

Primary care improvement case study

The Hutt Union and Community Health Service diabetes improvement project

Number 5 in a series of 18

Project overview

Our journey in quality improvement started late in 2016 when the Hutt Union and Community Health Service (HUCHS) became one of three health providers to have our project selected for the Health Quality & Safety Commission's first national Whakakotahi Primary Care Quality Improvement Challenge. At the same time HUCHS had also been selected for a pilot initiative in our primary health organisation, Te Awakairangi Health Network, which provided a 0.5 full-time equivalent clinical pharmacist to the practice team.

We undertook an ambitious project to reduce average blood glucose levels, as measured by HbA1c, in our low-decile and largely Pacific and Māori community. To help us in this work, we formed a patient advisory group, Te Kete Hauora, which co-designed some of the changes made in the practice and undertook its own quality improvement work. Key achievements of our project were improving participation in the diabetes annual review, which rose from below 60 percent to above 70 percent, and reducing the average HbA1c in our patient cohort (the group of patients with poor glycaemic control identified at the start of the project and named Cohort 1).

Background and context

Hutt Union and Community Health Service is a Very Low Cost Access (VLCA) practice with approximately 6,700 enrolled patients. It has two clinics, one in Pomare and the other in Petone in Lower Hutt. HUCHS is community owned and low cost, and has a multidisciplinary team of doctors, nurses, community health workers, counsellors, receptionists and administrators.

Among the HUCHS enrolled patient population, 39 percent are Māori and 33 percent are Pacific peoples. Most patients (62 percent) live in areas ranked among the most socioeconomically deprived (quintile 5) and 85 percent have high needs.

Te Awakairangi Health Network plans, funds and provides a wide range of primary health care services to people living in the Hutt Valley. It has an enrolled population of 117,200 people, with 37 percent being high needs (Māori, Pacific and living in quintile 5 areas). The Network includes 21 general practices operating from 23 clinic sites within the Hutt Valley. Six of these, including HUCHS, are VLCA practices.

Diagnosing the problem

1 Problem statement

Hutt Union and Community Health Service has 574 patients with diabetes. Almost 50 percent of patients have an HbA1c greater than 64 mmol/mol, which indicates poor glycaemic control.

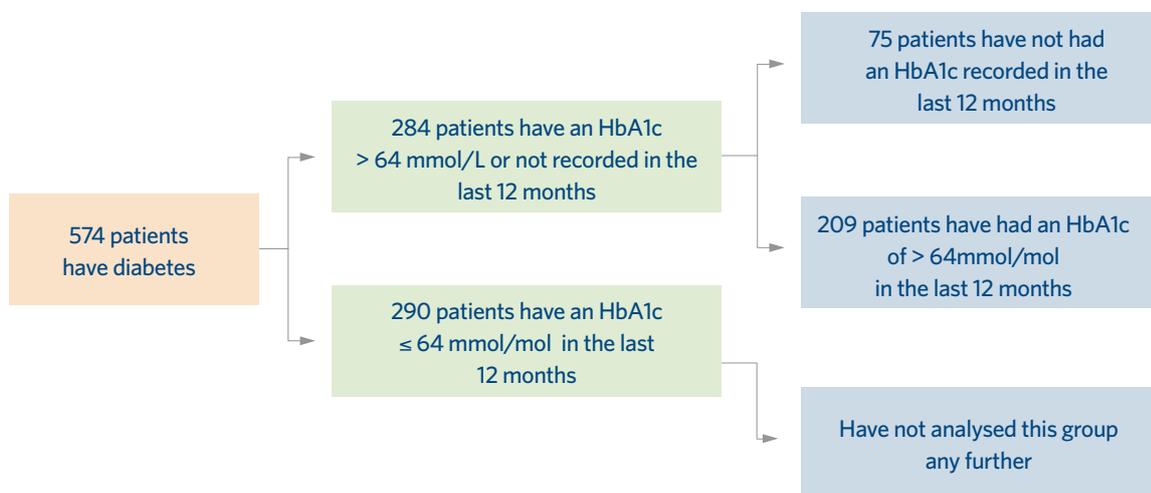
The target HbA1c level for people with diabetes is between 50 and 55 mmol/mol. Evidence shows that every 10 mmol/mol reduction in HbA1c is linked to a 21 percent decrease in diabetes-related death and significant decreases in other complications.

