Reducing Demand on Hospital Services in Victoria: Opportunities for Targeted Interventions

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Abstract
The Victorian Ambulatory Care Sensitive Conditions (ACSCs) study used the Victorian Admissions Episodes Dataset (1999–2000) for analysing hospital admissions for diabetes complications, asthma, vaccine-preventable influenza and pneumococcal pneumonia. The analyses were performed at the level of Primary Care Partnerships (PCPs). There were 12 100 admissions for diabetes complications in Victoria—a rate of admission of 2.56 per 1000 (2.53–2.63). There was a 12-fold variation in admission rates for diabetes complications across PCPs, with 13 PCPs having significantly higher rates than the Victorian average, accounting for just over half of all admissions (6114) and 39 per cent of total bed days. Similar variations in admission rates across PCPs were observed for asthma, influenza and pneumococcal pneumonia. This analysis, with its acknowledged limitations, has shown the potential for using these indicators to identify opportunities for targeted public health interventions in reducing demand on hospital services in Victoria.

Introduction
Ambulatory Care Sensitive Conditions (ACSCs) are those for which hospitalisation is thought to be avoidable if preventive care and early disease management are applied, usually in the ambulatory setting. In theory, timely and effective ambulatory care can help reduce the risks of hospitalisation by: preventing the onset of an illness or condition; controlling an acute episodic illness or condition; or managing a chronic disease or condition.

The preliminary analyses from the Victorian ACSCs study offer a new set of indicators describing differentials and inequalities in access to the primary health care system in Victoria. They also provide an evidence-based platform for policies to reduce demand on Victorian hospital services by offering opportunities for targeted community-based interventions.

There is increasing pressure on the Victorian public acute and emergency hospital system to meet the demand for inpatient care. To address this problem, the Victorian Department of Human Services is conducting a major project: Meeting Emergency Demand. The Victorian ACSCs study analysed a set of priority conditions in which hospital admissions can be reduced through improved prevention and primary care. This paper presents the results of analyses of selected conditions at the Primary Care Partnerships (PCPs) level and the implications for reducing demand on the hospital system in Victoria.

Methods
Hospital separation data were obtained from the Victorian Admitted Episodes Dataset (VAED) for 1999–2000. The VAED is a minimum dataset containing data on all admitted patient activity submitted by all public and private acute hospitals, including acute facilities in rehabilitation and extended care institutions and day procedure centres.

Clinical data are stored as ICD-9-CM codes in 12 diagnosis and procedure fields in the VAED. For the purpose of this study, the ACSCs identified using the ICD-9-CM codes in the 12 diagnoses fields of the VAED were diabetes complications (ICD-9-CM 2501-2509) in any diagnosis field, asthma (493) as principal diagnosis only, and influenza and pneumococcal pneumonia (481, 4870, 4871, 4878) in any diagnosis field.

Analyses of individual ACSC admissions to hospital require the calculation of admission rates for defined geographic areas. In Victoria, the boundaries of the geographic areas that make up Local Government Areas (LGAs) under the Australian Standard Geographic Classification (ASGC) have changed significantly over the past decade. Currently, there are 200 statistical local areas (SLAs), which make up 78 LGAs. These boundaries have been collapsed into 32 PCP catchment areas.

Population figures by sex and five-year age groups were obtained from the Estimated Resident Population figures produced by the Australian Bureau of Statistics and were used for calculating admission rates and 95 per cent confidence intervals. Estimates at the LGA level were used to...
calculate admission rates and 95 per cent confidence inter-
vals for the 32 PCP areas in Victoria. Admission rates
were age and sex standardised (direct method) using the
Victorian population for 1996 as the reference. Ninety-five
per cent confidence intervals for the standardised rates
were based on the Poisson distribution.

Results

Diabetes Complications

Victoria had 12,100 admissions for diabetes complications
in 1999–2000, with an average of 8.06 bed days. The rate
of admissions for diabetes complications was 2.56 per
1000 (95 per cent confidence interval of 2.53–2.63 per
1000). There was a 12-fold variation in admission rates
for diabetes complications across PCPs. Thirteen PCPs had
significantly higher admission rates than Victoria’s aver-
age (Figure 1), contributing just over half of the State’s
total admissions (6,114) for diabetes complications and 39
per cent of total bed days.

