

**Monograph Series Number 9**

# **Diabetes Mellitus in the ACT**



**Josie McConnell & Cathy Fraser  
Health Status Monitoring  
Epidemiology Unit  
ACT Department of Health and Community Care  
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# 1. INTRODUCTION

Diabetes mellitus, a national health priority area, is the seventh leading cause of death in Australia, and contributes significantly to morbidity, disability, poor quality of life and potential years of life lost. Diabetes mellitus is a condition in which the body is either unable to produce sufficient insulin or cannot use insulin effectively. This leads to disturbances of the body's usage of glucose or sugar which in turn affects basic cell and organ function. The most common forms of diabetes mellitus are type 1 diabetes (insulin dependent diabetes mellitus or IDDM), type 2 diabetes (non insulin-dependent diabetes mellitus or NIDDM) and gestational diabetes mellitus (GDM).

Type 1 diabetes is characterised by little or no insulin production. This disorder is usually diagnosed in childhood although it can develop in later years. There is a strong auto-immune component involved in the aetiology of type 1 diabetes, along with genetic and environmental factors such as viral infections. Symptoms leading to the diagnosis of type 1 are usually severe. Treatment always involves insulin injections and careful diet control.

In type 2 diabetes there is a resistance in the body's ability to use insulin. This form of diabetes tends to be mature-age onset with diagnosis often being delayed because of the lack of symptoms in the early stages of onset. Although genetics play a role in the onset, lifestyle factors such as diet and exercise are strongly associated with this disease. Appropriate changes to diet and exercise have been shown to increase insulin sensitivity in those who are insulin resistant and may even delay the onset of type 2 diabetes.

Gestational diabetes mellitus occurs in women who develop an impaired glucose tolerance that is first detected during pregnancy. Women who develop gestational diabetes require careful monitoring during pregnancy to minimise complications. Glucose intolerance for women who develop gestational diabetes usually returns to normal after the pregnancy. There is however an increased risk of developing type 2 diabetes later on.

The prevalence of diabetes mellitus is of growing concern. In the 1995 National Health Survey approximately 4600<sup>1</sup> ACT residents reported having been diagnosed with diabetes. However, the actual number of people with diabetes is considered to be much higher as diabetes often goes undiagnosed. Prodromal symptoms such as impaired glucose tolerance tend to be invisible. Often there is no real indication of diabetes until specific tests have been undertaken. It is estimated that up to half of all people with diabetes are not aware they have the condition. This estimation is disturbing given not only the strong association diabetes has with other life threatening illnesses such as heart disease, stroke, kidney disease and peripheral circulatory disease, but also the projected rise in the incidence of diabetes as a result of an ageing population.

This monograph aims to present data and give an analysis on the prevalence, mortality, morbidity and associated comorbidities and risk factors of diabetes mellitus in the ACT.

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<sup>1</sup> There are two methods used for calculating estimates of the number of people with diabetes from the 1995 National Health Survey. The method used in this publication involves calculating the number of people who gave a positive response to the question, "Have you ever been told by a doctor or nurse that you have diabetes?" This is the same method used by the Australian Bureau of Statistics for their Catalogue No. 4371.0, 'Diabetes'.

## **2. RISK FACTORS ASSOCIATED WITH TYPE 2 DIABETES**

### ***2.1 General***

The most common risk factors associated with type 2 diabetes include, increasing age, being overweight, physical underactivity, family history of diabetes, previous gestational diabetes, being female, ethnicity and being of Aboriginal or Torres Strait Islander descent.

Although ACT residents rate more favourably than the rest of Australia on many of these risk factors, figures indicate that this is not the case with being overweight. In 1995, 39.2 percent of ACT residents were overweight or obese. This compares with 38.5 percent of Australia as a whole<sup>1</sup>. Furthermore, in this same year the ACT had a higher proportion of overweight and obese people in the 65 years and over age group than Australia generally.

### ***2.2 Indigenous people***

Diabetes is a major cause of disease and death for Aboriginal and Torres Strait Islander peoples. It is estimated that the overall prevalence rate of diabetes is between 10 percent and 30 percent<sup>2</sup>. This is between 2 and 4 times the estimated rate for non Indigenous Australians.

Risk factors associated with diabetes such as smoking and being overweight are common in Aboriginal populations. For instance, it is estimated that between 38 percent and 60 percent of Aboriginal and Torres Strait Islander people are either overweight or obese<sup>3</sup>. Furthermore, with smoking it is estimated that 54 percent of males and 46 percent of females smoke. This compares with 28 percent of males and 22 percent of females in Australia as a whole<sup>4</sup>.

There is little information on Aboriginal people living in the ACT. What is available concerns the South East Region or the Queanbeyan ATSI<sup>\*</sup> Region and not the ACT specifically. The number of Aboriginal and Torres Strait Islander people living in the ACT in 1998 is estimated to be between 3,266 and 3,723. This shows an increase of between 39 percent and 47 percent since 1994 when the Indigenous population was at 1,969. Although this increase has implications for prevention and control strategies it should be kept in mind that much of this increase can be attributed to improved data collection methods.

### ***2.3 Ethnicity***

The prevalence of diabetes is higher in the overseas born population than that of the Australian born population. Various epidemiological studies have shown that people born in areas such as Southern Europe, Micronesia, Polynesia, China and certain Arabian areas are at greater risk of developing diabetes<sup>5</sup>. Approximately 8 percent of the ACT population comes from these areas.

The higher prevalence in these groups is in part attributed to a genetic susceptibility combined with exposure to a westernised lifestyle. Another factor exacerbating the problem is related to gaining access to health services for non English speaking people.

