

1 Introduction

1.1 Purpose

This project forms part of a systematic review currently being undertaken by the Australian Centre for Asthma Monitoring (ACAM) to refine and simplify Australia's national asthma data monitoring system. The primary purpose of this study was to review the currently recommended list of 24 national asthma indicators in order to identify a smaller set of core indicators, which provide the most information and which are more effective at signalling change, for future asthma monitoring activities.

1.2 Background

The Australian System for Monitoring Asthma (ASMA) has been developed to monitor asthma data and inform policies addressing asthma in Australia. It is an indicator-based monitoring system in which defined measures of interest (indicators) have been developed for data collection and monitoring. The current asthma monitoring system is based on 24 asthma indicators (see Table 1).

These were initially developed at a workshop convened by the Australian Institute of Health and Welfare (AIHW) in 2000 (AIHW 2000) and subsequently refined by ACAM in 2004 (Baker et al. 2004). They cover the areas of disease prevalence, impact (quality of life, disability, disease severity and mortality), risk factors, health service use and management practices.

In the report *Australian asthma indicators: Five-year review of asthma monitoring in Australia* (ACAM 2007), ACAM recommended a review of the national asthma indicators in order to simplify the asthma monitoring system by excluding indicators that were no longer relevant, or that were redundant or not feasible to measure in the foreseeable future. Two overlapping projects were proposed to revise the existing set of indicators. One of these projects employed an expert opinion approach, via the use of a Delphi survey, to obtain expert input on the relative merit of each asthma indicator. The other project was data-driven and involved the assessment of statistical correlations between data series for some asthma indicators to identify redundancy within the existing set of indicators.

Delphi surveys

A Delphi survey is a qualitative research method used to gain consensus among a panel of individuals who have knowledge of the topic (Keeny et al. 2006). It employs a series of surveys (referred to as rounds) in which each subsequent survey provides summary feedback to the panellists from the responses to the previous survey and invites panellists to modify their responses based on the views of the group (Keeny et al. 2001). By this means, it implements a structured group communication process in which panellists can be influenced by the responses of others in the group. The goal of a Delphi survey is to organise a debate, collect and synthesise opinions and to achieve a degree of consensus and agreement among participants (Hader & Hader 1995).

A key component of the methodology of the Delphi technique is that the identities of panellists and their individual responses are kept hidden from the rest of participants (Hasson et al. 2000). This is designed to avoid dominance in the group by more outspoken or prestigious participants. However, although the panellists remain anonymous to each other, they are not anonymous to the

investigators who need to know their identities in order to feed back responses and to follow up panellists during rounds. A high retention rate along all survey rounds is crucial as the number of participants is usually small.

A Delphi survey is a valuable tool for accessing the judgment of experts in circumstances where there are limits in the ability of empirical methods to ascertain information because knowledge is, by its nature, incomplete or unavailable (Powell 2003). This is relevant to the situation existing for most asthma indicators, and this method has the potential to provide helpful information for refining national asthma indicators.

Table 1: Current national asthma indicators

Indicator	Description
1 Ever asthma	Reporting ever having doctor-diagnosed asthma
2 Current asthma	Reporting doctor-diagnosed asthma plus symptoms of or treatment for asthma in the last 12 months
3 Current wheeze	Reporting wheeze in the preceding 12 months
4 Airway hyperresponsiveness	Proportion of the population who are diagnosed with airway hyperresponsiveness
5 Deaths (all ages)	Deaths due to asthma in the population
6 Deaths (age 5 to 34 years)	Deaths due to asthma among people aged 5 to 34 years
7 Hospitalisations	Episodes of hospitalisation for asthma
8 Hospital patient days	Patient days (or 'bed days') in hospital for asthma
9 Individual hospitalisations	People hospitalised for asthma
10 Hospital re-admissions	Re-admissions to hospital for asthma within 28 days of a previous admission for asthma
11 Emergency department attendances	Attendances at emergency departments in the population for asthma each year
12 Re-attendances	Re-attendance at either hospital or an emergency department for asthma within 28 days of a previous attendance for asthma
13 General practice encounters	General practice encounters for asthma
14 Urgent asthma visits	Total healthcare visits (hospital, emergency department and general practice) for asthma exacerbations or worsening asthma
15 Asthma Cycle of Care uptake	Asthma Cycle of Care (formerly Asthma 3+ Visit Plan) Practitioner Incentive Program payments
16 Asthma action plans	People with asthma who have a written asthma action plan
17 Preventer use	People with asthma who use preventers (inhaled corticosteroids, leukotriene receptor antagonists or similar drugs) regularly
18 Quality of life	People with asthma who report poor health-related quality of life
19 Smoking	Current smoking among people with asthma
20 Children residing with smokers	Smoking in households where children with asthma reside
21 Spirometry	People with asthma who have had spirometry within the last 12 months
22 Asthma control	A composite indicator developed from measures of symptoms and medication use to impute the proportion of people with asthma who have poor clinical control
23 Occupational asthma	Asthma caused by occupational exposure
24 Costs of asthma	An index derived from expenditure and burden of disease data to examine the costs of asthma to individuals

Note: These are the indicator descriptions provided to panellists involved in the Delphi survey.

Correlation analysis

Correlation is a measure of the strength of association between two continuous variables. Two variables that are highly correlated contain essentially the same information and, hence, one of them can be considered redundant. We applied this methodology to the analysis of indicators that had been measured using existing data sources to see if any combination of two indicators were highly correlated. If two items were strongly correlated we considered that one of them was redundant and could be excluded from the indicator list.

Approaches such as the expert opinion and data-driven methods used here are consistent with those used in the creation and refinement of health indicator lists in other jurisdictions. In Scotland, a mixed approach was used to establish a robust set of mental health indicators for adults (NHS Health Scotland: Parkinson 2007; Parkinson 2006). In the United States, committee members were asked to rank-order lists of national health indicators according to their personal judgment (IOM 1999). A similar method was used in Canada, where a modified Delphi process was undertaken to develop a draft list of population health indicators at a consensus conference held in 1999 (Canadian Institute for Health Information (CIHI) 1999). Indicators were retained or rejected on the basis of average scores. A second consensus conference was held in 2004 to identify information gaps, validate the originally proposed indicators and identify potential new indicators (CIHI 2005).

1.3 Aim and objectives

The overall aim of this body of work was to define an efficient set of indicators for asthma that are useful for stakeholders, avoid redundancy and can be measured reliably and validly using population data.

Specific objectives of the Delphi survey

There were three main objectives of the Delphi survey:

- 1) To consult individuals with interest and expertise in asthma and data monitoring on the priority of individual indicators for monitoring asthma in Australia
- 2) To obtain consensus among asthma and data monitoring experts on which indicators are the most important in the asthma monitoring system
- 3) To engage asthma and data monitoring experts in the asthma monitoring process.

Specific objectives of the correlation analysis

The objectives of the correlation analyses were:

- 1) To examine correlations among asthma indicators that are classified by sex, age group, geographical remoteness and socioeconomic disadvantage of location of residence
- 2) To use this information to identify a smaller set of indicators that provides independent information with minimal redundancy.