

EPIDEMIOLOGY OF DIABETES AMONG ASIANS IN NEW ZEALAND

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ABSTRACT

This paper summarises the rising diabetes burden among Asians living in New Zealand. The diabetes prevalence among Asians world-wide has increased over the years with increasing lifestyle change, particularly with urbanisation. The proportion of Asians in New Zealand is increasing at a rapid pace, yet studies on prevalence of known and undiagnosed diabetes among Asians, diabetes risk factors and complication rates remain limited. Studies to date, compared with those elsewhere, suggest that prevalence rates are in upwards transition. There is an urgent need for closer surveillance of diabetes among Asians.

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INTRODUCTION

New Zealand Census groups 18 different ethnic groups under the term "Asian", which is strategic on one hand and disguises difference on the other. The major Asian ethnic groups in New Zealand are Chinese (42%), Asian Indians (25%), Koreans (8%), Filipinos (5%) & Japanese (3%) (2005). Asians are the fastest growing ethnic group in New Zealand, increasing by around 40% over the last five years. According to the 2006 population estimates, European New Zealander's make up 77% of the population, Māori 15%, Pacific people 7% with Asians now accounting for 9% (2004c). By 2021 Asians are expected to make up 15% of New Zealand's total population.

PREVALENCE OF DIABETES IN ASIANS

In 1998, Dr Hilary King (King et al., 1998) of the World Health Organisation predicted that people with known diabetes will rise from 140 million in 1998 to 300 million in 2025. Of these, more than 150 million will be in Asia. Prevalence varies widely between ethnic groups. Despite the ethnic diversity, a number of common themes can be found with regard to patterns of diabetes and prevalence rates among Asians. Type-1 diabetes is relatively less common in these populations compared with Europeans and Type-2 diabetes is increasingly becoming common, particularly among younger people of Asian origin (Cockram, 2000). The prevalence rates have markedly increased over the years with urbanisation and lifestyle changes. Genetic pre-disposition added with lifestyle changes of the modern era has accelerated the rise in prevalence rates.

Effects of urbanisation.

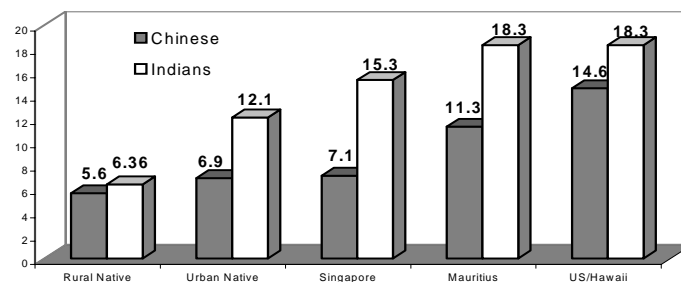
Type-2 diabetes remain low in rural areas but are increasing rapidly with improvement in living conditions and urbanisation. The prevalence of diabetes in rural India has increased three-fold over a period of 14 years from 2.20% in 1988 to 6.36% in 2003 (Ramachandran et al., 2004). A series of surveys has shown that in recent decades the prevalence of diabetes in mainland China has markedly increased from 1% in 1980 to 6.1% in 2002 (4.1% for undiagnosed and 2.1% for previously known diabetes) (Dong et al., 2005). These changes reflect lifestyle change, urbanisation and in studies of known diabetes, improvements in diabetes detection rates.

Effects of migration.

The prevalence in Chinese & Indians increases with migration and lifestyle changes (Figure 1). The prevalence rate among Chinese ranges from 7% to 14%, the highest in Hawaii. The current diabetes prevalence in urban India is catching up with that among Indians living in developed countries (around 15% to 18%). Prevalence rates from societies where the Chinese and Indians live together indicate that Asian Indians are more pre-disposed to diabetes compared with people of Chinese origin.

Figure 1. Prevalence of Diabetes Among Indians & Chinese in rural and urban regions of the native countries (India & China respectively), Singapore, Mauritius, U.S & Hawaii.

