

higher HIV prevalence such as Benin, Burkina Faso, Columbia or Kisumu will be considered. We will also contrast the impact of ART programme targeted to FSW on HIV transmission in the general population and assess the influence of key parameters of the treatment cascade on the impact of ART among FSWs.

## S.05 - Fostering an Integrated Approach to the Control of Antimicrobial Resistance in *Neisseria gonorrhoeae* (WHO Symposium)

### S05.1 ANTIMICROBIAL RESISTANCE IN *N. GONORRHOEA*: UPDATE OF THE SITUATION

doi:10.1136/sextrans-2013-051184.0031

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**Background** The rapidly changing antimicrobial susceptibility of *N. gonorrhoeae* since the introduction of antibiotics has created challenges in gonorrhoea control. Antimicrobial resistance has regularly appeared and expanded with every release of new classes of antibiotics for gonorrhoea.

**Methods** The Gonococcal Antimicrobial Surveillance Programme (GASP) has been documenting the emergence and spread of antimicrobial resistance in gonorrhoea since 1992 and has informed treatment guidelines.

**Results** Sixty two countries participated in GASP in varying degrees including the extend of specific antimicrobials tested for resistance in 2010. There are high rates of resistance in *N. gonorrhoeae* to penicillin and quinolones. There are 36 countries reporting increasing minimum inhibitory concentration (MIC) to Cefixime ( $\geq 0.25 \mu\text{g}/\text{mL}$ ) or Ceftriaxone ( $\geq 0.125 \mu\text{g}/\text{mL}$ ). Treatment failures to Ceftriaxone were reported in Japan, Austria, Australia, Canada, France, Norway, Slovenia, Sweden, UK and South Africa. Majority of reports is from developed countries. This is only the tip of the global health burden as surveillance data from resource-constrained settings are scarce.

Spectinomycin and azithromycin resistance are monitored in limited countries. Brunei, China, Mongolia and Russia reported decreased susceptibility to spectinomycin. Resistance to azithromycin has been identified in some European countries, US and Chile. Azithromycin resistance remains well below the 5% threshold in most countries.

**Conclusions** Treatment options for gonorrhoeae is dwindling. In the short term, options for treatment will include increasing dosage, using intramuscular or intravenous route and multiple doses of Ceftriaxone; use of alternative medication (e.g. gentamycin), and combination therapies. In the long term there is a need to develop newer classes of antibiotic. There is a need to ensure rational drug use and strengthen antimicrobial resistance monitoring in gonorrhoea including detection and management of treatment failure.

### S05.2 CHALLENGES AND OPPORTUNITIES: POTENTIALS IN RESEARCH ON AMR GONOCOCCI

doi:10.1136/sextrans-2013-051184.0032

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Although gonorrhoea has afflicted humans for centuries and the causative bacterium, *Neisseria gonorrhoeae*, was identified over a century ago, gonorrhoea remains a global public health problem. Stepwise acquisition of genetic mutations has conferred gradually increasing resistance to multiple antibiotics, thus limiting their usage for presumptive therapy. Until recently cephalosporins have remained the foundation of treatment, but growing evidence suggests that resistance is emerging. Even as researchers work to

understanding the genetic mutations required for cephalosporin resistance, it is clear that new treatment options are needed. This presents a challenge as the number of new systemic antimicrobials evaluated and approved each year by regulatory agencies has steadily fallen over the past 30 years. Currently one new antimicrobial is undergoing clinical study as a potential treatment of gonorrhoea. An alternative strategy is to repurpose older antibiotics by studying the efficacy of dual therapy combinations of existing antimicrobials. Ultimately new antimicrobial development is needed now, since the development process can take more than a decade.

Detecting and responding to emergence of multidrug resistant gonorrhoea remains a challenge. Rapid detection of resistant infections is facilitated by local antimicrobial susceptibility testing, which requires live organisms isolated by culture. However, as the use of nucleic acid amplification tests (NAATs) have expanded, the number of *N. gonorrhoeae* cultures performed by public health laboratories decreased rapidly and the capacity of laboratories to perform culture has declined. An alternative strategy is to develop molecular assays for detecting genetic mutations associated with resistance or susceptibility to specific antimicrobials to guide antibiotic selection by the clinician at the point of care. Even with this potential, molecular assays may not be able to supplant culture-based antimicrobial susceptibility testing for surveillance to detect novel resistance phenotypes and genotypes. Ultimately a gonococcal vaccine may be the most effective public health strategy.

### S05.4 INTEGRATING ANTIMICROBIAL SUSCEPTIBILITY MONITORING IN *NEISSERIA GONORRHOEA* TO BROADER AMR AGENDA

doi:10.1136/sextrans-2013-051184.0033

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**Background** Based upon the strategies of the WHO "Global action plan to control the spread and impact of antimicrobial resistance in *Neisseria gonorrhoeae*", a plan was developed and implemented to align GASP related activities within the broader agenda of the Antimicrobial Resistance Latin-America Network. Spite of the achievements of GASP in the last decades, there was a need to increase the number of countries and institutions collaborating in *N. gonorrhoeae* susceptibility surveillance. In order to achieve this, a comprehensive plan to strengthen the capacity of the Latin-America National Reference Laboratories (NRL) to conduct AMR surveillance in a systematic and regular manner to ensure the early detection of resistant *N. gonorrhoeae* was implemented.

**Methods** After a number of communications and training activities with the NRL, *N. gonorrhoeae* susceptibility 2010 data were collected through a questionnaire sent to the National Reference Laboratories in Latin America. Data included country, number of isolated tested, and percentage of resistance to cefixime, ceftriaxone, ciprofloxacin, spectinomycin, penicillin, and tetracycline.

**Results** From 21 Latin American countries integrating the network, 8 (38%) provide data. None of them detected decreased susceptibility to ceftriaxone; resistance to ciprofloxacin ranked from 0% to 83%; penicillin from 6 to 78%; no resistance to spectinomycin; resistance to tetracycline from 27 to 83%.

#### Conclusions

- The NRL demonstrated certain capacity and commitment to collect, analyse, and report data on *N. gonorrhoeae* susceptibility; however, this should be strengthened and expanded to more countries in the Region.
- Broad differences among countries were observed, specially on the susceptibility to ciprofloxacin and penicillin.