2 How did you know that this is a problem? What data did you have to describe this problem?

Using best practice intelligence (BPI) reports, we analysed our population with diabetes (type 1 and type 2) for glycaemic control.

As of 30 September 2016, BPI data showed that 574 of our patients had diabetes. Of these, 290 patients had an HbA1c of 64 mmol/mol or lower and 284 patients had an HbA1c above 64 mmol/mol.

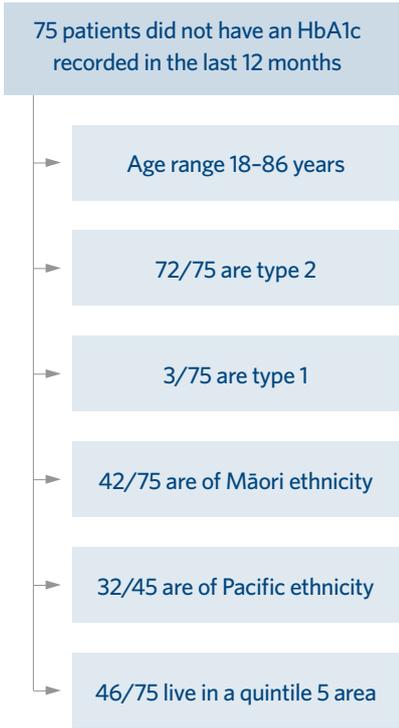
The flowchart below summarises what our data showed us.



Using the alert set-up in Medtech, we coded the 209 patients with an HbA1c higher than 64 mmol/mol as 'DIP' for 'diabetes improvement project'. This classification allowed us to use the alert field as part of a query build for other characteristics we wanted to look at. We identified these 209 patients as 'Cohort 1' in this study. We did not code the 75 patients who did not have their HbA1c recorded in the last 12 months as DIP because we did not have recent data.

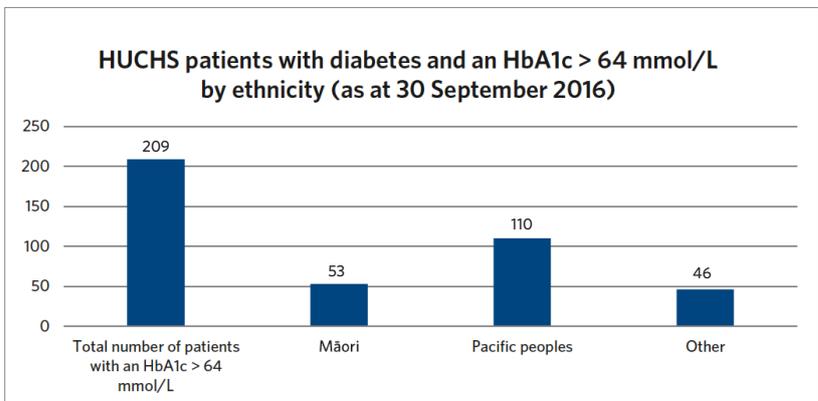
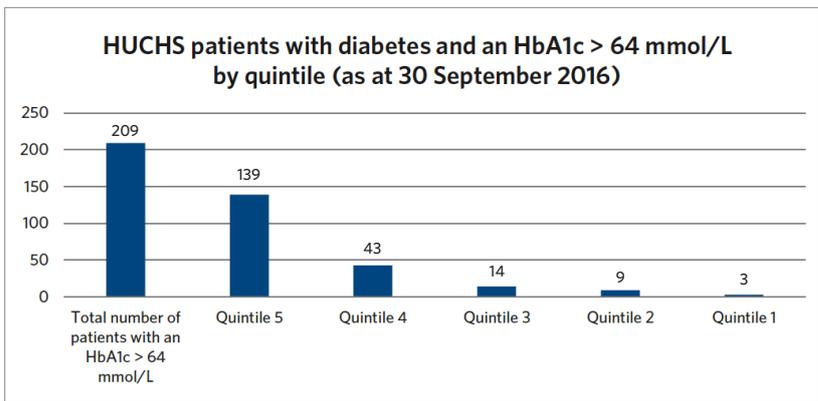
Using Medtech query builds, we further analysed the subpopulation of 209 patients with poor glycaemic control by ethnicity, socioeconomic deprivation, albumin creatinine ratio above range, blood pressure, total cholesterol, debt and being overdue for their diabetes annual review.