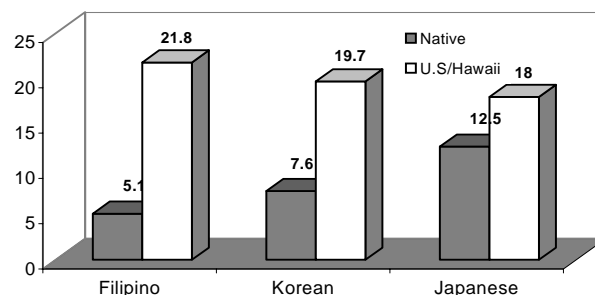
Sources: (Dong et al., 2005), (Ramachandran et al., 2004), (Ramachandran et al., 2001), (Singapore, 2005), (Soderberg et al., 2005), (Venkataraman et al., 2004), (Carter et al., 1996).



High diabetes prevalence rates have been reported among Filipinos, Japanese and Koreans living in U.S/Hawaii, but the difference compared with that in the home country is most evident among the Filipinos (Figure 2).

Figure 2. Prevalence of diabetes among Filipinos, Koreans & Japanese in their native countries (Philippines, Korea & Japan respectively) and in U.S/Hawaii.

Sources: (Baltazar et al., 2004), (Akazawa, 1994), (Kim et al., 2006), (Carter et al., 1996)



PREVALENCE OF DIABETES AMONG ASIANS IN NEW ZEALAND

There are very limited number of studies in New Zealand looking at diabetes in Asians. The growing diabetes burden among Asians has been highlighted by a recent review (Joshy & Simmons, 2006). Even early studies in the 1990's reported higher prevalence rates among

Asians in New Zealand when compared with Europeans (Table 1), although less than Maori and Pacific people. The Auckland workforce survey in 1990 (Scragg et al., 1991) appears to have with relatively low diabetes prevalence rates of 2.82% among Asians aged 40-64, intermediate between European (1.06%) & Maori (5.26%). Interestingly, the undiagnosed diabetes rate was highest among Asians. In the South Auckland Diabetes Project (SADP) household survey in 1992-95 (Simmons et al., 1999), 6085 people with known diabetes classified under "Other" ethnic group. Among them were 98% of Asian origin and 2% of Middle Eastern origin. The SADP survey found a prevalence of known diabetes of 4.32% among Asians, which was similar to the rates among Maori and Pacific people and comparable with the 1996/7 New Zealand Health Survey.

Table 1: Prevalence(%) of known diabetes, undiagnosed diabetes and IGT/IFG in New Zealand by ethnicity.

		European	Maori	Pacific	Asian
Prevalence % of Known Diabetes- all ages					
SADP household survey	1992-95* All ages	1.86%	5.21%	4.01%	4.32%
New Zealand Health Survey	1996/97* [‡] ≥15	3.10%	8.30%	8.10%	4%
New Zealand Health Survey	2002/03* [§] ≥15	2.9%	8%	10.1%	8.4%
Prevalence % of Known Diabetes – 40+ age group					
Auckland Workforce	1990 ^a 40-64	1.06%	5.26%	5.28%	2.82%
Auckland Surgical Ward (Simmons & Laughton, 1993)	1990-91 40-59	6.0%	18.3%	16.1%	7.8%
	60-69	7.9%	31.7%	30.2%	16.7%
SADP household survey	1992-95 40-49	1.5%	6.8%	4.7%	4.1%
	50-59	3.8%	13.1%	12.1%	8.0%
	60-69	5.6%	15.0%	12.6%	11.4%
Prevalence of diabetes in other subgroups					
Christchurch, Type 1 (prevalence/100,000) (Wu et al., 2005)	2005 <25	274	81	77	52
Gestational Diabetes(Yapa & Simmons, 2000)	1994-95	3.3%	7.9%	8.1%	5.5%
Prevalence % of Undiagnosed Diabetes (percentage of total diabetes)					
Auckland Workforce Survey	1990 40-64	0.8 (42)	4.64 (48)	3.59 (40)	4.72 (57)
Prevalence(%) of IGT/IFG					
Auckland Workforce Survey	1990 40-64	1.93	7.40	5.21	7.82

