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**The
Epidemiology of
Asthma in the
ACT**

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TABLE OF CONTENTS

1. Introduction.....	4
1.1 What is asthma?.....	4
1.2 Overview	4
2. Mortality.....	5
3. Morbidity	6
3.1 Hospital morbidity.....	6
3.2 1989-90 National Health Survey	9
3.3 Childhood asthma.....	10
4. Asthma management	10
4.1 Asthma management plan.....	11
4.2 Asthma Card.....	11
5. ACT initiatives	12
References.....	13
Appendix 1: The National Asthma Campaign.....	14
Appendix 2: ACT health goals and targets for asthma	15
Appendix 3: Limitations in developing an asthma profile	16

TABLES

Table 1: Trigger factors reported as provoking wheeze, Victorian study 1993.....	4
Table 2: Deaths caused by asthma, by sex, by age, ACT, 1994	5
Table 3: Hospital separations, by principal and secondary diagnosis, ACT, 1991-94	7
Table 4: Hospital separations, by principal cause of asthma, by number for individuals, 1991-92 to 1993-94, ACT.....	8
Table 5: 1989-90 National Health Survey, age-sex standardised ratios for ACT residents.....	9

FIGURES

Figure 1: ACT Asthma death rates from 1986 to 1993	6
Figure 2: Hospital separations for principal diagnosis of asthma, month of earliest admission, ACT, July 1991 to June 1994	7
Figure 3: Hospital separations for asthma (ICD-9 code 493) inpatients by age, 1993-94	8
Figure 4: Hospital separations for asthma, by average length of stay, by sex, ACT, 1993-1994.....	9

THE EPIDEMIOLOGY OF ASTHMA IN THE ACT

1. Introduction

1.1 What is asthma?

Asthma can be described as a paroxysmal (a severe attack or one increasing in violence) disorder of respiration with laboured breathing, wheezing, a feeling of constriction in the chest, and coughing.¹ It causes inflammation of the airways. The reason for the inflammation is not fully understood, but genetic factors, allergens, viruses and pollutants are thought to play a major role.

A study of asthma in Victorian adults in 1993⁸ showed that trigger factors reported as provoking wheeze by 159 subjects with diagnosed asthma and 430 subjects not diagnosed, but who had non-specific respiratory symptoms consistent with asthma were as follows:

Table 1: Trigger factors reported as provoking wheeze, Victorian study 1993

Trigger factor	Diagnosed asthma (%)	Non-specific respiratory symptoms (%)
Upper respiratory tract infection	86	68
Cigarette smoke	69	44
Smog	68	35
Traffic fumes	64	40
Household chemicals	56	34
House dust	72	31
Pollen	63	23
Animal dander	48	11
Cold air	55	27
Eating or drinking	40	16
Aspirin	10	4

Although asthma can be managed, it cannot be cured. It is a major cause of morbidity in the community, especially among children and can be a long-term condition which frequently leads to hospitalisation. Asthma death rates and hospital morbidity rates are not as high as those for cancer and heart disease, but asthma morbidity appears to be as high, if not higher in the ACT than in other states and territories and therefore needs to be examined.

1.2 Overview

Australia and New Zealand experience higher prevalence, morbidity and mortality rates from asthma than any other developed country.¹² An Australian report published by the National Asthma Campaign in 1992⁶ estimated that asthma affects one in five children, one in seven teenagers and one in ten adults. It costs the Australian community between \$585 million and \$720 million each year. It is known that poorly controlled asthma will cost more than well managed asthma, and that people who do not manage their asthma properly risk an asthma attack which could result in hospitalisation or even death. There is substantial morbidity from asthma which could be reduced by greater or more appropriate use of preventative medications, avoidance of trigger factors, peak flow monitoring and actions plans.⁸ This has major implications for the development of education and preventative strategies.⁶

