COSTS OF STRENGTHENING THE HIV TREATMENT CASCADE IN PAPUA, INDONESIA
This publication was prepared by Catherine Cantelmo (Palladium), Bryant Lee (Palladium), and Ratna Soehoed (Palladium) of the Health Policy Plus project.


Health Policy Plus (HP+) is a five-year cooperative agreement funded by the U.S. Agency for International Development under Agreement No. AID-OAA-A-15-00051, beginning August 28, 2015. The project’s HIV activities are supported by the U.S. President’s Emergency Plan for AIDS Relief (PEPFAR). HP+ is implemented by Palladium, in collaboration with Avenir Health, Futures Group Global Outreach, Plan International USA, Population Reference Bureau, RTI International, ThinkWell, and the White Ribbon Alliance for Safe Motherhood.

This report was produced for review by the U.S. Agency for International Development. It was prepared by HP+. The information provided in this report is not official U.S. Government information and does not necessarily reflect the views or positions of the U.S. Agency for International Development or the U.S. Government.
# Contents

Acknowledgments ................................................................................................................ iv
Abbreviations .......................................................................................................................... v

**Executive Summary** ........................................................................................................ vi
  Results ................................................................................................................................. vi
  Discussion .............................................................................................................................. viii

**Introduction** ....................................................................................................................... 10
  HIV Epidemic in Papua ........................................................................................................ 10
  Strategies to Improve Cascade Outcomes in Papua ............................................................ 12

**Methodology** .................................................................................................................... 13
  Data Sample ...................................................................................................................... 13
  Identifying Interventions .................................................................................................... 14
  Costing Approach .............................................................................................................. 15

**Results** ............................................................................................................................. 17
  Identification ....................................................................................................................... 17
  Linkage to Care and Treatment .......................................................................................... 22
  Retention and Viral Suppression ......................................................................................... 24

**Discussion** ......................................................................................................................... 25
  Opportunities for Efficiency Gains ..................................................................................... 26
  Recommendations and Next Steps ...................................................................................... 27

**References** ......................................................................................................................... 29
Acknowledgments

The authors wish to acknowledge the following individuals and organizations that made the costing study possible:

- The civil society organizations, puskesmas, private clinics, provincial health office, district health offices, Provincial AIDS Commission, and District AIDS Commission staff for participating in data collection workshops and sharing program and financial data with the Health Policy Plus (HP+) team.

- The U.S Agency for International Development (USAID)-funded LINKAGES project for sharing cascade and budget data with the HP+ team, assisting in selecting the sample of civil society organizations and puskesmas for data collection, and providing feedback on preliminary results.

- Ibu Tetty Rachmawati, Dr. Edhie Rahmat, and Jack Langenbrunner from USAID for providing guidance throughout the costing study and feedback on this report.

- Arin Dutta of HP+ for technical guidance and thorough input for this assignment and Gus Sutakertya, an HP+ consultant, for leading data collection efforts at puskesmas and private clinics.
### Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART</td>
<td>antiretroviral therapy</td>
</tr>
<tr>
<td>CSO</td>
<td>civil society organization</td>
</tr>
<tr>
<td>HIV</td>
<td>human immunodeficiency virus</td>
</tr>
<tr>
<td>HP+</td>
<td>Health Policy Plus</td>
</tr>
<tr>
<td>IDR</td>
<td>Indonesian rupiah</td>
</tr>
<tr>
<td>LTFU</td>
<td>lost to follow-up</td>
</tr>
<tr>
<td>MOH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>PEPFAR</td>
<td>U.S. President's Emergency Plan for AIDS Relief</td>
</tr>
<tr>
<td>PHO</td>
<td>Provincial Health Office</td>
</tr>
<tr>
<td>PLHIV</td>
<td>people living with HIV</td>
</tr>
<tr>
<td>US$</td>
<td>U.S. dollar</td>
</tr>
<tr>
<td>USAID</td>
<td>U.S. Agency for International Development</td>
</tr>
</tbody>
</table>
Executive Summary

Papua province in eastern Indonesia is home to over 3.3 million people, the majority of whom identify as Christian, and has a large and diverse indigenous population. Papua province faces critical economic and health challenges; more than half (61 percent) of Papuans are estimated to live in the lowest wealth quintile and Papua has relatively high rates of maternal and infant mortality compared with other provinces in Indonesia (BKKBN et. al, 2018). Papua province has the highest HIV burden in the country with an adult HIV prevalence of 2.3 percent and faces persistent challenges in HIV prevention, identification, linkage to care, retention in care, and viral suppression. Still, the Subdirectorate for HIV within the Ministry of Health and the Provincial Health Office have set ambitious HIV service delivery coverage targets for Papua under its fast-track strategy and National Acceleration Plan. Overcoming barriers along the HIV treatment cascade are essential for meeting these targets and improving efficiency of the HIV response.

Given the paucity of data on HIV intervention costs in Papua—particularly by service delivery model or population served—the U.S. Agency for International Development (USAID)- and U.S. President’s Emergency Plan for AIDS Relief (PEPFAR)-funded Health Policy Plus (HP+) project conducted a cascade costing analysis in Papua. The analysis involved collecting primary data from the government, civil society organizations (CSOs), puskesmas (health centers), a private clinic, and a provincial hospital to answer the following questions:

- What are the interventions, by service delivery model and targeted population, needed to overcome barriers along the HIV treatment cascade?
- How much does the intervention cost per person reached in a year?
- How cost-efficient are these interventions?

The results of this study are intended to inform provincial and district planning and budgeting for HIV.

Results

The analysis identified unit cost estimates for key interventions and opportunities for efficiency improvements along the HIV treatment cascade.

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Cost per person reached per year (in Indonesian rupiah)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outreach</td>
<td>1,281,881 (general population), 1,101,809 (men who have sex with men), 517,764 (female sex workers)</td>
</tr>
<tr>
<td>Facility-based HIV testing</td>
<td>369,510 (puskesmas)</td>
</tr>
<tr>
<td>Mobile HIV testing</td>
<td>263,535 (CSOs), 377,458 (puskesmas)</td>
</tr>
<tr>
<td>Referral to antiretroviral therapy</td>
<td>3,237,997 (CSOs)</td>
</tr>
<tr>
<td>Antiretroviral therapy</td>
<td>8,332,573 (puskesmas), 11,502,708 (provincial hospital), 7,783,007 (private clinic)</td>
</tr>
<tr>
<td>Adherence support</td>
<td>683,771 (CSOs)</td>
</tr>
<tr>
<td>Key population support groups</td>
<td>1,046,427 (CSOs)</td>
</tr>
<tr>
<td>Lost to follow-up tracing</td>
<td>3,269,657 (CSOs)</td>
</tr>
</tbody>
</table>
Cross-Cutting Costs

Management and indirect costs account for a significant proportion of CSO unit costs. Management staff, including program managers, finance staff, field coordinators, and monitoring and evaluation staff, account for most of these costs. CSOs may be able to reduce these costs by scaling up coverage of services to achieve better economies of scale or by improving the ratio of technical/program staff to management/administrative staff.