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<sup>\*</sup> Aboriginal and Torres Strait Islander Commission.

## ***2.4 Female risk factors***

Diabetes mellitus affects more females than males. Results from the National Health Survey indicate that there were approximately 22 percent more ACT females diagnosed with diabetes than ACT males. Similar differences can be seen in other states and territories. Although this difference can in part be explained by gestational diabetes, it is still significant.

One factor that may contribute to the sex difference in the incidence of diabetes is the female condition known as polycystic ovary syndrome. Polycystic ovary syndrome is one of the most common endocrinopathies of women, with between 5 percent and 10 percent of premenopausal women being diagnosed. One of the disturbing outcomes for women with this syndrome is that by the age of 40 years; up to 40 percent will have type 2 diabetes or impaired glucose tolerance<sup>6</sup>. Studies indicate that much epidemiological and basic endocrine research is needed to uncover how many women with type 2 diabetes have also had polycystic ovary syndrome, and whether the syndrome is causal.

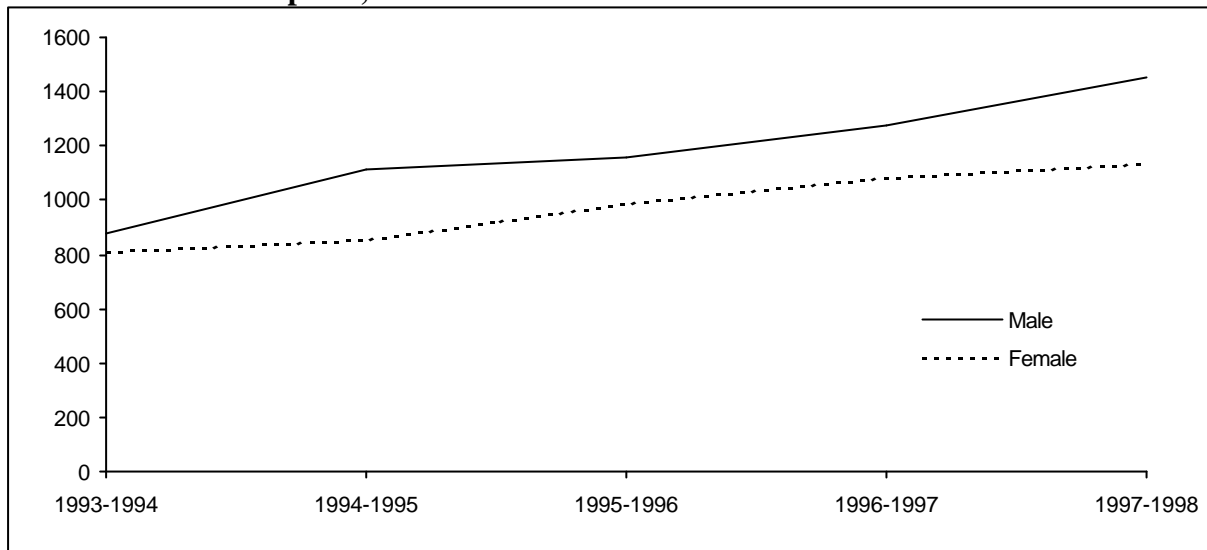
## **3. GENERAL MORBIDITY**

As mentioned earlier, there is no reliable estimate of the number of people with diabetes in the ACT. The National Health Survey 1995 surveyed, amongst other things, health risk factors and long-term conditions. The results estimated between approximately 4,300 and 6,000 people had diabetes in the ACT - very few of whom were under 25 years of age. Diabetes estimates such as these may well be under estimates as they do not include those whose existing diabetes or high blood sugar levels are not yet diagnosed. In Australia overall, the breakdown between type 2 (non-insulin dependent diabetes mellitus) and type 1 (insulin dependent diabetes mellitus) is believed to be approximately 88 percent to 12 percent respectively with less than one percent being other or unknown types of diabetes<sup>7</sup>. However, it must be noted that a large proportion of people with diabetes (approx 33% Australia wide) are unaware of what type of diabetes they have<sup>8</sup>.

It is not easy to gauge the incidence of diabetes, since most people are diagnosed and treated by their general practitioner and data concerning these visits are not extensive. Hospital separation data will give an indication of acute occurrences of the disease. There were 3,246 separations from ACT hospitals for type 1 and 2 diabetes mellitus related episodes (principal and secondary diagnoses), for the year 1997-98. Of these, approximately 73 percent were for ACT residents (percentage excludes separations from John James Memorial Hospital where data are unavailable). Of all diabetes related separations in ACT hospitals in 1997-98, 82 (50 male, 32 female) recorded retinopathy as a complication and 115 (69 male, 46 female) recorded chronic renal failure as a complication.

Figure 1 shows that there has been a gradual increase in the number of diabetes related separations for both males and females between July 1993 to June 1998. There are consistently more male separations over this time period which is interesting given that females are more frequently diagnosed with diabetes than males.

