

# Seen and unseen work: the intensity of service provision for individuals with type 2 diabetes in a high-needs population

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The funding and sustainability of primary healthcare are urgent priorities that must be addressed if the recent health reforms are to achieve the goal of equitable access and outcomes for all New Zealanders. This is particularly critical for services where large proportions of the enrolled population have high health needs and/or multiple social disadvantages. Providing adequate services to such groups is recognised as challenging,<sup>1,2</sup> and long-term under-funding of these services is recognised.<sup>3</sup> These populations have higher rates of multi-morbidity, more frequently utilise health and other social services and have higher unmet needs than other groups.<sup>4-7</sup> This results in high concentrations of complexity<sup>6</sup> and the need for evidence-based interprofessional collaborative models of care,<sup>7</sup> including a diverse range of regulated and unregulated workers.<sup>8</sup> However, current data detailing the extent of work and the range of skills and workers needed within practices serving these populations are limited.<sup>9</sup>

Within a practice serving a high-needs population, this exploratory study aimed to ascertain the complexity of individuals with type 2 diabetes (T2D) and the volume of work undertaken by members of the practice team providing healthcare to these individuals over 1 year.

## Context

Porirua Union Community and Health Service (PUCHS) operates as a Very Low Cost Access (VLCA) practice and serves a population of 7,189, comprising 48% Pacific Peoples, 21% Māori and 9.2% Refugee (many with English as a second language). Overall, 89% of this population live in the most deprived areas (quintile five) and many have multi-morbidity. Within PUCHS, 9.3% (n=657, including 20 individuals aged 14–29 years) have T2D, compared with 4.7% overall in the primary

health organisation (PHO) that PUCHS operates within. Similarly high proportions have pre-diabetes; PUCHS 8.8% (n=627, including 36 aged 14–29 years), PHO overall 4.4%. In return for higher capitation and equity funding than other practices, caps are placed on co-payments charged to individuals attending VLCA practices.<sup>10</sup> PUCHS utilises a wide range of staff to address the enrolled population's needs, including general practitioners (GPs), nurses, health coaches, health-care assistants, and a practice-based prescribing pharmacist, podiatrist, dietitian, counsellor, health improvement practitioner (HIP), cross-cultural worker and community health worker. Many of these staff are culturally matched and live within the local community.

## Methods

Ethical approval was provided by the University of Otago Human Ethics Committee (Health) (HD23/003). To ascertain the practice work, we collected anonymised clinical records and data extracts from the MedTech practice management system for eight individuals with T2D, purposefully selected to include a range of ages, genders and ethnicities. Table 1 describes the data and analysis.

## Results and discussion

A summary of the findings is presented in Table 2. The mean number of recorded long-term conditions (LTC), unique items prescribed and daily record entries per case/year were high, confirming the complexity of these cases.<sup>11</sup> Nevertheless, these numbers alone under-represent complexity. Case 7 had only seven daily record entries; however, this individual was worryingly unengaged in healthcare, difficult to locate and the HIP was actively but unsuccessfully