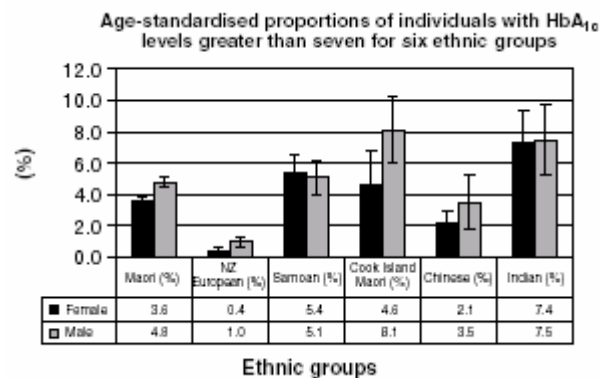
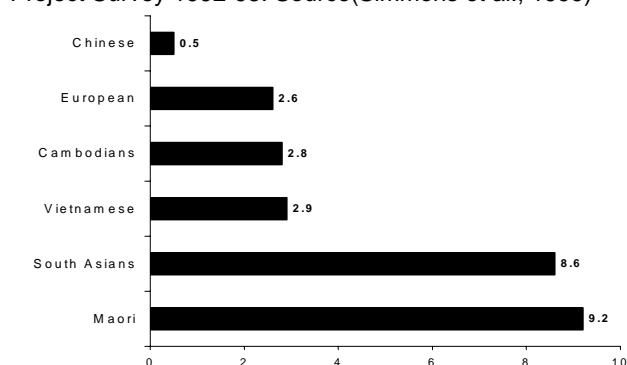
* Age standardised. [‡] Asians include others. [§] Europeans include others.

The population based SADP survey reported a low prevalence of 0.5% in Chinese but high prevalence of 8.6% in South Asians in the 40-49 age group (Figure 3). A recent HbA1c screening of 50,819 subjects aged 20+ found that Indians had particularly high rates of elevated HbA1c screening (Figure 4). The rates among Chinese were also high compared with Europeans.

Figure 3. Prevalence(%) of known diabetes among 40-49 year olds

Figure 4. HbA1c Screening for undiagnosed diabetes by ethnic group in the South Auckland Diabetes Project Survey 1992-95. Source:(Simmons et al., 1999)

Source: (Ellison TL, 2005 Jan-Feb)



The New Zealand Health Survey (NZHS) included questions on diabetes in 1996-97 but Asians were counted together with Others (1999). The prevalence rates for Asian/Others in this survey was 4.2% which was around half the prevalence among Maori. The latest NZHS (2004a; 2004) reported prevalence rates among Asians which is similar to that among Maori. The latest NZHS studied Asians as a separate ethnic group for the first time in 2002-03. Alarming prevalence rate of 8.7% for females and 8.1% for males has been reported and the latest rates are similar to that among Maori and Pacific people (Table 2). Asians have a low age at diagnosis especially for males (42 years).

Table 2. New Zealand Health Survey 2002-03 Results on Diabetes (2004a).

	Female				Male			
	Maori	Other	Pacific	Asian	Maori	Other	Pacific	Asian
No: of people with self-reported diabetes	7915	34081	5762	4404	9707	43063	2203	4886
Age standardised prevalence of diabetes	6.7	2.4	11.9	8.7	9.5	3.4	8.1	8.1
Prevalence of diabetes in 45-64 age group	11.1	3.6	19.8	15.1	19.9	6.1	-	-
Median age at diagnosis	41	55	44	46	47	53	58	42
Medical treatment for diabetes (%)	60.5	67.3	75.5	72	71.7	62.7	72	85.3

Further analysis of NZHS 2002-03 (Scragg & Maitra, 2005) results revealed that within the Asian community, South Asians have an increased risk of diabetes (14%), treated high cholesterol (12%) and asthma (16%) (Table 3).

Table 3: Age-standardised prevalence of chronic diseases, by Asian ethnic group

Chronic disease	Chinese %	South Asian %	Korean %	South-East Asian %	p- value
Hypertension*	9	14	11	12	0.69
High cholesterol*	3	12	0	6	0.0001
Heart Disease	2	11	2	4	0.26
Diabetes	6	14	7	6	0.21
Asthma	7	16	3	8	0.07

* currently on medication

According to the recently released Asian Health Chart Book (2006), the prevalence of self-reported diabetes is over three times higher for Indian people than for the total population (standardised rate ratio 3.3 (1.5 – 4.9)). They are also more likely to report having been tested for diabetes than the total population.

Impact of the increasing prevalence on service planning

Due to the small population proportion, and low diabetes prevalence according to the then existing literature, the Ministry of Health's diabetes model (2002a) did not include Asians as a separate category. But the Asian population in New Zealand has grown at a rapid pace and has out numbered Pacific people. The model, which is used for diabetes service planning and funding in New Zealand, needs to be updated to reflect the growing diabetes burden among Asians.

