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# POPULATION SIZE ESTIMATION REPORT FOR VENEZUELAN MIGRANTS LIVING WITH HIV IN PERU

Local Health System Sustainability Project
Task Order 1, USAID Integrated Health Systems IDIQ

**Local Health System Sustainability Project**

The Local Health System Sustainability Project (LHSS) 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.

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# Acronyms

| | |
|---|---|
| **DPVIH** | Prevention and Control Program for HIV/AIDS and Sexually Transmitted Diseases and Hepatitis and the Migrant Unit |
| **HIV** | Human Immunodeficiency Virus |
| **LHSS** | Local Health System Sustainability Project |
| **MOH** | Ministry of Health |
| **USAID** | United States Agency for International Development |

# 1. Introduction

The objective of the Local Health System Sustainability Project (LHSS) in Peru is to strengthen the capacity of the Ministry of Health (MOH) to provide equitable, affordable, and acceptable access to quality prevention, testing, treatment, and care services for Venezuelan migrants living with HIV.

To achieve this, LHSS will conduct a modified health system assessment focused on HIV services, and to strengthen the technical, management, and coordination capacity of the Prevention and Control Program for HIV/AIDS and Sexually Transmitted Diseases and Hepatitis and the Migrant Unit (DPVIH) of the MOH. This will include delivering targeted capacity development support to the MOH to improve forecasting and planning for HIV services, commodities, and antiretrovirals, based on findings from a health systems assessment and this population size estimation report. LHSS will also seek to strengthen regional coordination to improve continuity of care for migrants moving among countries.

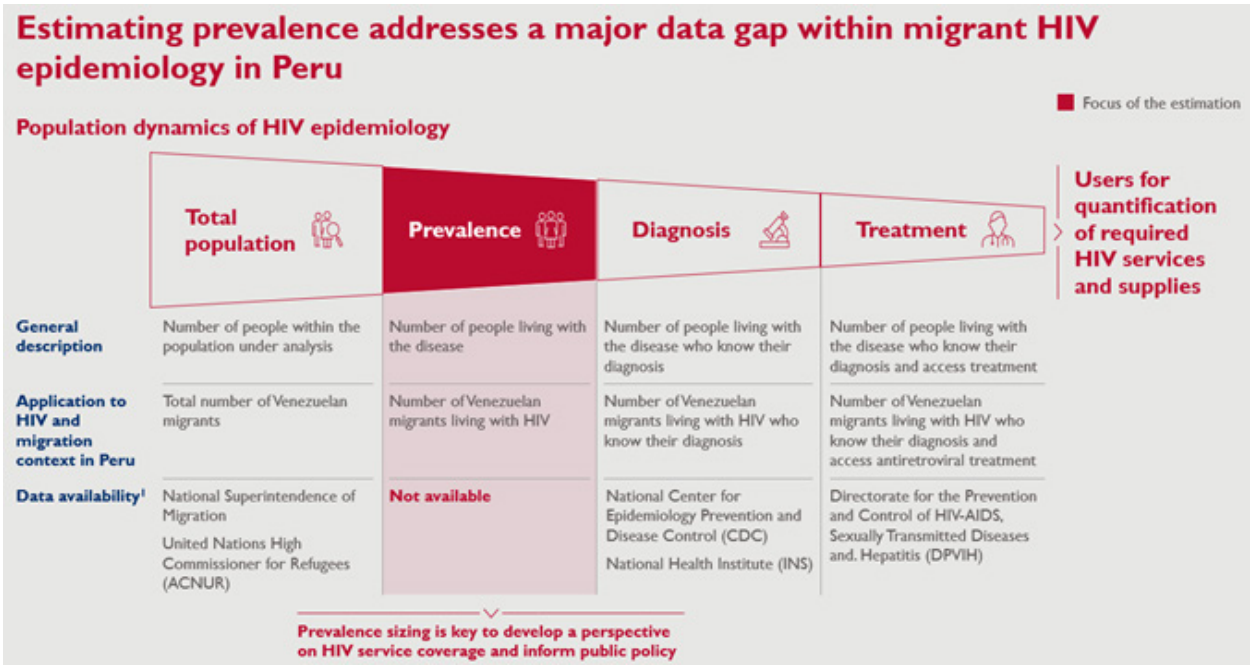
Under the LHSS Peru Year 1 Workplan, Objective 2, LHSS aims to strengthen MOH capacity to ensure availability of HIV medicines and commodities for the Venezuelan migrant population. The first task to achieve this goal is to estimate the HIV population among Venezuelan migrants in Peru. LHSS will quantify the demand for HIV commodities needed to provide adequate coverage for Venezuelans living with HIV in Peru and analyze existing forecasting systems at the MOH to determine its accuracy in procuring and monitoring the distribution of key HIV drugs. Lastly, LHSS will provide technical assistance to the MOH to implement recommendations based on the findings from the health systems assessment and forecasting analysis.

This report provides the results of the estimation exercise in four sections, including this introduction. Section two establishes the scope of the estimation of Venezuelan migrants living with HIV in Peru. Section three presents the methodological approach used for the estimation. Section four details the proposed prevalence calculation model and presents initial results.

# 2. Scope of Estimation

There are four components of the population dynamics of HIV epidemiology: total population, prevalence, diagnosis, and treatment. Total population is the number of people under analysis; in the context of Venezuelan migration to Peru, it is the number of Venezuelan migrants living in Peru, with both regular and irregular status. Prevalence refers to the number of people living with the disease; in context under analysis, it is the number of Venezuelan migrants living with HIV in Peru. Diagnosis refers to the number of people living with the disease who know their HIV status; in this case, the number of Venezuelan migrants living with HIV who know their diagnosis. Finally, treatment refers to the number of people; in this case, Venezuelan migrants living with HIV who know their status and are accessing antiretroviral treatment under the DPHIV program. Together, these components create a funnel that results in the number of users or patients to be considered for quantification of required HIV services, drugs, and commodities (see Figure 1).

**Figure 1. Population dynamics of HIV epidemiology**




According to the DPVIH of the MOH, there is data available for three of the four components, although there may be quality concerns. There is currently no formal or structured approach to establish a nominal or estimated number for HIV prevalence in Venezuelan migrants living in Peru.

Considering that prevalence is key to develop a perspective on HIV services coverage and to inform public policy, the purpose of the estimation exercise is to identify the total number of Venezuelan migrants living with HIV in Peru, and to address the identified data gaps within migrant HIV epidemiology in Peru.

# 3. Methodological Approach

To estimate the number of Venezuelan migrants living with HIV in Peru, a three-step process was developed that considers the availability and quality of information.

