

# Characteristics of nurses providing diabetes community and outpatient care in Auckland

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## ABSTRACT

**INTRODUCTION:** There is a worldwide trend for diabetes care to be undertaken in primary care. Nurses are expected to take a leading role in diabetes management, but their roles in primary care are unclear in New Zealand, as are the systems of care they work in as well as their training.

**AIM:** To describe and compare demographic details, education and diabetes experience, practice setting and facilities available for the three main groups of primary health care nurses working in the largest urban area in New Zealand.

**METHOD:** Of the total number of practice nurses, district nurses and specialist nurses working in Auckland (n=1091), 31% were randomly selected to undertake a self-administered questionnaire and telephone interview in 2006–2008.

**RESULTS:** Overall response was 86% (n=284 self-administered questionnaires, n=287 telephone interviews). Almost half (43%) of primary care nurses were aged over 50 years. A greater proportion of specialist nurses (89%) and practice nurses (84%) had post-registration diabetes education compared with district nurses (65%,  $p=0.005$ ), from a range of educational settings including workshops, workplaces, conferences and tertiary institutions. More district nurses (35%) and practice nurses (32%) had worked in their current workplace for >10 years compared with specialist nurses (14%,  $p=0.004$ ). Over 20% of practice nurses and district nurses lacked access to the internet, and the latter group had the least administrative facilities and felt least valued.

**DISCUSSION:** These findings highlight an ageing primary health care nursing workforce, lack of a national primary health care post-registration qualification and a lack of internet access.

**KEYWORDS:** Community health nursing; diabetes mellitus; internet; nurses; primary health care

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## Introduction

New Zealand (NZ) is in the middle of a growing epidemic of diabetes.<sup>1</sup> Since the 1990s, results from major international intervention studies have shown that improved clinical management of blood glucose levels (BGLs) in patients with diabetes reduces microvascular complications,<sup>2</sup> and that improvements in major cardiovascular (CV) risk factors reduces all diabetes-related complications.<sup>3–7</sup> Despite the increasing role and need for health professionals in the detection and management of diabetes, there already exists a

shortage of specialists to manage the condition in NZ.<sup>8</sup> Thus, it is unlikely that the demands from increasing numbers of patients diagnosed with Type 2 diabetes, and from expanded roles into screening, can be met without a re-examination and re-defining of existing work practices of health professionals, including primary health care (PHC) nurses.

In 2010, there were 42 334 registered nurses working in NZ and, of those, 23% were working in a community or rural setting.<sup>9</sup> The four main groups of nurses providing PHC are practice nurs-

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es (PNs), district nurses (DNs), diabetes specialist nurses (DSNs), and chronic care management (CCM) nurses—formerly referred to as disease state management nurses. CCM nurses receive funding for further education and to develop competencies in chronic condition management, and during the survey were employed by general practices, Primary Health Organisations (PHOs) and independent providers. PNs are primarily employed in general practice and have the greatest opportunity to develop new roles in the PHO environment, as they comprise the largest group of nurses working in the community—45% in the 2010 national survey.<sup>9</sup> All DNs in Auckland are employed by the three Auckland District Health Boards (DHBs) and their role is aligned with secondary health care services to provide home care for patients. DSNs predominantly work within secondary health care services, although as in the United Kingdom, a proportion now work in PHC settings or across both sectors.<sup>10</sup>

The Ministry of Health encouraged the development of PHOs, following the PHC Strategy in 2001,<sup>11</sup> which offered new opportunities for nurses working in community settings, including professional development and leadership, to enable nurses to work more independently.<sup>12</sup>

The aim of this paper is to describe and compare the demographic characteristics, current practice settings and diabetes training and experience of the main groups of PHC nurses to gain an understanding of their experience and skill set in providing community-based services for patients with diabetes in Auckland.