One of the major concerns regarding asthma is our inability to adequately describe the prevalence and incidence of asthma in the population. Furthermore, diagnosis, especially in young children, is not easy. Mortality and hospital morbidity data (from the Australian Bureau of Statistics collections and ACT Department of Health and Community Care Hospital Morbidity Data Collection) provide partial indicators for diagnosed asthma prevalence, but the data refer to acute episodes only and do not provide a true reflection of prevalence or incidence. In addition, hospital admissions are governed by such things as admitting protocols (wherever possible, patients are stabilised in the Accident and Emergency Department and not admitted). There are no comprehensive data available on asthma treatment by general practitioners. As most asthma treatment and management takes place in general practice, this is a major deficit in estimating asthma prevalence.¹¹ What data are available are outlined in this report. The limitations of interpreting the data are outlined in Appendix 3. It should be noted that the numbers used in hospital morbidity data include all patients from the South East Region of NSW treated in ACT hospitals. On average, NSW admissions account for over 20 per cent of all admissions to ACT hospitals.

The purpose of this report then, is to give as broad an overview as possible of the health profile of asthma in the Australian Capital Territory with some comparative information in relation to the Australian population as a whole. It will assist ACT planners and policy makers of health and related services to ensure that people with asthma are considered in appropriate planning of new or existing services.

2. Mortality

There was a slow, unexplained, increase in deaths of young people aged 5 to 34 years with asthma during the 1980's, but this trend ceased in 1991 and there has been a consistent decline in deaths since.¹³

There were 8 asthma deaths in the ACT in 1994 (of residents usually residing in the ACT).² This is less than one per cent of all ACT deaths (0.65%). The age and sex breakdown of deaths is outlined in Table 2.

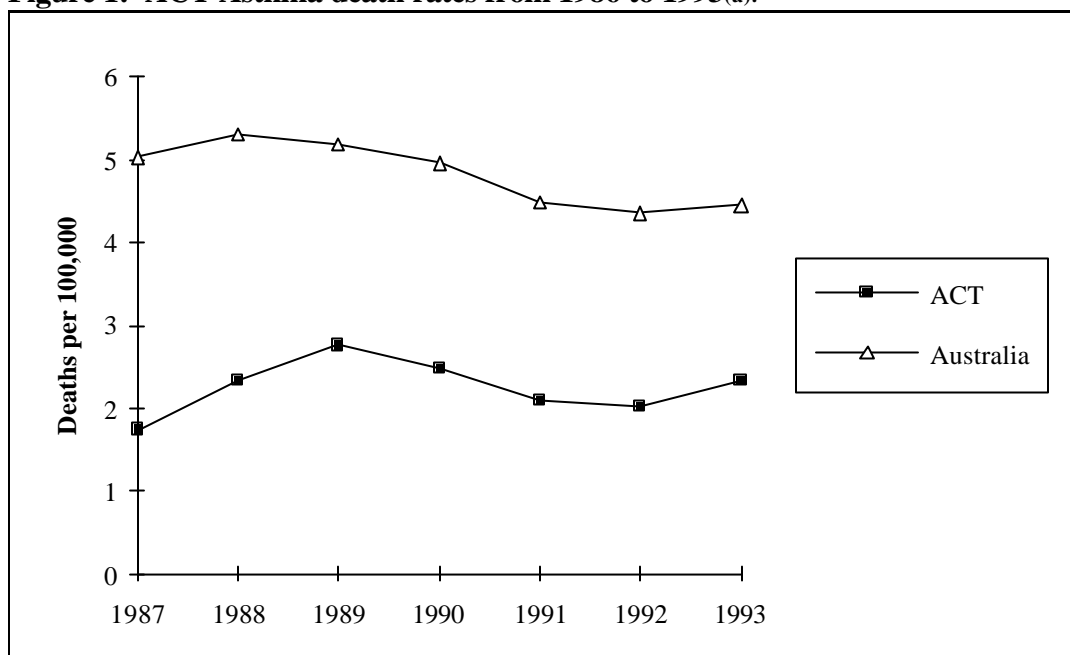
Table 2: Death caused by asthma, by sex, by age, ACT, 1994

	Age groups						Total	
	15-19	20-24	55-59	60-64	65-69	75-79		80-84
Males	0	0	1	0	1	1	0	3
Females	1	1	0	1	1	0	1	5

Source: Australian Bureau of Statistics Mortality Tabulations 1994

The small numbers of deaths cause annual rates to fluctuate. Accordingly, rather than looking at isolated years, it is more meaningful to look at trends over time. Figure 1 shows that, over the last few years, the ACT rates have been consistently lower than national rates.

