

Timely surveillance of *Neisseria gonorrhoeae* antimicrobial resistance utilising electronic laboratory reporting in the NSW notifiable diseases database

Fitzgerald T¹, Sisnowski J¹, Selvey C¹, Rose N², Sheppard V¹

¹ Health Protection NSW; ² NSW Ministry of Health

Background

- Antimicrobial resistant *Neisseria gonorrhoeae* (Ng) infection is a serious public health concern.
- The Australian Gonococcal Surveillance Program (AGSP) has been monitoring and reporting on Ng antimicrobial resistance in Australia since 1981.
- However, the AGSP data are not linked to gonorrhoea surveillance data which are collected by all Australian states/territories. Combining epidemiological and antimicrobial resistance data enhances the public health utility these datasets.

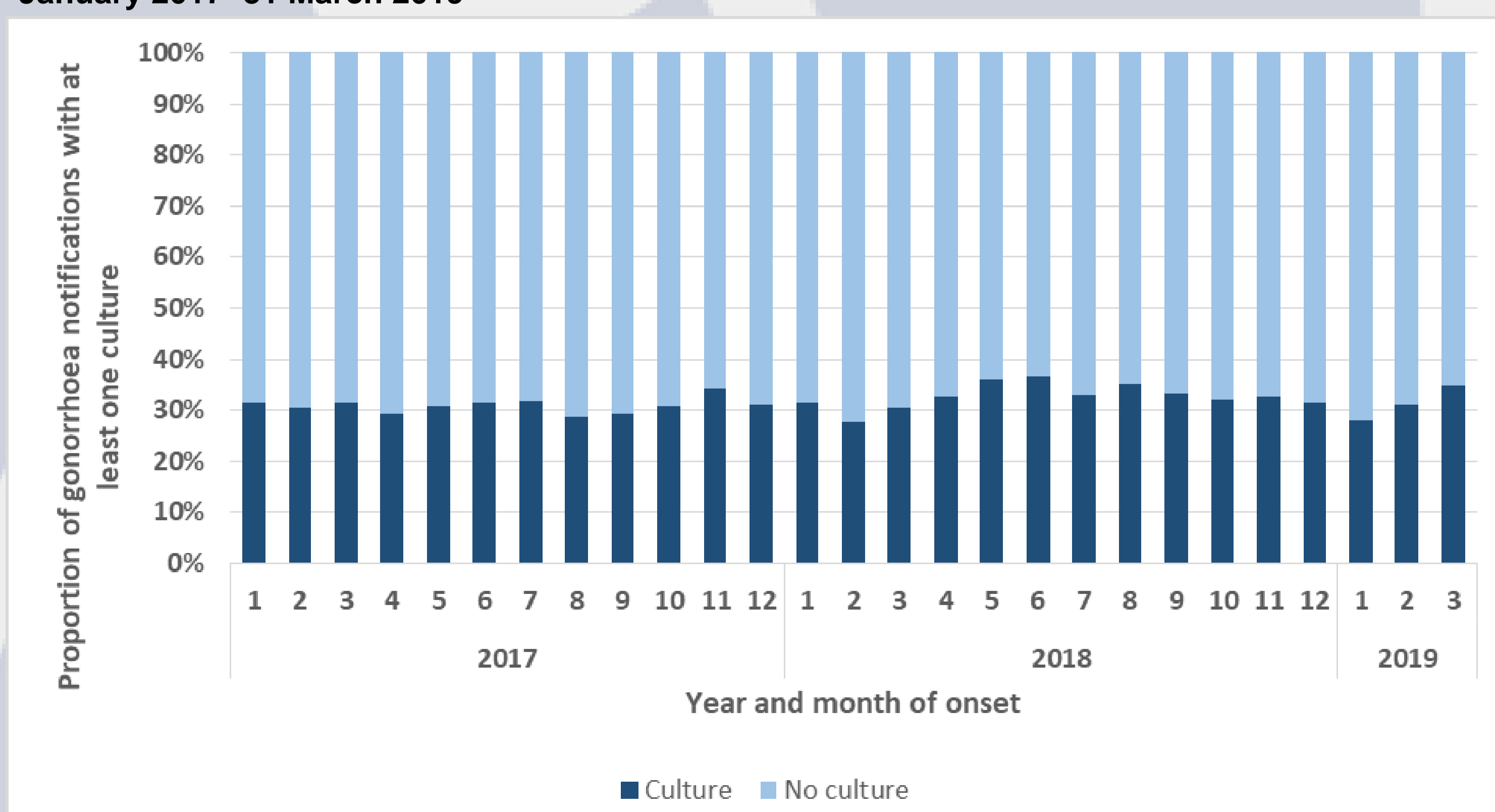
Methods

- The NSW *Neisseria* reference laboratory undertakes susceptibility testing for all Ng cultures in NSW.
- A process was established to enable susceptibility results sent via electronic laboratory reporting (ELR) to be uploaded into the NSW notifiable conditions information management system (NCIMS).
- After an initial retrospective upload of susceptibility results with a specimen collection date on or after 1 January 2017, all susceptibility results received from the laboratory have been uploaded to NCIMS on a weekly basis since 1 April 2019.