**Step 1.** Develop a model to estimate the number of migrants living with HIV and requiring treatment based on benchmarking of prevalence rates in comparable geographic location or population groups. To accomplish this, four activities were completed:

1.1. Quantify the total population of Venezuelan migrants under analysis and highlight key sociodemographic characteristics

1.2. Identify a set of comparable groups (geographic, migrant groups, vulnerable groups) based on their sociodemographic composition

1.3. Research and benchmark HIV prevalence rates and establish a reference range value

1.4. Apply reference prevalence range value to the total population of Venezuelan migrants in Peru

Sources consulted in step 1 included key informant interviews with government officials, external reports and databases, and data from the DPVIH.

**Step 2.** Ensure consistency of the initial estimation by comparing it to existing diagnosis and treatment data or estimates of Venezuelan migrants. To accomplish this, there were four activities to complete:

2.1. Obtain the number of Venezuelan migrants with known diagnosis and accessing treatment based on available information, or estimate using comparable rates

2.2. Calculate diagnosis and treatment rates for Venezuelan migrants living with HIV in Peru

2.3. Calculate initial results

2.4. Build scenarios to identify potential planning gaps

Sources consulted in step 2 included data from the DPVIH and the Centers for Disease Prevention and Control (CDC).

**Step 3.** Validate the initial results of the estimation with the MOH and incorporate feedback to the model. To accomplish this, there were four activities to complete:

3.1. Present methodology and initial results to experts

3.2. Establish clear use cases for the estimation of Venezuelan migrants living with HIV in Peru

3.3. Inform on existing data gaps and limitations

3.4. Incorporate feedback on the initial results, and update the model accordingly

Sources consulted in step 3 included data from the DPVIH. Additionally, LHSS consulted with groups that work directly with migrants such as NGOs and humanitarian assistance organizations. A detailed list of sources consulted can be found in Annex II.

# 4. Prevalence Model and Initial Results

LHSS developed an estimation model that can be used for planning and forecasting HIV commodities to meet the increased health system demands resulting from the influx of Venezuelan migrants living with HIV in Peru. The first step of the model is calculating the size of the Venezuelan population living in Peru, followed by a calculation of HIV prevalence among this population. This section includes the detailed process to develop the estimation model, estimate the number of Venezuelans living with HIV in Peru, steps taken to ensure consistency of the estimation, initial results, and three planning scenarios for forecasting.

## 4.1 Step 1: Develop the Estimation Model for Planning Scenarios

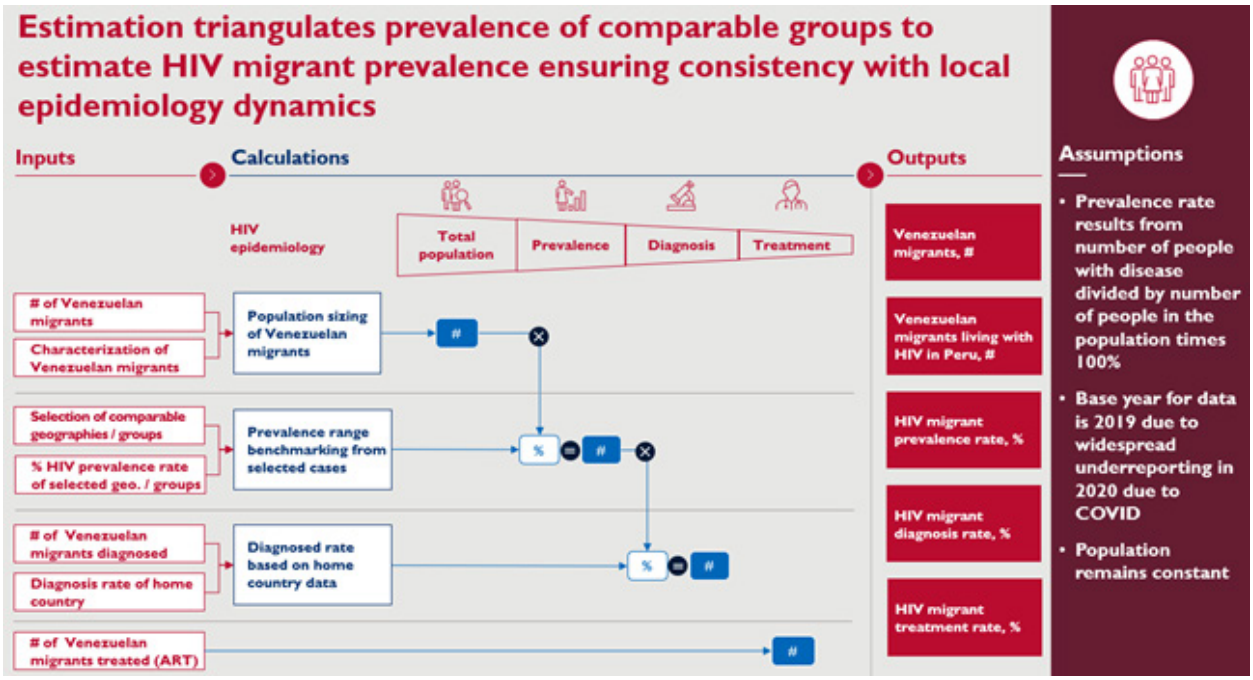
The estimation model triangulates comparable prevalence rates to derive the prevalence rate for Venezuelan migrants, while ensuring consistency with existing local epidemiological dynamics (i.e., the interrelationship between prevalence, diagnosis, and treatment rates). See Figure 2 for details.

The model requires seven inputs: (1) total number of Venezuelan migrants in Peru, (2) sociodemographic profile of Venezuelan migrants, (3) selection of comparable geographies and groups, (4) HIV prevalence rates of selected groups, (5) number of Venezuelan migrants with known diagnosis, (6) diagnosis rate of home country of migrants, (7) number of Venezuelan migrants treated.

There are three calculations considered as part of the model: (1) estimating the population size of Venezuelan migrants, (2) prevalence benchmarking from selected cases, and (3) establishing a diagnosis rate based on home country data.

There are five expected outputs: (1) Venezuelan migrant population, (2) Venezuelan migrants living with HIV in Peru (nominal terms), (3) HIV migrant prevalence rate (relative terms), (4) HIV migrant diagnosis rate, (5) HIV migrant treatment rate.

