among MSM. Oropharynx to oropharynx transmission through kissing is estimated to account for nearly three quarters of all incident cases (71.6% [64.4–80.5%]%]) of gonorrhoea in MSM. Substantially increasing annual oropharynx screening for gonorrhoea from the current 40% to 100% may only halve the prevalence of gonorrhoea in MSM. In contrast, the use of mouthwash with moderate efficacy (additional 1% clearance per daily use) would further reduce the corresponding prevalence rates to 3.1% (2.2%–4.4%), 3.8% (2.3%–4.9%) and 0.10% (0.06%–0.11%), and a high efficacy mouthwash (additional 1.5% clearance per daily use) may further halve the gonorrhoea prevalence. Without oropharynx to oropharynx transmission, we could not replicate current prevalence data.

Conclusion Our model suggests that kissing may play a key role in NG transmission among MSM. Focusing on STI screening alone is not sufficient to control the rising epidemic. Promotion of regular mouthwash may achieve near elimination of gonorrhoea in MSM.

O14.5 CONTINUOUS DECLINE OF HIV PREVALENCE AND INCIDENCE AMONG FEMALE SEX WORKERS IN BENIN OVER 22 YEARS OF TARGETED INTERVENTION, BUT RESURGENCE OF GONORRHOEA IN THE CONTEXT OF INADEQUATE TREATMENT POLICIES

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Background An HIV preventive intervention aimed at female sex workers (FSW) and involving structural interventions, condom promotion and care for sexually transmitted infections (STI) is ongoing in Benin since 1993 [antiretroviral treatment (ART) available since 2005]. No routine surveillance of *Neisseria gonorrhoeae* (NG) resistance is carried out in Benin and, despite evidence of emerging ciprofloxacin resistance in surrounding countries, this antibiotic remained the recommended treatment till 2015. We estimated time trends in HIV/STI prevalence among FSW from 1993 to 2015.

Methods 8 integrated biological and behavioural surveys were conducted among FSW using cluster sampling procedures. HIV antibodies were detected on serum or dried blood spots using standard assays. Cervical (1993–99) or self-administered vaginal swabs (2002–15) were tested for NG and *Chlamydia trachomatis* (CT) using nucleic acid amplification tests. Time trend analysis controlled for potential socio-demographic confounders using log-binomial regression. HIV incidence data were available from 4 FSW cohort studies (1997–2000, 2005–07, 2009–12 and 2014–16).

Results HIV prevalence declined from 53.3% in 1993 to 49.4% in 1996, 40.7% in 1999, 46.5% in 2002, 30.1% in 2005, 26.8% in 2008, 20.5% in 2012 and 15.8% in 2015 ($p<0.0001$). During the same period, condom use with all clients in the last month increased from 13.9% in 1993 to 77.1% ($p<0.0001$) in 2015 (93% at last sex with a client in 2015). HIV incidence declined steadily, from 9.6 per 100 person-years in the 1997–2000 period to 5.9 in the 2005–07 period, 1.4 in the 2009–12 period and 0.9 per 100 person-years in the 2014–16 period. Following a sharp decline during the 1993–2005 period, from 43.2% in 1993 to 30.7% in 1996, 23.7% in 1999, 20.4% in 2002 and 3.4% in 2005 ($p<0.0001$), NG increased progressively to 6.2% in 2008, 6.8% in 2012 and 8.4% in 2015 ($p<0.0001$). CT also declined from 9.4% to 5.4% (1993–2005), but then stabilised at 4%–6%.

Conclusion Our results suggest a significant impact of this intervention aimed at FSW in Benin, where HIV prevalence in the general population is stable at 1.1% since 2006, despite increased survival due to ART scale-up (current ART coverage >50%). However, NG has steadily increased in the last decade likely due to inadequate treatment policies. Setting up NG resistance surveillance is of paramount importance in African countries, most of them not currently having such programs on a regular basis.

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O14.6 SEXUAL TRANSMISSION OF FLAVIVIRUSES – A LIVING SYSTEMATIC REVIEW

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Introduction Flaviviruses, such as Zika virus (ZIKV), are primarily transmitted by infected arthropods. Evidence indicates that some of these viruses can be transmitted between persons through sexual intercourse. Sexual transmission of ZIKV is of special interest because of the risk of congenital abnormalities such as microcephaly. Several health agencies have produced guidelines on the prevention of sexual transmission of ZIKV, but there are many uncertainties. A systematic approach to assessment of the risk and epidemic potential of sexual transmission of flaviviruses is therefore crucial.

Methods We conducted a systematic review with questions derived from a conceptual framework of the key parameters that drive infection transmission. We searched multiple databases and websites for studies of any design and in any language. Because of the rapid increase in publications, we have developed the review as a living systematic review, allowing continual updating of the findings.