Figure 1: ACT Asthma death rates from 1986 to 1993^(a).



(a) Based on 3yr moving averages.

Sources: Causes of Death Australia, ABS Publications Catalogue No. 3303.0, *Unpublished data*

Estimated Resident Population by Sex and Age, States and Territories of Australia, ABS Publications No. 3201.0

3. Morbidity

In a study of seventeen population- based studies undertaken on Australian children aged 5 to 12 years over the past two decades, Bauman¹⁴ concluded that the prevalence of recent (12 month) and cumulative wheeze increased significantly each year, and diagnosed asthma showed a smaller, but also significant increase. (Both by almost 1% per year). It is unclear as to the cause of the increases, but it is thought that changes in diagnostic practices and an increased awareness of asthma symptoms may be liable. The ACT data on the narrower hospital separations (ie acute cases only) does not suggest a trend towards increase. (Refer 3.1).

A study in September 1990¹⁵ conducted in NSW, Victoria and Queensland, found that the prevalence of wheeze in children 5 to 12 years was 19.5 per cent and diagnosed asthma 17.1 per cent (in a sample of 8753 children). For adults, (n=13,945), the self-reported prevalence of asthma was seven per cent.

It appears, that for adults at least, the prevalence of asthma is higher in the ACT than was found in the above study (Refer 3.2).

3.1 Hospital morbidity

There were 994 separations in ACT hospitals for the period 1993-94. This total includes cases where asthma was a principal or secondary diagnosis. It does not include people being treated in the Emergency Department who, when stabilised, are not admitted. The number of principal diagnoses was 708. This compares to 977 principal diagnoses of asthma in 1992-93. Given the large difference, it is interesting to compare over three years.

Table 3: Hospital separations, by principal and secondary diagnosis, ACT, 1991-94*

	1991-92	1992-93	1993-94
Principal diagnosis	706	977	708
Secondary diagnosis	326	301	286
Principal or secondary diagnosis	1032	1278	994

* Includes re-admissions

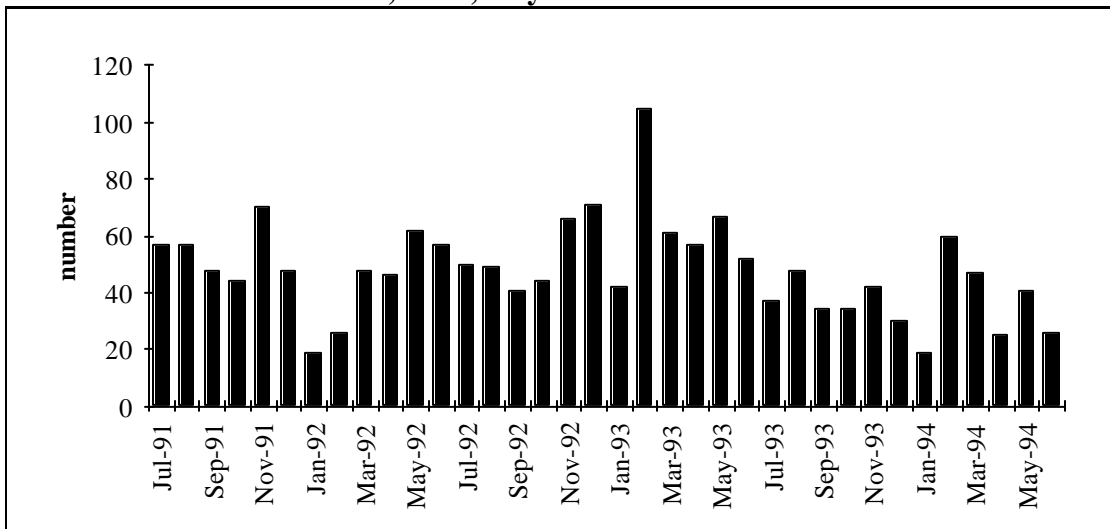
It is noted that 1992-93 had a high hospital usage for asthma treatment. This is unexplained, although is probably due to the fact that ACT incidence is small and therefore can fluctuate dramatically. Since the 1993-94 usage returned to slightly under the "norm" of 1991-92, and previous years, there is no reason for concern, but the situation should be monitored.