## Methods

The current study is a cross-sectional survey of PHC nurses providing community management for patients with diabetes in the Auckland region, conducted between September 2006 and February 2008. Approval was obtained from the Northern X Regional Ethics Committee (NTX/05/10/128).

A total of 1091 nurses providing PHC services were identified in 2006/7 and stratified by nurse group with the aim of randomly sampling approximately 25% from each group. In total, 813

PNs were identified as working in Auckland from an updated register of PNs and general practitioners (GPs) held by the Department of General Practice and Primary Health Care, The University of Auckland. Further, 180 DNs were identified from lists obtained by the three Auckland DHBs in 2007, and 73 DSNs and 25 CCM nurses were identified by contacting all 19 PHOs in the Auckland region and the three independent Maori providers. Of the total 1091 nurses, 383 were randomly selected and, of those, 335 (31%) nurses were still working in PHC (based on telephoning their workplace) and were invited to participate in the survey. Of the total number invited, 287 (86%) agreed to participate, including 210 (85%) PNs, 49 (83%) DNs, 19 (95%) DSNs and 9 (100%) CCM nurses.

A self-administered four-page questionnaire consisting of closed questions with 'other' response options, where appropriate, and a reply-paid envelope were mailed to all 335 randomly selected nurses. This was followed by a telephone call a week later to solicit participation and arrange a time for a telephone interview for those who agreed to participate. A total of 284 nurses returned and completed the self-administered questionnaire. This contained questions about their nursing training, subsequent diabetes education and experience, facilities and processes for managing patients with diabetes in their current workplace, and their involvement in managing diabetes. All 287 nurses who agreed to participate completed the telephone interview, including two PNs and one DN who did not complete the self-administered questionnaire. The telephone interview, made up of closed questions or multi-choice options, was designed to elicit further information on work facilities and how valued and supported nurses felt in the management of patients with diabetes. Responses were recorded in writing.

For statistical analyses, nurses were categorised into three groups: PNs, DNs, and specialist nurses (SNs), who included both the DSNs (n=19) and CCM (n=9) nurses. The latter two groups were combined because of small numbers. Standard univariate methods were used for analysing categorical outcome data, using PROC FREQ in SAS version 9.2 (SAS Institute, Cary, North Carolina, 2008).

## Results

Table 1 shows the biographical details of the 284 PHC nurses who completed the self-administered questionnaire. Almost all were female, 80% were aged over 40 years and significantly more DNs had graduated more recently than SNs and PNs. Three-quarters of nurses self-identified as NZ Europeans, and only 4% as Maori; the latter were more likely to be CCM nurses (Table 1). Most nurses had completed their undergraduate nursing education in NZ and half of the nurses had, or were working towards, post-registration qualifications, including significantly more SNs (Table 1).

Table 2 outlines previous community nursing experience and current work settings of the nurses. Over half had worked within the community for over 10 years and significantly more PNs and DNs had also been in their current work positions for >10 years compared with SNs. However, more SNs worked full-time compared with DNs and PNs who tended to work three to four days per week (Table 2). The proportion of PHC nurses working in each DHB was similar, being Waitemata (35%), Auckland (34%) and Counties Manukau (30%), as was the distribution for each nurse group ( $p=0.12$ ).

Table 3 shows details of prior diabetes education and work experience. Although a large proportion of participants had undertaken specific diabetes education, this was predominantly workshop- and workplace-based. Furthermore, significantly more DNs and PNs had received  $\leq 10$  hours diabetes education compared with SNs and almost 20% of nurses surveyed listed over 30 diabetes courses or education providers where they had received this education.

Table 4 reports the practice size and workplace setting of nurses. Almost half of the PNs worked at mid-sized practices, while most SNs worked in larger practices or services. In contrast, only a small proportion of PNs and SNs worked in small (one GP) practices.

Over half of SNs and about 40% of PNs had their own office or room to carry out administrative work (Table 4). In contrast, the majority of DNs

## WHAT GAP THIS FILLS

**What we already know:** There is a shortage of specialists involved in diabetes care. Primary health care nurses are increasingly taking a greater role in the management of patients with diabetes.