Identification Costs

Although the underlying estimates of people living with HIV are uncertain, recent modeling and programmatic data suggest that Papua has identified 60 percent of people living with HIV. Papua may face challenges in reaching those who remain undiagnosed, but the local government plans to implement minimum service standards that require routine testing of at-risk populations as well as scale up partner notification and index testing.

CSO outreach will remain a critical intervention for identifying new people living with HIV. Outreach costs per person reached are higher in Jayawijaya than in Jayapura due to higher staff and other direct costs associated with outreach. Outreach costs per person reached are also high among the general population and men who have sex with men compared with female sex workers. High unit costs among the general population are driven by expenses related to information, communication, and educational materials. High unit costs among men who have sex with men are driven by relatively few people being reached at hotspots.

Outreach costs per person (across all populations) referred to HIV testing are IDR 4,486,448 (US$310) in Jayapura and IDR 6,203,827 (US$429) in Jayawijaya. Differences in these unit costs are driven by lower unit costs for outreach in Jayapura compared with Jayawijaya, not by differences in referral to HIV testing; CSOs in both locations have similar average HIV referral testing rates. Prevention is another important component of outreach activities, however, it is unknown how outreach in either location affects individuals’ behavior to prevent HIV.

On average, HIV testing is estimated to cost less per person tested in Jayawijaya (IDR 185,654 [US$13]) than in Jayapura (IDR 298,193 [US$21]). Direct costs are lower in Jayapura due to economies of scale in mobile testing as well as lower transportation costs for staff and clients, while indirect intervention costs are much higher in Jayapura compared with Jayawijaya. For facility-based testing, medium- and high-volume puskesmas have lower unit costs than low-volume facilities, as expected due to gains from economies of scale. Despite differences in HIV testing unit costs between Jayapura and Jayawijaya, higher HIV testing yields in Jayapura than in Jayawijaya result in the cost per positive person identified being about the same.

Costs for Linkage to Care and Treatment and Antiretroviral Therapy Case Management

Just over half (55 percent) of those identified as living with HIV initiate antiretroviral therapy (ART). Several CSOs accompany patients to initiate ART to improve linkage to care. High indirect and management costs for CSO referral to ART are a result of referral processes being time-intensive, as well as relatively few people being referred to ART.

As expected, ART is the highest-cost intervention within the treatment cascade. The average cost per ART patient per year in puskesmas does not vary by patient load. Average ART costs
per person per year in the provincial hospital were 1.4 times that found in puskesmas; this cost difference is driven by more new patients with advanced disease and patients not stable on treatment being managed at the provincial hospital rather than at puskesmas. Still, costs of managing a stable person on treatment per year are higher in the provincial hospital compared with puskesmas.

**Costs for Retention in Care and Viral Suppression**

There are significant challenges in retaining patients in care and achieving viral suppression in the province. As of January 2020, only a quarter (26 percent) of patients ever to be on ART are currently on ART. Tracking patients that are lost to follow-up is a priority for the Provincial Health Office, but this analysis found that the costs of these activities per person reached are very high compared with other interventions, and these activities are not implemented to scale or with fidelity, meaning the rate of patients returning to care remains low. The Provincial Health Office could explore using records from BPJS-K—Indonesia’s national health insurance agency, who tracks patients with ID cards—to analyze patient patterns and outcomes. Routine support group meetings to promote retention in care are also expensive to carry out and not implemented to scale, partly due to language, transportation, and financial barriers. The impact of support groups in terms of retaining patients in care is unknown as well.

**Discussion**

There are several opportunities to strengthen Papua’s treatment cascade to achieve fast-track targets. The local government can use costing evidence in this report to plan and budget for the efficient scale-up of HIV services with local government funding. HP+ recommends the following:

- **Ensuring patients are managed at appropriate levels of care:** Only patients with advanced disease or those who are not responding well to treatment should be managed at hospitals, while stable patients should be managed at puskesmas. HP+’s study found that managing stable patients costs more at the provincial hospital than at puskesmas, suggesting there can be efficiency gains as well as cost savings to JKN (the national health insurance scheme) if more patients are managed at lower levels of care. This recommendation will require additional investments in puskesmas to ensure that they are fully operational, that staffing shortages are filled or addressed through task shifting (which requires guidelines and training of staff), and that they meet minimum quality standards for being able to provide ART. Given the mobility of ART patients in Papua, referral systems should be in place to allow patients to access antiretroviral drugs at different facilities or pharmacies.

- **Introducing or scaling up new service delivery models:** Changing how services are delivered can have a significant impact on total resource requirements for the HIV response in Papua. Identifying the optimal mix of testing modalities is important in Papua as the province approaches reaching the target of 90 percent of all people living with HIV knowing their HIV status. Finding the remaining undiagnosed people living with HIV may be difficult and expensive because of diminishing yields from testing. Therefore, targeted, high-yielding interventions such as index testing need to be scaled up with fidelity. Similarly, scaling up differentiated care models where stable patients require fewer facility visits and laboratory tests could help improve retention while also reducing costs. Lastly, the Provincial Health Office should consider innovative ways to retain patients in care or track patients lost to follow-up as these remain the biggest challenges in Papua. Additional consultation
is needed to identify potential models to pilot; solutions that can provide support to ART patients that are stigmatized or living in remote, hard-to-reach areas should be considered. While some of these solutions may require an upfront investment, they may be cost-effective and even eventually cost-saving if they increase ART retention rates and viral suppression.

• **Conducting additional research on the cost-efficiency of the HIV response:** As Papua aims to scale up services toward meeting fast-track targets, it is imperative that the Provincial Health Office uses cascade cost analytics to ensure efficient use of resources while improving performance around key indicators such as retention and viral suppression. The Provincial Health Office can build upon the current analysis, using the same methodology and data collection tools used by HP+. HP+ recommends periodic collection and analysis of cost data in addition to routine programmatic data collection to systematically evaluate the cost-efficiency of HIV prevention, testing, and treatment service delivery models by population over time. Tracking patient outcomes through unique identifiers, allowing for longitudinal data analysis, is preferred over the use of service statistics to identify gaps in the cascade.