Figure 2 shows the number of separations by month of earliest admission over a three year period. This may assist in determining whether climatic or other conditions have an effect on acute attacks of asthma. It can be seen, for instance, that the month of February for 1992-93 and 1993-94 (but not for 1991-92), had peaks in hospital usage for asthma. Further analysis shows that the fluctuation occurred for children aged 0 to 14 years rather than in the older age ranges. This may have something to do with climatic changes or perhaps the stress of going back to school after a holiday. The lowest usage occurred in January of each year, perhaps due to residents taking annual holidays (reduced stress) or moving outside the ACT (climatic change). This usage was low for all age ranges.

Over the three years, children tended to have peak hospital usage in August, November, February/March and May/June. Adults had peaks in October/November, February/March, May and July.

Further investigations will be necessary to test the hypotheses.

Figure 2: Hospital separations for principal diagnosis of asthma, month of earliest admission, ACT, July 1991 to June 1994



Re-admissions

To a certain extent, the efficacy of asthma management plans can be evaluated by considering the levels of re-admissions to hospital.

Table 4: Hospital separations, by principal cause of asthma, by number for individuals, 1991-92 to 1993-94, ACT

No. of separations	1991-92	1992-93	1993-94
1	499	686	512
2	66	86	70
3	14	18	8
4	2	7	4
5	0	3	2
6	0	0	1
7	1	2	0
8	1	1	0
9	0	0	0
10	1	0	0
Total	584	803	597

Patients having only one separation in the above financial years account for 85.4 per cent (1991-92), 85.4 per cent (1992-93) and 85.8 per cent of total separations. The proportion of people being re-admitted does not seem to have changed.

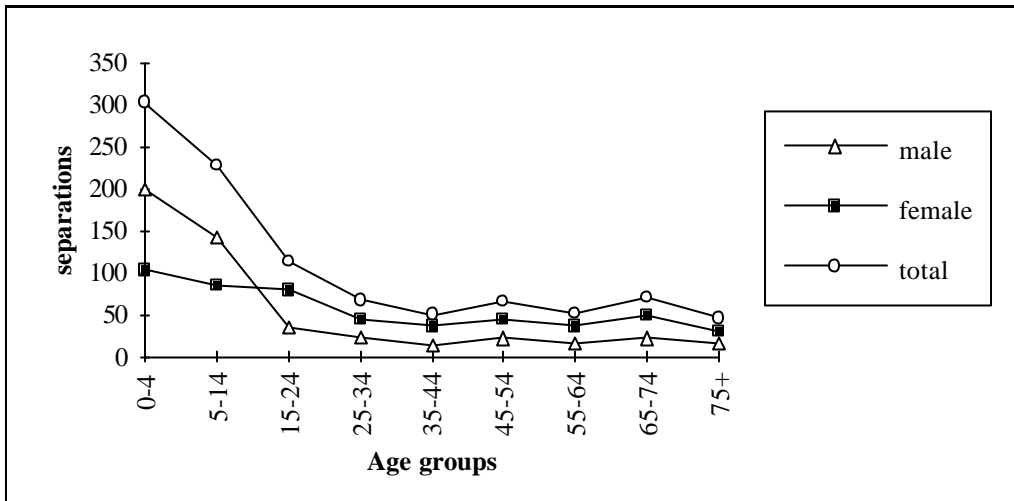
If you consider separations over the three year period 1991-94 together, the proportion of patients being admitted only once reduces to 79 per cent. (This allows for consideration of patients being re-admitted over longer than one financial year). Fourteen per cent of patients were admitted twice, four per cent admitted three times and two per cent admitted four or five times.

