this approach is that, ideally, the content of all spending items is analysed in detail and, if required, appropriate allocation keys are constructed. However, in many cases the exact content of spending items is unknown and even then, the identification of accurate allocation keys is complicated. As a result, this approach can lead to a skewed allocation of spending to health care functions and providers on an aggregate level if spending items are too often allocated to only one function and provider based on the main activity or provider. Hence, ideally, spending by health providers estimated with this approach should be cross-validated with available statistics of revenues or costs from the health providers' side which can then help in the calibration of "distribution keys".

The primary sources of data used to assign the different spending categories of financing in Peru are those mentioned above. However, a functional breakdown had not been fully developed in the CCNNS, and the categories for providers are currently under revision to correspond methodologically to SHA 2011. To reach the level of detail required, additional (secondary) data sources and allocation keys are a key part of the methodological development to be undertaken.

For both public and private spending in the CCNNS, a combination of methods has been used. For example, the category Other Public Management Providers, that provide health services through charities and municipalities, receive their financial resources from government and households as well as through external donations. The financial results of public health institutions, such as local governments, charities and others,

can be added together to obtain public expenditure. However, in the case of the amounts through external co-operation (from international donors) which are channelled through MINSA and regional governments, proportional allocation based on historical trends is used.

A major weakness in the CCNNS appears to be the lack of reconciliation (triangulation) of data sources across different health expenditure dimensions. There are significant benefits to be gained by comparing data from the different financing agents with revenues from the health providers obtained from cost, business or industry statistics. This can either validate the accounting approaches or point to areas where improvements could be made. In many cases inaccuracies are due to weaknesses in the measurement of private health spending, in particular, out-of-pocket spending.

As discussed, the weakest element is often an estimate of out-of-pocket spending generated directly or indirectly from household budget surveys (HBS). Other sources from the provider side can be used to validate or refute the estimates and trends derived from the HBS. This can refer, for example, to tax statistics (income or value added), industry statistics measuring revenues, output and costs or other statistics. Using these data sources can come with their own challenges. It needs to be clearly understood which providers are covered in the statistics and whether exemptions exist. The price concept behind the measurement of revenues also needs to be clear. If statistics are based on a further survey, then additional problems with sampling errors can also exist. Small differences when comparing health spending from the financing side with those from providers are unavoidable – e.g. there are incompatibilities between the records from SIS and MINSA. However, if large unexplainable differences persist, it will require country experts compiling health accounts to judge which data source is likely to be more reliable.

The sustainability of the production process requires sufficient in-house capacity

In 2013, the team producing the health accounts was made up of three MINSA officials (of whom only one remains) together with three external consultants (two experts in National Health Accounts and one in Public Budgeting). This raises important questions regarding the sustainability of the process and the need to provide for knowledge transfer to ensure the future ongoing production of the accounts. To support knowledge building and continuity, OECD countries rely to a large extent on employed officials, regardless of institutional arrangements.

For the updating of the CCNNS for 1995-2012 and estimations for 2013 and 2014, MS-Excel has been the tool used to construct the financing tables while STATA software was used to calculate the household spending on health, access, and utilisation of health services. The production tool HAPT[13] is being tested for the production of SHA 2011-based accounts. HAPT is primarily a data management tool which has been developed for low- and medium-income countries to implement health accounts in a standardised SHA 2011 format. It can be useful in cases where the health accounts production is in an initial or early stage of development and the main data sources and allocation rules are relatively simple. However, as source databases become more complex and inter-linked requiring sophisticated statistical and data management software, there may be a need to develop a more bespoke database system, with the necessary flexibility.

This is the case for OECD countries where country-specific solutions have generally been created, depending on the nature and structure of the core data sources, the available IT infrastructure and IT skills of health accountants. Using generally a bottom-up approach to health accounts, Germany, for example, calculates individual spending items and distribution keys in MS Excel but uses the functionality of database managing of MS Access to calculate the three core tables of health accounts. The database has been expanded to allow the allocation of health expenditure per provider by disease, age and gender. Austria uses a SAS tool to retrieve health-relevant transactions from public records and complements this with manual calculation in MS Excel for some transactions. All spending items are aggregated into a three-dimensional data cube for a time series back to 1990 in Excel.

3.6. Dissemination and use of the CCNNS

CCNNS is strongly focused on national categories of financing and provision. The disaggregation by providers is only carried out at the level of MINSA and regional governments.[14] Similarly, the breakdown by revenue sources is at an aggregate level. There has not been a detailed disaggregation by functions. Until now, any breakdown by disease, age, and gender has not been produced.

Once available, CCNNS results are discussed with principle stakeholders, MINSA officials and other key experts belonging to various academic and labour fields. In addition, the results are compared with the results obtained by INEI and the institutional administrative registries. In the case of the production of SHA 2011, it is hoped that the National Health Accounts Committee (to be approved by Supreme Decree) will accelerate

the revision process and will organise the discussion of the results in a periodic manner.

Publication of the health accounts has been done on an infrequent basis and the time lag between the end of the reference period and the final release has been around three years, severely limiting the usefulness of the information for policy use. For example, the 2012 CCNNS study was undertaken during 2013 and 2014 and finalised in November 2014; however, the publication was in May 2015.

MINSA has responsibility for publishing the results of the CCNNS and makes them freely available for download on the MINSA webpage. The health accounts information is also available in a series of tables consolidating information by financing sources and principle providers together with a brief analysis of trends. The latest reports are published on the Virtual Library of Health on the MINSA webpage (http://bvs.minsa.gob.pe/blog/category/publicaciones-minsa/). The most recent report is Cuentas Nacionales de Salud Perú 1995-2012.[15] Where final results have not yet been published, the latest estimations are to be found in the MINSA REUNIS System,[16] which is still in the process of being implemented, but is available for key decision makers in the health sector.

Data obtained from the CCNNS are also submitted to PAHO/WHO to be published, as well as being diffused to the countries that are a part of the Andean Commission of Health and Economic of the Andean Organization of Health and Economics – *Convenio Hipólito Unanue*.

The establishment of a National Health Accounts Committee should result in a higher profile dissemination of the health accounts

Dissemination of health spending figures differs widely across OECD countries. Some countries restrict the direct national impact of the health accounts by submitting their health spending data as part of the annual health accounts data collection of the three international organisations (OECD, WHO and EC) without actively communicating the results to a national audience. Most countries, however, publish their results, although the format and reach of these publications differs. This can range from simply making the basic data available on a website accompanied by a short press note to the annual production of extensive analytical publications released by senior government officials. The Canadian Institute for Health Information, for example, has created a National Health Expenditure Database (NHEX) which includes health expenditure figures for all core dimensions on a regional level and publishes detailed annual analytical reports and projections of health spending.[17] Elsewhere, DREES, the

directorate of research, evaluation and statistics in the French Ministry of Health prepares a comprehensive analytical publication of health spending development and related trends on an annual basis which is presented in a high-profile meeting attended by the Minister of Health, as well as stakeholders from government, academia, provider and health professional associations.[18] It is clear that greater political buy-in and involvement raises the profile and status of the health accounts reports.

A wider dissemination of the Peruvian health accounts can benefit and strengthen the various stages of the health accounts cycle. In general, the awareness of MEF and other authorities external to the health care system concerning the health accounts could be increased. Regional governments, in particular could be interested in the future accounts disaggregated by region for their own analyses and productivity comparisons, etc. This should in turn lead to the provision of more accurate data as well.

More particularly, closer collaboration with INEI and MEF through the proposed National Health Accounts Committee should contribute to a strengthening of the methodology and make the results and indicators more relevant from a broader economic point of view. Enhanced collaboration with INEI on health accounts will also ensure the confidence from the side of MEF, potentially leading to wider use of NHA for policy setting outside of MINSA. The production of health accounts is linked to the sources of macroeconomic information and health sector data. This is all the more relevant to ensure the formal compatibility of the health accounts produced by MINSA with information on National Accounts in a way that explains the clear criteria that differentiates the methodologies but also allows the comparison of the country at an international level.

Improved timeliness and focus should lead to greater policy use

Health accounts can provide a set of health expenditure and financing indicators which can be very important for international and national purposes, e.g. they can provide valuable input and support for annual budget negotiations with the Ministry of Economy and Finance. The use of spending information is of vital importance for health policy, thus constituting a central axis in the assignment of resources and distribution of finances, even more so in an imperfect market such as health sector. The generation of scientific evidence that incorporates costs and spending is a key factor in directing decision making. In this respect, there are initiatives that are being developed to generate a body of evidence to assist economic evaluations and studies of budget impact to inform decision makers. With resource information that allows linkage with activity statistics and access indicators, this will permit those responsible to take decisions and achieve greater performance in the assignment of resources.

In Peru, there currently appears limited regular or widespread usage of the information in shaping health care policy, both in MINSA and beyond. In that context, the usability of the results for politicians could certainly be improved by wider and higher profile releases, and the production of short executive summaries and policy briefs with key messages alongside the main annual report.

Although the CCNNS of Peru may have had some impact and use in the planning and policy-making process within the health sector and its institutions, this has been hampered by irregular production to date. The National Health Accounts Committee is expected to establish the necessary systems and processes for the continuous delivery of reliable and timely information, as well as developing the additional health accounts classifications. It is planned that health accounts production in Peru will move to an annual cycle under the SHA 2011 institutionalisation and standardisation plan as of 2017. The timeliness of NHA in Peru can also be expected to be markedly improved with the regular and timelier production of SHA 2011-based accounts (See Section 3.5). It is an important issue for policy makers to have access to timely health spending data, particularly during the process of budget monitoring and budget setting negotiations.

Further areas of development have been identified that can further enhance the usability and impact of the accounts. Additional work at the regional level opens up some further possibilities, such as the linking with income information and identifying unmet needs. Related to this is the disaggregation of health expenditures by beneficiary characteristics (i.e. by disease, age and gender) to provide information on resource allocations and in the context of meeting future needs as demographic and epidemiological patterns evolve.

3.7. The transition to SHA 2011-based reporting in Peru

To address some of these challenges, Peru has been in the process of transitioning to the SHA 2011 methodology and commissioned a feasibility study[19] to evaluate the harmonisation between the two systems, in particular:

- to assess the information gap arising from applying information generated in the preparation of the 2011-2012 CCNNS to the SHA 2011 framework;
- to evaluate the level of disaggregation that can be achieved at i) the sub-national level (departmental, provincial, district) and ii) by disease or set of diseases according to national priorities (such as malnutrition/anaemia, infant/neonatal, maternal mortality,

contagious/meta-chronic, and non-communicable chronic disease); and

- to construct preliminary SHA 2011-based tables for 2011 and 2012.

Assessing the current information gaps

Previous sections have pointed to differences in scope and detail of CCNNS compared with SHA 2011 reporting. The starting point of the study was therefore a comparison of the SHA 2011 classifications with the CCNNS classifications. This allowed the identification of any conceptual differences, and the need to draw up alternatives to reorganise the information or adapt it to the SHA methodology taking into account the source characteristics; either disaggregating it to a more detailed level, modifying the characteristics of the source of information (for example, by incorporating questions into surveys) or searching for alternative data sources, if necessary.

The work consisted of two parts: the first was the development of the financing flows according to SHA for a graphical comparison with the CCNNS flows, and the second part has been a comparison between the concepts of both methodologies. This highlighted the new concept of "Financing Schemes" in SHA 2011 referring to arrangements that "mobilise and allocate funds within the health system, to meet the needs of the population (individual and collective) current and future" (SHA, 2011, p. 172).

Importantly, the study led to a re-examination of some important financing issues with an impact on the CCNNS as well as the construction of SHA 2011 accounts, namely the financing by private households with respect to health insurance and private providers is taken into account. As such, the characteristics of the financing of EsSalud and Private Health Provision Entities (EPS) were clarified:

- EsSalud is financed by households and employers, not by the government.
- EsSalud and the EPS both have mandated funding and another part that is voluntary on the part of the households. Affiliation to an EPS is voluntary while the percentage assigned to the EPS corresponding to the social security is mandated. That is, when opting for an EPS, the 9% that the employer contributes is divided into 2.25% for the chosen EPS and 6.75% is still contributed to EsSalud.
- In the case of EsSalud, the optional (non-compulsory) insurance is minimal with respect to the financing it administers. However, in

the case of EPS the resources coming from households are having an increasingly greater relative weight.

- Government financing is directed to its public insurer, the Integrated Health Insurance (SIS).
- With the characteristics mentioned for EsSalud and SIS, three types of insurance are considered: public (SIS financed from the public treasury),[20] social security (EsSalud / EPS mandatory) and private (private voluntary).
- CCNNS has attempted to identify, as far as possible, the administrative expenses related to the management of each funds.
- Finally, the possibility of buying services between the different insurers was made legally possible as of December 2013 with the approval of Legislative Decree 1159.[21] The most developed experience has been between SIS and SISOL (a decentralised public organism of the Municipality of Lima that has technical and administrative autonomy) where SIS pays to SISOL and not to the establishment that gave the service; in the case an insured SIS affiliate is treated in the EsSalud network the payment is made to the central EsSalud administration.

The information from CCNNS makes it possible to disaggregate according to the requirements of SHA 2011 at the financing level, but the information base does not cover all the requirements such as for functions, providers, diseases/conditions, gender or age; a more detailed analysis to overcome these shortcomings is required.

Further disaggregation is required at sub-national and disease levels.

Peru's National Health Accounts (CCNNS) have not developed the level of disaggregation of SHA 2011, previously only focusing on specific topics or sub-groups such as medicines or SIS insurers. As part of the feasibility study, an evaluation of the main data sources was undertaken to determine whether they meet the requirements of SHA 2011 as well as the usefulness in the formulation and monitoring of public health policies by the following disaggregation:

- *By level of government:* SIAF allows a disaggregation at the regional level since each region provides a breakdown of budgetary information; however, at the Executing Units level, spending does not necessarily correspond to provincial areas. EsSalud information can also be disaggregated at the regional level as its budget is linked

to its organisation and there is a level of management for each region. This is not possible at the provincial level. In the case of the ENAHO, according to the technical file, it is representative at the regional level; in fact, it assumes each of them as a study domain. In conclusion, considering the main data sources, the subnational level that can be reached is the regional one.

- *By function:* None of the three data sources are organised according to the functions of SHA 2011. Given, for example, the policies related to the Integrated Networks of Primary Health Care (RIAPS)[22] implemented under the Sector Reform framework, information by function is required. To enable this disaggregation require a survey of institutions and interviews with key personnel, to create the distribution of the expenditures from SIAF and inputs from SIGA (Integrated Administrative Management System) by function. Similar studies have already been carried out in 1996 when information systems were more limited.
- *By disease:* SIAF information includes Results-based Budgeting (PpR) activities, which provide a limited but growing list of disease-related categories (see Table 3.2) and offer the opportunity to identify public spending (SIS, regions, etc.) by some disease categories. In the case of EsSalud, it is possible to find in production and purchasing system the costs related to a number of diseases, as has already been used in studies such as for malaria, tuberculosis and HIV / AIDS. On the other hand, ENAHO, the main source of information for households does not have any comprehensive information by disease or condition; the questionnaire has a few limited questions related to the respondent's illness.[23]

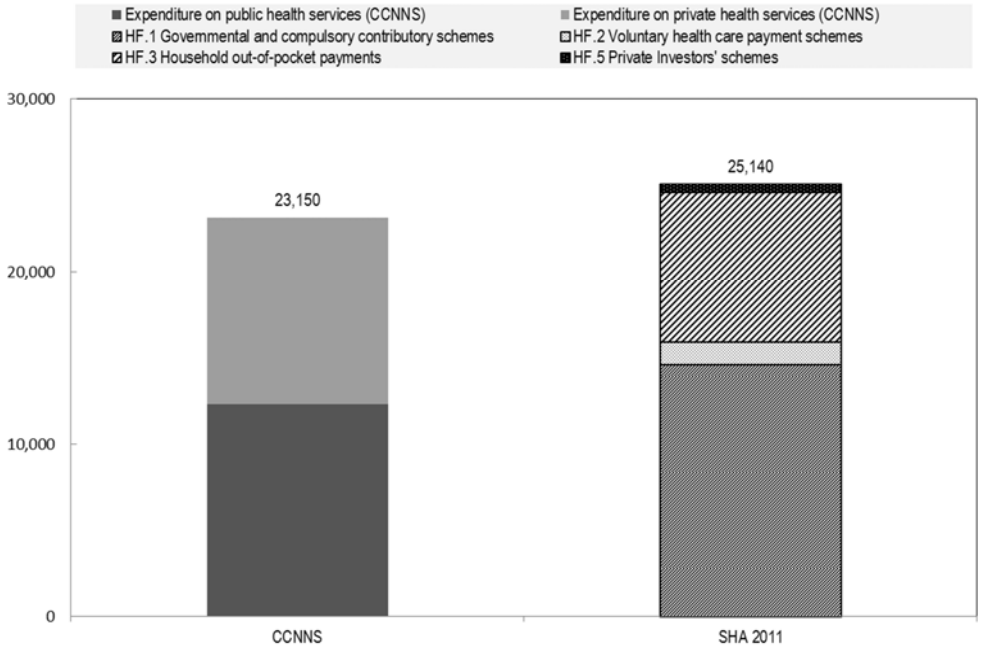
Preliminary SHA-based estimates highlight some differences but also some complementarities

Preliminary SHA 2011-based figures have been constructed using a mapping of data used in the 2011 and 2012 CCNNS study. The exercise was carried out in parallel with a comparison of the structure of dimensions in the SHA 2011 framework. The central objective was to evaluate the feasibility of incorporating the current data sources and reorganising them into the SHA-based classifications. Initially, the categories used in the CCNNS were aligned with the coding in SHA 2011, and correspondence tables between the two methodologies were established, as well as the flow diagram.

To date, no progress has been made in comparing the results within MINSA, due to delays in training of the project team of the National Health

Accounts Committee, whose composition is subject to approval by the Supreme Decree. However, some preliminary differences can be observed between the amounts obtained by the CCNNS methodology and SHA 2011, but these require further detailed analysis to determine the reasons for these differences. CCNNS is closely focused on the funding flows in health provision and produces a measure of spending and financing. SHA-based spending estimates for 2011 point to an additional 8.6% expenditure in the total, which equates to a further 0.4% of GDP (Figure 3.5). The breakdown of total spending is somewhat different with the focus of CCNNS being on the public or private provision of health services such that public spending at 53% refers to services under MINSA, regions and EsSalud. The SHA-based breakdown refers to the type of scheme under which services and goods are purchased with the main categories covering "public" schemes (i.e. SIS, EsSalud and over government schemes) (58%), private voluntary insurance (5%) and household out-of-pocket spending (34%).

Figure 3.5. Health spending according to CCNNS and SHA 2011, Peru, 2011



Source: Authors' calculations based on OGEE preliminary estimates.

