

# MOLECULAR EPIDEMIOLOGY OF GONORRHOEA IN WESTERN AUSTRALIA

Giele C<sup>1</sup>, Pearson J<sup>2</sup>, Mak DB<sup>1</sup>, Kahler C<sup>3</sup>, Whiley D<sup>4</sup>

<sup>1</sup> Communicable Disease Control Directorate, Department of Health, WA. <sup>2</sup> PathWest Laboratory Medicine, Fiona Stanley Hospital, WA. <sup>3</sup> University of Queensland, Queensland. <sup>4</sup> University of Western Australia, WA.

**Background:** In Western Australia, gonorrhoea has historically affected Aboriginal people in remote regions and men who have sex with men (MSM) in the metropolitan area. Recently notifications among heterosexual people in the metropolitan area have increased. Using molecular typing, we explore the characteristics of strains and transmission between sexual networks.

**Methods:** Molecular characterisation of the gonococcal isolates from 2017 was performed by the iPLEX method and assigned a 'WA type'. These were analysed with antimicrobial susceptibility, demographic and behavioural notification data.

**Results:** Molecular types were available for 710/3,332 (21%) notifications in 2017. The majority were from the metropolitan area (80%), male (69%) and non-Aboriginal (81%). A total of 76 WA types were identified; 10 types accounted for 519 cases (73%). Type WA 10 was the most prevalent (157 cases, 22%).

Of the 10 most common types, eight (WA 3, 6, 10, 14, 24, 32, 51 and 52) comprised predominantly non-Aboriginal people (83-99%) in the metropolitan area (81-96%); five types (WA 3, 6, 10, 51, 52) were mostly heterosexual people (85-100%), two types had higher proportions of MSM (53 and 23%) and one type was 82% MSM. The remaining two common types predominated in Aboriginal people (76%-93%), accounting for 55% of those cases; all were heterosexual with >65% from remote areas. One type which contributed to 15 cases comprised only Aboriginal people from remote regions. Overall, there was less genetic diversity among metropolitan heterosexual vs MSM cases, with four types comprising 90% and 60% of infections, respectively.

**Conclusion:** Molecular typing of gonococcal isolates revealed a wide variety of strains associated with sexual orientation, Aboriginal status and regions suggesting distinct sexual transmission networks. Further investigations with longitudinal studies and whole genome sequencing will enhance the ability to target interventions.