# COVID-19 Vaccine Post-Introduction Evaluation Report

# (Mini-cPIE).

## Bolivia, 6 to 8 October 2021


**Comprehensive Family Immunization (IM)**

**Family, Health Promotion, and Life Course (FPL)**

**Pan American Health Organization/World Health Organization**

**Washington, DC, 5 November 2021**

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## I. ACKNOWLEDGEMENTS

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We also acknowledge the work carried out these past months and the time given to this evaluation by those responsible for the Expanded Program on Immunization (EPI) at national and subnational level

Finally, we would like to thank the National Immunization Committee, the members of the Advisory Committee, the interviewed partners and organizations and the PAHO/WHO Representative in Bolivia for their collaboration.

## II. EXECUTIVE SUMMARY

The COVID-19 pandemic forced countries all over the world to implement mitigation strategies at all levels that also affected many areas of people's lives and the performance of health systems. One of the pillars of the strategy, the tenth in the World Health Organization (WHO) model, was the introduction of COVID-19 vaccines. Never in the history of health has there been a scenario in which, as the result of the spread of an infectious agent and the obvious threat to our lifestyles and economies, a significant range of vaccines to immunize a large part of the population has been available in a short time and almost simultaneously. However, the variety of platforms for these new products, and their different storage and distribution requirements, as well as their different patterns of effectiveness and, above all, initial shortages in the face of widespread demand, made the first months of 2021 a genuine health challenge.

In this context, accepting an invitation from the Pan American Health Organization/ World Health Organization (PAHO/WHO), the Government of the Plurinational State of Bolivia, through its Ministry of Health and Sports decided to carry out a reduced country level intra-action review (IAR)[1]2 (Mini-cPIE) using the methodology proposed by the WHO for this purpose. The objective of the evaluation was to analyze the COVID-19 vaccination response to identify best practices, weaknesses and lessons learned and to propose recommendations to update and improve the National Deployment and Vaccination Plan (NDVP) against COVID-19.

Between 6 and 8 October 2021, semi-structured interviews were held in virtual sessions. At the time of this evaluation, Bolivia had introduced 5 different vaccines in the campaign against COVID-19, reaching a total of 13,699,380 doses (increasing to 15,222,230 on 31 October). The first batch of vaccines arrived in the country on 29 January, and this was the Sputnik V vaccine from the Gamaleya Institute, and the largest number of doses (9,000,000) received to date corresponds to the SARS-CoV-2 Vaccine (Vero Cell), Inactivated (InCov), from the Sinopharm/BIBP laboratory.

The Mini-cPIE methodology has made it possible to swiftly identify the critical areas to be strengthened, as well as best practices and lessons learned, which support Bolivia and other countries in the region.

[1] WHO Mini-cPIE (COVID-19 vaccination IAR): What is it and how to conduct one? Available at: https://bit.ly/3HTFdrI

[2] WHO (2020) Guidelines for internal evaluation during application of the measures adopted in the country against COVID-19 (EIDA). Available at: https://bit.ly/3rQaDtg

The Mini-cPIE carried out in Bolivia has allowed the following conclusions:

- COVID-19 vaccination was taken on as a political priority, led by the President of the Plurinational State of Bolivia, with different ministries integrated, such as Foreign Affairs, Economy and Finance and Health and Sports, facilitating the processes of investment, timely availability of vaccines and supplies, mobilization of resources, flexibility of regulatory processes and social communication.

- Important advances in vaccination have been seen, with 54% coverage, with a complete national scheme for risk groups. However, there are major gaps in those over aged 60 and rural residents, so there is a need to evaluate the causes at local level and develop specific strategies to cover them, including hiring human resources.

- We note the contributions made by the national programs of Misalud, Telesalud, Bono Juana Azurduy, Universities and private initiative.

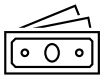
- The Expanded Programme on Immunization (EPI), as well as other health essential services, have been negatively affected by the pandemic, which requires primary care to be strengthened to recover health essential services and the EPI routine vaccination coverages.

- We recognize the support of the PAHO/WHO Representative in the management of COVID-19 vaccines, as well as the financial support from Canada, GAVI and UNICEF.

- Areas of technical cooperation have been identified for 2021 and 2022, which will be important for COVID-19 vaccination as well as for the EPI regular activities.

## III. ACHIEVEMENTS, LESSONS LEARNED AND CRITICAL AREAS

### Achievements

| | |
|---|---|
|  | National policy priority, led by the President of the Plurinational State of Bolivia. |
|  | Technical support from the National Immunization Committee and other vaccination rollout committees. |
|  | Regulatory frameworks applied exceptionally and rapidly, without affecting supervision of the vaccines, accompanied by improvements in information transparency. |
|  | Allocation of resources from the National General Treasury to buy 11,469,960 doses, which correspond to 75% of the total vaccines: the other 25% comes from COVAX and donations. |
|  | Increase in vaccine storage and distribution capacity. |
|  | Commitment and standing of health personnel, and a stronger EPI team at central level. |
|  | Generation of strategic alliances through summits with governors and mayors, promoting vaccination, universities, and private initiative. |
|  | Coordination with the media to broadcast messages. |
|  | Articulated work between ADEMED, EPI and SNIS/VE for ESAVI oversight. |
|  | Development of an electronic vaccination registry and document (QR code). |

**Best practices and lessons learned, by component evaluated**

| *Component* | *Best Practices and Lessons Learned* |
|---|---|
| ***Planning, Coordination, and Essential Services*** | **Best practice:** Involvement of the Ministerial Office in mobilizing resources to implement the vaccination plan. |
| | **Lesson learned:** The limited participation of sub-national governments in the planning processes did not permit its empowerment. |
| ***Regulation*** | ***Best practice***: Flexibility in regulatory frameworks on an exceptional basis, without weakening vaccines control. Broadening this good practice will improve the response to other emergency situations and the regular program. |
| | ***Lesson learned***: There were improvements in the transparency of the information implemented by AGEMED. |
| ***Financing*** | **Best practice:** Implementation of an austerity policy ((reduction of administrative expenses of public institutions), making extreme efforts by the central government to allocate part of these resources for health care and the Vaccination Plan (purchase of vaccines, supplies and medicines). |
| | **Lesson learned**: Permanent monitoring and the sub-national governments accountability regarding their co-responsibility for implementing the vaccination encourages them to honor their commitments. |
| ***Human resources*** | **Best practice:** Rapid mobilization and training of healthcare workers, both from the Ministry of Health and Sports, and from the universities and other institutions, which enabled the advance of vaccination activities. |
| | **Lesson learned**: Extended use of virtual training across various platforms was implemented, which could be applied to other emergencies and to the regular EPI. |
| ***Cold chain, supply, logistics and vaccines management*** | **Best practice**: Immediate customs duties waived and tax exemption for vaccines and supplies. |
| | **Lesson learned:** Intra- and extra-institutional coordination and linkage, allowed the use of ultra-low temperature equipment with specialist professional control. |
| ***Scientific investigation*** | **Best practice:** Availability of University personnel. |
| | **Lesson learned:** Agreements between public/private Universities and the Ministry of Health and Sports to carry out investigations. |

| *Component* | *Best Practices and Lessons Learned* |
|---|---|
| ***Vaccine safety*** | **Best practice:** Mass vaccination points complying with the technical standards for ESAVI prevention and care. |
| | **Lesson learned:** The multidisciplinary and external perspectives from outside the Ministry of Health and Sports has enabled the process for investigation and analysis of severe ESAVI to be enriched. |
| ***Information and monitoring system*** | **Best practice**: Use of the regular nominal registry program system for the COVID-19 vaccine. |
| | **Lesson learned:** Adequate functioning of the RNVe requires appropriate architecture to avoid system saturation. |
| ***Social communication and mobilization*** | **Best practice:** Involving recognized medical professionals from outside the Ministry of Health and Sports as spokespeople for COVID-19 vaccination. |
| | **Lesson learned:** The communication plan for the introduction of the vaccine did not have clear and specific segmentation for the different populations included under the vaccination plan (by urban/rural geographic area, ecological type, plateau, valley, plain, economic income, age group, ethnicity, etc.). This is necessary to ensure that the audiences are reflected and identified with the messages and channels of communication. |

**Critical areas for achieving vaccination target: 70 out of 100 people by June 2022**

| *Component* | *Recommendation* |
|---|---|
| ***Planning, Coordination, and Essential Services*** | • Update micro plans to resolve gaps, with a focus on areas that are hard to access and/or where vaccine rejection is strongest.<br>• Plan and finance effective vaccination strategies to ensure access to vaccination in rural areas |
| ***Financing*** | • Guarantee prompt financing at sub-national levels, with an emphasis on human resources, the cold chain, social communication, and mobilization.<br>• Strengthen management of financing and negotiations with bilateral and multilateral organizations, to identify weaknesses and sources of financing. |
| ***Human resources*** | • Hiring human resources to absorb decentralization of the vaccine, fill gaps and accelerate the recovery of essential services.<br>• Fit the EPI into hierarchy of the organizational structure of the Ministry of Health and Sports and SEDES.<br>• Strengthen the structure of EPI at departmental level.<br>• Implement a recognition and incentives plan for health workers. |
| ***Social communication and mobilization*** | • Implement a sub-national level communication campaign to give information about the vaccine's safety and effectiveness and generate demand.<br>• Develop a plan to approach anti-vaccine groups and reach reticent populations, rapidly and with transparent information from reliable sources.<br>• Strengthen community participation strategies that involve local leaders to empower them to be protagonists in communication in the community and increase work within the Bolivian social network.<br>• Assign financial resources at all levels. |
| ***Cold chain, supply, logistics and vaccines management*** | • Negotiate with departmental and municipal governments the assignment of personnel to manage the cold chain, supplies and logistics of the vaccines.<br>• Acquire and use temperature monitoring devices to send vaccines at all levels.<br>• Develop an administrative module in the electronic vaccination register (RNVe) that allows generating information on the use of vaccines and percentages of waste. |
| ***Vaccine safety*** | • Regulate the National Committee on Vaccine Safety<br>• Carry out timely and complete ESAVI investigations, following the WHO methodology.<br>• Transfer the database of all ESAVIs to PAHO, as part of Bolivia's adherence to the ESAVI Regional Surveillance System<br>• Strengthen the Departmental Committees on Vaccine Safety.<br>• Strengthen the vaccine safety communication plan to include crisis communication for the different events. |
| ***Information and monitoring system*** | • Ask governors, mayors, and networks for support to improve physical infrastructure and equipment in health facilities.<br>• Ensure internet availability and connectivity between health facilities, as part of the public policy for access to ITS.<br>• Incorporate social security and private sector in the implementation and use of the system. |
| ***Supervision*** | • Implement and finance a training supervision plan at all levels.<br>• Systematize supervision to facilitate monitoring of compliance with recommendations. |

## IV. INTRODUCTION

Since the creation of the Expanded Programme on Immunization (EPI) in 1977 to date, the average use of vaccines in the national immunization program in American countries/territories has increased from six to more than 16 vaccines, with COVID-19 vaccines the latest to be added.

While the Americas have had more than 40 years' experience in programmed immunization, supported by the achievements made with significant reductions in several vaccine-preventable diseases, such as smallpox, polio, rubella, congenital rubella syndrome, measles and neonatal tetanus, the introduction of vaccines to control the COVID-19 pandemic has posed previously unseen challenges.

Since approval of the first COVID-19 vaccine in December 2020, until the moment of the Mini-cPIE, the WHO has approved 6 vaccines for emergency use, and 13 more have been approved by other countries3. There are various platforms, such as mRNA, inactivated virus, viral vectors, and proteins which have determined different requirements for their distribution, storage and administration chains. Of the more than 6.838 billion doses administered worldwide, the Americas have given more than 1.2 billion doses, which represents approximately 18%.

The vaccination target groups have also been different from those that the EPI usually has as an objective in many countries, particularly adults in the productive phase of life. In addition, there is also the difficulty of achieving the highest short-term coverage in a scenario of an imbalance between global supply and demand.

Many countries have had to incorporate other ways of acquiring vaccines into their traditional mechanisms such as the PAHO Revolving Fund or the COVAX mechanism, such as bilateral negotiations and donations.

In this context, and as part of the WHO recommendations, countries have been provided with a guide to planning the deployment of COVID-19 vaccines4 and a methodology for prompt analysis of the actions that make up the different pillars of response to the pandemic, of which the Mini-cPIE has been developed as part of the immunization Pillar X.

Thus, to review the early phases of the rollout of COVID-19 vaccine implementation in the Plurinational State of Bolivia and to identify challenges needing corrective and practical measures for continual improvement and collective learning, a PAHO's adapted Mini-cPIE was carried out between 6 and 8 October 2021. The following components were included in this evaluation:

- **Planning, Coordination, and Essential Services**
- **Regulation**
- **Financing**
- **Cold chain, supply, logistics and vaccines management**
- **Human resources**
- **Social communication and mobilization**
- **Vaccine safety**
- **Information and monitoring system**
- **Scientific investigation**

[3] View Hub, Accessed 18 October 2021. Available at: https://bit.ly/3BXtHJL
[4] World Health Organization (WHO) (2020). Guidance on developing a national deployment and vaccination plan for COVID-19 vaccines Available at: https://bit.ly/3BqkBER

## V. EVALUATION OBJECTIVES

### Overall objective

To analyze the deployment of COVID-19 vaccination, to identify best practices, weaknesses, lessons learned, and propose recommendations.

### Specific objectives

- Describe the country context, procurement processes, products procured, and the status of COVID-19 vaccine deployment in the country.
- To identify the achievements during the COVID-19 vaccine deployment process in each of the components analyzed.
- Analyze the challenges associated with the processes of procurement, storage, distribution and administration of the COVID-19 vaccine, the strategies implemented, and propose recommendations for the short and medium term.
- Document and apply lessons learned to strengthen the National COVID-19 Vaccine Deployment Plan and the routine vaccination program.

## VI. METHODOLOGY

The Mini-cPIE is based on the methodology proposed by the WHO for internal evaluation during application of the measures adopted in the country against COVID-19 (EIDA), known as the Intra Action Review (IAR)[1]. The aim of the methodology is to evaluate the functionality of the public health systems and the response to the pandemic in the different pillars into which it is organized. The Mini-cPIE will allow countries to assess new ways for improvement and to make corrections to their NDVP for tackling the pandemic and, through cooperation and the systemization of lessons learned, share experiences with other countries or with lower levels within their own health system.
This evaluation was focused on Pillar X of immunizations in the face of the pandemic, without prejudice to incorporating the contents of Pillar IX, which corresponds to strengthening essential health services. The evaluation focuses on actions taken at national level for each component of it Coronavirus Vaccination Plan (PVCC, as per it acronym in Spanish) and in certain components the sub-national level of the 9 Departments into which the country is organized.

### i. Evaluation process

The Mini-cPIE process begins with the country accepting the PAHO/WHO's invitation to evaluate the vaccination component of the pandemic response and was organized into 4 phases as shown in **Figure** of the Mini-cPIE Bolivia **1.**

a. *PAHO/WHO design and preparation*

This phase involved methodological and technical definitions of the evaluation process, including formation of the evaluation group, development of terms of reference for national consulting and adaptation of the evaluation instrument, including trigger questions and indicators.

b. *National preparation*

Development via consultation and with the support of the PAHO/WHO representation in Bolivia. This phase involved preparation of the evaluation at national level, defining national stakeholders for interviewing, collecting information on vaccine deployment and indicators for the components of the PVCC. In this phase, and in conjunction with the PAHO/WHO Comprehensive Family Immunization (IM) Unit, the logistics plan was developed.