- A descriptive analysis was undertaken of all gonorrhoea notifications with a specimen collection date between 1 January 2017 and 31 March 2019 to determine the prevalence of culture and patterns in the availability and results of susceptibility testing

Results

- A total of 22,275 gonorrhoea notifications were received by NSW Health. Of these, 7,087 (32%) had at least one positive culture result (Figure 1).
- A total of 1,009/3931 (26%) of females and 6,042/18,254 (33%) of males notified to NSW Health with gonorrhoea had a culture collected (Figure 2).
- The proportion of people aged 15-29 years, 30-49 years and 50+ years notified to NSW Health with gonorrhoea who had at least one culture collected was the same (32%) across all groups (Figure 3).
- Ng susceptibility results were available for 6,738/7,087 (95%) notifications with culture-positive results. Of the 6,738 notifications with susceptibility results, ceftriaxone, azithromycin and ciprofloxacin results were available for 6,737 (99.9%), 6,713 (99.6%) and 6,736 (99.9%) notifications respectively.
- Decreased susceptibility to ceftriaxone was reported in 3/6,738 (0.04%) notifications. Azithromycin resistance was reported in 536/6,738 (7.9%) and 3/6,738 (0.04%) notifications respectively. Ciprofloxacin resistance was reported in 2,009/6,738 (30%) notifications.

Figure 1: Proportion of gonorrhoea notifications with at least one culture by month, NSW, 1 January 2017- 31 March 2019



Results (continued)

Figure 2: Proportion of gonorrhoea notifications with at least one culture by sex and month, NSW, 1 January 2017- 31 March 2019