• **Using unit costs to set appropriate reimbursement rates for HIV services provided by CSOs:** As CSOs apply for local government grant funding to carry out HIV services, the government should evaluate their budget proposals based on costing evidence. Currently, budgets are developed using government standard unit costs, which may lead to grant obligations to CSOs that are too small or too large for the scope of work. As Papua experiences external financing transitions and scales up contracting with local CSOs providing HIV services, it is important that grant funding is based on accurate estimates of resource requirements to meet programmatic goals.
Introduction

Indonesia faces a heterogenous HIV epidemic with significant variations in prevalence by province, low coverage of HIV prevention, testing, and treatment services, and delayed adoption of global HIV guidelines and best practices. As of June 2019, only 54 percent of people living with HIV nationally knew their status, 18 percent of people living with HIV were estimated to be on antiretroviral therapy (ART), and 1 percent of people living with HIV were virally suppressed (MOH, 2019). Suboptimal coverage contributes to an estimated 50,000 new infections a year, and this number is expected to increase if past trends continue (UNAIDS, 2018).

Despite these challenges, as well as the lack of comprehensive data on program achievements, the government of Indonesia is committed to tackling the HIV epidemic, as evidenced by its ambitious fast-track strategy and National Acceleration Plan (Fast Track, unpublished). The country aims to have 81 percent of all people living with HIV receiving ART by 2030. To achieve these fast-track targets, the government needs to prevent losses along the treatment cascade. Specifically, the government needs to identify the most effective and efficient interventions for overcoming barriers along the cascade, estimate the cost of scaling up these interventions, and secure adequate and sustainable funding for its HIV response. These analyses need to be conducted at the subnational level given wide variations in demography, HIV epidemiology, geography, HIV program costs, HIV resource availability, health system capacity, and social and cultural practices across provinces.

Due to a high HIV burden, challenges in achieving high levels of viral suppression, and lack of sufficient cost data for Papua province, the Health Policy Plus (HP+) project—funded by the U.S. Agency for International Development (USAID) and U.S. President’s Emergency Plan for AIDS Relief (PEPFAR)—conducted a cascade costing analysis in Papua. The analysis involved collecting primary data from the government, civil society organizations (CSOs), and HIV service providers to answer the following questions:

- What are the interventions, by service delivery model and targeted population, needed to overcome barriers along the HIV treatment cascade?
- How much does the intervention cost per person reached in a year?
- How cost-efficient are these interventions?

The results of the analysis can inform local government planning and budgeting for HIV at both provincial and district levels. This summary report includes a description of the cascade costing methodology and key results, including unit costs of HIV interventions, disaggregated by population served and type of service delivery model.

HIV Epidemic in Papua

Papua province in eastern Indonesia is home to over 3.3 million people, the majority of whom identify as Christian, and has a large and diverse indigenous population. More than one in four Papuans live in poverty (Statistic Central Bureau of Papua Province, 2019). The province also has relatively high rates of maternal and infant mortality and disease prevalence compared with other provinces in Indonesia, mainly due to health system constraints, geographical barriers to access, language/cultural barriers, and poor health-seeking behavior that leads to low service coverage. For example, only 42.9 percent of
pregnant women in Papua attend at least four antenatal care visits compared with 77.4 percent nationally (BKKBN et. al, 2018).

In terms of HIV, Papua is the highest-burden province in the country with an estimated HIV prevalence rate of 2.3 percent among adults ages 15 to 49 (PHO Papua, 2017). Key populations such as men who have sex with men and female sex workers are disproportionately affected by HIV—their respective prevalence rates in Jayapura City is 7.8 percent and 8 percent (PHO Papua, 2014). Evidence suggests that HIV prevalence among these groups may be even higher in other parts of the province; HIV prevalence among female sex workers is estimated to be 16.9 percent in Mimika Regency and 11 percent in the city of Wamena (MOH, 2013; MOH, 2015).

There are significant losses along the HIV treatment cascade (see Figure 1). An estimated 60 percent of people living with HIV (PLHIV) in Papua know their status. Just over half (55 percent) of people identified as living with HIV initiated ART and only a quarter (26 percent) remain on ART as of January 2020. Among patients who received a viral load test, the majority (64 percent) are estimated to be virally suppressed.

**Figure 1. HIV Treatment Cascade in Papua, 2020**

Source: PHO Papua, 2020

Note: Estimated people living with HIV is based on population size, HIV prevalence, sexual behavior, and other uncertain inputs. As a result, there can be a wide range in estimates of people living with HIV. Identification rates may also be uncertain as some people previously diagnosed may be counted as newly diagnosed.

Reasons for poor cascade outcomes include:

- **Limited access to services:** The majority of Papuans (60 percent) are considered difficult to reach, with some communities living more than 100 kilometers from a health center. HIV testing is not yet available at many health facilities. ART is now available in some puskesmas (health centers), but many do not fulfil the minimum requirements for being able to provide ART. As a result, while there are 136 testing facilities, only 45 facilities provide ART in Papua. Staffing shortages and capacity gaps from limited experience in providing HIV services exacerbate this problem. Also, staff members may not speak the same language as patients, hindering effective HIV counseling (PHO Papua, 2017). Unrest in districts, particularly in the highlands, also contributes to poor service coverage and high rates of those who are lost to follow-up.
Costs of Strengthening the HIV Treatment Cascade in Papua, Indonesia

- **Misinformation and cultural beliefs about HIV:** According to the 2013 Integrated HIV Bio-Behavioral Surveillance in Papua, only 9.2 percent of respondents had comprehensive knowledge of HIV, including how it is transmitted, prevented, and treated (Subdirectorate for HIV, 2013). Some Papuans have misconceptions about HIV, including that it is a curse or punishment from God, and follow traditional medicine to treat HIV. Further, poor treatment literacy results in some patients discontinuing treatment once they start to feel better (PHO Papua, 2020).

- **Stigma and discrimination:** A LINKAGES study found that people on HIV treatment in Papua are ashamed of their status and afraid of family or neighbors discovering that they are living with HIV (LINKAGES, 2019). Consequently, most ART patients prefer to take their medicine secretly or seek HIV services at facilities far from their homes.

- **Poor viral load testing capacity and reporting:** Viral load testing in Papua is only available in three districts—Jayapura, Mimika, and Tolikara—leaving many patients without access. In areas without viral load testing capacity, patient samples are transported to Jayapura, which is expensive; for example, samples from Wamena are flown to Jayapura for viral load testing. Additionally, results are not always recorded in information systems, contributing to very low rates of reported viral load results in Papua.

**Strategies to Improve Cascade Outcomes in Papua**

The Provincial Health Office in Papua recognizes the need to overcome cascade barriers to meet ambitious fast-track service delivery targets and improve health outcomes. The National Acceleration Plan calls for increasing the number of people on ART in Papua to 22,182 by the end of 2020, which is nearly double the number on ART as of 2019. As a result, there are five strategic priorities for HIV prevention, testing, and treatment in Papua:

1. **Improving access to HIV services:** Includes scaling up mobile HIV testing services, focusing on notifying and testing partners of people living with HIV, and increasing the number of sites capable of providing HIV services, particularly voluntary medical male circumcision.

