

Using population health surveys to provide information on access to and use of quality primary health care

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Abstract

Objective: Currently, primary health care (PHC) is under-represented in health statistics due to the lack of a comprehensive PHC data collection. This research explores the utility of population health surveys to address questions relating to access to and use of PHC, using diabetes as an example.

Methods: Drawing on published material relating to diabetes management, we developed a conceptual framework of access to and use of quality PHC. Using this framework we examined three recent population-based health surveys — the 2001 National Health Survey, 2002–03 NSW Health Survey, and AusDiab — to identify relevant information collection.

Results: We identified seven domains comprising aspects of quality PHC for people with diabetes. For each domain we proposed associated indicators. In critiquing the three population health surveys in relation to these indicators, we identified strengths and weaknesses of the data collections.

Conclusion: This approach could inform the development of questions and extension of population health surveys to provide a better understanding of access to and use of quality PHC in Australia. The additional information would complement other data collections with a community-based perspective and contribute to the development of PHC policy.

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OVER THE PAST TWENTY YEARS there has been a radical shift in the way in which health care services are provided. This is reflected in shorter hospital stays, increases in day-only procedures, and increased management in community set-

What is known about the topic?

Australia does not have a comprehensive primary health care data collection, and thus primary health care is under-represented in health statistics.

What does this paper add?

Indicators of access to and use of quality primary health care could be collected through inclusion of relevant questions in population health surveys. Using diabetes care as a case study, this paper highlights current limitations, particularly the focus of the questions on individual care rather than use of services.

What are the implications?

In the absence of a comprehensive primary health care data collection, population health surveys could provide a source of information on access to and use of quality primary health care that is currently not captured in other population health data collections. ♦

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tings of conditions that previously would be considered acute health problems requiring hospitalisation. Investment in these community-based settings has been estimated at between 30%–40% of all health expenditure.¹ Despite this, Australia does not have a comprehensive data collection on access to or use of primary health care (PHC) services, and thus PHC services are under-represented in health statistics.² By PHC, we refer to those health-related services provided in community-based settings through general practice, allied health and nursing services (publicly and privately funded) and community health services (generally funded by state governments and the non-government sector). The reasons for the lack of a comprehensive PHC data collection lie in the complex mix of Commonwealth and state, publicly and privately funded services, as well as the range of services that are provided.

While a variety of population health data collections provide some information on access to and use of PHC, services that have limited public funding are not captured in these data collections. The Health Insurance Commission (HIC) collates information on claims for reimbursement for medical care, diagnostic services and pharmaceutical products. Due to regulatory and financial considerations, these are incomplete. For example, prescriptions that cost less than patient copayments will not appear in the data collection; and similarly, many medical services are not identified.² In addition, specific patient information such as diagnosis, reason for the service, and treatment provided are not collected.² To address the gap in general practice data, the Bettering the Evaluation and Care of Health (BEACH) program was developed as a cross-sectional paper-based survey of GP activity, collecting information on patients and their treatment in the GP setting.³ BEACH provides a snapshot of general practice activity, but not a comprehensive overview of patterns of access to and use of PHC services, or quality or outcomes of care. Except locally, information on allied health and nursing services in either the private or public sectors is not systematically collected.⁴ Hospital admissions

for ambulatory care-sensitive conditions, that is, conditions that should not present to hospital services if adequate care is provided in the PHC setting, have also been used as proxy measures of PHC activity.⁵ These data may be unreliable for this purpose because factors other than PHC may influence hospital admission. Current interest in the use of record linkage to combine data on individuals from several population health data collections may provide more comprehensive information on aspects of health care.⁶ While this is an important initiative, record linkage will still not systematically capture the full range of privately and publicly funded services that comprise PHC. In addition, record linkage will only provide information on those people who use services. It can not tell us anything about those people with conditions requiring comprehensive health care who do not present to services.

In recent years there has been substantial investment in population health surveys by state and national governments. Using cross-sectional methodology, surveys are designed to provide population estimates of a range of health-related issues, including health status. They have not been exploited in health service research as they are considered the least reliable study design, due to their reliance on recall of information and events, inability to address questions of causality, and the impact of individual propensity to report. Despite these limitations, population health surveys do collect information on a range of health and other subjects from a representative sample of the target population in a cost-effective and timely fashion. In an environment where there are significant changes in health service delivery, including the introduction of Medicare Australia's incentives to encourage implementation of comprehensive PHC, population health surveys may be another strategy to monitor the impact of policy initiatives on patient care. Population health surveys could be used to investigate access to and use of PHC services, the contribution of a package of care to overall health, and aspects of the relationships between consumers and providers of health care. A next step in survey development would then be to explore ways in which

they could be adapted to address identified limitations.

