



Computer
Assisted
Telephone
Interviewing
Technical
Reference
Group

Population Health Monitoring and Surveillance:
Question Development Background Paper

Asthma in Australia

May 2003

CATI Technical Reference Group
National Public Health Partnership

Computer Assisted Telephone Interviewing (CATI) is a methodology widely used for surveillance of health behaviours and health outcomes in populations in Australia. The National CATI Health Survey Technical Reference Group (CATI TRG) is an advisory committee to the National Public Health Information Working Group under the National Public Health Partnership. Members of the CATI TRG include representatives from State/Territory Health Departments, the Commonwealth Department of Health and Ageing (DoHA), the Australian Bureau of the Statistics, the Australian Institute of Health and Welfare and the Public Health Information Development Unit at the University of Adelaide. Since its inception in 1999, the CATI TRG has been a forum for the development and promotion of national standards, valid methods and capacity for CATI health surveys and health surveillance.

To embark in the efforts towards 'harmonisation' of CATI health surveys in Australia, the CATI TRG has identified the need 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 proposed question modules are set to undergo a rigorous process of cognitive and field-testing under the guidance of the CATI TRG and the results will be published in a question module manual as a key reference to those interested in CATI health surveys in Australia.

This paper has been prepared by the CATI TRG as part of a series, with funding predominantly from the DoHA. Its preparation has involved input from all State and Territory jurisdictions, DoHA, the Australian Bureau of Statistics, the Australian Institute of Health and Welfare and the Public Health Information Development Unit at the University of Adelaide as well as recognised content experts.

Any comments or information relevant to the subject matter of this background paper would be welcome. Correspondence should be directed to:

Chair
National CATI TRG
c/- Population Health Data & Information Services Unit
Australian Institute of Health & Welfare
GPO Box 9848 (MDP 16)
CANBERRA ACT 2601

Tel: 02 6244 1000
Fax: 02 6244 1299
Email: info@aihw.gov.au

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Asthma in Australia

1 Introduction

The purpose of this background paper is to present the conceptual framework that underpins the concepts and data requirements for the ongoing monitoring and surveillance of asthma in Australia. This will assist in the development of nationally agreed computer assisted telephone interview (CATI) survey questions to monitor the prevalence of asthma and its associated impact on individuals.

The prevalence of asthma is a concern for both health authorities and the general population in terms of personal, social and economic costs. In the 2001 National Health Survey, 11.6% of the Australian population reported having asthma. Asthma was identified as the sixth National Health Priority Area in 1999.

This paper is divided into five sections. Section 2 provides a profile of asthma. Section 3 describes the factors influencing the health of people with asthma. Section 4 identifies data requirements and concepts that are necessary and desirable to monitor asthma. Section 5 outlines a number of issues and methodologies applicable to the monitoring of asthma.

This paper will provide a valuable resource to those interested in the monitoring and surveillance of asthma consumption.

2 Profile of asthma

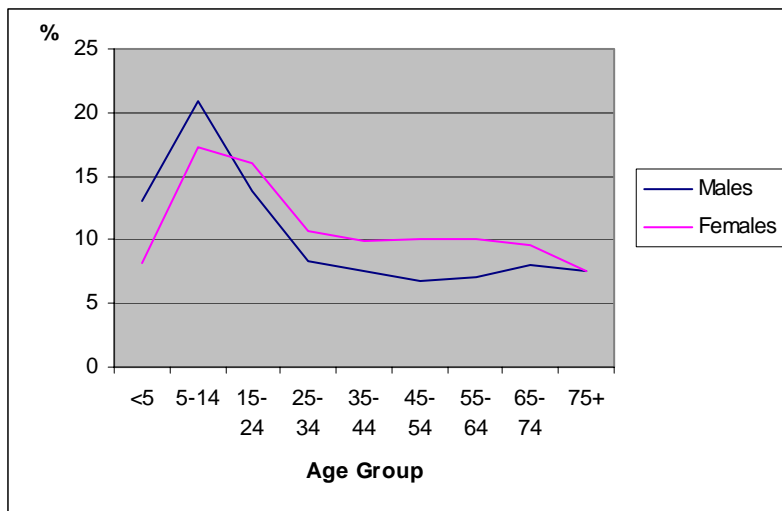
There is a general lack of agreement on a definition of asthma and diagnosis and thus operationalisation is problematic. However, one possible definition is: asthma is an inflammatory disorder of the airways in which the small airways are hypersensitive to a wide range of stimuli that cause them to narrow too much, resulting in symptoms of wheeze, chest tightness and shortness of breath.

