proportions of African, Aboriginal and Caribbean populations. The ecological approach used in this study suggests that certain phenomena exist at the population level that may not exist at the individual level, which can be used to target population-level prevention programs.

Epidemiology poster session 4: Methodological aspects: Neighbouring / mapping

P1-S4.13 MAPPING HIGH RISK ACTIVITIES OF HIV/AIDS IN GAOXIN AND YANTAN DISTRICT OF ZIGONG CITY

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Background Zigong is located in the south of Sichuan Province of China. As a key area with a large number of migrants, Zigong has long been confronting the danger of HIV/AIDS. The goal of "Zigong geographic mapping on HIV/AIDS high-risk population" research project is to provide information on the location, type and volume of the female sex workers (FSWs) in Gaoxin (urban) and Yantan District (rural) to provide baseline information for HIV/AIDS prevention policy and programs in future.
Methods This study adopted a "geographical approach" to map the location and spots of the activities of sex trade and estimated the number of FSWs involved in the activities. This included two sequential steps: 1) Systematic information gathering from key informants (KI) suggested the locations ("hot spots") where FSWs congregate. 2) The "hot spots" were validated through site visit and insiders; the information about the number and characteristics of FSWs in each spot were collected.
Results In Gaoxin District: 59 high-risk spots were confirmed and 16 clusters were marked in 10 zones. The most common type of sex trade spots was hair salon/massage room/foot massage room. 72.9% of the spots were both "seeking risk" and "taking risk", while 22.0% and 3.4% were only "seeking risk" and "taking risk" respectively. 39.0% of the spots had more than three clients per FSW per day. The estimated number of total FSWs in this urban area was 303. 38.5% of FSWs were in hotel/small lodge, while 29.3% and 27.3% were in small tea house/bar/KTV and hair salon/massage room/foot massage room respectively. The peak season, peak date and peak time of the most spots was summer, the whole week, afternoon and night. In Yantan District: 12 high-risk spots were confirmed and half were concentrated in Yantan Town. The most common type was small tea house/bar/KTV. Nine spots were both "seeking risk" and "taking risk", while three were "taking risk" only. Five spots had more than three clients per day for each FSW. The estimated number of FSWs was 42, and 74.4% worked in the small tea house/bar/KTV. The peak season, peak date and peak time of the most spots was spring and summer, the whole week, and night, respectively.
Conclusions The mapping approach provided direct and visible geographic distribution information, which enables a quick mastery of the distribution of high risk spots and the number of high risk population, for public health intervention planning and program implementation.

P1-S4.14 DOES CORE THEORY APPLY IN RURAL ENVIRONMENTS?

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Background The expansion of core theory to include geographically defined core areas of elevated infection has been based primarily on spatial investigations into sexually transmitted infections (STIs) in large urban areas. It is uncertain whether core theory is applicable for rural environments. Our objective was to evaluate the concept of geographical core areas for gonorrhoea and syphilis in North Carolina, a rural state with urban pockets.
Methods We analysed geomasked gonorrhoea and syphilis cases reported to the North Carolina State Health Department's sexually transmitted disease surveillance program from 1 January 2005 to 31 December 2007 for gonorrhoea and from 1 January 2000 to 31 December 2007 for syphilis. Incident gonorrhoea and syphilis rates were estimated using census tract level population estimates for the total North Carolina population from the US census. Rates were mapped by census tract and quarter. Rurality was measured at the census tract using two different definitions: percent rural and rural-urban commuting area (RUCA). RUCAs were used to classify North Carolina census tracts into rural, small town, micropolitan, or urban. SatScan was used to identify spatiotemporal clusters of significantly elevated rates of infection. Clusters were classified as outbreak or core based on duration. Clusters lasting the entire study period were considered potential core areas, while clusters of shorter duration were considered outbreak areas. Clusters were overlaid on maps of rurality and qualitatively assessed for correlation.
Results On average, gonorrhoea rates are low in the western mountains and higher in the eastern coastal part of the state. Most of the clusters were located in urban RUCAs or very low percent rural. Clusters for rural and small town RUCAs were of short duration and usually covered several census tracts and sometimes more than one county. Consequently, they were considered outbreak areas rather than core areas. Similar results were found for syphilis.
Conclusions We found that core areas of elevated STIs were limited to the urban centers in rural environments. Significant clusters of infection in rural environments appear to be due to outbreaks. Rural environments may have core areas but not enough infection to sustain ongoing transmission. Bridge contacts may be more important for STI transmission in rural environments.

Epidemiology poster session 4: Modelling

P1-S4.15 REVISITING HIV EPIDEMIC APPRAISALS FOR ASSISTING IN THE DESIGN OF EFFECTIVE HIV PREVENTION PROGRAMS

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Background There is substantial heterogeneity in the size and trajectory of HIV, driven largely by differences in the population sexual structure, which determines overall HIV transmission dynamics. Two standard methods have been developed to appraise epidemics and guide prevention strategies. The numerical proxy method classifies epidemics based on HIV prevalence thresholds. The Modes of Transmission (MOT) model estimates the distribution of incidence over 1 year among subgroups. Neither approach explicitly captures the drivers of the epidemic and can therefore lead to misguided prevention priorities. Using data from India, we explored the limitations of current methods and propose an alternative approach.
Methods We compared outputs of the traditional methods in five countries with published results, and applied the numeric and MOT model to India, and to six districts within India. We developed an alternative approach based on a qualitative understanding of local

epidemic drivers, the Transmission Dynamics Epidemic Classification (TDEC) scheme, and demonstrated its application. Where data permitted, we calculated the population attributable fraction of paid sex for HIV infection among males to assist in TDEC classification.