**Figure 2. Structure of the model**

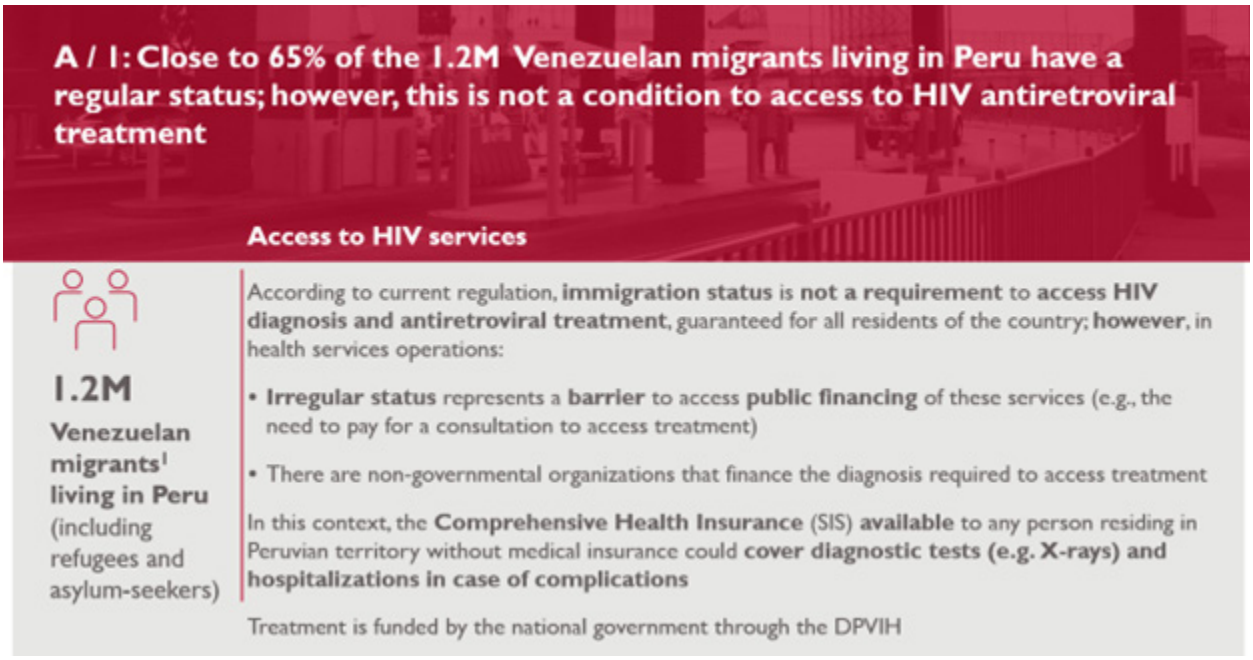



### 4.1.1 Quantify the total population of Venezuelan migrants under analysis and highlight key sociodemographic characteristics

According to the World Bank, as of mid-2020, there were 1.2 million Venezuelan migrants living in Peru.[1] Of these, roughly 790 thousand or close to 65% have regular migration status, meaning they registered their entry at a border check point, according to the latest report by the National Superintendency of Migration. Access to HIV antiretroviral (ARV) treatment is not contingent on migration status or enrollment in the Comprehensive Health Insurance (SIS) program. While ARV, viral load tests, and HIV tests are provided for free by the MoH, other services are not covered. See Figure 3 for more information on access to HIV services.

[1] World Bank – 'Infografía: Migrantes y Refugiados Venezolanos en El Perú: El Impacto de la Crisis de la Covid-19', Superintendencia Nacional de Migraciones – 'Características sociodemográficas de la migración venezolana en el Perú Feb 2017 – Mar 2021'

**Figure 3. Estimating the size of the population of Venezuelan migrants living with HIV in Peru**




The gender composition of Venezuelan migrants is 52% male and 48% female, while the group between 15-49 years old represents roughly 78% of all migrants, often considered at risk of HIV due to sexual activity / reproductive ages (as shown in Figure 4).

The same survey found that roughly 10% of Venezuelan migrants have a chronic disease or illness, of which 0.4% indicate are HIV positive. With regards to health care, less than 15% indicate receiving adequate treatment for a chronic disease, mainly in terms of frequency (e.g., limited availability of routine check-ups). Only 3% of migrants claim to have access to HIV testing, and only 9% report having health insurance, including the Comprehensive Health Insurance (SIS). Figure 5 shows health characteristics of Venezuelan migrants.

**Figure 4. Demographic characteristics of Venezuela migrants**

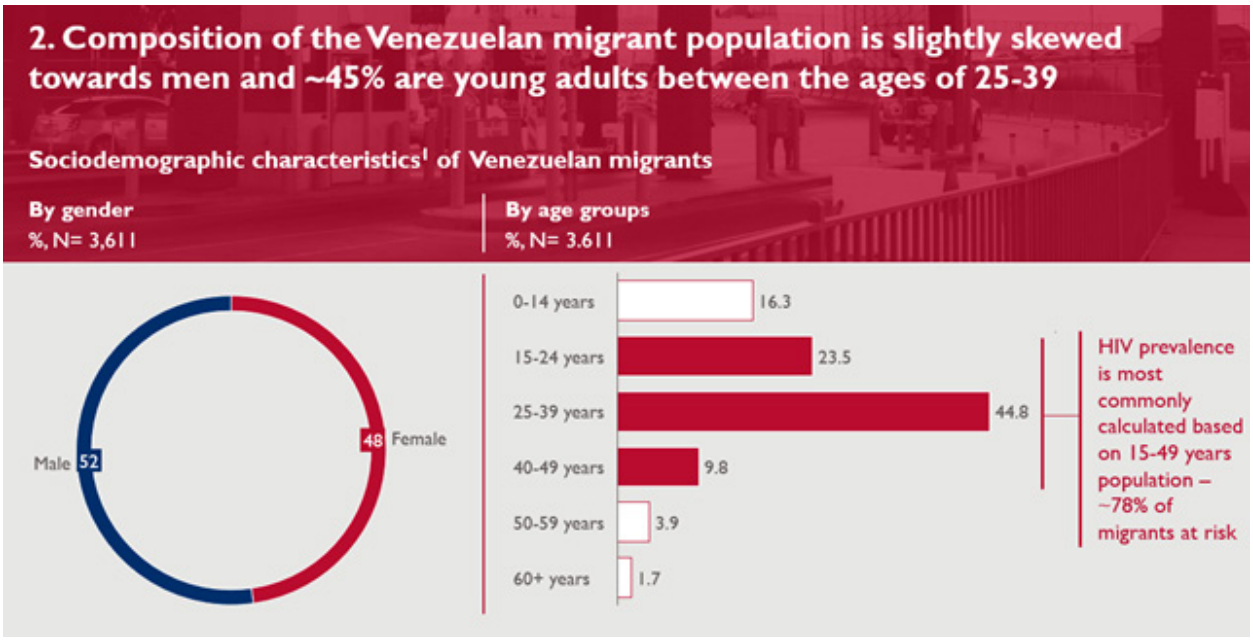
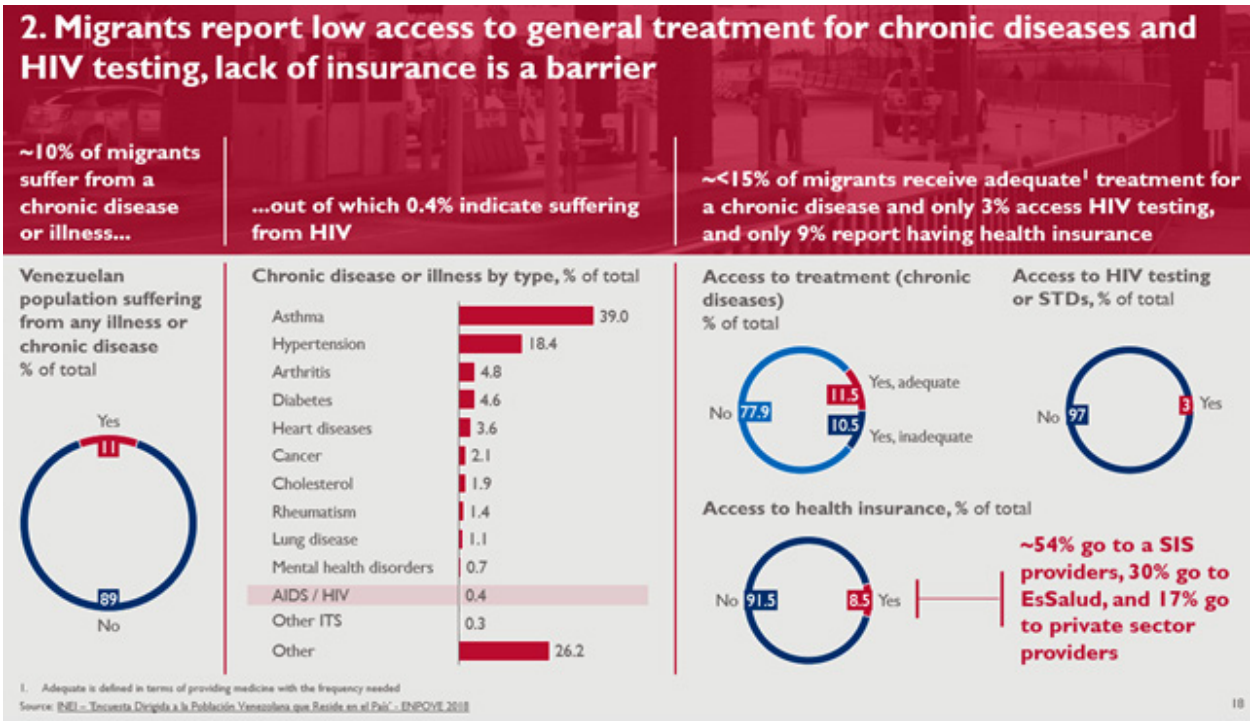



