

Incidence of antimicrobial resistant *Escherichia coli* urinary tract infections in the Australian Capital Territory

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Background

- ❖ Urinary tract infections (UTIs) are one of the most common infections acquired worldwide.
- ❖ *Escherichia coli* (*E. coli*), the pathogen most frequently implicated in UTIs, is becoming increasingly resistant to current antimicrobials.
- ❖ While the prevalence of resistance in urinary *E. coli* is increasing in Australia,¹ the resistance incidence is not well described.
- ❖ Prevalence data provides information on disease burden while incidence quantifies the risk of disease.²
- ❖ Investigating both prevalence and incidence is important to gain a better understanding of the epidemiology of urinary *E. coli* resistance in order to make meaningful disease management decisions.²

Aim

This study evaluated:

- ❑ Incidence of single-drug resistant, multidrug-resistant (MDR), extensively drug-resistant (XDR) and pandrug-resistant (PDR) *E. coli* UTI in a cohort of Australian Capital Territory (ACT) residents.
- ❑ Associations of age, gender and urine sample source with risk of resistant infections.

Methods

- ACT Pathology is the sole public pathology service for the ACT and provides specialist pathology services to public and private patients in the region.



Methods

- Laboratory-based retrospective data were obtained for all ACT residents who submitted urine samples to ACT Pathology between January 2009 and December 2013.
- Urine cultures with presence of $\geq 10^7$ cfu/L were considered positive for UTI.
- MDR, XDR and PDR were defined based on published international standardised definitions.³
- Multivariate logistic regression models were constructed to determine the effect of age, sex and urine sample origin (the health service requesting the urine sample test) on risk of resistance.



Results

- ❖ A total of 146,915 urine samples from 57,837 ACT residents were identified over 5 years.
- ❖ The mean age of residents was 48 years (standard deviation 26 years) with 64.4% female.
- ❖ The incidence of single-drug resistant *E. coli* UTI was high for ampicillin, trimethoprim and cefazolin (6.8%, 3.5% and 1.9% respectively).
- ❖ No PDR *E. coli* UTI was detected.
- ❖ Five-year incidences of MDR and XDR *E. coli* UTI were 1.9% and 0.2% respectively.
- ❖ Female sex and age over 38 years were significantly associated with single-drug resistance and MDR.

Results

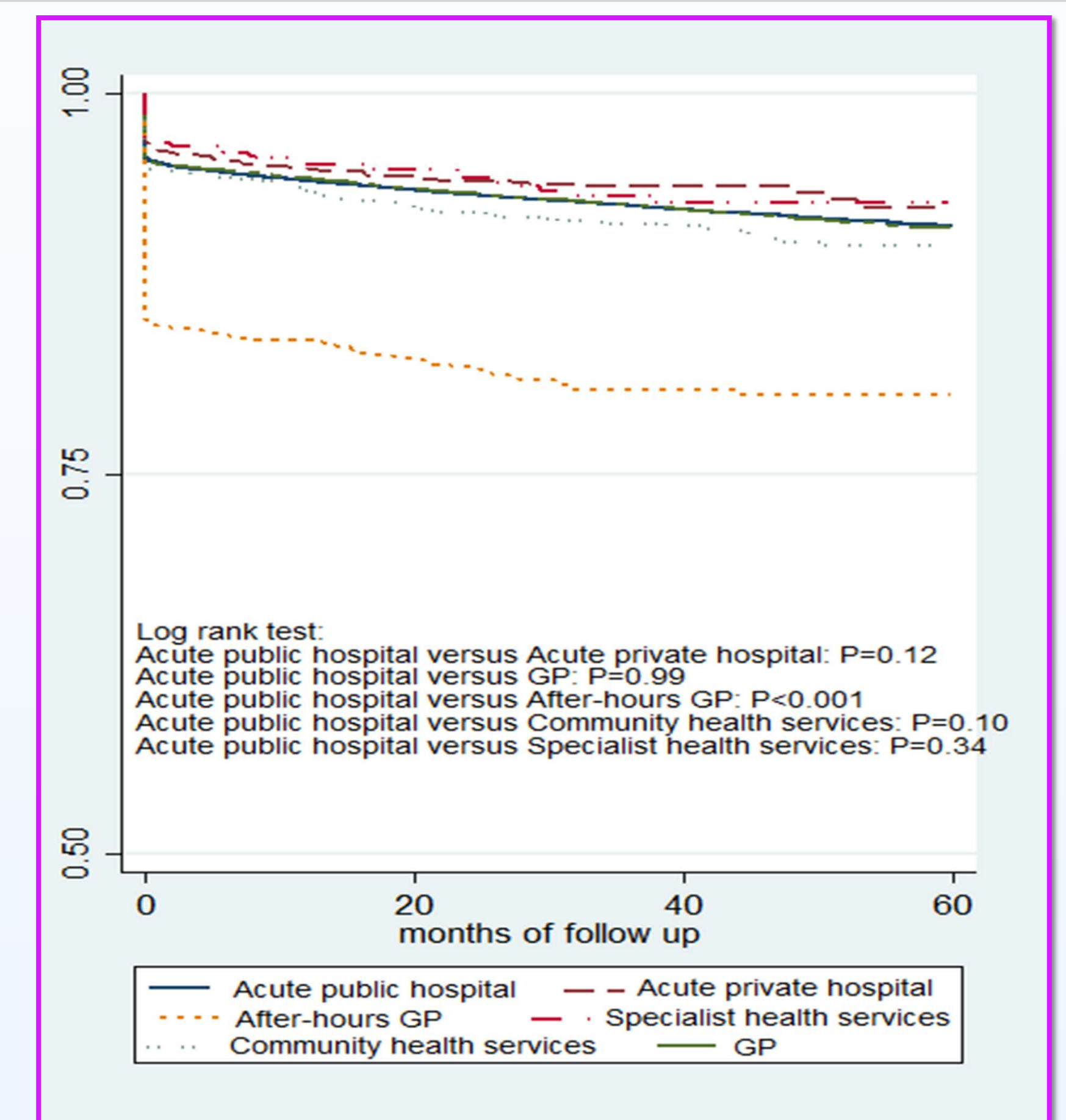


Figure 1 Kaplan-Meier curves of incidence of single-drug antimicrobial resistance by urine sample origin

- ❖ The risk of single-drug resistance was significantly higher in samples from after-hours general practices compared to hospitals, office-hours general practices (GP), community and specialist health services, (adjusted-odds ratio (OR) and 95% confidence intervals (CI) 2.6 (2.2–3.1)) (Figure 1).

Discussion and conclusion

- ❖ Detection of single drug-resistant, MDR and XDR *E. coli* UTI emphasises the need for continued monitoring of resistance to ensure suitable empirical therapeutic agents remain available.
- ❖ Higher risk of resistance in patients attending after-hours GP clinics necessitates further research to investigate antimicrobial prescribing practices within these health services.

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References

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