2.1 Asthma prevalence

The prevalence of asthma is a concern for both health authorities and the general population in terms of personal, social and economic costs. Asthma was identified as the sixth National Health Priority Area in 1999.

In 1995, 11.3% of Australians (2.0 million people) had asthma, an increase on the 8.5% prevalence in 1989-90. This increase may be the result of a number of factors including: actual increased prevalence of asthma, heightened awareness of this condition and/or improved identification and treatment. This increase cannot be attributed to the ageing of the population because age-specific rates for asthma were highest in those aged less than 25 years (ABS 1998).

Prevalence of asthma by sex and age group



Source: National Health Survey: Asthma and Other Respiratory Conditions, Australia, 1995, ABS Cat. No. 4373.0.

2.2 Morbidity and mortality

In 2000, there were 454 deaths where the category asthma and status asthmaticus was identified as the underlying cause (169 males and 285 females), accounting for 0.4% of all deaths in that year. The standardised death rate for females was one third higher than that for males. Death rates for asthma have declined in recent years. Between 1990 and 2000, the standardised death rate for asthma and status asthmaticus fell by 57% (65% for males and 49% for females) (ABS 2001).

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Burden of disease is a measurement of the difference between current health status and the ideal of living into old age free of disease and disability. It can be measured using the disability-adjusted life year (DALY), which takes into account the impact of disability and other non-fatal health outcomes, as well as the impact of premature death. One DALY is equivalent to one lost year of “healthy” life. DALYs are calculated as the sum of years of “healthy” life lost due to poor health or disability (YLD) and years of life lost due to premature mortality (YLL).

In Australia in 1996, asthma accounted for 2.6% of total DALYs (2.1% for males and 3.1% for females). This 2.6% includes 4.8% of YLD and only 0.6% of all YLL, reflecting the fact that asthma is a major cause of chronic disability rather than death (AIHW: Mathers et al. 1999c).

2.3 Asthma and the health care system

In 1998-99, asthma was the sixth most frequently managed problem (32 per 1,000 encounters) by general practitioners, accounting for 2.2% of problems managed (AIHW: Britt et al. 1999b).

Asthma was one of the five most common reasons for referral to hospital by general practitioners in 1998-99 (AIHW: Britt et al. 1999b). In 1997-98, asthma was the principal diagnosis in 60,280 hospital separations (1.1% of all hospital separations), with an average stay of 3.5 days. Asthma is often reported as an additional diagnosis. When both principal and additional diagnoses are combined, there were 251,472 or 4.52% of all hospital separations where asthma was reported as a cause (AIHW 1999a). Asthma is also one of the most common reasons for emergency department admissions (AIHW 2000).

2.4 Health system costs

In 1993-4 the total health system cost of asthma was estimated at \$438 million, which was 40% of the total expenditure on chronic respiratory diseases (AIHW: Mathers et al. 1999c). The total cost burden of asthma to the community is much higher.

3 Factors influencing the health of people with asthma

3.1 Predisposing, causal and contributing factors

The Global Initiative for Asthma Management and Prevention Workshop Report (1995) identified the interaction of predisposing, causal and contributing factors in the development of asthma.

