I-TECH MALAWI

HIV DRUG RESISTANCE IN MALAWI

WHY IS UNDERSTANDING HIV DRUG RESISTANCE IMPORTANT?

Once a person gets HIV, the virus begins to multiply in the body. As HIV multiplies, it sometimes mutates. Some HIV mutations develop while a person is taking HIV medications, which can lead to drug-resistant HIV that can be transmitted to others. Because of this, the World Health Organization (WHO) recommends countries routinely implement nationally representative HIV drug resistance (HIVDR) surveys among people infected with HIV to measure the level of drug resistance. The results of HIVDR surveys are a critical component of HIV programs and can guide changes to pediatric and adult antiretroviral therapy (ART) treatment regimens, including first- and second-line regimen decisions. I-TECH has been implementing HIVDR Surveys in Malawi since 2016.

HIVDR SURVEYS CONDUCTED IN MALAWI

- **Infant HIVDR Survey:** An HIVDR survey was conducted among infants aged 18 months and younger to determine the level of pediatric resistance to nonnucleoside reverse transcriptase inhibitors (NNRTI), nucleoside reverse transcriptase inhibitors (NRTI), and protease inhibitors (PI) ART drugs through exposure during pregnancy and breastfeeding. A total of 232 eligible remnant dried blood spot (DBS) samples from nine early infant diagnosis (EID)-approved laboratories were used for the diagnosis of HIV in infants between June 2016 and December 2017. They were successfully amplified and sequenced at the University of North Carolina molecular laboratory with technical support from the US Centers for Disease Control and Prevention (CDC).
- **ANC/Pregnant Women HIVDR Survey:** An HIVDR survey was conducted to measure resistance to NNRTI, NRTI and PI drugs among antenatal care (ANC) clients who were found to have a recent HIV infection. A total of 45 DBS samples from women with recent HIV infection were collected as part of the 2016 HIV sentinel surveillance survey and were successfully amplified and sequenced.

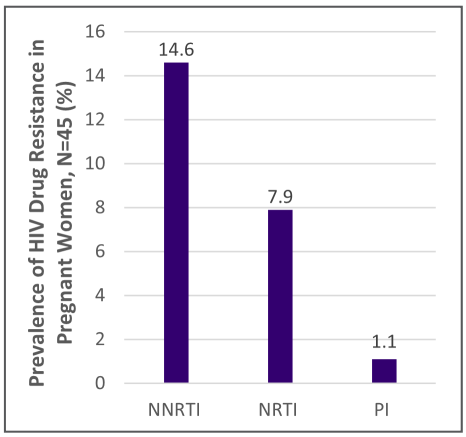

Figure 1. Prevalence of HIVDR in pregnant women by HIV drug class

KEY SURVEY FINDINGS

INFANT HIVDR SURVEY:

- Resistance to NRTI- and NNRTI-based regimens among infants were 25.8% (47/232; 95% CI: 17.5-36.4) and 68.8% (145/232; 95% CI: 61.7%-75.1%), respectively. None of the infants had PI resistance.
- The resistance to NNRTIs and NRTIs was above the 10% prevalence threshold set by WHO for both NNRTI and NRTI drug regimens and thus at a level to which countries should consider urgently responding.

ANC/PREGNANT WOMEN HIVDR SURVEY:

- The prevalence of resistance to NNRTIs among women attending ANC with a recent HIV infection was 14.6% (5/45; 95% CI: 4.7-36.8). (***Figure 1***).
- The prevalence of drug resistance to NRTIs among women attending ANC with a recent HIV infection was 7.9% (2/45; 95% CI: 1.4-34.6).
- Drug resistance to PI was not observed in women attending ANC in the HIV sentinel surveillance survey.

PUBLIC HEALTH IMPLICATIONS

The rates of resistance seen in the infant HIVDR study are consistent with the high exposure of infants to single dose infant nevirapine prophylaxis and lifelong maternal ART coverage (tenofovir, lamivudine and efavirenz) for HIV-positive pregnant and lactating women following Malawi's adoption of the WHO Prevention of Mother-to-Child Transmission Option B+ in 2011. The level of resistance to NNRTIs among women attending ANC (14.6%) is consistent with other published data from Malawi.

POLICY CHANGE

Findings from both surveys supported the transition to an integrase inhibitor-based first-line ART regimen (e.g., TLD*) for children and adults. Malawi began the transition to TLD in January 2019 after a successful pilot in mid-2018.

**tenofovir, lamivudine, dolutegravir*

NEXT STEPS

The next step is to continue monitoring HIVDR among pregnant women initiating dolutegravir (DTG)-based regimens, as well as the potential emergence of DTG resistance in infants via mother-to-child transmission. A study of DTG resistance is currently underway in Malawi and will determine the level of DTG resistance in adults who are unable to achieve viral load suppression and DTG resistance in children < 15 years old who are unable to achieve viral load suppression.

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