A 35 per cent reduction in admissions for diabetes compli-
cations in these 13 PCPs and an 18 per cent reduction in
admissions in the remaining PCPs would lead to a 25 per
cent reduction for the Victorian total, which would equate
to approximately $8.4 million of hospital expenditure.

Asthma

Victoria had 10,079 admissions for asthma in 1999–2000,
with an average of 2.71 bed days. The rate of admissions
for asthma was 2.15 per 1000 (95 per cent confidence
interval of 2.11–2.19 per 1000). Sixteen PCPs had signifi-
cantly higher admission rates than the Victorian average
(Figure 2), contributing about 40 per cent of the State’s
total admissions for asthma and 38 per cent of total bed
days.
A 40 per cent reduction in admissions for asthma in these 16 PCPs and a 23 per cent reduction in admissions in the remaining PCPs would lead to a 30 per cent reduction for the Victorian total, which would equate to approximately $3.5 million of hospital expenditure.

**Vaccine Preventable Influenza and Pneumococcal Pneumonia**

Also in 1999–2000, Victoria had 2079 admissions for influenza and pneumococcal pneumonia, of which 63 per cent (n=1312) were due to pneumococcal pneumonia. The rates of admissions were 0.44 per 1000 (95 per cent confidence interval of 0.42–0.46 per 1000) for influenza and pneumococcal pneumonia, and 0.28 per 1000 (95 per cent confidence interval of 0.26–0.30 per 1000) for pneumococcal pneumonia. The average bed days were 9.03 and 11.26 respectively.

Thirteen PCPs had admission rates significantly higher than the Victorian average for influenza and pneumococcal pneumonia (Figure 3), contributing about 40 per cent of the State’s total admissions for influenza and pneumococcal pneumonia and 38 per cent of total bed days. A 40 per cent reduction in admissions for influenza and pneumonia across all PCPs in Victoria would equate to approximately $5.5 million of hospital expenditure.

Nine PCPs had admission rates significantly higher than the Victorian average for pneumococcal pneumonia (Figure 4), contributing about 35 per cent of the State’s total admissions for pneumococcal pneumonia and 33 per cent of total bed days.

**Discussion**

Better access to primary health care increases the use of ambulatory care and prevents unnecessary hospitalisations. Appropriate and timely care have been demonstrated to largely prevent microvascular and macrovascular complications of diabetes. The test of equity of access involves determining whether there are systematic differences in the use of health services and health outcomes among groups and whether these differences result from barriers to primary care services.

Analysis of ACSC admission rates in LGAs identified significant variations among PCP areas. These variations need to be monitored to identify specific catchment areas that consistently show above-expected rates. To the extent that these differences in rates are attributable to access barriers, small-area analysis may prove to be a valuable planning and evaluation tool.

Policy-makers interested in assessing the impact of local access barriers often look for a yardstick to compare how different communities meet...
the needs of their particular groups. ACSCs may prove to be a useful tool for monitoring service accessibility and need, as well as for providing valuable information for local health planning.\(^1\) They will also complement the small-area analysis that forms part of the Victorian Burden of Disease study.\(^8\)

Small-area analysis of ACSCs may also help evaluation of the impact of policies and interventions.\(^1\) It may provide a new means of assessing the impact of major initiatives in Victoria—such as PCPs and integrated chronic disease management programs—in improving access to care.

What is driving high rates of ACSCs in some areas compared with other areas in Victoria? This analysis cannot separate the economic, structural and geographic barriers that are traditionally lumped together as ‘access barriers’.\(^1\) Differences in ACSC admission rates could also occur as a result of environmental factors, variations in disease prevalence, severity of illness and propensity to seek primary health care.\(^1\) The current analyses do not allow for the exclusion of any of these explanations. Further detailed analyses and investigation would assist in assessing the relative contribution of various factors that are driving the excess rates of ACSCs in Victoria.

The study of ACSCs, within its acknowledged limitations, has shown the potential for using these indicators in assessing the operation of the ambulatory health care system at the community level in Victoria. It is now possible to plan strategic programs and interventions that may reduce demand on hospital services in Victoria.\(^11\)\(^-\)\(^15\) A number of public health interventions have already been identified from the study information (Table 1). These interventions could decrease pressure on demand for inpatient and emergency care by reducing ACSC attendances in the acute sector.

References

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