We also compared the characteristics of the 75 patients who did not have an HbA1c recorded in the last 12 months with those of the 209 patients that were the focus of this analysis. The majority of the patients in both groups had type 2 diabetes and were registered as living in a quintile 5 area. The diagram below summarises the findings of this comparison.



Among the 209 patients with poor glycaemic control, 67 percent were living in a quintile 5 area. In terms of ethnicity, 53 percent were Pacific, 25 percent were Māori and 22 percent were non-Māori and non-Pacific.

While these results are representative of the enrolled practice population, in which approximately 87 percent of patients are Māori or Pacific and/or live in quintile 5 areas, the following graphs demonstrate inequity in terms of the groups who are more likely to have poor glycaemic control.



The (SMART) aim:

This project aimed to reduce the average HbA1c by 10 percent in HUCHS patients with diabetes by 31 December 2017.

The measures:

Outcome measures:

- Reduce the average HbA1c in all HUCHS patients with diabetes by 31 December 2017.
- Reduce the average HbA1c in HUCHS Cohort 1 patients with diabetes by 31 December 2017.
- Increase the number of patients with an HbA1c of 64 mmol/mol or lower by 10 percent by 31 December 2017.

Process measure:

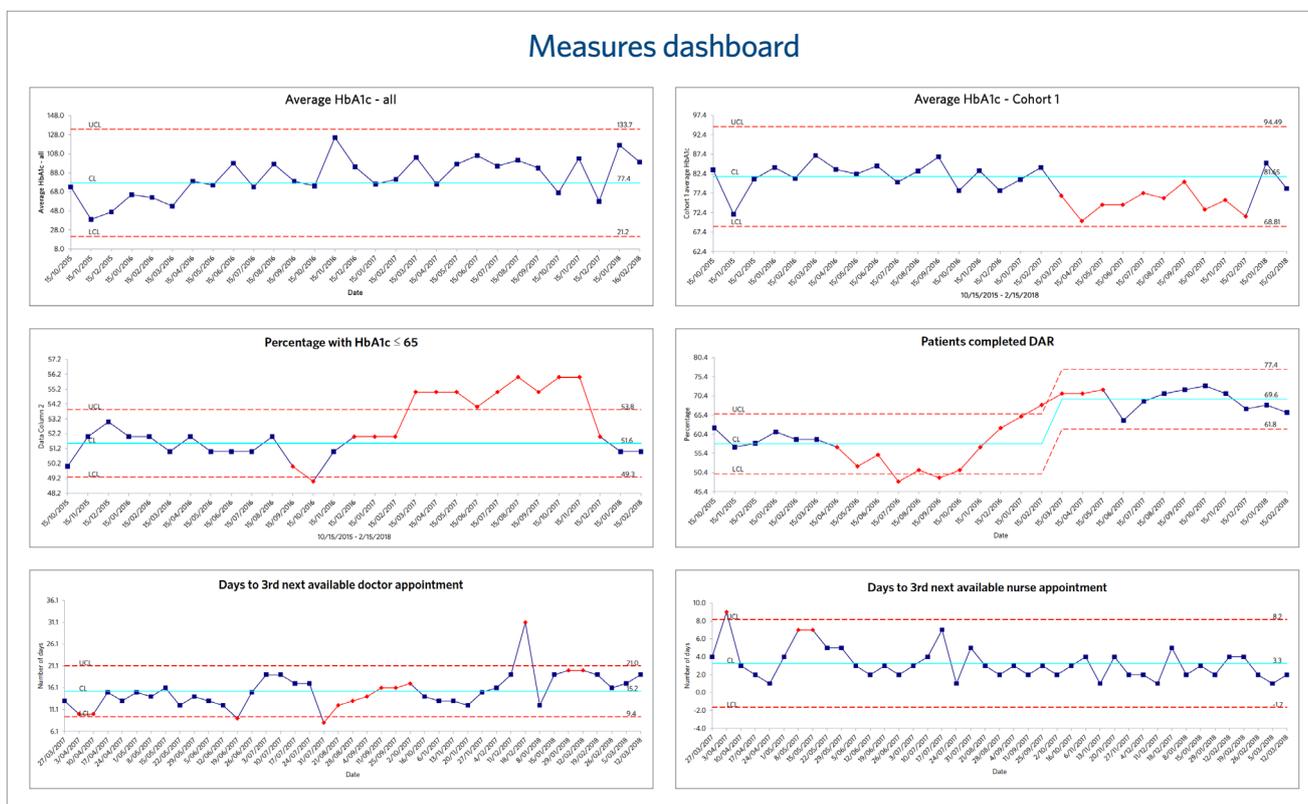
- Increase the percentage of patients with diabetes who complete a diabetes annual review from 56 percent to 75 percent by 31 December 2017.