In terms of predisposing factors, atopy - a hypersensitive state in which an individual has the propensity to produce abnormal amounts of IgE antibodies in response to exposure to environmental allergens - is considered the strongest identifiable risk factor for the development of asthma (NIH 1995). Both twin and family studies have shown that atopy is at least partly under genetic control (NIH 1995). It has been estimated that 90% of children and 80% of adults with asthma are atopic (Thoracic Society of Australia and New Zealand & Australasian Society of Clinical Immunology and Allergy 1997).

Causal factors such as inhaled allergens are thought to sensitise the airway and contribute to the onset of asthma. Contributing factors, such as tobacco smoking, air pollution, viral respiratory infections, small size at birth, diet and parasitic infections, may either augment the likelihood of asthma developing or increase susceptibility to asthma.

Smoking has been identified as a health risk factor for many conditions, including asthma. In 1995, 24% of Australian adults (aged 18 years or more) were current smokers, a further 27% were ex-smokers and 49% had never smoked. When age and sex standardised rates for adults are compared, the prevalence of asthma was higher among smokers (11%) and ex-smokers (11%) than among those who had never smoked (9%) (ABS 1998).

The prevalence of asthma in young children living in households with one or more smokers was higher than in non-smoking households. Of those aged 0-4 years, 13% in households with one or more smokers had asthma compared with 9% in households where there were no smokers. Of those aged 5-9 years, the rate of asthma was 22% in smoking households and 18% in non-smoking households. In contrast, for children aged 10-14, asthma was less prevalent in those living in smoking households (17%) than in those in non-smoking households (20%). Differences in asthma rates between smoking and non-smoking households were proportionally greater for boys than for girls in each age group under 15 years. The differences between non-smoking households and those with one or more adults who were ex-smokers were not investigated as no information was collected on how recently people had given up smoking (ABS 1998).

3.2 Protective factors

A number of protective factors against asthma onset have been identified including having been breastfed for more than six months and having older siblings (NSW Asthma 2002).

3.3 Population groups at risk of developing asthma

There are a number of groups at greater risk of developing asthma. Some occupational fields increase the risk of developing asthma, for example individuals who work with animals such as laboratory workers and veterinarians who are exposed to dander and animal urine proteins; and also manufacturing workers who may be exposed to certain chemicals (NIH 1995).

Infants born at a low weight are also thought to be at increased risk of developing asthma during childhood or adolescence. The mechanism is unclear, but may involve reduced airway size and calibre and increased susceptibility to viral infections (NIH 1995). Certain conditions, such as viral respiratory infections and pregnancy, may also aggravate asthmatic symptoms (McDonald & Burden 1996).

3.4 Triggers for symptoms of asthma

Triggers are involved in the development of exacerbations of asthma once an individual's airways are sensitised. Triggers may include exposure to factors such as exercise, cold air, weather changes, inhaled allergens such as dust mite or cockroach, diet, exercise, extreme emotional expression, air pollutants, fungi, pollens, respiratory infections, aspirin and other drugs (Global Initiative for Asthma 1995).

3.5 Management of asthma

There is no cure for asthma but appropriate management of the disorder often leads to its control. The National Asthma Campaign identifies six aims of asthma management:

- Minimise symptoms;
- Maximise lung function and maintain best lung function at all times;
- Identify trigger factors;
- Minimise side-effects from medication in order to achieve best quality of life for the person with asthma; and
- Reduce morbidity and mortality.

The six steps in the management plan for asthma

The Asthma Management Handbook (2002) notes six steps that should be followed by clinicians. These are:

- Assess asthma severity;
- Achieve best lung function;
- Maintain best lung function/ avoid trigger factors;
- Maintain best lung function with optimal medication;
- Develop an action plan; and
- Educate and review regularly.

These six steps cover a number of important concepts relating to asthma, which are outlined below.