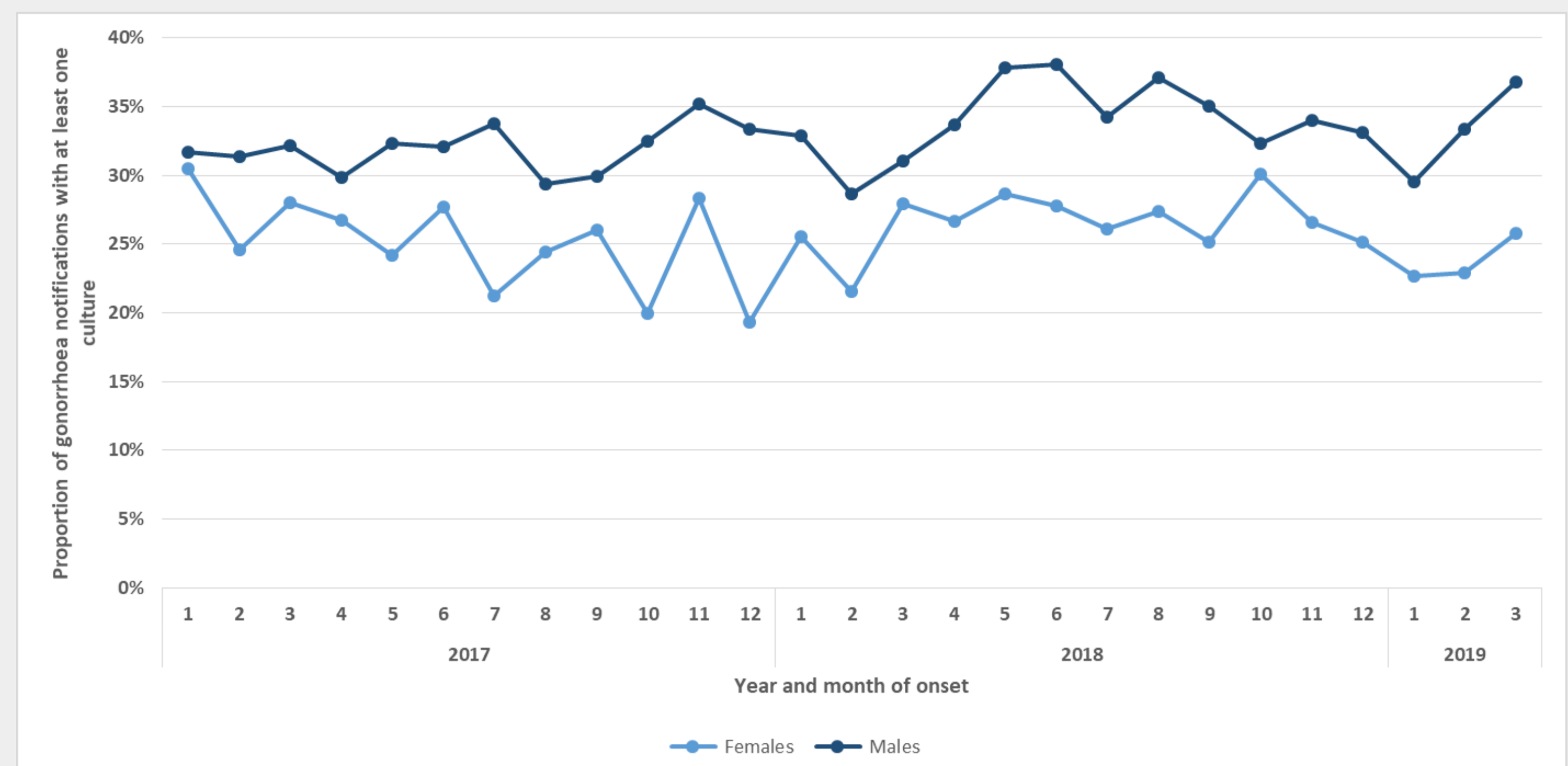
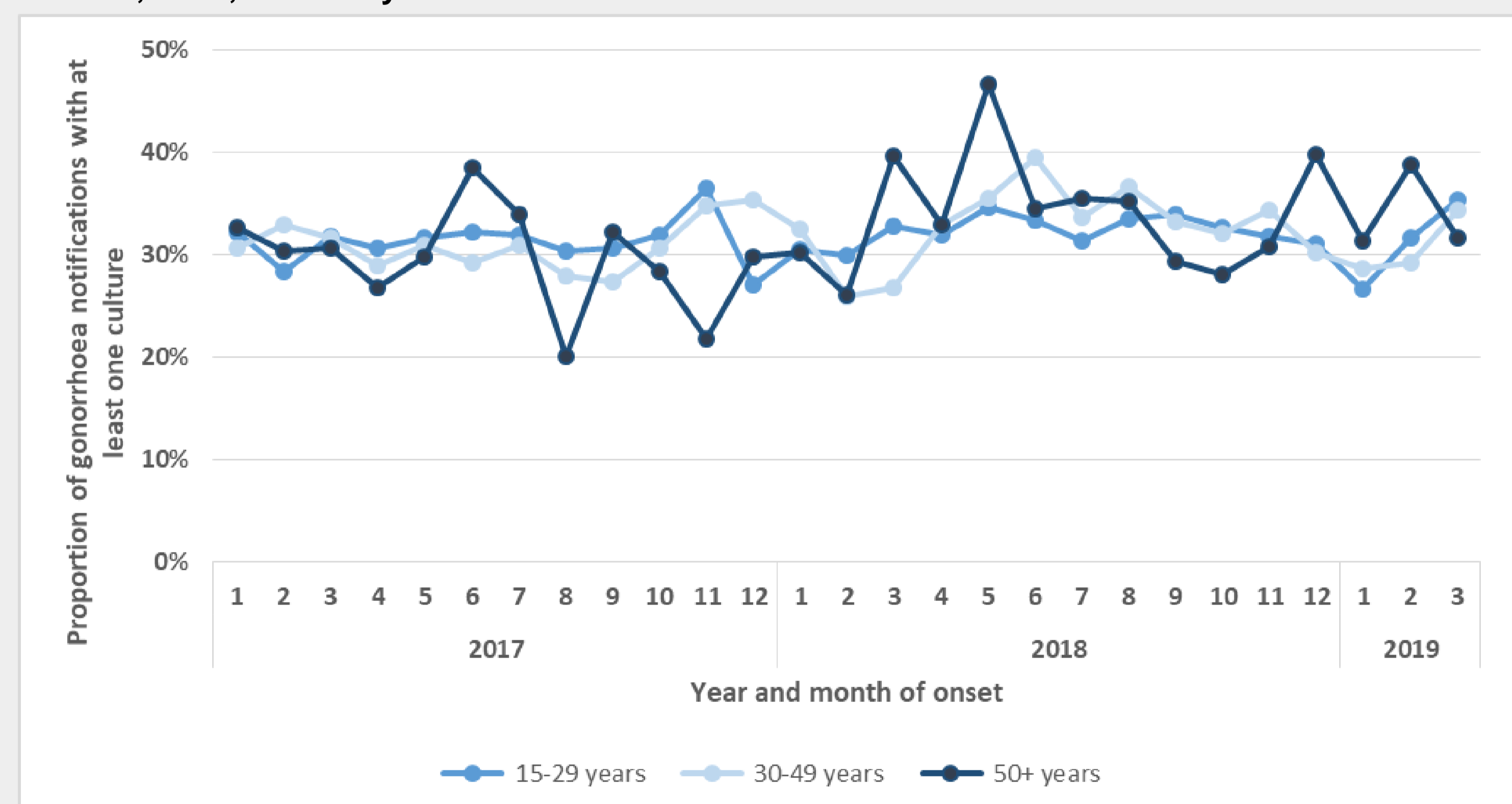


Figure 3: Proportion of gonorrhoea notifications with at least one culture by age group and month, NSW, 1 January 2017- 31 March 2019



Discussion

- The proportion of gonorrhoea notifications with at least one culture across all age groups was similar, suggesting that culture collection is representative of the age groups being notified
- At least 2 of the 3 NSW cases with decreased susceptibility to ceftriaxone were acquired overseas. This is consistent with ceftriaxone resistant strains that have been detected elsewhere in Australia. Although gonococcal infections with decreased susceptibility are currently notified infrequently in NSW, these types of infections may be notified more frequently as overseas travel among Australian residents increases.

Conclusion

- NCIMS is a useful repository for compiling gonorrhoea antibiotic susceptibility data with epidemiological data.
- The combination of antibiotic susceptibility data with epidemiological data in the one database enables identification and follow-up of people with gonorrhoea caused by resistant strains to ensure appropriate treatment has been administered, and partner notification and test-of-cure done.
- Access to epidemiological data along with susceptibility data also facilitates identification of risk factors associated with resistant Ng infection.