Balancing measures:

- Monitor the average number of days until the third next non-urgent doctor appointment is available.
- Monitor the average number of days until the third next non-urgent nurse appointment is available.

We created a measures dashboard (see below) and used it to communicate about the project with our project team and other practice staff.

For detailed operational definitions and SQL (query build) instructions, including screenshots, see [Appendix 1](#).



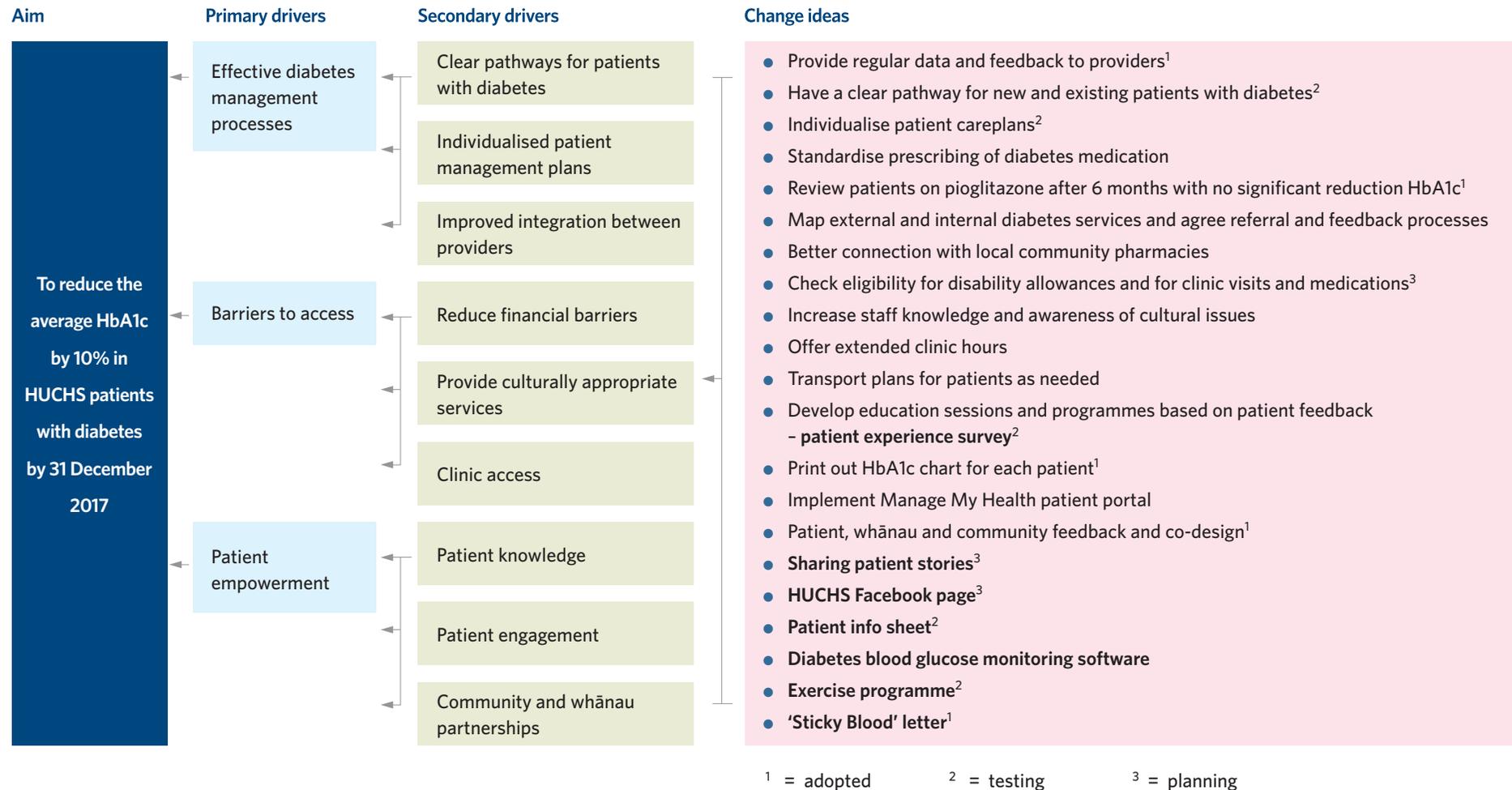
Drivers of change

The two main drivers of change that we worked on were patient empowerment and diabetes management processes. Although one of the primary drivers we identified was patient access, project constraints prevented us from working on it given the enormity of our project and its workload. We also felt that working to improve patient access is one of the fundamental goals we are continually working to achieve in our practice, including through low-fee or free services and transport provided by our community team.

We learnt that the driver diagram (see over) was a useful tool to prompt a conversation about what we are trying to achieve and the impact of our project. It was our reference point for mapping change ideas coming through. We revised the diagram several times, adding and removing change ideas over time. We also kept the change ideas section as a dynamic part of the diagram and used it to indicate which ideas we were planning, testing or adopting.

Drivers of change - continued

Driver diagram



What we did

1 Were there any ethical considerations to be aware of?

This project involved no ethical concerns.

2 How did you involve consumers in co-design? What processes did you use?