2. **Improving quality of HIV services:** Includes instituting routine HIV training for health workers; creating a task-sharing policy to allow nurses to initiate ART; developing standard operating procedures for HIV services, particularly viral load testing and early infant diagnosis; and implementing a quality improvement plan for prevention of mother-to-child transmission and integrated tuberculosis/HIV services.

3. **Reducing lost to follow-up:** Includes increasing frequency and completeness of HIV reporting, conducting home visits for those who are lost to follow-up, and improving communication and coordination across health facilities.

4. **Improving HIV knowledge in the community:** Includes developing context-specific HIV educational materials and updating the reproductive health curriculum for adolescents in public schools.

5. **Developing partnerships:** Includes involving key groups in decision making and program implementation. Key groups include traditional leaders, religious leaders, government staff, women’s groups, youth, motorcycle drivers, taxi drivers, port workers, and support groups for people living with HIV.
While Papua has strategic priorities as outlined above, there is a lack of up-to-date cost data that considers how costs may vary across populations served and service delivery model to inform implementation of these strategies (see Box 1) (Sucayha and Mardiati, unpublished). These data are essential for decision making; the Provincial Health Office needs to understand how much it will cost to meet programmatic targets and identify opportunities to improve targeting and use of financial resources available for HIV.

**Box 1. Limited HIV Costing Evidence**

**Top-down cost estimates:** Existing unit cost estimates are based on dividing total expenditure on an intervention by the number of people who received it, which does not account for variations in quality or standards of care. While bottom-up cost data may over-state true financial resource needs, they are needed for program decision making and budgeting.

**Lack of detailed cost estimates:** Existing unit cost estimates do not estimate costs by population or service delivery model.

**Lack of recent data:** The last costing study that estimated HIV service delivery and program costs in Papua was conducted in 2015. Several HIV policy and programmatic changes have been introduced since then (e.g., test-and-start and routine viral load testing).

**Methodology**

HP+ conducted a cascade cost analysis to determine the investments required for scaling up interventions to improve identification, linkage to care, retention in care, and viral suppression and to assess the cost-efficiency of these interventions. The analysis considers costs from the perspective of the provider, rather than the payer. The analysis involved interviewing key stakeholders to understand the interventions needed—by service delivery model and target population—and collecting cost data from CSOs, puskesmas, and health facilities to estimate unit costs of interventions. The Provincial Health Office and the USAID- and PEPFAR-funded LINKAGES project played an important role in designing the study, including selection of the data sample, and were routinely consulted from the beginning to the end of the study for quality control. The study timeline and process are described in Figure 2.

**Figure 2. Study Timeline and Process**

This analysis was conducted in Jakarta and Papua provinces. Results from the Jakarta analysis are reported separately (Cantelmo et al., 2019).

**Data Sample**

HP+ collected data from four CSOs, six puskesmas located in Jayapura City and Jayawijaya District, a provincial hospital located in Jayapura City, and a private clinic located in Jayawijaya district (see Table 1). These two locations were selected to represent coastal and
highland regions within Papua and, combined, account for approximately 14 percent of the total population in Papua. Jayapura and Jayawijaya are both administrative and urban centers for the coastal and highland areas, respectively. One of the CSOs sampled operates in both locations. HP+ selected CSOs based on populations served, including female sex workers, men who have sex with men, and the general population. Three CSOs included in the costing study receive funding from a Global Fund grant to conduct activities. HP+ selected a sample of facilities based on quality of reporting data and the monthly volume of HIV patients in order to have a diverse range of facilities included in the study. High-volume puskesmas may have different practices and resources than low-volume puskesmas.

### Table 1. Data Collection Sample

<table>
<thead>
<tr>
<th>Populations Served</th>
<th>Number of CSOs</th>
<th>Funding Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female sex workers and their clients</td>
<td>2</td>
<td>Global Fund</td>
</tr>
<tr>
<td>Men who have sex with men</td>
<td>1</td>
<td>Global Fund</td>
</tr>
<tr>
<td>General population and female sex workers</td>
<td>1</td>
<td>Protestant Nederland Church; Government of New Zealand</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Categorization of Facilities</th>
<th>Number of Facilities</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-volume puskesmas*</td>
<td>2</td>
<td>Jayapura City and Jayawijaya District</td>
</tr>
<tr>
<td>Medium-volume puskesmas*</td>
<td>2</td>
<td>Jayapura City and Jayawijaya District</td>
</tr>
<tr>
<td>Low-volume puskesmas*</td>
<td>2</td>
<td>Jayapura City and Jayawijaya District</td>
</tr>
<tr>
<td>Provincial hospital</td>
<td>1</td>
<td>Jayapura City</td>
</tr>
<tr>
<td>Private clinic</td>
<td>1</td>
<td>Jayawijaya District</td>
</tr>
</tbody>
</table>

*High-volume puskesmas are those that conduct at least 800 HIV tests per year and have at least 50 people on ART. Medium-volume puskesmas are those that conduct between 400 and 800 HIV tests per year and have between 20 and 50 people on ART. Low-volume puskesmas are those that conduct fewer than 400 HIV tests per year and have fewer than 20 people on ART.

### Identifying Interventions

HP+ interviewed key stakeholders in Papua, including staff from the Provincial Health Office, District Health Offices, Provincial AIDS Commission, District AIDS Commission, CSOs, and the LINKAGES project, to identify the specific interventions needed to overcome barriers along the HIV treatment cascade. Participants revealed that some existing interventions for HIV testing and treatment need to be scaled up with fidelity in order to improve cascade outcomes. However, existing interventions alone will not address all barriers along the cascade, particularly in reaching testing targets. Therefore, stakeholders also suggested introducing new service delivery models and best practices, such as home visits for patients lost to follow-up and specialized training for outreach workers, which were accounted for in the costing study. HP+ held an initial workshop with CSOs in October 2018 to discuss the methodological approach, confirm the interventions to include in the cost analysis, and identify the inputs needed for specific service delivery models and populations (see Table 2).
Table 2. Definition of Interventions Included in the Cost Analysis

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outreach</td>
<td>Outreach workers or peer volunteers provide or refer people to HIV prevention, testing, or treatment at places frequently visited by those populations (church, key population hotspots, etc.)</td>
</tr>
<tr>
<td>Facility-based HIV testing</td>
<td>HIV testing and counseling conducted at a health facility</td>
</tr>
<tr>
<td>Mobile HIV testing</td>
<td>HIV testing and counseling provided at hotspots</td>
</tr>
<tr>
<td>Referral to ART</td>
<td>Providing information on or accompanying individuals to a facility for treatment initiation following diagnosis, ideally the same day</td>
</tr>
<tr>
<td>ART</td>
<td>HIV treatment services that include monthly clinical visits and laboratory monitoring through CD4 testing (two times/year) and viral load testing (annually) for all patients</td>
</tr>
<tr>
<td>Adherence support</td>
<td>Individualized counseling and support to ART patients who may be at risk of being lost to follow-up or not adhering to their treatment regimen</td>
</tr>
<tr>
<td>Key population support</td>
<td>Routine meetings with key populations to provide information and support related to HIV prevention, testing, and treatment</td>
</tr>
<tr>
<td>Lost-to-follow-up tracing</td>
<td>Facility-based staff calling or visiting an ART patient who has stopped coming for ART services for at least three months</td>
</tr>
</tbody>
</table>

Costing Approach

HP+ estimated direct and indirect costs faced by service providers to deliver interventions based on interviews with program staff or service providers and review of financial records. Table 3 explains the differences in costing perspectives and how a provider perspective can inform reimbursement rates for services by funders. Direct costs captured include the costs of human resource time; commodities, medical supplies, and educational materials; transportation; communication; and program support activities directly related to scaling up service delivery coverage. Indirect costs included management staff costs, operating costs, and fixed costs not directly associated with service delivery but still essential for scaling up services.