Age profile

Children in the 0-14 years age group accounted for slightly over half (57.3%) of people having only one admission in a year, whereas children in this age group accounted for slightly over two thirds (67.5%) of re-admissions.

Figure 3 shows that of the 1993-94 separations, 53.2 per cent were in the zero to fourteen age range. That is, about half of acute asthma conditions are experienced by children and young teenagers.

Figure 3: Hospital separations for asthma (ICD-9 code 493) inpatients by age, 1993-94

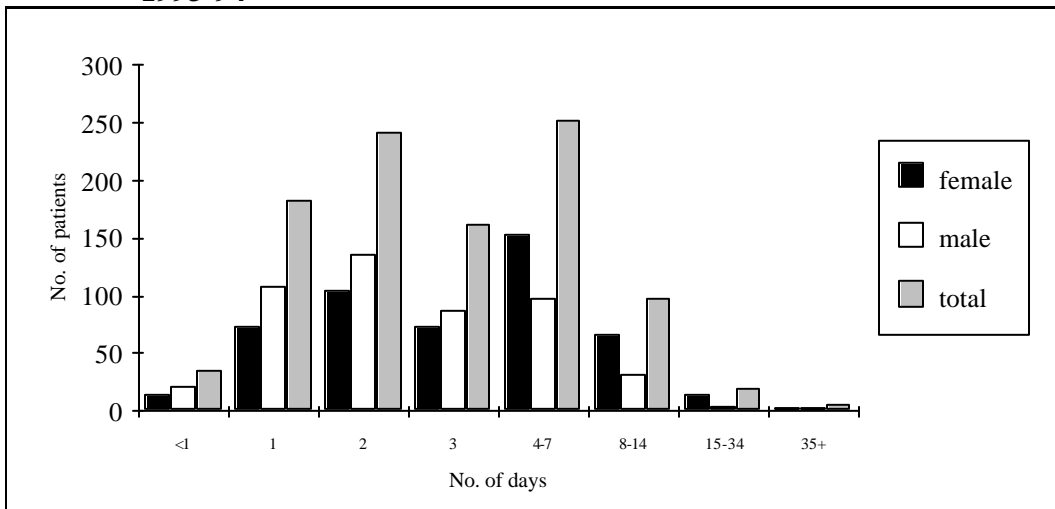


Average length of stay

A measure of acuity is reflected in the length of stay spent in hospital by patients suffering asthma. Figure 4 outlines average length of stay for the years 1993-94.

It is interesting to note that male usage is higher than female usage in short average lengths of stay (0 to 3 days), but females have considerably higher usage at the longer lengths of stay (over 3 days). This may be because males tend to be in the younger age range than females. Most asthma patients are in hospital for longer than a day. The mean for average length of stay for 1993-94 was 3.5 days (males), 4.8 days (females) and 4.1 days (all patients). 1991-92 had similar means and, as expected, 1992-93 (the unexplained "abnormal" year) had higher ones.

Figure 4: Hospital separations for asthma, by average length of stay, by sex, ACT, 1993-94



3.2 1989-90 National Health Survey

In the 1989-90 National Health Survey, 9.7 per cent of ACT residents were self-reported asthmatics compared to 8.5 per cent nationally³. ACT numbers were second only to Queensland where 10.2 per cent of the population self-reported asthma. Even after adjustment for age and sex of the ACT population⁴, the ratios were still shown to be higher than that of the national average. (Refer Table 5).