**Figure 5. Health characteristics of Venezuelan migrants**




## 4.1.2 IDENTIFY A SET OF COMPARABLE GROUPS BASED ON THEIR SOCIODEMOGRAPHIC COMPOSITION

The selection of the potential cases for comparison used three categories: comparable geographies, comparable migrant groups, and comparable vulnerable groups. Fourteen

potential cases were initially identified: three under comparable geographies, seven under comparable migrant groups, and four under comparable vulnerable groups.

For each of the cases identified (included in Figure 6) an HIV epidemiology data assessment was carried out, which included the assessment of three qualitative variables:

- Availability: Is there any HIV epidemiology data related to the case? For example, recent prevalence, notification, or treatment statistics?
- Quality: Is the data found related to prevalence figures or can it be used to estimate prevalence?
- Comparability: Is the sociodemographic composition of the case comparable to that of Venezuelan migrants living in Peru?

**Figure 6. List of potential cases for prevalence rate benchmarking**

**3: We identified 14 potentially comparable groups to Venezuelan migrant population in Peru before selecting comparable prevalence levels**

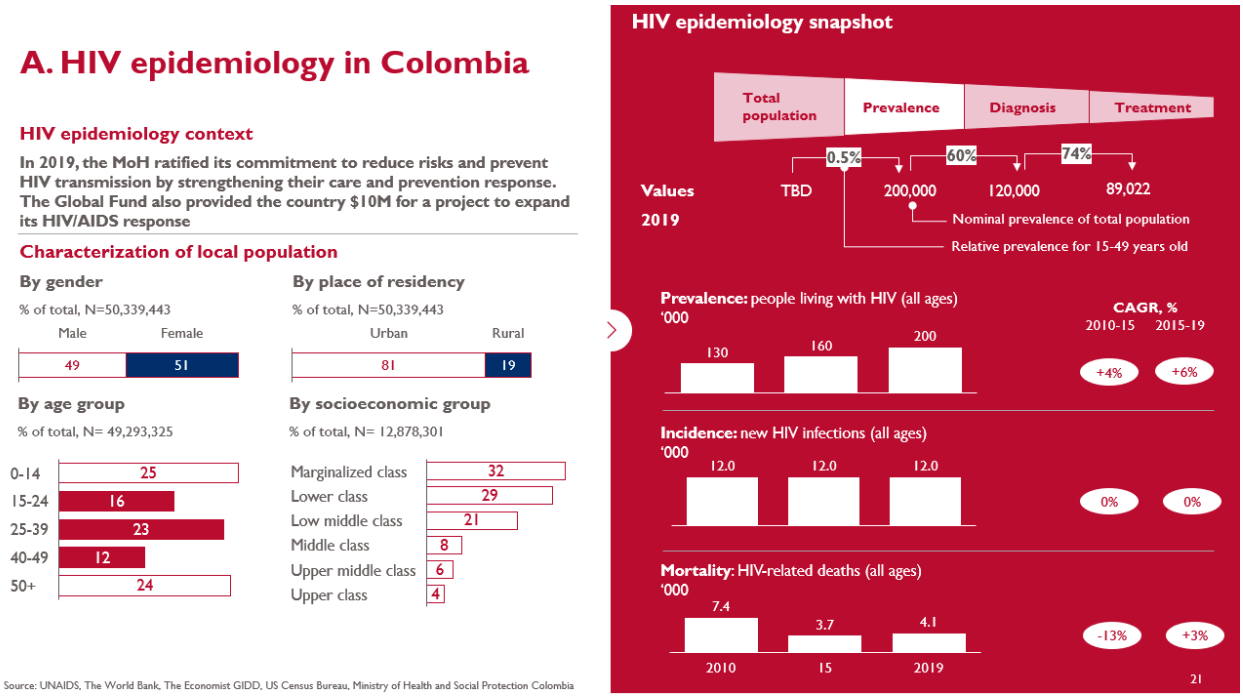
NON-EXHAUSTIVE

✓ Yes ✗ No / Not applicable X% Selection as benchmarking input

| Categories | Definition | List of potential cases | Country | HIV epidemiology data assessment: Availability[1] | Quality[2] | Comparability[3] | Deep-dive available: HIV prevalence rate, % |
|---|---|---|---|---|---|---|---|
| Comparable geographies (3) | Geographic or political territories (e.g. countries, provinces, cities) | A Colombia | | ✓ | ✓ | ✗ | 0.5% |
| | | B Peru | | ✓ | ✓ | ✗ | 0.3% |
| | | C Venezuela | | ✓ | ✓ | ✓ | 0.6% |
| Comparable migrant groups (7) | Migrant groups with a comparable demographic and socioeconomic structure | D Migrants in Arauca | | ✓ | ✓ | ✓ | 0.7% |
| | | E Migrants in La Guajira | | ✓ | ✓ | ✗ | 2.1% |
| | | F Migrants in Norte de Santander | | ✓ | ✓ | ✓ | 0.6% |
| | | G Venezuelan migrants in Colombia | | ✓ | ✓ | ✓ | 0.7% |
| | | H Venezuelan migrants in Brazil | | ✓ | ✗ | ✗ | N/A |
| | | I Venezuelan migrants in Argentina | | ✓ | ✗ | ✗ | N/A |
| | | J Venezuelan migrants in Chile | | ✓ | ✗ | ✗ | N/A |
| Comparable vulnerable[4] groups (4) | Demographic groups considered to be at a higher risk than general population (e.g. transgender women, me who have sext with men) | K Indigenous population in Peru | | ✓ | ✓ | ✗ | 0.4% |