**Table 1:** Description of data and analysis.

<b>Data, explanation and analysis</b>
<p><b>Demographic data</b></p> <p>Data: age, ethnicity, gender and community service card status.</p>
<p><b>Read code classifications</b></p> <p>Data: Read code classifications for the individual's entire enrolment with the practice.</p> <p>Definition: LTC were defined as any ongoing condition warranting ongoing monitoring or management, or any disabilities, likely to increase the complexity of care delivery.</p> <p>Classified<sup>a</sup> LTC present across all cases:</p> <p>Asthma, atopic dermatitis/eczema, bipolar affective disorder, chronic obstructive pulmonary disease, chronic renal failure, coronary artery disease, depression, diabetes mellitus, disability (intellectual), gastro-oesophageal reflux, gout, habit and impulse disorders, hypertensive disease, mixed hyperlipidaemia, obesity, obstructive sleep apnoea, osteoarthritis, polycystic ovaries, psoriasis, smoker or ex-smoker, transient ischaemic attack</p> <p>Classified complications:</p> <p>Diabetic nephropathy, diabetic retinopathy or diabetic maculopathy, microalbuminuria</p>
<p><b>Prescriptions</b> covering 1 April 2022–31 March 2023</p> <p>Data: All individual items prescribed over a 1-year period.</p> <p>Analysis: The total number of individual items (including repeat prescriptions for the same item) and the total number of unique items prescribed over the year were calculated.</p>
<p><b>Daily records</b> covering 1 April 2022–31 March 2023</p> <p>Data: These records document healthcare actions directly with or in relation to each patient. These typically include face-to-face or phone consultations, prescription reviews and prescribing and other patient-related queries or tasks and their outcomes. Some providers, particularly those whose work is not invoiced to the individual receiving care, did not routinely enter notes into the daily records.</p> <p>Analysis: For each case all entries into the daily record were coded according to staff provider type and counted. Entries with provider name only and no comment were excluded from counts. Then, to enable a more contextual analysis of each case, factors likely to impact the intensity of service use or case complexity and that were not evident in the classification coding were identified by reading the content of the notes and recorded in each case summary.</p>
<p><b>Outbox and inbox transactions</b> covering 1 April 2022–31 March 2023</p> <p>Data: Outbox entries captured investigation requests, referrals and certificates. Inbox entries captured incoming correspondence including investigation results and other service providers reports.</p> <p>Analysis: Entries were coded according to broadly similar categories and counted. To avoid over-estimation of work volume, entries by a health improvement practitioner or health coach that were recorded in the inbox and daily records were removed from inbox/outbox counts and represented in the daily record counts only.</p>
<p><b>Invoices</b> covering 1 April 2022–31 March 2023</p> <p>Data: Due to the complex nature of funding streams, not all care is directly invoiced to the individual receiving care.</p> <p>Analysis: The total co-payment directly invoiced to each case was calculated and coded according to provider type.</p>

LTC = long term conditions.

<sup>a</sup>Some records used alternative read code terminology for the same condition; for simplicity only one condition for each category is reported.

Table 2: Summary data.

	Individual case data								Summary data	
	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Mean	Range
<b>Demographics</b>										
Age range	40–50	60–70	30–40	60–70	50–60	20–30	20–30	60–70		
Gender	Female	Male	Female	Female	Female	Other	Male	Male		
Ethnicity	Māori	Māori	Samoan	Tokelauan	Middle Eastern	Cook Island Māori	Māori	South Asian		
CSC holder	Yes	Yes	Yes	No	Yes	Yes	Yes	No		
<b>Read code classifications</b>										
Number of read coded LTC	10	5	10	9	7	3	3	4	8.5	3 to 10
LTC complications	3	2	1	3	1	0	1	1	2.0	1 to 3
<b>Medications<sup>a</sup></b>										
Number of individual items prescribed within 1 year	77	57	41	58	49	25	4	29	56.7	4 to 77
Number of unique items prescribed within 1 year	29	15	19	27	18	14	3	14	23.2	3 to 29
<b>Daily record entries by staff provider type</b>										
GP	17	7	11	23	9	16	1	12		
Nurse	9	22	3	11	7	12	2	1		
Practice-based prescribing pharmacist	3	8	2	0	2	3	0	1		
Dietitian	0	0	0	0	0	1	0	0		

**Table 2 (continued):** Summary data.

Counsellor	2	0	0	0	0	0	0	0		
Podiatrist	2	1	0	0	0	0	0	0		
Health improvement practitioner	0	0	0	0	0	2	4	0		
Health coach	11	0	0	0	0	0	0	0		
Other workers <sup>b</sup>	0	0	0	0	0	0	0	0		
<b>Total entries daily records</b>	<b>44</b>	<b>38</b>	<b>16</b>	<b>34</b>	<b>18</b>	<b>34</b>	<b>7</b>	<b>14</b>	<b>25.6</b>	<b>7 to 44</b>
<b>Outbox transactions</b>										
Lab/radiology request	4	4	5	6	5	4	2	5		
Certificates <sup>c</sup>	2	2	0	3	0	8	0	0		
Referral/special authority request/other forms	3	2	1	6	3	5	3	3		
<b>Total outbox interactions</b>	<b>9</b>	<b>8</b>	<b>6</b>	<b>15</b>	<b>8</b>	<b>17</b>	<b>5</b>	<b>8</b>	<b>9.5</b>	<b>5 to 17</b>
<b>Inbox transactions</b>										
Hospital/specialist/other service	12	8	8	24	3	17	1	7		
Labs/investigation results	26	12	15	35	7	16	0	16		
Preventative care—screening	1	1	0	1	1	0	0	3		
<b>Total inbox interactions</b>	<b>39</b>	<b>21</b>	<b>23</b>	<b>60</b>	<b>11</b>	<b>33</b>	<b>1</b>	<b>26</b>	<b>26.8</b>	<b>1 to 60</b>