Table 3. Costing Perspectives

<table>
<thead>
<tr>
<th>Costing Approach</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provider perspective</td>
<td>Estimates resource requirements faced by facilities, CSOs, and other providers to deliver an intervention. This does not necessarily reflect what is being paid for the service by funders (e.g., JKN, Provincial Health Office, and patients). If providers are paid a lower rate than the cost of an intervention, they lose profit or may shift more costs to patients. If providers are paid a higher rate than the cost of an intervention, they make a profit.</td>
</tr>
<tr>
<td>Payer perspective</td>
<td>Estimates financial costs to the health system for paying for health services.</td>
</tr>
</tbody>
</table>

For estimating direct costs, HP+ used an ingredients-based or bottom-up costing approach. This involves calculating costs based on the types and quantities of inputs needed to deliver each intervention to each specific population group (as outlined in Figure 3). Weighted unit costs were estimated across CSOs based on number of people reached. For indirect costs,
HP+ used a top-down approach by dividing the total indirect cost associated with an intervention by the number of people reached. The proportion of indirect costs associated with a particular intervention was based on the amount of time direct staff spend per person per year on the intervention and the total number of people reached. One key limitation of this approach is that significant management costs are associated with labor-intensive interventions, even though they may not require more management personnel time, infrastructure, or other indirect resources to implement compared with other interventions, resulting in an over-estimated unit cost.

**Figure 3. Ingredients-Based Costing Approach**

*Formula for each input required to deliver an intervention:*

\[
\text{Percent (%) receiving input} \times \text{Quantity needed per month/year} \times \text{Unit cost of input} = \text{Cost per person reached per month/year}
\]

*Formula for calculating cost of staff time delivering an intervention:*

1. **Step 1: Calculate cost per minute**
   
   \[
   \text{Average annual salary and benefits per staff type} ÷ \text{Average number of days worked per year} ÷ \text{Average number of minutes worked per day} \times (1 + \% \text{ of time spent on administrative activities}) = \text{Cost per minute by staff type}
   \]

2. **Step 2: Estimate number of minutes spent delivering each service**
   
   \[
   \text{Average number of minutes spent per visit/encounter} ÷ \text{Number of visits per patient per year} = \text{Total number of minutes spent per patient per staff type for each intervention}
   \]

3. **Step 3: Calculate direct labor cost per patient**
   
   \[
   \text{Number of minutes per patient by staff type} ÷ \text{Cost per minute by staff type} = \text{Cost of staff time delivering intervention per person per year}
   \]

In addition to estimating the cost per person reached by intervention, HP+ estimated the cost for a desired outcome, such as, for HIV testing, the cost per person identified as living with HIV, when data were available. These costs were estimated by dividing total costs for the intervention by the number of people achieving the outcome of interest (see Figure 4). The costs per outcome have the same limitations as unit cost estimates due to indirect and management cost allocations based on labor-intensity of an intervention. Therefore, the analysis may underestimate the cost-efficiency of labor-intensive interventions.
Results

Unit costs are presented for each component of the HIV treatment cascade by intervention and target population.

Identification

Outreach

According to modeling estimates, Papua has identified the majority (60 percent) of the estimated population living with HIV. Successful outreach initiatives have contributed to increases in identification in the province in recent years. CSOs reach key populations as well as members of the general population with peer volunteers or outreach workers at specific places and times of the day (e.g., key population hotspots, churches, and other social gatherings). CSOs provide a variety of prevention and support activities through this outreach, including distributing educational materials and condoms, in addition to referring people for HIV testing. Virtual outreach models are currently not available in or being considered for Papua.

The unit cost of reaching people through outreach services vary by population group (see Box 2 and Figure 5). Cost of outreach per person reached is highest among the general population due to the cost of information, education, and communication materials distributed to them during outreach activities. According to the CSOs included in the study sample, the general population may receive a brochure, booklet, poster, and CD with HIV prevention and other information through CSO outreach activities. The CSO serving men who have sex with men has a high allocation of management and indirect costs for outreach due to the reported time intensity of conducting outreach among this population.

Box 2. Why are outreach unit costs highest among men who have sex with men and the general population?

Staff time: CSOs serving men who have sex with men spend more time per person reached than CSOs serving other groups.

Educational materials: CSOs distribute more educational materials per encounter with the general population than with key populations.

Economies of scale: CSOs focused on men who have sex with men reach relatively fewer people through hotspot outreach compared with CSOs serving female sex workers.
Figure 5. Average Annual Cost per Person Reached through Outreach by Population Group in IDR (US$)

Service delivery costs other than staff time account for the largest proportion of outreach costs across CSOs; this includes cost of materials distributed, transportation, communication, and staff training. As shown in Figure 6, the cost of outreach per person reached is higher in Jayawijaya than in Jayapura (IDR 1,260,882 [US$87] versus IDR 873,365 [US$60]), primarily due to one CSO in Jayawijaya that accounts for 96 percent of all those reached through general population outreach within our sample distributing more educational materials per person reached than any other CSO sampled. For context, the unit cost of outreach per person in Jakarta (IDR 172,003 [US$11.9]) is significantly lower than in Papua, primarily due to it being easier to reach large numbers of key populations through hotspots in Jakarta (Cantelmo et al., 2019).

Figure 6. Average Annual Cost per Person Reached through Outreach by Location in IDR (US$)
A key aspect of the cost-efficiency of outreach depends on whether the outreach results in uptake of prevention and HIV testing services for those in need of those services (testing yields are discussed later in the report). HP+ estimated the cost per person reached through outreach who accesses HIV testing services (see Figure 7). Since only a subset of those reached are referred to HIV testing, the outreach costs per person referred to HIV testing is higher than the cost of outreach per person per year. Outreach costs per person (all populations) referred to HIV testing are IDR 4,486,448 (US$310) in Jayapura and IDR 6,203,827 (US$429) in Jayawijaya. Jayapura has a lower overall cost per person referred to testing despite including one CSO serving men who have sex with men that has very high outreach costs per person referred (IDR 13,531,590 [US$936]). This is a result of the CSO only referring 8 percent of people reached to testing services, but it does not significantly affect the average weighted cost as other CSOs account for a bigger proportion of outreach clients. Reasons for low testing referral rates include CSOs reaching a high proportion of people who already know they are living with HIV or have already been tested for HIV recently.

