Experience in Piloting HIV Drug Resistance Early Warning Indicators to Improve the Antiretroviral Program in Papua New Guinea

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In 2009, World Health Organization human immunodeficiency virus drug resistance early warning indicator monitoring was piloted at 2 large antiretroviral therapy (ART) clinics in Papua New Guinea: Heduru Clinic in Port Moresby and Tininga Clinic in Mount Hagen. Results demonstrated that both Heduru and Tininga clinics met internationally suggested targets for prescribing appropriate first-line ART regimens in accordance with national ART guidelines, retention on first-line ART at 12 months, and drug supply continuity. However, both clinics failed to achieve suggested targets for rates of loss to follow-up and on-time pill pickup. Reasons for poor clinic performance on loss to follow-up and on-time pill pickup were explored, and appropriate corrective actions were implemented.

The antiretroviral therapy (ART) program in Papua New Guinea (PNG) commenced in 2004 and has scaled up rapidly ever since. By the end of 2009, 6751 patients of an estimated 9061 individuals in need were receiving ART, representing coverage of 74.5% of those in need [1]. ART services are delivered using a public health approach [2] characterized by decentralized service delivery with simplified regimens and limited laboratory monitoring. Currently, there are 55 ART clinics across the country, of which 4 are designated major regional centers that distribute antiretroviral drugs (ARVs) to satellite clinics throughout the country. These 4 major regional centers are Heduru, Tininga, and Michael Alphes clinics and Anua Moriri Day Care Centre. At present, there is no capacity for viral load or human immunodeficiency virus drug resistance (HIVDR) testing within the country.

The National Department of Health (NDOH) has exerted efforts to scale up ART and strengthen the capacity of existing ART sites to ensure quality service delivery. As a part of PNG’s national strategic plan, an HIVDR prevention and assessment strategy was developed with the objective of providing actionable information to optimize ART program performance and thus minimize emergence of HIVDR. A core element of PNG’s national HIVDR prevention and assessment strategy is monitoring World Health Organization (WHO)–recommended HIVDR early warning indicators (EWIs) to assess how effectively ART clinics and programs function in optimizing quality of patient care and minimizing emergence of HIVDR [3, 4].

In 2009, an HIVDR EWI pilot survey was conducted at 2 large ART sites: Heduru Clinic in Port Moresby and Tininga Clinic in Mount Hagen. Together, these 2 clinics treat approximately 60% of ART patients in the country. The results from this EWI pilot have informed development of public health actions to improve the ART program.

METHODS

The 2 participating ART sites were selected based on the availability of reliable data. Heduru Clinic, founded in 2004 and located in the national capital, is the country’s oldest and largest ART clinic. Heduru Clinic currently
cases for nearly 40% of all patients receiving ART in PNG. Tininga Clinic, located in Mount Hagen, began providing ART in 2006 and has doubled the number of patients on ART served over the last 3 years. Tininga Clinic serves as the regional reference site for 5 high-disease-burden provinces in the highlands of PNG and provides care for 20% of the total patients on treatment in the country.

The National HIVDR working group elected to focus on 5 EWIs from WHO: (1) percentage of patients initially prescribed an appropriate first-line ART regimen in accordance with the PNG national treatment guidelines; (2) percentage of patients lost to follow-up during the 12 months after starting ART; (3) percentage of patients taking an appropriate first-line ART regimen at 12 months after treatment initiation; (4) percentage of patients picking up all prescribed ARVs on time during their first year of treatment; and (5) percentage of patients whose regimen was stopped, modified, or incompletely dispensed during the first 12 months of ART due to ARV stockouts or shortages.

Data abstraction started in June 2009 and was performed by NDOH staff with support from data officers based at each site. The sample consisted of patients who commenced treatment in March 2008. The annual number of eligible patients for each site was estimated to be 100–200. According to WHO EWI monitoring guidance [5], 100 patients were sampled from each of the 2 clinics [5]. Eligible patients were identified using the site’s ART registration logbook; consecutive patients were included in the sample until a sample size of 100 was reached at each site. Variables for each indicator were abstracted from patient medical records and entered into a standardized WHO data abstraction tool (Microsoft Excel). After completion of data abstraction, 10% of data were validated using alternate medical records.

### RESULTS AND DISCUSSION

Results demonstrated that both Heduru and Tininga clinics met the targets for prescribing appropriate first-line ART regimens in accordance with national ART guidelines, retention on first-line ART at 12 months, and drug supply continuity. However, both failed to achieve the suggested targets for loss to follow-up and on-time pill pickup (Table 1).

<table>
<thead>
<tr>
<th>Indicator, Description/Target</th>
<th>Heduru Clinic</th>
<th>Tininga Clinic</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART prescribing practices/target 100%</td>
<td>100% (n = 100)</td>
<td>100% (n = 100)</td>
</tr>
<tr>
<td>Patients lost to follow-up/target &lt;20%</td>
<td>32% (n = 98)</td>
<td>27% (n = 95)</td>
</tr>
<tr>
<td>Patient retention on first-line ART/target &gt;70%</td>
<td>84% (n = 95)</td>
<td>74% (n = 100)</td>
</tr>
<tr>
<td>On-time ARV drug pickup/target &gt;90%</td>
<td>40% (n = 100)</td>
<td>57% (n = 100)</td>
</tr>
<tr>
<td>Regimen was stopped, modified, or incompletely dispensed due to drug stockout/target 0%</td>
<td>0% (n = 100)</td>
<td>0% (n = 100)</td>
</tr>
</tbody>
</table>

Abbreviations: ART, antiretroviral therapy; ARV, antiretroviral drug.

maintained a formal transfer in/out procedure reflects a weakness in the patient information system that, if left uncorrected, will limit future efforts to trace patients who default from care.

Regarding on-time pill pickup, transportation-related factors were hypothesized as primary contributors of poor clinic performance. More than 75% of patients enrolled at Tininga Clinic reside in rural villages or remote areas, and most come into the clinic to refill their drugs only when they are in town to collect domestic supplies or when they are sick. Patients may arrive 1–2 days, or even a week, early or late depending on other factors such as lack of bus fare, tribal clashes, or roadblocks.

After detailed clinic investigation and discussions with clinic staff, the following recommendations and actions were taken to strengthen ART services and improve future site performance: (1) establishment of a formalized referral system that includes compulsory documentation of patient transfers between clinics, which will ensure transfer of medical records between clinics and providers; and (2) regular review of patient clinic attendance and drug pickups to identify patients at risk for suboptimal adherence to ART and ways to remove barriers to on-time pill pickup by providing subsidies for transportation and food for those in need.

Through this pilot EWI monitoring exercise, it was recognized that HIVDR EWIs provide valuable and actionable programmatic data. While more efforts are needed to expand access to immunologic and virologic monitoring for patients on ART, EWI monitoring is needed to assess and minimize preventable HIVDR among patients receiving ART. The national ART program in PNG is planning to expand EWI monitoring to additional ART clinics and implement other elements of the WHO HIVDR prevention and assessment strategy [3, 4, 6].
Notes

Disclaimer. The conclusions and opinions expressed in this article are those of the authors and do not reflect those of the WHO.

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References