

Quality of care indicators for population-based primary care in New Zealand

Barry Gribben, *Director RNZCGP Research Unit*; Gregor Coster, *Professor of General Practice, Department of General Practice and Primary Health Care, University of Auckland*; Mike Pringle, *Professor of General Practice, Department of General Practice, University of Nottingham, Nottingham, England*; Jonathan Simon, *Medical Director, FirstHealth, Auckland*.

Abstract

Aim. To develop a set of non-invasive, evidence-based, population-based quality of care indicators for primary care in New Zealand and to test their feasibility.

Methods. New Zealand, British and Australian publications were reviewed and a set of quality of care indicators was constructed. These were trialed on data collected from seventeen fully computerised practices from the FirstHealth network of general practices.

Results. 28 indicators are proposed in five categories: smoking cessation, preventive health activities, prescribing

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quality, chronic disease management and data quality. We were able to calculate ten indicators from data already collected routinely, a further twelve could be calculated now with more sophisticated data queries and six would require the trial practices to collect further data.

Conclusions. While any set of indicators is arbitrary there are sufficient research data to support a set of evidence-based, population-focused, quality of care indicators in New Zealand primary health care. In computerised practices these indicators can be calculated from routinely collected data.

Measuring quality of primary health care is a focus of attention within New Zealand and internationally as health care providers and funders recognise the need for objective measures.¹ One method of demonstrating quality is through maintenance of membership of professional colleges and participating in continuing medical education or 'maintenance of professional standards' (MOPS) programmes. Quality may also be measured at a practice level. Tools have been proposed for this purpose by colleges of general practice in New Zealand, Australia and UK, and by other organisations eg, Australian Community Health Accreditation and Standards Programme (CHASP) and Health Plan Employer and Data Set (HEDIS) from the USA National Committee on Quality Assurance.²

There is increasing emphasis on delivering and purchasing primary care at a population level.³ The measurement of outcomes, for example mortality and morbidity rates, remains the gold standard for measuring population health. However, crude rates are insensitive measures of the quality of health care since they may take a long time to reflect changes in quality of care and are heavily confounded by environmental determinants. Process measures can provide more timely indicators of quality and reduce confounding effects of environmental variables on assessments of the quality of care.⁴ This paper proposes a set of process measures for quality of primary care that may be easily calculated from data collected by computerised queries of practice databases.

Methods

The RNZCGP Research Unit was commissioned by FirstHealth, to develop a set of quality of care indicators for the FirstHealth network of general practices. We reviewed recent publications and reports from New Zealand, Australia and the UK.^{2,5-10} We constructed a list of all proposed indicators but restricted this list to indicators that were (a) evidence-based, (b) population-focused and (c) could be easily measured using computerised queries of practice databases or other electronic data sources. To examine the feasibility of this approach in practice we attempted to calculate the indicators using data from seventeen fully computerised general practices in the FirstHealth network.

Results

The indicators developed fell into natural groups: smoking cessation, preventive health activities, prescribing quality, chronic disease management and data quality. Table 1 gives

the complete set of indicators and shows whether an indicator could be calculated, whether a modified structured query language (SQL) query could enable the indicator to be calculated from collected data, or whether a new data element would be needed.

Table 1. Indicator summary.

Indicator	Now	New SQL	New data
% smoking	✓		
% smokers given advice			✓
Smear	✓		
Mammogram		✓	
Childhood immunisations	✓		
Flu immunisations for aged 65 and older	✓		
BP screened	✓		
Bronchodilators to inhaled steroids	✓		
Penicillins to Cephalosporins	✓		
Trimethoprim to Cotrimoxazole	✓		
Paediatric (amoxicillin + clavulanate) to amoxicillin	✓		
Low risk NSAID to (medium and high) risk NSAIDs	✓		
Long to short acting sulphonylureas	✓		
Anxiolytics and hypnotosedatives prescribing rate	✓		
warfarin in NVAf		✓	
ACE in HF		✓	
Statins in IHD (secondary prevention)		✓	
Aspirin for sec prophylaxis		✓	
% of asthmatic patients with action plans.			✓
% HbA1c recorded in last six months		✓	
% of diabetics with HbA1c below 7%		✓	
% with eye check in last 2 years			✓
% with feet sensation checked in last year			✓
% ACR in last year		✓	
% pats with creatinine > 0.150 on metformin or glibenclamide		✓	
% pats with microalbuminaemia not on ACE inhibitor.		✓	
% with elevated BP (>160/90)			✓
% with cardiovascular risk assessed			✓
Data quality score	✓		

'Now' = could be calculated from currently collected data. 'New SQL' = requires access to patient level data, 'New data' = requires recording of new data element in patient notes (or sophisticated/time consuming search of written notes or letters).

Smoking cessation. Smoking cessation was placed in its own category because smoking is the single most important modifiable risk factor for mortality and morbidity in the population. Provision of simple advice¹¹ and/or the provision of nicotine replacement therapy are effective in promoting smoking cessation.¹² Two indicators were proposed – percentage of patients who are smokers and percentage of smokers who have been offered advice on stopping smoking. We restricted the denominator to patients over sixteen years and assumed that if smoking status was not recorded, the patient was a smoker. This will

substantially overestimate the number of smokers initially, but will provide a strong incentive to enter complete data.