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Step 1

Assessing asthma severity in a clinical setting involves asking a number of questions relating to: the frequency of night-time wheeze or cough which required the use of a reliever; the frequency of use of reliever; the number of puffs needed to gain relief; and the effect of wheeze, cough or chest tightness on normal daily activities. Thus, questions relating to step 1 cover concepts such as frequency of night-time symptoms, the use of relievers, and the effect of asthma on life.

Step 2

Compliance is the critical factor in achieving best lung function. This involves the correct usage of the inhaler device as well as stressing the importance of maintaining the prescribed medication regimen. Step 2 involves concepts such as inhaler usage and use of medication.

Step 3

Identifying and avoiding trigger factors may improve an individual's asthma. Concepts covered by step 3 revolve around trigger factors such as exercise and exposure to allergens.

Step 4

Maintaining best lung function involves optimising the medication program to ensure absent or minimal symptoms, absent or minimal use of reliever medication, no nocturnal or early morning symptoms and none or minimal side effects from medication. Step 4 covers a number of concepts including frequency of use of reliever medication, frequency of symptoms, and side effects from medication.

Step 5

Developing a written asthma action plan with a medical practitioner aims to provide individuals with information, which helps them to make decisions about responding to deterioration in condition. The concept of a written asthma action plan is covered by step 5.

Step 6

The concept covered by step 6 relates to education of the patient.

4 Data requirements and concepts to be measured

Following the Commonwealth Government announcement of asthma as the sixth National Health Priority Area in 1999, a number of initiatives were undertaken to reduce the burden of disease associated with asthma. As a result of an initiative of the Australian Health Ministers' Advisory Council, the Australian Centre for Asthma Monitoring (ACAM) was established at the Institute of Respiratory Medicine, Sydney, in February 2002. ACAM is a collaborating unit of the Australian Institute of Health and Welfare (AIHW). The purpose of ACAM is to undertake research and to provide expert advice on the current levels, recent trends and socio-demographic patterns of asthma in Australia; and to prepare a plan for future development of data and information systems to monitor asthma (AIHW 2002). ACAM will monitor asthma using a set of national indicators that were agreed to at a workshop conducted by the AIHW in 2000. Details of these indicators are as follows.

4.1 Disease prevalence

Prevalence rate for asthma.

4.2 Co-morbidity

Prevalence rate for obesity and overweight in people with asthma.

4.3 Primary care, emergency department attendance and hospital separation

Rate of asthma related GP visits.

Re-admission rate, within one month, for asthma.

Rate of asthma related emergency attendance.

Hospital separations for asthma.

4.4 Quality of life

Average number of sick days due to asthma per year.

Proportion of persons who perceive their asthma as a limitation on their physical activity, social role and emotional well-being.

4.5 Mortality

Death rate for asthma among persons aged 5-34 years.

4.6 Risk factors

Prevalence rates for smoking among persons with asthma.

Prevalence of smoking within the household where children with asthma reside.

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Prevalence of occupationally caused asthma.

Prevalence of occupationally aggravated asthma.

4.7 Management

Proportion of people with asthma who have a recent written Asthma Action Plan developed in consultation with their GP.

4.8 Health Maintenance

Proportion of people with asthma who regularly attend for review of their Asthma Action Plan.

Proportion of people with asthma who have had spirometry measurements in the last twelve months.

- (a) Proportion of people with asthma for whom preventers are indicated and use preventers regularly.
- (b) The ratio of preventer to reliever among asthma patients.

4.9 Education

Proportion of schools (primary & secondary), child-care centres, pre-schools and hospitals using standard asthma education programs.

4.10 Severity

Proportion of people with asthma who have been woken at night due to their asthma.

4.11 Disability

Proportion of people with asthma who are restricted in their performance of core activities.

5 Issues in measurement

This section discusses the methods and issues involved in measuring the data requirements for the surveillance of asthma.

