# Epidemiological analysis of *Neisseria gonorrhoeae* antimicrobial susceptibility testing (AST) surveillance data in Australia, 2020-2021.

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**Background:**
In 2020 the Communicable Diseases Network Australia (CDNA) endorsed the collection of enhanced gonococcal antimicrobial susceptibility testing (AST) data in the National Notifiable Diseases Surveillance System (NNDSS). National AST data collection along with core data provides the opportunity to contextualise gonorrhoea notifications and emerging antimicrobial resistance in Australia. This is the first review of NNDSS AST data since their collection commenced.

**Methods:**
Following assessment of the completeness and representativeness of the data, a descriptive analysis was undertaken of the epidemiology of *Neisseria gonorrhoeae* antimicrobial resistance (AMR) in Australia as recorded on the NNDSS from January 2020 to December 2021. Associations between AMR and exposures were sought.

**Results:**
10,466/56,680 (18.5%) of *N.gonorrhoea*e notifications to the NNDSS included AST data. The highest rates of resistance were for ciprofloxacin (47.4%), benzylpenicillin (33.4%) and tetracycline (23.2%). 4.5% of notifications were resistant to azithromycin. There was one confirmed case of resistance to ceftriaxone or cefotaxime and 55/10,421 (0.5%) of cases had intermediate susceptibility. On univariate analysis, resistance to any first-line antibiotic was most strongly associated with being male (OR 1.6, 95%CI 1.4 – 1.8, $P < 0.001$) , in the 30-34 year age group ( OR 3.1, 95%CI 1.4 – 8.3, $P = 0.01$), sexual exposure to person(s) of both sexes (OR 1.6, 95%CI 1.1 – 2.4, P = 0.02), and a general practice presentation (OR 4.6 95%CI 3.0 – 7.1, P <0.001).

**Conclusion:**
AMR in *N.gonorrhoeae* is of increasing concern as evidenced by high rates of resistance in commonly used antimicrobials and the identification of gonococcal isolates resistant to the last option for first-line empirical monotherapy. Enhanced gonorrhoea AST surveillance enables detailed contextual analyses of gonorrhoea AMR and an improved understanding of priority population resistance patterns. Efforts should be made to improve the completeness and representativeness of data collected to ensure these objectives are achieved.

**Disclosure of Interest Statement:**
Nothing to disclose