| | | L MSM[5] in Peru | | ✓ | ✓ | ✗ | 10% |
| | | M Sex workers in Peru | | ✓ | ✓ | ✗ | 2.3% |
| | | N Transgender women in Peru | | ✓ | ✓ | ✗ | 32% |

For all the potential cases that had the necessary information available, an HIV epidemiology profile was elaborated. This profile included three sections: context, characterization of population, and an HIV epidemiology snapshot. The context section identified whether HIV/AIDS was a major issue within the geography or group under assessment. The characterization section analyzed population through four lenses: gender, place of residency, age group and socioeconomic group (when information was available). Finally, the epidemiology snapshot section presented all information available for the epidemiology funnel – total population, prevalence, diagnosis, and treatment, despite prevalence being the major focus. Colombia was selected for the HIV epidemiology profile depicted in Figure 7 given the availability of data and because it was one of the 14 potential comparison groups identified for prevalence rate benchmarking.

**Figure 7. Profile example – HIV epidemiology in Colombia**

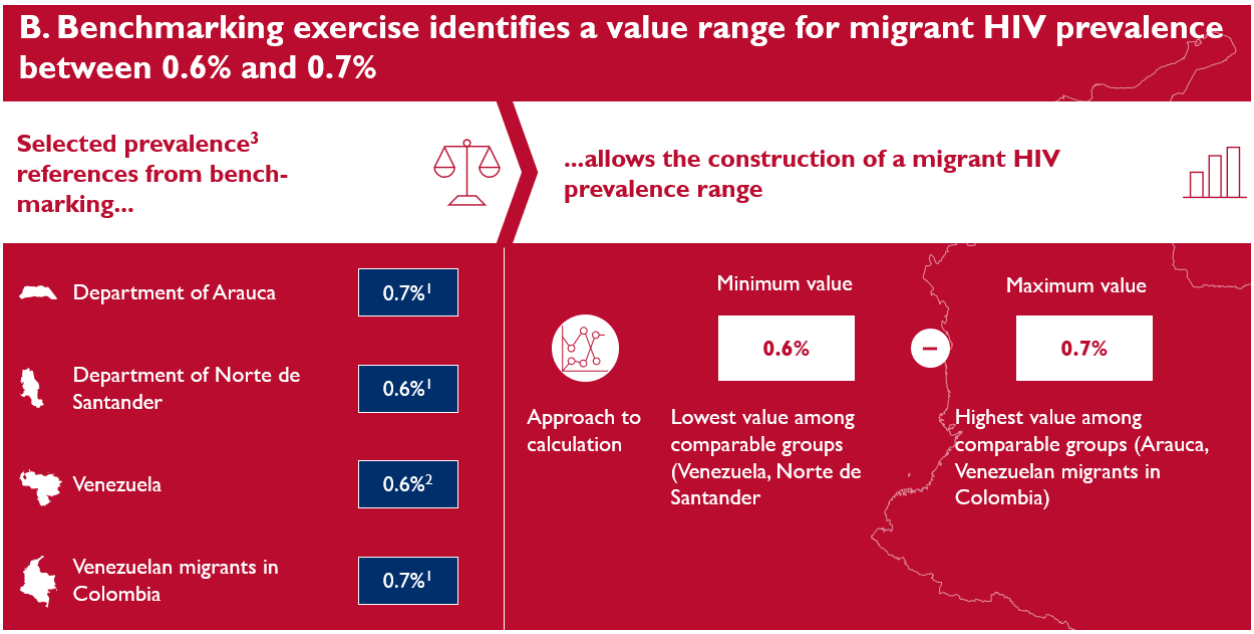



### 4.1.3 Research and benchmark HIV prevalence rates and establish a reference range value

Of the fourteen potential cases analyzed, only four of them completed the HIV epidemiology data assessment successfully (as shown on Figure 8), and their prevalence rates were identified as benchmarking inputs:

- Department of Arauca: 0.7%
- Department of Norte de Santander: 0.6%
- Venezuela: 0.6%
- Venezuelan migrantes in Colombia: 0.7%

**Figure 8. Definition of prevalence reference range**




### 4.1.4 Apply reference prevalence range value to the total population of Venezuelan migrants in Peru

The four selected data points allow for the construction of a migrant HIV prevalence range where the lowest value was 0.6% and highest value was 0.7% (as shown in Figure 9). The application of this range to the number of Venezuelan migrants living in Peru resulted in a prevalence range in nominal terms of 7,200 (0.6%) to 8,400 (0.7%).

## 4.2 Step 2: Ensure consistency of the initial estimation

As a second step, LHSS ensured consistency of the initial estimation by comparing it to existing diagnosis and treatment data or estimates of Venezuelan migrants in Peru.