**Figure 1: Hospital separations for diabetes mellitus (excluding gestational diabetes), by sex, ACT Hospitals, 1992-1998**



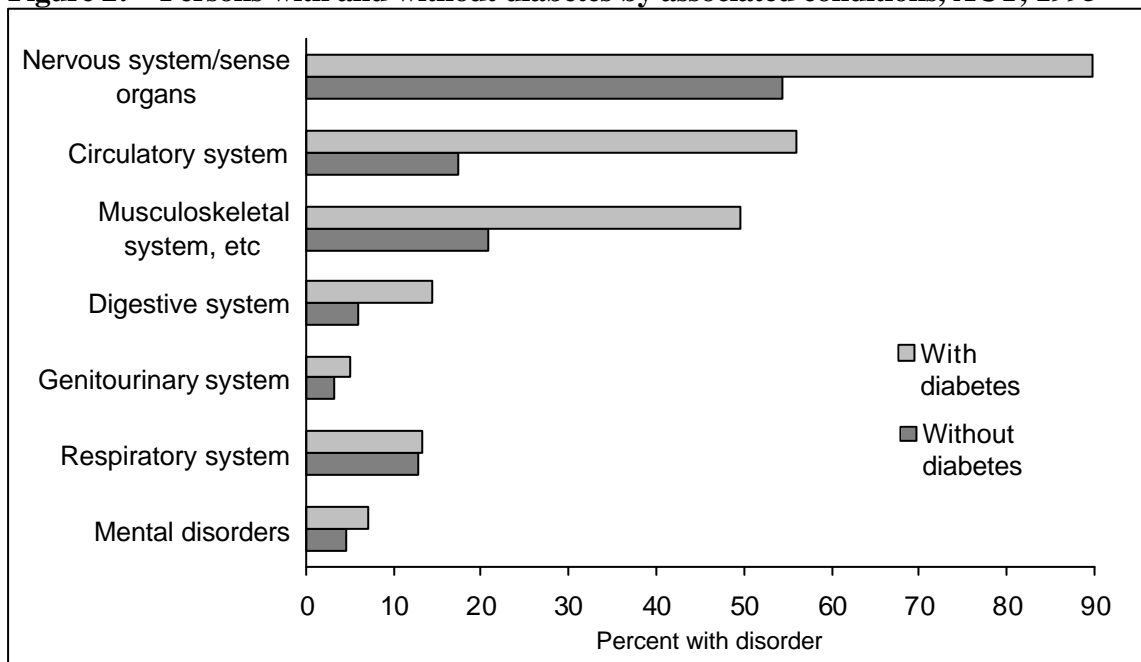
Note: Includes non-ACT residents.

Source: ACT Hospital Morbidity Data Collection, 1993-98

### 3.1 Complications and associated conditions

People with diabetes are more likely to suffer from other health conditions leading to disability and premature death than people without diabetes. Figure 2 presents information from the National Health Survey 1995. It can be seen that considerably more people with diabetes in the ACT reported having other serious health conditions. This is particularly the case with diseases of the circulatory system where over half of all people with diabetes reported to also have this condition compared with less than 20 percent for those without diabetes.

**Figure 2: Persons with and without diabetes by associated conditions, ACT, 1995**

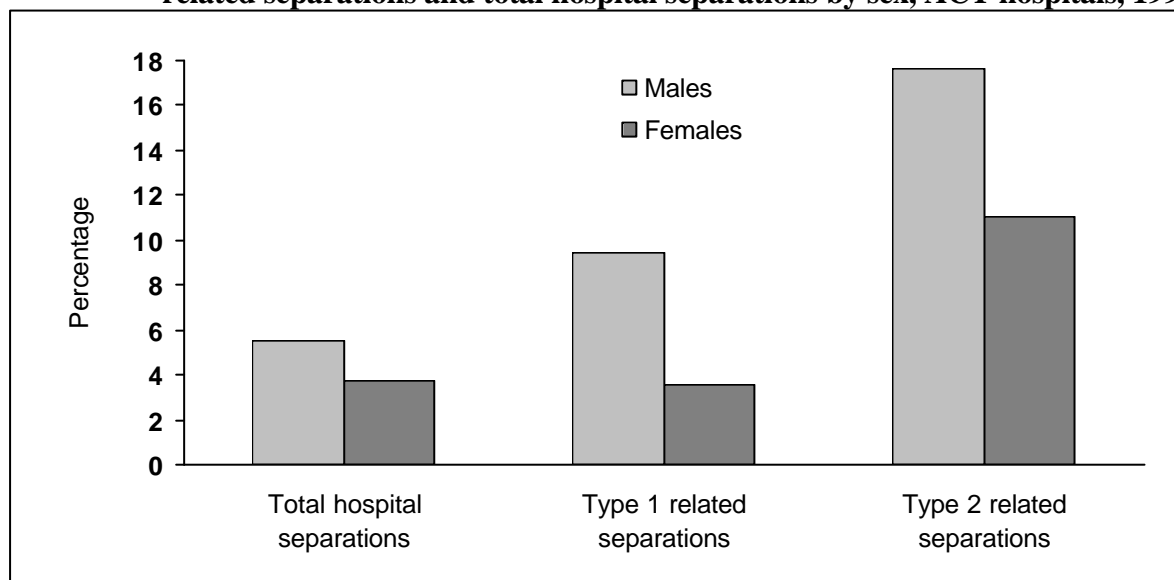


Source: ABS, National Health Survey, 1995

### 3.1.1 Circulatory system

The major principal diagnosis of diabetes related hospital separations was diseases of the circulatory system. Figure 3 shows diseases of the circulatory system is a far more significant reason for hospitalisation for those with type 2 diabetes. As a percentage of all type 2 diabetes related separations (excluding those with supplementary classifications) 29 percent (18 % males, 11 % females) had a principal diagnosis of diseases of the circulatory system while a far smaller percent of all separations (11%) had such a diagnosis. Also of interest is that a greater percentage of type 1 diabetes male separations were for diseases of the circulatory system (10%) but this was not the case for female type 1 separations (4%) (Figure 3). This is of particular concern for males with type 1 diabetes as they tend to be younger than the general hospital population.