**Table 2 (continued):** Summary data.

Patient invoices <sup>d</sup>										
Total co-payment invoiced directly to the patient	\$100	\$68	\$88	\$110	\$67	\$51	\$0	\$60	\$68	\$0 to 110
Total number of non-zero invoices to patient	8	10	8	17	9	8	0	5	8.1	0 to 17
Non-zero invoices by provider type	7 GP, 1 pharmacist	3 GP, 5 pharmacist, 2 podiatrist	7 GP, 1 pharmacist	17 GP	7 GP, 2 pharmacist	8 GP	N/A	4 GP, 1 pharmacist		

LTC = long-term conditions; CSC = community service card holder; GP = general practitioner.

<sup>a</sup> An item refers to a single prescribed medication or device (such as insulin needles etc).

<sup>b</sup> Other unregulated staff providers include healthcare assistant, community health worker and cross-cultural worker; some data from this type of worker was missing from daily records.

<sup>c</sup> Includes off-work, medical and Work and Income (WINZ) certificates.

<sup>d</sup> Funding for VLCA practices comes through multiple streams, and therefore not all interactions are directly invoiced to the patient.

trying to engage them. This highlights the hidden complexity of work when care is recognised as not optimal but remains invisible if relying solely on services provided as an assessment of future service requirements.

Outbox and inbox interactions predominantly undertaken by GPs contributed a large work volume and require timely attention to ensure safety and quality are maintained. Given the number of LTC, coordinating referrals and responding to incoming results and communications is likely more complex than other population groups.

The range of workers contributing to service provision is notable. While GP and nurse work are expected, the practice-based prescribing pharmacist role in primary care is relatively new<sup>12</sup> and well utilised, as were the growing use of the newer HIP and health coach roles. Both HIP and health coach roles are funded centrally through the PHO; however, HIP services are shared between practices. Given the nature of diabetes and the socio-economic status of the population, there are likely to be opportunities for more intense work by dietitians and there was no involvement from a social worker; these workers' input is limited by funding.

Work completed by nurses, HIPs, health coaches and community health workers is not charged to the individual and is therefore financially invisible and only seen if documented in the daily records. The low value of invoices compared with the high volume of work represented in the daily records by GPs and the pharmacist and podiatrist whose work was directly invoiced to the individual is particularly striking. Total daily record entries from these providers (n=118) divided by the total directly invoiced to all individuals (\$612) gives an average of \$5.19 per daily record entry for these

workers alone. This does not include non-contact time for outbox and inbox transactions, following up on referrals or trying to contact patients. GPs are allocated 15-minute appointments; however, the complexity of care required in this population frequently requires longer consultations,<sup>2</sup> which could not be accounted for in this analysis.

## Conclusion

This study demonstrates the amount of work staff in a VLCA practice provided over 1 year to a purposefully selected sample of individuals with T2D, and highlights the complexity of these cases with multiple LTCs and high medication use. It reveals the range of workers and the work volume involved in caring for this population with complex needs. Lack of invoicing aside, work may be under-represented and under-valued if entries by workers are missing from daily records, and it was impossible to quantify the time taken for work completed and the real cost of each health transaction. Time required for care delivery is particularly pertinent in populations where social disadvantage impacts engagement in health-care. The extremely low fee-for-service invoiced to individuals for care compared to current VLCA practice funding<sup>10</sup> highlights problems with funding models and service sustainability. Together these data highlight factors that require consideration in future funding and resourcing arrangements. Further research is required to holistically examine the nature and intensity of this type of interprofessional work in culturally diverse high needs and other practices, the current funding received, the financial and workforce resourcing requirements and the health outcomes achieved.

**COMPETING INTERESTS**

Nadine Kuiper, Bryan Betty, Ioana Viliamu-Amusia, Linda Bryant and Erin Millar are practising clinicians at PUCHS. They contributed to the study design, data interpretation and review of the manuscript; however, they did not analyse the study data.

**ACKNOWLEDGEMENTS**

The authors thank Professor Tony Dowell and Associate Professor James Stanley for advice on study design. This study was funded by the Health Research Council (HRC 21/1008/A).

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