

COMMENTARY

Investing in longitudinal studies of primary healthcare: what can we learn about service performance, sustainability and quality?

BM Ward, PF Buykx, R Tham, L Kinsman, JS Humphreys

*Centre for Research Excellence in Rural and Remote Primary Health Care, School of Rural Health,
Monash University, Bendigo, Victoria, Australia*

Submitted: 19 March 2014; Accepted: 22 June 2014; Published: 16 November 2014

Ward BM, Buykx PF, Tham R, Kinsman L, Humphreys JS

Investing in longitudinal studies of primary healthcare: what can we learn about service performance, sustainability and quality?

Rural and Remote Health 14: 3059. (Online) 2014

Available: <http://www.rrh.org.au>

Primary health care (PHC) is recognised as an efficient, effective and equitable approach to health service delivery^{1,2} and successful PHC is integral to a sustainable and accountable healthcare system, and ultimately improved population health outcomes³. Internationally there is a move towards strengthening and improving the quality of PHC^{4,5}. Nowhere is this more important than in rural and remote areas where, compared to metropolitan settings, there is poorer access to quality health care, and a disproportionate and preventable burden of morbidity and mortality⁶. In light of the ongoing reviews of the Australian GP Super Clinic Program⁷ and Medicare Locals⁸, it is timely to consider what we can learn about health service performance, sustainability and quality from a longitudinal study of a rural Australian PHC service.

The Elmore Primary Health Service (EPHS) is a single-entry point private–public PHC model that provides services to its local and surrounding communities. The EPHS has been the focus of a longitudinal evaluation of its performance and sustainability for the past 6 years⁹. Elmore is located 46 km north-east of Bendigo and 170 km north of Melbourne, the capital city of the state of Victoria, with a population of approximately 668¹⁰. The current EPHS model was designed to meet local health needs following the closure of the town's hospital 8 years earlier.

The evaluation framework for this 6-year longitudinal study drew on Donabedian's quality of care paradigm that linked structure (health system performance), process (health service utilisation and satisfaction) and outcome (health behaviours, outcomes and community viability)^{11,12}, together with a conceptual framework for primary healthcare



performance assessment based on the 2002 National Health Performance Framework¹³. The details of these have been reported previously^{9,12}.

Drawing on international and national health service research and policy documents¹⁴⁻¹⁸, several sentinel indicators for each important service domain were selected based on their technical merits, validity, likely longevity, applicability and the fact that these data were routinely collected and could be reliably extracted from primary care service and medical records. All quantitative data were extracted by an EPHS staff member and were collated in a de-identified and aggregated form for the university research team in order to ensure privacy and confidentiality of service and patient medical records. The Monash University Human Research Ethics Committee approved the study. To date, six annual data collection cycles (2007–13) of the EPHS have been completed.

Health service performance

The study sought to use routinely collected data to examine health service performance in terms of several key dimensions, including accessibility, appropriateness and continuity³.

Accessibility is defined as the ability of people to obtain appropriate health care at the right place and the right time irrespective of income, cultural background or geography. Several proxy indicators were used, such as 'bulk-billing' (ie no co-payment by patients) and service expansion within its catchment area¹⁹. Results to date show that, over the 6-year period, the proportion of 'bulk-billed' consultations increased to more than 80%, and all patients who required emergency care were seen on the day of contact, regardless of the time of day. Moreover, the service expanded from one central site to include three regular outreach GP services, so that patients previously presenting at Elmore were then able to access appropriate quality care at an alternative location closer to their place of residence.

Appropriateness is defined as a service that meets a patient's specific needs. Two key indicators that were used as proxy measures of appropriateness were number of full-time equivalents (FTE) of allied health professionals and female general practitioners (GPs). While these are only minimal indicators of every aspect of appropriateness, they are nevertheless seen as essential elements in service delivery in rural Australia where there are well-documented shortages of female GPs and allied health professionals^{20,21}. Since the initial data collection in 2006–07, the number of FTE allied health service providers doubled to 1.2FTE while the female GPs FTE per 1000 women increased by 0.8 to 2.7.

Continuity, defined as uninterrupted, seamless and integrated care that is provided across the continuum of care, was measured through completion of GP management plans and 'cycles of care' (CoC)¹⁹. Over the 6-year period, CoC or GP management plan completions for the proportion of patients with asthma increased, and they decreased for patients with diabetes. Similarly, the proportion of active patients (≥ 75 years) who received health checks decreased. Importantly, service records indicate that the same reminder and recall system remained in place over this period.

Health service sustainability

Health service *sustainability* was monitored using proven indicators developed in relation to the key elements of workforce, funding, infrastructure, linkages, leadership, governance and management identified in previous research²². Staff profiles and funding sources are two particularly important indicators. During the study period the EPHS was actively engaged in recruiting and retaining staff and maintaining funding through several different sources. Over the 6-year period, the catchment population per GP FTE increased from 1159 in 2006–07 to 1552 in 2012–13. The number of practice nurses remained relatively stable (0.6–0.8 FTE) while the number of administrative staff decreased from FTE 7.0 in 2006–07 to 4.8 in 2012–13. As reported above, the FTE of allied health staff and female GPs both increased. In terms of funding during the study period,



the proportions of total income diversified from more than 10 different sources, but remained relatively stable in total with two-thirds of income coming from Medicare.