**Figure 3: Principal diagnosis of diseases of the circulatory system as percentage of diabetes related separations and total hospital separations by sex, ACT hospitals, 1997-98**



Note 1: Excludes separations for supplementary classifications

Note 2: Includes non-ACT residents

Source: ACT Hospital Morbidity Data Collection, 1997-98

People with diabetes mellitus are particularly susceptible to a number of diseases of the circulatory system and contract these diseases at a younger age than others. These include atherosclerosis, myocardial infarction, stroke or gangrene<sup>9</sup>.

In 1997-98, the major types of diseases of the circulatory system for type 1 diabetes separations include heart failure (20 separations), atherosclerosis of native arteries of the extremities (11 separations), and acute myocardial infarction (5 separations). The major diseases of the circulatory system were somewhat different for type 2 diabetes separations with intermediate coronary syndrome (128 separations), atherosclerosis (94 separations), heart failure (79 separations), acute myocardial infarction (60 separations) and angina pectoris (58 separations).

### 3.1.2 Amputations

People with diabetes are more susceptible to peripheral circulatory disorder which may lead to gangrene. An amputation (the endpoint treatment for gangrene) has a major emotional and physical effect on the patient. Over the years 1993-94 to 1997-98, there have constantly been more males with a principal or secondary diagnosis of diabetes having amputations than their female counterparts (refer Table 1). On average over this time there were 2.7 times more amputations on males than females. In general, the number of amputations each year remains fairly constant. Between 1993-94 and 1997-98, 59 percent of diabetes related amputations were performed on people with type 2 diabetes and 41 percent on people with type 1 diabetes. If the estimate that 88 percent of people with diabetes have type 2 and 12 percent have type 1 is taken into consideration, this shows a substantial over representation of those with type 1 diabetes.

**Table 1: Number of amputations with diabetes as a principal or secondary diagnosis, by sex, ACT Hospitals, 1993-98**

Sex	1993-94	1994-95	1995-96	1996-97	1997-98
Males	28	29	29	22	24
Females	11	10	6	10	12
<b>Persons</b>	<b>39</b>	<b>39</b>	<b>35</b>	<b>32</b>	<b>36</b>

Note: Includes non-ACT residents.

Source: ACT Hospital Morbidity Data Collection, 1992-98

### 3.1.3 Musculoskeletal and connective tissue

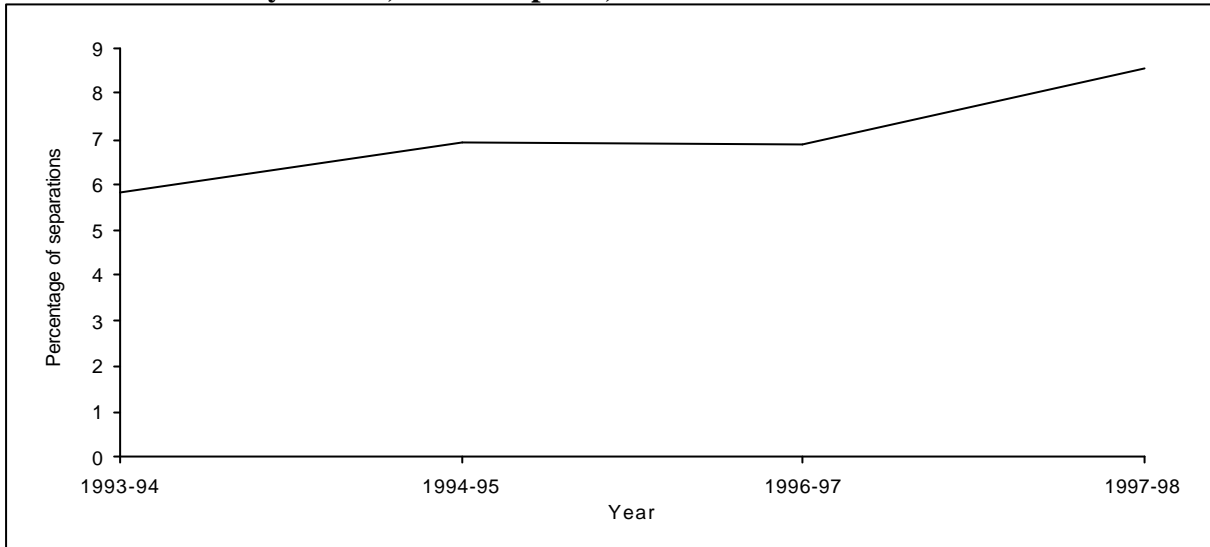
One of the important factors in managing diabetes is exercise. However, this can be difficult for those with medical conditions which prevent or make exercise difficult or painful. Of those separations related to diabetes in 1997-98, 180 had a principal diagnosis of diseases of the musculoskeletal and connective tissue. The main disorder within this category was arthritis and similar conditions with 62 separations, 50 percent of which were of the lower leg. Other complications included rupture of tendon, disorders of bone and cartilage such as osteoporosis, pathologic fractures, and malunion of fractures.

### 3.1.4 Kidney disease

Over the years from July 1993 to June 1998, 7.2 percent of all diabetes related separations involved kidney disease. However, Figure 4 shows that there has been a gradual and steady increase in this percentage from 5.8 percent in 1993-94 to 8.6 percent in 1997-98. In 1997-98, the average age of separations with type 1 diabetes which had a principal or secondary diagnosis of kidney disease was 51 years while for those with type 2 diabetes it was somewhat older at 69 years.