5.1 Measuring current asthma prevalence

The prevalence of asthma is difficult to ascertain with great accuracy, as there is neither a 'gold standard' for diagnosis nor a standard definition of asthma, which is suitable for epidemiological studies (Burr 1992).

The difficulty in measuring the prevalence of asthma can be seen in epidemiological studies both in children and adults which consistently suggest that asthma is under diagnosed and as a consequence, under treated. Part of the problem is that many patients tolerate intermittent respiratory symptoms before obtaining a medical opinion. The seasonal nature of asthma symptoms serves to reinforce the acceptance of asthma symptoms. Furthermore under diagnoses can be due to the non-specific nature of the symptoms that can lead to alternative diagnosis by the health care professionals. Not infrequently asthma is diagnosed as variant forms of bronchitis and as a consequence treated inappropriately and ineffectively with successive courses of antibiotics and cough medications (Wilson 1989). As a guide, a diagnosis of asthma is suggested by recurrent episodes of wheeze, persistent nocturnal cough and exercise-induced wheeze (Van Asperen 1995).

An important issue to consider when measuring asthma prevalence is that theoretically asthma is considered as a lifetime condition. However in general, people tend to under report asthma when they are without current symptoms. It is commonly assumed that some people will 'grow out of' their asthma. Therefore it is important to try and identify the group of people who have been diagnosed with asthma at some time during their lives but are without current symptoms.

5.2 Length of reference period

One critical factor that will affect the approach used to measure symptoms and treatments of asthma is the length of the reference period, that is, the length of time period for which the respondent is asked to describe the symptoms of asthma.

In epidemiological research on asthma 'the last 12 months' is a well-accepted reference period to collect data. For example, a definition for 'current wheeze' is the history of wheeze or whistling in the chest over the past 12 months (Robertson 1998). As asthma symptoms vary dramatically in different seasons a twelve-month period should be sufficient.

5.3 Asthma action plan

The problem with collecting information on the asthma action plan is that it is not a direct indication of the management of asthma. The rationale behind the asthma action plan is to assist patients with asthma to recognise deterioration promptly and respond appropriately (National Asthma Campaign 1998). Further research is needed to examine whether patients with an asthma action plan do follow the health care worker's instructions and manage their conditions appropriately. Therefore the data from the questions about action plans merely

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provide information on the number of people who have a written asthma action plan - they do not indicate how the asthma is managed.

Furthermore not all asthmatic patients have an asthma action plan. Approximately 79% of asthmatic cases are mild and only have asthmatic symptoms occasionally. These groups of people are more likely to use reliever medications when symptoms of asthma appear. The feedback from interviewers in the National Health Survey 2001 dress rehearsals suggests that many respondents with asthma have never heard of an asthma action plan.

5.4 Measuring severity

The classification of asthma based on severity is of importance when decisions have to be made about asthma management. If severe asthma exacerbations are not recognised and treated appropriately, such exacerbations can be fatal. However it is important to realise that any patient with asthma, however mild or chronic, may have an acute severe asthma exacerbation (Weiss & Wagener 1990).

The problem with trying to measure asthma severity is that there are no single tests to precisely classify the severity of the disorder. However, combining measurements of symptoms and the measurement of lung function yields a useful characterisation of the disorder by its severity (National Asthma Campaign 1998). According to the Asthma Management Handbook (2002) asthma severity can be assessed by asking a set of questions during general practitioner consultations.

From this list of questions it appears that with a CATI instrument questions about waking up at night with asthma symptoms, restrictions on normal daily activities, reliever use, inhaler use and days lost from school/ work, need to be asked to determine asthma severity. The questions need to be designed in a way that allows the responses to be combined to classify severity as; infrequent episodic asthma (episodes are 6-8 weeks or more apart, the attacks are not severe and there are no interval symptoms), frequent episodic asthma (episodes are less than 4-6 weeks apart, there are some interval symptoms), persistent asthma (symptoms most days, nocturnal asthma more than twice a week, daily use of short acting b2- adrenergic agonists, attacks are severe requiring visits to the hospital).

