

**Conclusion.** The resistance prevalence (6%) in this study supported the WHO guideline to prescribe *pol* resistance testing before initiation of HAART therapy in the treatment naïve patients.

**Disclosures.** All authors: No reported disclosures.

### 1370. Monitoring of HIV Drug Resistance Mutations in Newly Diagnosed Patients in Cyprus (2010–2012)

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**Background.** A molecular epidemiology study of HIV-1 infection was conducted in 100 HIV-1 diagnosed and untreated patients in Cyprus representing 65.4 percent of all the reported HIV-1 infections in Cyprus between 2010 and 2012.

**Methods.** Eighty-two patients were newly diagnosed (genotypic drug resistance testing within six months from diagnosis), and 18 patients were HIV-1 diagnosed for a longer period or the diagnosis date was unknown.

**Results.** Phylogenetic trees of the *pol* sequences obtained in this study with reference sequences indicated that subtypes B and A1 were the most common subtypes present and accounted for 41.0 and 19.0% respectively, followed by subtype C (7.0%), F1 (8.0%), CRF02\_AG (4.0%), A2 (2.0%), other CRFs (7.0%) and unknown recombinant forms, URFs (12%). Most of newly-diagnosed study subjects were Cypriots (63%), males (78%) with median age 39 (Interquartile Range, IQR 33–48) reporting having sex with other men, MSM (51%).

**Conclusion.** A high rate of clustered transmission of subtype B drug-sensitive strains to reverse transcriptase and protease inhibitors was observed among MSM. Twenty-eight out of forty-one MSM study subjects (68.0%) infected were implicated in five transmission clusters, two of which are subtype A1 and three subtype B strains. The two largest MSM subtype B clusters included nine and eight Cypriot men, respectively, living in all major cities in Cyprus. There were only three newly diagnosed patients with transmitted drug resistant HIV-1 strains, one study subject from the United Kingdom infected with subtype B strain and one from Romania with subtype A2 strain, both with the PI drug resistance mutation M46L and one patient from Greece with subtype A1 strain with the NNRTI drug resistance mutation K103N.

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### 1371. Drug Resistance After Failure of WHO Recommended First-Line Antiretroviral Regimen for Adult HIV-1 Infection in South Africa: A Modeling Analysis

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**Background.** Antiretroviral therapy (ART) is critical for ending the HIV epidemic. Tenofovir-containing ART is the first-line regimen in many countries including South Africa, with limited access to second-line ART. High levels of drug resistance have been reported among patients after virologic failure on tenofovir-containing first-line regimens (TenoRes Study, Lancet Infect Dis 2016). We assessed drug resistance at the population level using mathematical modeling.

**Methods.** We developed a stochastic individual-based model of the heterosexual HIV epidemic in KwaZulu-Natal South Africa, and compared drug resistance from scenarios of tenofovir-containing ART scale-up, either CD4-based (threshold < 500 cells/mL) or Fast-track (80% coverage by 2020). The model represents details of HIV transmission and disease progression, demography, sexual behavior, condom use, circumcision, treatment interventions and drug resistance dynamics including key mutations (M184V, K65R and non-nucleoside reverse transcriptase inhibitor (NNRTI)). Using an initial population of 2.5 million, we performed 100 simulations from 1978 to 2030. We examined the prevalence of (majority) transmitted and acquired resistance by 2030.

**Results.** The total resistance (proportion of HIV-infected persons with drug resistance) reached 34% from CD4-based ART by 2030, with 30% relative contribution from transmitted resistance and 70% from acquired resistance. In contrast, Fast-track ART reduced the total resistance to 22%; though, there was an increased relative contribution from transmitted resistance (~ 50%). In both scenarios, NNRTI mutations were the most prevalent, followed by M184V and K65R mutations. About 48% of persons with acquired drug-resistance harbored dual drug mutations, 44.7% had triple mutations and 7.3% just single mutations, from CD4-based ART. The respective estimates from Fast-track ART were similar; 49% for dual, 44.1% for triple and 6.9% for single mutations. In both scenarios, NNRTI mutations comprised about 80% of prevalent transmitted resistance.

**Conclusion.** Current WHO-recommended first-line ART could lead to substantial drug resistance. Effective surveillance for resistance transmission and access to second-line regimens would be crucial.