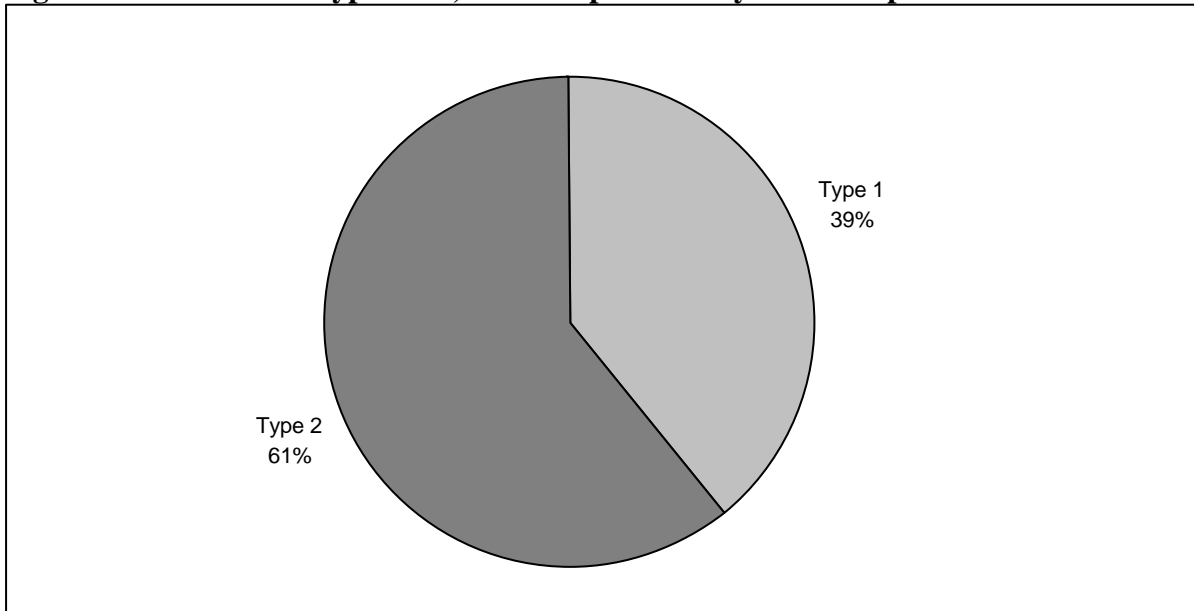
**Figure 4: Percentage of all diabetes separations that have a principal or secondary diagnosis of kidney disease, ACT Hospitals, 1993-98**



Note: Includes non-ACT residents.  
 Source: ACT Hospital Morbidity Data Collection, 1992-98

Of the 278 separations of people with diabetes and kidney disease, 181 were male and 97 were female. There is also an over-representation of those with type 1 diabetes separations having kidney disease (39% type 1, 61% type 2) (refer Figure 5). This may be due to the fact that type 1 has a much earlier onset than type 2 and there is more time for such problems to develop.

**Figure 5: Diabetes type ratio, ACT hospital kidney disease separations 1997-98**



Note: Includes non-ACT residents.  
 Source: ACT Hospital Morbidity Data Collection 1997-98

### 3.1.5 Ophthalmic conditions

There were 124 diabetes related separations (72 male, 52 female) with ophthalmic (eye) conditions in 1997-98.

Retinopathy, a microvascular disease of the retina, is an eye disorder which can affect people with diabetes. Early diagnosis of retinopathy is essential so that local laser photocoagulation can seal the breaks in the blood vessels and thus prevent further sight loss. Retinopathy was the most common eye disorder accounting for 50 male and 32 female separations in 1997-98. Blindness was also a significant problem with 21 principal and secondary diagnosis separations in 1997-98 (refer Table 2).

**Table 2: Diabetes related conditions with conditions of the eye by diabetes type by sex, ACT hospitals, 1997-98**

Eye condition	Type 1	Type 2
<b>Males</b>		
Diabetes with ophthalmic conditions	38	30
Retinopathy	27	28
Diabetic retinopathy	27	23
Blindness	4	11
Cataract	1	2
Glaucoma	1	0
Retinal oedema	1	0
<b>Total male separations*</b>	<b>40</b>	<b>45</b>
<b>Females</b>		
Diabetes with ophthalmic conditions	28	21
Retinopathy	22	13
Diabetic retinopathy	22	10
Blindness	2	4
Cataract	0	4
Glaucoma	0	0
Retinal oedema	0	0
<b>Total female separations*</b>	<b>29</b>	<b>27</b>

\* Separations may have multiple morbidities

Note: Includes non-ACT residents.

Source: ACT Hospital Morbidity Data Collection, 1997-98

### 3.1.6 Pregnancy, childbirth and the puerperium

As well as those with gestational diabetes mellitus, there are also women with a pre-existing diagnosis of either type 1 or type 2 diabetes whose diabetes affects their pregnancy. In 1997-98 there were 33 pregnancy, childbirth and the puerperium separations of women with type 1 and 12 separations of women with type 2 diabetes. The main complication arising for pregnant women with diabetes is giving birth to large babies. Table 3 shows women with diabetes have a higher risk of caesarean section than those without diabetes. Overall, 14.6 percent more women with diabetes had caesareans.

**Table 3: Caesarean and other births by diabetes type, births in ACT Hospitals, 1997-98**

Diabetes type	Vaginal births	Caesarean's	Caesarean's to total births (%)	Total
Type 1	8	6	42.9	14
Type 2	4	1	20.0	5
Gestational diabetes	86	41	32.3	127
High blood sugar	1	1	50.0	2
Total diabetes related births	99	49	33.1	148
Other births (not diabetes related)	3529	803	18.5	4332
<b>Total</b>	<b>3727</b>	<b>901</b>	<b>19.5</b>	<b>4628</b>

Note: Includes non-ACT residents.

