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## EXECUTIVE SUMMARY

Expansion and Sustainability Plan for the Technological Solution *Mi Paciente-  
NETUX* for Remote Monitoring of COVID-19 Cases

Local Health System Sustainability Project

Task Order I, USAID Integrated Health Systems IDIQ

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## Local Health System Sustainability Project

The Local Health System Sustainability (LHSS) Project under the USAID Integrated Health Systems IDIQ helps low- and middle-income countries transition to sustainable, self-financed health systems as a means to support access to universal health coverage. The project works with partner countries and local stakeholders to reduce financial barriers to care and treatment, ensure equitable access to essential health services for all people, and improve the quality of health services. Led by Abt Associates, the five-year, \$209 million project will build local capacity to sustain strong health system performance, supporting countries on their journey to self-reliance and prosperity. In Colombia, this project is known as “Comunidades Saludables”.

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# EXECUTIVE SUMMARY

## I. DESCRIPTION

### Objective

Strengthen surveillance and monitoring of cases of acute lower respiratory infection (including COVID-19) in adults and children over nine years of age by identifying early warnings signs, enabling immediate response to emergencies, and to current and future outbreaks and epidemics. The *Mi Paciente* application also seeks to optimize and relieve congestion on hospital and intensive care unit (ICU) services in eight prioritized territorial entities.

### Description of the Problem

In Colombia, Acute Respiratory Infection (ARI) is one of the top ten leading causes of disease and death among the general population, including the first three causes for children under five years of age and for people living with some chronic illnesses, particularly those receiving immunosuppression treatment (INS, 2022). In 2022, Colombia's integrated social protection information system, SISPRO reported 1,044,464 ARI cases, of which 618,815 were acute lower respiratory infection, including COVID-19. Of these, influenza represented 11.9 percent, seasonal influenza A 2.2 percent, influenza B 0.1 percent, COVID-19 12 percent, and other respiratory viruses 74.5 percent. SISPRO also reported that 86.9 percent of severe acute respiratory infections (SARI) lead to hospitalization, 13.1 percent require ICU treatment, and 13.1 percent home treatment, with a mortality rate of 7.8 percent. Likewise, of the 85 percent of cases arriving to the emergency room, 21 percent lead to hospitalization and some progress to an acute respiratory distress syndrome, thus, needing to be transferred to an ICU. The hospitalization average length of stay is 2.5-5 days, and average ICU stay is 10–14 days.

During July and August 2021, LHSS, in partnership with the company NETUX, led the development and parameterization of the technological solution *Mi paciente* (software and artificial intelligence). This application, developed as part of the response to the COVID-19 health emergency, aims to monitor symptomatic ARI cases and identify the cases linked to COVID-19 for people over 18 years of age who are not enrolled in health insurance, and for migrants in the territorial entities of Norte de Santander, La Guajira, Bogotá, and Buenaventura. LHSS and Netux donated kits (230 pulse oximeters) and pedagogical material, provided training for operating the technological solution, set up a technical support help desk, and transferred the licenses required to operate the pulse oximeters to the territorial entities.

The *Mi Paciente* technical solution was efficient in detecting early signs and identifying contacts, enabling the monitoring of over 488 symptomatic COVID-19 cases in adults over 18 years of age, of which 44 percent were men, 56 percent women; 20 percent were Venezuelan migrants, and the remaining represented host communities. 35 percent of the people monitored had a co-morbidity, which increased their risk in developing a severe clinical diagnosis due to COVID-19. A total of 731 close contacts, a 1:1 average ratio of contact cases, were reported to the surveillance system in the territorial entities. Three percent of the cases being monitored registered a moderate or high alert, of which 14 percent required early hospitalization. All hospitalized patients had a full recovery, and no deaths were recorded.

As COVID-19 cases declined due to increased vaccination coverage and strategies implemented to interrupt COVID-19 transmission chains, LHSS began analyzing the possibility of adapting and expanding *Mi Paciente* for remote surveillance and clinical monitoring of symptomatic SARI cases, including COVID-

19, targeting adults and children over nine years of age. The remote surveillance and monitoring would be conducted using clinical criteria, and include: monitoring the risk progression score in real time; exploration of clinical variables and screening questions; the design and delivery of educational messages (key messages), the identification of risk alerts, and early referral to emergency care and hospitalization.