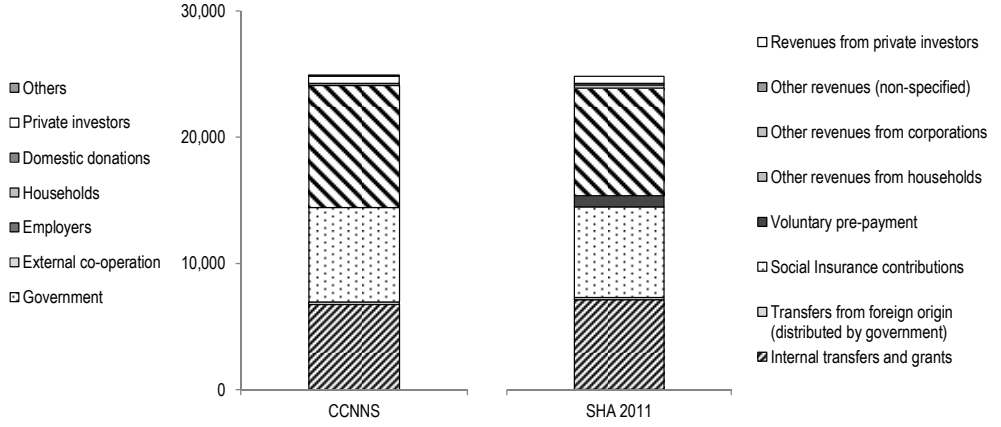
More comparability is observed between the financing of health care, both in terms of the level of overall revenues and the categories (Figure 3.6).

While the SHA 2011 classification of revenues (FS) focuses on the type of revenue flow, CCNNS has a mix of institution and type of revenue. However, there is close correspondence, for example, between social contributions (for EsSalud) under SHA 2011 and employers (as a revenue source) under CCNNS. In general, the information is complimentary to both systems and should be retained for both international and continuing national needs – particularly with regards the supplementary information on financing in the CCNNS.

A further review of the classifications is required to achieve the accuracy and/or detail of each of the codes considered in the SHA estimates. In the technical study, a matrix between the classifications of SHA 2011 and CCNNS identified some methodological differences that need to be kept in mind for the migration to SHA 2011. With the information available in the CCNNS, it was not possible to go down to disaggregated levels such as levels of government or function. In the initial tables, 99% of health spending is unable to be allocated to function. At this stage, the study has yet to be refined and supplemented with information from other sources and additional studies needed to complete gaps and the different classifications.

In terms of the provider category, a different classification of providers exists that needs to be adjusted to the international classification (76% of spending was not allocated to HP categories). In the same way, the financing categories need to be adjusted according to the different focuses used by the CCNNS.

Figure 3.6. Health financing according to CCNNS and SHA 2011, Peru, 2011



Source: Authors' calculations based on OGEE preliminary estimates.

3.8. Conclusions

The provision of timely, accurate and detailed data on health care financing and spending according to standards and national priorities is vital for informed decision making. There is still a need to improve the quality of primary data reporting at the provider or institutional level and the interpretation and use of the information at the decision-making level.

The creation of the National Health Accounts Committee (to be approved by Supreme Decree) is an important step and needs to be seen through. The embedding of the overall management within MINSA can reflect the specific health sector policies and priorities. Furthermore, proximity to the ministry ensures that there is suitable knowledge and expertise available. The production of health accounts – in addition to health policy and public health expertise – requires strong accounting and statistical inputs. Therefore, close collaboration with INEI regarding data sources, methodological concepts and any possible future work on supplementary accounts is therefore recommended. Moreover, broader involvement, from other ministries and government agencies (both at the state and regional level) increases the usefulness and authority of the figures.

The impact and use in the planning and policy-making process is of course dependent on improvements in the confidence of the figures. A wider dissemination of the health accounts could benefit and strengthen the various stages of the health accounts cycle. In general, the awareness of MEF and other authorities external to the health care system concerning the health accounts could be increased. Further areas of development related to health accounts have been identified that can further enhance the usability and impact of the accounts of Peru. Regional governments, in particular could be interested in the future accounts disaggregated by region for their own analyses and productivity comparisons, etc. This should in turn lead to the provision of higher quality data.

Despite the fact that the providers of information send their financial data as requested, not all comply in a transparent manner, and with the existence of differences in classification for example EsSalud has a different disaggregation from MINSA. For this reason, a legal mandate should be established that insures that the type of information that is required is provided in a periodic, timely and verifiable manner.

The original programme of work was expected to take two years depending on availability of information, formalisation of information flows, adequate sources of information according to standards, and importantly building and maintaining in-house capacity. In 2013, the initial team consisted of three MINSA officials (of whom only one remains in the

Ministry). This team worked together with three external consultants (two experts in National Health Accounts and one in Public Budgets). The sustainable production is dependent on sufficient in-house resources and expertise. Currently, technical assistance to support the institutionalisation of SHA 2011 in accordance with national politics is provided by PAHO/WHO and financed by the World Bank and further capacity building initiatives are planned.

As with many countries, the weakest element of financing scheme data sources is estimates of out-of-pocket spending generated directly or indirectly from household budget surveys (HBS). For some spending elements included in the HBS, other sources from the provider side can be used to validate or refute the estimates and trends derived from the HBS. This can refer, for example, to tax statistics (income or value added), industry statistics measuring revenues, output and costs or other statistics.

One of the main challenges is obtaining valid and reliable raw data according to established standards. The structure of the current data sources is highly dependent on the accounting systems used to collect and process financial information across the various subsystems, making it difficult to consolidate reporting and enhancing the fragmentary nature of the information. Administrative data records should be improved and standardised, since there is currently too much diversification and differences between the subsystems and also within the subsystems. Information providers should be trained to reduce review periods and ensure better quality of information. While much of the regulatory framework around standards is in place the challenge remains in implementation of those standards and the buy-in from the stakeholders, e.g. EsSalud.

On the face of it, both the ENSUSALUD patient survey and the aggregate and patient-level data that all providers are obliged to provide through SETI-IPRESS could provide the standardised detailed information needed to validate and disaggregate the aggregate spending data from existing sources. Indeed, a major weakness in the health accounts is this lack of reconciliation between financing and provision. This can either validate the accounting approaches or point to areas where improvements could be made. It is to be seen how far the implementation of SETI-IPRESS goes and how this fits in the plans of the OPEE in their health accounts development.

Notes

1. Produced by a consortium from Universidad ESAN, Association of University Programs in Health Administration, SERVERS and Fundación Mexicana para la Salud.
2. The System of Health Accounts and the System of National Accounts share many of the same concepts, definitions and data sources. Annexes A and B of the SHA 2011 manual show the correspondence tables between the classifications as well as the conceptual relationship between the two systems.
3. Public Rectory, Public administration, Provision of health services, Investments, Supplementary activities for public health, and Others.
4. Resources used by MINSA came from its own funds, while those from CIES came from the agreement signed with the Ford Foundation in support of the Observatory of Health-CIES project. UNICEF, the Belgian Development Agency (BTC), and CARE-Peru financed the publication of the study.
5. Development work benefitted from technical support and financing from WHO/PAHO and the publication from Government of Korea, PAHO/WHO and the World Bank. The first stage of the study was also financed by the United Kingdom Department for International Development (DfID) via PAHO/WHO.
6. Service Contract: PE/CNT/1500042.001
7. With the decision to align with the SHA 2011 standard, MINSA will no longer continue with the production of the Health Satellite Account.
8. Ministerial Resolution No. 198-2008/MINSA; Ministerial Resolution No. 535-2009/MINSA; Ministerial Resolution No. 068-2012/MINSA.
9. Supreme Decree No. 007-2016-SA.
10. In 2011, the Directorate of Supply of Strategic Health Resources (DARES) replaced the General Office of Administration carrying out and reporting on the corporate procurement processes in the sector using the Integrated System of Supply of Medicines and Supplies – Surgical Physicians (SISMED-DIGEMID). As part of the structural reform of

MINSA, as of February 2016, these functions were assumed by CENARES.

11. See Chapter 2 for more information regarding ENAHO and ENDES.

12. https://www.mef.gob.pe/es/transferencias-a-gobierno-nacional-regional-y-locales/base-legal-y-aspectos-metodologicos/canon. It should be noted that this is only used for the financing of projects or infrastructure works, and in that sense, for investment projects in relation to installation or creation, extension or improvement (Article 6 of Act No. 27506, Canon Law).

13. http://www.who.int/health-accounts/tools/HAPT/en/.

14. A more detailed disaggregation has been carried out in the pilot study for 2011-2012, to assess deviations with the SHA 2011 methodology.

15. http://bvs.minsa.gob.pe/local/MINSA/3248.pdf.

16. http://www.minsa.gob.pe/reunis/index.asp?op=52.

17. https://www.cihi.ca/en/spending-and-health-workforce/spending.

18. http://drees.social-sante.gouv.fr/etudes-et-statistiques/publications/recueils-ouvrages-et-rapports/recueils-annuels/comptes-nationaux-de-la-sante/article/les-depenses-de-sante-en-2014-resultats-des-comptes-de-la-sante.

19. Services contract PE / CNT / 1500042.001

20. Within SIS there exists the subsidised system (financed entirely by the government) and the semi-contributory system (partly funded by the affiliate).

21. Legislative Decree 1159 has been replaced by Legislative Decree 1302 that Optimises the Health Exchange in the Public Sector.

22. The Integrated Primary Health Care Networks (RIAPS) were created by Legislative Decree 1166 of December 7, 2013 and have been repealed under Legislative Decree No. 1305 of December 2016. However, information by functions is necessary for the health accounts, and should be detailed by level of care, for which a study is planned after the creation of the National Health Accounts Committee.

23. The following questions are included in ENAHO. Have you suffered any symptoms, illness or accident in the last 4 weeks? Check for control of the healthy child: vaccination program in the last 3 months?·Family planning consultation: iron supplement in the last 12 months? Consultation services, medicines, analysis, etc. received in the last 4 weeks. Dental and related services, ophthalmology, vaccines, etc., received in the last 3 months. Inpatient service, pregnancy or birth control in the last 12 months.

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Chapter 4

Human and physical resources in Peru

The health care sector is heavily dependent on the skills and number of staff. Constituting the largest share of health service costs, human resource supply and planning has a significant impact on resource allocation. Many countries also struggle with an unequal geographical distribution of health professionals. Effective governance requires a standardised and comprehensive system to record information on human and physical resources.

Peru has not had a system to adequately monitor and compare human and physical resources. Limitations have been due to gaps in reporting, although improvements have been made in recent years for public institutions, also differences in definitions remain across sub-systems. Developments in the collection of comparable information on human and physical resources for international purposes can serve as support in improving data collection. This chapter discusses definitions and suggests directions for further areas for improvement in Peruvian data on human and physical resources.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

4.1. Introduction

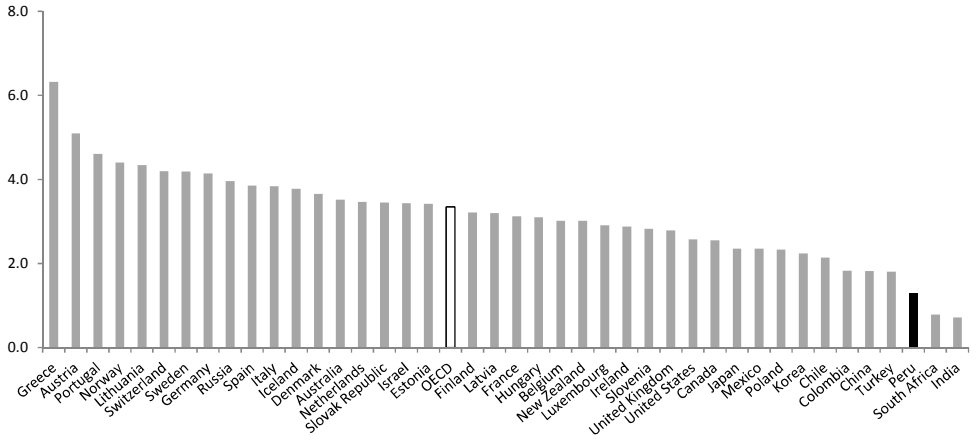
Accurate and comprehensive statistics on human and physical resources available across the entirety of the health system are a key input for effective health system monitoring and service planning. Together with financial resources, they constitute part of the prerequisite information base to reach informed policy decisions on priorities and resource allocations. In the health care sector, human capital is the most important and decisive factor of production, accounting for a proportionally large share of overall costs compared to other sectors of the economy. This makes rational human resource planning a key factor in achieving better performance in the health sector. In Peru, variations in data reporting and gaps in coverage, together with inadequate information systems, do not allow for an accurate and exhaustive picture of the current level of resources nationwide.

Latest available figures published by MINSA indicate that Peru had 1.3 practicing doctors per 1 000 population in 2016 and 2.16 practicing nurses per 1 000 population in 2013 (DGGDRH, 2016; INEI, 2014). Compared with the two OECD countries in the Latin American region, Peru reports fewer doctors than both Chile and Mexico, which had 2.0 and 2.2 doctors per 1 000 population respectively in 2015 (Figure 4.1). All three countries remain well below the OECD average of 3.3. However, the steadily increasing numbers of medical staff, especially nurses over the last decade, due to an extensive expansion of educational capacity in Peru, is a promising development. That said, accurate information on how many medical graduates remain to practice medicine in Peru and in the public sector is a vital component of human resource planning.

As with many other countries, Peru also struggles with an unequal distribution of its resources across the regions and sub-systems. While awareness of the disparities is high and national programmes have been implemented to overcome this problem, an improved information base of where health professionals are practicing is important to be able to monitor and assess the success of such efforts as well as for the general governance of the health system.

The picture is similar regarding the reported level of physical resources (e.g. hospitals, beds and medical technologies) in the Peruvian health sector. For example, the number of beds per population reported in Peru at 1.6[1] per 1 000 population is well below the OECD average of 4.7 in 2014 but again on a par with its peers in Latin America.

Figure 4.1. Practising physicians in OECD and selected countries, 2015



Note: Data include not only doctors providing direct care to patients, but also those working in the health sector as managers, educators, researchers, etc. (adding another 5-10% of doctors). Data refer to all doctors licensed to practice (resulting in a large over-estimation of the number of practising doctors in Portugal, of around 30%).

Source: OECD Health Statistics 2017.

This chapter reviews the availability and quality of the current statistics on human and physical resources in the Peruvian health sector and assesses to what extent the figures reported are nationally representative and internationally comparable. As such, it discusses the gaps in the information base that Peru should strive to fill to be able to more appropriately use such information in national policy formulation. The chapter covers the data areas on human resources (by main professional categories and remuneration levels), and physical resources (number and use of hospital beds and medical equipment). As with the other chapters, the review of available data on these categories serves a dual purpose. One is to assess Peru's ability to provide internationally comparable aggregates of basic health resource data. The other is to assess to what extent resource data are available for domestic analytical purposes in the country.

The quality of the data is assessed by comparing available Peruvian statistics against international definitions and standards, defined and used by OECD (in conjunction with other international partners) for its regular data collections that feed the OECD Health Statistics database. Standard definitions were provided to MINSA together with the questionnaires sent to the Peruvian authorities at the start of this review process. It should be noted that the data submitted by countries in the OECD data collection is intended

to be nationally representative e.g. in terms of doctor or nurse numbers per 1 000 population and not pertaining only to a particular region or part of the health system. Thus, an important element of quality assessment is the coverage of the reported statistics, i.e. if the data represents the whole geographical defined area, population and set of institutions. Considering the highly fragmented nature of Peru's health information system, coverage across institutional and organisational boarders is a challenging element. For human resources, Peru has made great progress in this area over the recent years, perhaps with the exception of improved information on private providers.

It should be noted that the initial data submitted by the Peruvian authorities at the start of the review process has been complemented during the later stages of the study, subsequent to the mission in Peru, and after further dialogue with the Peruvian authorities. In line with the stringent validation process undertaken for OECD countries, detailed metadata was also requested; the source, coverage, deviation from definitions, estimations to derive data, and breaks in the time-series. This enables a full documentation of the quality of the data, and makes it possible to assess its comparability.

4.2. Defining and measuring human resources in health care

OECD collects a large amount of information on human resources in the health sector through its international data collections, following a well-established set of internationally agreed definitions. Statistics allow for a wide range of analyses of available resources as well as how these resources are allocated within the health systems, for example to what extent they are deployed across the health sector (i.e. registered versus practicing), how many work in hospitals compared to other (e.g. primary health) care providers, or how the mix of different health care professional categories compares across countries. This section describes the main types of professional staff. For each category of staff the base indicator is defined as the number of persons, i.e. a head count rather than a measure of full-time equivalents (FTE). To avoid the prospect of any double counting, the predominant area of practice is counted for those doctors with more than one specialisation, or if not possible, the latest specialisation registered for the individual doctor.[2]

Making a clear distinction between licenced, active and practising doctors

Measuring the numbers of available staff in the health sector necessitates the application of robust and unambiguous definitions. The fact

that several professions in the health sector require very specific education and licencing can help in this regard, but it can also prove illusive in monitoring how many are actually available to the health sector. For each medical profession there are three different concepts regarding status. The first is *practicing*, which includes staff in direct current contact with patients. The second, *professionally active*, includes the former category but widens this to also include professionals working on other aspects within the health system, e.g. establishing norms and regulations, policy, research or administration. The third category defined as *licenced to practice* includes the two former categories, but also those registered and entitled to practice but not necessarily part of the current health work force. This may include those employed in another profession, or perhaps registered as unemployed, as well as those that have emigrated. Table 4.1 describes the definitions for medical doctors.

These three distinct concepts are applied to those medical professions which are normally subject to licensing in order to practice, i.e. medical doctors, midwifes, nurses, dentists, pharmacists. For example, practicing nurses provide services directly to patients, while professionally active nurses may include nurses working in administration, management, research and in other posts without direct contact with patients, while nurses licenced to practice may not be necessarily active in their profession or are working abroad.

For many countries, Peru included, the management and planning of the health sector workforce is not limited to providing a steady supply of physicians or nurses, but finding the right balance regarding different specialisations. For example, the availability of general practitioners is vital in providing the population with adequate access to primary health care services. To allow for a comparison and analysis of the extent of medical specialisation of medical doctors, data collected by OECD includes a breakdown into three main categories and eight sub-categories, as detailed in Table 4.2. The classification of generalist medical practitioners includes general practitioners and family doctors, even if the latter may be considered a specialised domain in its own right in some countries. Doctors with this specialisation or under training to become a generalist are accorded their specific sub-category, general practitioners. Non-specialists, including medical interns and residents who have completed a basic medical university education and are undertaking postgraduate clinical training but have not yet chosen their area of specialisation, are allocated to the sub-category other generalists. The other sub-categories under specialist medical practitioners also include medical interns or residents specialising in their respective area.

Table 4.1. Definitions of levels of activeness for medical doctors

Practicing	Professionally active	Licensed to practice
Practising physicians provide services directly to patients.	Professionally active physicians include practising physicians and other physicians for whom their medical education is a prerequisite for the execution of the job.	Physicians licensed to practice include practising and other (non-practising) physicians who are registered and entitled to practice as health care professionals.
Inclusion: - Persons who have completed studies in medicine at university level (granted by adequate diploma) and who are licensed to practice - Interns and resident physicians (with adequate diploma and providing services under supervision of other medical doctors during their postgraduate internship or residency in a health care facility) - Salaried and self-employed physicians delivering services irrespectively of the place of service provision - Foreign physicians licensed to practice and actively practising in the country	Inclusion: - Physicians who provide services directly to patients - Physicians working in administration and management positions requiring a medical education - Physicians conducting research into human disorders and illness and preventive and curative methods - Physicians participating in the development and implementation of health promotion and public health laws and regulations - Physicians preparing scientific papers and reports.	Inclusion - Physicians who provide services directly to patients - Physicians for whom their medical education is a prerequisite for the execution of the job - Physicians for whom their medical education is NOT a prerequisite for the execution of the job - Physicians licensed to practice but who due to various reasons are not economically active (e.g. unemployed or retired) - Physicians working abroad.
Exclusion - Students who have not yet graduated - Dentists and stomatologists / dental surgeons - Physicians working in administration, research and in other posts that exclude direct contact with patients - Unemployed physicians and retired physicians - Physicians working abroad.	Exclusion - Dentists and stomatologists/dental surgeons - Physicians who hold a post / job under which medical education is not required - Unemployed physicians and retired physicians - Physicians working abroad.	Exclusion - Dentists and stomatologists/dental surgeons.

