

diverse factors that drive the epidemic. Therefore, it is critical that HIV prevention programmes and strategies match the local context and that resources are allocated to interventions with the greatest impact. Nigeria's National Agency for the Control of AIDS (NACA) is coordinating a large-scale initiative to conduct rapid epidemic appraisals across most states, including the mapping and size estimates of female sex workers (FSWs). Seven states have completed the appraisal of FSWs, and are now planning programmes accordingly.

**Methodology** Mapping was done using a two-level process of identifying and validating locations where FSWs solicit and/or meet clients. The first level involved conducting interviews with secondary key informants to collect information on the location and profile of hotspots, size estimates and typology of FSWs. The second level was done by interviewing primary key informants (FSWs themselves) at each hotspot to validate the information collected and generate more detailed information.

**Results** A total of 10,233 hotspots were identified across the states and 126,489 FSWs {Hotel/Lodge (29.6%) Bar/Nightclub (30%), Home based (4.1%), Brothel (14.6%) and Street based (16.6%)} were mapped. There was substantial variability in the population density of FSWs (per thousand adult men) across the states ranging from 17 in Abuja to 2 in Anambra. Furthermore, there were clear differences in the density of FSWs per spot with the mean number of FSWs/spot ranging from 17 in Abuja to 8 in Ondo.

**Conclusion** The FSW population in Nigeria is large and diverse, with substantial differences between and within states with respect to the population size, density and organisational typologies of sex work. This information is central to Nigeria's planning process for scaling up focused HIV prevention programmes and services.

### 013.2 CAN THE UNAIDS MODES OF TRANSMISSION MODEL BE IMPROVED? A COMPARISON OF THE ORIGINAL AND REVISED MODEL PROJECTIONS USING DATA FROM NIGERIA

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Mathematical modelling has increased our understanding of the HIV epidemic and played a key role in decision making. The UNAIDS Modes of Transmission (MoT) model has been used by 29 countries to analyse their HIV epidemics, with the results helping to guide and focus interventions. However, the simplistic compartmentalisation of the population within the model has raised concerns over its reliability.

We compared the MoT model projections for Cross River, Nigeria, with a revised MoT model that incorporates additional heterogeneity (including subgroups for sero-discordant partnerships and individuals engaging in transactional sex) and updated parameters. We categorised population subgroups into 'high-risk', representing core groups, their bridging partners and sero-discordant partnerships; 'medium-risk', who are regular partners of 'high-risk' individuals; and 'general population', who are not linked to 'high-risk' or 'medium-risk' groups. Sensitivity analyses were undertaken and model projections assessed which population categories generated the highest incidence of HIV.

The original MoT model projections suggest 73% of HIV infections occur in general population subgroups and 21% amongst 'high-risk' groups. Following revisions to the MoT, model projections estimate 76–94% (95%CrI) of new HIV infections are expected to occur in high-risk groups, who make up just 23% of the population, compared to 6–24% amongst general population subgroups. Changes in the distribution of infections result from the introduction

of sero-discordant partnerships and 'transactional sex' groups (a relatively large subset of the population, often ignored in modelling analysis) in the model, which are classified as 'high-risk'.

The UNAIDS MoT remains an accessible and potentially useful model that can help inform intervention priorities. However, our findings strongly suggest that the current model may produce misleading findings, especially in more concentrated HIV epidemic settings. Results from this study indicate the need for UNAIDS to conduct a formal review of the MoT, and for further revisions to be made.

### 013.3 ESTIMATING THE EPIDEMIOLOGICAL IMPACT OF ANTIRETROVIRAL TREATMENT ON HETEROSEXUAL HIV EPIDEMICS IN SOUTH INDIA: A MODELING STUDY

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**Background** In south India, where intensive condom-based targeted interventions (TIs) for female sex workers (FSWs) have been successful, the potential impact of past, current, and proposed universal antiretroviral treatment (ART) eligibility criteria on concentrated HIV epidemics, remains unknown.

**Methods** We developed a mathematical model of heterosexual HIV transmission to simulate the HIV epidemic in three south Indian districts, using district-specific epidemiological data. The model was calibrated to HIV prevalence by risk groups (low-risk, clients, FSWs), population size, and ART coverage. Assuming that condom-based TIs, HIV testing and treatment access, and retention in HIV-care are sustained at current levels, we compared the following scenarios against no ART: (a) continue with the previous eligibility criteria (CD4 ≤ 250 cells/μL) from the start of each district's ART programme; (b) expand from previous to current eligibility (CD4 ≤ 350 cells/μL) after November 2011; and (c) expand to early ART at any CD4 cell count after January 2013.

**Results** Without ART, the three districts achieve local elimination between the years 2040 and 2082, and by 2035–2063 under the current ART programme (eligibility criteria: CD4 ≤ 250 cells/μL prior to November 2011, CD4 ≤ 350 cells/μL thereafter). By January 2013, the current ART programme has potentially averted 7.8–11.0% of HIV infections, and saved 32–44 life-years per 100-person years on ART, in addition to gains achieved by local TIs. By 2023, the additional fraction of HIV infections averted by ART (compared to sustained TIs without ART) under scenarios A, B, and C are 21–42%, 33–57%, and 43–69%, respectively, and the incremental gains in life-years per 100-person years on ART are 120–140, 68–111, and 40–91, respectively.

**Conclusions** In declining HIV epidemics with sustained TIs, current ART programmes and proposed ART expansion could provide additional epidemiological impact. The medium-term incremental gains become smaller as eligibility expands but access and retention in care remain constant.

### 013.4 AN ETHNOGRAPHIC MAPPING STUDY OF "MONEY BOYS" AND THE MALE SEX TRADE INDUSTRY IN CHENGDU, SOUTH WEST CHINA

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