In this paper, we explore the utility of population health surveys to address questions of access to and use of quality PHC for Australians. We use a broad definition of access that encompasses both availability (potential access) and utilisation

of services (realised access).^{7,8} Firstly, we propose a conceptual framework based on domains of care that might comprise quality health care and propose some indicators of these using type 2 diabetes mellitus as an example. Next, we compare and contrast three data collections: the Australian Bureau of Statistics 2001 National Health

1 Comparison of methods for three population health surveys: The Australian Diabetes, Obesity and Lifestyle Study (AusDiab), Australian Bureau of Statistics 2001 National Health Survey (2001 NHS), and New South Wales Health Surveys in 2002 and 2003 (NSW HS)

	AusDiab*	2001 NHS	NSW HS
Data assessed	2000	2001	2002–03
Frequency	One-off	Every 5 years	Annual
Ownership/provider/source	National Diabetes Strategy	ABS	NSW Health
Target population	All Australians aged 25 + years	All Australians and all ages	Residents of NSW
Sampling	All households within the sampled clusters (42 randomly selected urban and non-urban census collector districts)	Dwellings were selected at random using a multi-stage area sample of private dwellings	Random digit dialling method. Simple random sampling of household phone numbers within each area health service
Participant selection	All household members 25 + years	Within each selected household, a random sub-sample of usual residents was selected as follows: one adult (18 +), all children aged 0–6 years, one child aged 7–17 years	One family member randomly selected and interviewed per household
Method of survey	Face-to-face interview	Face-to-face interview	Computer assisted telephone interviews
Weighting	Weighted to the Australian population aged 25 + as projected to have applied at June 30, 1998	Weights calibrated against population benchmarks	Weighted to adjust for unequal probability of selection and post-stratification for the data to match the ABS 2001 mid-year residential population benchmark in NSW
Number of respondents	11 479 households (20 257 people completed interviews) and (11 247 people participated in the physical examination)	17 918 households (26 863 persons)	15 442 (2002)
Response rate	70% of households; 99.6% of eligible identified adults	92%	67.6% (2002)
Number of respondents who are 45+ years	Unknown	9472	8098
Proportion of respondents who are diabetic (45+ years)	Unknown	6.0%	10.2%
Additional data collection			
Physical examination	✓	X	X
Blood tests	✓	X	X

* Limited to initial survey component. ABS = Australian Bureau of Statistics. ✓ = Data collected. X = Data not collected.

Survey (2001 NHS), the New South Wales Health Surveys in 2002 and 2003 (NSW HS), and The Australian Diabetes, Obesity and Lifestyle Study (AusDiab). Finally, we comment on the strengths and weaknesses of each collection in relation to their contribution to understanding access to quality PHC.

Diabetes is a useful model for this purpose because it is a relatively common condition in older Australians and has management that is well defined according to evidence-based guidelines.^{9,10} Management strategies based on early intervention through glycaemic control, intensive treatment of blood pressure¹¹⁻¹³ and dislipidaemia,¹⁴ and lifestyle modifications¹⁴⁻¹⁶ have been shown to reduce complications of diabetes including microvascular and macrovascular disease. This and other evidence has informed development of disease management strategies and guidelines that set out recommendations for monitoring and continuing care and support from specialist and allied health care.¹⁷⁻²⁰ The guideline recommendations are designed to be implemented in the PHC setting,^{9,10,21,22} and extensive educational and support initiatives through Divisions of General Practice and funding incentives encourage this.

Methods

We examined current guidelines for diabetes care,^{9,10} extensive research evidence, and the National Diabetes Strategy Group (NDSG) Priority Indicators²³ to identify domains of diabetes care that are consistent with quality care and are deliverable in the PHC setting. Next we identified, from these resources, potential indicators of access to and use of quality PHC in each of these domains. For example, to support early detection one would be interested in a question that sought evidence of screening for diabetes or its risk factors, whereas to explore multidisciplinary care one would be interested in questions that sought information on the range of health professionals involved in care of patients with diabetes.