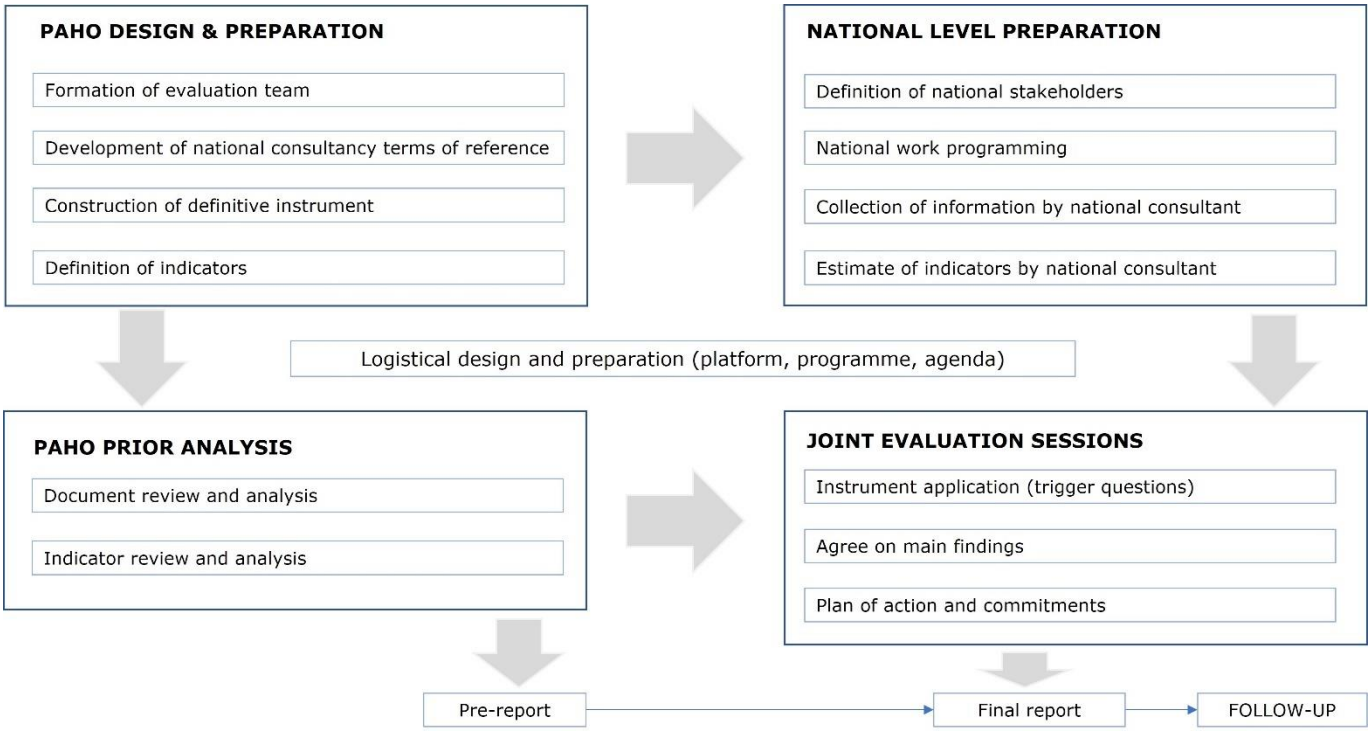
c. *Prior Analysis*

With the information collected at national level, review of reports and the country's background, a pre-report, a definitive evaluation instrument and the interview agenda are all defined.

d. *Evaluation sessions*

The evaluation was performed by PAHO/WHO through virtual interviews with the national authorities involved in Pillar X and with the technical managers of each component of the PVCC.

**Figure 1:** Diagram of the preparation phases of the Mini-cPIE, Bolivia




### *ii. Instrument*

The set of indicators and trigger questions proposed for Pillar X by WHO, adapted by the region's PAHO/WHO evaluation team, was used as an instrument. The final instrument consisted of 21 indicators and 63 trigger questions (**Annex 1**).

### *iii. Participants*

National stakeholders included those in charge of PVCC policies and vaccine financing and purchasing at national level; the vaccination campaign technical managers at national and sub-national levels; PVCC's components responsible; and other persons involved in the introduction of COVID-19 vaccines (**Table 1**).

### *iv. Interviews*

The interviews took place virtually between 6 and 8 October

**Table 1:** List of authorities and professionals interviewed during the Mini-cPIE. Bolivia, 6 to 8 October 2021**.**

| Institution | Job title | Name |
|---|---|---|
| Ministry of Health and Sports | Minister of Health | Jeyson Marcos Auza Pinto |
| | Vice Minister of Promotion Epidemiological Surveillance and Traditional Medicine | María Rene Castro Cusicanqui |
| | Director-General of Epidemiology | Freddy Armijo Zubieta |
| | Director-General of Planning | German Crespo |
| | Director-General of Health Services | Igor Pardo |
| | Director-General of Administrative Subjects | Janeth Alemán |
| | Head of Expanded Program on Immunization | Max Enríquez Nava |
| | Chief of Staff | Eduardo Ayllon |
| | Head of the Social Communication Unit | Iván Ayaviri |
| | PAHO/WHO Support Consultant | Roger Chino |
| | SNIS/VE National Coordinator | Rocco Abruzzese |
| | Head of Communication for the Expanded Program on Immunization | Paula Vera Chávez |
| | ESAVI EPI Manager | Carlos Echazu |
| | EPI Logistics Manager | Claudia Carrizales |
| | MSD Budget Manager | Ciro Puma |
| | EPI Supervisor | Mary Quintanilla |
| | EPI Supervisor | María Teresa Bonifaz |
| | COVID-19 Focal Point | |
| | EPI cold chain technician | Efraín Loza |
| | EPI logistical technician | Joaquín Quironda |
| SEDES | Manager, EPI Chuquisaca | Franklin Morales Barroso |
| | Manager, EPI Oruro | Ever Pérez |
| | Manager, EPI Potosí | David Choquectilla Rodríguez |
| | Manager, EPI Tarija | Ricardo Jerez Flores |
| | Manager, EPI Beni | Mery Parada Cholima |
| | Manager, EPI Pando | Roxana Lima Nakashima |
| | Manager, EPI Santa Cruz | Dorian Jiménez |
| | Manager, EPI La Paz | Rosmery Azurduy |
| | Manager, EPI Cochabamba. | Gaby Quiroga |
| National Agency for Medicines and Technologies in Health | Director | Yuri Quisberth |
| | Head of the Health Technologies Evaluation and Rational Use Department | Julio Antonio Cáceres |
| National Immunization Committee (CNI) | President of the National Immunization Committee (CNI) | Adalid Zamora Gutiérrez |
| | National Immunization Committee (CNI) | Rolando González |
| University of San Andrés | Head of Research | Roger Carvajal |
| | Researcher | Carolina Terán |
| | Lecturer | Guido Zambrana Ávila |
| National Health School | National Executive Directorate | María Isabel Fernández Canqui |
| Ministry of the Economy and Public Finance | Vice-Minister of the Budget and Fiscal Accounting | Zenon Pedro Mamani Ticona |
| Ministry of Foreign Affairs | Vice-Minister of Foreign Trade and Integration | Benjamín Juan Carlos Blanco Ferri |
| Health Store and Supply Center | Director | Juan Nacer Villagómez Ledezma |
| Short-Term Social Security Supervision Authority (ASUS) | Health Service Surveillance and Control Technical Directorate | Ramiro Walter Narváez |
| UNICEF | Health and Nutrition Official | Carmen Lucas |
| PAHO/WHO | PAHO/WHO Representative in Bolivia | Alma Morales |
| | Transmissible Diseases and Health Environmental Determinants Consultant | Alfonso Tenorio |
| | Communications Manager | Sandra Mallo |
| | RNVe Manager - PAHO/WHO Consultant | Álvaro Choque |

## VII. OVERALL CONTEXT

### a. Administrative, demographic, and economic background

The Plurinational State of Bolivia estimated a national population of 11,841,955 for 2021, of whom 6,228,663 are persons over 18 years of age.

Administratively, the country is divided into 9 departments and 340 municipalities. 70.04% of the population lives in urban areas and 29.96% in rural areas. 52.4% of the population is concentrated in the 9 departmental capital cities and in El Alto. The 4 cities with the biggest population concentration are: Santa Cruz, El Alto, La Paz, and Cochabamba.

According to the latest 2012 National Census, 41.7% of the Bolivian population aged over 15 years of age are of indigenous origin, distributed as follows: Quechua (43.7%), Aimara (38.1%), and Chichas (1.4%) who mainly live on the plateau; in the lowlands, there are Chiquitano (3.5%), Guaraní (2.3%) and Moxeño (1%), who when added to the other 10% comprise the 36 recognized indigenous peoples. Bolivia has ratified the main international Human Rights agreements for indigenous peoples, and Bolivia adopted the name Plurinational State in 2009.

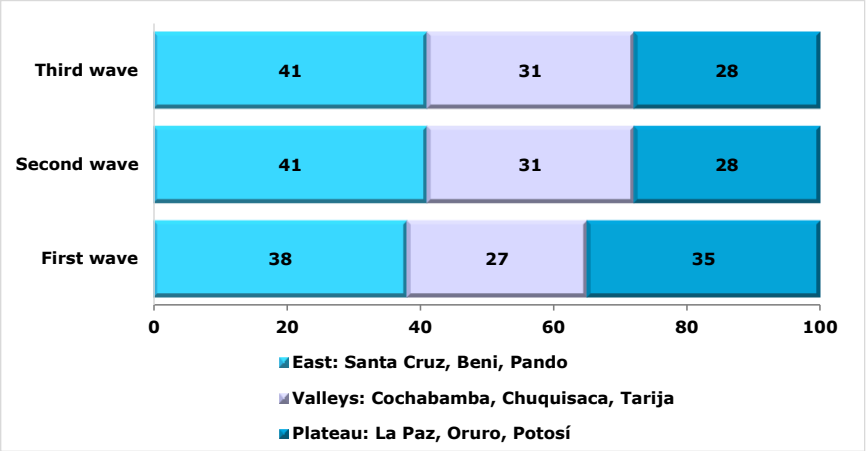
In 2020, the Bolivian economy recorded an 8.2% contraction, the worst fall since 1953 with an almost general fall in all economic activities, which can be explained by the COVID-19 pandemic and the rigid quarantine measures and other restrictions applied to contain it, and the modifications to the community social and productive economic model. The Gross Domestic Product (GDP) of Bolivia in 2020 was US$ 45.118 million.

Falls in the manufacturing, transport, mining, and construction sectors explain this decline, while agriculture, public administration and communications expanded, but not to an extent that would compensate for the cited falls.

## b. COVID-19 epidemiological situation

Since the first confirmed cases of COVID-19 in the country on 10 March 2020, to 31 October 2021, 513,810 cases have been reported, including 18,925 cumulative deaths. Along with other countries, in Bolivia cases have been seen in epidemic waves, with three waves identified as of 31 October 2021. In the first wave 28% of cases were reported, with 28% in the second wave and 44% in the third; in these three periods the highest proportion of cases was in the eastern region (**Figure 2**), although the plateau has a higher concentration of the population (37.6%).

**Figure 2:** Percentage distribution of confirmed cases of COVID-19, by ecological niche and epidemic wave, as of 31 October 2021.




**Source:** General Directorate of Epidemiology of the Bolivian Ministry of Health and Sports.

In the first epidemic wave, Tarija had the highest incidence rate, in the second wave, Tarija was first again, followed by Santa Cruz and in the third wave, in decreasing order, the highest rates of incidence were seen in Chuquisaca, Cochabamba, Santa Cruz and Oruro (**Table 2**).

**Table 2**: Number of cases and incidence rates per 100,000 inhabitants, by department and epidemic waves. Bolivia, 10 March 2020 to 31 October 2021.

| Department | | Total | First wave | | Second wave | | Third wave | |
|---|---|---|---|---|---|---|---|---|
| | | Incidence rate | # of cases | Incidence rate | # of cases | Incidence rate | # of cases | Incidence rate |
| East | Santa Cruz | 5.174 | 44.87 | 1.334 | 53.123 | 1.579 | 76.016 | 2.260 |
| | Beni | 4.07 | 7.34 | 1.447 | 4.001 | 789 | 9.300 | 1.834 |
| | Pando | 4.313 | 2.402 | 1.514 | 1.503 | 947 | 2.939 | 1.852 |
| Valleys | Cochabamba | 3.613 | 14.238 | 682 | 11.736 | 562 | 49.429 | 2.369 |
| | Chuquisaca | 5.087 | 8.021 | 1.226 | 9.055 | 1.384 | 16.195 | 2.476 |
| | Tarija | 6.634 | 16.651 | 2.813 | 22.611 | 3.821 | 0 | 0 |
| Plateau | La Paz | 3.392 | 35.489 | 1.174 | 27.884 | 922 | 39.303 | 1.296 |
| | Oruro | 4.453 | 6.155 | 1.122 | 6.710 | 1.223 | 11.561 | 2.108 |
| | Potosí | 2.646 | 9.426 | 1.038 | 5.059 | 557 | 9.528 | 1.050 |
| Total | | 4.226 | 144.592 | 1.221 | 141.682 | 1.196 | 214.171 | 1.809 |

**Source**: General Directorate of Epidemiology of the Bolivian Ministry of Health and Sports

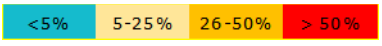
Since the start of the pandemic until 31 October, 18,925 cumulative deaths were reported, with an estimated case-fatality rate of 3.7%. When fatality rate is analyzed by wave, it is shown that it decreased from 6.2% to 2.7% between the first and second waves, and then remained at 2.7% in the third wave.

### c. Impact of the COVID-19 pandemic on the health services

Most of the health system's essential functions were affected by the pandemic in Bolivia, according to the results of the second round of the essential services continuity during the COVID-19 pandemic survey 5, conducted by WHO between January and March 2021, In the interviewees' opinion, TB diagnosis and treatment and the prevention of neglected diseases have been interrupted by more than 50%. The immunization program, for its part, had an interruption of between 5% and 25% (**Table 3**).

**Table 3:** Percentage of interruption of the essential health services because of the pandemic[5]. Bolivia, January to March 2021**.**

| Essential health service delivery area or channel | Essential health service | Disruption level |
|---|---|---|
| Primary care | Health promotion and prevention services | 26-50% |
| | Routine scheduled visits | <5% |
| | Visits for undifferentiated symptoms | <5% |
| | Referrals to specialist consultancies | <5% |
| | Renewal of chronic drug prescriptions | 26-50% |
| Emergency, critical care, surgeries | Elective surgeries | <5% |
| | Referral for urgent conditions | 26-50% |
| | Triage-based emergency units | 5-25% |
| | Emergency obstetric surgery | 5-25% |
| Reproductive, maternal, child to adolescent and nutritional health | Family planning and contraception | 5-25% |
| | Antenatal care | 5-25% |
| | Handling moderate to severe malnutrition | <5% |
| | Postnatal care | 5-25% |
| | Paediatric care | <5% |
| | Sexual and gender-based violence prevention and response | 5-25% |
| | Safe abortion and post-abortion care | 5-25% |
| | Institutional births | 5-25% |
| Immunisations | Routine intramural immunisation services | 5-25% |
| | Routine extramural immunisation services | 5-25% |
| Communicable diseases | HIV prevention services | 5-25% |
| | HIV testing | 5-25% |
| | TAR continuation | <5% |
| | TAR indication | <5% |
| | Hepatitis B and C diagnosis and treatment | 5-25% |
| | TBC diagnosis and treatment | > 50% |
| | Malaria prevention campaign | <5% |
| Neglected infectious diseases (NIDs) | NID chemotherapy prevention campaigns | > 50% |
| | NID awareness campaigns | 26-50% |
| Non-communicable diseases | Hypertension control | 26-50% |
| Mental and neurological changes and substance abuse | Psychotherapy, counselling and psychosocial interventions | 26-50% |
| | Neuroimaging and neurophysiology | 5-25% |
| | Mental health, disability or dementia services for adults | 26-50% |
| | Handling emergencies | 26-50% |




**Source**: WHO (2021). Results of the second round of the essential services continuity during the COVID-19 pandemic survey.