**What this study adds:** This is the first cross-sectional study reporting on the demographic characteristics, diabetes education and experience of a representative sample of primary health care nurses from the wider Auckland region. Practice and district nurses need to be supported to further their diabetes education and to gain access to internet and email services. Further effort is required to ensure district nurses feel valued and supported in this role and are adequately connected to other primary health care professionals.

carried out administrative work in a shared room, in patients' homes and/or in their car, and typically carried out administrative work in one large office with a limited number of computers. Most SNs had access to broadband internet compared with only 78% of PNs and DNs (Table 4) and nine nurses used dial-up internet. A high proportion of all three nurse groups had access to a telephone, computer and printer (93–100%), although far less had access to emails—internal (72%) and external (45%). A significantly larger proportion of PNs (54%) had external email access compared with only 18% of DNs and SNs ( $p<0.0001$ ). Despite this, most SNs (96%) and PNs (91%) and all 32 DNs (who answered this question) had access to a private room when consulting patients with diabetes (data not shown).

Table 5 outlines details of other health professionals involved in diabetes care at the nurse's workplace. Significantly more SNs and DNs reported other clinical specialists were involved in diabetes care at their practice or service compared with PNs, although largely limited to dietitians for DNs. Furthermore, only a third of respondents reported other CCM nurses or DSNs visited their workplace and, of those, significantly fewer PNs and DNs received weekly visits compared with SNs (Table 5).

A greater proportion of SNs (92%) felt they were 'always or often' valued as skilled practitioners in the management of patients with diabetes at their practice or service compared with 78% of PNs and 56% of DNs ( $p=0.004$ ). Moreover, significantly

Table 1. Biographical details of primary health care nurses (n=284), by nursing group—sex, age, ethnicity and country of graduation.

Variable and level	Total N=284 n (%)	Type of nurse			p-value*
		Practice nurses n=208 (%)	District nurses n=48 (%)	Specialist nurses n=28 (%)	
Sex (n=284)					0.43
Female	278 (98)	99	96	96	
Male	6 (2)	1	4	4	
Age, years (n=280)					0.27
25–40	57 (20)	20	25	14	
41–50	104 (37)	34	46	43	
51 and older	119 (43)	46	29	43	
Ethnicity (n=284)					0.001
NZ European	209 (74)	76	75	54	
Asian	20 (7)	8	2	7	
Pacific	14 (5)	6	0	7	
United Kingdom	14 (5)	3	8	11	
Maori	11 (4)	1	6	18	
†Other	16 (6)	5	8	3	
Year of graduation (n=279)					0.04
1959–1975	91 (33)	36	17	30	
1976–1985	94 (34)	34	32	33	
1986–2006	94 (34)	29	51	37	
Country of graduation (n=284)					0.13
New Zealand	224 (79)	78	77	86	
United Kingdom	22 (8)	5	17	11	
Pacific nation	12 (4)	5	2	0	
Australia	10 (4)	4	2	0	
Asia / Malaysia / Middle East	10 (4)	5	0	0	
North America / South Africa	6 (2)	2	2	4	
*Academic qualification/s	140 (49)	45	46	86	0.0003
Certificate	66 (23)	22	19	39	0.81
Diploma	48 (17)	14	17	43	0.17
Degree	43 (15)	15	10	25	0.63
Master's degree	15 (5)	3	6	21	0.03
Other qualifications					0.72
Hospital course	7 (3)	3	2	0	
Midwifery	7 (3)	2	2	4	
Nutrition/non-health	3 (1)	1	0	0	

\* p-value showing significance of variation in percentages in subgroups, from the Chi-square value

† 2% each from Australia and North America and 1% from Europe

‡ Post-registration qualifications

Table 2. Primary health care nurses (N=284) by nursing group—community experience and current demographic work details.