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### 1372. Antiretroviral Therapy Prescribing Practices and Virologic Response in HIV-Infected Individuals with the M184V Mutation: Results from the 550 Clinic Cohort Study

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**Background.** Human immunodeficiency virus (HIV) treatment guidelines recommend using a regimen that contains three fully active antiretroviral agents in patients with drug resistance mutations. However, some evidence suggests that protease inhibitor (PI) based regimens containing less than three fully active drugs may be as efficacious in achieving viral suppression (VS) as a three-drug regimen in the presence of a M184V mutation. The purpose of this study was to identify current prescribing practices and determine if VS can be achieved with regimens containing less than three fully active agents in patients with a M184V mutation.

**Methods.** A single-center retrospective chart review was conducted on patients receiving treatment at the 550 Clinic from January 2003 to July 2016. Patients were screened for a M184V mutation. Patients were excluded for lack of a genotype and inadequate documentation of viral load (VL) prior to initiating or changing therapy. Regimens were characterized as containing three fully active agents or less and evaluated for VS success (VL less than 200 copies/mL). Data was analyzed using descriptive statistics, Chi-square tests, and Fischer's exact tests.

**Results.** A M184V mutation was identified in 100 of the 754 patients screened for inclusion. 90% of the 167 regimens evaluated contained less than three fully active drugs. PI-based regimens ( $n = 86$ ) and integrase strand transfer inhibitor (INSTI)-based regimens ( $n = 25$ ) were the most commonly prescribed regimens containing less than three fully active drugs. VS was achieved with 72% of regimens containing less than three fully active agents compared with 69% of those containing three fully active agents ( $P = 0.108$ ). In patients with a baseline VL greater than 100,000 copies/mL, VS was achieved with 80% of INSTI-based regimens compared with 21% of PI-based regimens ( $P = 0.040$ ). VS was achieved with 85% of INSTI-based regimens and 78% of PI-based regimens in those with a baseline VL less than 100,000 copies/mL ( $P = 0.513$ ).

**Conclusion.** Regimens containing less than three fully active drugs may be as efficacious as regimens containing three fully active drugs in those with a M184V mutation. In those with a high baseline VL, INSTI-based regimens may have better efficacy compared with PI-based regimens.

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### 1373. Moderate Levels of Pretreatment HIV Drug Resistance — Zimbabwe, April–July 2015

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**Background.** The World Health Organization (WHO) HIV Drug Resistance (HIVDR) report 2012 demonstrated that the levels of HIVDR to first-line antiretroviral therapy (ART) are increasing. This finding threatens to reverse a decade of gains in HIV/AIDS epidemic control. The WHO Global Action Plan for HIVDR emphasizes strengthening surveillance of drug resistance through the implementation of national cross-sectional surveys. We conducted such survey to determine the prevalence of HIVDR among ART-naïve patients in Zimbabwe and to describe the profile of the surveillance drug resistance mutations (SDRM) encountered in the country.

**Methods.** A prospective, nationally representative, cross-sectional survey was conducted in 35 clinical sites selected using two stage probability proportional to size sampling. Patients were enrolled during April–July 2015. Specimens were sent for genotyping to CDC Atlanta. SDRM were interpreted using Stanford HIV Drug Resistance Database classification.

**Results.** A total of 361 subjects were surveyed. Most participants were female (60.3%) and the median age was 35.8 years. Thirty-four out of 361 subjects presented with  $\geq 1$  SDRM (9.4%, 95% confidence interval: 6.8–12.8%) prior to initiation antiretroviral therapy (ART). Non-nucleoside reverse transcriptase inhibitor (NNRTI) mutations were the most commonly detected mutation ( $n = 30$ ). Only two patients presented with a nucleoside reverse transcriptase inhibitor mutation and one patient presented with a protease inhibitor mutation. In two patients,  $\geq 3$  SDRMs were detected, which may suggest they were not truly ART-naïve.

**Conclusion.** This study provides national estimates of HIVDR in a high burden country with broad access to ART and provides valuable insight on the state of HIVDR in such setting. Zimbabwe has reached moderate levels of HIVDR in ART-naïve patients, as specified by the WHO classification. These levels may impact the ability to achieve viral suppression in a significant number of patients initiating standard ART regimens in Zimbabwe, where NNRTI-based regimens are used as the first line. The use of drugs with high resistance barrier, such as dolutegravir, may improve the care of patients in the developing world, where individualized pretreatment genotype is not feasible.

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### 1374. Reviewing Clinical Outcomes of Patients with the E157Q Mutation in Detroit

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