[5] WHO (2021). Results of the second round of the essential services continuity during the COVID-19 pandemic survey. Available at: https://bit.ly/35Bo3Re

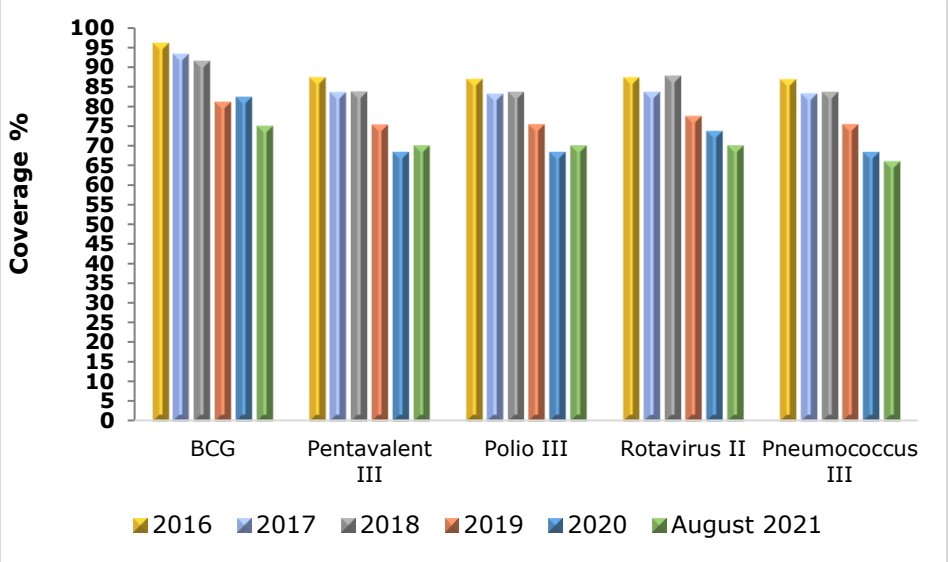
### d. EPI situation in the context of the COVID-19 pandemic.

Bolivia has a Single Health System made up of public sector health services, short-term social security, and a private health sector, the first being the one that covers most of the population. The national health authority - the governing body - is the Ministry of Health and Sports, and its functions are to guarantee the health of the population through promotion and prevention, treatment, and rehabilitation of diseases. At departmental level, the health system is set up in accordance with its territorial distribution in 9 Departmental Health Services (SEDES), and at local level through autonomous municipal governments, responsible for primary and secondary care.

Within the Ministry of Health and Sports, the EPI is in the Vice Ministry of Promotion, Epidemiological Surveillance and Traditional Medicine, dependent on the General Directorate of Epidemiology. In Bolivia, the Vaccine Law (#. 3,300) regulates the acquisition, storage, and distribution of vaccines, defining them as the national interest.

Vaccination in Bolivia is universal and takes place indistinctly in any health facility, therefore information is collected from all subsectors: public, private, short-term insurance and non-governmental organizations, to calculate coverage.

**Figure 3:** Vaccination coverage in children aged under one year, Bolivia 2016-2021*




*As of August 2021

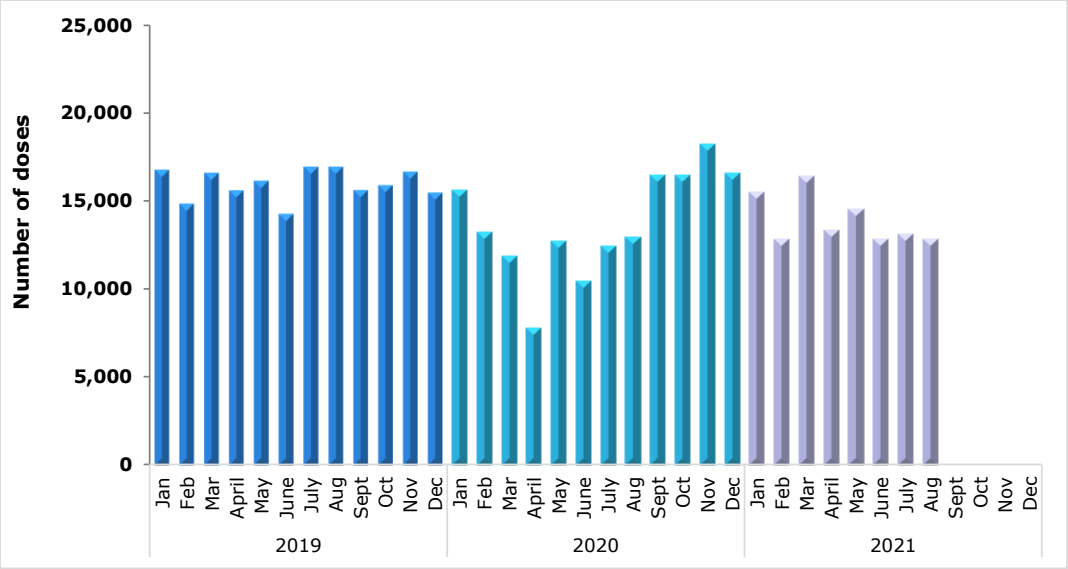
**Source:** National Health Information System (SNIS) of the Bolivian Ministry of Health and Sports.

Prior to the COVID-19 pandemic, the vaccine schedule of the EPI included BCG, Pentavalent (diphtheria, tetanus, pertussis, hepatitis B, haemophilus influenzae), polio, pneumococcal, rotavirus, HPV, MMR (measles, rubella and mumps), adult dT and seasonal influenza for older adults and younger children. However, the increase in the number of immuno-preventable diseases covered by the EPI showed a downward trend in the 4 years prior to the pandemic in terms of vaccine coverage in children aged under 1 year (except for the influenza vaccine), with a fall in BCG from 96% to 88% and for third dose vaccines at 6 months from 87% to 78% (**Figure 3).** In 2020, meanwhile, all vaccines decreased in terms of coverage, including seasonal influenza. By August 2021, coverage was around 70%, but due to information latency it is not possible to predict the final figures.

The context of the COVID-19 health emergency limited and continues to limit regular vaccination processes and epidemiological surveillance of vaccine-preventable diseases. In 2020, the Ministry of Health and Sports, via the EPI with support from PAHO/WHO and the National Immunization Committee (CNI), issued technical guidelines for vaccination in accordance with the COVID-19 epidemiological scenario: during 2021, it was decided to carry out follow-up measles and polio vaccination campaigns intensify the strategies to reach the unvaccinated.

The following figure (**Figure 4**) shows the monthly number of polio doses given in 2019, 2020 and to August 2021. Compared with 2019, a significant decrease is observed in the first months of the pandemic with a moderate recovery at the end of 2020. By August 2021, the 2019 levels had not been reached.

**Figure 4:** Number of OPV3 doses given per month. Bolivia, 2019-2021*




*As of August 2021.
**Source**: National Health Information System (SNIS) of the Bolivian Ministry of Health and Sports.

### e. General elements of COVID-19 vaccine deployment

Between 29 January and 31 October 2021, Bolivia has received vaccines from 5 different producers/laboratories, with a total of 15,222,230 doses. The largest amount of vaccine received was from the Sinopharm/BIBP Laboratory, with 59.1% of total doses, followed by the Gamaleya Institute (16.2%), the Serum Institute of India (9.0%), Janssen-Cilag International (6.6%) and Pfizer-BioNTech (9.1%) (**Table 4**).

The first delivery (20,000 doses) that arrived in the country was of the Sputnik V vaccine, acquired via bilateral agreements with Russia, which subsequently allowed the delivery of 2,469,960 doses. 8.5 million doses were acquired from the Sinpharm/BIBP Laboratory, under a bilateral agreement, and 500,000 doses from direct donation. Also, via a bilateral donation from Mexico, 300,000 doses of the Covishield vaccine from the Serum Institute of India were acquired and received. The other vaccine doses that have arrived in the country, 3,452,270 doses, have been acquired under the COVAX

mechanism with donations from India, Sweden, Spain, France, and the US, including Covishield vaccines, and the Janssen and Pfizer-BioNTech Laboratories (**Table 4**).

As of 31 October 2021, a total of 7,806,054 doses of COVID-19 vaccines have been administered in the country, corresponding to 51.3% of the doses received. No information is currently available about use of the vaccine by product, except for the Janssen laboratory vaccine (Ad26.COV1.5), of which 932,405 doses have been administered, corresponding to 92% of those received.

**Table 4:** Vaccine remittances and number of doses received by Bolivia during 2021 (as of 31 October), by vaccine type and arrival date.

| | | | | Remittance date (2021) | |
|---|---|---|---|---|---|
| **Vaccine name** | **Manufacturer** | **Procurement mechanism** | **Total doses** | **First** | **Last** |
| Sputnik V | Gamalaya Institute | CB | 2,469,960 | 29 Jan | 19 Sep |
| SARS-CoV-2 Vaccine (Vero Cell), Inactivated (InCov) | Sinopharm / BIBP | CB | 8,500,000 | 24 Feb | 6 Sep |
| SARS-CoV-2 Vaccine (Vero Cell), Inactivated (InCov) | Sinopharm / BIBP | Donation | 500,000 | 24 Feb | 6 Sep |
| Covishield (ChAdOx1_nCoV-19) | Serum Institute of India Pvt. Ltd | COVAX | 1,062,500 | 22 Mar | 19 Sep |
| BNT162b2/COMIRNATY Tozinameran | Pfizer - BioNTech | COVAX | 1,381,770 | 29 Apr | 23 Oct |
| Covishield (ChAdOx1_nCoV-19) | Serum Institute of India Pvt. Ltd | Donation | 300,000 | 13 Jun | 12 Sep |
| Ad26.COV1.5 | Janssen–Cilag International NV | COVAX | 1,008,000 | 11 Jul | 11 Jul |
| | **Total** | | **15,222,230** | **29 Jan** | **23 Oct** |

BC: bilateral agreement
**Source**: Area and Supply Chain Reports - EPI, Ministry of Health and Sports.

The coverage achieved under the complete schedules (second and single doses) has been 53.9%, while 63.1% of the population has been vaccinated with first doses (first doses and single doses). At department level, the highest coverage is in the Tarija department, where 64.5% of the target population has been fully vaccinated, while the lowest is in the Pando department, which has reached 41.7% coverage (Table 5). Using the population of Bolivia as the denominator, coverage under complete courses on that date was 32.7%.

**Table 5:** Number of doses administered and coverage by priority group, department, and country total up as of 31 October 2021. Bolivia, 2021.

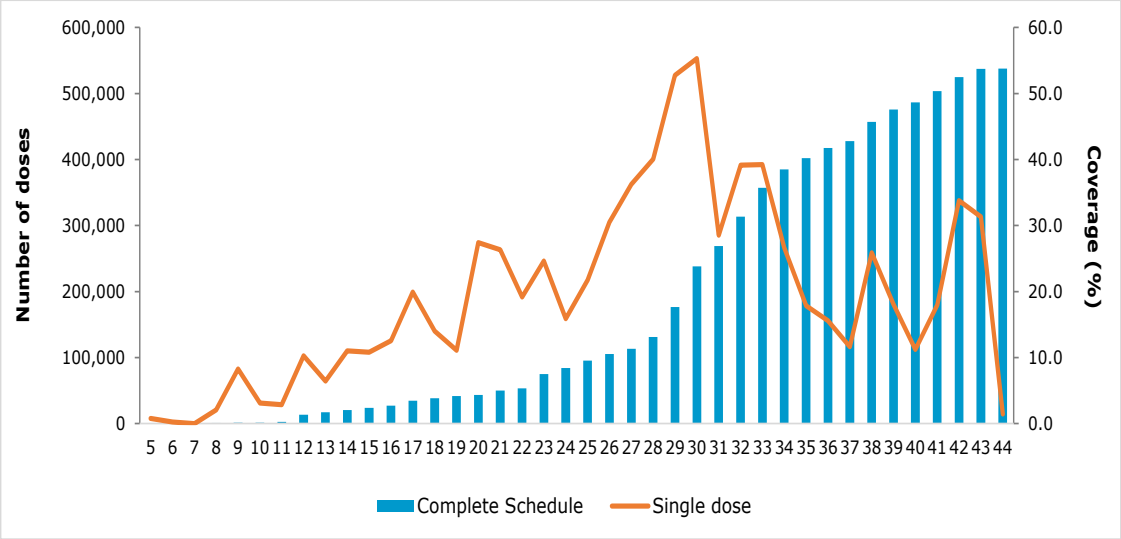
| Priority Groups / Department | Population | Total doses administered | Coverage | | | |
|---|---|---|---|---|---|---|
| | | | 1st dose | 2nd dose | Complete Schedule (2nd dose and single dose) | Booster |
| **Bolivia** | **7,180,428** | **7,806,054** | **50.1%** | **40.9%** | **53.9%** | **4.7%** |
| >60 years old | 1,191,515 | 1,641,049 | 61.9% | 56.3% | 62.2% | 13.7% |
| Health workers | 179,667 | 392,310 | 97.2% | 93.4% | 96.1% | 25.1% |
| 18 to 59 years old with underlying disease | 307,909 | 524,200 | 80.5% | 73.6% | 77.7% | 12.1% |
| 18 to 59 years old, "healthy" | 5,501,337 | 5,248,495 | 44.3% | 34.0% | 49.4% | 1.7% |
| **La Paz** | **1,869,184** | **1,872,305** | **45.6%** | **37.0%** | **50.5%** | **4.0%** |
| >60 years old | 351,439 | 431,013 | 55.3% | 50.3% | 56.8% | 10.5% |
| Health workers | 47,320 | 99,852 | 93.6% | 89.4% | 93.6% | 23.8% |
| 18 to 59 years old with underlying disease | 61,083 | 104,667 | 80.3% | 74.3% | 78.1% | 13.0% |
| 18 to 59 years old, "healthy" | 1,409,342 | 1,236,773 | 40.1% | 30.2% | 46.3% | 1.4% |
| **Oruro** | **343,112** | **385,496** | **53.6%** | **44.0%** | **53.5%** | **5.3%** |
| >60 years old | 62,263 | 89,927 | 66.2% | 60.7% | 64.4% | 13.8% |
| Health workers | 8,509 | 24,086 | 124.9% | 120.8% | 122.9% | 35.3% |
| 18 to 59 years old with underlying disease | 11,472 | 19,925 | 83.0% | 78.3% | 79.3% | 11.4% |
| 18 to 59 years old, "healthy" | 260,868 | 251,558 | 46.9% | 36.0% | 47.5% | 2.0% |
| **Potosí** | **514,418** | **442,724** | **38.2%** | **30.7%** | **45.0%** | **2.9%** |
| >60 years old | 104,983 | 105,205 | 46.2% | 39.3% | 47.5% | 6.5% |
| Health workers | 12,782 | 25,687 | 92.3% | 86.0% | 90.5% | 18.1% |
| 18 to 59 years old with underlying disease | 10,980 | 21,476 | 94.5% | 85.6% | 89.4% | 11.7% |
| 18 to 59 years old, "healthy" | 385,673 | 290,356 | 32.6% | 25.0% | 41.6% | 1.1% |
| **Cochabamba** | **1,250,294** | **1,470,039** | **53.1%** | **44.7%** | **58.2%** | **6.2%** |
| >60 years old | 220,630 | 339,411 | 67.3% | 62.0% | 67.9% | 18.6% |
| Health workers | 31,587 | 69,954 | 96.9% | 94.0% | 96.3% | 28.2% |
| 18 to 59 years old with underlying disease | 42,656 | 96,993 | 104.8% | 99.3% | 102.6% | 20.0% |
| 18 to 59 years old, "healthy" | 955,421 | 963,681 | 46.1% | 36.6% | 52.8% | 2.0% |
| **Chuquisaca** | **389,973** | **464,831** | **55.9%** | **47.5%** | **57.0%** | **6.4%** |
| >60 years old | 75,053 | 110,648 | 67.2% | 61.6% | 65.6% | 14.7% |
| Health workers | 9,500 | 30,555 | 143.1% | 137.3% | 139.5% | 39.1% |
| 18 to 59 years old with underlying disease | 21,240 | 66,667 | 148.6% | 138.4% | 142.4% | 22.8% |
| 18 to 59 years old, "healthy" | 284,180 | 256,961 | 43.0% | 34.0% | 45.5% | 1.9% |
| **Tarija** | **372,740** | **498,190** | **63.8%** | **55.0%** | **64.5%** | **5.5%** |
| >60 years old | 60,103 | 99,891 | 75.4% | 70.0% | 73.8% | 17.0% |
| Health workers | 9,179 | 19,663 | 98.9% | 96.2% | 97.7% | 17.6% |
| 18 to 59 years old with underlying disease | 21,982 | 19,796 | 43.1% | 40.0% | 41.4% | 5.5% |
| 18 to 59 years old, "healthy" | 281,476 | 358,840 | 61.7% | 51.6% | 63.2% | 2.6% |
| **Pando** | **89,770** | **95,378** | **57.7%** | **41.7%** | **41.7%** | **6.9%** |
| >60 years old | 8,135 | 10,577 | 62.7% | 52.2% | 52.2% | 15.1% |
| Health workers | 2,361 | 6,045 | 109.9% | 103.7% | 103.7% | 42.5% |
| 18 to 59 years old with underlying disease | 4,830 | 12,993 | 128.1% | 112.1% | 112.1% | 28.8% |
| 18 to 59 years old, "healthy" | 74,444 | 65,763 | 51.0% | 34.0% | 34.0% | 3.4% |
| **Beni** | **284,751** | **273,606** | **49.7%** | **37.8%** | **42.5%** | **3.9%** |
| >60 years old | 36,085 | 48,272 | 64.8% | 56.1% | 59.0% | 10.0% |
| Health workers | 6,971 | 15,636 | 102.4% | 96.4% | 98.3% | 23.6% |
| 18 to 59 years old with underlying disease | 22,502 | 33,193 | 72.5% | 64.4% | 65.5% | 9.5% |
| 18 to 59 years old, "healthy" | 219,193 | 176,505 | 43.2% | 30.2% | 35.7% | 1.6% |
| **Santa Cruz** | **2,066,188** | **2,303,485** | **50.8%** | **40.7%** | **56.3%** | **4.4%** |
| >60 years old | 272,824 | 406,105 | 66.1% | 60.6% | 66.9% | 15.9% |
| Health workers | 51,459 | 100,832 | 87.1% | 84.5% | 86.3% | 22.5% |
| 18 to 59 years old with underlying disease | 111,164 | 148,490 | 63.5% | 56.0% | 62.4% | 7.6% |
| 18 to 59 years old, "healthy" | 1,630,741 | 1,648,058 | 46.2% | 34.9% | 53.1% | 1.7% |