These findings suggest that there may be an opportunity to improve the cost-efficiency of outreach services in both Jayapura and Jayawijaya. Jayawijaya has higher rates of HIV testing referral compared to Jayapura, but costs of reaching one contact through outreach are also generally higher, primarily due to the additional educational resources distributed to those targeted for outreach in Jayawijaya compared with Jayapura.

**HIV Testing and Counseling**

There are several HIV testing and counseling entry points in Papua. People accessing tuberculosis, sexually transmitted infection, and prenatal services at health facilities are targeted to receive HIV testing. CSOs also support HIV testing and counseling through mobile testing services that primarily aim to serve key populations and their partners. On average, HIV testing is estimated to cost less per person tested in Jayawijaya (IDR 185,654 [US$13]) than in Jayapura (IDR 298,193 [US$21]) (see Figure 8). Service delivery costs are lower in Jayapura due to economies of scale in mobile testing, as well as lower transportation costs for staff and clients. However, indirect intervention costs are much higher in Jayapura compared with Jayawijaya. One CSO in Jayapura that accounts for 21 percent of all those reached through mobile testing in our Jayapura sample has significantly higher management costs than any other CSO sampled, which is driving the high indirect costs in this location.
Costs of Strengthening the HIV Treatment Cascade in Papua, Indonesia

Figure 8. Costs of HIV Testing per Person Tested by Location in IDR (US$)

For facility-based testing, medium- and high-volume puskesmas have lower unit costs than low-volume facilities, as expected due to gains from economies of scale (see Figure 9). Staff in low-volume facilities actually spend less time with each patient compared to staff in medium- and high-volume facilities but have very high other direct costs and higher indirect costs associated with facility-based testing than other facility types. Medium- and high-volume facilities have similar numbers reached and unit costs for facility-based testing. The slightly higher average unit cost in high-volume facilities is due to staff spending more time per patient tested for HIV.

Figure 9. Costs of Facility-Based HIV Testing per Person Tested by Facility Type and Location in IDR

To assess the cost-efficiency of HIV testing, HP+ estimated the cost of testing per person identified as living with HIV by location. The cost-efficiency of HIV testing depends on testing yield (e.g., percentage of people tested for HIV who test positive). In Papua, Jayapura had higher testing yields (5.2 percent) in 2018 compared to Jayawijaya (2.7 percent) (see Figure 10). This can partly be explained by higher concentrations of men who have sex with men and female sex workers in Jayapura. Unfortunately, testing yield data disaggregated by mobile and static testing modalities are not available. In our sample, 17 percent of HIV tests
in Jayawijaya were conducted through mobile testing compared with 28 percent in Jayapura, which could partially explain differences in testing yield.

**Figure 10. HIV Testing Yields in Papua by Location, 2014–2018**

Despite differences in testing yields between Jayapura and Jayawijaya, the cost per person tested as positive is about the same due to high HIV testing unit costs in Jayapura compared with Jayawijaya (see Figure 11 and Box 3). This suggests that any cost savings achieved in Jayawijaya from providing HIV testing service delivery more efficiently was offset by its lower testing yields, highlighting a need for more targeted testing approaches that will improve yields. Conversely, Jayapura may be able to improve the cost-efficiency of HIV testing by finding ways to reduce its indirect costs, the main driver of its expenses, particularly for indirect costs associated with mobile HIV testing.

**Box 3. What is driving the cost of HIV testing per person identified?**

**Jayawijaya:** Low testing yields—just 2.7 percent of people tested in 2018 are living with HIV; the rate in Jayapura was nearly double.

**Jayapura:** Costs per person tested—was nearly double that in Jayawijaya, driven by indirect costs.
Linkage to Care and Treatment

Referral to ART

CSOs in Papua refer key populations and their partners to ART services once they are diagnosed as living with HIV. Most CSOs have outreach workers accompany patients to the facility to initiate ART and some CSOs will provide transport stipends of IDR 70,000 (US$5) to patients who initiate ART (see Box 4). Peer volunteers at one CSO were also reimbursed for transport for referring patients to health facilities for treatment. No additional incentive payments are made to outreach workers or peer volunteers for referrals, unlike in Jakarta, even though many CSOs reported that outreach workers may spend out-of-pocket to purchase food and water for a patient being referred to treatment.

Unit costs of ART referrals are similar between CSOs in Jayapura and Jayawijaya (see Figure 12). The cost per person referred to ART is IDR 3,297,077 (US$228) in Jayapura and IDR 3,005,105 (US$208) in Jayawijaya. A significant proportion of the costs are for indirect and management costs due to high overall indirect/management costs among Papuan CSOs and ART referral requiring more time than any other intervention provided by CSOs.

Figure 12. CSO Average Cost per Client Referred to ART by Location in IDR (US$)

The activity is time intensive, requiring usually at least three hours per patient, especially since many patients are not referred to treatment the same day they are diagnosed (see Figure 13). Direct costs other than staff time are driven by staff transportation costs as some CSOs additionally offer transportation reimbursement to clients.
The cost-efficiency of linkage to care and treatment is based on cost per person referred to ART who initiates ART. Due to lack of available patient tracking data, HP+ is unable to calculate the cost-efficiency of linkage to care initiatives.

**Treatment Initiation and Maintenance**

The overall average cost per person on ART does not vary by patient load across puskesmas (see Figure 14). Very few new or patients not stable on treatment are managed at the puskesmas level. As a result, treatment standards in terms of number of visits to the facility, types of providers providing treatment, and amount of time providers spent with each patient were relatively consistent across the puskesmas sampled. Across all puskesmas, antiretrovirals and laboratory monitoring (including viral load testing) account for the largest proportion of treatment unit costs. Puskesmas could achieve some cost savings in terms of staff time and laboratory costs by introducing differentiated care for stable patients on treatment (see Box 5).

The provincial hospital in our sample provides treatment for a large number of new patients with advanced disease (37 percent of all ART patients managed at the hospital) and recurring patients not stable on treatment (12 percent) who require additional staff time and laboratory monitoring compared with stable patients. As a result, the average cost of ART per person per year in the provincial hospital is IDR 11,502,708 (US$735), which is 1.4 times the cost of ART in puskesmas. Even among stable patients, average ART costs are nearly 1.3 times higher in the provincial hospital than in puskesmas.