Finally, we examined recent population health surveys to identify questions that seek informa-

tion on our proposed indicators of access to and use of quality PHC (Box 1). We chose three health surveys as examples of a range of health-related surveys that have been conducted in Australia in recent years. AusDiab was a population-based survey of Australian adults aged 25 years or more that was purpose-designed to gather information on diabetes and its management in the Australian population.²⁴ Participants in AusDiab were also offered a clinic visit and examination including biological measures, but for the purpose of this work we limited our discussion to the population-survey section of the study.

The National Health Survey is a national population-based household survey of Australians conducted by the Australian Bureau of Statistics (ABS) every 6 years.²⁵ The 2001 data were examined.

The NSW Health Survey (NSW HS) is a continuous cross-sectional survey of NSW residents using computer assisted telephone interviewing (CATI) technology.²⁶ We examined 2002-03 data. These general health surveys are designed to collect population benchmarks on a range of health conditions of the Australian or NSW adult population, but not specifically diabetes.

Box 1 compares the methodology of the three surveys. Each survey used standard population-survey methods to provide data on a representative sample of the Australian or NSW population. These methods include satisfactory response rates and generation of known sampling weights to provide population estimates.

Results

Domains for assessing quality of PHC for diabetes

We identified seven domains that represent aspects of quality PHC for people with diabetes. These were prevention, early detection, proactive care, monitoring, complication screening, multidisciplinary care, and outcomes of care (Box 2). These domains are supported by strong research evidence, are consistent with accepted standards of quality care and can be implemented in the GP setting.

2 Recommendations for diagnosis, management and outcomes of type 2 diabetes mellitus and proposed indicators of access to and use of quality health care for use in population health surveys

Domain of care	National Diabetes Strategy Group priority indicators 2005 ²⁰ (indicator number)	Guideline recommendations ⁹	Suggested indicator for population health survey
Prevention	<p>The proportion of individuals who correctly identify the risk factors for type 2 diabetes (1C.1.2)</p> <p>The proportion of people at risk of type 2 diabetes who know what their evidence-based healthy lifestyle options are (1C.2.1)</p> <p>The proportion of at-risk people of type 2 diabetes who are aware of the need for type 2 diabetes screening (2C.1.1)</p>	<p>Screening for/identification of diabetes and risk factors</p> <p>Recognise patients at risk of diabetes</p> <p>Management of risk factors</p>	<p>Awareness of diabetes</p> <p>Awareness of risk factors for diabetes</p> <p>Awareness among at-risk people of the need for diabetes screening</p> <p>Awareness of healthy lifestyles</p> <p>Diabetes screening</p>
Early detection	<p>The proportion of people at risk of diabetes who are aware of the need for type 2 diabetes screening (2C.1.1)</p> <p>The proportion of people at risk of type 2 diabetes who are being screened, and the proportion of these undergoing appropriate screening (as defined by current evidence-based guidelines) (2B.1.1)</p>	<p>Identification of high-risk individuals</p> <p>Active case detection</p> <p>Identification of diabetes type</p>	<p>Evidence of people at high risk being identified</p> <p>Awareness of at-risk people of the need for diabetes screening</p> <p>Evidence of people at high risk being screened for diabetes</p> <p>Early diagnosis</p> <p>Age of diagnosis</p>
Proactive care	Nil proposed	<p>Optimise control of glycaemia</p> <p>Identification and treatment of risk factors for complications</p> <p>Treatment of existing complications</p> <p>Self monitoring</p>	<p>Identification of barriers to health care</p> <p>Use of hypoglycaemic medications</p> <p>Use of pharmaceuticals for hypertension or dislipidaemia</p> <p>Diet/weight loss/exercise</p> <p>Smoking cessation</p>
Monitoring	<p>The proportion of people with diabetes mellitus who had an annual cycle of care (4B.1.1):</p> <p>HbA_{1c} measured in the last 6 months</p> <p>Lipids measured in the last 12 months</p> <p>Blood pressure measured in the last 6 months</p> <p>Urinary albumin measured in the last year</p>	<p>Assessment of diabetes control and cardiovascular risk factors</p> <p>Monitor control of risk:</p> <p>HbA_{1c} checked every 12 months</p> <p>Lipids checked every 12 months</p> <p>Blood pressure checked every 6 months</p>	<p>Awareness of lipid/HbA_{1c} level</p> <p>Report of blood test (lipid/HbA_{1c}) in last 6/12 months</p> <p>Annual kidney check (urinary microalbumin)</p> <p>Blood pressure checked</p> <p>Awareness of blood pressure control</p>
Complication screening	<p>The proportion of people with diabetes mellitus who had an annual cycle of care (4B.1.1):</p> <p>Weight/body mass index measured in last 6 months</p> <p>A foot examination in the last 12 months</p> <p>An eye examination within the last 2 years</p>	<p>Identification of end-stage organ damage</p> <p>Foot examination every 6 months</p> <p>Eye examination every 2 years</p> <p>Weight/BMI every 3 months</p>	<p>Report of annual cycle of care including:</p> <p>Foot examination in last 12 months</p> <p>Time since last eye examination</p> <p>Weight control</p>
Multidisciplinary (shared) care	The proportion of patients who have attended a diabetes educator (for self-management education) (5C.1.1)	<p>Engagement of other health professionals</p> <p>Referral to specialist</p> <p>Saw other health professional in addition to general practitioner</p> <p>Diabetes educator</p> <p>Dietitian</p> <p>Podiatrist</p> <p>Nurse</p>	<p>Referral to:</p> <p>Specialist</p> <p>Other health professional (podiatrist, nurse, dietitian, diabetes educator)</p> <p>Involvement of other health professional</p> <p>Saw general practitioner for review of diabetes</p>
Outcomes of care	<p>Self-reported barriers to access of care (3C.2.1)</p> <p>Satisfaction with access to and cultural suitability of services (3C.1.1)</p>	<p>Health status</p> <p>Achievement of control (eg, blood pressure, cholesterol, HbA_{1c})</p> <p>Hospitalisation</p> <p>Satisfaction/ease of access to care</p>	<p>Health status</p> <p>Evidence of achievement of outcomes</p> <p>Hospitalisation within the last 12 months</p> <p>Satisfaction with care</p> <p>Ease of access to health care</p>