*Second doses include single doses of Janssen laboratory vaccine.
**Source**: Electronic Immunization Registry (RNVe) - Ministry of Health and Sports

The volume of doses given increased progressively, with fluctuations probably associated with deliveries arriving in the country. Weeks 28 to 30 had the highest number of doses administered, when more than

500,000 doses were given each week. In the last 5 weeks there has been a decrease in vaccine administration, stabilizing between 100 and 200 thousand weekly doses (**Figure 5**).

**Figure 5**: Number of doses (single, first and second) administered and cumulative coverage of fully vaccinated by epidemiological week (EW). Bolivia, EW 5 to 44, 2021




**Source**: Electronic Vaccination Registry (RNVe), Bolivian Ministry of Health and Sports

In relation to vaccination by geographical area at country level, there is a serious gap: in the urban area there is 66.5% of fully vaccinated coverage, the rural area fully vaccinated coverage is 42.2% (**Table 6**). The departments with the biggest fully vaccinated shortfalls are Cochabamba (urban 85%, rural 43%), followed by La Paz (urban 63%, rural 31%), Chuquisaca (urban 73%, rural 44%), and Potosí (urban 66%, rural 38%).

**Table 6**: Number of doses administered and urban /rural area coverage, department, and total for country as of 31 October 2021. Bolivia, 2021.

| MUNICIPAL DEPARTMENTS | Population | Total doses administered | Coverage | | | | |
|---|---|---|---|---|---|---|---|
| | | | 1st dose | 2nd dose | Single dose | Complete Schedule (2nd dose and single dose) | Booster |
| **Bolivia** | **7,180,428** | 7,843,479 | 50.6% | 40.9% | 13.1% | 53.9% | 4.7% |
| Urban | 3,458,368 | 4,921,698 | 69.2% | 55.5% | 11.0% | 66.5% | 6.6% |
| Rural | 3,722,060 | 2,921,781 | 33.3% | 27.3% | 15.0% | 42.2% | 3.0% |
| **BENI** | **284,751** | 274,276 | 49.9% | 37.8% | 4.7% | 42.5% | 3.9% |
| Urban | 77,423 | 76,133 | 54.8% | 39.4% | 1.1% | 40.5% | 3.0% |
| Rural | 207,328 | 198,143 | 48.1% | 37.3% | 6.0% | 43.3% | 4.2% |
| **COCHABAMBA** | **1,250,294** | 1,488,044 | 54.6% | 44.7% | 13.6% | 58.2% | 6.2% |
| Urban | 450,257 | 835,277 | 90.6% | 76.8% | 7.7% | 84.5% | 10.3% |
| Rural | 800,037 | 652,767 | 34.3% | 26.6% | 16.8% | 43.4% | 3.9% |
| **ORURO** | **343,112** | 387,206 | 54.1% | 44.0% | 9.5% | 53.5% | 5.3% |
| Urban | 191,062 | 277,102 | 74.3% | 58.5% | 5.5% | 64.0% | 6.7% |
| Rural | 152,050 | 110,104 | 28.6% | 25.8% | 14.6% | 40.4% | 3.4% |
| **SANTA CRUZ** | **2,066,187** | 2,312,013 | 51.2% | 40.7% | 15.6% | 56.3% | 4.4% |
| Urban | 1,059,664 | 1,437,099 | 65.8% | 51.8% | 13.1% | 64.9% | 5.0% |
| Rural | 1,006,523 | 874,914 | 35.8% | 29.0% | 18.3% | 47.2% | 3.9% |
| **PANDO** | **89,769** | 95,631 | 58.0% | 41.7% | 0.0% | 41.7% | 6.9% |
| Urban | 46,167 | 57,435 | 66.7% | 47.9% | 0.0% | 47.9% | 9.8% |
| Rural | 43,602 | 38,196 | 48.8% | 35.0% | 0.0% | 35.0% | 3.8% |
| **POTOSI** | **514,419** | 443,462 | 38.3% | 30.7% | 14.3% | 45.0% | 2.9% |
| Urban | 129,507 | 172,229 | 62.8% | 49.5% | 16.3% | 65.8% | 4.4% |
| Rural | 384,912 | 271,233 | 30.1% | 24.4% | 13.6% | 38.0% | 2.3% |
| **LA PAZ** | **1,869,184** | 1,879,810 | 46.0% | 37.0% | 13.6% | 50.5% | 4.0% |
| Urban | 1,152,999 | 1,538,596 | 64.1% | 50.8% | 12.0% | 62.8% | 6.6% |
| Rural | 716,185 | 341,214 | 16.9% | 14.7% | 16.1% | 30.8% | 0.0% |
| **CHUQUISACA** | **389,973** | 464,835 | 55.9% | 47.5% | 9.4% | 57.0% | 6.4% |
| Urban | 179,736 | 281,110 | 73.9% | 59.9% | 12.7% | 72.7% | 9.9% |
| Rural | 210,237 | 183,725 | 40.5% | 36.9% | 6.6% | 43.5% | 3.4% |
| **TARIJA** | **372,739** | 498,202 | 63.8% | 55.0% | 9.5% | 64.5% | 5.5% |
| Urban | 171,554 | 246,717 | 70.0% | 60.3% | 7.2% | 67.5% | 6.3% |
| Rural | 201,185 | 251,485 | 58.4% | 50.4% | 11.4% | 61.8% | 4.7% |

**Source**: Electronic Vaccination Registry (RNVe), Bolivian Ministry of Health and Sports.

## VIII. OUTCOMES

### A. Planning, Coordination, and essential health Services

| | |
|---|---|
| ***Achievements*** | ✓ COVID-19 vaccination is considered a political priority, led by the President of the State, via the intersectoral COVID-19 Presidential Office.<br>✓ The authorities united around a common goal, which was to respond in the best possible way to the pandemic, regardless of party-political orientation.<br>✓ The role of diplomatic missions abroad has been essential in the vaccine management strategy for the country.<br>✓ Support by PAHO/WHO Representative in managing and facilitating the arrival of vaccines in the country, via donation and COVAX. Technical and financial cooperation in developing and implementing the Vaccination Plan.<br>✓ The credibility of the CNI among healthcare workers, the population and the health authorities are important in maintaining confidence in vaccines safety.<br>✓ Strategic plan, with participation from different committees: policy management committee, technical management committee, scientific consultancy committee, National Immunization Technical Advisory Groups (NITAG), ESAVI committee, and social communication committee.<br>✓ Participation by the country in different mechanisms to access vaccines (COVAX, bilateral negotiations, donations)<br>✓ Agreement between the Ministry of Health and Governors to strengthen COVID-19 vaccination and the routine vaccination program<br>✓ Scheduling vaccination for the indigenous population, representants of different original and countryside indigenous nations or peoples who live in areas that are difficult to access, with communication barriers and intercultural barriers. |
| ***Challenges*** | • Difficulty in appropriate access to vaccines, syringes, supplies and cold chain equipment.<br>• Poor offer by vaccine providers in the market.<br>• National policies of producer countries that prevent appropriate fulfilment of contracts, regarding vaccine acquisition<br>• Difficulty mobilizing resources at sub-national level.<br>• Gaps in each age group or priority population have not been closed.<br>• Vaccination coverage in rural areas is much lower, when compared with urban areas, in most departments.<br>• Translate scientific evidence (about illness, vaccines) for decision-making and understanding of healthcare workers. |
| ***Recommendations*** | ▪ Continue policies and strategies aimed at strengthening the health system and by extension the immunization program. This includes, among others:<br>o Updating the EPI Five-Year Plan.<br>o Improving management and technical capacity at departmental and municipal level.<br>o Promoting allocation of the resources needed to carry out the vaccination activities, via tracking agreements with governors and mayors.<br>▪ Carrying out a plan (strategic, financial, communication) to identify and vaccinate the priority population not yet vaccinated.<br>▪ Continue using scientific evidence to guide decision-making and update the national plan and the micro plans.<br>▪ Strengthening the EPI at national and departmental level and fitting it into the organizational structure of the Ministry of Health and Sports and SEDES.<br>▪ Achieving strategic alliances at national and departmental level with public and private actors to expand COVID-19 vaccination coverage and the regular scheme.<br>▪ Promoting appropriation of subnational authorities over vaccination actions, by forming permanent coordination and articulation spaces that allow management of commitments (vaccination summits).<br>▪ Incorporating into micro planning the participation of local authorities and social organization leaders to ensure vaccination of the target population. |

## B. Regulations

| | |
|---|---|
| ***Achievements*** | ✓ The National Regulatory Authority established the regulatory mechanisms required to introduce the COVID-19 vaccines, in response to the national plan for the vaccination rollout.<br>✓ Flexibility in regulatory frameworks on an exceptional basis, without weakening the control of the vaccines. This made it possible to enter international contracts to buy vaccines, diagnostic tests and other goods and services, when they are not available in the domestic market<br>✓ AGEMED established a list of health authorities to apply the authorization approval procedure, as well as taking the following actions:<br>o A confidentiality agreement was signed with WHO to access non-public information on vaccines included on the emergency use list (EUL).<br>o It participated in exchange sessions between national regulatory authorities throughout the Americas, via the network of pandemic preparation focal points.<br>o Simplified batch release processes were applied - prior to the entry of vaccines into the country - in the case of vaccines acquired through COVAX, PAHO's Revolving Fund, allowing their nationalization and immediate distribution.<br>✓ Improvements in the transparency of the information implemented by AGEMED. Current regulatory mechanisms and the results of regulatory actions are available to the public. |
| ***Challenges*** | • Maintain a focus on proactive regulation:<br>• Apply regulatory practices and lessons learned to other similar emergency situations and the regular vaccination program<br>• Continue supporting the strengthening of the national regulatory system, given that there are notable improvements, and the achievements must be sustainable over time.<br>• Improve the existing legal/regulatory instruments to reflect exceptional registration process practices, and simplified batch release processes when vaccines are procured through the PAHO's Revolving Fund, which has been used for many years at the national level.<br>• Financing |
| ***Recommendations*** | ▪ Maintain a focus on proactive regulation:<br>o Apply regulatory practices and lessons learned to other similar emergency situations and the regular vaccination program.<br>▪ Continue supporting the strengthening of the national regulatory system, given that there are notable improvements, and the achievements must be sustainable over time.<br>▪ Improve the existing legal/regulatory instruments to reflect exceptional registration process practices, and simplified batch release processes when vaccines are procured through the PAHO's Revolving Fund, which has been used for many years at the national level. |

## C. Financing

| | |
|---|---|
| ***Achievements*** | ✓ Allocation of extraordinary budget with funds from TGN to acquire vaccinations and supplies for the Vaccination Plan.<br>✓ Allocation of resources from the National General Treasury to buy 11,469,960 doses, which correspond to 75% of the total vaccines: the other 25% comes from COVAX and donations.<br>✓ Implementation of an austerity policy (reduced public institution administrative costs), extreme efforts by the central government to assign part of these resources to health care services and the Vaccination Plan (purchase of vaccines, supplies and medicines).<br>✓ Willingness of the Ministry of the Economy and Public Finance to analyze and manage resources to implement actions to strengthen the information system, cold chain and vaccination safety under the Vaccination Plan.<br>✓ Instruction on the use of IDH resources to Departmental Governments to put vaccinations into operation, in accordance with their competencies.<br>✓ Establishment of the goal of allocating 10% of public health spending, which includes resources to buy vaccines, syringes and supplies.<br>✓ Regulatory changes, allowing greater flexibility in procurement and contracting at subnational levels.<br>✓ Financial support from GAVI, UNICEF and PAHO. |
| ***Challenges*** | • Partial compliance of the sub-national responsibilities in the appropriate financing of the vaccination process.<br>• Insufficient availability of human and financial resources in the immunization program.<br>• Lack of resources assigned to communication.<br>• Suspension of mayors' and governors' budgets in the pre- and post-election period made it difficult to start the vaccination process.<br>• Inflexibility of some credit programs which require extensive bureaucratic processes and monitoring systems. |
| ***Recommendations*** | ▪ Based on updated costs, include the funds required to conduct an annual COVID-19 vaccination in discussions regarding the budget for the five-year period.<br>▪ Carry out a systematic survey of needs for resources at subnational levels to implement the different vaccination strategies.<br>▪ Strengthen coordination mechanisms with bilateral and multilateral agencies and organizations, to identify gaps and sources of financing.<br>▪ Develop a formal mechanism for monitoring and return of accounts from the subnational governments, regarding their co-responsibility for implementing the vaccination. |