The second indicator requires collecting a new data item: whether advice has been offered on smoking cessation. This may require that software vendors modify their software to support the delivery and recording of smoking cessation advice. A mechanism similar to cervical smear recalls would need to operate, which reminded GPs to offer cessation advice at regular intervals, and recorded that it was offered.

Preventive health activities. Five indicators were proposed - percentage of eligible women who have had a smear in the last 3½ years, percentage of eligible women who have had a mammogram in last 2½ years, percentage of children whose immunisations were completed at two years, percentage of people aged 66 and older who have had received influenza vaccination in the previous year, and the percentage of people over 35 who have had their blood pressure recorded in the last five years.

The first three indicators are uncontroversial, being included in many proposed quality indicator sets. The fourth, (influenza vaccination) has been shown to reduce morbidity and mortality in the elderly.^{13,14} We chose the cut off age of 66 years to allow eligible persons a year to get immunised and to allow the examination of immunisation data from the previous year.

The fifth indicator in this set, recording BP, was included because of the strong evidence linking antihypertensive treatment to improved outcomes.¹⁵ It would be desirable to document actual levels of blood pressure, as it is this which correlates with improved outcomes (for BP < 160/90); this indicator is included in a later component.

Prescribing quality indicators. Considerable attention has been directed in the UK to developing prescribing quality indicators. The collection of complete data in the prescribing analyses and cost (PACT) system has made this a useful source of data on prescribing quality and prescribing cost-effectiveness.¹⁶ After considering the various proposed indicators we proposed two sets of indicators, depending on how tightly each was bound to disease coding.

Set 1 - derived from raw data from Health Benefits Limited (HBL). These indicators can be calculated from claims data directly from HBL. They all rely upon complete data collection and for some indicators this is not guaranteed if the maximum allowable patient prescription charge exceeds the cost of the pharmaceutical. There is a move to require complete data collection from pharmacies, and at that time indicators dependent on the costs of these cheaper pharmaceuticals will become more reliable.

Until that time community service card (CSC), general medical services (GMS) category and high user health card (HUHC) adjustments can be made to control for differences in the eligibility of patient populations to subsidies, for example calculating ratios by adjusting prescribing rates for CSC holding rates. A much better alternative would be to calculate rates and ratios using data directly extracted from the patient record. This will be possible when all (or nearly all) prescribing is computerised. The only complicating variable then becomes differential prescription pick-up rates. However, it is reasonable to argue that, for the purposes of prescribing indicators of quality, it is the act of prescribing that is relevant, not obtaining the prescription.

We suggest the following indicators:

(a) Ratio indicators

- bronchodilators to inhaled steroids^{17,18}
- penicillins to cephalosporins
- trimethoprim to cotrimoxazole

- paediatric amoxicillin + clavulanate to amoxicillin
- low risk NSAID to medium and high risk NSAIDs
- long to short acting sulphonylureas.

(b) Rate indicators

- Rate of hypnotic and anxiolytic prescribing per patient.

Studies^{7,19} on some of these ratios have been published and are available on the BMJ's web page (www.bmj.com/cgi/content/full/313/7069/1371/DC1). We chose indicators based on the patterns of prescribing in New Zealand.²⁰ The distribution of ratios is presented in Figure 1 to show how these might be reported. We recast the calculation of ratios so that 0% is a good score. This avoids division by zero problems in calculating ratios. Ratios reflect total prescription numbers, that is number of prescriptions dispensed by a pharmacist, not the volume of drug dispensed (number of prescribing units). The percentage values reported have been scaled by dividing each value by the average value for each indicator. Thus a score of 1 on the x-axis for each indicator represents the average rate of the indicator.

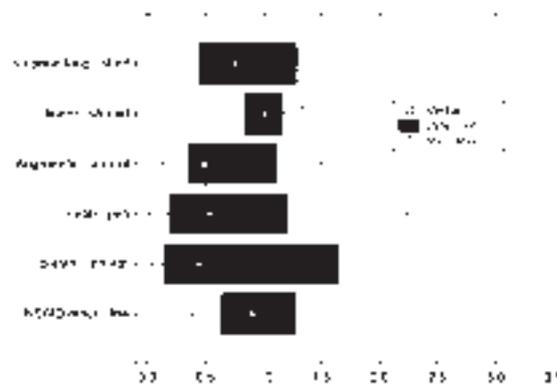


Figure 1. Summary of ratio prescribing indicators. The X-axis is a ratio constructed as described in the text. A score of zero is high quality practice. Scores are scaled so that 1 corresponds to the mean ratio of drug group volumes for each category.

The rate measure in this set, the number of prescriptions for anxiolytics and hypnotics dispensed per registered patient should be calculated with age-standardisation as the different age structures of practice populations can have an important effect on prescribing rates. This is less important for ratio measures, which reflect prescribing choices in a specific clinical situation. It must be stressed that these ratios and rates are arbitrary, not absolute values.