Modelling of the future supply and demand of the health care workforce is a key responsibility of ministries of health. Therefore, a disaggregation of the total number of practising physicians into age and gender classes is also applied. OECD applies a breakdown by the following age groups: under 35, 35-44, 45-54, 55-64, and above 65 with each age group further split into male and female. As discussed later in this chapter, Peru currently applies an alternative split of physician categories which might be suitable for its national policy needs, but presents some barriers to international reporting according to the categories in Table 4.2.

Table 4.2. Physicians by category

Main category	Sub-category
Generalist medical practitioners	- General practitioners - Other generalist (non-specialist) medical practitioners
Specialist medical practitioners	- General paediatricians - Obstetricians and gynaecologists - Psychiatrists - Medical group of specialists - Surgical group of specialists - Other specialists not elsewhere classified
Medical doctors not further defined	

The evolving role of the nursing profession necessitates a greater granularity of reporting

A number of important trends have been observed in different countries regarding the evolution of the nursing profession. Prime among these has been the increasing level of clinical responsibility taken on by nurses; often referred to as task-shifting. This practice can also take place between other professions in the health sector. Nurses are also increasingly shouldering more of the managerial tasks in different clinical settings (e.g. hospitals or ambulatory clinics). In addition, a nurse's medical specialisation is becoming increasingly important for the development of diverse health services. Many countries have developed curriculums and specialist training for nurses leading to narrower degrees of specialisation within the nursing profession.

Because the nursing profession can mean very different things depending on the country context, and also to allow for a more granular description of the complexity of staffing health services, data reporting of the numbers of nurses is separated into two categories; professional nurses and associate professional nurses. The professional nurse can work autonomously and assume responsibility for the planning and management of the care of patients, including the supervision of other health care workers. The associate professional nurse typically works under the supervision of, and in support of, other health professionals.

Although the health sector is characterised by its requirements for the licencing of professional staff, many services are also dependent on a range of other professions, most notably care personnel or personal care workers.

This category includes both health care assistants in institutions and home-based personal care workers. Health care assistants provide direct personal care and assistance to patients and residents in a variety of health care settings such as hospitals, clinics, and residential nursing care facilities. Home-based personal care workers provide routine personal care and assistance to persons in their own homes or other independent residential settings. The category excludes nurses and social workers which are separate professions. Since this is not a measure of licenced professionals but of professionally active staff, it will also include foreigners working in the sector.

Statistics on educational capacity and use of staff are essential for forward-planning

Data on educational capacity is also collected across five medical professions: medical doctors, dentists, pharmacists, midwives, professional and associate professional nurse graduates. For medical graduates, the data represents the number of students who have graduated in medicine from a medical faculty or similar institution. The definition includes the completion of basic medical education in a given year, not post-graduate studies or training. For the other professions the equivalent headcounts are the number of students who have obtained a recognised qualification in their respective field in a given year. OECD does not apply a definition of length of content of the education, although the European Union's directive may serve as a guideline.[3]

Information on educational capacity provides an insight into a country's ability to plan ahead and supply its health system with adequate numbers of staff into the future. In common with Peru, most OECD countries have increased educational capacity for the health sector in recent years. A standard comparison of educational capacity is the number of graduates per 100 000 population. For example, the OECD average for medical graduates is 11.5, ranging from a low of 5.1 in Israel to 20.3 in Ireland (2013). Importantly, inflows and outflows of medical staff into the health system are supplemented by analysing migration statistics of medical staff, e.g. the low level of graduates in Israel is compensated by a large inflow of foreign trained physicians.

OECD also collects data specifically on hospital employment for six types of professions: physicians, professional nurses, midwives, associate professional nurses, health care assistants, other health service providers, and other staff employed in hospitals. For these categories an important distinction is made between number of staff and full-time equivalents. It also includes non-clinical staff (e.g. administrative staff) working in hospitals.

The data allows for the description and analysis of the respective weight of staff categories in countries' health systems and can be studied in combination with other resource data, such as physical infrastructure and expenditure data.

4.3. Tracking human resource supply in Peru

The fragmentation of the Peruvian health system is fully reflected in the coverage and availability of data on human resources for health. Despite notable progress over the last few years, notably by the Directorate for Management and Human Resources Development in Health (DGGDRHS) at MINSA, it remains a challenge for any centrally placed authority to keep up-to-date and comprehensive statistics on the level and structure of human resources across the Peruvian health sector. This is illustrated by the observed discrepancies between Peru's medical training capacities, the relatively rudimentary data about how many are currently employed in medical facilities throughout the country, and the data based on membership of the medical association (as provided in response to the OECD questionnaire). While data are available on medical universities, nursing schools, and number of graduates, which all show an impressive increase in recent years, it is much more difficult to collect data on how many professionals are actually practicing in the country.

Records from the "public" sector only paint part of the picture of available human resources

There are several factors which have contributed to the problem of collecting information on human resources currently working in the Peruvian health system. While MINSA maintains a constant record of what may be referred to as the "public" system, this in effect only includes SIS-funded institutions. As is the case with many other types of data, MINSA does not have automatic access to information where sub-systems are not funded or managed by the ministry. For example, the regional health authorities, the DIRESAS, are funded by the Ministry of Economy and Finance and hence there is no direct line of authority to the resources distributed to regions. EsSalud, which is subordinated to the Ministry of Labour and Employment, is also separately funded out of employers' and employees' contributions, and thereby independent of MINSA. While different parts of the health sector each have detailed records of their own capacity, varying definitions and modes of collection creates issues in keeping track of overall resources.

The other dimension to this problem concerns the private sector which has no reporting obligation regarding their use of resources. According to a

World Bank study from 2015, only 10% of graduates from medical schools practice in the Peruvian public health sector two years after finalising their residence training (Jiménez, 2015). There is no concrete data as to where the vast majority of graduates ends up, either into which profession, sub-specialisation, or geographically. Private sector providers do need to provide human resource capacity information in order to retrieve a licence to practice, but there is no obligation to update this regularly or report any change in staffing thereafter. Private health institutions are often regarded as part of a private market and as such have not always been subject to the same strict supervision or regulation.

There are many other factors which also exacerbate the difficulty in monitoring human health resources in the country. Peru is subject to the large migration flows in Latin America and beyond, which complicates planning of educational capacity. Data on emigration is unreliable and consequently the government is unclear to what extent medical staff work in the domestic private health sector, or have moved abroad to practice. A high percentage of medical and nursing students plan to migrate out of the country after finishing their studies, but no actual figures are available (Jimenez, 2015). This leads to difficulties in taking informed decisions about educational capacity, and in monitoring available human resources.

Information from EsSalud and the private sector is often patchy and irregular

As a consequence, most studies of the Peruvian health human resource situation (e.g. CRONICAS, 2014) tend to be limited to public employees, that is, only those hired by MINSA and the regional governments. A World Bank report confirmed that information on human resources working in the social health insurance (EsSalud) and the private sector is limited to current data held by the MINSA's National Observatory on Human Resources for Health, which is provided voluntarily and not necessarily on a regular basis (World Bank, 2014). The report also states that the data on human resources provided by EsSalud and other sub-schemes is of a significantly more general nature than MINSA's, i.e. it does not contain the same granularity, nor does it follow the same classifications as data collected for public institutions. While MINSA collects and publishes data on type of specialisation and gender, the data on human resources from other schemes is less informative and reliable.

Since 2012, DGGDRHS publishes an annual report on human resources supply in Peru (DGGDRHS, 2015). The publication provides a detailed description of practicing medical staff covering important aspects such as numbers of main medical staff by region, type of medical facility, and financing scheme. The publication has developed with relevant additions since

its inception, e.g. combining data on staff supply with geographical poverty levels. The ministry has developed fruitful collaboration with the regional administrations which makes much of this data possible. This report is a good example of a working relationship between MINSA and the DIRESAS when it comes to data collection and sharing. This collaboration, however, is only relevant in regards to their own data, as they are unable to offer the same quality of data for all health institutions in the country. This means that while the data collected and disseminated by DGGDRHS provides policy relevant information in terms of geographical categorisation and socio-economic groups, the data needs to be more comprehensive and offer better coverage in terms of other financing schemes and health providers.

In addition to its limited coverage of EsSalud and the other public schemes, the DGGDRHS data suffers from a persistent lack of current data on privately employed staff. Although there are data on the private sector included in the publication, this gives rather a misleading picture. The number of privately employed professionals is unrealistically small, given the size of the private sector. The reporting is transparent in that it refers to the data being based only on parts of the private sector and provides the number of establishments by type of provider. The data from private providers originates from a single collection round and the same data points are repeated in each subsequent report. The incompleteness, and the fact that it is three years older than some of the public providers' data, adds to the restricted value of the data. These limitations are in common with much of the available data on the private health institutions in Peru, be it monetary or non-monetary data.

Another shortcoming relates to how the data describes the Primary Health Care (PHC) sector. This is an area which typically varies by country since the way of organising PHC can be very different. PHC clinics can be organised in group or single doctor practices, have multiple types of professionals or only GPs, etc. MINSA documentation describes the number of SERUM[4] posts by geographical area and type of providers, as well as staff category. The focus on resource availability in deprived areas is very important, but there is no description of the number of specialised GPs or the number of qualified nurses working in PHC. Monitoring of resources for first-line services and maternal and child health services should be further developed.

The mandatory reporting to SUSALUD should help plug some of the information gaps

In a potentially significant development in countering some of the difficulties listed above, SUSALUD has assumed control over and has

gradually been introducing a revision of the infrastructure registry, RENAES, with two fundamental changes. RENAES incorporates the entire health sector, not only MINSA facilities, and involves the collection of data not only on physical infrastructure but also on human resources and equipment. The new database, RENIPRESS, is a promising initiative requiring health facilities to register, and provide information regarding their human and physical resources. Registration, which includes submission of data, is a mandatory process required in order to receive governmental accreditation and categorisation as a health establishment. This process includes inspections carried out by the regional authorities (DIRESAs), and is a requirement for being able to provide care to patients. The registration process involves the provision of information on human resources (staff members are registered by the specialty, work unit, equipment (beds, furniture), infrastructure and management practices.

There are seems some issues to be resolved in the implementation of RENIPRESS. Facilities signed up for it during 2016, but at the end of 2016 it remained unavailable for external consultation. In addition, the way human resources data is registered in the system is based on the professional association to which the individual is affiliated. This can lead to problems in differentiating between licenced, practicing and professionally active, as described above. The possibility of a mismatch between what the staff member does in their work and their adherence to a professional association may lead to some difficulties in determining actual numbers of practising professionals.

The OECD questionnaire on Human Resources for this review asked for number of staff by the following types of medical professions; physicians, midwives, nurses, caring personnel, dentists, pharmacists, and physiotherapists. The questionnaire also contains a section on hospital employment and number of graduates for each of these categories. Table 4.3 lists a selection of the variables asked for in the Human Resource domain and the availability of this data in Peru. For a comparison of how available this data is for international comparison using the same definitions, the table gives the number of the 35 OECD member states currently submitting data for the same variable in the annual data collection undertaken by OECD.

The numbers submitted state both professionally active (*activos*) and licenced medical doctors. The former category is registered by MINSA and is available by geographical region. MINSA data covers all public institutions but has a major underestimation and timeliness issue for the number of staff in the private sector. The number of licenced medical doctors is data from the medical association (*Colegio Médico del Perú*) which is 14% higher than the number of active doctors in 2016. The licencing body in Peru (CONEAU) is responsible for accrediting education programmes and the medical

associations (*collegios*). These associations in turn licence medical staff, hence basic data on how much medical capacity is licenced in the country is available. Peru has a recertification requirement mandating renewal of licenced professions every five years, although compliance is not reliable and therefore not adequate for monitoring the number of staff.

In addition to MINSA specific human resource data, EsSalud also produces its own figures. EsSalud as part of the Ministry of Labour is independent in its internal procedures. It publishes data on human resources on its website, including a document accounting for all EsSalud employees, classified by speciality and role. Data from this is exhaustive but the document is out of date, being from 2010. EsSalud does provide data to the DGGDRSH but, as discussed above, the level of detail is limited.

Importantly, EsSalud institutions are included in the RENIPRESS system, where data is received directly from individual institutions parallel with the way SUSALUD collects data on activities (see Chapter 5). As with other types of health system indicators, there is a certain degree of alignment between EsSalud and MINSA data, but with limitations. It is important that both schemes (and ideally the private sector) conform to the same definitions and share information with the same degree of granularity to maximise its comparative value and the capacity to internationally report nationwide data.

Peru is not alone in having difficulties reporting available human resources. Examples include the difference between licenced and professionally active professionals, which is difficult to track for several countries, resulting in an over-estimation of the number of practicing doctors. Other countries can have a minimum threshold of activities for doctors to be considered to be practising, thereby resulting in an under-estimation compared with other countries. Similar to the case of Peru, some OECD countries have likely over-estimates as reporting is based on medical registers which are not updated to account for migration, retirement or death. In decentralised countries, doctors can sometimes be registered in multiple regions of the country resulting in double counting. Furthermore, in some countries, the age splits are based on all doctors licensed to practice, not only those practising. Other splits, for example by specialisation, are not possible to report in some countries due to specialty-specific data not being available for doctors in training or for those working in private practice.

Table 4.3. Availability of data on human resources by occupational category, Peru and OECD

OECD Indicators	OECD Specification	Peru Source	Number of OECD countries (total 35) providing data for 2013	
Physicians	Practicing	RENIPRESS (SUSALUD), DGGDRHS, ESSALUD	28 (1)	For at least one (1) category 35
	Professionally active	PA (Professional association)	23	
	Licenced to practice	RENIPRESS (SUSALUD), DGGDRHS, ESSALUD	26	
Nurses	Practicing	RENIPRESS (SUSALUD), DGGDRHS, ESSALUD	24	34
	Professionally active		22	
	Licenced to practice	PA	22	
Midwives	Practicing	RENIPRESS (SUSALUD), DGGDRHS	21	30
	Professionally active		18	
	Licenced to practice	PA (Obstetricians)	20	
Dentists	Practicing	RENIPRESS (SUSALUD), DGGDRHS, ESSALUD	21	34
	Professionally active	ENDES	18	
	Licenced to practice	PA	23	
Pharmacists	Practicing		24	33
	Professionally active		21	
	Licenced to practice	PA	21	
Caring Personnel	Practicing	-	19	22
	Professionally active		10	
Physicians by sub-specialisation		DGGDRHS (for MINSA)	35 (2)	35
Physicians by age and gender		DGGDRHS (for MINSA)	34	-
Hospital employment		DGGDRHS (for MINSA)	31 (3)	-
Graduates		DGGDRHS (via SERUM program), PA	35	-

1. For several OECD countries, the data on licenced physicians is based on administrative records, while the data on practicing and professionally active is estimated based on surveys. 2. While all OECD countries provide national data on physicians by categories of sub-specialisation, five countries do not submit data for GPs and non-specialist generalists, and another four countries for GPs only. 3. Of these, 15 countries provide data on all categories of staff, physicians, professional nurses, midwifes, associate professional nurses, health care assistants, other health service providers, and other staff employed in hospitals.

4.4. Measuring levels of remuneration

OECD collects data on remuneration across five categories: employed and self-employed medical doctors for general practitioners and specialists respectively, and hospital nurses. Level of remuneration is defined as annual gross income, including social security contributions and income taxes payable by the employee. For self-employed doctors all practice-related expenses should be excluded, i.e. the measurement attempts to capture income, not clinicians' revenue, even though this can be difficult to capture. Distinguishing between employed and self-employed is also difficult in many countries, as many physicians have engagements in more than one facility and these might have different legal forms.

The OECD data collection on remuneration distinguishes between two types of physicians: general practitioners and specialists. The need to attract doctors to specialise in family medicine and seek employment as generalists is shared by many countries and the ability to measure relative success given different structures and reforms is important. In many countries generalists still have lower income levels compared to specialists, although this in itself is a broad category with large variations in remuneration. For national monitoring purposes, there might be good reasons to define more narrow groups of specialists. The remuneration data on nurses is for hospital employment only, but not all countries can specify this. The type of nurse is not specified and some countries include income only for professional nurses, excluding associate professional nurses and/or nursing assistants.

International comparisons are susceptible to differing treatment of taxes, contributions and bonuses

Producing data on income levels which are relevant for international comparison remains a challenge for many countries. Differences in tax regimes and social security payments make direct comparisons complicated. In reporting to OECD, several countries treat the inclusion of payments for overtime work, bonuses and benefits, other supplementary income or social security contributions differently. Another difficulty for many countries is collecting remuneration levels from private providers, which tends to underestimate the average data because salaries in private facilities are often higher. Private providers can also represent another set of health services and thereby require different specialties employed and average levels become non-comparable. For countries where informal payments are part of the culture, data is also systematically underestimated.

One indicator used to mitigate some of these problems is the medical professionals' income as a share of the average income in the country.

OECD uses its Labour Force Statistics Database to calculate the ratio of medical staff income to the average income of full-time employees in all sectors of the country. In all countries submitting this data to OECD, medical doctors have a higher income than the average employee. The differences are large though, ranging from 1.5 times in Estonia to 4.6 times in Luxembourg for general practitioners. Nurses' income tends to be just above average income in the OECD but also varies considerably, from 0.9 to 1.6 times the average income.

Salary estimates for Peru are limited to legislated rather than actual salaries

In response to the questionnaire for this health statistics review, Peru submitted data for all the three staff categories of salaried staff; GPs, specialists, and hospital nurses. However, it is unclear if by GPs this refers to specialists in Family Medicine, or non-specialist generalists. The data makes it possible to build indicators of relative salaries, especially important for analysing how supply of staff is distributed within the health sector. This data is however based only on staff employed by MINSA and regional administrations' providers, excluding other government institutions, EsSalud and the private sector. In addition, the salary level is based on what is legislated, not actual remuneration.[5]

Table 4.4. Available data on remuneration levels, Peru

Variables submitted	Submitted by Peru in response to OECD questionnaire	Number of OECD countries providing data for 2013
Remuneration, salaried GPs	✓	14
Remuneration, salaried Specialists	✓	24
Remuneration, salaried hospital nurses	✓	25
Remuneration, self-employed GPs		8
Specialists, self-employed		5

As with data on numbers of staff, sources of information on income are very patchy. This is a result not only of the diversity in funding and provision, but also of the different employment contracts that exist in the public sector. There are a wide range of contracts, with large differences in salary and benefits. Permanent contract "276" are paid much better than temporary contracts (e.g. RECAS), and with different employment benefits attached. Within each type of contract it is relatively easy to collect data on formal salaries since they adhere to an official pay-scale by medical professions and remuneration data is collected for public facilities. The pay

scale is the same for all areas of service in the country, regardless of whether the area is rural or urban, socially deprived, etc. This in itself implies a rigid management HR system with low level of provider autonomy, which doesn't assist in rational human resource planning, e.g. raising salaries in deprived, difficult to recruit areas. There is no other system to collect data on remuneration levels which means private employees and professionals working in multiple assignments are not captured. In addition, there is often a mismatch between what employees are legally entitled to receive and their actual remuneration. For example, salary increases introduced in recent legislation have experienced some delays in their actual implementation.