## D. Cold chain, supply, logistics and vaccines management

| | |
|---|---|
| ***Achievements*** | ✓ Sufficient capacity to receive, store and distribute vaccines.<br>o Central (national) store with 7 cold rooms. Net total capacity: 233,683 liters.<br>o Departmental Level net total capacity: 40,454 liters.<br>o 3 new cold rooms: Santa Cruz: 2 and La Paz: 1.<br>o Cochabamba, Santa Cruz, Chuquisaca, and Tarija: 700-liters capacity ultra-low temperature (-70°C) provided by public, academic and private institutions.<br>o EPI refrigerated vehicles and contracts with a private company to distribute vaccines.<br>✓ Strategic alliance with the company "Boliviana de Aviación" and the National Police for vaccine security, logistics and distribution.<br>✓ Immediate dispatch of vaccines from the runway, to safeguard refrigeration conditions and other technical requirements.<br>✓ Customs duties waived for the import of vaccines for the public sector.<br>✓ Updated inventory, cold chain teams at central and departmental level.<br>✓ Increase in human resources with fixed roles at central level, from 5 to 12 cold chain and logistical professionals and a driver. In some departments there was also a small increase in HR.<br>✓ Reserve inventory (2 million syringes) from the regular vaccine program, to ensure uninterrupted COVID-19 vaccination.<br>✓ There was no breakdown in the cold chain during storage or during transport of vaccines from national level to the departments, considering that work took place with multiple vaccine products.<br>✓ Intra- and extra-institutional coordination and articulation for the health system, and interinstitutional with other institutions (Universities) that allow the use of ultra-low temperature equipment with permanent monitoring and emergency motors with specialized professional control. |
| ***Challenges*** | • Insufficient cold chain and logistics personnel in the immunization program, at departmental and municipal levels.<br>• Use of new COVID-19 vaccines from different platforms.<br>• Insufficient dual refrigeration equipment at municipal level and in health services.<br>• Short period to use the vaccine as recommended, after opening a multi-dose bottle. |
| ***Recommendations*** | ▪ Include in the annual plan a budget for: operating costs, logistics, purchase of refrigerated equipment and vehicles, training, and supervision.<br>▪ Negotiate the assignment of a larger number of personnel to manage the vaccine cold chain, supplies and logistics by department and municipal governments,<br>▪ Extend the good practice of immediate dispatch of vaccines from the runway for all vaccines in the regular immunization program<br>▪ Develop an administrative module in the RNVe that allows information to be generated about the use of vaccines and percentages wasted.<br>▪ Update the inventory of cold chain equipment at municipal and local level, based on which the investment plans (departmental and municipal) for cold chain equipment will be drawn up.<br>▪ Implement a continuous training plan for cold chain management of the different COVID-19 vaccines.<br>▪ Implement the training supervision plan at all levels of management.<br>▪ Acquire and use temperature monitoring devices to send vaccines at all levels.<br>▪ Manage the construction of a national store for vaccines, syringes, and supplies. |

## E. Human resources

| | |
|---|---|
| ***Achievements*** | ✓ Generation of strategic alliances with universities and private initiatives.<br>✓ Mobilization of human resources for the domestic vaccination program (central level).<br>✓ Generation of mass vaccination points in urban zones.<br>✓ Allow duly trained non-professional human resources to take part in vaccinations.<br>✓ Extended use of virtual training across various platforms.<br>✓ Explicit use of training to generate critical pro-vaccination mass.<br>✓ Use lessons from this process to rapidly update the EPI technical manual. |
| ***Challenges*** | • Disruption of the health essential services.<br>• Limited budget for supervision in the field.<br>• Lack of working recognition and incentives for the health care workers involved in vaccination activities.<br>• Lack of human resources to absorb decentralization of the vaccination and accelerate the recovery of health essential services.<br>• Lack of recognition of the needs to train and/or strengthen the health care workers in charge of vaccination. |
| ***Recommendations*** | ▪ Permanently strengthen EPI human resources at all levels, considering incorporating the COVID-19 vaccine into the regular program.<br>▪ Evaluate human resources gaps.<br>▪ Assign financial resources to the supervision processes.<br>▪ Consider a recognition plan for healthcare workers.<br>▪ Ensure that healthcare workers dedicated to vaccination remain in the health services network.<br>▪ Set out and generate a plan to maintain health essential services in an integrated manner with the COVID-19 response, ensuring personnel in the health services network comply with continuous vaccination.<br>▪ Systematize good practices and publish the findings, to be shared with the international community. |

## F. Social communication and mobilization

| | |
|---|---|
| ***Achievements*** | ✓ The work with the press, which was willing to providing time in their media to disseminate messages, through the designated spokespeople, with zero cost for disseminating these messages, bearing in mind the budget limitations in place.<br>✓ Use of testimonials from expert medical professionals as examples of increasing the acceptance of COVID-19 vaccines.<br>✓ Important work to add into key social structures (federation of teachers, guilds, universities).<br>✓ Have support from technical groups (CNI, recognized doctors) to encourage the population be vaccinated with the available vaccine.<br>✓ Implementation of strategic surveillance and media and press monitoring, carried out by the Ministry of Health and Sport's Communication Unit.<br>✓ Experience working with indigenous communities (Takana, Ese Eja and Cavineño) in the Amazonian zone of Pando. The success achieved by this strategy will be one of the references that will support development of the communication strategy at rural level. |
| ***Challenges*** | • Insufficient budget to support an active communication strategy, considering the production, disclosure and mobilization needed.<br>• Coordination and articulation of the work to implement the communication strategy, in the Ministry of Health and Sports, with other public institutions and technical and financial support organizations (PAHO/WHO, UNICEF) took a lot of effort.<br>• Lack of appropriation of the COVID-19 Vaccines Risk and Social Mobilization Action Plan by the subnational governments.<br>• The communication and social mobilization actions have partially reached the population, but there is still a major gap in vaccination. |
| ***Recommendations*** | ▪ Strengthen the internal articulation between the interested parties (Ministry of Health and Sports, EPI, Vice-Ministry of Communication, PAHO/WHO, other partners) under the technical leadership of the Communication Unit within the Ministry of Health and Sports.<br>▪ Develop a plan to approach anti-vaccine groups and reach reticent populations and tackle misinformation and actions and messages from anti-vaccine groups, rapidly and with transparent information from reliable sources.<br>▪ Give permanent communication guidelines to departmental and local bodies and others to contribute to the homogeneity of messages, directives, and spokespeople.<br>▪ Strengthen community participation strategies that involve local leaders to allow them be protagonists in communication in their community and increase work within the Bolivian communities.<br>▪ Update the Communication Plan, based on lessons learned to date.<br>▪ Carry out a specific communication and training strategy for healthcare workers, which must include messages in recognition of the important work they have done during the pandemic.<br>▪ Manage the allocation of specific and sufficient financial resources to develop, implement, disclosure and evaluate activities at national, departmental and municipal level.<br>▪ Monitor and evaluate both the scope and the impact of the different activities within the Communication Plan.<br>▪ Strengthen the vaccine safety risk communication plan to include a crisis communication component for the different events. |

## G. Vaccine safety

| | |
|---|---|
| ***Achievements*** | ✓ Regular operation of the National Committee on Vaccine safety and the 9 Departmental committees (Ministerial Resolution #0098).<br>✓ Articulated work between AGEMED, EPI and SNIS/VE for ESAVI surveillance, with technical assistance from PAHO/WHO.<br>✓ In the mass vaccination points of 6 out 9 departments, compliance with technical prevention standards and the allocation of kits and personnel for ESAVI care was verified.<br>✓ Medical care for severe ESAVIs has been covered by Universal Health Insurance and short-term insurance. (Ministerial Resolution #0098)<br>✓ Adherence to the ESAVI Regional Surveillance System and the ESAVI/EVADIE Regional Sentinel Surveillance Network.<br>✓ Implementation of a Vaccine Safety Risk Communication Plan against COVID-19.<br>✓ Transparency of information, available on the website of the national regulatory authority, publication of the ESAVI National Surveillance Bulletin.<br>✓ Strengthening of national ESAVI monitoring capacities.<br>✓ The electronic vaccination Registry (RNVe) has the registry of all the ESAVI, while the ESAVI surveillance committee has the supporting documents of the severe cases. |
| ***Challenges*** | • Sensitization and continuous training of health professionals on the notification and investigation of ESAVIs.<br>• Manual registration of severe ESAVI notification and investigation tools.<br>• Partial analysis of the ESAVIs and EVADIEs. |
| ***Recommendations*** | ▪ Officially form the National Committee on Vaccine Safety with representation of different specialties, external to the MoH, with defined roles and responsibilities. The secretariat, which would be the MoH and PAHO/WHO.<br>▪ Incorporate in the RNVe the ESAVI classification recommended by PAHO/WHO (Severe and Non-Severe).<br>▪ Carry out timely and complete ESAVI investigations, following the WHO methodology.<br>▪ Maintain the transfer of the database of all ESAVIs to the regional PAHO, as part of Bolivia's adherence to the ESAVI Regional Surveillance System (Phase 1, Phase 2)<br>▪ Promote electronic notification of ESAVIs and implement the digital transformation of ESAVI surveillance from the local to the national level.<br>▪ Implement the continuous training plan at all levels.<br>▪ Strengthen Committees on Vaccine Safety at the departmental level.<br>▪ Increase data management and analysis capacity at the national level.<br>▪ Strengthen the vaccine safety risk communication plan, including the crisis communication component for the different events. |

## H. Information and monitoring system

| | |
|---|---|
| ***Achievements*** | ✓ Development of a nominal electronic vaccination registry for COVID-19 using the existing registry in the country, which has legal support and political support for its use.<br>✓ Friendly and flexible system that allowed the incorporation of the cohorts to be vaccinated according to the national plan.<br>✓ Online registration – it does not allow to incorporate duplicates.<br>✓ Human resource trained in its use.<br>✓ Verification of the quality of the records daily by the departments.<br>✓ Used as an official source of information for monitoring and accountability.<br>✓ Registration of foreigners and other vulnerable population.<br>✓ Online card with QR code. |
| ***Challenges*** | • There is no population base in the registry for estimating vaccination coverage, nor a population base for the migrant/refugee population.<br>• Lack of equipment, and poor internet connectivity at the local level, which means that in some areas the information system remains saturated.<br>• Limited participation of social security and private.<br>• Information system saturation persists in some areas. |
| ***Recommendations*** | ▪ Joint work with the National Institute of Statistics to incorporate the denominators.<br>▪ Empower governors, mayors, and networks to improve physical infrastructure, telecommunications provision, and equipment.<br>▪ Ensure the availability of the internet in all health facilities, and the interconnection between the different clinics and vaccination centers.<br>▪ Incorporate social security and private individuals in the registry.<br>▪ Continue working in data security.<br>▪ Perform a DQS.<br>▪ Maintain training for the use of the system and decision-making based on data.<br>▪ Integrate the management of supplies (administrative module) to the electronic vaccination registry (RNVe). |

## I. Scientific investigation

| | |
|---|---|
| ***Achievements*** | ✓ Agreements between public/private universities and the Ministry of Health to carry out research.<br>✓ The Universities are conducting immunogenicity studies with the aim of measuring seroconversion after the first and second doses of the vaccines according to variables such as ethnicity.<br>✓ Carrying out studies on the duration of the presence of antibodies<br>o Seroprevalence in different demographic strata<br>o Variant prevalence<br>✓ Availability of university personnel.<br>✓ There is interest in conducting research studies and generating national evidence. |
| ***Challenges*** | • Lack of financial resources to conduct research.<br>• Coordination with the MoH is not enough.<br>• Lack of databases that allow making the link between vaccination, cases, hospitalization, among others. |
| ***Recommendations*** | ▪ Strengthen the coordination between the MoH and the Universities for the development of research.<br>▪ Strengthen and implement existing agreements for conducting research with the objective of supporting vaccination policies against COVID-19.<br>▪ Coordination with cooperation agencies for the development and strengthening of research. |

## ANNEXES

### Annex 1: Trigger questions instrument

**Figure 6:** Instrument for Mini-cPIE trigger questions.

## 10. COVID-19 vaccination

**Description:** This pillar reviews the early phase(s) of the roll-out of COVID-19 vaccine implementation to identify vaccine delivery challenges needing corrective action and best practices for continual improvement and collective learning. Specific areas for in-depth review include: regulatory preparedness; planning, coordination, and service delivery; funding; supply chain and waste management; human resource management and training; vaccine acceptance and demand; vaccine safety; and monitoring and evaluation. The areas covered follow the National Deployment and Vaccination Plan for COVID-19 Vaccines (NDVP) and align with the COVID-19 vaccine implementation Post-Introduction Evaluation (cPIE) Strategy.

| PROGRAM EVALUATION AREA | SECTION KEY |
|---|---|
| REGULATORY PREPAREDNESS | A |
| PLANNING, COORDINATION, & SERVICE DELIVERY | B |
| FUNDING | C |
| SUPPLY CHAIN & WASTE MANAGEMENT | D |
| HUMAN RESOURCE MANAGEMENT & TRAINING | E |
| VACCINE ACCEPTANCE & DEMAND | F |
| VACCINE SAFETY | G |
| MONITORING AND EVLUATION | H |

| | | Possible indicators (For trigger question selected that are linked to specific indicators, it is preferable to collect any available data before the IAR so that it can be validated and put in context during the discussion) | Trigger questions (Please only select questions that are relevant for this IAR) | Relevance for this IAR |
|---|---|---|---|---|
| 10.B. Planning, coordination, and service delivery | 10.B.6 | % of all vaccine doses distributed/administered by the private sector | Did organizations outside of the MoH (private sector, NGO's, faith-based organizations, etc.) participate in COVID-19 vaccine administration in certain priority groups? If yes, how did they participate and how well has this worked? | Not relevant |
| 10.B. Planning, coordination, and service delivery | 10.B.7 | | What vaccine delivery strategies are being used to reach identified priority groups (e.g. health facility fixed-post, non-health facility fixed-post, outreach, or mobile visits, other)? | Relevant |
| 10.B. Planning, coordination, and service delivery | 10.B.8 | | Were any major changes or deviations required in the planned vaccination strategy compared to what was stated in the NDVP? What were the reasons for the changes (e.g., product allocated)? | Maybe relevant |
| 10.B. Planning, coordination, and service delivery | 10.B.9 | •Vaccine uptake overall and by priority group<br>•Behaviour and social drivers survey or qualitative evaluation results | Have the current vaccine delivery strategies been successful? Please describe why or why not for each priority group and vaccine product. | Relevant |
| 10.B. Planning, coordination, and service delivery | 10.B.10 | | If the country has rolled out more than one COVID-19 vaccine product, what challenges and lessons learned have been identified related to the use of multiple vaccine products simultaneously? (e.g. In the case of scarce supply, have products been used interchangeably in individuals receiving 2 dose regimens?) | Not relevant |
| 10.B. Planning, coordination, and service delivery | 10.B.11 | •Vaccine uptake by priority group<br>•Behaviour and social drivers survey or qualitative evaluation results | What are the major barriers, if any, for administering COVID-19 vaccine to health workers? Please consider the following areas:<br>•Identification of the group<br>•Delivery to the group (i.e. do eligible individuals reach designated vaccination sites)<br>•Refusal/hesitancy<br>•Other barriers | Please select relevancy |
| 10.B. Planning, coordination, and service delivery | 10.B.12 | •Vaccine uptake by priority group<br>•Behaviour and social drivers survey or qualitative evaluation results | What are the major barriers, if any, for administering COVID-19 vaccine to older people? Please consider the following areas:<br>•Identification of the group<br>•Delivery to the group (i.e. do eligible individuals reach designated vaccination sites)<br>•Refusal/hesitancy | Please select relevancy |

Please select relevancy
Relevant
Maybe relevant
Not relevant

2. Risk communication | 3. Surveillance | 4. Points of Entry | 5. National laboratory system | 6. IPC | 7. Case management | 8. Operations & Logistics | 9. Maintaining Health Services | 10. COVID-19 vaccination | 11. Vulnerable p ...