Health service quality

Service quality was assessed using indicators relating to primary and secondary disease prevention and treatment goals. For example, from 2008–09 (data were not available for 2006–07) to 2013, the proportion of patients with recorded secondary prevention activities remained stable (>90%) for smoking status and for blood pressure. For the same timeframe, body mass index recordings increased from 46% to 59%, while treatment goal activity of haemoglobin A1c recordings increased from 75% to 80% amongst patients with diabetes mellitus.

What new knowledge has this study generated?

Several messages emerge from this study – specifically (i) the value and problems associated with using routinely collected data to monitor service performance, sustainability and quality, (ii) the benefits of working with health authorities and related jurisdictions to benchmark and use primary health service evidence to formulate policies and programs designed to meet population healthcare need, (iii) the importance of a longitudinal study design, and (iv) the importance of systematic service performance evaluation.

Challenges of using routinely collected data to monitor service performance and sustainability

The evaluation undertaken in this study illustrates the capacity for any small rural PHC service to monitor its own trends in performance, sustainability and quality. For example, the results show that the EPHS achieves high levels of patient accessibility as measured by an increased proportion of bulk-billing, seeing patients in a timely manner and the number of outreach services. However, while the EPHS is a multidisciplinary PHC service, some of the

programs are provided by other agencies, and researchers do not necessarily have access to all the data collected by those services. This may compromise the comprehensiveness of the service evaluation and, potentially, consumers' experience of care²³. Moreover, while from the outset of the study, every effort was made to select valid and reliable indicators likely to have longevity, this research strategy is not flawless in a rapidly changing health system environment. For example, changes to the funding of after-hours services, the reporting of site-specific immunisation coverage data and residential aged care facilities policy have meant that several of our indicators of health system performance (particularly effectiveness) are no longer available in a consistent and replicable manner necessary for longitudinal monitoring. Performance monitoring remains a challenge for both service providers and researchers whenever routinely extracted measures are changed to meet new policy and reporting requirements.

Working with health authorities and related jurisdictions to benchmark and meet population need

This longitudinal study has focused on one PHC service and its capacity to engage in and contribute to health system research. Its inception emerged from close synergies between the aims of the research team, the health service itself, the principal healthcare providers and the funding body. However, without other comparative sites or a population capitation system, it is difficult to rigorously evaluate the transferability of the evaluation framework that was used in this study or to determine how well the particular service responds to the health needs of its local community. In Australia, PHC network organisations such as Medicare Locals have an important role in ensuring that, collectively, services within that catchment are adequately meeting population health needs through the provision of high-quality, sustainable healthcare services. They will also play a key role in assisting services with data cleaning, linkage and analysis for the purpose of quality improvement and feedback to stakeholders.



The changing nature of the EPHS workforce to an increasing proportion of nurses and allied health professionals reflects greater diversity in health service delivery that, from our measures, has helped to increase the ability of the service to improve access to care and still maintain high-quality care. Further investigations into the relationship of how health care is provided and the quality of that care (as measured both normatively and from the perspective of consumers) should be considered in future research to improve our understanding of the potential for role substitution to address rural health workforce shortages²³.

Importance of a longitudinal study design

Longitudinal PHC service studies such as this one are rare in Australia. Indeed, most evaluations of rural PHC services are conducted at a single point in time²⁴. Such cross-sectional studies are significantly more limited in their usefulness, because it is not possible to examine trends over time and to link these to important changes that occur as a matter of course, both internally (eg service expansion or changes to the staffing profile) or externally in the policy and funding environment (such as changes to Medicare funding and the political importance of PHC in the complex Australian health system).

However, while the longitudinal data such as those presented here provide useful information relating to service performance, sustainability and quality, invariably they do not tell the full story. For example, while our measures of secondary prevention activities suggest improved quality of care, we were unable to link these to treatment goals. It is important also to take into account other information when interpreting apparent statistical trends. The evaluation of the EPHS collected and analysed a number of other sources of data (including community surveys and staff interviews) to assist our understanding of the trends shown in the service and medical record data. Importantly, this was done independently of the EPHS and we did not actively recruit frequent service users as research participants. Internationally, patients' perspectives are recognised as an important component of PHC service monitoring and

evaluation^{25,26} and plans for ongoing work include engaging more closely with service users.

Importance of systematic service performance evaluation

Increasingly, evaluation of service performance is recognised as one important factor in ensuring there is consistency of quality PHC care to communities. Such an activity is integral to the ongoing collection of information required of health services by health authorities and government agencies. Identifying an appropriate but adaptable evaluation framework to guide the collection of data can facilitate an efficient and reliable process that enables performance monitoring for both internal quality improvement purposes as well as external benchmarking, so that services can learn from each other about how best to deliver efficient and effective care to their patients.