Source: ACT Hospital Morbidity Data Collection, 1997-98

### 3.2 Gestational diabetes mellitus

Gestational diabetes poses risks to both mother and foetus. Women who develop gestational diabetes have an increased risk of developing obstetric complications. Also, for these women, there is a much greater risk for developing type 2 diabetes in later life, with some estimates as high as 50 percent up to 28 years later<sup>10</sup>. For the foetus, there is an increased risk of developing macrosomia (overly large body size) as well as developmental abnormalities in later life. It has been suggested that the longer-term effects for the foetus are increased risks for developing both adult obesity and glucose intolerance, thus perpetuating familial transmission of diabetes mellitus.

**Table 4: No. of separations for principal and secondary diagnosis of gestational diabetes & diabetes complicating pregnancy, birth & puerperium, by age, ACT, 1997-98**

	15-19	20-24	25-29	30-34	35-39	40-44	45-49	Total
<b>Gestational diabetes</b>	4	12	32	68	32	17	1	166
<b>Pre-existing diabetes complicating pregnancy childbirth and the puerperium</b>	1	7	16	12	6	2	0	44

Note: Includes non-ACT residents.

Source: ACT Hospital Morbidity Data Collection, 1997-98

During 1997-1998, there were 166 ACT hospital separations (involving 140 individuals) for women with gestational diabetes. The average length of stay was 3.1 days. Most of these separations involved the confinement of one or more babies.

Table 4 shows that the age group involving the greatest number of separations for gestational diabetes was 30 to 34 years.

In this same period there were 44 hospital separations (involving 32 individuals) for women with pre-existing diabetes having complicated pregnancy, childbirth and the puerperium. Of these separations, 27 did not involve the confinement of a baby. The average length of stay for these separations was 5.7 days. As seen in

Table 4 there was a similar number of separations for diabetes complicating pregnancy, childbirth and puerperium in the 25 to 29 year age group and the 30 to 34 year age group with over 60 percent of all separations occurring in these two age groups.

As with type 2 diabetes, gestational diabetes is associated with age. Table 5 shows that the proportion of deliveries in ACT hospitals involving women with gestational diabetes doubles for women aged 30-34 years compared to those aged 25-29 years. The proportion continues to increase for older age groups. Although the numbers are small, this pattern has been evident in previous years.

**Table 5: Number of all deliveries in ACT hospitals and the proportion involving women with gestational diabetes, by age, 1997-1998**

	Age groups (years)						
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
<b>Number of deliveries</b>	193	661	1481	1466	686	121	3
<b>Percentage with gestational diabetes</b>	1.0	1.5	2.0	4.4	4.5	8.3	30.0

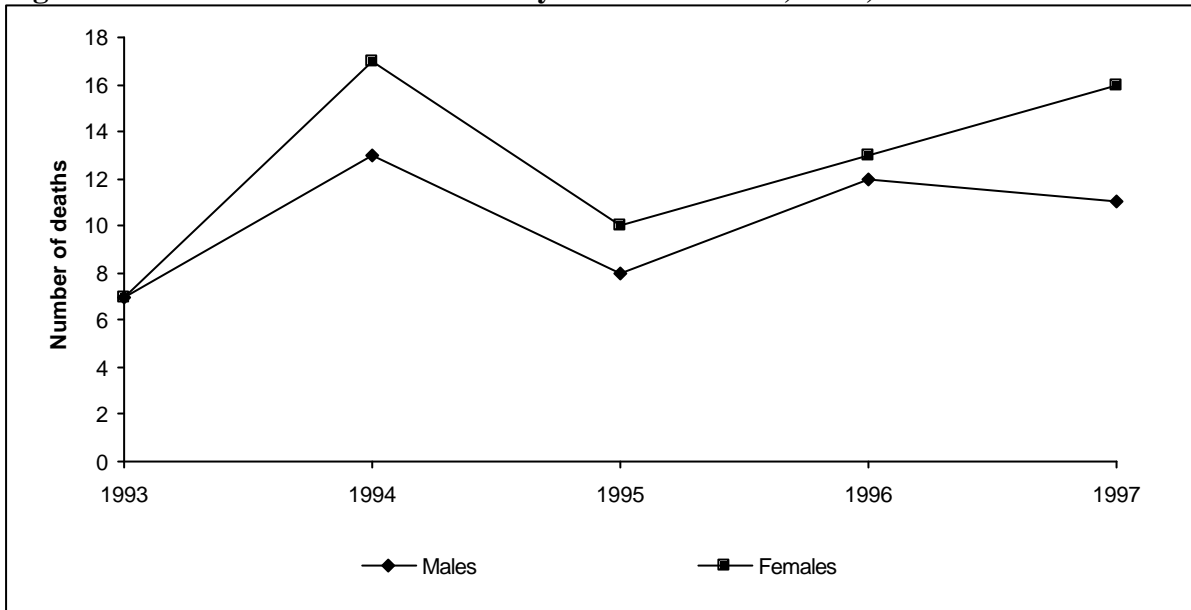
Note: Includes non-ACT residents.

Source: ACT Hospital Morbidity Data Collection, 1997-98

## 4. MORTALITY

The number of deaths in the ACT featuring diabetes mellitus as the underlying cause are quite low. In 1997 there were 27 deaths, involving 11 males and 16 females, which were directly attributed to diabetes mellitus. This equates to approximately 2 percent of all deaths in the ACT for that year. Diabetes by itself is not a major life threatening condition if it is properly managed. However, many individuals with diabetes develop life threatening conditions such as heart disease. For instance during 1997, there was a further 51 deaths that featured diabetes as a contributing cause of death. Of these deaths, 21 featured heart disease as the underlying cause of death. When figures such as these are taken into consideration it can be seen that mortality linked to diabetes mellitus is difficult to determine.