Other possible sources of information on health professional's remuneration are SUNAT and AFP. SUNAT is the body responsible for tax administration and is part of MEF. It provides information on the salary of private institutions staff since all private entities must report remuneration information to them. However, this does not apply to physicians. On the other hand, the AFP (*Administradoras de Fondo de Pensiones*) is the body responsible for the administration of pension funds, and collects information from privately employed physicians in order to determine their contribution based on their remuneration, although its scope is again limited, since this only applies in certain cases, dependent on the type of contract.

4.5. Physical resources in the health system

In addition to human resources which are the main cost driver in health spending, OECD collects data on three areas of physical resources in the health sector: hospitals, beds and technical equipment. Monitoring of data on hospitals and beds provides information on structural costs and is widely used to derive basic efficiency indicators such as length of stay, discharges per bed and others. Medical equipment is also widely used for efficiency measurement since the use of expensive equipment can vary considerably, e.g. number of tests per unit. It can also be used as an indicator of quality or access to services in some instances, e.g. diagnostic tests per 1 000 population. These indicators are focusing on hospital resources and since these tend to be inequitably distributed with a bias to urban and areas served by private specialist providers, the data can also be used for indicators of equity in access to advanced care. In Peru's health system which contains such a variety of ownership and affiliations, the need to monitor and analyse efficiency differences is warranted, just like measuring differences in quality.

Classifications of resources take their lead from health accounting to ensure proper linkage with expenditures

The classification of hospitals for international data collections follows the definitions set out in the provider classification, ICHA-HP (International Classification of Health Accounts – Healthcare Providers) of the System of Health Accounts (SHA) 2011 (OECD, EC and WHO, 2011), with general hospitals, mental health hospitals and other specialised hospitals. An additional ownership categorisation is used, such that both the number of hospitals and number of beds are separated into publicly-owned hospitals, not-for-profit privately owned hospitals and for-profit privately owned hospitals as follows;

- Publically owned hospitals are owned or controlled by a government unit or another public corporation (whereby control is defined as the ability to determine the general corporate policy).
- Not-for-profit privately owned hospitals are legal or social entities created for the purpose of producing goods and services, whose status does not permit them to be a source of income, profit, or other financial gain for the unit(s) that establish, control or finance them.
- For-profit privately owned hospitals are legal entities set up for the purpose of producing goods and services and are capable of generating a profit or other financial gain for their owners.

The specification of ownership for hospitals is of high policy relevance in many countries. In the case of Peru, the international classification and terminology is relevant for classifying hospital beds by the different sub-schemes of the country. Publicly-owned hospitals refer to hospitals that are owned or controlled by a government unit or another public corporation. This means that all hospitals belonging to EsSalud are also public entities, and should be classified accordingly.

Hospital beds are further specified according to a functional classification which also follows the definitions of SHA. It defines five categories of beds;

- Curative care beds.
- Psychiatric care beds.
- Long-term care beds.
- Other hospital beds (which include beds which have a rehabilitation purpose).
- Nursing or long-term care beds.

Long-term care facilities primarily provide residential long-term care that combines nursing and supervisory care, with a significant part of the care being nursing care and social services. Data on physical bed resources complement the collected data on health expenditure and allow for comparison of how different countries invest in hospital services.

Data on medical technology is also specified along two dimensions. The first is the equipment specified by eight categories (listed below). These units are further distributed by type two types of providers, hospitals and ambulatory providers (again following the SHA ICHA-HP classification). The number of available units for each type of equipment is collected. In the data collection of activities (Chapter 5), the number of examinations provided by each of the first three types of equipment listed below is reported. This makes it possible to compare not only the availability of medical equipment, but also how much these are used. This is a common efficiency indicator also in comparing individual providers in a country.

- Computed Tomography scanners (CT units)
- Magnetic Resonance Imaging units (MRI units)
- Positron Emission Tomography scanner units (PET units)
- Gamma cameras
- Digital Subtraction Angiography units (DSA units)
- Mammography machines
- Radiation therapy equipment (Number of machines used for treatment with x-rays or radionuclide)
- Lithotriptors (or shock-wave lithotripsy units; LSI units)

The ability of countries to submit full data on this range of equipment varies with hospital beds typically being the most complete type of data available. Peru submitted data on hospital beds, although the coverage of data remains incomplete. The relevance for domestic policy use of collecting such data falls into two domains. First, following international classifications will allow Peru to consistently compare resources over time with other countries in the region, for example being able to compare the number of beds by function with countries like Mexico, Chile, Colombia and Costa Rica. The other domain is internal comparison across the country and between sub-schemes, which can be a vital complement to indicators like density of doctors and financial resources, when assessing access to hospital services. For national purposes, more granular data is needed than what is normally reported to OECD.

4.6. Tracking physical resources in Peru

For the purposes of this review, data was requested on hospitals and facilities, hospital beds and on medical technology/equipment. MINSA supplied data on the number of hospitals and beds, extracted from RENAES, the registry of national health establishments, a web platform described in more detail in Chapter 2. This web-platform allows the DISAs and DIRESAs to monitor the status of facilities and medical equipment. However, this only applies to MINSA facilities and excludes other sub-schemes.

RENIPRESS has the potential to deliver nationwide estimates of the number of beds by sub-scheme

In the future, RENIPRESS has the potential to be a more comprehensive repository accounting for all health facilities, as it includes all sub-schemes, including EsSalud and private providers. It includes not only beds but other physical and human resources.

The data reported on number of beds referred only to those in institutions owned by MINSA. These are classified by two types of beds, psychiatric and non-psychiatric (curative) care beds. Long term care beds are not reported since, as stated in the response, there are none in Peru. Although not included in the questionnaire response, EsSalud also collects data on hospital beds from its facilities, which are reported online on a monthly basis. In addition to the data from these two institutions, WHO compiled information on physical and human resources in the Peruvian mental health sector in 2011, providing the most recent figure on psychiatric beds for all sub-schemes (WHO, 2011).

Considering data for MINSA and EsSalud facilities are not reported in the same way, and possibly not aligned in definitions, data on bed resources generally, and especially by function of care, is very limited. The number of beds is included in RENIPRESS for all sub-schemes, including private beds. However, this data will not become publicly available until early 2018 at the earliest, as SUSALUD is currently collecting this information from health care centres. Since this is a centralised record, RENIPRESS can potentially become a repository with national coverage.

Regarding data on medical technology, Peru has very little compiled information available. Regularly available information on CTs and MRIs is reported to MINSA as part of the reimbursement system for services. It is unclear if this information includes only the price per service and number of procedures, or if also the number of available units is included. Similarly, EsSalud has data on procedures using technological equipment but no

information on the numbers of equipment. Currently there is an ongoing project by the General Directorate of Infrastructure, Equipment and Maintenance in MINSA aiming to evaluate equipment shortages in health facilities, which includes collecting data on available medical technological equipment, although the result has not been accessible for this review.

Effective governance of expensive equipment is essential, and collecting data on this is a prerequisite. The complicated structure of ownership with a separate ministry in charge of capital investments, many health facilities belonging to yet another ministry, and others in private ownership, leads to risks of non-optimal investment and use of expensive equipment. Keeping track of the number of units and their use is not enough to improve efficient use if the incentives are not in place for the individual providers to share resources. But currently there is no ability at all to assess total investments and use of costly equipment, and other capital investment. A key recommendation to increase health system efficiency is to promote cross sector exchanges. Improved ability to keep track of basic physical investments can support allocation decisions and a rational use of resources.

4.7. Conclusions

Peru needs to develop a reporting system for all available human resources which allows for a regular monitoring of the main medical staff categories. This system need not necessarily be under the responsibility of MINSA, but its information should be freely available to analysts and policy makers at the ministry. Just like much of the governance and stewardship in the health sector, the system must be built on the inclusion of all actors; regardless of whether they are publically or privately owned and funded, that is to include all staff, regardless of their affiliation. Reaching compliance with reporting requirements would need to be accompanied with harmonised definitions across sub-schemes. A system such as RENIPRESS would appear to fulfil many of the needs, although a full assessment has not been possible within this review.

Peru produces and disseminates data on many policy relevant aspects of human resources, such as availability by geographical area, remoteness and a basic split of competence. While there has been an effort to collect this data from various institutions, the stringency of the data at source is more questionable. It is not stated if the number of staff is practicing clinicians or generally professionally active, if it's a head count or full-time equivalents (FTE) or if its end-of-year data. This raises questions about whether the various institutions providing data follow the same definitions. The different sources might for example have dividing definitions of what qualification a medical doctor must have to practice, which affects the numbers reported.

While the licencing and recertification system is essential for patient safety, it can potentially also provide information for resources planning. Peru should strengthen compliance with recertification rules. Data on workplace for active staff could for example inform about human resources available by type of facility and sub-scheme. Today's information published by MINSA has adequate splits, e.g. in terms of geography, but lacks comprehensiveness.

In order for Peru to find a system which allows policy makers to have adequate data on the total number of staff by categories, the migration of health workforce must be captured. There are different ways of achieving this. One is to work closer with the Bureau of Immigration and Naturalisation (DIGEMIN) on improved quality of migration data. But the aim is not necessarily to understand how many leave or enter the country, but how many are available to the system. Therefore an alternative is to enable links between a licence register and a provider register. Improving these two types of registers would also have many other advantages.

Data on PHC or first-line services, as well as maternal and child health services (MCHC) should be further developed. Currently in Peru, a lot of this area of services is captured in surveys. But there are potential to strengthen administrative data on resources which can be valuable for monitoring. For example, clarifying staff categories working with these services, make them internationally comparable, and including all service providers, would complement survey data on access and use of PHC and MCHC services.

Data collection on income and salary is difficult in many countries. Given the differences in the different sub-schemes of the Peruvian health system, and the wide geographical variety in prerequisites and actual care across the country, basic but consistent data collection on income could be useful information in human resource policy formulation.

MINSA needs to strengthen the regulatory framework for data collection on resources. This could be for example by using RENIPRESS as the overarching platform for physical resource data of all sub schemes. Because physical resources generally, and more specifically investment in infrastructure, is so dependent on several different ministries, the system cannot rely on reporting to funding institutions which do not have responsibility for monitoring the health sector. There need to be access to consolidated, consistently defined and relevant data for a government body which has an oversight.

Peru does not have a functional view of what is classified as public and private. At least for international purposes, the notion of public and private should follow international classifications. For example, the definition of

public and private providers could follow the definition used for hospitals in this chapter; publically owned hospitals are owned or controlled by a government unit or another public corporation (where control is defined as the ability to determine the general corporate policy). From this follows that public hospital beds include all beds in the EsSalud, and health agencies under any line ministry of government, as well as all beds owned by local authorities.

Notes

1. Refers only to MINSA facilities only in 2015.
2. The categories build on the classification International Standard Classifications of Occupations (ISCO) by the International Labour Organisation (ILO), See http://www.ilo.org/public/english/bureau/stat/isco/docs/health.pdf.
3. In the European Union, a Directive has defined basic medical training as comprising a total of at least six years of study or 5 500 hours of theoretical and practical training provided by, or under the supervision of, a university (article 24, Directive 2005/36/EC of the European Parliament and of the Council).
4. SERUM is a programme that aims to improve health provision in the most deprived areas of the country, both rural and poor urban where recruitment is difficult. As a requisite to become a MINSA doctor or nurse, study for a specialisation or receive funding to study abroad, participating in the SERUM is mandatory.
5. Legilastivo Decree No. 1153.

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Chapter 5

Health care activities in Peru

Effective monitoring of health activities is needed to verify that resources are used efficiently and health interventions match stated priorities and goals. Ensuring adequate financing of the health system relies on the degree of activities being performed within the health care system. Activities are also a measure of health outputs, which in turn are used to measure outcomes. A thorough and nationally comparable record of activities enables policy makers to identify challenges and improve the quality and efficiency of a health system.

However, tracking of health activities in Peru suffers from the disparate nature of the various sub-schemes, a lack of unified definitions, incomplete reporting especially from the private sector and the cohabitation of administrative and survey data. Experiences of OECD countries can help tackle these challenges. This chapter discusses the quality and availability of a number of indicators and presents recommendations to improve the collection and use of activity data.

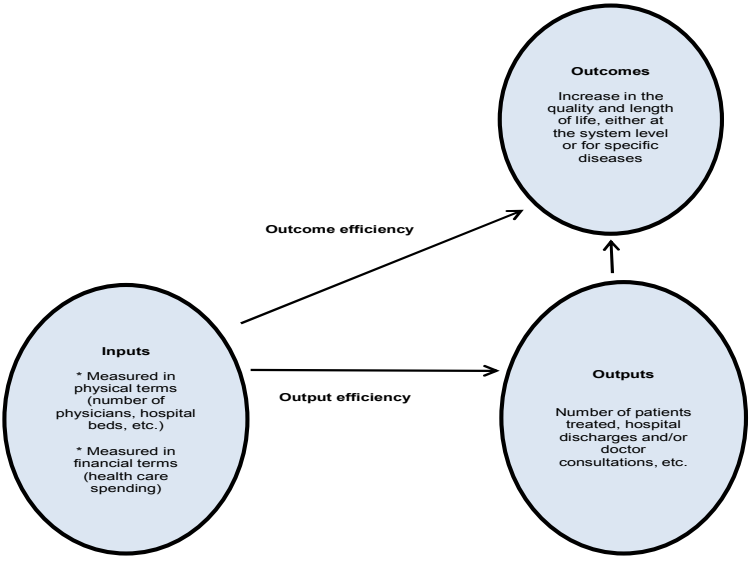
5.1. Introduction

Obtaining reliable data on the multitude of health care services provided to the population, or the outputs produced by the health care system, is a vital component of the flow of information needed for effective monitoring and evaluation of health care system performance. It is the most direct way of assessing whether resources are being used for the intended purposes, and therefore essential for transparency and accountability. Across OECD countries there are vast differences in the use of the different types of services produced by countries' health care systems. For example, the average number of consultations per person by a medical doctor in Finland is 2.6 per year, whereas in Korea this is almost six times higher at 14.6 consultations per person!

A robust system for measuring health activities is also a prerequisite for several other types of data-driven activities needed to assess performance of a health care system. For example, activity-based data are required in any reimbursement system which goes beyond a simple input-based funding mechanism, such as one based on fee-for-service payments or process quality indicators in primary care. Case-based payments for hospital services, linked to Diagnostic Related Groups (DRG) or similar systems, also build on a register of activities including diagnoses and procedures. Activity data is also an essential part of developing any efficiency analysis of the health care sector, which relates inputs to outputs and eventually outcomes (Figure 5.1).

A good standard of activity data is also an essential element for measuring quality of care (see Chapter 6). For example, patient safety and medical effectiveness require the use of more advanced data and linkages of such data, but the base requirement is the registration of individuals' health status and the various health care actions taken, in the form of diagnoses and procedures. So, while activity data is essential for knowing how resources are used and who has access to health care services, it does not on its own provide information about results of any medical intervention or health system effectiveness as measured by outcomes.

Figure 5.1. The links between inputs, outputs and outcomes in the health care system



Source: OECD (2010) with minor adjustment.

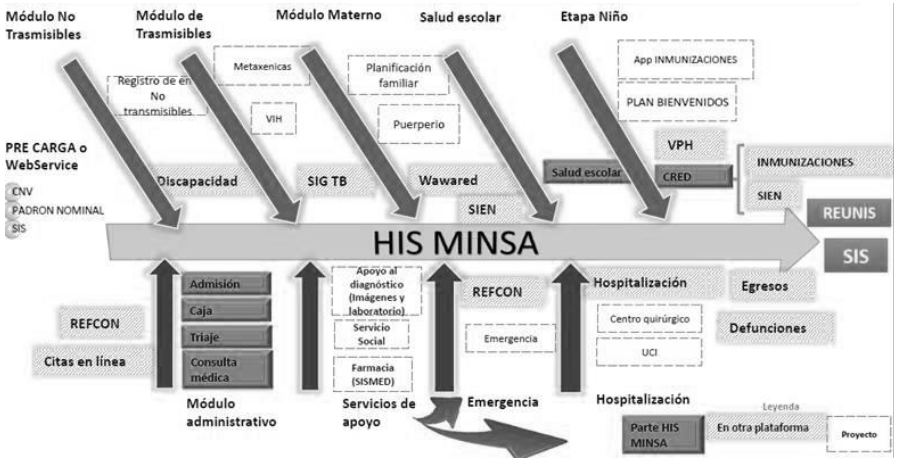
5.2. Activity data collection in Peru

As with most areas of the health information system, the compilation of comprehensive data on health activities in Peru is largely affected by the disparate health care system. Although there would appear to be an abundance of data for the majority of standard activities, it often lacks adequate and thorough coverage, both in terms of geographical coverage and across the various sub-schemes. Data on health sector inputs and activities is an area in which Peru has traditionally concentrated its efforts and amasses a lot of information, especially on maternal and child health and infectious diseases. Peru can build on this relative strength in order to more fully develop its performance measurement system and monitor policy objectives. For example, to gauge progress towards effective health care coverage, data is needed on utilisation in addition to insurance coverage.

Of the various reporting systems in place, MINSA data on activities come from HIS-MINSA and SIS-GalenPlus (see Chapter 2). Specific modules allow health professionals and administrative staff to record admissions, consultations, discharges and other information along an individual's care pathway (Figure 5.2). The development of a modular system allows the integration of an extensive set of indicators using data

recorded on a daily basis, and most of these are focused on the various activities through the system.

Figure 5.2. Example of reported activities within HIS-MINSA



Source: OGTI, MINSA.

The information collated through HIS-MINSA serves a variety of purposes. SUSALUD receives data on activities for MINSA facilities through the system, as do the DIRESAs/DISAs and MINSA to regulate their mutual agreements with SIS. MINSA also uses a similar set of indicators to monitor objectives by DIRESAs and individual facilities. The exact list of indicators, together with thresholds to measure performance, are established under each *convenio*, with some indicators being specific to certain establishments or regions, either in terms of performance goals or delivered services.

Activity data on a provider-by-provider basis is important for monitoring variations

SUSALUD is alone in compiling data from all registered health care providers. Its mandate focusing on patient's rights and quality of care uses two main channels: the ENSUSALUD survey to measure patient satisfaction, and the collection and publication of data comparing health activities across the different providers. SUSALUD provides a platform where patients can compare providers. While the primary purpose is not to inform policy or allow for benchmarking, the published material is a rich source of nationwide activity indicators, although there are some limitations, as discussed in the following sections. However, SUSALUD is collecting

more indicators and providing better coverage than available via the individual sub-schemes. Much of the data is submitted directly from providers rather than being channelled through regional and national agencies, which means that the indicators coming from individual facilities become more easily identifiable. For instance, data on doctor consultations is collected and released by all sub-schemes, but only SUSALUD releases a comprehensive picture of consultations across the whole health sector.

For the purpose of this review, a set of questionnaires was sent to MINSA, one of them specifically covering health activity data. The questionnaire was a subset of that sent to all OECD members to produce a standard set of indicators which can be used to compare and analyse OECD countries. MINSA was able to provide detailed responses concerning several indicators. However, the activity data provided by MINSA typically represents only MINSA facilities, excluding activities performed by institutions belonging to other sub-schemes, such as EsSalud and private providers (EPS), thus providing an incomplete picture of the whole system.