Set 2 - requiring cross referencing to disease coding. These indicators are tightly bound to disease prevalence within the registered population. They can be calculated by comparing aggregate statistics from the practice and HBL databases in the first instance, but could also be calculated from practice databases if prescribing were computerised and accessible in a SQL query.

- warfarin in non-valvular atrial fibrillation²¹
- ACE inhibitors in heart failure²²
- statins in secondary prevention of ischaemic heart disease²³
- aspirin for cerebral vascular events prophylaxis²⁴

In calculating these indicators for the supplied datasets, ie using aggregate rates instead of examining individual patients records, we were seriously constrained by the accuracy of disease coding. If prescribing were linked with individual patient data the effect of non-recording on the

usefulness of these indicators would be lessened, as a 'zero' score, would indicate that a recommended intervention had not occurred. The calculation of these indicators requires a SQL query to access patient level regular medication and diagnosis tables.

Chronic disease management indicators. These indicators measure the quality of care being received by patients with chronic illnesses. The previous section on prescribing quality indicators includes a number of indicators that relate to management of chronic illnesses. The items in this group relate to additional, validated interventions that have been proven to improve outcomes. Most of them would require the collection of new data from clinical records and/or linking prescribing and laboratory data to individual patients. Whenever possible these indicators are based on guidelines, published or in preparation.

Asthma.

- % of asthmatic patients with action plans. This indicator requires the collection of a new piece of data – whether an asthmatic patient has an action plan or not. This would have to be entered as a new data item by the doctor, rather than merely writing a new SQL query.

Diabetes.

- % HbA1c recorded in last six months
- % of diabetics with HbA1c below 7%
- % with eye check in last two years
- % with feet sensation checked in last year
- % albumin:creatinine ratio (ACR) in last year
- % pats with creatinine > 0.150 on metformin or glibenclamide
- % pats with microalbuminaemia not on ACE inhibitor.

We were able to calculate the percentage of diabetics with HbA1c recorded in the last six months from existing data, however the other six items in the quality of care set could not be calculated due to lack of data. A comprehensive recall and review of diabetes by GPs has been shown to be as good if not better than hospital clinics.²⁵ Hence, the case for recording these data is strong given the high prevalence (and incidence) of diabetes, and the high morbidity and mortality associated with poor diabetes management. Some of these indicators would require access to actual values of lab tests (HbA1c, creatinine, and ACR determinations). All these data are elements of a proposed national diabetes minimum dataset.^{26,27}

Hypertension.

- % with elevated BP (>160/90). The screening for elevated BP is already in the dataset (% adults over 35 with BP recorded in last five years). This indicator requires the actual recorded BP, which is not presently available. Its interpretation is complicated by such factors as transient elevation, however anything more complicated than merely accessing the latest BP would be a very difficult informatics task.

Cardiovascular risk assessment.

% with cardiovascular risk assessed. The National Heart Foundation guidelines for management of mildly elevated hypertension and hypercholesterolaemia are based on the concept of absolute risk. Access to subsidised medicines can also depend upon a patient being in a high risk group. Primary prevention of cardiovascular disease may be achieved by prescribing statins to high risk groups.²⁸ Accordingly, we propose including the assessment of absolute risk of a cardiovascular event as a quality of care indicator. This would require the entering, or calculating, of a new piece of data by the doctor.

Data quality indicators. This indicator is included on the premise that high quality data are necessary for high quality

general practice. We developed a set of data quality indicators in previous work, using prescribing and laboratory data to estimate disease prevalence rates.¹⁰ We suggest that the data quality indicator (% threshold crossed from a set of indicators) be included as a marker for high quality of care. The threshold values are of necessity arbitrary, and could change as requirements on data collection become more stringent.

Discussion

Some of the above proposed indicators are arbitrary and based on perceptions of good practice.²⁹ Furthermore, they have a narrow focus and careful interpretation of the findings is required.⁸ Despite their limitations,^{5,16} these indicators serve as a starting point to encourage health professionals to collect measurable data on those aspects of professional performance over which they have substantial control and for interventions that can improve health outcomes.^{6,7} However, there is no 'correct' set. As new interventions and research data become available more meaningful indicators will be developed. The proposed indicators are suggested as a compromise between validity and feasibility, with ease of collection being the pre-eminent criterion. Analysis of individual case notes could more accurately assess quality of care for specific patients, but such an exercise would be labour intensive and cost prohibitive. More sophisticated information technology may permit this type of approach to be utilised in future.

The assessment of quality of care at the population level is becoming an important component of health care purchasing strategies in a capitation funding environment. It is imperative that quality indicators are trialed in practice to ensure they are appropriate and acceptable to both health care providers and funders.^{8,30} Studies have shown that such a task is feasible.^{9,30} In these days of evidence-based medicine, quality indicators have the potential not only to improve the quality of patient care but also have an impact on the population's health.

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Correspondence. Barry Gribben, RNZCGP Research Unit, Department of General Practice and Primary Health Care, University of Auckland, PO Box 92019, Auckland. Fax: (09) 834-2970. Email: b.gribben@auckland.ac.nz

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