PREVALENCE OF DIABETES RISK FACTORS

It is evident from different surveys that a high proportion of Asians have a sedentary lifestyle (Table 2). The low levels of physical activity is found even among children (2002b). While Asians appear to have comparatively lower obesity (2004a), Rush et al (Rush et al., 2004) have found high body fat composition for Asian Indians compared with Europeans for a given BMI.

Table 4. Prevalence of Risk Factors for Diabetes.

		European	Maori	Pacific	Asian
Sedentary (%)	NZHS 1996/97* [§]	14.7	19.8	14.1	20.5
	NZHS 2002/03 * [†]	11.2	12.6	17.8	22.3
	SPARC Survey(2002b) 1997-01 [§] , 5-17 year	8.0	10.0	19.0	12.0
		>=18 years	9.0	12.0	10.0
Obesity (%)	NZHS 2002/03 * ^{†‡}	18.9	28.3	43.0	5.7

*Age Standardised. [†] European includes Other.

[‡] Obesity is BMI \geq 30 for European/Other/Asian, BMI \geq 32 for Maori/Pacific. [§] Asian include Other.

DIABETES TREATMENT & METABOLIC CONTROL

There are few limited publications on diabetes treatment and metabolic control among Asians in New Zealand. Results from the recently published diabetes audit in South Auckland (Robinson et al., 2006) indicate that 44.9% of Indians have HbA1c >8% whereas 30.2% Other Asians, 22.7% Europeans and 49.5% Maori fall in this category. Indians are more likely to be Aspirin treated (odds ratio =1.31) and less likely to be on diet therapy (odds ratio=0.64) compared with Europeans. Other Asians (Chinese) are less likely to be insulin treated (odds ratio=0.44) compared with Europeans. Few studies of access to care among New Zealand Asians with known diabetes have been undertaken. During the SADP household survey, those visited at home were asked questions about how to improve their care and what prevented them from looking after their diabetes (Simmons et al 1998). At that time, the most highly ranked barrier related to language and communication, followed by the strictness of the diabetes regimen, the need for more diabetes knowledge and the range of services available.

PREVALENCE OF DIABETES COMPLICATIONS

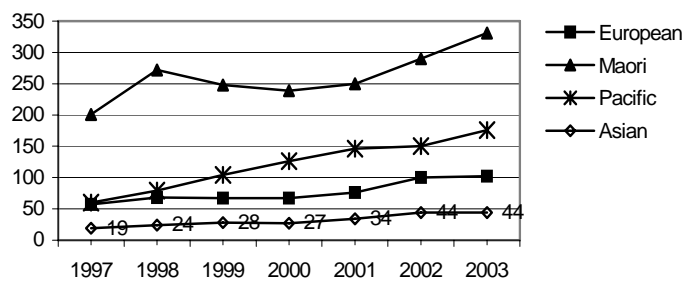
Table 5 . Diabetes Related Complications

	European	Maori	Pacific	Asian
Crude Incidence (per 100,000) of diabetes related renal disease in New Zealand in 2001*	1.5	18.2	19.8	3.8
Vision threatening retinopathy in 2002 (Reda et al., 2003)	2.5%	4.3%	4.9%	4.6%
Prevalence of diabetes among new renal disease patients in 2003 (2004b)	23%	65%	67%	50%

*Estimated from ANZDATA Registry 2001 and Census 2001

The crude incidence of diabetes related renal disease among Asians is two-fold compared with that among Europeans. From the prospective data from Australia & New Zealand Dialysis and Transplant Registry (ANZDATA) reports(2004b), the numbers with of diabetes related ESRD in Asian population is gradually increasing. (Figure 4). Diabetic eye disease would also appear to be higher than among European New Zealanders and comparable with Maori and Pacific people.

Figure 4: Number of Dialysis Patients with Diabetic Primary Renal Disease: 1997-2003
(Source: ANZDATA Reports 1998-2004)



CONCLUSION

The proportion of Asians in New Zealand is increasing rapidly, a large proportion being Chinese and Asian Indians. As with Asians living elsewhere in the world, there is an increasing prevalence of diabetes and its complications among Asians in New Zealand. Increasingly the risk of diabetes and its complications appear to be comparable with Maori and Pacific people. We need to align our planning and funding to these to address the increasing burden. Closer monitoring of undiagnosed diabetes and IGT/IFG in these groups are needed.

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