## Methodology

LHSS and the Ministry of Health and Social Protection (MSPS) used a co-creation and adaptive management approach to analyze and project the costs and savings that could be achieved both in hospitalization and ICU care processes by implementing the SARI monitoring and surveillance technology, including for COVID-19, for adults and children over nine years of age using outpatient and emergency services. The costs and saving projections were based on the monitoring of cases during the previous year.

LHSS, in conjunction with the National Program of Acute Respiratory Infection of the MSPS and NETUX, defined the inclusion criteria to customize and expand the *Mi Paciente* technological solution. This includes designing the architecture, developing the formats, processes, and procedures for new health events to be included: community-acquired pneumonia and acute lower respiratory infection in children; pneumonia and bronchiolitis; COVID-19 in children above 9 years of age based on risk score; and the continuation of COVID-19 in adults above 18 years of age. Additionally, this process included the parameterization and integration of data from the pulse oximeters, thermometers, and from the screening questions. The inclusion criteria were discussed and agreed on in meetings held on August 3 and 10, 2022.

The plan for expanding the *Mi Paciente* solution included 15 steps, which were initiated in the second half of 2022: 1) agreeing on the expansion criteria; 2) designing the situations in which the software will be used and 3) its general architecture; 4) designing the clinical algorithms for SARI-COVID-19; 5) programming the roles; 6) programming the processes and procedures; 7) creating the users; 8) purchasing biomedical devices; 9) logical design and programming of risk scores; 10) structuring the module; 11) delivery of the kits and training human resources; 12) implementing the technical support group; 12) organizing feedback and dialogue opportunities and consulting on plans for sustainability; 14) monthly monitoring of expansion activities in the territories and 15) identifying local counterparts who will assume responsibility for the application in the territories.

## Collaborative Process

This deliverable is based on the outcome of LHSS's COVID-19 Innovations intervention implemented in 2021. Additionally, it is consistent with the protocols for phased comprehensive care, which includes home-based care, outpatient, emergency, hospitalization, and critical care for COVID-19 patients over 18 years of age, and the protocol for early post ICU comprehensive rehabilitation care addressing patients over 18 years of age with post-acute sequelae COVID-19, or long COVID. Likewise, this deliverable is in line with the LHSS-supported protocol aimed at providing technical guidance on occupational health and safety to prevent or mitigate physical and mental health problems targeting the health professionals working with COVID-19 patients.

## 2. RESULTS

LHSS supported the process to strengthen the remote clinical monitoring of symptomatic SARI, including COVID-19, for adults and children over nine years of age, targeting the uninsured Venezuelan migrant population and host communities. Remote clinical monitoring aims to identify early warning signs and guide the response for SIRA cases, including COVID-19, by customizing and adapting the *Mi Paciente*

platform for use in Norte de Santander, La Guajira, Buenaventura, Bogotá, Medellín, Arauca, Bucaramanga, and Cali. The use of this technological platform was found to reduce the risk of SARI cases progressing to needing hospital-based emergency care by an estimated 6.5 percent, general hospitalization by 4 percent, and admission to the ICU by 18.8 percent, which is a substantial reduction in risk.

## Recommendations

The development of the technological solution *Mi Paciente* has contributed to strengthening the management of public health surveillance programs and evidence-based decision-making processes for health care. It is worth noting that this platform also granted an active role to patients and their families in reporting COVID-19 signs and symptoms, contributing to alerting authorities of rising cases and potential demand for health care in each region.

The implementation of the expansion plan requires establishing links with territorial entities to encourage them to participate in the process of developing strategies for promoting the use of the application among patients, among other important strategies. To strengthen the expansion of *Mi Paciente*, LHSS recommends identifying education and communication strategies that territorial entities and Netux can use to define an operational architecture that is user friendly and aligns with the needs and context of each territory.

## 3. SUSTAINABILITY / USE OF THE DELIVERABLE

This document identifies several scenarios for sustaining the use of *Mi Paciente* for monitoring ARI/COVID-19 patients, considering the socio-economic conditions of each territory. These scenarios explore the institutional development and the financial and governance capacity of the territories. Understanding the capacity of the territorial entities facilitated the development of five detailed scenarios under which the technological platform *Mi Paciente* can continue to be implemented after the completion of the LHSS Colombia Activity.

The co-creation exercise implemented to develop the possible scenarios facilitated the identification of the capacity that will remain in the territorial entities after implementing *Mi Paciente*. Netux has committed to deliver the platform after completing its grant with LHSS.