We established a patient advisory group, Te Kete Hauora, to provide consumer support and to enable development of the patient diabetes pathway. In general, community health workers approached consumers to offer them the opportunity of joining the group and most members chose to join based on the trusted relationships they had with the community health workers.

Our philosophy in planning the agenda for meetings with Te Kete Hauora was for the group to provide useful feedback on processes in place for diabetes care and, in return, for HUCHS to provide and build the group's knowledge base on diabetes and quality improvement. To us, Te Kete Hauora meant 'sharing baskets of knowledge'.

- All members received a kete with information they could take away and a certificate of attendance at each meeting.
- We used the Mike Evans video to introduce quality improvement to the group and used a graphic to explain visually what happens when someone has diabetes.
- We gave background to the diabetes quality improvement project, along with a rationale for why we are focusing on diabetes. To do so, we presented a graphic that showed the risk reduction of complications with every 10 mmol/mol reduction in HbA1c, the driver diagram and the measures we were using to see if we were making improvements.

- Before and after each session, we conducted an evaluation of members' knowledge of diabetes and quality improvement.
- Each session had a focus on knowledge related to diabetes management and we invited speakers, such as a dietitian, physiotherapist, doctor and pharmacist, to contribute.

Te Kete Hauora initiated its own separate quality improvement project to develop the Toiora exercise group. It co-designed Toiora with physiotherapist Colleen Dunne as part of the Whakakotahi Diabetes Improvement Project. Members of Te Kete Hauora went on to serve on the DHB Consumer Council and the team presented at the 2018 [Let's Talk conference](#). To find out more about Toiora, see [A day in the life of the Toiora exercise class](#).