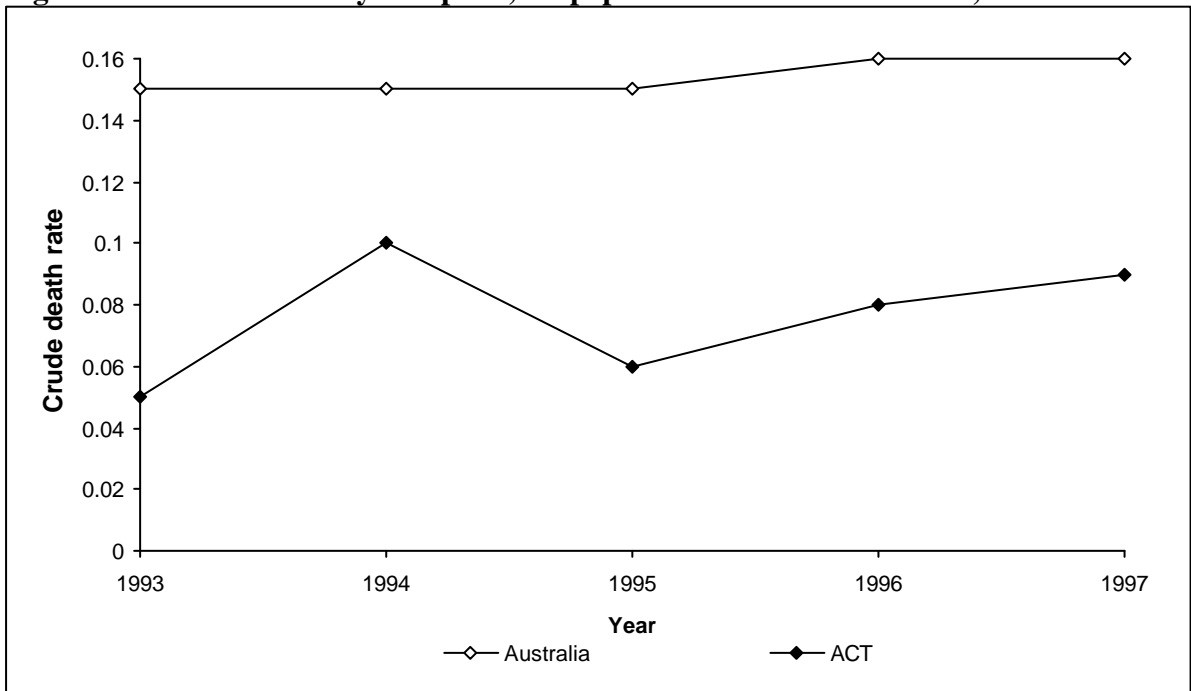
**Figure 6: Numbers of deaths caused by diabetes mellitus, ACT, 1993-1997**



Source: ABS, *Causes of Death*, 1993-1997

Due to the small size of the ACT and the relatively small number of deaths the pattern of deaths from diabetes has fluctuated over the years. The rise in deaths attributed to diabetes seen in 1994 did not indicate an emerging trend, as the numbers in subsequent years fell.

**Figure 7: Crude mortality rate per 1,000 population ACT and Australia, 1993-1997**

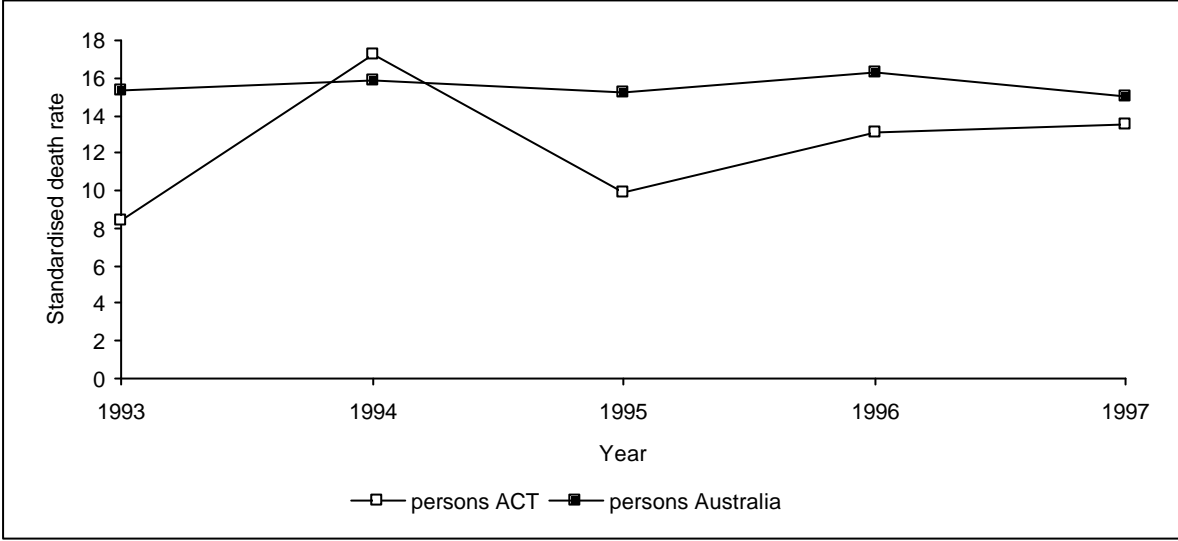


Source: ABS, *Causes of Death*, 1993-1997

The crude death rate from diabetes for the ACT is lower than the rest of Australia for both males and females. It could be speculated that this might be attributable to the ACT's relatively high socio-

economic status. However, age standardised rates (Figure 8) indicate that the difference between the ACT and Australia can in part be attributed to the ACT's relatively younger population.

