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The effect of cross-jurisdictional linked hospital and death data on estimating risk-adjusted grouped hospital standardised mortality ratios in Australia

Spilsbury, Katrina^{1*}, Ferrante, Anna², Rosman, Diana³, Alan, Janine¹, Boyd, James², and Semmens, James¹

¹Centre for Population Health Research, Faculty of Health Sciences, Curtin University

²PHRN Centre for Data Linkage, Centre for Population Health Research, Curtin University

³Data Linkage, Department of Health WA, Perth, Western Australia

Objectives

The Population Health Research Network (PHRN) was established to increase data linkage capacity in Australia. A proof of concept study investigating cross border hospital use and hospital mortality was undertaken to demonstrate the effectiveness of increased data linkage capacity in supporting nationally significant health research. The objective of this study was to evaluate whether cross-jurisdictional linkage of hospital and death records across Australian states could refine estimation of Hospital Standardised Mortality Ratios (HSMRs).

Approach

In Australia, administrative hospital and death data are collected by individual state governments. The newly established Centre for Data Linkage created a cross-jurisdictional linkage key that brought together hospital and death records belonging to individuals across four Australian states over a five year period (1st July 2004 - 30th June 2009). Hospital inpatient records from public, psychiatric and private hospitals and private day surgery centres were provided by New South Wales, Western Australia and Queensland. South Australia provided public hospital inpatient records only. The linked data underwent extensive cleaning and standardisation to improve the validity of interstate comparisons.

The final cohort comprised 7.7 million hospital patients. In-hospital deaths and deaths within 30 days of hospital discharge from the four state jurisdictions were used to estimate the SMR of hospital groups defined by geography and type of hospital (grouped HSMR) under three record linkage scenarios; 1) cross-jurisdictional person-level linkage, 2) within-jurisdictional (state-based) person-level linkage and 3) unlinked records. All public and private hospitals in New South Wales, Queensland, Western Australia and public hospitals in South Australia were included in

this study. Death registrations from all four states were obtained from state-based registries of births, deaths and marriages.

Results

Cross-jurisdictional linkage identified 11,116 cross-border hospital transfers of which 170 resulted in a cross-border in-hospital death. An additional 496 cross-border deaths occurred within 30 day of hospital discharge. The inclusion of cross-jurisdictional person-level links to unlinked hospital records reduced the coefficient of variation amongst the grouped HSMRs from 0.19 to 0.15; the inclusion of 30 day deaths reduced the coefficient of variation further to 0.11. There were minor changes in grouped HSMRs between cross-jurisdictional and within-jurisdictional linkages, although the impact of cross-jurisdictional linkage increased when restricted to geographic regions with high cross-border hospital use such as the New South Wales and Queensland border area.

Conclusion

Cross-jurisdictional data linkage modified estimates of grouped HSMRs, particularly for hospitals groups that were likely to receive a high proportion of cross-border users.

*Corresponding Author:

Email Address: katrina.spilsbury@curtin.edu.au (K. Spilsbury)