ART costs in Papua are very similar to those reported for Jakarta, except laboratory testing was two to three times higher in Papua than Jakarta due to higher sample transportation and other costs in Papua (Cantelmo et al., 2019). Facilities in Jayapura have a higher ART unit cost than those in Jayawijaya because in Jayapura, staff spend more time with ART patients and patients receive more clinical tests (including biannual CD4 and viral load tests in many facilities) than in Jayawijaya. Due to lack of data, it is unknown if additional staff time and clinical monitoring results in improved health outcomes for patients.
Retention and Viral Suppression

Retention in care and viral suppression remain challenges along the treatment cascade in Papua and are top priorities for the government and development partners. ART patients stop attending facility visits for a variety of reasons, from stigma and discrimination to inconvenient facility operating hours (e.g., half day operating hours) to financial barriers to not being able to access facilities outside specific areas due to resident ID cards. In order to accommodate patients living in remote areas, some ART patients stable on treatment receive multi-month antiretroviral scripts in Papua; however, this has not been implemented at scale. Multi-month scripting is now officially supported by the Ministry of Health, which released a circular on July 31, 2019, allowing for patients to receive two- or three-month scripts (MOH, 2019).

CSOs and facilities conduct activities to help retain patients in care and return those who are lost to follow-up. One such activity provided by CSOs is individualized treatment adherence support. This intervention costs IDR 1,457,245 (US$101) per person per year in Jayapura where the cost is driven by training for staff and staff transportation. In Jayawijaya, the cost is significantly less at IDR 524,241 (US$36) because of lower staff training costs and less needed for staff transport reimbursement (see Box 6). Due to lack of data, HP+ is unable to analyze whether the additional staff training on adherence support in Jayapura results in lower rates of patients lost to follow-up.

Another activity to support ART patients is support group meetings for people living with HIV. CSO support group meetings are usually open to all key populations to provide psychosocial support regardless of whether they have HIV and are on ART. This intervention costs IDR 307,282 (US$21) per person reached in Jayapura where a significant portion of the cost (24 percent) is for client transport reimbursement to attend the meetings. In Jayawijaya, the cost is nearly six times the cost in Jayapura at IDR 1,000.

**Figure 14. Average Cost per ART Patient per Year by Puskesmas Type and Location in IDR**

![Costs of Strengthening the HIV Treatment Cascade in Papua, Indonesia](image-url)

**Box 6. Why do costs for group meetings and individualized support differ by location?**

**Jayapura:** Individual adherence support costs are driven by staff training and transportation. Group meeting costs are driven by client transport reimbursement expenses.

**Jayawijaya:** No training is provided for individualized treatment adherence support. The majority of group meeting costs are for client transport reimbursements to attend meetings.
1,730,898 (US$120); the majority of the cost (91 percent) is for client transport reimbursement to attend the meetings. There is variation across CSOs in the number of support group meetings per year ranging from 1 to 12 per year, with many Jayawijaya CSOs holding more frequent meetings, which explains large variations in the total amount required for client transport reimbursement.

A third intervention that CSOs and puskesmas conduct to improve retention is tracing patients who are lost to follow-up (LTFU) through phone or home visits. CSO unit costs for LTFU tracing in Jayawijaya are IDR 2,008,659 ($139) driven by high allocations of indirect/management costs for the time-intensive activity, despite just 15 people reached with the intervention. In Jayapura, the CSO unit cost is significantly higher at IDR 6,800,449 ($470), similarly driven by high indirect/management costs but additionally a result of high costs for training and staff transportation to conduct the activity. These costs are much higher than costs of patient tracing conducted by facilities. For example, patient tracing by facilities in Jayapura cost 95 percent less, on average, than patient tracing by CSOs in Jayapura. This difference is driven by differences in approach; CSO staff spend much more time tracking patients than facility staff. Among facilities, unit costs for LTFU tracing are lower for those that are low-volume because staff do not spend very much time on LTFU, conducting only limited outreach through phone rather than more extensive follow-up that includes home visits (see Figure 15). This is largely a consequence of shortages of health workers, which limits staff time to be able to conduct time-intensive LTFU activities in lieu of other clinical and administrative responsibilities. Due to the lack of data by facility or CSO on how many people are returned to care from LTFU activities, HP+ cannot assess the cost-efficiency of different LTFU approaches.

**Figure 15. Average Unit Cost of LTFU Tracing by Facility Type and Location in IDR**

![Figure 15: Average Unit Cost of LTFU Tracing by Facility Type and Location in IDR](image)

**Discussion**

This report fills gaps in data on the costs of implementing HIV interventions in Papua. By analyzing intervention costs per person reached or for a desired outcome by service delivery model and population served, this report helps advance the evidence base for improving cost-efficiency of Papua’s HIV response and cascade outcomes. The Provincial Health Office in Papua can use results from this study to inform grants for CSOs and assess appropriate costs for CSO-led HIV services.
Opportunities for Efficiency Gains

Management and indirect costs account for a significant proportion of CSO unit costs. Management staff, including program managers, finance staff, field coordinators, and monitoring and evaluation staff, account for most of these costs. CSOs may be able to reduce these costs by scaling up coverage of services to achieve better economies of scale, but this is a challenge in Papua due to relatively low population density and geographical barriers to access. CSOs may be able to reduce indirect/management costs by improving the ratio of technical/program staff to management/administrative staff and instead leveraging partnerships with faith-based and other community leaders to carry out activities. As noted previously, using a top-down costing approach for indirect costs was a limiting factor for the study, given that it is difficult to know if allocations made are accurate.

As expected, low-volume puskesmas tend to have slightly higher management and other indirect costs per person reached. However, management and indirect costs account for a relatively small proportion of puskesmas’ HIV unit costs, unlike the case with CSOs. This suggests that reducing overall management or indirect costs within puskesmas will have very little impact on HIV-related costs. The private clinic’s unit costs of HIV services such as ART and HIV testing and counseling are in line with unit costs seen in high-volume puskesmas.

As Papua scales up HIV services to meet ambitious fast-track strategy targets, there are several opportunities to improve cascade outcomes and the cost-efficiency of the HIV response by making changes to how services are delivered. These are described next by cascade component.

Identification

Although the underlying estimates of people living with HIV are uncertain, recent modeling and programmatic data suggest that Papua has identified 60 percent of them. Papua may face challenges in reaching those who remain undiagnosed, but the local government plans to expand upon minimum service standards that require routine testing of at-risk populations as well as scale up partner notification and index testing.

CSO outreach will remain a critical intervention for identifying new people living with HIV. Outreach costs per person reached are higher in Jayawijaya than in Jayapura, as well as among the general population and men who have sex with men compared with female sex workers. High unit costs among the general population are driven by expenses related to information, communication, and educational materials. A diverse range of materials (pamphlets, CDs, posters, etc.) are needed to reach people who speak different languages and have different social/cultural characteristics in the Papuan highlands. High unit costs among men who have sex with men are driven by relatively few people being reached at hotspots.