The instrument is an Excel spreadsheet which is available at: https://bit.ly/3hsdMcS

## Annex 2: Principal regulatory documents for EPI and tackling COVID-19

| Date | Name | Purpose/Object |
|---|---|---|
| 12/12/2005 | Vaccine Law (#3300) | This Law creates and regulates the preventive immunization system for all inhabitants of the Republic, in order to allow the State:<br>a) Establish a national preventive health policy, in compliance with its constitutional obligation.<br>b) Program, organize, execute and control the actions aimed at guaranteeing the compulsory and free nature of the prevention of preventable immune diseases through vaccination services.<br>c) Provide the permanent and necessary economic resources for the achievement and fulfillment of the stated objectives. |
| 1/4/2020 | Law for the Prevention, Containment and Treatment of Coronavirus Infection (COVID-19) (#1293) | The activities, actions and measures necessary for the prevention, containment and treatment of coronavirus infection (COVID-19) are declared of national interest and priority.<br>Activities, actions, and necessary measures:<br>I. The Executive Branch, in coordination with the autonomous territorial entities, within the framework of its powers and competencies, will implement the necessary and timely activities, actions and measures for the prevention, containment and treatment of the Coronavirus infection (COVID-19) .<br>II. The managing bodies of Social Security in the short term, in coordination with the Ministry of Health, in their health establishments, must implement necessary and timely measures for the prevention, containment, care and treatment of coronavirus infection (COVID-19). ).<br>III. The private subsector must comply with what is issued by the Ministry of Health and the autonomous territorial entities, and must also guarantee its users and workers the adequate means for care |
| 29/12/2020 | Supreme Decree 4432 | Authorizes the competent entities the direct contracting, under the principles of transparency and legality, of vaccines, diagnostic tests, medicines, medical devices, supplies, reagents, medical equipment, as well as other goods, works and services, for the containment, diagnosis and COVID-19 care. |
| 30/12/2020 | Supreme Decree 4438 | Main Objective:<br>a) Establish the requirements that must be met by providers of vaccines against COVID-19 in the domestic market.<br>b) Defer the Tariff Tax to zero percent (0%) until December 31, 2021, for the importation of the established merchandise. |
| 13/1/2021 | Supreme Decree 4452 | Main Objective:<br>a) Create the National Coordination Committee for the Monitoring of Supply, Regulation of Prices of Medicines, Medical Devices and Provision of Health Services – COMARPRE.<br>b) Establish mechanisms for the supply, regulation and price control of medicines, medical devices, provision of laboratory analysis services and provision of health services.<br>c) Order infractions and sanctions within the framework of current regulations, for compliance with this Supreme Decree. |
| 17/02/2021 | Health Emergency Law (#1359) | Establish measures to protect the life, health and well-being of the population, in the event of a health emergency in all or part of the national territory. |
| 31/3/2021 | Supreme Decree 4481 | Its purpose is to establish:<br>a) Epidemiological surveillance measures for travelers coming from abroad to the Plurinational State of Bolivia, aimed at mitigating the risks associated with the entry of new variants of SARS-CoV-2 that cause COVID-19;<br>b) Prioritization of vaccination against COVID-19 at borders;<br>c) Temporary closure of the border with the Federative Republic of Brazil. |
| 16/6/2021 | Supreme Decree 4521 | Provide the Autonomous Governments with the conditions for the direct procurement abroad of COVID-19 vaccines, guaranteeing their quality, free availability, universality and voluntary nature within the framework of current regulations and the National Vaccination Plan. |

## Annex 3: Acronyms

| | |
|---|---|
| **AESI** | Adverse Events of Special Interest |
| **AGEMED** | State Drugs and Health Technologies Agency |
| **ASUS** | Short-Term Social Security Supervision Authority |
| **CEASS** | Health Store and Supply Center |
| **CNI** | National Immunisation Committee |
| **COVAX** | Global collaboration initiative to accelerate COVID-19 treatments, tests and vaccines. |
| **COVID-19** | Coronavirus disease |
| **CPE** | State Political Constitution |
| **EPI** | Expanded Programme on Immunization |
| **ESAVI** | Events supposedly attributable to vaccination and immunization |
| **EUL** | Emergency use list |
| **FRVOPS** | PAHO/WHO Vaccines Revolving Fund |
| **GAD** | Departmental Autonomous Governments |
| **GAM** | Municipal Autonomous Governments |
| **INLASA** | National Health Laboratories Institute |
| **MEFP** | Ministry of the Economy and Public Finance |
| **MRE** | Ministry of Foreign Affairs |
| **MSyD** | Ministry of Health and Sports |
| **NDVP** | National Deployment and Vaccination Plan for COVID-19 Vaccines |
| **NGO** | Non-Governmental Organisations |
| **PAHO/WHO** | Pan American Health Organization / World Health Organization |
| **PQ** | Prequalification |
| **PVCC** | COVID-19 Coronavirus Vaccination Plan |
| **RNVe** | Electronic Vaccination Register |
| **SAGE** | Group of WHO experts in strategic consultancy about immunisations |
| **SEDES** | Department Health Services |
| **SICOES** | Brazilian State Contracting System |
| **SNIS/VE** | National Health Information System / Epidemiological Vigilance |
| **UCC** | Ultra Cold Chain |
| **WHO** | World Health Organization |

## Annex 4: Additional information by components

### 1. Planning, Coordination, and Essential Services

The government established an Integral Strategic Plan that aimed to contain the COVID-19 pandemic, which has 3 fundamental pillars: 1) Diagnostic testing, 2) Mass vaccination, 3) Coordination with autonomous departmental and municipal governments.

In relation to the second pillar, a COVID-19 Coronavirus Vaccination Plan was developed following the route map recommended by SAGE and NITAG, using clearly defined vaccination strategies. This plan has been revised with the advance of vaccination and updated.
As established by the Political Constitution of the State, 3 levels of coordination are defined for the vaccination plan. The central level defines the national policies for dealing with COVID-19, managing buying vaccines and establishing a national vaccination plan, defining priority populations, with macro planning and the distribution of vaccines at departmental level. This level oversees the campaign's disclosure and communication strategies.

The autonomous departmental government level is responsible for storage, inspection of vaccines and distribution plans at municipal level, as well as the micro planning corresponding to this level. The autonomous municipal government level receives, inspects, and stores vaccines in line with their capacities, with municipal micro planning and vaccine administration, via the primary healthcare level.

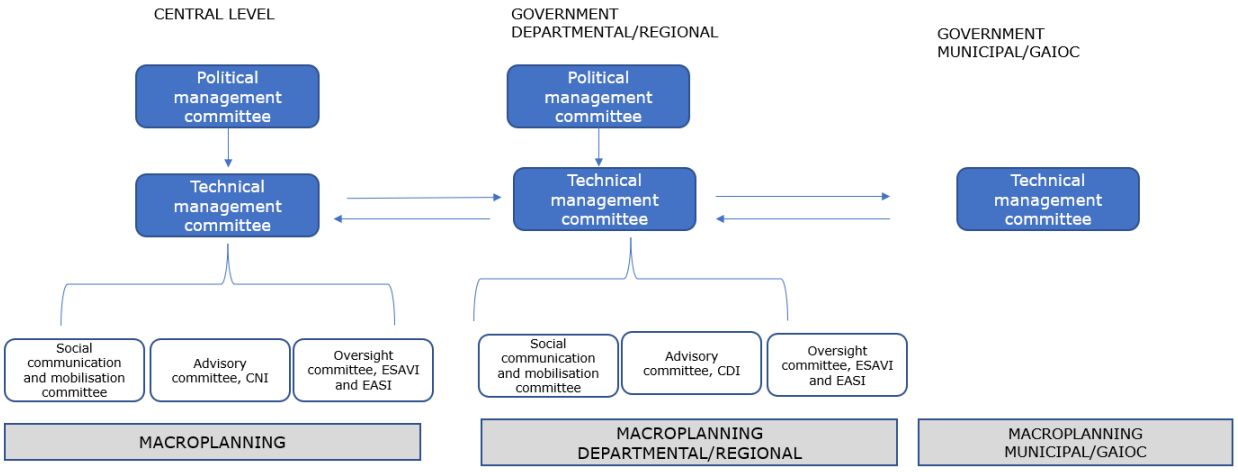
Implementation of the vaccination plan was ordered by the President of the State and the Council of Ministers, particularly for the organization of vaccine acquisition. In this context, the Ministry of Health and Sports established the criteria for the vaccines in terms of safety and efficiency, as well as the requirements associated with the receipt, storage, distribution, and administration of the different vaccines. The Ministry of Justice and Institutional Transparency supported the legal aspects associated with contracts, the Foreign Ministry was very important due to its negotiations through the embassies, both for bilateral purchases and donations, as well as for acquisitions using the COVAX mechanism, and the Ministry of the Economy and Public Finance ensured financing for the acquisition of vaccines and supplies for the vaccination campaign.

Although the central government responded positively to departmental government requests to acquire vaccines directly under Supreme Decree 4521, in practice this has not taken place and the vaccines in use have been entirely provided by the central level.
It is important on this point to highlight the role of the PAHO/WHO Representative in the country, both in providing consultancy about vaccine acquisitions (by donation and COVAX) and in the technical aspects of introducing a new vaccine into the country.

At each level of management of the health system in the country, to organize the campaign, two committees were defined, one political and other technical, except for the municipal level, which only had a technical committee (**Figure 7**).

On this point, in mid-2021 the Governors and Municipal Mayors Summit was held with the aim of committing resources to COVID-19 vaccination, and to maintain and strengthen the progress made by the EPI in immunization at all stages of the lifecycle and to ensure accessibility, sustainability and safety for essential healthcare services.

**Figure 7**: Diagram of the organization of governance of the immunization campaign in Bolivia, at central, departmental, and municipal level.




**Source**: COVID-19 Coronavirus Vaccination Plan (Ministry of Health and Sports)

Various technical support committees have participated in organizing the response, including the National Immunization Committee (CNI), the ESAVI epidemiological surveillance committee and the social communication committee. It is worth mentioning the CNI, which was already in place at the start of the pandemic and whose appointment and functions are defined in the Vaccine Law. The CNI has participated actively in the development of the Bolivia's COVID-19 Coronavirus Vaccination Plan (PVCC), prioritization of the population to be vaccinated and definition of vaccination strategies. The CNI has also been an essential role communicating scientific and technical information to the population about the safety and effectiveness of the vaccine in the context of approval of the emergency, and in the response to myths and rumors that have arisen around the vaccines and the vaccination process.

The PVCC has established priority populations and phases for approaching them, as vaccines have been available, following SAGE recommendations (**Table 7**).

**Table 7**: Population prioritized for COVID-19 vaccination and advance phases under the COVID-19 Vaccination Plan. Bolivia, 2021.

| First phase | | | Second phase | Special vaccination |
|---|---|---|---|---|
| Health workers | Population aged 18 to 59 years living with an underlying illness | Population > 60 years of age | Rest of population aged 18 to 59 years | |
| • Carers,<br>• Service administrators,<br>• Residents<br>• Interns<br>• Traditional doctors<br><br>From:<br>• UTI<br>• COVID sites<br>• Patient transport<br>• Other establishment personnel | • Cardiovascular disease plus hypertension<br>• Chronic kidney disease<br>• Chronic respiratory disease<br>• Chronic liver disease<br>• Diabetes<br>• Cancers with direct immunosuppression and with possible direct or indirect suppression<br>• HIV<br>• Tuberculosis<br>• Chronic neurological disorders<br>• Tobacco smoker<br>• Obesity | All<br><br>• Concentrated in homes, nursing homes and hospices.<br>• Personnel working in these places.<br>• People who live in their homes. | Other essential workers:<br>• Teachers<br>• Journalists<br>• Agricultural workers<br>• Armed Forces<br>• Police<br>• Food sellers.<br>• General population. | • Isolated indigenous populations in Amazonia and Chaco (their population is included under municipalities)<br>• Migrants/refugees<br>• Prisoners<br>• People living on the street. |

**Source**: COVID-19 Coronavirus Vaccination Plan (Ministry of Health and Sports)

In general terms, prioritization has been respected by making adaptations according to the risk analysis for certain situations, for example in cities bordering Brazil, in response to the spread in that country of a variant of concern, the flow of population and the difficulties of access, vaccination of younger groups was brought forward as a measure to prevent outbreaks. This was recommended by the CNI. The PVCC also included vulnerable populations such as indigenous communities (36 different original nations), migrants and refugees, prisoners and homeless. For each group, specific vaccination strategies were defined, considering access difficulties, monitoring and demand for vaccines.

Recently, and with the support of the CNI, pregnant women and adolescents were added to the COVID-19 vaccination target groups.

The vaccination process itself was implemented mainly through the public health and social security system, however there was collaboration from other organizations such as universities, NGOs, and health professional associations, by providing personnel (health careers students), vaccination sites and logistics to reach certain priority groups. There was also collaboration from the private business community and business groups, with contributions for refreshments for vaccinators.

Vaccination took place in various ways, related to the population to be vaccinated and other variables such as access, population density, coverage achieved, vaccine type and cold chain needs. This included:

- Fixed vaccination sites in the healthcare network and vaccination sites system.
- Fixed vaccination sites outside the health system. Mass vaccination points were established in stadiums, schools, and universities, among other places.
- Mobile teams for door-to-door vaccination.

Strategies were implemented in parallel, but their implementation varied depending on the demand for vaccines by the population. Planning these strategies takes place at departmental and municipal level. All strategies included health teams with the capacity to respond to possible adverse events that may require urgent medical attention. **Table 8** shows the scheduling and final execution of the different strategies.

**Table 8:** Number of vaccination points and mobile units, scheduled and executed by department. Bolivia, between January and September 2021.

| Departments | Vaccination Points | | COVID-19 Teams | |
|---|---|---|---|---|
| | Planned | Executed | Planned | Executed |
| **La Paz** | 15 | 25 | 250 | 266 |
| **Potosí** | 3 | 1 | 200 | 20 |
| **Tarija** | 3 | 5 | 200 | 18 |
| **Oruro** | 3 | 6 | 200 | 55 |
| **Cochabamba** | 10 | 13 | 200 | 475 |
| **Beni** | 2 | 7 | 100 | 120 |
| **Chuquisaca** | 3 | 7 | 200 | 3 |
| **Santa Cruz** | 15 | 40 | 300 | 87 |
| **Pando** | 2 | 25 | 100 | 25 |
| **Total** | **56** | **129** | **1,750** | **1,069** |

**Source**: EPI, Ministry of Health and Sports

There were no major difficulties with the arrival of vaccines except initially with Sputnik V due to delays with remittances at the start, which generated communication problems with the population and required the interval between doses to be extended.

The EPI did not record any difficulties in working with 5 different vaccines. The population showed an initial preference for the Pfizer / BioNTech vaccine, and there was discrimination due to this being limited to departments with cold chain capacity for that vaccine, however this has not become any more significant. There was also specific difficulty with Covishield (ChAdOx1_nCoV-19) and the cases of thrombosis that occurred in Europe that generated reticence among the population.

Healthcare worker vaccination reached 96.1%, for second doses at national level, however the departments of Potosí and Santa Cruz still have more than 10% of their personnel not immunized (Table 5). In this group, strategies have included vaccination at fixed sites, in the same healthcare facilities**.** One of the difficulties with this group has been planning, fundamentally due to the lack of complete records of healthcare workers in the facilities. Considering that for this group there was unrestricted access to vaccines, it is believed that for those who remain unvaccinated it is due to doubts and erroneous beliefs about the vaccines and their approval processes.

Vaccination in adults reached 62.2% for fully vaccinated at national level, varying at departmental level from 47.5% in Potosí to 73.8% in Tarija (Table 5). All vaccination strategies have been used in this group, including mobile teams to long-term care centers and nursing homes. There may be several reasons why the intended coverage was not achieved, which include problems of access (rural areas, role of the elderly people at home, lack of company to attend to the health centers), erroneous beliefs about vaccines, religious or cultural reasons and fear of becoming infected, among others.

In the case of the population aged from 18 to 59 years with underlying medical conditions, coverage of 77.7% has been achieved at national level, varying between departments from 41.4% in Tarija to 142.4% in Chuquisaca. For this group there were difficulties in defining the denominator, which was higher at the beginning and then adjusted. Healthy people posing as sick to access the vaccine has also been detected, however how extent is this behavior is unknown. At departmental and municipal level, work with patient associations and with specialized physicians has facilitated access to patients.