Table 5: 1989-90 ABS National Health Survey, age-sex standardised ratios for ACT residents.

Description	Age-sex standardised ratios	Comments
Long-term conditions(a)		
Respiratory Diseases	127.0	* Had highest age-sex standardised ratio for states and territories
Asthma	117.2	* Higher than Australian average, however not as great as QLD (118.4)

(a) refers to medical conditions which have lasted at least 6 months or which are expected to last 6 months or more.

Source: 1989-90 National Health Survey as cited in Glover G and Woollacott T, *A Social Health Atlas*.

* significantly different to Australia, with Australia as reference = 100.0.

3.3 Childhood asthma

A workshop on early childhood asthma was held in Massachusetts in 1994. The participants included leading world pediatricians, four of whom were from Australia. Their deliberations are summarised below.⁹

- Wheezing in young children is quite common in the industrialised world, with estimates of its prevalence ranging between 30 and 60 per cent. Most children tend to "outgrow" their illness by the time they reach school age. Between 30 and 70 per cent of school aged children with doctor-diagnosed asthma can expect a marked improvement in their condition or to become symptom free by adulthood. School-aged boys with asthma appear to have a better long-term (adult) prognosis than school-aged girls. The incidence of school-aged asthma is greater in males until puberty, but increases in females after puberty.
- While death from asthma in children under five years of age is not common, it has been noted that male children tend to die more often than female children in that age range.
- Not all wheezing conditions are, or lead to, asthma diagnoses. However, it is recognised that wheezing in infants and small children pose a significant public health issue with respect to morbidity and health care costs. Since a percentage of these children will go on to develop asthma, further high morbidity and financial burdens result.
- It is impossible to distinguish between wheezing conditions which do or do not result in asthma. Symptoms and signs of illness are very similar. The two conditions share several predisposing factors such as lower socio-economic status, exposure to environmental pollutants such as tobacco smoke and suspended particulates, and an increased risk in males.

- Epidemiological studies have demonstrated an increase in asthma prevalence and airway hyperresponsiveness in children over the past 25 years. This increase is more likely to be related to environmental factors than to a genetic shift.
- Migration studies have suggested that environmental factors in early life are of critical importance.
- It has been noted that the incidence of wheezing during the first year of life can be reduced by such measures as avoiding certain foods by babies and their lactating mothers, the removal of house dust mite antigen, and the continuation of breast feeding.
- The importance of viral infections in inducing the asthmatic inflammatory state has not been proved.
- Since the prevalence of asthma is often low in countries with high air pollution, it cannot be assumed that air pollution is a high trigger for asthma.

4. Asthma management

Understanding of the role of inflammation in asthma has led to changes in emphasis in treatment over recent years. The two types of current treatment involve the use of preventers and relievers. Preventers actually prevent asthma symptoms and include such medications as Becotide, Intal, Pulmicort, Aldecin and Becloforte. Relievers provide fairly quick relief of asthma symptoms and include such medications as Ventolin, Asmol, Bricanyl, Atrovent and Respolin.

4.1 Asthma management plan

The National Asthma Campaign (refer Appendix 1), promotes a six step Asthma Management Plan which has been endorsed by asthma associations and practitioners around the country. The six steps are:

1. Know how severe your asthma is. Ask your doctor whether your asthma is mild.
2. Achieve your best lung function. Find out how your lungs can function at their best. Your doctor can help you measure your "peak flow" and work out what your best peak flow is.
3. Avoid asthma triggers (eg dust pollens, animal fur, moulds, tobacco smoke, air pollution, cold air, respiratory infections).
4. Stay at your best. Use preventer and reliever medication as recommended by your doctor.
5. Have an action plan. Work out with your doctor how to manage your asthma.
6. Check your asthma regularly.

The Campaign runs annual public education campaigns to promote the sensible management of asthma and to assist the public in understanding asthma.