Results By January 10th 2017, we identified 28 unique reported cases of likely sexual transmission of ZIKV in 9 countries; 20 male to female, three female to male, one male to male, four unknown. In the US, 1% (36/4,310) of reported travel-associated ZIKV cases likely resulted from sexual contact. ZIKV has been detected by PCR for up to 188 days in semen and 14 days in vaginal secretions. Two of three included modelling studies quantified the contribution of the sexual transmission route, two studies estimated the

proportion of ZIKV cases due to sexual transmission: 0.03 (95% CI: 0.001–0.46) and 0.23 (0.01–0.47). One publication about possible sexual transmission of West Nile virus has been identified so far.

Conclusion Sexual transmission of ZIKV can occur but is likely not sufficient to sustain an epidemic. In high risk groups with frequent sexual partner change, it might contribute more to secondary transmission. We are tracking this fast-moving research field in a living systematic review to fill gaps in the evidence about the risks and prevention of sexual transmission of flaviviruses.

Oral Presentation Session 15

STI/HIV Testing and Management

O15.1 EXAMINING THE ROLE OF LOCATION IN STI PREVENTION AMONG MEN WHO HAVE SEX WITH MEN USING MOBILE APPLICATIONS

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Introduction Due to the disproportionate impact of HIV on men who have sex with men (MSM), public health messaging encourages routine STI and HIV screening among this population. While STI testing services are often situated within high prevalence areas, providing accurate population estimates of MSM, and their subsequent movements, remains limited. This study sought to explore the relationship between STI clinic locations and operating hours and real time locations of MSM using mobile applications.

Methods Using global positioning system (GPS) coordinates, location data were collected over a 7 day period from MSM in a mid sized US city who used a mobile phone application for the purpose of engaging in social and sexual interactions with other men. Data points were collected hourly for all men online, including their GPS position and self reported profile demographics (i.e. race/ethnicity and age). Aggregated data points were plotted onto a map of the city along with the position of Health Department STI testing locations.

Results Data were collected from a total 5083 individual men. Young men accounted for nearly half of all participants, with 45.4% indicating they were between the ages of 18–24% and 54.6% being 25 years of age or older. Ethnicities included Latino (49.1%), white (30.4%), African American (6.4%), and Other (14.1%). During a 24 hour period 85.3% of all online activity occurred between 7pm and 7am, with 8pm being the hour of the day in which the most people were online (22.9%). The median distance between an individual and a STI clinic was 3.8 miles. Latino and African American men and those under the age of 25 were significantly more likely to be farther away from STI testing services than men who were White or older ($p<0.05$)

Conclusion Findings highlight location differences among MSM based on age and race, and suggest the need to further explore how these differences influence MSM sexual health. Additional examination of the integration of real time GPS data into STI prevention programing is warranted.

O15.2 FINDINGS FROM THE NATIONAL ONLINE HIV SELF-SAMPLING SERVICE IN ENGLAND: A NATION-WIDE JOINED APPROACH TO INCREASE HIV TESTING ACCESS AMONG MOST AT-RISK POPULATIONS

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Introduction Higher effectiveness in HIV testing programmes is needed in order to achieve the WHO target of diagnosing 90% of people living with HIV. Based on the success of two national pilots, Public Health England (PHE), with support of Local Authorities, launched a nation-wide HIV self-sampling service for most at-risk populations for HIV acquisition in November 2015. The service delivers reactive results through a community organisation that provides emotional support while linking individuals into the clinical pathway for confirmatory testing and care. Self-sampling is distinct from self-testing in which the individual performs the test themselves and receives the results there and then. The aim of this analysis was to determine who is accessing the service and whether it reached most at-risk groups (including MSM and Black African communities) and first-time testers.

Methods Disaggregated anonymised data was collected from all service users requesting a HIV self-sampling kit from the national service (www.freetesting.hiv). Data included ethnicity, gender, sexual orientation, local authority residency, and HIV testing information from 28 657 service users between 11 November 2015 and 31 December 2016.

Results During this time period there were 55 726 kits ordered of which 52.5% (n=29,233) were returned. 28 657 kits were tested with a 1.1% reactive rate (n=311); 67% (n=19079) of users returning their kits, reported never testing or testing over a year ago. 74% of kits tested were from MSM (n=21,309) with 1.4% reactive rate (n=291) of kits tested by heterosexuals (n=6,689), 50% (n=3316) were from ethnic minority communities showing a reactivity rate of 1.3% (n=43).

Conclusions The service has been successful at engaging most at-risk populations for HIV acquisition. Service users in their majority were different from those attending clinical settings as reported in the high numbers of first time testers and those not testing regularly. A joined commissioning model allowed for a cost-efficient service that increases access to testing for those in higher need.

O15.3 COST-EFFECTIVENESS OF ANTIMICROBIAL RESISTANCE POINT-OF-CARE TESTING FOR OPTIMISING THE TREATMENT OF GONORRHOEA

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Introduction Antimicrobial resistance (AMR) threatens successful *Neisseria gonorrhoeae* (NG) treatment and WHO recommends specific NG treatments be used only if ≤5% circulating strains are resistant to them. Ceftriaxone plus azithromycin dual therapy, currently recommended, has few practical alternatives should ceftriaxone resistance become widespread, and azithromycin use is undermined also by AMR emergence.