Variable and level	Total N (%)	Type of nurse			p-value*
		Practice nurses n=208 (%)	District nurses n=48 (%)	Specialist nurses n=28 (%)	
Years of community experience0.048					
<1	9 (3)	1	10	4	
1–5	70 (25)	24	27	29	
6–10	53 (19)	18	21	21	
>10	152 (54)	57	42	46	
Years in current PHC role0.002					
<1	14 (5)	2	8	18	
1–5	92 (33)	29	42	43	
6–10	53 (19)	20	15	14	
>10	124 (44)	48	35	25	
Current work setting<0.0001					
General practice	206 (73)	92	0	54	
Accident & Medical clinics	17 (6)	8	0	0	
Home visits	51 (18)	0	100	11	
Hospital outpatient clinics	7 (2)	0	0	25	
Community	3 (1)	0	0	11	
Time in current position (years)0.004					
<1	22 (8)	5	10	25	
1–5	122 (43)	44	33	50	
6–10	52 (18)	19	21	11	
>10	88 (31)	32	35	14	
Hours worked per week0.01					
≤8	5 (2)	2	0	0	
9–16	20 (7)	8	6	4	
17–24	48 (17)	20	10	7	
25–39	117 (41)	43	42	25	
≥40	94 (33)	27	42	64	

\* p-value showing significance of variation in percentages in subgroups, from the Chi-square value.

more DNs felt less valued, with 42% responding they were ‘sometimes or rarely’ valued compared with PNs (19%) and SNs (8%,  $p=0.004$ ). Despite this, a high proportion of all nurses—SNs (96%), PNs and DNs (88%) stated their suggestions regarding the management of patients with diabetes were either ‘always or often’ taken seriously and 96% of SNs, 90% of PNs, and 77% of DNs, ‘always or often’ felt supported in their management of patients with diabetes.

## Discussion

This is the first survey of the diabetes education and experience of a representative sample of nurses from the wider Auckland region. Of the total nurses surveyed, a slightly higher proportion were female (98%) than that reported nationally for all nurses (93%) and those working in a community setting (94%),<sup>9</sup> although similar to that recently reported for urban-based PNs in

Table 3. Proportion of primary health care nurses (N=284) with specific diabetes education and experience.

Variable and level	Total N (%)	Type of nurse			p-value*
		Practice nurses n=208 (%)	District nurses n=48 (%)	Specialist nurses n=28 (%)	
Diabetes education and experience					
Specific diabetes education	230 (81)	84	65	89	0.005
Workshop (n=212)	145 (51)	55	27	64	0.0008
Workplace (n=212)	110 (39)	34	44	64	0.007
Conferences (n=212)	52 (18)	17	8	46	0.0001
Tertiary (n=212)	31 (11)	8	6	39	<0.0001
Hours of diabetes education					<0.0001
0	56 (20)	17	35	11	
<5 (n=228)	50 (18)	16	33	4	
5–10	53 (19)	22	13	7	
11–20	43 (15)	19	8	0	
>20	82 (29)	26	10	79	
Diabetes experience					
PHC experience (n=229)	187 (66)	78	10	71	<0.0001
Hospital setting (n=228)	58 (20)	17	21	46	0.001
District nursing (n=228)	36 (13)	3	58	7	<0.0001

\* p-value showing significance of variation in percentages in subgroups, from the Chi-square value.

Table 4. The number of medical practitioners and nurses and access to office space at each practice or service (N=286), by nurse group.