Outreach costs per person (across all populations) referred to HIV testing are IDR 4,486,448 (US$310) in Jayapura and IDR 6,203,827 (US$429) in Jayawijaya. The difference in cost-efficiency is driven by differences in outreach unit costs between the two locations rather than outcomes; Japaura and Jayawijaya have similar HIV testing referral rates. Prevention is another important component of outreach activities, however, it is unknown how outreach in either location affects individuals’ behavior to prevent HIV.

On average, HIV testing is estimated to cost less per person tested in Jayawijaya (IDR 185,654 [US$13]) than in Jayapura (IDR 298,193 [US$21]). Direct costs are lower in Jayapura due to economies of scale in mobile testing, as well as lower transportation costs.
for staff and clients, while indirect intervention costs are much higher in Jayapura compared with Jayawijaya. For facility-based testing, medium- and high-volume puskesmas have lower unit costs than low-volume facilities, as expected due to gains from economies of scale. Despite differences in HIV testing unit costs between Jayapura and Jayawijaya, higher HIV testing yields in Jayapura than in Jayawijaya result in the cost per positive person identified being about the same.

**Linkage to Care and Treatment and ART Case Management**

High indirect and management costs for CSO referral to ART are a result of referral processes being time-intensive, as well as relatively few people being referred to ART. As expected, ART is the highest-cost intervention within the treatment cascade. The average cost per ART patient per year in puskesmas is about the same, regardless of patient load. Puskesmas could potentially reduce significant costs of managing stable patients by introducing differentiated care models that reduce the frequency of clinical visits and laboratory monitoring. Average ART costs per person per year in the provincial hospital were 1.4 times that found in puskesmas; this cost difference is driven by more new patients with advanced disease and patients not stable on treatment being managed at the provincial hospital rather than at puskesmas.

**Retention in Care and Viral Suppression**

Retention in care and viral suppression remain challenges in the province. Some interventions to improve these outcomes, such as routine support group meetings, require significant resources. For stable ART patients, reducing the frequency of these meetings, consolidating groups across CSOs, using peer volunteers in villages or religious leaders rather than full-time CSO staff to hold the meetings, and maximizing support through other mechanisms could reduce the unit cost of these activities.

Tracking patients that are lost to follow-up is a priority for the Provincial Health Office, but this analysis found that the costs of these activities per person reached are very high and the rate of patients returning to care is unknown. Outreach and lost to follow-up models through mobile phones or online platforms may help reduce costs of these activities in urban areas. Use of village volunteers or religious leaders rather than facility or CSO staff to trace and support patients could reduce costs in remote, hard-to-reach areas. The Provincial Health Office could also explore using records from BPJS-K—Indonesia’s national health insurance agency, who tracks patients with ID cards—to analyze patient patterns and outcomes.

**Recommendations and Next Steps**

Papua needs to address leaks and inefficiencies in its treatment cascade to achieve fast-track targets. The local government can use costing evidence in this report to not only improve the technical efficiency of HIV interventions, but also to plan and budget for the scale up of HIV services with local government funding as the province experiences transitions in external financing support. HP+ recommends the following:

---

1 For example, a creatinine clearance test would be conducted only for clients on tenofovir (TDF)-based regimens once per year as opposed to all clients getting a clinical chemistry test twice per year. Also, a hemoglobin (hematology) test would be conducted for clients on zidovudine (AZT)-based regimens once per year as opposed to all clients getting a full blood count twice per year. Lastly, continuing stable clients would only get a viral load test once per year, compared to twice per year for non-stable clients.
• **Ensuring patients are managed at appropriate levels of care:** Only patients with advanced disease or those who are not responding well to treatment should be managed at hospitals, while stable patients should be managed at puskesmas. This study found that managing stable patients costs more at the provincial hospital than at puskesmas, suggesting there can be efficiency gains as well as cost savings to JKN (the national health insurance scheme) if more patients are managed at lower levels of care. This recommendation will require additional investments in puskesmas to ensure that they are fully operational, that staffing shortages are filled or addressed through task shifting (which requires guidelines and training of staff), and that they meet minimum quality standards for being able to provide ART. Given the mobility of ART patients in Papua, referral systems should be in place to allow patients to access antiretroviral drugs at different facilities or pharmacies.

• **Introducing or scaling up new service delivery models:** Changing how services are delivered can have a significant impact on total resource requirements for the HIV response in Papua. Identifying the optimal mix of testing modalities is important in Papua as the province approaches reaching the target of 90 percent of all people living with HIV knowing their HIV status. Finding the remaining undiagnosed people living with HIV may be difficult and expensive because of diminishing yields from testing. Therefore, targeted, high-yielding interventions such as index testing need to be scaled up with fidelity. Similarly, scaling up differentiated care models where stable patients require fewer facility visits and laboratory tests could help improve retention while also reducing costs. Lastly, the Provincial Health Office should consider innovative ways to retain patients in care or track patients lost to follow-up as these remain the biggest challenges in Papua. Additional consultation is needed to identify potential models to pilot; solutions that can provide support to ART patients that are stigmatized or living in remote, hard-to-reach areas should be considered. While some of these solutions may require an upfront investment, they may be cost-effective and even eventually cost-saving if they increase ART retention rates and viral suppression.

• **Conducting additional research on the cost-efficiency of the HIV response:** As Papua aims to scale up services toward meeting fast-track targets, it is imperative that the Provincial Health Office uses cascade cost analytics to ensure efficient use of resources while improving performance around key indicators such as retention and viral suppression. The Provincial Health Office can build upon the current analysis, using the same methodology and data collection tools used by HP+. HP+ recommends periodic collection and analysis of cost data in addition to routine programmatic data collection to systematically evaluate the cost-efficiency of HIV prevention, testing, and treatment service delivery models by population over time. Tracking patient outcomes through unique identifiers, allowing for longitudinal data analysis, is preferred over the use of service statistics to identify gaps in the cascade.

• **Using unit costs to set appropriate reimbursement rates for HIV services provided by CSOs:** As CSOs apply for local government grant funding to carry out HIV services, the government should evaluate their budget proposals based on costing evidence. Currently, budgets are developed using government standard unit costs, which may lead to grant obligations to CSOs that are too small or too large for the scope of work. As Papua experiences external financing transitions and scales up contracting with local CSOs providing HIV services, it is important that grant funding is based on accurate estimates of resource requirements to meet programmatic goals.
References


LINKAGES. 2019. Barriers and Supporters in Seeking Care and Maintaining HIV Treatment in the Papua Highlands. Papua, Indonesia: LINKAGES.


National Population and Family Planning Board (BKKBN), Statistics Indonesia (BPS), Ministry of Health (Kemenkes), and ICF. 2018. Indonesia Demographic and Health Survey 2017. Jakarta, Indonesia: BKKBN, BPS, Kemenkes, and ICF.