While Peru collects a lot of activity-based data, the quality and coverage is variable

In general, data submitted on activities collected in Peru by different providers and institutions align well within the categories used by OECD countries in terms of the set of indicators used and the rationale behind them (Table 5.1). Although limited in coverage, the indicators on activities collected by Peru cover the main areas for which OECD collects data and which are typically considered a basic requirement to monitor performance in OECD countries. However, Peruvian activity data vary in terms of quality when compared to OECD definitions and standards. This relates both to sources used, definitions, and collection methods.

Peru relies heavily on survey data, and has implemented several country-wide surveys. While this is common for mid-income countries, the use of administrative data and its quality should increase for a number of indicators. That said, coverage and reliability do not automatically rise with administrative data, and the preferred choice is not always obvious, but with a maturing health information infrastructure, basic routine data on health activities are most efficiently collected by administrative data.

The following sections take each of the main sectors in turn, namely the ambulatory sector and the hospital sector overall, followed by data according to types of procedure – diagnostic examinations and selected surgeries, including caesarean sections. After discussing the rationale behind collecting the various indicators, an assessment is made of the degree to which Peru can meet the definitions and coverage in each category.

Table 5.1. Types of health activity data as collected by OECD and Peru

Activity Area	OECD activity indicators	Hosting institution in Peru	Data source in Peru
Ambulatory care	Consultations	MINSA	Administrative
		EsSalud	Administrative
		SUSALUD[1]	Administrative & Survey (ENSUSALUD)
		INEI[1]	Survey (ENDES)
	Immunisation	MINSA	Administrative
		EsSalud	Administrative
		INEI[1]	Survey (ENDES)
	Screening	MINSA	Administrative
		Lima Cancer Registry[1]	Administrative
		EsSalud	Administrative
		INEI[1]	Survey (ENDES)
Hospital care	Discharges	MINSA	Administrative
		EsSalud	Administrative
		SUSALUD[1]	Administrative
	ALOS	MINSA	Administrative
		EsSalud	Administrative
Medical procedures	Diagnostic exams	MINSA	Administrative
		EsSalud	Administrative
	Surgical procedures	MINSA	Administrative
		EsSalud	Administrative
		SUSALUD (only for EsSalud)	Administrative
	Caesarean sections	MINSA	Administrative
		EsSalud	Administrative
		SUSALUD[1]	Administrative
		INEI[1]	Survey (ENDES)

1. Includes activities in private health care facilities.

Source: Authors' assessment.

5.3. Measuring activities in ambulatory care

The number of consultations is a basic measurement of the volume of out-patient services produced. It can be used for analysis of several aspects of utility and efficiency. For example, the number of visits per doctor is a common efficiency indicator useful for both comparing countries, regions or care organisations, although needs to be adjusted for quality aspects such as the time spent with the doctor. For domestic purposes, building a system which can keep a record of the volume of services provided by staff categories other than doctors (e.g. senior nurses) is of high value, not least to

monitor the development of their relative importance and roles in the health system. Indeed some countries reporting low rates of doctor consultations to OECD have other staff categories that are providing relatively advanced services.

Doctor consultations are defined as the average number of consultations/visits with a physician per person per year. The definition includes all types of specialists working in any type of physician's office or out-patient department of hospital. It also includes doctors' home visits but not telephone contacts or prescribed and scheduled laboratory tests and treatments. It also does not include visits to other health professionals, such as nurses and physiotherapists. For domestic analytical purposes, these categories are also useful to collect.

The source of consultation data for most OECD countries is administrative records, although some countries also use health survey data, such as the United Kingdom and Spain. The two sources can produce different estimates with surveys tending to show lower figures due to recall and response rate problems. Depending on what other data is available, and ability to link different data sources, the use of the data from these two principle sources varies and can have other benefits. For example, with survey data, equity aspects like utilisation by socio-economic groups can be analysed, while this typically requires data linkages of different registries if administrative data is used.

Several countries do not meet the standard definition of a doctor consultation applied in the OECD data collection, which leads to either underestimation or overestimation of the values which has to be taken into account in any analysis. For example, the Netherlands excludes contacts for maternal and child care while the United Kingdom excludes specialist consultations outside of hospital outpatient departments. In Hungary, visits for MRI and CT scans are included, while data for Portugal exclude visits to private practitioners. In many countries data are based on reimbursed visits, which in the case of Germany can lead to underreporting.

There are some differences in the definition of a consultation between MINSA and EsSalud

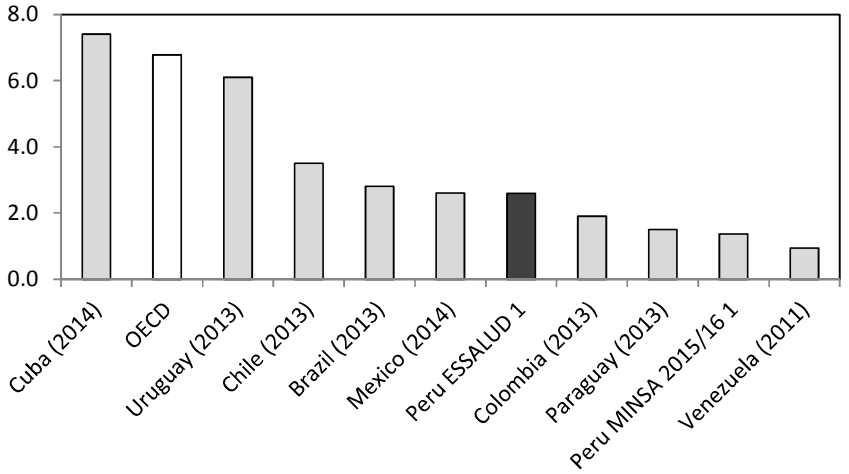
For Peru, the main difficulty is the data heterogeneity due to the different sub-schemes. The data submitted to OECD is limited to MINSA first and second level of care facilities, collected through their information tool HIS-MINSA. The data from HIS-MINSA comes from primary care facilities and hospitals. Second level facilities are increasingly using SIS-GalenPlus, but it is not fully integrated yet. Consequently, some outpatient visits to hospitals are likely to not have been adequately recorded and it only

covers MINSA facilities. It is noted though that EsSalud also collects data on consultations, which include consultations by specialists (in addition to primary care consultations).

Both MINSA and EsSalud data are sent to SUSALUD which compiles it and publishes it with data and indicators provided by other sub-schemes nationwide (Figure 5.3). In principle this allows the comparison of health activities in terms of consultations between the different providers. But these data are arranged differently for each sub-scheme. Since each sub-scheme uses its own system of information collection and classification, SUSALUD is not able to combine everything into a single table or graph. For instance, consultations at providers affiliated with SIS are displayed by region, sex, and affiliation of the patient (including whether the consultation was under the subsidised or semi-subsidised regime). Consultations taking place at EsSalud facilities are published together with the number of individuals that received them. The data are not arranged by region but according to the EsSalud care network, which is the geographical organisation applied by EsSalud to group their facilities. EsSalud data from SUSALUD does not provide the number of consultations by sex or affiliation status of the patient. SUSALUD also collects data on consultations to private providers In this case, consultations are displayed by type of benefit package.

In addition to all the various administrative data, INEI and SUSALUD publish survey data from ENSUSALUD which defines consultations as visits by persons 15 years or older that were treated in outpatient settings. The ENSUSALUD survey is carried out every year in health facilities belonging to all sub-schemes, and it is commissioned by SUSALUD. It includes both GPs and specialists separately, which is very useful. SUSALUD is the only institution collecting and publishing data that includes all providers and insurance programmes, both through its data collection from providers and the ENSUSALUD survey INEI carries out on their behalf. Although this survey is meant to be a measure of patient satisfaction and not volume of services, it can be used to cross-validate data coming from administrative surveys.

Figure 5.3. Number of doctor consultations per capita, Peru and selected countries



1. OECD estimate based on SUSALUD figures.

Source: SUSALUD, National Sources.

The current situation with survey data based on one sampling method and administrative data collected by different sub-schemes serve different purposes for the different owners of the data but does not help to build consolidated information which allow monitoring and analysis of the entire system. The build-up of a nationwide health information repository (REUNIS) which collects data originating from all providers will support unified definitions. Even though a developed reporting system with unified definitions should meet most information needs, the INEI survey instrument will most likely be an important source of information on care utilisation for the foreseeable future.

Historically, Peru is strong in collecting data on childhood immunisation rates

Many public health interventions have shown to be cost-effective, including a broad range of vaccinations and some screening activities. The rate of immunisation is an indicator that remains fundamental for OECD countries, even if they have generally achieved good levels of infectious disease control. Peru on the other hand, still continues to experience persistent problems with communicable diseases and child health, e.g. Peru is still struggling to eradicate tuberculosis and malaria, which makes effective immunisation a fundamental policy objective.

While Peru has well-established child vaccination programmes with generally high coverage rates, there remain some sections of the population vulnerable to vaccine-preventable infectious diseases. In 2015, 90.3% of children received the recommended pentavalent vaccine (against diphtheria, tetanus-pertussis, haemophillus influenzae and hepatitis B) and 92.5% received their first dose of measles vaccine. By comparison, coverage rates are below 90% in Austria and Mexico for DTP as well as in Austria and Italy for measles. Among the 25 OECD countries that have followed the WHO recommendation to incorporate the hepatitis B vaccine into their national childhood vaccination programmes, coverage was 92% on average in 2014. A number of OECD countries only administer the hepatitis B vaccination for specific high-risk groups. As a result, hepatitis B vaccination rates are significantly lower in these countries.

A much larger variation exists for influenza vaccination rates in persons aged 65 and over. On average across the OECD, less than half (47%) of the elderly population was vaccinated against influenza in 2014 ranging from 1.4% in Estonia to 82.3% in Mexico. In Peru, around 50% of the elderly population was vaccinated against influenza in 2016.

Peru collects data on immunisation through several different sources, some of them providing national coverage. The ENDES survey includes a set of questions on immunisation, including a vaccinations form. Figure 5.4 displays the vaccinations whose coverage is measured in the survey.

Figure 5.4. Vaccines included in the ENDES survey

		DÍA MES AÑO		DÍA MES AÑO		DÍA MES AÑO
BCG (Recién nacido)	BCG		ANTIHEPATITIS B HvB (Recién nacido)		HVB 0	
POLIO	P 1		P 2		P 3	
PENTAVALENTE (DPT + HVB + HIB)	Pe 1		Pe 2		Pe 3	
DPT	DPT 1		DPT 2		DPT 3	
ANTIHEPATITIS B - HVB	HvB 1		HvB 2		HvB 3	
ANTIHAEMOPHILUS - HIB	Hib 1		Hib 2		Hib 3	
TETRAVALENTE	T					
HEXAVALENTE	He 1		He 2		He 3	
ROTAVIRUS	Rot 1		Rot 2			
NEUMOCOCO	Neu 1		Neu 2		Neu 3	
INFLUENZA	Inf 1		Inf 2			
ANTISARAMPIONOSA / SPR	SPR 1		SPR 2			
ANTIAMARÍLICA / AMA	AMA					
REFUERZOS Y VITAMINA " A "						
DPT	1ero		2do			
POLIO	1ero		2do			
VITAMINA "A"	VA 1		VA 2		VA 3	
	VA 4		VA 5		VA 6	

Source: INEI 2014.

In addition to survey data, administrative data are also available, although information does not cover all health subsystems. MINSA has extensive data on BCG vaccination rates, hepatitis (HvB), intramuscular and oral polio, rotavirus, pneumococcal, pentavalent (diphtheria-tetanus-pertussis-haemophillus influenzae-hepatitis B), influenza, yellow fever, measles-rubella-mumps (SPR), diphtheria-tetanus-pertussis (DPT) for children, in addition to HPV for adolescents. These data are collected from MINSA facilities and obtained through the HIS-MINSA system. Immunisation is often used to evaluate performance, mainly by MINSA and SIS, and provide incentives accordingly. Although immunisation indicators are part of the REUNIS repository, which is meant to provide figures covering the whole health sector, currently available data only cover MINSA activities.

EsSalud publishes a single indicator on vaccination, specifically the number of pentavalent vaccinations provided. The majority of the immunisation activity carried out in Peru is centred around children's health, which falls within the mandate of SIS, which explains why MINSA-SIS immunisation data includes a wide range of on vaccines.

No nationwide administrative data on cancer screening is currently available in Peru

Screening indicators are important measures of the quality of preventive care. As middle income countries experience a shift in their disease burden and non-communicable diseases play an even bigger role, being able to screen for chronic diseases can be cost-effective (or cost-saving) and ultimately lead to better health outcomes. In 2003, the Council of the European Union recommended screening programmes for breast, cervical and colorectal cancer after reviewing the scientific evidence about their effectiveness. The WHO European Region endorsed this recommendation in 2011 (McKee and Rechel, 2014). As a result, screening programmes for breast, cervical and colorectal cancer are among the most prominent early disease detection programmes across OECD countries. Depending on the country, these can refer to "opportunistic" screening programmes, where the initiative for screening may come from the individual health providers or patients themselves, or organised "population-based" screening programmes, in which patients are actively identified and encouraged to participate. Evidence suggests that population-based screening programmes are more effective and reach patients with low socio-economic status better than screening that is conducted in an opportunistic fashion (OECD, 2013).

OECD countries with non-population-based breast cancer screening (e.g. Chile, the Czech Republic or the Slovak Republic) are seen to have lower screening rates than countries with population-based screening programmes.

Even where nationwide rollout of population-based screening has been achieved, differences between countries exist in terms of target populations and other design elements which in turn affect overall screening costs.

Screening rates are based either on surveys or encounter data, which can influence the results. Survey-based results may be affected by recall bias. Countries are invited to supply both survey data and programme data when these two sources are available. Programme data are often calculated for monitoring national screening programmes and differences in target population and screening frequency may also lead to variations in screening coverage across countries.

For breast cancer screening, the rates are based on the number of women aged 50-69 who have received a bilateral mammography within the past two years (or according to the specific screening frequency recommended in each country) divided by the number of women aged 50-69 answering survey questions on mammography (for survey-based data) or eligible for an organised screening programme (for programme-based data). For cervical cancer, the numerator refers to the number of women aged 20-69 who have been screened for cervical cancer within the past three years (or according to the specific screening frequency recommended in each country).

Data availability for cancer screening in Peru highlights the health system fragmentation in the country. Although good quality data on cancer exist in Peru, there is no national or even complete single sub-scheme coverage; data collection is heavily pro-urban. The best registry for cancer information is the Registry for Cancer in Metropolitan Lima, which as it names indicates only operates in the capital. This registry functions across all sub-schemes and has been very successful in recording screenings, treatment and mortality linked to cancer. All other regions of the country are significantly less well equipped to collect and present data on cancer indicators. At the national level, cancer is the responsibility of the General Directorate for Epidemiology, which has been successful in ensuring adequate recording of all cancer deaths. But this directorate is severely limited by the fragmentation in the health information system. Although the directorate is given data by non-MINSA facilities, not all follow the same system of notification of cancer cases and only some private institutions share their information.

There is one exception to the geographical fragmentation of screening and cancer data. INEI does include a set of questions on screening in its ENDES survey. This survey focuses on child and maternal health, and includes questions regarding mammography and human papanicolau tests (see Box 5.1).The survey collects information on the frequency of the screening and the location and characteristics of the procedure.

Box 5.1. Cancer screening questions in ENDES

Questions asked to people between 15 and 49 years old

- Do you consider that cancer is preventable?
- Have you ever heard of cervical cancer?
- Have you ever heard of HPV?
- Do you think that HPV can cause cervical cancer?

Questions asked to people between 40 and 59 years old

- Did you have a cancer screening in the last 24 months?
- Where did this screening or screenings take place?

Questions asked to women between 30 and 59 years old

- Has a doctor or another health professional ever performed a physical breast examination on you?
- When was the last physical breast examination you had?
- Has a doctor or another health professional ever perform a papanicoulau test on you?
- When was the last time you had a papanicolau test?
- Were you made aware of the results of the papanicolau?

Questions asked to women between 40 and 59 years old

- Has a doctor or another health professional ever performed a mammography on you?
- When was the last time you had a mammography?

Source: INEI 2014.

5.4. Activities in the hospital sector

OECD collects four basic types of hospital activities; number of discharges, number of bed-days, bed occupancy rate, and average length of stay (ALOS). A distinction is also made between inpatient care and curative care. ALOS is calculated by dividing the average number of bed-days with the number of discharges. The four indicators are used for measuring, benchmarking and analysing the use of hospital resources. For discharges and ALOS, OECD collects the number of cases and days by diagnostic categories following the International Classification of Diseases (ICD).[1] Discharges and ALOS are submitted by the vast majority of OECD countries, while bed-occupancy rates, which requires a record of bed resources, is reported by approximately 25 countries. As with data on

physical resources on hospitals and beds (Chapter 4), definitions of providers and functions are aligned with the System of Health Accounts classifications (Chapter 3).

Data on the number of discharges provides a basic indication of hospital activity levels between schemes

The number of hospital discharges is the most basic indicator of hospital sector activity. It enables a description of the number of patient treatments and the capacity of hospitals. It can also be used to calculate basic efficiency indictors such as ALOS, monitor changes in demand for services, and reflect technological advances and shifts in how health services are organised. For example, the use of day surgery and changes in the content of primary health care services are factors which can be reflected in data on hospital consumption.

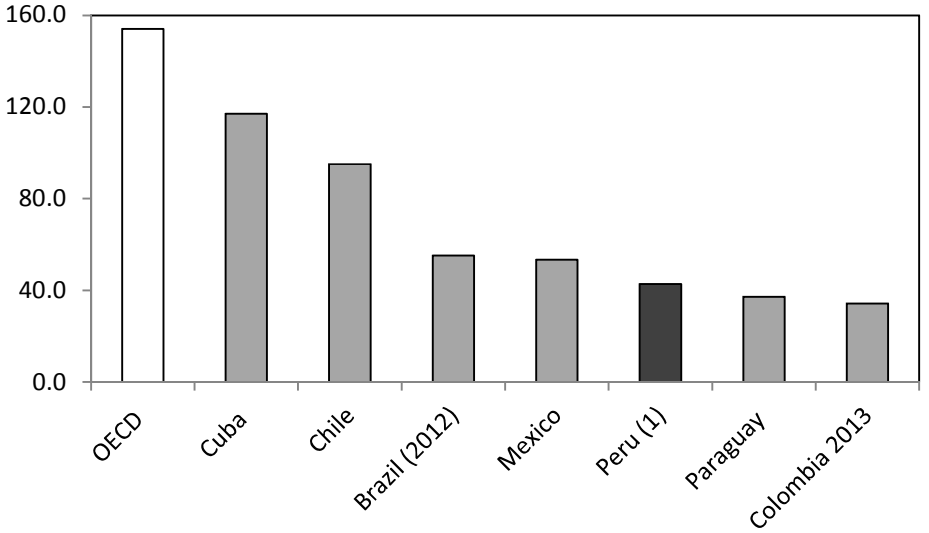
Levels in hospital discharge rates vary widely across OECD countries. Trends in the number of discharges are also going in different directions in the countries. Among OECD countries where discharge rates have decreased substantially the last 15 years, there has been a strong rise in the use of day surgery. For domestic purposes, variations in basic hospital activities can inform about differences in utility across the population groups (schemes), hospitals or geographical area. In most countries, there are large variations within countries (OECD, 2014).

