Information GPs can trust: What is the validity of the GP National Antimicrobial Prescribing Survey (GP NAPS) compared to an in-practice audit of antimicrobial prescribing?

Student researcher: Jimmy Wang
Supervisors: A/Prof Jo-Anne Nanski-Mankervis, Dr Christine Hallinan
Department of General Practice, University of Melbourne

THE UNIVERSITY OF MELBOURNE

BACKGROUND

Australia is a prolific user of community-prescribed antimicrobials compared against other developed nations. Many of these antimicrobials are prescribed inappropriately and/or against clinical guidelines[1]. Such antimicrobial overuse is a major contributing factor towards antimicrobial resistance.

The General Practice National Antimicrobial Prescribing Survey (GP NAPS) was developed to improve access to antimicrobial auditing in general practice and facilitate quality improvement. GP NAPS uses a data extraction tool to passively collect limited clinical and prescription data from the electronic medical record when an antimicrobial is prescribed. This data is used to assess prescribing quality, which is fed back to the clinic in a feedback report.

This validation study measures the accuracy of a GP NAPS passive audit against a manual audit reference standard to ensure that the feedback given to GPs based on GP NAPS is reliable and accurate.

AIMS & OBJECTIVES

To validate GP NAPS audit results conducted using data passively extracted from general practice records against a manual in-practice audit.

METHODS

A data extraction tool was installed in three general practices in Melbourne. Over a two-week period (14/11/19 – 27/11/19), data including patient demographics, prescription details, and indications for antimicrobial scripts were passively extracted from the electronic medical record. An antimicrobial stewardship pharmacist then analysed the data to make prescribing quality assessments.

A manual audit was conducted on these same prescriptions through in-practice data collection with access to the full clinical record, including clinical notes and investigations. This information was used to make prescribing quality assessments.

Prescribing quality was defined by two measures: “Appropriateness” and “Guideline Compliance”. Scores in these two categories were determined for each prescription by expert team consensus including a pharmacist and general practitioner and were judged on pre-defined criteria. The manual auditor was blinded to the audit results of GP NAPS while making assessments.

Descriptive statistics were used to describe the study population. “Appropriateness” and “Guideline Compliance” determinations were coded into binary outcomes (i.e. Appropriate / Not Appropriate and Compliant / Not Compliant) for both audits. Sensitivity, specificity, positive / negative predictive values, and kappa were calculated to explore the validity of the GP NAPS audit. Analysis was done using Stata/IC version 16.1.

RESULTS & DISCUSSION

A total of 231 antimicrobial prescriptions were captured within a two-week period across three Melbourne general practice clinics.

	Clinic 1	Clinic 2	Clinic 3	Total
Scripts captured	15	93	123	231
Mean age (SD)	32.9 (21.7)	40.5 (14.1)	40.9 (17.0)	40.2 (16.3)
Gender (% male)	33.3	50.5	48.0	48.1

GP NAPS had good accuracy in determining the “Appropriateness” of antimicrobial prescriptions. Total sensitivity, specificity, and positive predictive value (PPV) were good at 85.3%, 85.0%, and 93.7% respectively. Negative predictive value (NPV) was slightly lower at 68.9%. A kappa value of 0.66 indicates ‘good’ agreement between the two audits[2].

GP NAPS also had reasonable accuracy for determining “Guideline Compliance”. Total sensitivity, specificity, PPV, and NPV were 78.8%, 82.7%, 76.8%, and 84.3% respectively which were slightly lower than for “Appropriateness”. A kappa of 0.62 is still categorised as ‘good’ agreement, but exists on the lower boundary[2].

The results suggest that despite the limited clinical data collected by GP NAPS, the passive auditing of antimicrobial prescribing is still reasonably accurate compared to a manual audit. “Appropriate” prescriptions were quite accurately identified, but “Inappropriate” prescriptions were over-reported leading to a lower NPV. Accuracy for “Compliance” was lower, but still within the bounds of acceptable accuracy.

These validation results support the credibility of the GP NAPS antimicrobial prescribing feedback reports. However it was found that the accuracy of GP NAPS is dependent on the quality of documentation in the electronic medical record which can vary across clinics and prescribers.

	Clinic 1	Clinic 2	Clnic 3	Total
Appropriateness				
Sensitivity (%)	91.7 (61.5, 99.8)	85.5 (74.2, 93.1)	84.1 (74.4, 91.3)	85.3 (78.7, 90.4)
Specificity (%)	100 (29.2, 100)	80.8 (60.6, 93.4)	87.1 (70.2, 96.4)	85.0 (73.4, 92.9)
PPV (%)	100 (71.5, 100)	91.4 (81.0, 97.1)	94.5 (86.6, 98.5)	93.7 (88.3, 97.1)
NPV (%)	75.0 (19.4, 99.4)	70.0 (50.6, 85.3)	67.5 (50.9, 81.4)	68.9 (57.1, 79.2)
Kappa	0.81	0.63	0.65	0.66
Guideline Compliance				
Sensitivity (%)	87.5 (47.3, 99.7)	78.6 (59.0, 91.7)	77.8 (62.9, 88.8)	79.0 (68.5, 87.3)
Specificity (%)	83.3 (35.9, 99.6)	85.7 (72.8, 94.1)	80.0 (67.0, 89.6)	82.7 (74.3, 89.3)
PPV (%)	87.5 (47.3, 99.7)	75.9 (56.5, 89.7)	75.6 (60.5, 87.1)	77.1 (66.6, 85.6)
NPV (%)	83.3 (35.9, 99.6)	87.5 (74.8, 95.3)	81.5 (68.6, 90.7)	84.3 (76.0, 90.6)
Kappa	0.71	0.64	0.58	0.62

CONCLUSION

Overall, the GP NAPS passive audit demonstrated good accuracy for determining antimicrobial prescribing quality when compared against an in-practice manual audit. Further validation in a wider variety of practices will ensure the robustness of the GP NAPS audit across different settings.

REFERENCES

1. Australian Commission on Safety and Quality in Health Care. AURA 2019: Third Australian Report on Antimicrobial Use and Resistance in Human Health. ACSQHC Sydney, Australia; 2019.
2. Altman DG. Practical statistics for medical research. CRC press; 1990.

ACKNOWLEDGEMENTS

Guidance GP is a collaboration between Department of General Practice, National Centre for Antimicrobial Stewardship and the North Western Melbourne Primary Health Network. The researchers gratefully acknowledge Therapeutic Guidelines Ltd and the RACGP Foundation for their support of this project. This project is also supported by an MRFF Next Generation Clinical Researcher Program TRIP Fellowship.