Conclusions

Sustainable, accessible PHC has a key role to play in health service provision for rural populations, and can help to guide policies designed to overcome some of the disparities in health outcomes experienced by rural Australians when compared to their metropolitan counterparts. It is essential to understand the key principles required for the provision of responsive, sustainable rural services in which longitudinal studies can play an important role. The framework and indicators developed for this 6-year study have proven to be useful in the provision of objective, relevant and comprehensive information and could be further refined for future rural PHC services research.

References

1. Frenk J. Reinventing primary health care: the need for systems integration. *The Lancet* 2009; **374(9684)**: 170-173.
2. Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Quarterly* 2005; **83(3)**: 457-502.



3. Watson D, Broemeling A, Wong S. A results-based logic model for primary healthcare: a conceptual foundation for population-based information systems. *Healthcare Policy* 2009; **5**: 33-46.
4. World Health Organization. *Primary health care – now more than ever*. Geneva: WHO, 2008.
5. Department of Health and Ageing. *Building a 21st century primary health care system Australia's first national primary health care strategy*. Canberra: Australian Government, 2010.
6. Australian Institute of Health and Welfare. *Australia's health 2012*. Canberra: AIHW, 2012.
7. Department of Health. *Evaluation of the implementation of the GP super clinics program 2007–08 – recommendations*. (Online) 2012. Available: <http://www.health.gov.au/internet/main/publishing.nsf/Content/gpsc-evaluation-recommendations> (Accessed 12 March 2014).
8. Department of Health. Medicare Locals review. (Online) Available: <http://www.health.gov.au/internet/ministers/publishing.nsf/Content/health-mediarel-yr2013-dutton025.htm> (Accessed 14 March 2014).
9. Tham R, Humphreys J, Kinsman L, Buykx P, Asaid A, Tuohey K, et al. Evaluating the impact of sustainable comprehensive primary health care on rural health. *Australian Journal of Rural Health* 2010; **18**: 166-172.
10. Australian Bureau of Statistics. *Census of population and housing*. (Online) 2011. Available: <http://www.abs.gov.au/census> (Accessed 10 November 2014).
11. Donabedian A. The quality of care. How can it be assessed? *Journal of the American Medical Association* 1988; **260**: 1743-1748.
12. Tham R, Humphreys J, Kinsman L, Buykx P, Asaid A, Tuohey K. Study protocol: evaluating the impact of a rural Australian primary health care service on rural health. *BMC Health Services Research* 2011; **11(1)**: 52.
13. Sibthorpe B. *A proposed conceptual framework for performance assessment in primary health care: a tool for policy and practice*. Canberra: Australian Primary Health Care Research Institute, Australian National University, 2004.
14. Canadian Institute for Health Information. *Pan-Canadian Primary Health Care Indicators*. Ottawa: Canadian Institute for Health Information, 2006.
15. National Health and Hospitals Reform Commission. *A healthier future for all Australians – final report of the National Health and Hospitals Reform Commission*. Canberra: Commonwealth of Australia, 2009.
16. The Royal Australian College of General Practitioners. *Standards for general practices*. South Melbourne, VIC: RACGP, 2010.
17. Wakerman J, Humphreys J, Wells R, Kuipers P, Entwistle P, Jones J. Primary health care delivery models in rural and remote Australia – a systematic review. *BMC Health Services Research* 2008; **8**: 276.
18. Australian Institute of Health and Welfare. *Rural, regional and remote health – information framework and indicators, version 1b*. Canberra: AIHW, 2005.
19. Australian Institute of Health and Welfare (AIHW). *Rural, regional and remote health: indicators of health status and determinants of health* Canberra: AIHW, 2008.
20. Watson D, McGrail K. More doctors or better care? *Health Policy* 2009; **5(1)**: 26-31.
21. Russell DJ, Humphreys JS, Wakerman J. How best to measure health workforce turnover and retention: five key metrics. *Australian Health Review* 2012; **36(3)**: 290-295.
22. Wakerman J, Humphreys J, Wells R, Kuipers P, Jones J, Entwistle P, et al. Features of effective primary health care models in rural and remote Australia: a case-study analysis. *Medical Journal of Australia* 2009; **191(2)**: 88-91.



23. Harris MF, Zwar NA, Walker CF, Knight SM. Strategic approaches to the development of Australia's future primary care workforce. *Medical Journal of Australia* 2011; **194(11 Suppl)**: S88-S91.

24. Buykx P, Humphreys J, Tham R, Kinsman L, Wakerman J, Asaid A, et al. How do small rural primary health care services sustain themselves in a constantly changing health system environment? *BMC Health Services Research* 2012; **12(1)**: 81.

25. Hannon L, Lester H, Campbell S. Patients' views of pay for performance in primary care: a qualitative study. *British Journal of General Practice*. 2012; **62(598)**: e322-e328.

26. Pillay M, Dennis S, Harris MF. Quality of care measures in multimorbidity. *Australian Family Physician* 2014; **43(3)**: 132-136.