A hospital discharge is defined as the release of a patient who was formally admitted into a hospital for treatment and who stayed for a minimum of one night. This includes deaths occurring during hospitalisation, transfers between but not within hospitals, as well as the discharge of new-borns. The aggregate number for the entire country should reflect all hospital activity, i.e. include discharges from all hospitals, regardless of ownership or legal status. Discharges by diagnostic categories according to ICD chapters allows for comparison of hospital activity by the main groups of diagnoses.

The definition of a discharge is not strictly followed in the international reporting by all OECD countries often due to different definitions under national information and reporting systems. For example, same day discharges are not always excluded by all countries. Another common deviation is that healthy new-borns discharged are not included in a number of countries, which can make up 3-10% of all discharges. Several countries do not include data from all hospitals or all types of care, for example exclude private and/or privately funded hospitals. Others may include only publicly-owned hospitals or publicly-funded hospitals.

In the questionnaire sent to Peru, data on discharges were provided, but only related to MINSA "public" facilities. The submitted data is however also available by diagnosis, following the ICD 10 classification. Data from HIS-MINSA is also submitted to SUSALUD, who publish it quarterly. In this case, discharges are not arranged by type of diagnosis but solely according to the insurance affiliation of the discharged patient.

Figure 5.5. Hospital discharges per 1 000 population, Peru and selected countries, 2014



1. Authors' calculation based on data from MINSA, EsSalud and others.

Source: National sources.

The MINSA response to the questionnaires states that there is no data on discharges for the institutions belonging to other sub-schemes. Although it is true that currently there is no national repository containing nationwide figures on hospital discharges, data are available from EsSalud and private facilities. Data from EsSalud is published both by themselves and by SUSALUD. The data on discharges disseminated directly through EsSalud describes the number of discharges down to individual facility level, and additional hospitalisation indicators such as number of readmissions and number of average patients per day are available.

SUSALUD collects data directly from EsSalud facilities including not only discharges but also average length of stay. As with the rest of EsSalud specific data published by SUSALUD, the number of discharges are

arranged according to EsSalud's own health networks. SUSALUD also requires private health care providers to submit data on discharges, which is then arranged by type of insurance and region.

Average length of stay (ALOS) is a key indicator of hospital performance and efficiency

Shorter stays reduce costs per discharge, although too short ALOS can be detrimental for health outcomes and patient satisfaction. ALOS has decreased over several decades in most OECD countries but the trend is more mixed during recent years. Disease specific ALOS is useful to distinguish resources allocated and differences in how services are provided, but can also describe how different types of care develop. Efforts are made in all countries to further reduce unnecessary hospital stays while maintaining or improving quality of care. ALOS is defined as the average number of days a patient spends in hospital. It is calculated by dividing the total number of bed-days by the number of discharges.

For Peru, producing data on ALOS is an opportunity to benchmark its use of hospital resources and care delivery with other countries. This is especially informative when broken down by different diagnosis areas. The different service profiles of the different sub-schemes in the Peruvian health system means that monitoring of both discharges, bed-days, and ALOS separated by financing arrangement but following the same definition, can be very useful.

Data submitted to the OECD questionnaire, similar to the discharges indicator, only included ALOS in MINSA facilities. Due to the lack of long term care beds in Peru, ALOS refers to acute care only (see also the chapter on physical resources for more on bed resources). It is important to note that SUSALUD only collects data from MINSA on discharges, and not on ALOS or bed-days. This is an important gap in cross-sector indicators.

Other sub-schemes measure length of stay in slightly different ways. EsSalud includes in its monthly performance indicators of bed efficiency, by measuring the ratio of discharges per available bed. This is one of their main indicators to track efficiency in their health care facilities. In addition to this, there are also available data on total number of bed-days, average hospitalised patients per day and number of beds. These are all indicators that enable the measure of hospital performance and efficiency, but EsSalud should also able to provide disease specific ALOS which would enable better national and international benchmarking.

Based on EsSalud reported data, SUSALUD also publishes number of stays and ALOS in each of the EsSalud care networks. They collect and

publish these indicators only for EsSalud, but not for MINSA or private (EPS) facilities. Although displaying the ALOS indicator is informative, its comparability is weakened by the lack of figures based on diagnosis and, as with others EsSalud indicators, the difference in the geographical classification of the different health networks within EsSalud.

Since SUSALUD does not collect data on ALOS or other bed efficiency indicators from private institutions, there are no currently available figures for private providers. Data gathered both from MINSA and published data from EsSalud give similar levels of 5.0 and 5.1 days for ALOS in 2016 and 2015 respectively. On latest figures, this rough estimate would place Peru below Chile (5.6) and the OECD average (6.6), but above Mexico (3.6).

5.5. Medical procedures

The use of diagnostic procedures is closely related to both medical effectiveness and efficient use of resources

Of course, the practice of diagnostics should be based on medical evidence of its use. In addition, the ability to benchmark how the use of diagnostic exams varies across the country regionally or by health insurance scheme or providers, and compare this with other countries, provides additional information on the rational use of resources. It can show both the efficiency frontier in terms of how equipment is used, as well as provide information about wider organisational aspects of services which benefit from expensive diagnostic equipment. Common indicators for comparison are number of exams per unit of equipment and per 1 000 population.

In Chapter 4 on resources data collection, the number of units of medical equipment is described. OECD collects activity data for the three most common and expensive diagnostic medical devices; Computed Tomography (CT), Magnetic Resonance Imaging (MRI) and Positron Emission Tomography (PET). The number of exams is collected with a split between hospitals and ambulatory care providers. An exam is defined as a medical imaging session to study one (or more) body part that yields one (or more) views for diagnostic purposes. 28 of the 35 OECD countries report activity data on the use of this medical equipment, although some of these cannot separate hospital and ambulatory use, or can only report hospital data.

There are large variations in the use of medical equipment across countries, but also within countries. For example, in the United Kingdom (England), the utilisation of CTs and MRIs is generally very low in an OECD comparison, but the variation across regions is greater, with almost a four-fold difference between the Primary Care Trusts that have the highest

rates and lowest rates of MRI and CT exams. In Canada, there has been a strong rise in the use of both MRI and CT exams in all parts of the country over the past decade, but there continues to be wide variations across provinces (OECD, 2014).

Peru was unable to provide a response for diagnostic exams in the questionnaire used for this review, but there are data publicly available for both MINSA and EsSalud. SIS uses provider data on these technological procedures for reimbursement calculations. Detailed lists of procedure prices exist which suggests that there is capacity to accurately estimate the number of procedures. EsSalud does have figures for its CT, MRI and PET exams, which they make available on their website on an annual basis. Although the number of exams carried out in each specific facility is not made public, EsSalud would seem able to trace procedures accurately. EsSalud does publish monthly figures at the individual facility level for x-ray and laboratory exams, but these indicators are not sufficiently accurate for comparison following the OECD standards.

Published data on surgical procedures in Peru is currently sparse

Data collection of surgical procedures captures the volume of surgical services provided in hospitals. These data are common in describing and analysing service levels by disease area. Procedure coding is necessary in all countries using DRG for description or reimbursement and is therefore increasingly available on a standard basis. Data on the number of surgical cases can be used for several other areas of analysis depending on how the data are collected and which data linkages are possible, e.g. the development of health service utility by population groups. The OECD collection of the number of provided cases of 22 specific surgeries also entails the number of day-cases provided for each procedure and for two of these (cataract and tonsillectomy) how many are provided in outpatient settings. In OECD countries there is a strong focus on shifting towards ambulatory or same day surgeries to increase efficiency and collecting this data provides the possibility to track the development of these policies across countries. More than 30 OECD countries report most of these procedures, although not all countries can separate out day-cases.

In its health system development, Peru has not yet experienced a clear shift towards ambulatory surgeries and classifies its surgical procedures not by length of stay but by level of complexity. This criteria defining complexity of a specific procedure is not clear, and each provider might be adhering to different definitions. The capacity to inform on the number and type of surgeries that are carried out varies greatly between health providers.

MINSA is not currently publishing indicators on surgical procedures, although EsSalud does. MINSA should be able to do this through HIS-MINSA, SIS-Galen Plus and SIA-SIS, where this data is being collected. SUSALUD collects surgical procedures data from EsSalud which is included in their quarterly reports, by level of complexity of the surgery and care network. EsSalud also releases this information on its website, by volume of each surgery category at the individual provider level.

Data on surgical procedures is perhaps the health activities domain that most clearly illustrates the fragmentation of the information reporting. SUSALUD only collects it from EsSalud providers. EsSalud also releases very detailed indicators on this area through its own channels. But neither MINSA nor private providers seem able to provide this to SUSALUD or to make it available themselves.

One of the 22 surgeries in the OECD data collection is caesarean sections, which is an important indicator to understand changing trends in deliveries across OECD countries. When caesarean sections rise, this can be due to bad practices, older age pregnancies, scheduling or simply personal preference. As is the case in a number of OECD countries, such as Italy or Spain, the ratio of caesarean sections varies significantly across regions in Peru.

Both EsSalud and MINSA collect and release data on number of live births, classified by method of delivery. This information is collected and published by SUSALUD as well as independently by the institutions. Data collection directly at the delivery room has been a priority for Peru, and with the *Registro de Nacidos Vivos* (Live Registry of Births), information can be immediately collected not only on the conditions of delivery but also on the identity of the child and its integration with RENIEC. SUSALUD also collects and disseminates data on caesarean sections from private providers. The ENDES survey by INEI is also concerned with caesarean rates and broader questions of prenatal and postnatal care. Compared to other surgical activity data, the Peruvian HIS is well suited to measure relevant trends of delivery methods. However, as with other indicators mentioned in this report, this data could be more comparable across sub-schemes by decreasing the various ways this data is compiled and presented in the different sub-schemes.

5.6. Conclusions

Peruvian activity data is deeply fragmented, and lacks the national repository where all-encompassing indicators could be found. The high degree of system fragmentation leads to a number of difficulties which seem to vary depending on which type of data or indicator is collected, as sources,

methods and use of information differ substantially between sub-schemes. In many instances, MINSA seems unable to provide data that is collected at the health network and provider level. Some information is only partially available at the MINSA level, or only reaches dedicated agencies within the ministry. For other data, due to the many stages the information has to go through, they tend to be lost or redirected along the way, failing to make it to the aggregate level of the health information system, and thus limiting its analytical use and impact on resource planning and policy decisions.

Data on the majority of OECD indicators are available or at least could be made available with what is currently being monitored, but this only happens at the sub-scheme level. SUSALUD is the only institution providing information from all sub-schemes and thus enabling comparison, but this is limited to selected data. Currently four groups of indicators are collected by SUSALUD from all sub-schemes: consultations, hospitalisations, deliveries and emergency care. But each sub-scheme uses different geographical and organisational definitions to arrange its data; hence it is currently not possible to compile accurate national indicators. The efforts to achieve a national repository of information should be continued.

Another layer adding to the complexity of the HIS is the variety of channels used by MINSA to collect its data. Some of it is administrative data provided regularly through HIS-MINSA, some comes from SIS and other data from surveys. It is actually possible to find the same indicators displaying administrative data in some places while showing survey data in others, or combining both. For example, figures on consultations are sometimes administrative data from EsSalud or HIS MINSA and sometimes survey data from ENSUSALUD. In addition, indicators also come from one-off studies or audits integrated into a system of regularly collected data.

The collected indicators on health activities are not representative or comparable. However, there has been progress in central data collection in both MINSA and SUSALUD. The review of available data shows that there is a lot of activity data which is either not published, or could be published if a relatively limited amount of additional work was put into increasing comparability between the sources. More data can be disseminated, but the government must also decide whose reasonability this falls under.

In Peru there is a strong focus on infectious diseases and maternal and child mortality. This reporting of health activities matches the epidemiological profile and the focus on improving and expanding primary health care services. Also performance indicators used by MINSA and MEF to track progress are very much centred on these areas. But relative to the resources spent on hospital services, the available information about what is produced is scarce. The sector does not produce enough activity data across

the system to allow for effective monitoring and evaluation. With a future increased burden of chronic diseases, activity data also needs to reflect this to enable improved monitoring. This, of course, shall be combined with better reporting of health service quality data.

As explored in Chapter 2, efforts are being made to improve the quality of data collection applications and integrate them as part of a national repository of information. It is fundamental that all categories of staff are aware of the importance of complete and reliable health activities data to inform better policy decisions and resource allocation, but efforts should be done to ensure this does not breach their privacy and reflect the potential constraints they might face in their work. More staff is becoming aware of the advantages of having reliable and semi-real time data available to inform decisions and identify challenges, not only managerial personnel. To strengthen interest among clinicians to contribute with data, it is important to ensure that those responsible for filling the information see the use of the data as a means to inform about their own performance and contribution to positive health outcomes, not as a barrier or a waste of time in their daily routine. There is always a risk that data collection on activity is seen as detrimental to the actual activity or a waste of time. If information gets lost in higher levels and is never actually used, then clinical staff is not interested in contributing.

Activity data in Peru is to a large part complete and accurate, but only at the sub-scheme level. When it comes to collecting and processing nationwide indicators that apply to the whole health sector, the resulting information is very limited, with the exception of the data collected in its extensive surveys. While all sub-schemes have a relatively good capacity to collect activity data and use it for internal purposes, it varies in types of activity data, definitions and frequency. For example, DIRESAS sometimes struggle to produce timely and relevant information while EsSalud has monthly reports on hospital performance. Ensuring standardised information across all facilities and stakeholders and a central repository where information on health activities by all sub schemes can be reached are key points to address.

In this, MINSA (or a health information agency) should strengthen its role as the main repository of cross-sector health activities data. REUNIS has only been partially completed so far, but there is already access to a number of specific cross sub-scheme indicators, such as dentist consultations and vaccinations. The registry aims to be a real time tool to assess the effectiveness and reach of a number of interventions. If successful it could greatly improve the quality and availability of many health indicators. At the same time, SUSALUD has taken on part of the burden of collecting data from all registered providers directly. On the one hand it has

the regulatory cross-sector authority, but it has neither the resources nor the regional network to completely fulfil the role. The main agency responsible for this activity would require a stronger legal framework to enable it to collect the necessary data from other providers, in addition to its own facilities. Replacing SUSALUD in this role would seem to allow it to focus on its primary role which is not to be a source of information but to oversee the quality of treatment and coverage of patients.

Note

1. See the International Shortlist for Hospital Morbidity Tabulation (ISHMT), http://stats.oecd.org/HEALTH_QUESTIONNAIRE/ISHMT/JQNMHC_ISHMT.pdf.

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Annex 5.A1

Summary tables of data availability by institution

Table 5.A1.1. Activity data collected by SUSALUD from IPRESS (health care providers)

	MINSA-SIS	EsSalud	EPS (Private)
Consultations	x	x	x
Discharges	x	x	x
ALOS		x	
Emergencies	x	x	x
Prescriptions	x		
Deliveries	x	x	x
Surgeries		x	

Source: SUSALUD (2016).

Table 5.A1.2. Activity data collected by MINSA-SIS

Indicator	Publicly available
Consultations	Yes
Discharges	Yes
Length of stay	Yes
Immunisation (Children 0 to 4 yo)	Yes
Emergency care	Yes
Surgical procedures	No
Diagnostic exams	No
Screening	No

Source: Authors.

Table 5.A1.3. Activity data collected by EsSalud

Indicator	
Consultations	-Immediate Attention consultations Newly consulted
Hospitalisation	Discharges Stays Bed availability Deaths before and after 48 hours
Primary care	Mammographies among 50-74yo Third doses of Pentavelente under 1yo Processed samples of PAP First preventive care consultation
Intermediate activities	Dispatched prescriptions Lab analysis Radiological exams Radiographs
Obstetrics	Deliveries Problematic deliveries Unproblematic deliveries Caesarean sections Births Live births
Surgeries	Total number High complexity Medium complexity Low complexity Minor survey high demanding Minor survey low demanding Cancelled surgeries Scheduled surgeries
Emergencies	Number of emergency admissions Number of emergencies for each priority (level 1 to 4)
Non-medical attention	Psychological admissions Home visits Surgery preparation Group therapy Nutrition, obstetric and social care inspections

Source: EsSalud 2016.

Chapter 6

Health care quality in Peru

To expand universal health coverage beyond insurance and service coverage, and ensure that qualitative services are provided for all, Peru needs to monitor quality across providers and geographical areas. Peru is currently only able to report a few selected care quality indicators, and these typically cover only parts of the population. Comparing service quality across schemes and providers as well as any international comparison is therefore limited.

Ongoing development work on the health information system will, if successful, provide Peru with a firm foundation to produce health care quality indicators with national coverage. Moreover, Peru's extensive survey data collection, in which many quality aspects are already captured, should prove useful for the future collection of patient reported data. Peru should build analytical capacity to further drive data development. This chapter discusses the further developments necessary such that data is in demand by national analysts and policy makers.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

6.1. Introduction

This chapter provides an overview of Peru's current capacity to measure the quality of the health care services it is delivering to its population. It also puts forward some of the measures that should be put in place to take this forward to monitor quality both nationally as well as reporting according to international standards. Peru has yet to develop a clear national framework for measuring quality in health care services. As such, very little data is collected at a standardised national level which can be used to assess quality of services across the board. While there are some pockets of measurement within the various subsystems these tend to have been designed more for internal purposes rather than responding to national priorities and norms. As a consequence, the quality of services across Peru's various health sub-systems cannot be assessed in depth, and few indicators are therefore available for international benchmarking.

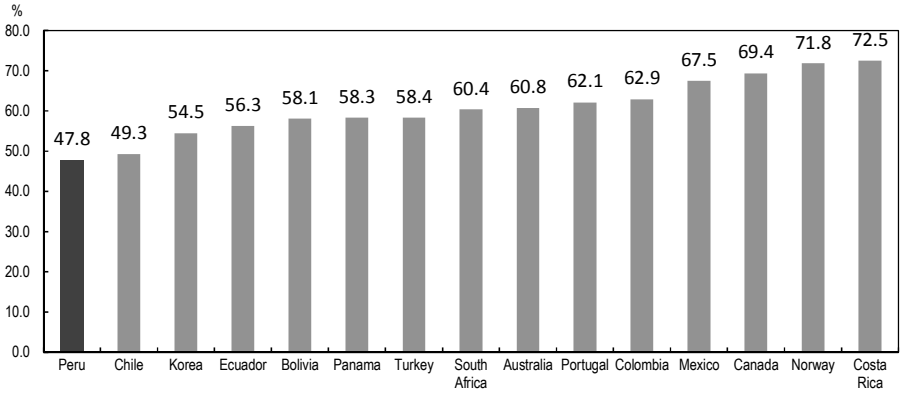
Given the main objective with health system reform in recent years have been wider population coverage and improved access within the Peruvian health system, it might be argued that information on resources and output of the system are the first logical steps in building a health information system which can inform about progress towards universal coverage for the population. This data is also easier to produce in many respects although the previous chapters show that Peru still has some way to go to form a consolidated picture of the true measure of the resources available to the health sector and what activities are currently performed. Moreover, in international data collections by WHO and PAHO, the focus has been on resources and service coverage, rather than health outcomes, public health and risk factor indicators. There are few indicators on service quality.[1] Over the longer time perspective however, quality aspects will need to be incorporated into national monitoring of the health system, not least to include a quality dimension in measuring *effective* universal coverage.