Regarding indigenous communities, there were territorial differences related to acceptance of the vaccine, with the north of the country showing the greatest vaccine hesitancy. Access to the most remote communities has been one of the problems, along with language and cultural barriers. By 31 October, , 847,118 people had been fully vaccinated from this group of the population. As the population is not known, it is not possible to establish the coverage. In this group, one-dose vaccines were prioritized.

There is a similar situation with the migrant population - without knowing the estimated population, it is not possible to establish coverage. Up to now, monitoring has been done via nationality in the RNVE. By 31 October, 42,878 doses had been given to foreigners, including one, two and single dose courses. Their main home countries are Brazil, Argentina, Peru, and Colombia. There is no specific data for the most vulnerable refugees and migrants. In general, detection and vaccination of this group is a municipal task. In this group, one-dose vaccines were prioritized.

## 2. Regulation[6]

During preparation for introduction of the vaccines against COVID-19, regulatory proposals were established to deal with it, in a health emergency context.

As part of the response to the COVID-19 pandemic, the country issued different legal instruments, changes in the standards for recording vaccines to make the regulatory framework more flexible, on an exceptional basis, and to execute vaccine regulation and oversight functions under the terms of Decree no. 44327, of December 2020, related to direct contracting abroad applicable to vaccines, diagnostic tests and other goods and services when they are not available in the national market.
The regulatory changes that were exceptionally incorporated into the Decree referred to establish that ".... for contracting vaccines and diagnostic tests, the health registers issued by at least one national regulatory authority considered highly vigilant by its country will constitute a Health Register by homologation in the Plurinational State of Bolivia..."

For its part, the State Agency of Medicines and Health Technology (AGEMED), using its attributions defined in Supreme Decree #2905, of 2016, decided via administrative resolution #017 of April 2021[8] , to approve evaluation of the request for a homologated health register within the framework of Supreme Decree 4432, of December 2020 and Ministerial Decree 553, of the same month, issued by the Ministry of Health and Sports; to establish the requirements for this purpose; to define the list of national regulatory authorities (ARN) which will be recognized for homologation of such registers; and a term of 12 months for homologated and abbreviated registers that can be renewed solely for a similar period, only if the health emergency remains. To date, registers have been issued for homologation for two of the vaccines received at national level [The Gamaleya National Centre, Sputnik V (Human adenovirus vaccine (vector) COVID-19, and Sinopharm/BIBP Inactivated vaccine SARS-CoV-2 (Vero cells)]. For the rest of the vaccines, only batch by batch release was requested, as established in the COVID-19 Vaccination Plan approved by Ministerial Resolution #0098, which establishes that when they are acquired via the 'PAHO's Revolving Fund the documentation related to the batch import and release process simplifies the prior authorization process of each vaccine that is imported in this way.

The actions, procedures, and requirements (tutorials, flow charts, current records, authorized companies) related to the vaccines and other supplies received to date by donations are available on the webpage of AGEMED[9]

[6] Relevant references:

- PAHO/WHO. Recommendations on Regulatory Processes and Aspects related to the Introduction of Vaccines during the COVID-19 Pandemic and Other Emergencies. Available at: https://bit.ly/3C7rco1
- PAHO/WHO. Regulatory reliance principles: concept note and recommendations. Ninth Conference of the Pan American Network for Drug Regulatory Harmonization (PANDRH) (San Salvador, 24 to 26 October 2018). Available at: https://bit.ly/3punmjY

[7] State of Bolivia. Supreme Decree 4432. Available at: https://bit.ly/3pfxq14

[8] State Agency of Drugs and Health Technology (AGEMED). Administrative resolution #. 017, April 2021. Available at: https://bit.ly/2Z67V7A

[9] AGEMED. Available at: https://www.agemed.gob.bo/

## 3. Financing

The authorities' commitment to vaccination is reflected in the budget allocation and in effective execution of resources, in addition to the official and communication documents. Starting with an original requirement of around US$ 170 million, as the cost of the vaccination plan rose, the allocation doubled that amount, up to around US$ 340 million.

**Table 9**: Budget requested and assigned for COVID-19 vaccination to 30 September 2021 (US$)

| Course of Action | Budget required initially by Fte. Financing | | | | Budget assigned by Fte. Financing | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | TGN | COVAX | Shortfall | Sub-total | TGN | COVAX | PAHO/WHO | UNICEF | Sub-total |
| Vaccines | 106,000,000 | 35,966,410 | | 141,966,410 | 295,401,845 | 35,966,410 | | | 331,368,255 |
| Syringes and supplies | 7,437,156 | | | 7,437,156 | | | 299,000 | | 299,000 |
| Planning | 75,848 | | 314,152 | 390,000 | | | 389,897 | | 389,897 |
| Cold chain | 7,870,909 | | | 7,870,909 | | | 286,588 | 700,000 | 986,588 |
| Personnel (vaccinators, recorders, educators / triage, supervisors) | 1,212,245 | | 3,522,905 | 4,735,150 | 4,122,767 | | 200,000 | 300,000 | 4,622,767 |
| Information system | 1,532,025 | | 719,275 | 2,251,300 | 2,040,816 | | 200,000 | | 2,240,816 |
| Social communication | 4,748,755 | | 184,971 | 4,933,726 | | | 385,100 | | 385,100 |
| Training | 174,927 | | 174,927 | 349,854 | | | 120,000 | | 120,000 |
| ESAVI Surveillance | 13,500 | | 45,000 | 58,500 | | | 58,300 | | 58,300 |
| Investigations | 300,000 | | 300,000 | 600,000 | | | 280,000 | | 280,000 |
| Total USD | 129,365,365 | 35,966,410 | 5,261,230 | 170,593,005 | 301,565,428 | 35,966,410 | 2,218,885 | 1,000,000 | 340,750,723 |

Source: Ministry of Health and Sport Budget Unit; PAHO/WHO Execution Report; EPI Ministry of Health and Sport reports (Adm. of resources, CAF)

As shown in the table above (**Table 9**), most of the resources have been provided from public funds from the National General Treasury, with a very low level of indebtedness to cover the plan. Only 3% of the total appears not to be covered, although based on the interviews during the evaluation it seems that at least half of this amount is already covered by financing agreements. In addition, the main responsibility for financing lies with the central level of government, although the different subnational levels are jointly responsible for certain activities.

It is important to note that this whole campaign is taking place in the context of the assumption by new authorities that, given the size of the fiscal deficit currently facing the country (approximately 9.5% of GDP) there needs to be a campaign of fiscal austerity. In this context, though, health resources seem to be shielded and the fiscal savings found in other sectors.

## 4. Cold chain, supply, logistics and vaccines management

It is a priority for the Bolivian Government to protect the Bolivian population, so that everyone who "can" be vaccinated exercises their right to do so in accordance with the guidelines of the SAGE group of the WHO, the technical direction of PAHO/WHO and the National Immunization Committee.

Prior to the introduction of the COVID-19 vaccines, the EPI's cold chain and logistics personnel worked, with support from PAHO/WHO, on updating the inventory of the refrigeration equipment in the cold chain, the estimates of the storage and transport capacities required to receive and distribute COVID-19 vaccines, although by that moment the characteristics and presentation were not known.

The cold chain was organized into five stages: scheduling, acquisition, receipt, storage, and distribution, which are described below:

- **Scheduling**

The Bolivian Government prioritized the population to be vaccinated as 7,180,428 inhabitants and scheduled the acquisition of 14,360,856 doses for vaccination: considering 10% of vaccine wastage, the estimated total number of doses needed is 15,796,942.

- **Acquisition**

Vaccines and supplies have been acquired via the COVAX mechanism, bilateral agreements, and donations.

- **Vaccine receipt**

Bolivia has three international airports: El Alto, Cochabamba, and Santa Cruz. Because of the location of the central warehouse (EPI/Ministry of Health and Sports), vaccine arrival was prioritized at the El Alto international airport. Similarly, the national EPI has contingency strategies at the other two airports.
With a joint effort between the Ministry of Foreign Affairs, the National Customs and the Ministry of Health and Sports vaccines have been collected by the EPI from the runway at three airports, optimizing timely distribution and maintenance of the cold chain.

It should be highlight that there were no delays in receiving the vaccines due to lack of cold chain storage capacity, due to their staged remittances.

Equally, to strengthen the EPI logistics area within the Ministry of Health and Sports, in consideration of the work overload, the logistics and cold chain staff were reinforced with permanent, sustainable roles.

As various vaccines have been received in the country, human resources were trained, with support from PAHO/WHO about estimates for capacity, receipt, storage, distribution, and handling of COVID-19 vaccines, including specifications and handling equipment and vaccines at ultra-low temperatures. Training took place virtually, at all department and local levels, on a cascade basis.

The aim was to enable logistics and cold chain personnel to use personal protection equipment when handling vaccines at low and ultra-low temperatures, thermal clothing, goggles, and cryogenic gloves acquired with support from PAHO/WHO.

- **Storage and conservation**

Between 29 January and 31 October 2021, there were 36 remittances of vaccines.
The fractional arrival has allowed the storage without difficulties at each level, in accordance with the type of vaccine and the storage conditions that each required.

The national warehouse has seven cold rooms, of which 2 have been assigned, each of 40,000 liters. The total net storage capacity is 233,683 liters. To store the Gamaleya-Sputnik ad26 vaccine, an exclusive -18°C cold room has been assigned.

At the Departmental level, the total net storage capacity is 40,454 liters. The departments of Cochabamba, Santa Cruz, Chuquisaca, and Tarija have 700 liters capacity of ultra-low temperature (-70°C). This equipment was borrowed by public, academic and private institutions. Three cold rooms have been assigned (Santa Cruz: 2 and La Paz: 1).

With technical assistance from PAHO/WHO, applications were made to GAVI and COVAX based on the calculation of needs, and which are focused on receiving the support of refrigeration equipment to strengthen the cold chain.

Vaccination was never interrupted due to the lack of syringes because to the EPI had a reserve inventory (2 million syringes) for the regular program, which allowed COVID-19 vaccination to take place. These syringes were later replaced.

No temperature excursions were reported during storage at central level, nor in vaccine distribution at central and departmental levels.

The National EPI monitored use of COVID-19 vaccines, with no considerable loss factors identified (FE, FM), however there was a notification due to a failure with the Sinopharm vaccine (in Santa Cruz, La Paz and Tarija) of approximately 15 doses (broken and empty vials).

To reduce wastage rates, vaccination concentration and scheduling strategies were applied, which allowed optimization of the greatest use of the vaccines.

- **Distribution**

An agreement was reached between the Ministry of Health and Sports and the company “Boliviana de Aviación” for the distribution of vaccines between the international airport and the departmental capital cities, with support from the National Police, focusing on logistics and the distribution of vaccines.

At municipal and network level, storage capacity is limited, so the contingency plan was used (small remittances, frequent dispatches), with distribution of vaccines and supplies taking place by ground transport. There are domestic refrigerators to store vaccines at between +2°C to +8°C with an installed capacity of 23,511 cubic meters.

The cold chain inventory is available at departmental level, with the departments of La Paz and Santa Cruz identified as having shown the greatest requirement for refrigerators compared with the rest of the country, followed by the department of Cochabamba. The requirement at national level is 1,121 conventional refrigerators (domestic refrigerators) and/or 904 pre-qualified 120 liters refrigerators. There is an inventory in progress in the municipalities and health facilities, which when finalized will enable the best possible identification of the needs to strengthen the cold chain at these levels. In this context, with support from UNICEF and the non-governmental organization World Vision, a donation was received of 84 dual domestic refrigerators. In terms of cold boxes, 1,400 were distributed to the 9 departments in the country.

One of the largest pending challenges is including the vaccines and syringes logistic module in the Nominal Electronic Immunization Registry (RNVe) for an appropriate analysis of the use of vaccines, to establish the loss factor and its specific causes (loss of vaccines in sealed flasks and in open flasks). Similarly, the inventory will be finalized for cold chain equipment at municipal and local levels.

Vaccine loading and unloading has been strengthened with forklifts at the national level and the 9 departmental storage facilities, acquired with support from PAHO/WHO.

## 5. Human resources

The national EPI has reinforced its human resources with two quality management professionals, one for safe vaccination oversight, and the other for the logistics and cold chain area.

At the departmental level, SEDES Santa Cruz has reassigned personnel from other areas of the EPI to strengthen their activities. For the rest of the departments, the national EPI does not have any information about the loan and/or reassignment of personnel to strengthen COVID-19 vaccination activities.

In relation to training human resources, a major cascade virtual training program has taken place, using the virtual platforms of Telesalud, the SNIS and PAHO/WHO. Departmental facilitators were appointed who, in turn, supported the training of staff in the respective departments. More than 11,000 people were involved in this process, and more than 2,500 people from the community and universities.

The training was not just to enable the vaccination process, but also to generate adhesion to it, bearing in mind that, at the start of the campaign, more than 40% of people had doubts about being vaccinated.

## 6. Social communication and mobilization

To address vaccine acceptance and demand among the target populations, the “Introduction to the COVID-19 Vaccine” was produced under the Risk Communication and Social Mobilization Action Plan. Its general objective is to “contribute to the process of acceptance of the new COVID-19 vaccine, aiming to hit the vaccination target, using 12 technical and technological resources to stimulate two-way communication between the priority population and vaccination specialists, thereby continuously promoting public trust in the vaccination, meeting the needs for information of the different segments and monitoring the climate of opinion to anticipate and control situations that may generate vacillation or rejection”.

The Risk Communication and Social Mobilization Action Plan was formulated based on a study about knowledge, attitudes and practices concerning COVID-19 vaccinations in Bolivia, carried out in December 2020 by PAHO/WHO which main results are summarized following:

- 4 out of every 10 Bolivians are still not sure they will get vaccinated.
- 37% of Bolivians consider the vaccine against the SARS-CoV-2 virus to be completely safe, as against 62.9% who consider it less safe or unsafe.
- 7 out of every 10 Bolivians will review information about the COVID-19 vaccine before being vaccinated.
- The main adverse effects that the COVID-19 vaccine may produce are the main barrier to vaccination.
- People aged 30 or over are more likely to believe conspiracy theories, because they are more exposed to social media. Anti-vaccine movements used this opportunity to create an argument that the COVID-19 vaccine would not be safe in comparison with other vaccines.
- Trusted doctors, followed by healthcare workers, are the principal sources of the information given to Bolivians to decide whether to get vaccinated or not.
- Without public and communication support from the health sector, it is difficult to consolidate a pro-vaccine message in Bolivia.
- Medical colleges and scientific societies can play a substantial role, along with the National Immunization Committee (CNI).
- There is a direct correlation between age, the anti-system narrative, low incomes, and a negative trend towards the vaccine.
- Half of all Bolivians have impacted, at one time or another, by an anti-vaccine message.
- The COVID-19 vaccine is an easy subject for a political campaign and includes the country of origin of the vaccine.
- Social media has a highly argumentative line that countries in the third world, such as Bolivia, are used as guinea pigs to test the vaccines.
- Unlike the introduction of other vaccines in Bolivia, where anti-vaccine groups operated anonymously, this time there has not only been an information epidemic but also conspiracy theories with interactive groups organized on social and messaging networks (Facebook and WhatsApp), along with activism in the streets in various cities in Bolivia, handing out material,

giving speeches and organizing public rallies. They have gained a prominent place and space within public opinion.

The communication strategy has been dynamic and adapted to the national context. It is important to note that Bolivia has been going through a political crisis since 2019, which was finally stabilized with the democratic election of a new government at the end of 2020, and in 2021 there were elections for new departmental and municipal authorities, and with this added to the uncertainty caused by the pandemic, the strategy was produced in a scenario that was highly challenging for the population and kept to its objective of promoting the population's acceptance of the vaccine, encouraging trust in the public health system, and providing information to the population by the communication efforts that were made.