Prevention has been demonstrated to be effective in high-risk groups such as those with impaired glucose tolerance identified through early detection. Interventions involve offering physical activity and dietetics programs.²⁷⁻²⁹ As diabetes is a progressive condition that can be symptomless in its early stages, early detection is critical to delaying the onset of complications. Of interest in regard to prevention and early detection would be: awareness of diabetes and risk factors for diabetes; awareness of the need for screening and early diagnosis; and receipt of advice in regard to these. It is important that this information is sought from all survey participants, not only those who are already diagnosed with the condition.

We describe proactive care as care that involves active non-pharmacological and pharmacological management of physiological risk factors such as hyperglycaemia, hypertension, dislipidaemia and overweight and obesity and for which there is strong supporting research evidence.^{11,12,14,15,27-29} Monitoring of diabetes involves regular assessment and monitoring of lifestyle risk factors (smoking, nutrition, alcohol and physical activity) and physiological factors (weight/body mass index [BMI], glycated haemoglobin [HbA_{1c}], dislipidaemia [lipids], blood pressure [BP]). These are outlined in recommendations for the “annual cycle of care” for patients with diabetes and include recommendations for frequency.¹⁰

Complication screening involves assessment of three key complications — eye complications (assessment of retinal changes), kidney complications (testing of urinary microalbumin and serum creatinine), and foot complications (neuropathy and vascular changes). These are also outlined in the annual cycle of care.¹⁰ There is strong research evidence that the involvement of a range of health professionals in the multidisciplinary care of patients with diabetes improves self-management and processes of diabetes management, and increases the early detection of complications. Multidisciplinary care may be coordinated by a GP and involve diabetes educators, dietitians, nurses and podiatrists.

Finally, the aim of quality management is to achieve “good” outcomes of care for people with diabetes. There is a notion that access to and use of quality diabetes care will prevent or delay the complications of diabetes and prolong normal function and quality of life, although this association is somewhat tenuous.²⁹ Intermediate outcomes include control of physiological factors (such as HbA_{1c}, lipids, BP, and BMI), health status and quality of life measures, hospitalisation, and mortality.