Variable and level	Total N (%)	Type of nurse			p-value*
		Practice nurses n=208 (%)	District nurses n=48 (%)	Specialist nurses n=28 (%)	
Number of doctors	279				<0.0001
None	41 (15)	0	86	11	
1	34 (12)	14	2	15	
2–3	104 (37)	46	9	15	
4–7	78 (28)	33	2	33	
>8	22 (8)	7	0	26	
Number of nurses	282				<0.0001
1	32 (11)	14	0	15	
2	64 (23)	29	0	15	
3–4	82 (29)	37	4	15	
>4	104 (37)	21	96	56	
Administrative work in:	286				<0.0001
A shared office	111 (39)	41	29	39	
Own room / office	104 (36)	41	4	57	
Office / reception area	33 (12)	16	0	0	
Shared room / patient's home / car	33 (12)	0	67	0	
Other (clinic / treatment area)	5 (2)	2	0	4	
Internet access	227 (79)	78	78	93	

\* p-value showing significance of variation in percentages in subgroups, from the Chi-square value.

Table 5. The proportion of primary health care nurses, by group, reporting specific health professionals involved in diabetes care at each practice or service (N=283).

Variable and level	Total N (%)	Type of nurse			p-value*
		Practice nurses n=208 (%)	District nurses n=48 (%)	Specialist nurses n=27 (%)	
<b>Specialist in diabetes:</b>	141 (50)	38	79	85	<0.0001
Dietitians	88 (31)	17	75	63	<0.0001
Diabetes nurse specialists	55 (19)	18	10	48	0.0002
Diabetes nurse educators	53 (19)	16	17	41	0.009
Podiatrists	41 (14)	12	15	33	0.01
CCM <sup>†</sup> nurses	16 (6)	4	0	26	<0.0001
Diabetologists	15 (5)	2	2	33	<0.0001
<b>Other specialists:</b>	13 (5)				<0.0001
Health psychologist	7 (2.5)	1	0	19	
Retinal screening	4 (1.5)	2	0	0	
Rheumatologists and retinal	2 (1)	1	0	0	
<b>Frequency of specialist nurse visits</b>	275				0.01
Never	173 (63)	63	67	50	
Weekly	24 (9)	8	4	25	
Monthly	25 (9)	10	2	15	
2–6 monthly	20 (7)	9	4	0	
Yearly	33 (12)	10	23	10	

\* p-value showing significance of variation in percentages in subgroups, from the Chi-square value.

† CCM chronic care management

Scotland<sup>13</sup> and DSNs in the UK.<sup>14</sup> PHC nurses in Auckland were slightly older than all nurses working in NZ, of whom 40% were aged over 50 years, although similar to all nurses working in community settings where 46% were aged 50 years or older.<sup>9</sup> They were also older than nurses in Scotland where 29% of PNs were aged over 50 years<sup>13</sup> and DSNs in the Netherlands who were on average 43 years of age.<sup>15</sup> An ageing nursing workforce may limit new graduates entering PHC.

Despite the ageing PN workforce PNs and DNs represent a stable workforce, with about a third having remained in their current workplace for over 10 years—similar to that reported for PNs in NZ in 1999,<sup>16</sup> although more than those surveyed in 1990.<sup>16</sup> However, they are less stable than their peers in Great Britain who had spent 9.3 mean years in their current positions<sup>17</sup> and less than

the eight mean years reported for PHC nurses in South Africa.<sup>18</sup> SNs had spent less time in their current positions than PNs and DNs and also less than their peers in the UK, who had been in their current positions for a mean of 6.2 years.<sup>17</sup> Stability, whilst viewed positively, may also limit opportunities for new graduates entering PHC.

A large proportion of SNs had, or were working towards, post-registration qualifications, similar to that reported for DSNs in the UK,<sup>14</sup> as were almost half of PNs and DNs in this survey and similar to that reported nationally,<sup>9</sup> but lower than the 58% reported nationally for all registered nurses,<sup>9</sup> despite extra funding for PHC nurses to further their education.<sup>12,19</sup> PHC nurse leaders identified the lack of PHC-focused courses as one reason for the lower uptake.<sup>19</sup> In addition, 15% of all nurses sampled had post-registration degrees which was slightly less than



the 19% and 22.5% reported for PNs in Great Britain<sup>17</sup> and Scotland<sup>13</sup> respectively. In contrast, a quarter of the SNs sampled held post-registration degrees, which was comparable with the 28% reported for DSNs in Great Britain.<sup>17</sup> Further, 6% of DNs and 3% of PNs (similar to the 3.5% reported for PNs in the Scottish survey)<sup>13</sup> and 21% of SNs held a master's degree—almost twice the proportion of CCM nurses compared with DSNs, which was more than the 6% reported as undertaking post-registration study in the UK<sup>17</sup> and the 8–9% of diabetes educators holding doctorates in the US.<sup>20,21</sup>