5.5 Measuring quality of life and disability

Results from the 1995 National Health Survey revealed that unlike other conditions, there was a lower level of restriction associated with asthma. Almost three-quarters (74%) of those with asthma had no disability. A more appropriate way of measuring the quality of life following asthma is to ask questions about the reduced activity due to asthma, for example days off school/work/home duties and the inability to engage in usual activities such as sports and exercise.

The issue with asking questions about the days lost from work and school due to asthma is that many other illness like colds, flu and coughs exacerbate symptoms of asthma. The problem arises when responses vary depending on whether respondents include days off for other illness such as the flu.

With the self-report instrument an issue that needs to be considered is that accurate number of days off in a twelve-month period may be hard to recall without the aid of leave records. Further problems may arise when respondents are trying to determine whether half a day off school/work should be counted as a whole day of work lost. For people engaged in home

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duties does a day off include missing a whole day of home duties or just one or two tasks?
These issues need further clarification.

References

- ABS 1998. National Health Survey: Asthma and other respiratory conditions, Australia, 1995. ABS Cat. No. 4373.0.
- ABS 2001. Causes of death. Australia. ABS Cat. No. 3303.0.
- AIHW 1999a. Australian Hospital Statistics 1997-98. AIHW Cat. No. HSE 6. Canberra: AIHW.
- AIHW: Britt H, Sayer GP, Miller GC, Charles J, Scahill S, Horn F, Bhasale A & McGeechan K 1999b. General Practice Activity in Australia 1998-99. AIHW Cat. No. GEP 2. Canberra: AIHW.
- AIHW Mathers C, Vos T & Stevenson C 1999c. Burden of disease and injury in Australia. AIHW Cat. No. PHE-17. Canberra: AIHW.
- AIHW 2000. Australia's Health 2000. AIHW Cat. No. 19. Canberra: AIHW.
- AIHW 2002. <http://www.aihw.gov.au/collaborating/index.html>.
- Asthma Management Handbook 2002. HYPERLINK <http://www.nationalasthma.org.au>.
- Burr ML 1992. Editorial: diagnosing asthma by questionnaire in epidemiological surveys. *Clinical and Experimental Allergy* 22:09-510.
- Global Initiative for Asthma 1995. HYPERLINK <http://www.ginasthma.com>
- McDonald CF & Burdon JG 1996. Asthma in pregnancy and lactation. *Medical Journal of Australia* 165: 485-488.
- National Asthma Campaign 1998. HYPERLINK <http://www.nationalasthma.org.au/publications/amh/>
- NIH 1995. Global Strategy for Asthma Management and Prevention NHLBI/WHO Workshop. National Heart, Lung and Blood Institute, 95-3659. HYPERLINK <http://ginasthma.com/workshop/ch3/three.html>.
- NSW Asthma 2002. HYPERLINK <http://www.asthmansw.org.au>.
- Robertson CF 1998. Asthma and other atopic diseases in Australian children. *Medical Journal of Australia*, 168: 434-438.
- Thoracic Society of Australia and New Zealand & Australasian Society of Clinical Immunology and Allergy 1997. Specific allergen immunotherapy for asthma. *Medical Journal of Australia* 167: 540-544.
- Van Asperen PP 1995. The management of asthma in children and adolescents. *Modern Medicine of Australia*, October:82-92.
- Weiss KB & Wagener DK 1990. Changing patterns of asthma mortality: identifying target populations at high risk. *Journal of the American Medical Association*, 264: 1683-1687.
- Wilson N M 1989. Wheezy bronchitis revisited. *Archives of Diseases in Childhood*, 64: 1194-1199.

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Secretariat
National CATI TRG
c/- Population Health Data & Information Services Unit
Australian Institute of Health & Welfare
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CANBERRA ACT 2601

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