Indicators of the domains

Box 2 summarises the NDSG priority indicators 2005²³ and current early detection and management guidelines for GPs¹⁰ in relation to these domains of health care. It indicates that there are some gaps in recommended priority indicators relating to these domains. For example, no indicators are recommended in relation to proactive care. In the last column of Box 2, we suggest potential indicators of each domain of quality care that could be measured through population health surveys. For example, an indicator of adequate monitoring could be awareness of HbA_{1c} levels.

Inclusion of indicators in current population health surveys

Box 3 provides a summary of the indicators measured in each of the three population health surveys examined. These are compared with our proposed domains and indicators for population health surveys listed in Box 2. This approach provides an interesting perspective on the scope of the current data collections relating to diabetes, and highlights domains where there is limited data collection. For example, little information was sought on prevention or early detection of diabetes in any of the surveys. However, similar questions on diagnosis of diabetes and age at diagnosis were sought in all three surveys. Information relating to proactive care of diabetes was sought, but information on risk factor management — for example, smoking prevention — was not. The 2001 NHS and NSW HS collected little information about monitoring and complication

3 Indicators of access to and use of quality primary health care currently used in population health surveys (The Australian Diabetes, Obesity and Lifestyle Study [AusDiab], Australian Bureau of Statistics 2001 National Health Survey [2001 NHS], and New South Wales Health Surveys in 2002 and 2003 [NSW HS])

Proposed Indicator for population health survey	AusDiab	2001 NHS	NSW HS
1 Prevention			
Awareness of diabetes	X	X	X
Awareness of risk factors for diabetes	X	X	X
Awareness of at-risk people of the need for diabetes screening	X	X	X
Awareness of healthy lifestyles	X	X	X
2 Early detection			
Screening for diabetes	✓	X	X
Awareness of at-risk people of the need for diabetes screening	X	X	X
Evidence of people at high risk being identified	X	X	X
Diagnosis of diabetes	✓	✓	✓
Age of diagnosis	✓	✓	✓
3 Proactive care			
Barriers to health care	X	X	✓
Treatment of diabetes	✓	✓	✓
Treatment of cardiovascular risk factors	✓	✓	✓*
Management of (smoking)	X	X	X
Management of (obesity)	✓	✓	X
4 Monitoring			
HbA _{1c} checks	✓	X	X
Serum lipids checks	✓	X	✓*
Blood pressure checks	✓	X	✓*
Urinary microalbumin checks	X	X	X
5 Complication screening			
Weight checks	X	X	X [†]
Foot checks	✓	✓	X [†]
Eye checks	✓	✓	X [†]
6 Multidisciplinary care			
Seen by a diabetes educator	✓	X	X [†]
Seen by a dietitian	✓	✓	X [†]
Seen by a nurse	X	✓	X [†]
Seen by other allied health professional	✓	✓	X [†]
Seen by a medical specialist	✓	✓	X [†]
Visited a community health centre	X	X	✓
Visited diabetes/hospital outpatient clinic	X	✓	X [†]
7 Outcomes of care			
Diabetes control/HbA _{1c} 7% or less	✓	X	X
Total cholesterol 5.0 mmol/L or less	X	X	X
BMI 25 kg/m ² or less/self-reported weight	X	✓	X
Blood pressure less than 130/80 mmHg	X	X	X
Patient knowledge	✓	X	X
Health status	X	✓	✓
Hospital admission	✓	✓	✓
Satisfaction with care	X	X	✓
Ease of access to health care	X	X	X

✓ Indicates that there are questions in the relevant survey that cover this indicator. X Indicates that there are no questions in the relevant survey that cover this indicator; HbA_{1c} = glycated haemoglobin. * 2002 survey only. † Not collected in the years that were examined. ◆

screening; only AusDiab collected information on monitoring of HbA_{1c}, and information on weight checks was not collected at all. Information on the range of health professionals who were involved in the respondents' care was not sought in the NSW HS and was limited to the last 2 weeks in the 2001 NHS. Overall, the information sought focused on individual issues rather than access to and use of health services.

Discussion

In this work we explored a new approach to investigating access to and use of quality PHC using recognised population-based surveys in Australia, using diabetes as a case study, and suggesting indicators of access to quality PHC that could be sought through inclusion of relevant questions in population health surveys. In comparing and contrasting the data collections in three recognised population-based Australian surveys in relation to diabetes care, we highlighted limitations in the information sought on access to and use of PHC and the focus of the questions on individual care rather than use of services. This approach provided a useful focus for developing measures of access to and use of quality PHC that could be applied in population health survey questions and other PHC-related population health data collections.