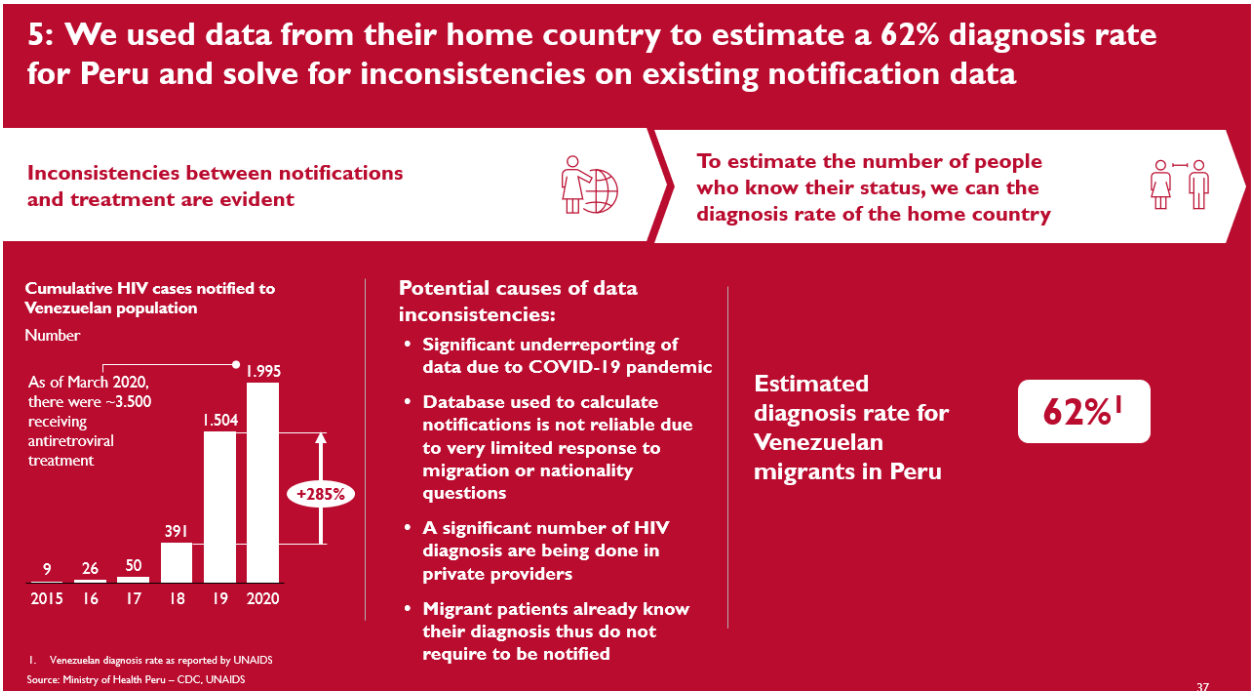
### 4.2.1 Obtain the number of Venezuelan migrants with known diagnosis and accessing treatment based on available information, or estimate using comparable rates

The initial approach intended to use MOH's National Center for Epidemiology, Prevention, and Disease Control notification data in a cumulative format to estimate the number of Venezuelans living with HIV that know their diagnosis. However, inconsistencies in available treatment data led us to instead estimate the diagnosis rate of Venezuelan migrants in Peru using the rate in their home country, Venezuela, 62%.

### 4.2.2 Calculate diagnosis and treatment rates for Venezuelan migrants living with HIV in Peru

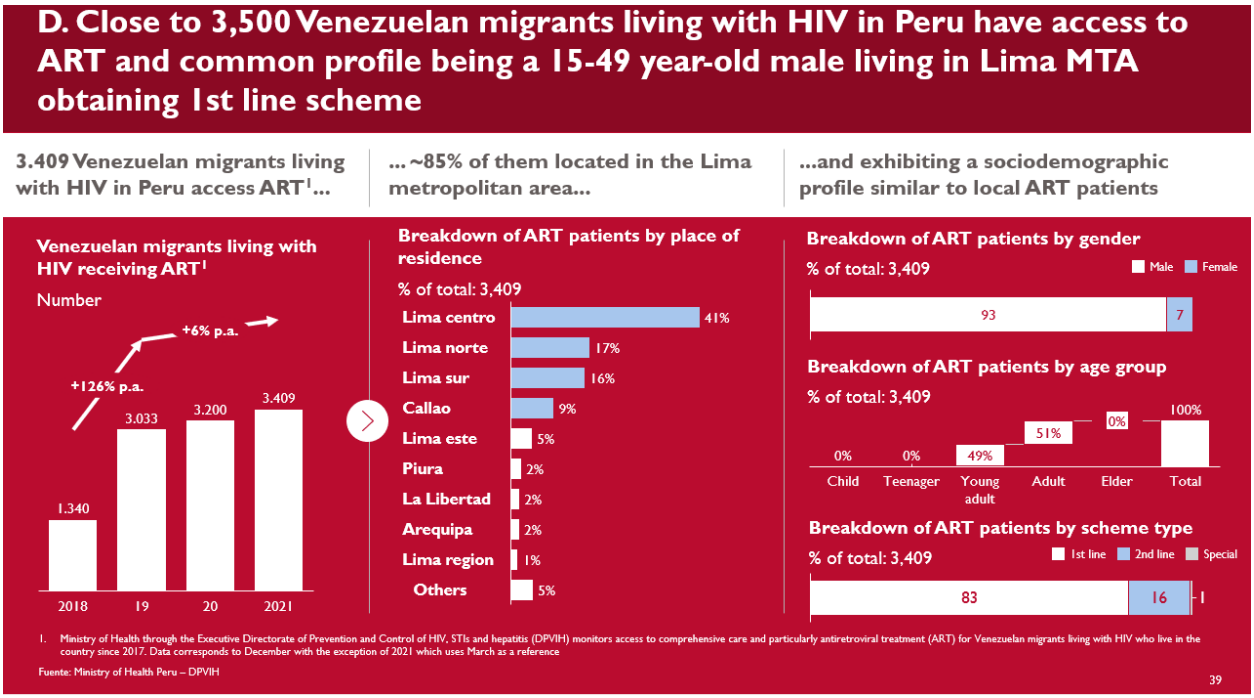
Applying the 62% estimated rate to the prevalence range of 7,200 to 8,400 leads to an estimated 4,464 to 5,208 of Venezuelan migrants that know of their diagnosis (see details in Figure 9).

**Figure 9. Estimation of diagnosis rate**




DPVIH reports that as of March 2021, 3,409 Venezuelans in Peru are receiving antiretroviral treatment through MOH providers. Roughly 85% of these are in the Lima metropolitan area, 93% are male, 100% are either young adults or adults, and 83% receive a first line antiretroviral treatment type (see Figure 10).

**Figure 10. Identification of Venezuelan migrants receiving treatment**




## 4.2.3 Calculate Initial results

Initial results of the HIV epidemiology funnel for Venezuelan migrants in Peru are:

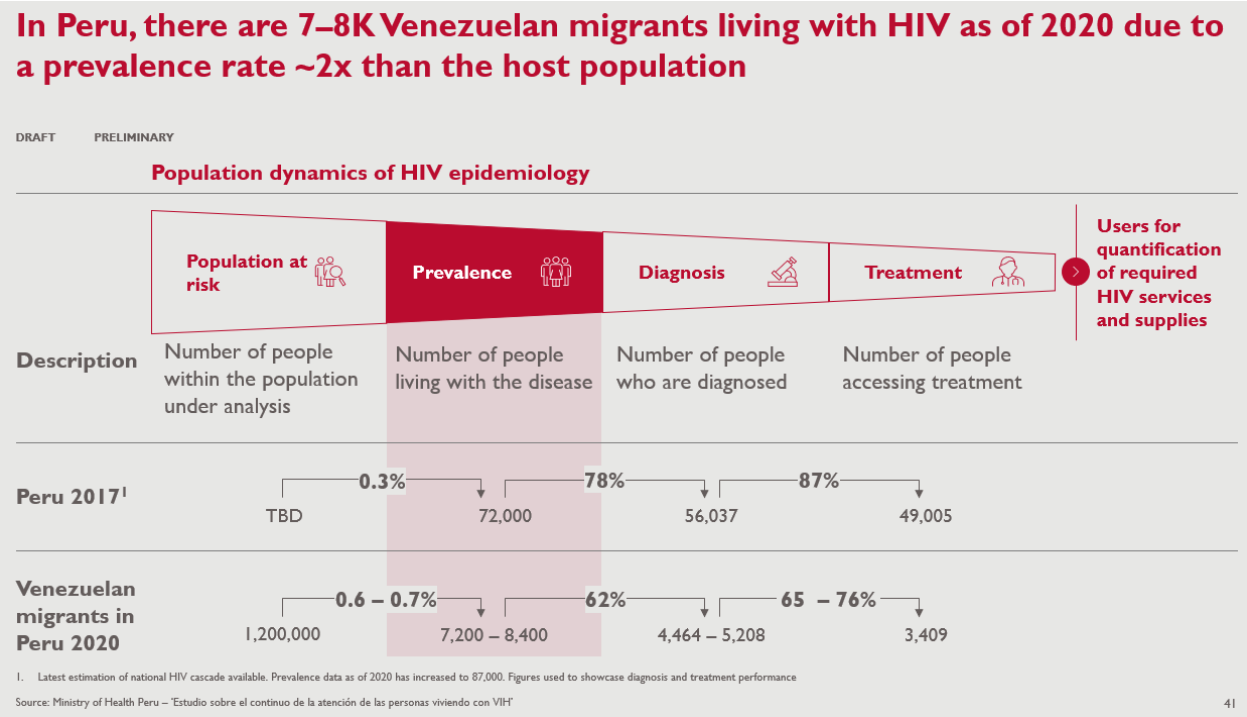
- From a total population of 1.2 million Venezuelan migrants, it is estimated that between 0.6% and 0.7% are living with HIV for an estimated 7,200 to 8,400 Venezuelan migrants living with HIV.
- Of the total Venezuelan migrants living with HIV, an estimated 62% or 4,464 to 5,208 know their diagnosis.
- The 3,409 migrants known to access treatment at a public health provider as of March 2021, therefore represent between 65% to 76% of total migrants diagnosed (depending on the prevalence level used).

HIV prevalence in Venezuelan migrants (0.6-0.7%) estimated by the model is around two times higher than the Peruvian host population prevalence of 0.3%, according to UNAIDS (see details in Figure 11). The estimated prevalence range for Venezuelan migrants in Peru is higher than several countries in the region (e.g., Colombia with 0.5%). There are lower prevalence countries in Latin America such as Peru and Guatemala at 0.3% prevalence, Ecuador at 0.4% and Brazil, Chile, and El Salvador at 0.6%, most of which are host communities for Venezuelan migrants.

The implications of higher HIV prevalence among migrants, compared to country nationals, are difficult to predict and depend on factors including the demographic characteristics of the migrant population and the communities in which they settle, integration of migrants into the host society, and adequate access to prevention and treatment services, as well as determinants such as access to economic opportunities, housing, food security, and risk for violence, discrimination and human rights violations.

Diagnosis and treatment rates for Venezuelan migrants are lower than the ones estimated for the whole country back in 2017. This indicates a potential performance gap between host population and migrant population related to HIV services.

**Figure 11. HIV epidemiology for Venezuelan migrants in Peru**



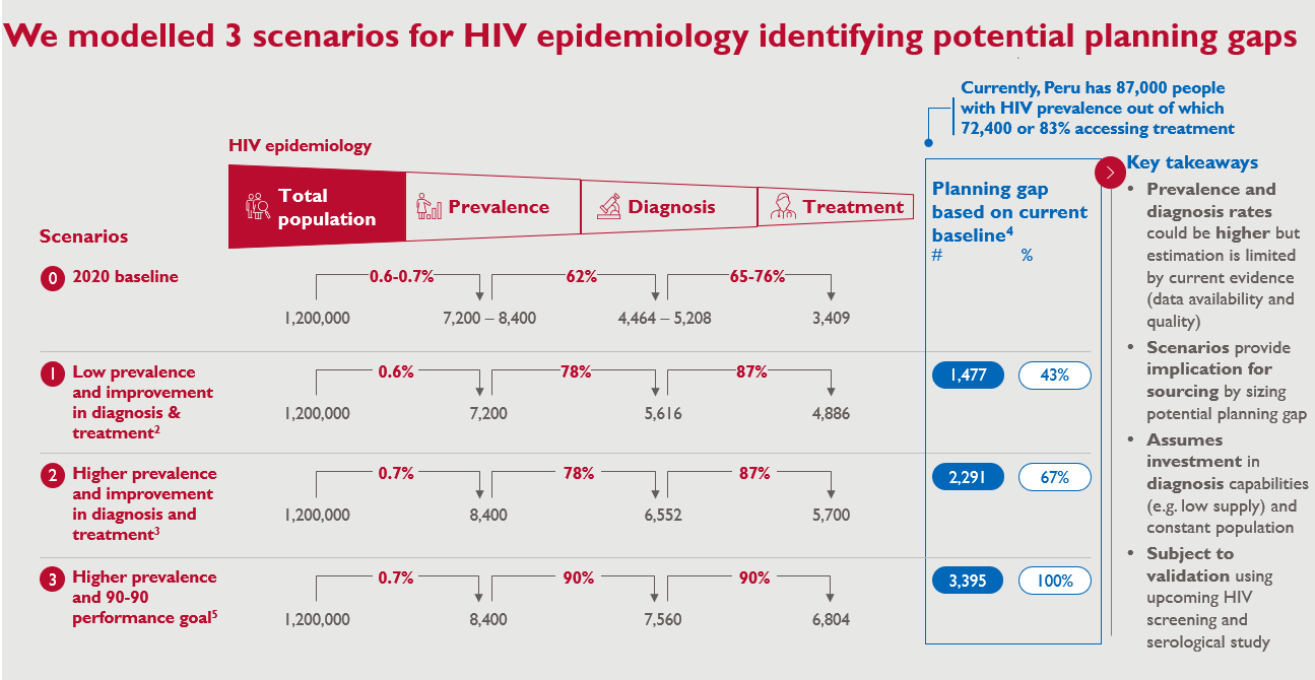

## 4.2.4 Build scenarios to identify potential planning gaps

Using our estimated HIV epidemiology funnel for Venezuelan migrants living in Peru as a 2020 baseline (as depicted in Figure 12), three scenarios were calculated with implications for planning and forecasting:

- **Scenario 1** assumes a low prevalence (0.6%) and an improvement in both diagnosis and treatment rates to meet national levels (78% and 87%, respectively), resulting in 4,886 migrants requiring antiretroviral treatment. This is an additional 1,477 migrants or 143% of the current 3,409 migrants accessing treatment.
- **Scenario 2** assumes a high prevalence (0.7%) and an improvement in both diagnosis and treatment rates to meet national levels (78% and 87%, respectively), resulting in a total of 5,700 migrants requiring antiretroviral treatment. This is an additional 2,291 or 167% of the current 3,409 migrants accessing treatment.
- **Scenario 3** assumes a high prevalence (0.7%) as well as achieving a 90% level performance in both diagnosis and treatment following the 2030 country goal, resulting in a total of 6,804 migrants requiring treatment. This is an additional 3,395 migrants or about 200% of the current 3,409 migrants accessing treatment.