To collect national data on quality of services, the same basic developments are needed as for other areas of data production. There need to be legal requirements established with a statutory authority such that different sub-systems are obliged to provide a minimum set of basic data and there has to be interoperability of information between the different insurance schemes and providers. But for several of the quality indictors to be calculated and monitored, data linkages between different insurance schemes, providers and administrations are of particular importance. Personal identifiers linking diagnoses and procedures are crucial for the future Peruvian health information system to provide data on quality of services, e.g. in using administrative data to measure the extent to which patients take the appropriate medicine, or mortality rates after hospitalisation based on patient level data.

Rational for more and improved quality indicators

Aggregate national estimates of basic standardised quality indicators are important to understand how the Peruvian health system compares with other countries. Peru ranks very low in terms of the public's confidence in their "healthcare and medical system" (Gallup World Monitor database), indicating that there is low trust in service quality (Figure 6.1). This confidence measurement is very crude and needs to be backed up by comparing a broader set of performance indicators, among them, service quality. Policy makers cannot make this assessment currently since the necessary quality indicators which can inform about differences in service quality are not available.

Figure 6.1. Confidence in health systems in Peru and benchmark countries, 2005-10



Note: Data for "confidence in health systems" show the percentage of people responding "yes" to the question "Do you have confidence in health care or medical systems?".

Source: Gallup Organisation (2015), Gallup World Monitor (database).

In addition to international benchmarking, quality indicators need to be developed to support clinical improvements of medical effectiveness and patient safety. Many OECD countries have a long tradition of fostering peer pressure by comparing clinical excellence across facilities. Box 6.1 provides two examples. In Sweden, public benchmarking by indicators has been developed by national health authorities in collaboration with clinical professional groups. This has helped to increase the credibility and relevance of the measures. The other example from the United Kingdom builds on a long tradition of public benchmarking, e.g. the Quality Outcomes Framework, an extensive package of primary health care indicators which have been developed over several years and been used for many purposes, such as

monitoring and reimbursement. A later initiative by the NHS is Atlas series which highlights variation in health services to foster development.

Given the fragmentation of the Peruvian health system, understanding the variation in service quality across subsystems and socio-economic status is crucial. The current monitoring of quantity of services across the country, by insurance scheme and by income groups, is important because resources as well as the type of services which the different beneficiary groups are entitled to are very much dependent on affiliation. But insurance coverage is not merely about entitlements and access to a specific set of services. These services need to be delivered with a high and equally distributed degree of quality. If discrepancies grow too much between different service providers or across groups of service providers or insurance schemes, the equity gained in access is lost in the content of services. In particular, the ability to measure patient safety and effectiveness of services needs to be enhanced and incorporated into the concept of universal health coverage.

Box 6.1. Using data to drive quality improvements in Sweden and the United Kingdom

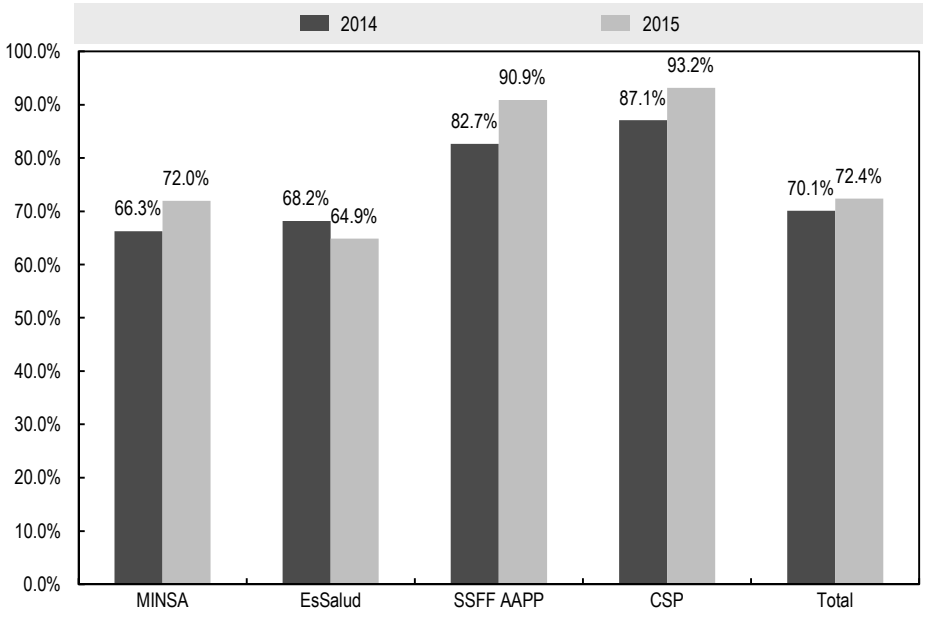
In Sweden, the National Board of Health and Welfare and the Swedish Association of Local Authorities and Regions (SALAR) regularly publish counties' performance across more than 150 indicators of health care quality and efficiency, drawn from Sweden's extensive set of national patient registers. The National Board also conducts in-depth assessments of defined areas of care. These reports typically examine 20 to 60 relevant indicators, presented on different levels (national, regional, county council and unit for instance hospital) as well as being disaggregated by age, gender and socio economic status (such as educational level). In an appendix to the main report the county councils' and units' results are presented as profile graphs showing their achievements relative to the national mean value per indicator. For each county council a summary of what areas need to be improved is compiled and measures to be taken in order to increase the quality of care are recommended. The assessment also results in national recommendations to the care providers focusing on indicators where performance appears poor (OECD, 2013).

Since 2010, NHS England is investing in a platform called the NHS Atlas series. By publishing performance data on variation, it aims at further improving transparency and use of publically available data, and focuses on differences and variation between providers and regions. Its main tool is mapping differences in resources, activities and quality across so called Clinical Commission Groups, which has led to an NHS-atlas. The intension is to promote clinical change and improvement, by identifying unwarranted variation between demographically similar populations. Just like in the Swedish example, the data and information presented in each of the atlases do not always explain the reason for the variation, however the strength and power of the atlas series is in the questions they raise about equity, effectiveness and value.

Source: http://www.england.nhs.uk/rightcare/intel/cfv/atlas.

The use of private providers which are funded by out-of-pocket payments and private insurance is an indication of unacceptable differences in quality (see Chapter 2 in *OECD's Review of Health System Performance*). Survey results of user satisfaction suggest that quality is higher in private facilities in Peru, but also in parallel public systems such as the military and police systems (Figure 6.2). The recent increasing trend of Peruvians seeking health services outside the provider network of their own insurance can also be an indicator of dissatisfaction or differences in medical quality or access to services. Policies to increase the use of provider capacity across different funding schemes are important to drive more efficient use of resources (see Recommendations in OECD's Review of Health System Performance). But pushing the system to more integrated funding and services need more comparable measurement of quality of care. Both purchasers and patients need to be able to take informed choices and there is a risk that low-quality services crowd out high-quality services if provided at lower cost.

Figure 6.2. User satisfaction with received health services, by insurance subsector, 2014 and 2015

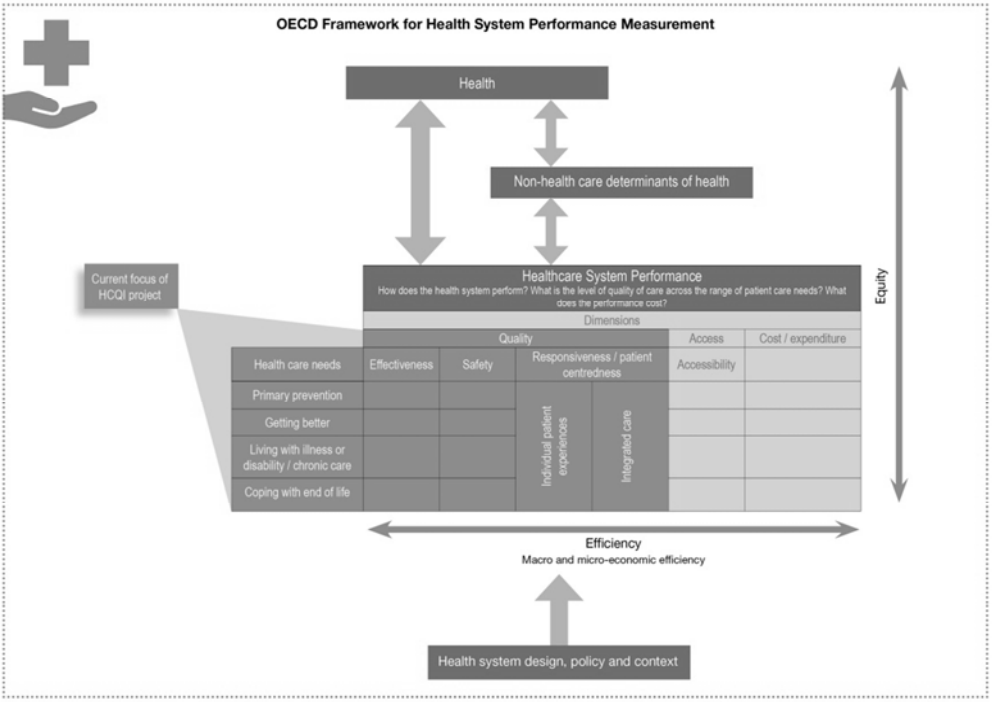


Source: SUSALUD; INEI – Encuesta Nacional de Satisfaccion de Usuarios en Salud 2015.

The OECD framework for health care quality indicators

When OECD started its Health Care Quality Indicators (HCQI) project in 2002 individual countries had already made progress in tracking and reporting quality data to monitor national development or regional and facility differences. There had also been earlier initiatives to collect a joint set of quality indicators for benchmarking and learning across countries, e.g. by the Commonwealth Fund and the Nordic Council of Ministries. There was however still limited data for comparisons across countries, which generally suffered from low comparability, lack of regularity in collection and a comprehensive approach for what should be collected. This has prevented policy makers to benchmark the performance of their system against peer countries.

Figure 6.3. The OECD framework for health systems performance measurement



Source: http://www.oecd.org/els/health-systems/health-care-quality-indicators.htm.

The initial work of the HCQI project included the development of a conceptual framework to guide the selection and prioritisation of indicators. While this framework focused on the quality of health care, it builds on a broader perspective of health and its determinants, i.e. it contains health outcomes, determinants of health, health system factors like costs and resources, and other performance areas than care quality, notably accessibility and efficiency. The main care quality dimensions in the framework are care effectiveness, safety and responsiveness (or patient centeredness) which are highlighted in Figure 6.3. The first OECD report on quality indicators was published in 2006.[2] Since then the project has focused on implementing a standard data collection process and quality assurance procedures. There are now around 50 indicators that are routinely collected and reported every two years.

The HCQI work has grown into a robust and sustainable effort to provide internationally comparable data on quality of care as well as a forum for policy makers and researchers to advance the quality measurement agenda. A large number of OECD and non-OECD countries, international organisations including WHO and the European Commission, and several universities and other expert organisations are included in the work. In spite of increasing robustness of data and comparability across countries, health data infrastructures in member states still have room for improvement. To a varying extent, countries struggle to develop better electronic health records, data sets in primary and long term care, unique patient identifiers and database linkage technologies, which will improve the availability of health care quality data.

Current quality data collection methods in Peru are mainly based on surveys

Beyond the collection of some selected examples of specific indicators, which are discussed later in this chapter and which all cover only parts of the population, the only means currently available to monitor the quality of health services in Peru is via surveys. These surveys are essential in collecting basic coverage data such as immunisation for children, and other maternal and child health services. For this, survey is the standard methodology for Peru and comparable countries. Surveys are also used for quality assessments, but inevitably, the focus is the perceived quality of health care provision, by asking patients and users to express their satisfaction with the service and accessibility. The two main national surveys used to measure quality and perceived quality in Peru are ENDES (Demographic and Health National Survey) and ENSUSALUD, respectively. For more information on these surveys, see Chapter 2 of this review.

Albeit, in a fragmented way, the surveys do manage to capture some quality aspects which are typically collected by administrative data in OECD countries. An example of this is to measure to what extent diabetes patients take the appropriate medicine, which can also be compiled from administrative records by linking diagnosis and prescription information. The two means of collecting data are not comparable though, and represent two conceptually different measurements. Administrative data on prescription in combination with diagnose information can be used for measuring rational prescription. A population survey on the other hand, measures consumption, and cannot capture diagnose information with the same accuracy.

The survey instruments in Peru are therefore certainly highly valuable and Peru has institutionalised these successfully. There are also additional dimensions of quality which can be developed in the future, such as patient reported experiences by provider to monitor quality at facility level, and patient reported outcomes to measure results beyond the traditional medical outcomes (see Box 6.2 for definitions). For these types of data, Peru's extensive experience and capacity in surveying patients can be beneficial. This is certainly valuable with the increasing focus paid to patient-centred care, an area in which many national and international surveys (e.g. Commonwealth Fund, Picker Institute Europe and US Consumer Assessment of Health care Providers and Systems) have been instrumental in measuring patient experiences, which help drive accountability and quality improvement. It is foreseen that these types of tools will play an important role in the future management of health systems, because measuring patient experiences will have to become an essential component of health services evaluation.

But there are also notable drawbacks with the survey instrument. They are costly and don't have the same negligible marginal cost for collecting the same information over time as have administrative systems. There are also methodological challenges, which in parts are linked to the cost of collecting data, such as frequency and population coverage of data collection, which in turn affects the statistical power of when analysing the data. In addition, traditional means of communication such as postal surveys and fixed line telephone interviews are less reliable as people shift to mobile and web-based means of communication, all of which makes traditional sampling and collection methods difficult.

In addition, for the results-based budgeting system (*Presupuesto por Resultados*, PpR), more comprehensive administrative data on both activities and quality can be useful. The PpR is a budget planning and resource allocation methodology the Ministry of Finance started developing in 2007 to focus the budget formulation on the government targets in service

delivery rather than the traditional funding of existing provider structures. The health sector was one of the first public sectors to embark on this approach. Ultimately all performance based systems are dependent on what results are possible to measure and the current system is limited to what information the health system (including survey data) can produce. Hence, also the PpR can benefit from improved data collection.

Box 6.2. Patient Reported Experience and Outcome Measurements (PREMS and PROMS)

PREMs: Measure patients' perceptions of their experience of care by focusing on the process of care and how that has an impact on their experience. Examples: Did the patient wait long for treatment? Did the patient feel they were involved in decision making?

PROMs: Measure patients' perceptions of their health status, clinical outcomes, mobility and quality of life. Examples: What was a patient's mobility like before a hip replacement, and did it improve after the intervention? Does a patient's condition limit their ability to do strenuous activities such as jogging, skiing or cycling?

Source: OECD (2017).

6.2. Data availability for quality indicators

OECD has developed a broad package of quality indicators which are collected via an extensive questionnaire sent to member states every other year. Linked to the data collection are regular technical meetings with experts from member states in which data quality, underlying information systems, and other related topics are discussed. The meetings serve the purpose of both increasing the scope and quality of data collected by OECD, as well as enhancing the policy use and relevance in the member states.

For the purpose of this health data review, a questionnaire with health care quality indicators was sent to MINSA. The questionnaire contained seven indicators selected from five dimensions of quality as defined by OECD. The seven indicators for which data was requested by Peru were selected from the more than 50 indicators which are collected by the member states. Most of these indicators require rather detailed information and advanced information systems. Acknowledging that the capacity to submit this data has been built up for several years in OECD member states, a careful selection was made for Peru, not to burden Peru more than necessary. The selection of the seven indictors were therefore intended to cover various types of quality indicators and provide an indication about which type of information Peru is currently able to collect. The request also included a Sources and Methods form for metadata information, such as collection agency, population coverage, etc. The indicators for Peru to submit are listed in Table 6.1.[3]

Table 6.1. Subset of quality indicators requested

Indicator	Quality dimension
Asthma hospital admission	Primary Health Care – Avoidable hospital admissions
Diabetes hospital admission	
Overall volume of antibiotics prescribed (DDDs/days/users)	Primary Health Care – Prescription
Admission based AMI 30 day in-hospital mortality	Acute Care
Colorectal cancer five year relative survival	Effectiveness of cancer care
Post-operative pulmonary embolism	Patient Safety
Postoperative deep vein thrombosis	

Avoidable hospital admissions are common indicators of primary health care effectiveness

OECD collects asthma and diabetes hospital admission rates as well as hospitalisation rates for chronic obstructive pulmonary disease (COPD) and congestive heart failure (CHF) from its member states. The indicators for asthma and diabetes are defined as the number of hospital admissions with a primary diagnosis among people aged 15 years and over, per 100 000 population.

These essentially chronic diseases can to a very large extent be handled in primary care settings, i.e. a high-performing primary care system can prevent admission to hospital. They are also subject to good possibilities for self-management and their negative consequences can often be mitigated by secondary preventive efforts provided by health care professionals other than doctors, e.g. specialised diabetes nurses. Countries are increasingly using these, or similar, indicators in their reimbursement system for primary care. Bonus or incentive payments rewarding primary health care (PHC) providers whose patients are seeking less hospital care can be used to top up basic payments, regardless if it's funded based on an input, capitation or a fee-for-service basis. It does however require a clinic responsibility by geographic area or population group in a listing system (i.e. a system where all patients are enrolled with a primary care provider). This adds additional demands on the health information system, since all listed individuals and their health consumption must be followed.

MINSA collects and can report data for all four diagnoses (asthma, diabetes, COPD and CHF), i.e. this is an area for which data is more readily available. However, as described below, and in line with the data limitations which follow the rigidly fragmented health system, the administrative data is only collected from public institutions reporting to the HIS-MINSA system. The numerator is provided by the OGEI at MINSA. It is based on

admissions in all publicly owned hospital facilities and partial reporting by private facilities. The denominator is based on the national census by INEI. This means there is no coherence between the numerator and the denominator and this is a source of a probably large underestimate since the denominator represents the entire population while the numerator doesn't. The data reported to OECD on the same indicators by Mexico and Colombia have the same basic insufficiencies. In the case of Mexico both private hospitals and hospitals under the Ministry of Defence are missing. In the Mexican reporting, underestimation has been alleviated by not including the part of the population which is covered by schemes funding these institutions.

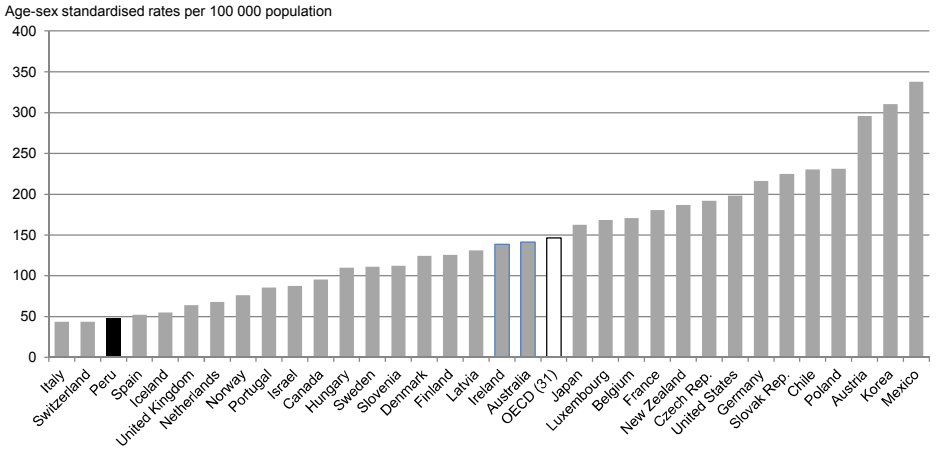
Being able to collect data on admissions in all hospitals, regardless of ownership and affiliation, would increase international comparability. It would also make hospital admissions a useful indicator to compare different segments of the population to inform domestic policy, since different population groups in practice use separate health systems, The groups with access to EsSalud, SIS, and other insurance arrangements have access to fundamentally different sets of providers on both primary and secondary levels of care, including differences in physical accessibility, quality of services, and referral options.