4.2 Asthma Card

The Pharmaceutical Society of Australia conducted a pilot study in the Wagga Wagga and Narrabri regions of NSW in 1994 to ascertain the use of such reliever medications as Ventolin which can be obtained over the counter without a doctor's prescription. The study was instigated as a result of concern over the easy availability of these medications and the thought

that people may be using them indiscriminately or too heavily without having a comprehensive individual asthma management plan developed in partnership with their doctor.

People who went to their local pharmacy to purchase reliever medication without a prescription were issued with an Asthma Card at a cost of \$3.50. The card was valid for twelve months or for twelve purchases, whichever came first. It was signed and dated each time the person purchased a reliever inhaler. This allowed the person and the pharmacist to monitor how much reliever medication the person was using. Should the person be using a large amount of the reliever, the pharmacist could encourage the person to discuss a management plan with a doctor. Should the person not wish to buy an Asthma Card, they were referred to their doctor to obtain prescriptions for the reliever (thus ensuring that the doctor could monitor use).

An evaluation of the pilot produced the following results:

- a 64% increase in referral of patients back to their doctor;
- 39% of people who went back to their doctor said that their GP changed their medication or dose;
- 31% of people reported that the Asthma Card and information provided by their pharmacist had altered the way they managed their asthma. Many people had not realised that even mild asthmatics can have a preventative medication plan. Many people had not realised how often they used relievers;
- only about a third of people objected to the \$3.50 charge.

As a result of the success of the pilot, the Asthma Card is continuing in the two regions and was extended to other rural NSW regions and the ACT in October 1995. All of NSW will be covered by April 1996.

Initial anecdotal findings suggest that the Card is having a similar effect in the ACT as it did during the pilot. Funding to conduct a structured evaluation is being sought by the Pharmaceutical Society.

5. ACT initiatives

Asthma information is available through consultation with GPs and Woden Valley Hospital's Asthma Education Program which is run by the Thoracic Medicine Department. Woden Valley Hospital offers a 'Living with Asthma' course for adults and parents of children with asthma.

Woden Valley Hospital has instituted protocols for treatment of patients with asthma. Wherever possible, the patient is stabilised in the Emergency Department and not admitted to hospital. For those who are admitted, an asthma management plan is developed to ensure that each individual patient has the benefit of all appropriate diagnostic and counselling services and life skills development. It is hoped that these measures will reduce re-admission rates in the near future.

In addition, the ACT Asthma Association provides information over the telephone, counselling, literature and on-going information and education through seminars, newsletters, library resources, school visits and information booths at public venues. It distributes a series

of twelve pamphlets produced by the NSW Asthma Foundation. The ACT Asthma Association also supports the National Policy on Asthma for Schools.⁵

ACT Health nurse practitioners in the areas around Canberra conduct asthma awareness and management sessions in primary schools. This involves identifying children with diagnosed asthma, seeking parents' permission to conduct classes and running three classes (approximately 1 hour for 3 weeks) on drug management, asthma triggers and how to manage your asthma. They also talk with teachers and parents.

The ACT Department of Health and Community Care, with assistance from the Commonwealth Government Ambulatory Care Reform initiatives, has developed a comprehensive data collection project which will strengthen improvements in the collection of accurate outpatient clinic statistics from Woden Valley and Calvary hospitals. This will assist in enhancing knowledge about asthma incidence in the Territory.

The ACT Government in its *ACT Health Goals and Targets for the Year 2000* (Refer Appendix 2) and The National Asthma Campaign with their document *National Asthma Strategy- Goals and Targets*⁷ are working towards addressing better prevention and management of asthma morbidity.⁵ The National Asthma Campaign is also encouraging general practitioners to develop more detailed care plans for patients, and pharmaceutical companies are using guidelines provided through the campaign to produce health promotional type materials. The Asthma Card (Refer 4.2) is an excellent example of this.

The ACT Health Outcomes Reference Group, which is overseeing the implementation of health goals and targets in the Territory, has decided to treat the development and implementation of asthma strategies as a major priority in its deliberations. An expert working group with representatives from all interested areas will be established to advise it.