**Figure 8: Age standardised death rates per 100,000, ACT and Australia, 1993-1997**



Source: ABS, Causes of Death, 1993-1997

Deaths resulting from diabetes tend to occur in older age groups. Table 6 shows that in 1997 there were no deaths in the under 45 years age groups with the majority of deaths occurring in the 65 years and over age groups. This pattern is evident throughout the five year period dating back to 1993.

**Table 6: Deaths from diabetes by age and sex, ACT, 1993-1997**

Year	Age groups								Total
	15-24	25-34	35-44	45-54	55-64	65-74	75-84	85+	
<b>Males</b>									
1993	1			1	1	3	1		7
1994					2	4	4	3	13
1995				2	1	2	2	1	8
1996		1		1	2	4	4		12
1997				1	1	5	1	3	11
<b>Females</b>									
1993					2	1	4		7
1994		1	1			8	2	5	17
1995					2	3	3	2	10
1996				1		3	6	3	13
1997				1	1	2	5	7	16
<b>Total</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>7</b>	<b>12</b>	<b>35</b>	<b>32</b>	<b>24</b>	<b>114</b>

Source: ABS, Causes of Death, 1993-1997

## **5. INITIATIVES IN DIABETES MANAGEMENT AND RESEARCH**

There are several important initiatives being planned or underway which will enhance the knowledge base and further improve service delivery in the area of diabetes. These include:

### ***5.1 ACT Diabetes Council***

The ACT Diabetes Council is the peak advisory body to the ACT Department of Health and Community Care on matters relating to diabetes. It comprises members with expertise in diabetes including health status research and treatment.

### ***5.2 ACT Diabetes Data and Information Working Group***

The role of this group is to develop and oversee the implementation of a diabetes information strategy for the ACT and to develop and monitor performance and outcome measures for the Integrated Diabetes Service. The working group reports to the ACT Diabetes Council.

### ***5.3 The Australian Diabetes, Obesity and Lifestyle Study (Ausdiab)***

This study is coordinated by the Melbourne based International Diabetes Institute in association with the Diabetes Centre at Sir Charles Gardiner Hospital, Perth. Over \$700,000 has been funded by the Commonwealth and over \$500,000 provided by private enterprise. This study aims to help find the estimated 450,000 people who have diabetes and are not aware of it. It also aims to both monitor the associated risk factors of diabetes as well as raise individual and public awareness.

### ***5.4 Integrated Diabetes Strategy***

This strategy is based on a multi-disciplinary services model with the General Practitioner playing a central role in patient management. Its aim is to improve service co-ordination and integration as well as create a greater community awareness of diabetes services. Patients with diabetes will only need to gain access to a single point of entry to ACT diabetes services. Patient records will either be held by the patient or shared between staff. This strategy also aims to improve systems of evaluation, patient review and assessment.

### ***5.5 National Biomedical Risk Factor Survey***

This survey has been developed under the auspices of the National Public Health Partnership and is anticipated to begin in 2001 as part of the Australian Bureau of Statistics program of health related household surveys. This survey addresses the four areas of major public health significance: cardiovascular disease, diabetes mellitus, nutrition and communicable diseases. It will include a health interview component as well as a voluntary physical examination, including blood sampling. This survey aims to collect examination data on 9,600 respondents between 18 and 74 years.

### ***5.6 National Diabetes Register***

This register is housed at the Australian Institute of Health and Welfare (AIHW) and is currently being developed. It will provide a database for measuring health indicators and samples for epidemiological and clinical studies. Initially, the register will be restricted to insulin treated diabetes. However, it is expected that in the future it will include all people with diabetes<sup>11</sup>.

## 5.7 National Diabetes Services Scheme (NDSS)

This scheme is funded by the Commonwealth and is operated by Diabetes Australia. It provides medication and medical equipment at a discount to people with diabetes who are registered on the scheme. The register serves also as a database of people with diabetes and it is estimated that the coverage of the database is 90 percent to 95 percent for insulin treated and 50 percent to 60 percent for non-insulin treated people. The NDSS database is currently being cross-referenced with the National Death Index in order to provide more accurate data on the numbers of people living with diabetes in Australia<sup>12</sup>.

## 6. DATA LIMITATIONS

In order to develop appropriate strategies and policies on diabetes prevention and treatment it is vital that comprehensive data be available. Some of the obstacles in achieving this are:

- Due to the invisibility of the early symptoms of diabetes many people with diabetes are not being identified in data collections.
- Available data tends to be small, especially data on the ACT. Smaller numbers can often lead to inexplicable fluctuations and at times misleading information.
- There may be inconsistencies in coding hospital admissions.
- With the exception of the National Diabetes Services Scheme there is no means for recording treatment for diabetes by services other than that provided by acute care facilities. This is problematic given that many people treat themselves or seek treatment from services outside of the hospital system (eg. general practitioner, podiatrist, ophthalmologist and pharmacist).

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  - <sup>10</sup> Hoffman, L., Nolan, C., Wilson, J. D., Oats, J. J. N., Simmons, D., *Gestational Diabetes Mellitus - Management Guideline*, The Australasian Diabetes in Pregnancy Society, Medical Journal of Australia, Vol 169, July, 1998.
  - <sup>11</sup> Diabetes Australia, *The National Diabetes Strategy and Implementation Plan*, 1998, p 38.
  - <sup>12</sup> Diabetes Australia, *The National Diabetes Strategy and Implementation Plan*, 1998, p 38.