Most SNs (89%) sampled had received specific diabetes education, which was a similar proportion to that reported for DSNs in the UK<sup>14,22</sup> and experienced staff nurses in an older survey from South Africa.<sup>18</sup> A large proportion of PNs (84%) sampled reported having specific diabetes education, similar to that reported by PNs in Scotland<sup>13</sup> and those surveyed from 123 general practices in Nottingham, UK,<sup>23</sup> and almost twice the proportion reported from the 1999 (47%) and far higher than that reported in the 1990 (14%) NZ surveys,<sup>16</sup> illustrating the increasing trend in post-registration diabetes education for PNs. Despite this, no national post-registration diabetes programme or qualification exists in NZ, making comparisons difficult on the quality and core content covered.

Most PNs and SNs had gained their diabetes experience in PHC, similar to the proportion reported for PNs in Scotland<sup>13</sup> and SNs had spent longer in PHC than diabetes educators in the US.<sup>20</sup> About half of the PNs worked in mid-sized practices—similar to that reported in NZ from the 1999 survey and more than in 1990<sup>16</sup>—and in practices in the Waikato region,<sup>24</sup> and with more nurses than the majority of PNs in Scotland where the majority worked with one to two other nurses (74%).<sup>13</sup> SNs tended to work in large practices or services with fewer working in multi-disciplinary teams compared with DSNs in the Netherlands (78%)<sup>15</sup> and the UK.<sup>10</sup>

The majority of PNs and SNs had access to a private room when consulting patients, and computer access. However, fewer had access to external email and, most concerning, over 20% of

PNs and DNs had no internet access, especially as 99% of general practices in NZ, prior to this survey, had internet services.<sup>25</sup> It is imperative in a modern practice that PNs and SNs have similar access as GPs in NZ who source information using internet sites more often than referring to textbooks<sup>26</sup>—an increase from earlier NZ<sup>27, 28</sup> and international reports.<sup>29,30</sup>

DNs had the fewest administrative facilities and least access to electronic patient data and received the least specialist nursing support. In addition, they felt the least valued in managing patients with diabetes, although this was comparable with DNs sampled in the UK who also felt undervalued.<sup>31</sup> The high proportion of SNs who 'always or often' felt valued was similar to that reported for DSNs in the Netherlands who felt more positive in their roles compared with hospital and nursing home-based nurses,<sup>15</sup> and both higher than PHC nurses in an older South African survey who suggested communication between health professionals should be improved to enhance patient care.<sup>18</sup>

This is the first comprehensive cross-sectional survey of PHC nurses in the largest urban area in NZ. Selection bias was unlikely to have occurred because of the very high response rate; however, differences in the PHC nursing workforce may differ in other urban areas. Limitations of the survey include potential bias on self-reported information and changes in practice facilities, including internet access, which may have improved since data collection.

In conclusion, PHC nurses represent a stable workforce. Funding for ongoing PHC and diabetes education for PNs and DNs should be extended along with a clearly defined national post-registration education that includes a core knowledge<sup>19</sup> of diabetes and common chronic health conditions, and career pathway that encourages ethnically diverse graduate nurses into PHC. DNs feeling less valued and their separation from PHC providers requires further investigation. The lack of access to the internet and patient management systems for PNs and DNs impedes communication between providers and patients and limits access to research and best practice guidelines.



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## COMPETING INTERESTS

None declared.