During implementation of the strategy there were three lines of communication:

- Pre-Rollout: the moment when the first vaccines arrived in the country and vaccination of health workers began.
- Initial Rollout: this started when vaccination was extended to the rest of the priority population groups.
- Wide Rollout: this began when the mass vaccination points were installed.

All messages were aimed at resolving doubts about the vaccines and providing information about administration of the vaccines at the mass points (time, place, requirement, population involved). In this process it is important to stress the role and work of the health workers in tackling the pandemic and in the vaccination processes. At the start of the vaccination processes, messages from health workers were not homogenous and could even be demotivating. However, it is important to stress the role and work of the health workers in tackling the pandemic and in the vaccination processes.

The initial stage of preparation and lack of instructional/educational dialogue with the press presented difficulties at the start of the process and is still a challenge. To include them in the vaccination cause in a more committed way, a direct relationship with them was changed and an open-door policy was implemented. This led to an improvement in handling the media narrative and the time and spaces provided by the communication media to broadcast messages and materials (e.g., Zero cost).

To implement the strategy, the national EPI formed a consultancy team of communication experts comprising communicators from the Ministry of Health, UNICEF, PAHO/WHO and UNFPA, which use technical assistance to support training and promotion processes, the design of materials and planning messages. PAHO collaborated financially in implementing the plan (design, production, training, distribution). For its part, the Ministry of Health's communication unit worked in areas exclusively related to the press and official public information, generating its own materials, messages, and actions. The Vice-Ministry of Communication contributed to broadening the information provided by the State about vaccines (management and access for the population), via its work in collaboration with other government bodies and State media. The advantage of this unagreed distribution of actions by up to three central government bodies allowed greater scope for the strategy: the disadvantage was dispersed official efforts, crossed and sometimes contradictory messages coming from the same government bodies, and a lack of coordination between the parties involved, which had repercussions at subnational levels, with a direct impact on the generation of communication disorganization. The immediate challenge is to improve coordination, approved by the EPI as leader and technical instructor in vaccine communication.

According to a second study carried out in August 2021, in exclusively urban populations in Bolivia, the most effective media and communication channels have been television and Facebook, which means that audiovisual media are those most accepted by the city population.

Other results that the study revealed were:

- There is lower vaccination coverage amongst those aged under 40, the informal sector and evangelists.
- The working hours of the vaccination points are not compatible with the times most of the population in the cities are available.
- Health centers and facilities are the preferred places for vaccination (highly reliable, well recommended).
- Acceptance of restrictive/prohibition measures being introduced: one of the main facilitating factors and accepted by more than 50% of respondents.
- Determinant effect on anti-vaccine messages, especially those circulating on Facebook and among friends. One in three unvaccinated people were exposed.
- Preferred sources of information in cities: TV, Facebook, and healthcare workers.
- The educational messages most in demand: vaccine purpose, safety, effectiveness (by type), immediate and long-term adverse effects.

Currently, most of the population are claiming the vaccine, which suggests that messages are penetrating the communities and they, in turn, recognize their rights. However, specific groups of people have been identified who do not accept the vaccine, and focused efforts must be implemented to reach them:

- Economically active people in the informal sector
- People who live in rural areas
- People who have an anti-system position
- People who promote chlorine dioxide in the country
- Healthcare workers who have echoed the rumors (to a lesser extent)

As part of the communication campaign, the country has produced a significant number of communication materials (for example ads, radio ads, posters, banners, videos featuring opinion formers, social media materials, guides, infographics, etc.) These materials were adapted in the many native languages of the country to reach a greater number of people. This effort was managed by the Ministry of Health and Sports with technical and financial support, principally from PAHO/WHO as well as UNICEF.

## 7. Vaccination Safety

The EPI in Bolivia regularly scrutinizes events supposedly attributable to vaccination and immunization (ESAVI), which is reinforced at the time of the introduction of new vaccines and in mass campaigns with high volumes of vaccinees: both situations apply to COVID-19 vaccination.

Under Ministerial Resolution 0098, post-COVID-19 vaccination ESAVI surveillance was institutionalized, on 10 March 2021, which has led to the creation of the ESAVI surveillance committee, the ESAVI surveillance manual, attention to ESAVI cases via public insurance and social security and the risk communication plan. These standards are mandatory for the public, short term insurance and private sectors.

The ESAVI surveillance committee was organized and functions regularly with participation from the EPI, AGEMED and SNIS-VE. The AGEMED representative was voted for as the president this year. At departmental level, the same committees have been organized that support ESAVI surveillance, carrying out training and supporting case investigation.

The electronic vaccination registry (RNVe) records all ESAVI, while the ESAVI surveillance committee has the supporting documents for severe cases.

The national and departmental committees have been strengthened in terms of their capacities to investigate and evaluate causality by the regional immunization program.

Official standards have established that there will be 4 workstations in all vaccination centers, mass points and mobile teams. The first corresponds to the vaccination information process, triage, anamnesis to prevent ESAVI due to history of serious anaphylactic reactions or uncontrolled illnesses and signing informed consent. The second is the RNVe, the third is the vaccination act, the fourth is 30 minutes of observation after vaccination, to deal with any immediate contingency that may arise. It has support from medical personnel, ESAVI kits and means of transport (ambulances). This standard has been verified in 6 of the 9 departments of the country.

As of 31 October 2021, 7,806,054 doses of COVID-19 vaccines had been administered, and 14,215 ESAVI recorded, which, under classifications in use in the country, have been classified as follows: severe (14) and not severe (moderate,193, and mild,14,008). Severe ESAVIs have been recorded in the departments of La Paz (8 cases), Santa Cruz (5 cases) and Chuquisaca (1 case), all related to the Sinopharm – BIBP vaccine (**Table 10**).

**Table 10:** ESAVI rates, by vaccine. Bolivia, January to September 2021

| Vaccine | Rate per 100,000 doses administered, by ESAVI type | | |
|---|---|---|---|
| | Severe | Not severe | Total |
| **Sinopharm – BIBP** | 0.33 | 215.92 | 216.26 |
| **Sputnik V (Gam-COVID-Vac)** | | 142.10 | 142.10 |
| **AstraZeneca ChAdOx1-S (Vaxzevria® and Covishield®)** | | 309.13 | 309.13 |
| **Janssen Ad26.COV2.S** | | 1.14 | 1.14 |

**Source**: PAHO/WHO, based on data provided by EPI, Ministry of Health and Sports.

Implementation of sentinel surveillance for serious ESAVI has begun in selected hospitals and is expected to be extended through the remaining second and third level hospitals in 2022.

To integrate the regional surveillance network on EVADIEs and ESAVIs, the Maternal, Childhood and Worker Hospitals of the National Health Board (CNS) were selected, as they meet the requirements for: IRAG and COVID-19 integrated surveillance, personnel managing surveillance, basic specialties and historic data that enables a base line to be established for the main EVADIE.

The Ministry of Health and Sports published ESAVI information in the ESAVI National Vigilance Bulletin10.

10 AGEMED. Available at: https://bit.ly/3bsh6lr

## 8. Information and monitoring system

In 2017, development of the National Electronic Vaccination Registry (RNVe) began in Bolivia. It was piloted in Sucre, Oruro and La Paz and scaled up nationally in 2019. To do this, training took place in all departments, and there was also support from international cooperation and Gavi to buy computers. With the arrival of COVID-19, it was used as the basis for the registration system and rapidly adapted for use throughout the country, which facilitates monitoring by different analysis variables.

- ***Personal record***

The RNVe in Bolivia is sufficiently flexible to allow inclusion of priority groups as established in the COVID-19 national vaccination plan. For example, if the target population was those aged over 80, the system would be open to this population and so on successively. The country has unique identifiers, which facilitates the registration process, enables duplicates to be avoided, and maintains a vaccination history for every person.

The RNVe interacts with the personal registry of the Personal Identification General Service (SEGIP) to validate the information from the unique identifier, in other words by entering the identification number and immediately finding the information for this person. However, due to the large number of people being vaccinated, the system was saturated in the first months of use. To do this, it was divided/replicated across three channels, allowing improved consumption of the information.

The system has mechanisms to capture special populations such as indigenous groups and foreigners, although vaccination of migrants is covered in the NDVP and in the country's vaccination policies, with some barriers, for example when the first dose is given in one location and the second in another, when authorization must be requested to open the system at department or national level.

The country has promoted the immunization program against COVID-19 for these special populations by creating vaccination points on the border and reaching places with vulnerable populations, such as prisons, etc.

Now, social security vaccinates, but reports aggregated data, and private insurers do not vaccinate. Taking the above into account, there should be consideration of short-term use by all actors in the health sector, including social security and the private sector, as well as non-governmental organizations.

***Denominators***

There is no population basis recorded in the system to cover the data. The aim was to start this activity at the beginning of 2020, but this was not achieved, so it is important to continue working with the National Statistics Institute to estimate the denominators. The denominators were obtained from the programs for the target groups (for example people with comorbidities).

- ***Vaccination registration***

The system records variables of interest such as biological product and vaccine characteristics, priority groups and other areas allowing breakdown, such as geography and gender.

At those sites where there is no Internet, data is recorded on paper and then entered manually on the IT system located in the municipal headquarters. Even though the RNVe does not allow duplicates to be entered, sometimes duplicates are found, or people who do not belong to risk groups in the manual record. The exceptional role of allowing these people to be registered is carried out by the department, which contacts the national EPI.

These connectivity problems may also lead to delays in obtaining information, as they may generate latency in recording information on the system, as it is recorded manually and then sent to the municipal headquarters for the data to be entered on the system, within a maximum of 10 days.

***Vaccination follow-up***

The form was one of the strategies to provide recipients of the vaccine with sufficient information about the need for second doses. People access a “check your vaccination” webpage, and with identifier data print the RNVe form that has a QR code. Work is underway to improve security to generate an international card. Other follow-up strategies include registering the contact's mobile phone number; this generally uses personal mobile phones.

***Biological traceability***

The system includes variables related to the biological product; however, the input module has not yet been developed, which will be very useful in monitoring coverage and in calculating the percentage of waste from broken bottles, handling the vaccine, etc.

- ***Reporting / monitoring***

The system generates different reports at all levels, which are heavily used by different political and technical actors. Daily monitoring is done by EPI and the Ministry of Health and Sports while the presidency reviews the data weekly and emphasizes where coverage is low.

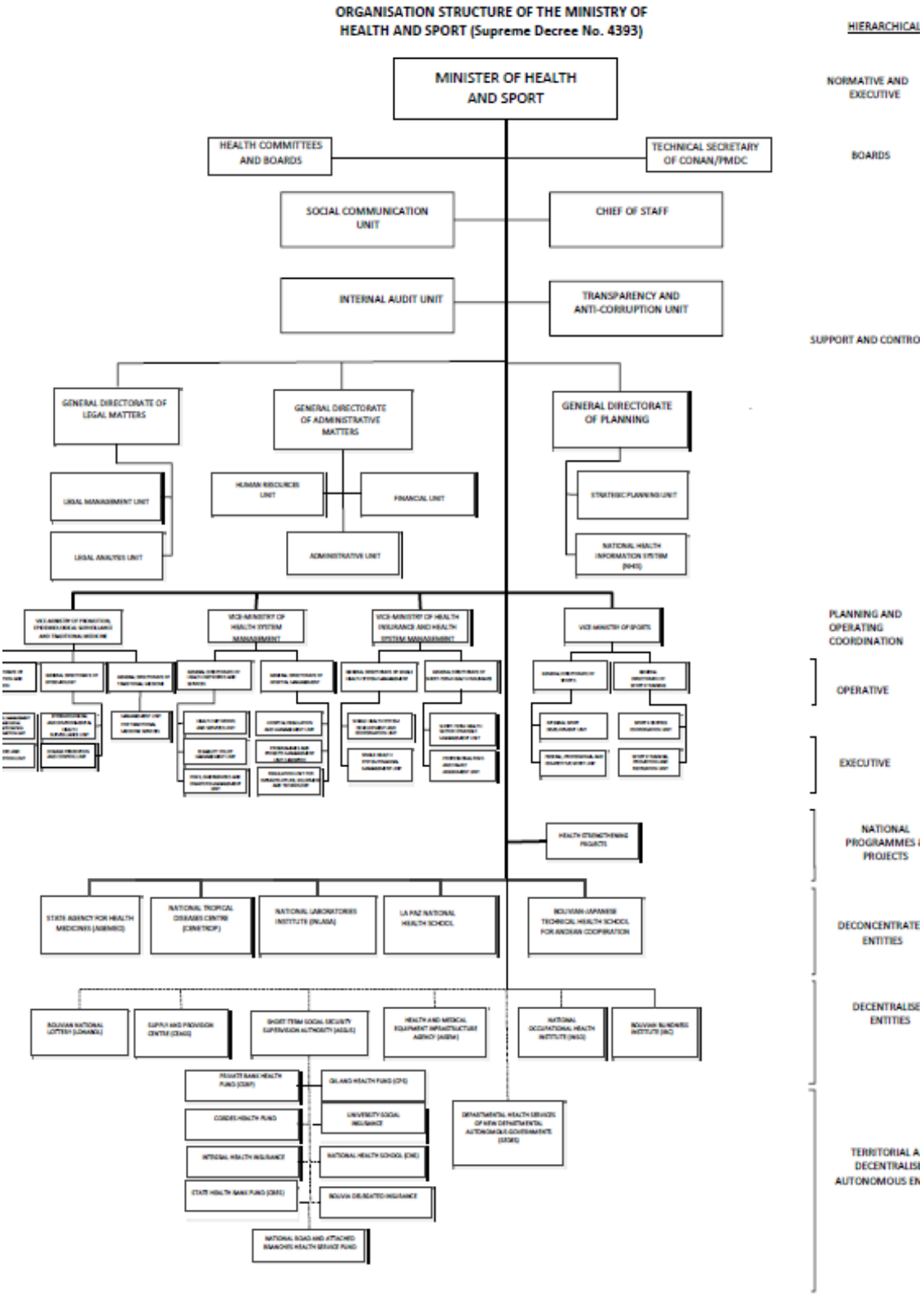
One of the difficulties has been the population base for calculating the indicators. The denominator was obtained from the programs for the target groups (for example people with comorbidities) or the National Institute of Statistics (for age groups): based on this target population it has been possible to do this monitoring, allowing the goal to be calculated.

An important thing is for departments to have the responsibility for verifying the quality of the records and doing so daily. A kind of healthy competition has been established between the departments to do this monitoring.

## 9. Scientific investigation

There are currently ongoing investigations, carried out by the universities, which are carrying out immunogenicity studies to measure seroconversion after the first and second dose of vaccines, according to variables such as ethnicity. Vaccines are not compared: they are all in the same study. The basic objective of the results of the study is to show the population that the vaccines work. Similarly, there are studies underway into the duration of the presence of antibodies, seroprevalence in different demographic strata, and the prevalence of variants.

## Annex 5: Ministry of Health and Sports Organization Chart



## Annex 6: List of Interviewers

| Name | Pan American Health Organization/ World Health |
|---|---|
| Alba Maria Ropero | Pan American Health Organization/ World Health Organization (Washington, DC. United States of America) |
| Alejandro Benavides | |
| Ana Elena Chevez | |
| Analía Caceres | |
| Desiree Pastor | |
| Emilia Cain | |
| Jeniffer Sanwogou | |
| John Ftzsimmons | |
| José Luis Castro | |
| Juan Pablo Pagano | |
| Lucia de Oliveira | |
| Maite Vera | |
| Marcela Contreras | |
| Margherita Ghiselli | |
| Maria Tereza Da Costa | |
| Mariluz Pombo | |
| Maritza Labraña | |
| Martha Velandia | |
| Mónica Chiu | |
| Nora Lucia Rodriguez | |
| Pamela Bravo | |
| Paola Ojeda | |
| Ricardo Fabrega | |
| Sebastian Oliel | |
| Sergio Loayza | |
| Soledad Urrutia | |
| Tanya Escamilla | |
| Leslie La Torre | PAHO/PWR in Bolivia |
| Rosario Quiroga | |