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Appendix 1: The National Asthma Campaign

The National Asthma Campaign is a non-profit organisation of all major interest groups. It is the shared initiative of:

- the Thoracic Society of Australia and New Zealand ;
- The Royal Australian College of General Practitioners ;
- the Pharmaceutical Society of Australia; and
- Australia's seven Asthma Foundations in each state and territory.

It aims to serve the community by creating awareness and providing information about asthma. Its goals are to:

- achieve correct diagnosis of most people with asthma;
- bring about a decline in preventable deaths from asthma; and
- establish team management of asthma comprising the patient, doctor and pharmacist, to ensure that most people with asthma will follow an individual action plan developed by their doctor and assisted by their pharmacist.

Appendix 2: ACT health goals and targets for asthma

The ACT Department of Health and Community Care developed health goals and targets for asthma after much deliberation and consultation with key stakeholders. The Department is committed to implementing them and intends establishing an Asthma Working Group to implement the process soon. This expert group will advise the Health Outcomes Reference Group as to priorities and mechanisms to progress the goals and targets in the ACT. The goals and targets are:

Focus Area	Identified Targets for Individual Goals
1. Increase co-ordination between ACT asthma programs & services	
2. Improve the health and quality of life for people with asthma	
3. Increase community awareness about asthma prevention & management	Reduce to less than 5 days the average no. of school days lost due to asthma, per year, per asthmatic
4. Reduce the prevalence of uncontrolled or poorly controlled asthma	a) Increase the proportion of asthmatics who have their asthma reviewed at least annually by their GP (and more often in cases of moderate or poorly controlled asthma) to at least 75%
	b) Increase the use of preventative maintenance therapy to 85% of all people with a persistent asthma (ie those who have symptoms more than twice a week)
	c) Reduce public hospital admissions due to asthma for ACT residents by 7.5%
	d) Increase to at least 50% the proportion of people with asthma who follow a recognised asthma management plan
	e) Increase to 50% the proportion of people with asthma (and who require regular preventative therapy) who use a peak flow meter to monitor their asthma
	f) Reduce the rate of hospital readmissions due to asthma to less than 10% per annum
5. Obtain baseline data about the prevalence and management of asthma	Conduct regular surveys to establish: <ul style="list-style-type: none"> - the prevalence & severity of asthma in the ACT - the proportion of GPs who follow a recognised asthma management plan, and - the annual level of school & work absenteeism due to asthma

Appendix 3: Limitations in developing an asthma profile

Developing a profile on asthma is not easy. Some of the problems are:

- Classification of asthma, where there is only a limited range of measures available, is not easy.¹⁰ Non-severe symptoms may not be sufficient on which to base an accurate diagnosis. The accurate diagnosis of asthma in children in particular, is difficult. Wheezing in early years does not necessarily lead to asthma. It is impossible to distinguish between those children who have developed or who will develop asthma and those who do not;⁹
- Comprehensive data are not readily available;
- What data are available, generally record small numbers of occurrences of particular events. The smaller the numbers, the more likely it is to have inexplicable fluctuations in results. Where changes in pattern from year to year are noted, time series are utilised to ensure a more reliable analysis;
- There could be inconsistencies in recording of cause of death (eg. a person may be recorded as dying from heart attack rather than from the severe asthma attack which resulted in the person having a heart attack);
- There may also be inconsistencies in coding hospital admissions (eg. a person may be coded as having a heart attack as the principal diagnosis, but it may have been caused by an asthma attack - a different coder may have coded principal diagnosis as "asthma" with the heart attack as the secondary diagnosis);
- In many cases, especially non-acute cases, people treat themselves or seek treatment from outside the hospital system (eg medical practitioner, physiotherapist, pharmacist). There are no structured mechanisms for recording these occurrences. The recently introduced Asthma Card (refer 4.2) will assist in estimating these contacts.