Results Country and district level analysis illustrated three main limitations of the numeric and MOT methods: (1) their results misinterpreted underlying transmission dynamics and were inconsistent; (2) they were difficult to apply to local epidemics with heterogeneity across districts ; and (3) the MOT model was highly sensitive to input parameters, many of which required extraction from non-regional sources. The TDEC method offered a logical algorithm to characterise local sexual structures that likely sustain onward HIV transmission; it required minimal but key input data.

Conclusion Traditional appraisals of HIV epidemics can misdirect prevention programming if the goal is long-term HIV control. By characterising local transmission dynamics, the TDEC approach provides a potentially more effective tool with which policy makers can design intervention programs.

P1-S4.16 THE UNAIDS MODES OF TRANSMISSION MODEL: A USEFUL TOOL FOR DECISION MAKING?

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Background The UNAIDS Modes of Transmission (UNAIDSMoT) model is increasingly being used to inform national-level HIV priority setting. Although the model is simple to use, important factors may be omitted. Using the UNAIDSMoT model, with Uganda and Cambodia as case studies, we explored the influence of the incorporation of additional factors.

Methods A detailed review of the UNAIDSMoT model was conducted, including reviewing the model structure, data requirements, parameters and assumptions. Country-specific literature reviews were undertaken, along with field visits involving key-informant interviews, to identify the main features of the HIV epidemic in each setting. Adaptations were made to the UNAIDSMoT model to explore the sensitivity of the model projections to these revisions.

Results A key limitation of the original UNAIDSMoT model is that it does not allow an individual's multiple sources of risk to be considered. The model was adapted to incorporate important multiple risk sources (including injecting drug use), and the effects of the 2008 change in Cambodian law on human trafficking which led to brothel closures, the migration of many sex workers into entertainment venues, and the discontinuation of numerous outreach and condom distribution programmes. As illustrated in Abstract P1-S4.16 figure 1, the revised model projects lower percentages of new HIV infections occurring among sex workers (2% vs 5%) and the regular female partners of men who buy sex (5% vs 48%) than the original model, primarily replaced with new infections occurring in the new groups: entertainment workers who sell sex (38%), and injecting drug users and their sexual partners (5%). In Uganda, the high prevalence of HIV infection among women means that the static model predicts men are more at risk of infection from their female partners than women are from their male partners. This fails to reflect the dynamic chain of HIV transmission.

Conclusions Our analysis highlights the limitations of the UNAIDSMoT model, and the potential dangers of over-interpretation of a relatively simplistic and static reflection of a dynamic HIV epidemic (and prevention priorities) at a particular time-point. It is important to regularly re-structure and re-parameterise models according to new data and changes in patterns of risk behaviours. Further research to test the validity, sensitivity and robustness of the UNAIDSMoT model projections in different epidemic settings is needed.

P1-S4.17 INTERACTIVE DEMONSTRATION OF A MODEL TO CALCULATE COSTS AND COST EFFECTIVENESS OF DIFFERENT STRATEGIES FOR CHLAMYDIA SCREENING AND PARTNER NOTIFICATION

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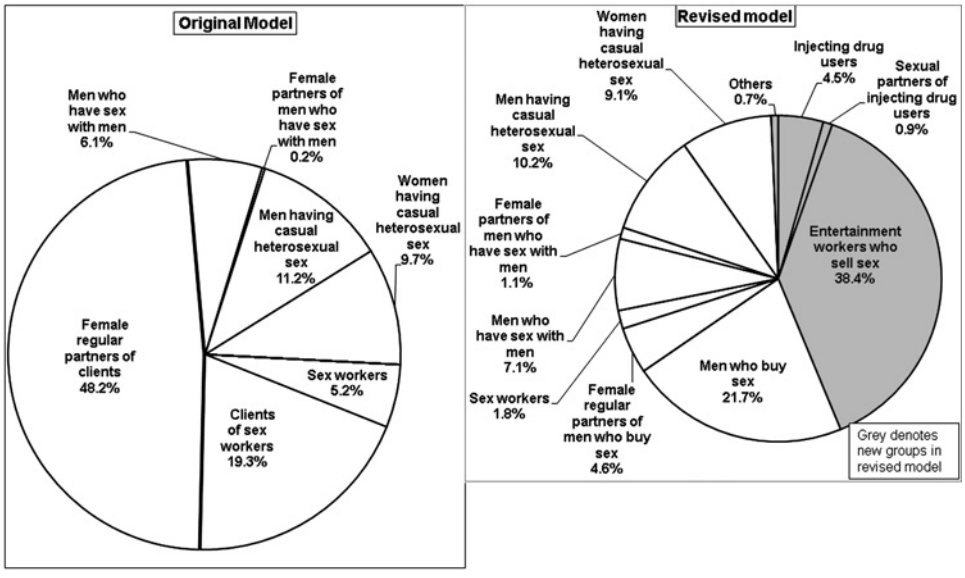
Background We have developed a model to calculate costs and cost effectiveness of different intervention strategies for chlamydia



Abstract P1-S4.16 Figure 1 Distribution of HIV incidence in original and revised UNAIDSMoT models.