While prevalence and diagnosis rates in these scenarios could be higher than estimated here, there is currently no data available that could support such adjustment. Moreover, the model assumes investment to improve diagnosis and treatment access is feasible to implement or execute in order to improve rates.

**Figure 12. Planning scenarios of HIV services and inputs for migrants**



# Annex I: List of Expert interviews

We completed 13 expert interviews in the following 10 stakeholder institutions of HIV migrant epidemiology in Peru:

**Table 1. List of Institutions Represented In `Stakeholder Interviews**

| Institutions | Date |
|---|---|
| Directorate for the Prevention and Control of HIV-AIDS, Sexually Transmitted Diseases and Hepatitis (DPVIH) | May 18, 2021<br>June 11, 2021 |
| Migrant Functional Unit | May 21, 2021 |
| Pan American Health Organization (PAHO / WHO) | May 25, 2021 |
| AIDS Healthcare Foundation (AHF) | May 25, 2021 |
| Directorate for the Prevention and Control of HIV-AIDS, Sexually Transmitted Diseases and Hepatitis (DPVIH) | May 18, 2021<br>June 11, 2021 |
| National Center for Epidemiology Prevention and Disease Control (CDC) | May 26, 2021 |
| Self-help Support Program for HIV-Positive People (PROSA) | May 26, 2021 |
| Joint United Nations Program on HIV/AIDS (UNAIDS) | May 26, 2021<br>May 28, 2021 |
| National Health Institute (INS) | May 28, 2021 |
| Comprehensive Health Insurance (SIS) | June 9, 2021 |

# Annex II: Sources Reviewed

The development and application of the model required an exhaustive review process of 489 sources across the seven inputs, which, in turn, led to the identification of 62 sources for the estimation exercise (detailed in Figure 13). The excel file accompanying this report details the list of sources reviewed. Figure 5 shows a summary of the review process.

**Figure 13. Review process of public information**

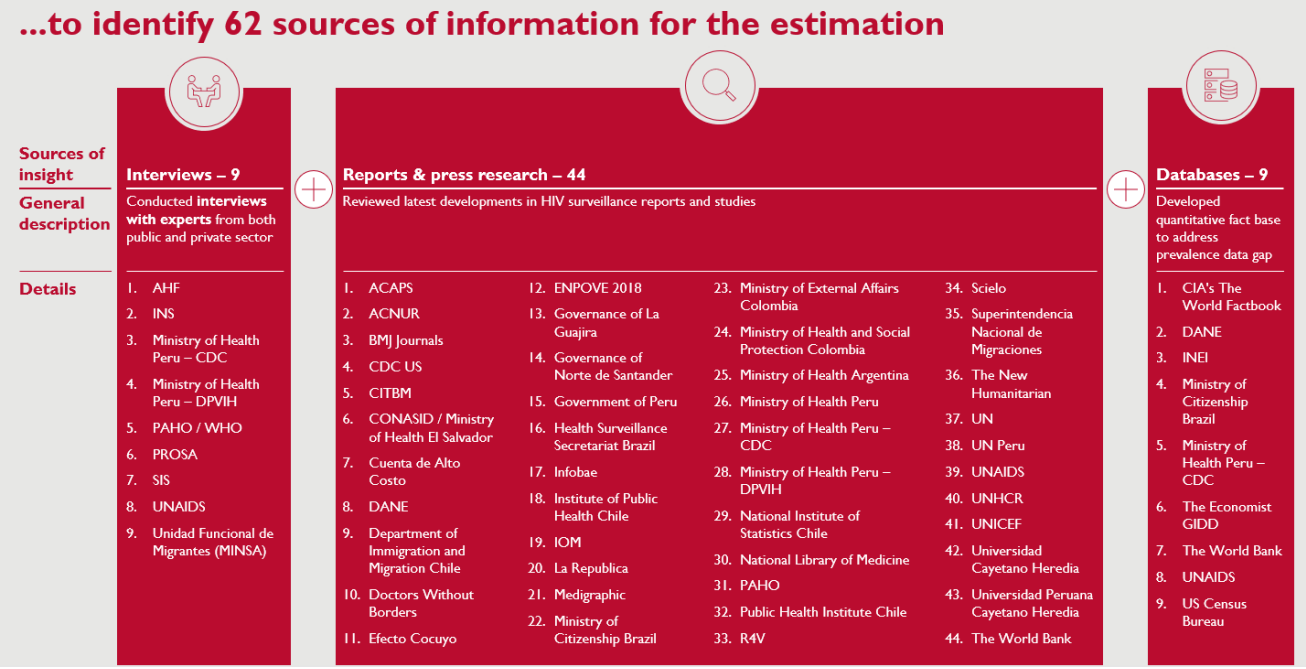
**We conducted an exhaustive review process of close to 500 sources for all inputs of the model...**

NON-EXHAUSTIVE

Details of the sources reviewed available on the shared Excel file with access link when applicable

| Model inputs | Sources reviewed (489) – Examples | | |
|---|---|---|---|
| | **Expert interviews (9)** | **Reports and press research (431)** | **Databases (50)** |
| **Venezuelan migration data** | • Migrant Functional Unit | • OIM<br>• OIM / UNICEF<br>• DW<br>• El Comercio.pe<br>• Gestion.pe | • INEI – ENPOVE 2018 |
| **HIV prevalence rates of comparable groups** | • DPVIH<br>• CDC<br>• UNAIDS<br>• AHF<br>• PROSA | • CITBM<br>• Ministry of External Affairs Colombia<br>• Ministry of Health and Social Protection Colombia<br>• Organization of American States<br>• World Health Organization<br>• Deutsche Welle | • UNAIDS<br>• DEIS Chile<br>• Ministry of Health Peru – CDC<br>• Institute of Geography and Statistics Brazil<br>• Ministry of Health Argentina<br>• UN ECLAC |
| **Coverage of HIV diagnosis in migrants** | • INS<br>• Ministry of Health Peru – CDC | • N/A | • Ministry of Health Peru – CDC |
| **Coverage of HIV treatment in migrants** | • Ministry of Health Peru – DPVIH | • N/A | • N/A |

**Figure 14. Identification of key sources of information**




The process of reviewing available information produced an excel file named '20210608 - Sources revision' with all the sources listed as well as the selection of sources of insights used in the study. The excel file can be found attached.