The NDSG has expressed interest in developing a set of indicators for use in assessing aspects of diabetes-related care.²³ Our analysis of the draft NDSG indicators against domains of care noted a lack of proposed indicators for some aspects of care that may reflect unavailability of data from routine data collections, while the national guidelines for general practice¹⁰ were more comprehensive.

While there has been discussion about the accuracy of self-reported survey data, a recent comparison of data collected through a GP-based patient survey with record audit had reasonable sensitivity and specificity.³⁰ While acknowledging survey limitations, these methods are acceptable for eliciting many aspects of patients' care.³⁰ Effort is needed to minimise measurement prob-

lems through design and validation of questions. Secondary analysis of these data will contribute to development of theories about how people use services, and their impact on health outcomes that could be further investigated using other study designs.

The scope of the questions in regard to our proposed indicators of access to and use of quality PHC for people with diabetes varied between the three surveys. A number of issues with the questions could be explained because the survey questions were not designed for the purpose of examining access to health care.

Standard questions on diagnosis and type of diabetes were developed through the National CATI Health Survey Technical Reference Group, an advisory committee to the National Public Health Information Working Group which aims to develop question modules for behavioural risk factor and chronic disease topics based on well-developed conceptual frameworks that underpin the data requirements for health surveillance. The standardisation of the questions on diabetes diagnosis indicates that it is possible to develop a consensus among stakeholders about both topics and questions. It also suggests that further discussion about the development and inclusion of questions on access to and use of PHC is warranted. We believe that our approach contributes to this discussion because of its systematic method of indicator development and specific focus on PHC.

Clearly, there are limitations in the design and scope of questions that can be asked in a population health survey, which will always involve compromise on the topics that are covered and the range of questions about each topic that are included. The NSW HS attempts to deal with this issue in its annual survey planning by including core questions in each annual survey and then supplementary questions that are included at intervals but not annually. Other ways to increase the data collection related to specific questions might be to reapproach specific sub-groups identified through the main survey and administer a supplementary survey to willing participants. There is also a need to

continue to work towards consistency and coordination of the data collections across different surveys. With a repetition of AusDiab already underway perhaps there are opportunities to ask more extensive questions relating to the domains of care and then to use a subset of these questions for the other population health surveys.

Given the current fragmentation of the PHC sector in Australia, and its diversity of funding sources and ownership structures, a comprehensive primary health care data collection is unlikely to be developed in the near future. Our approach may enable researchers interested in PHC to better describe the broad range of PHC services used by people. These data would contribute to better understanding the role of the PHC sector and the extent to which people access and use quality PHC. The data would also provide additional information on service use by people who do not use traditional services.

The next stage in this research is to test the utility of this approach. We will describe the sociodemographic patterns of access to and use of health care for people with diabetes using current data collections and applying the approach that we have described. In addition, further work is needed to test this approach for other health conditions, such as chronic respiratory disease or cancer.

Conclusion

We have proposed an approach to the use of health surveys to provide information on access to and use of quality PHC, using diabetes as an example. While we identify some gaps in current collections, we suggest that our approach might inform the development of population health surveys for this purpose. This approach would extend the utility of population health surveys, justify further investment in their development, and provide a more complete picture of the range of primary health care services that people use to manage their health problems. This information would complement and enhance other population health data collections that are available through other sources.

The information would contribute to the work of practitioners and policy planners in the development and funding of PHC medical and non-medical services. It would also provide a means of monitoring the impact of population-based interventions to support the implementation of comprehensive diabetes-related health care.

Health survey data would complement and enhance existing population health data collections such as that collated by Medicare Australia. Triangulation of survey data with these data collections could enhance the potential usefulness of these data collections to provide information on the management of selected health problems such as diabetes.

Against a background of rapid change in the delivery of health care, especially the increased provision of care in the community for conditions that previously would have been managed in hospital and increased expectations on PHC to respond to these changes, this would provide additional evidence on the impact of population health interventions. It could also enable evaluation of the impact of population funding incentives, such as chronic disease management Medicare items,³¹ over time. This information would inform the development of both medical and non-medical services in the PHC setting. It would assist in justifying increasing expenditure, changing roles and expectations of PHC practitioners and the need to better address chronic and complex care issues in the PHC setting.

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Competing interests

The authors declare that they have no competing interests.

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