There are differences across countries in how the definition of an admission is applied. In Peru, the MINSA information system cannot separate and exclude patient cases transferring from one hospital to another, which needs to be excluded from the calculations to avoid "double counting". This problem is shared by several other countries reporting to OECD, including Mexico for some indicators, but also some smaller European countries, e.g. Denmark. Also, similar to other Latin American countries using census data for the population denominator, the older age groups are not possible to separate, i.e. 80–84 and 85+ are in one age group. Chile and Colombia handle data the same way for these indicators in their data submission to OECD. This is manageable for aggregate statistics but not satisfactory for domestic analysis.

Figures 6.4 and 6.5 show how the reported hospital admission rates for asthma and diabetes compare to OECD countries. These estimates should be treated with care because of the likely underestimation and given that this is a first attempt to submit this data in the OECD format. There are also generally comparability issues for all countries. Coding practices regarding principal diagnosis versus a secondary diagnosis varies across countries, which affects comparability, especially in the case of diabetes as many admissions are for secondary complications rather than the diabetes itself. In the case of Peru, there is no secondary coding as of yet, which might be a reason for the relatively low estimates. Coding practices in the clinical

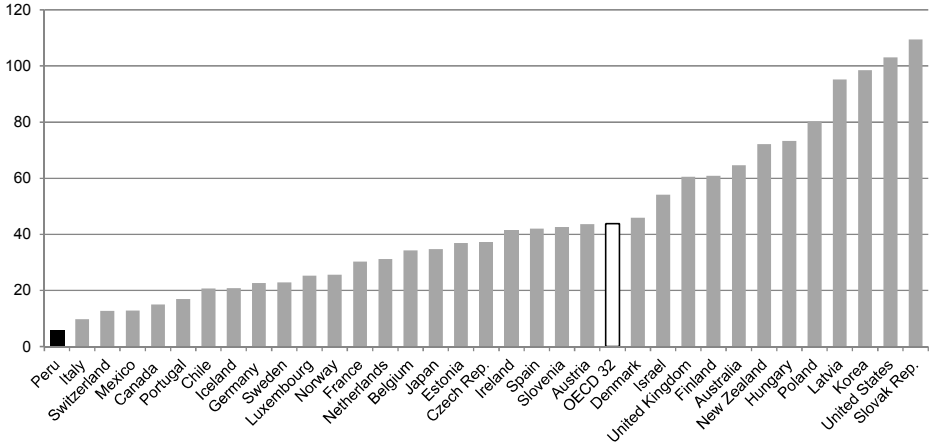
settings differ unavoidably, also within a country. The estimates submitted for Peru probably have inadequacies which lead to larger underestimates than is the case for the other countries which have worked during a long time to improve the data by the definitions agreed upon in the OECD collection.

Figure 6.4. Diabetes hospital admissions (adults), 2013 (or nearest year)



Source: OCED Health Statistics and MINSA.

Figure 6.5. Asthma hospital admissions (adults), 2013 (or nearest year)



Source: *OECD Health Statistics* and MINSA.

Figures 6.4 and 6.5 show how admission rates for asthma and diabetes vary widely across OECD. In addition to differences in data quality, the indicator differences can also be a result of underlying differences in disease prevalence, which may explain some variation in cross-country rates. This report is not assessing the performance of the health system. But the very low estimates of the hospital admission rates could also be an effect of generally low levels of hospitalisation compared to the OECD countries, besides prevalence and estimation issues as discussed above. This is per see not a result of effective PHC, but rather reflects the lower levels of hospital resources available.

Several aspects of prescribing in primary care can be used to build indicators of health care quality, some of which OECD collects

The overall volume of antibiotics prescribed in defined daily doses per day and user (DDDs/days/users, the standard measurement for volume of drugs is a basic indicator of rational prescription since antibiotics should be prescribed only where there is an evidence-based need, to reduce the risk of resistant strains. Therefore, total volumes of antibiotics prescribed, and second-line antibiotics as a proportion of total volume, have been validated as markers of quality in the primary care setting, which is also reflected in several national strategies. Over 30 OECD countries report this data and variation in consumption is large.

As a response to the questionnaire for this review, MINSA provided the type of volume data which is available. There is no standard monitoring of DDDs/days/users, but the data comprises enough information to calculate approximate numbers for this. The data includes the exact volume of prescribed pharmaceuticals by the full ATC (Anatomic Therapeutic Chemical) code. The difficulty, as is the case for much of the health data in Peru, is to attribute the consumption to the right population denominator. In principle it is the SIS insured population, but it is unclear if this is strictly followed in the data collection. For example, it probably also includes antibiotics prescribed to other patients visiting public facilities.

OECD also collects the share of prescribed antibiotics which are so called broad spectrum antibiotics and should be reserved for severe cases when first line antibiotics fail to be effective. These are quinolones and cephalosporins and are considered second-line antibiotics in most countries' prescribing guidelines. With the same basic problem defining the denominator and lacking information on total prescription, Peru can produce data on type of antibiotic consumption, although this was not asked for as part of this health data review.

In addition to pharmaceuticals prescribed per number of population which in the case of Peru's fragmented health system requires information which can relate prescription to the eligible population, OECD also collects a few indicators with prescription data which demands linkages to individual patients' diagnoses. It should be noted that only about a third of OECD countries report these types of indicators in the OECD data collection. This is also not available in Peru but is an aspect considered with the development of the new health information system. An example of rational and effective prescription of drugs which require this information is diabetic patients with hypertension. For this group angiotensin converting enzyme inhibitors (ACE-I) or angiotensin receptor blockers (ARB) are recommended in most national guidelines as first-line medications to reduce blood pressure, since they are most effective at reducing the risk of cardiovascular disease and renal disease..

OECD collects two indicators to measure the quality of acute care

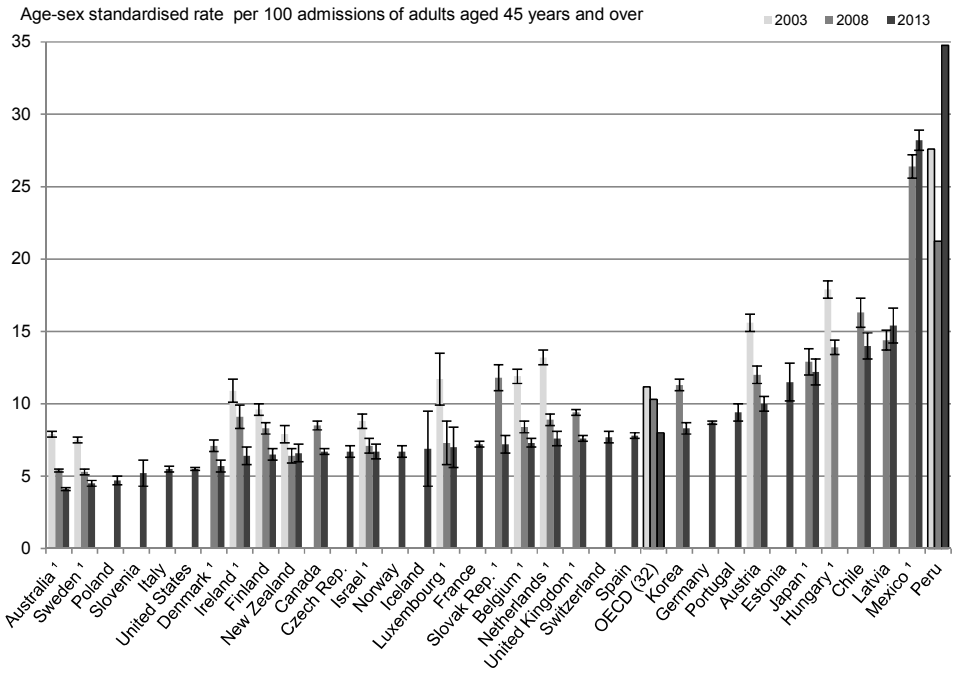
The 30-day AMI case-fatality rate and the 30-day stroke case-fatality rate measure the percentage of people aged 45 and over who dies within 30 days following admission to hospital for a specific acute condition. These measures reflect the quality of hospital processes of care, but can also be reflective of care processes before hospital care such as timely transport of patients and after hospital care such as effective primary care medical interventions. The indicators are naturally influenced by patient factors like severity of the diagnosis and prevalence of smoking. The statistical department of MINSA (OGEI) collects data for both AMI and Stroke which originates from their SEEM database.[4] It is based on discharges and just like the hospital admission data, only facilities under the SIS funding scheme and a few private facilities report to the database. In this review's questionnaire to Peru only the 30 day AMI case-fatality rate was asked for.

There are two basic approaches to report fatality rates for hospital care. The relatively straight forward method is to base it on admissions, which includes only cases which occur in the same facility as the patient was admitted. Admission based calculation is easier but also give lower values as it ignores deaths in other locations within 30 days. The alternative is to base the number of cases on fatal cases occurring also in other hospitals or elsewhere. This is a more robust indicator because it records deaths more widely (in fact all deaths) than the same-hospital indicator, but it requires a unique patient identifier and linked data which is only available in countries with relatively advanced health information systems. In 2015, 33 countries OECD countries have reported fatality rates based on admission, which is also the data Peru has submitted. Of these 33 countries, 21 countries have also reported patient based data. Among the countries reporting only

admission based data in 2015 are also Chile and Mexico. However, it is noted that both these countries have provided AMI rates based on linked data (at least for a sample of hospitals) for the current OECD Hospital Performance project indicating recent database developments. An important aspect of the Peruvian data quality is that even though it is based on a subset of providers, which do not serve a randomly selected average of the population, the same set of providers are reporting their data every year. This is the case for the data on both hospital admission and fatality rate indicators and suffices stable trend lines which provide information about quality of services for the included facilities.

Figure 6.6 shows the case-fatality rates within 30 days of admission for AMI when the death occurs in the same hospital as the initial AMI admission. All data is standardised by age and sex, i.e. the country admission rates are applied to a standard OECD population structure. Peru shows very high numbers for this indicator. As is pointed out also for the data on avoidable hospitalisation, performance data displayed in this report is not intended for any type of health system assessment, but rather to indicate the current levels of estimates which can help to assess the data quality itself. The Peruvian data on 30-day mortality is, just like the avoidable admission data, based on facilities in the MINSA/DIRESA network only, with single private providers added. For this indictor of hospital quality, it is not unlikely that performance is worse than in EsSalud-funded and private providers, for several reasons. Since the Peruvian data represents the population covered in the SIS scheme, these patients generally have a lower health and socio-economic status, which affects outcomes. For example, patients with diabetes have worse outcomes after AMI compared to those without diabetes, particularly if the diabetes is poorly controlled. Furthermore, public institutions are generally less generously funded in per capita terms. Other contributing factors to the low performance can be differences in access to hospital services and the fact that the main public system was built up around primary care services, with a focus on maternal- and child health. The Peruvian data on case fatalities is in line with Mexico, indicating that compared to OECD countries generally, some problems might be common explanatory factors. One of these factors can be poor performance is pre-hospital emergency services (Peralta, 2006).

Figure 6.6. Thirty-day mortality after admission to hospital for AMI based on admission data, 2003 to 2013



1. Admissions resulting in a transfer are included.

Source: OCED Health Statistics and MINSA.

A number of international indicators give an indication on the quality of cancer care

OECD regularly publishes data on three groups of cancer diagnoses; cervical cancer, breast cancer and colorectal cancer. For these cancers, data on screening coverage, mortality and five year relative survival rates are collected, which are respectively indicators of different dimensions of quality in cancer care. From 2017, OECD cancer data relies on the CONCORD project[5] which receives data from a large number of registries worldwide, including some Latin American counties. For this health data review, Peru was asked to provide data on five year relative survival of colorectal cancer. After breast and prostate cancer for women and men respectively, colorectal cancer is the most common form of cancer. Five-year survival rate is a broad indicator of quality in diagnosis and treatment including early detection, surgical techniques, radiation therapy and

combined chemotherapy. Improvements in diagnosis and treatment have contributed to increased survival over the last decade in all OECD counties. Indicators on screening capture other dimensions of quality and can be captured with survey methodology, an area in which Peru has well developed methodology, as discussed above.

Relative survival is the ratio of the observed survival experienced by cancer patients over a specified period of time after diagnosis to the expected survival in a comparable group from the general population in terms of age, sex and time period. The number of countries which monitor and report cancer survival has been increasing in recent years and a wide range of countries have cancer registries which enable international comparisons of cancer survival. Countries use either period analysis or cohort analysis to calculate cancer survival. Period analysis gives an up-to-date estimate of cancer patient survival using more recent incidence and follow-up periods than cohort analysis which uses survival information of a complete five-year follow-up period. The reference periods for diagnosis and follow-up years vary across countries.

Peru is currently unable to link diagnosis data to death registries and therefore cannot calculate relative survival rates in cancer. The national cancer institute (*Instituto Nacional de Enfermedades Neoplasicas*) has provided data from a regionally based cancer registry in the form of a cohort analysis of the mortality and incidence ratio. This data is collected from the Lima region only, covering 31.2% of the Peruvian population. While some OECD countries also provide survival rates based on a sample of the population, this Peruvian data represents a sample which has very different access to health services compared to the rest of the country, and differ in many other respects as well. Peru does have several projects to improve cancer care information, including the MINSA initiative Plan Esperanza, in which several stakeholders have come together to link data, among other measures.

Patient safety indicators may point to systemic problems in hospitals

OECD collects a set of indicators which are specifically measuring patient safety in hospital care. High rates of error during the delivery of medical care have been shown to constitute a large share of morbidity and mortality, and being a considerable cost to health systems (Kohn et al., 2000). While all cases of adverse events cannot be avoided due to the high-risk nature of some procedures, increased incidence at an aggregate hospital, regional or country level may indicate a systemic problem with safety culture in clinical practice.

For the purposes of the review, OECD requested Peru to provide rates of post-operative pulmonary embolism (PE) and post-operative deep vein thrombosis (PDV), relative to all surgical procedures. These conditions cause unnecessary pain and in some cases death, but can be prevented before, during and after surgery. The other hospital safety indicators collected by OECD are post-operative sepsis, post-operative wound dehiscence, obstetric trauma and foreign objects left in body after surgery.

For these indicators, secondary coding is particularly important because they rely on the identification of complication codes in secondary diagnosis fields. Surgical complications are defined as the number of discharges with ICD codes for complication in any secondary diagnosis field for the "surgical admission" and any diagnosis field for any subsequent related readmission within 30 days, divided by the total number of discharges for patients aged 15 and older. Peru has only recently begun to allow for the inclusion of secondary diagnose codes and only practice personal identification for tracking patients in a small set of the hospital system, hence cannot yet compile this type of data. Countries without access to a unique identifier are more likely to suffer from coding depth implications given the exclusive reliance on the reference admission for secondary diagnoses codes.

It is worth noting that so far only a minority of OECD countries, and none of the other Latin American countries participating in the OECD data collection, can submit data on hospital safety. Also for countries which do report these indicators, caution is needed in interpretation. Coding and reporting of diagnoses and procedures vary considerably across countries. Furthermore, higher adverse event rates may signal more developed patient safety monitoring systems and a stronger patient safety culture rather than worse care.

6.3. Conclusions

Although the survey instruments which Peru has developed and described in this chapter provide a substantial amount of valuable information, the various dimensions of medical quality outlined require investment in administrative data systems. The current survey tools do provide essential information and are likely to be important for future health systems development, but they need to be complemented with a system of administrative records with national coverage both in terms of geography and insurance affiliation. The planned health information system development described in Chapter 2 contains the essential building blocks and outlines how this should work. The main hurdles to measurement

described in this chapter can be generally overcome through the successful implementation of that plan.

The implementation of a unique patient identifier is generally required to link different types of information across registries and over time, which is seen as crucial to meet the data reporting demands in several indicators. The fact that 97% of the Peruvian population already have a national ID is clearly an advantage in developing an electronic health record system to provide such linkage.

Operability of information to enable linkages is the ability of different parts of the health system to read data the same way and communicate with each other. In this domain, the difficulties caused by the fragmentation of the system, are especially difficult. With many of the quality indicators, automatic data linkages are not enough for reporting. Common definitions and terminology are also needed, e.g. clinical information entered into a clinical records system in an EsSalud hospital must be possible to be read both in a SIS-funded public health care facility and the central SUSALUD repository.

Secondary diagnosis coding and the ability to flag pre-existing conditions upon hospitalisation will allow for more advanced monitoring of hospital quality, e.g. enable the reporting of patient safety indicators. A related issue is procedure coding. Many indicators rely on the presence of a diagnosis code and a procedure code. For example, postoperative complications, obstetric trauma, lower extremity amputation of people with diabetes and hip fracture surgery within 48 hours.

The above shortlist is not merely a matter of implementing more advanced medical record systems. The data quality and ability to build robust indicators is highly dependent on coding practices in the local clinical environment. Therefore, training and a structure for continuous education of relevant staff in coding standards is needed to improve coding depth and quality of data.

Besides the technical aspects of building a robust central health information system which covers all requirements of a modern system allowing for quality assessment, Peru can do more to move the focus from the norm based approach in providing health services to measuring quality and outcomes. Structure and process indicators are important to understand how the system works, but outcome indicators which service providers can be accountable for are more directly linked to quality as in safety and effectiveness of services. This approach is not new to Peru,[6] but should be pushed to increase focus on care quality.

Peru also needs to build stronger strategic analytical capacity than is currently the case. This is crucial to build demand for relevant data, which in itself supports the production of health information data, which enables analysis. In the case of quality of care, the lack of data makes informed policy choices difficult, regardless if this data is produced by international standards or not. For example, crude quality measurements of primary health care like hospital admission rates by diagnoses could be developed relatively easy, with regular compilations by insurance scheme and geographical area. These estimates would not necessarily follow international standards for measuring these indicators but could help guide policy. Currently quality is indirectly part of the universal health coverage (UHC) monitoring by tracking immunisations rates and similar coverage of services in PHC. Including more dimensions of quality of care into the monitoring of UHC would inform about the real difference in effective coverage.

Notes

1. See for example Core Indicators 2016. Health Situation in the Americas: http://iris.paho.org/xmlui/handle/123456789/31289.
2. For more on OECD quality indicator reports, see http://www.oecd.org/els/health-systems/health-care-quality-indicators.htm. See also OECD Health Policy Study: Improving Value in Health Care, Measuring Quality, 2010.
3. A full list of the quality indicators sent to OECD member states, including definitions, are available from the OECD database: http://stats.oecd.org/.
4. *Sistema de Información de Egresos y Emergencia* (Information System for Discharges and Emergencies).
5. http://csg.lshtm.ac.uk/research/themes/concord-programme.
6. See for example Dirección de Calidad en Salud, 2006, Sistema de Gestión de la Calidad en Salud – Documento Técnico, Dirección General de la Salud de las Personas, MINSA, http://www.minsa.gob.pe/dgsp/observatorio/documentos/sistema/RM-519-2006%20SGC.pdf.

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DATA AND STATISTICS

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