3 What QI tools did you use, that you would recommend?

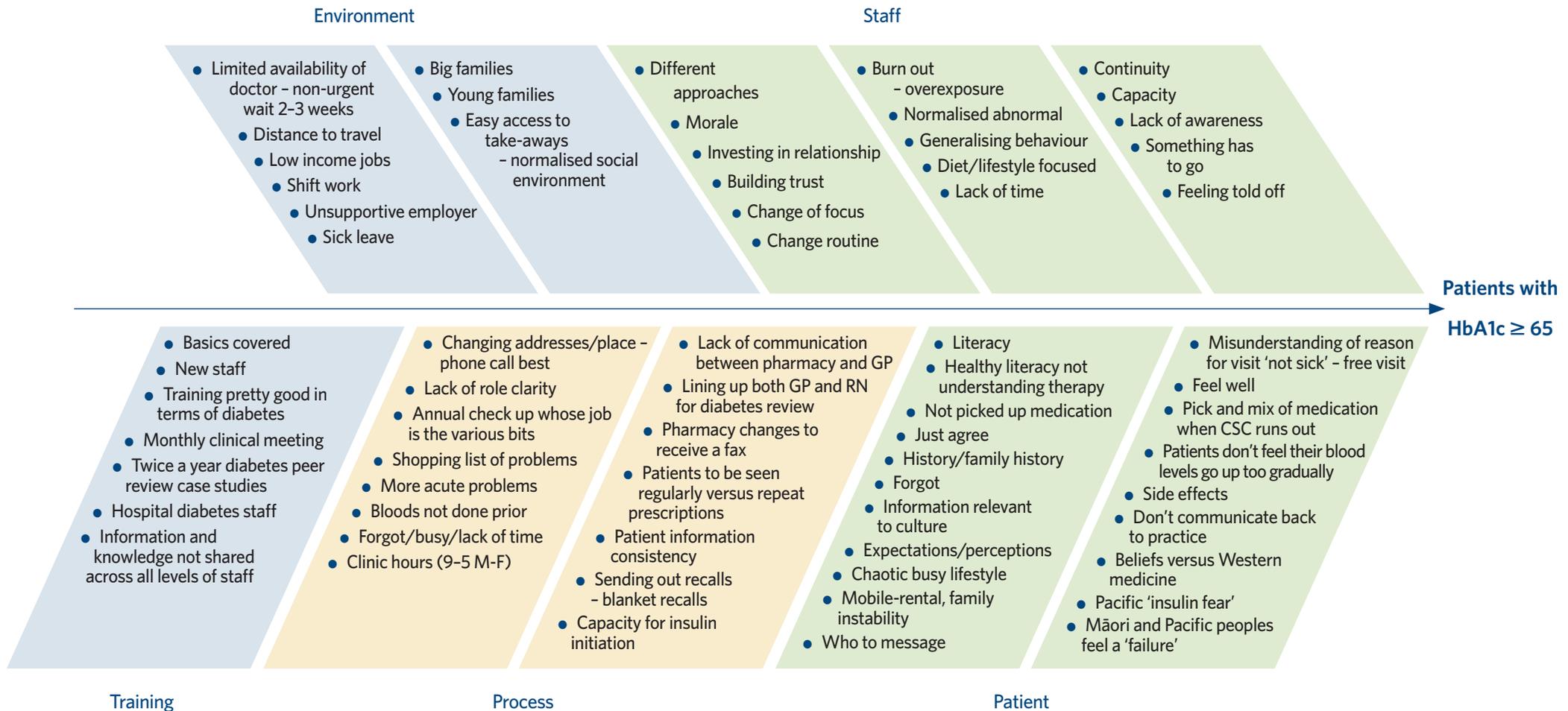
Fishbone (Ishikawa) cause-and-effect diagram

We used a fishbone diagram to understand and address the causes of the poor glycaemic control and inequity evident in the data for our patients with diabetes. A mix of clinical and non-clinical staff from the practice participated in this process. The fishbone diagram was a useful tool to bring together all possible causes, identify which ones we had control over, and reach an agreement as a practice (through a vote) on the ones we could look at in this project.

On our fishbone diagram (see over), the red ticks are the votes from participating staff to indicate what they thought were the top three causes of the problem our data was showing.

Fishbone diagram

Potential causes



Affinity diagram

We used the affinity diagram tool with the practice leadership group to brainstorm possible solutions and drivers we could use to improve glycaemic control in our patients with diabetes. This activity was an engaging way for all of us to focus on a common goal.

The affinity diagram was useful in that, first, it gave everybody in the leadership team a chance to generate ideas for change on coloured Post-it notes. Second, it helped us to separate out the broad areas of causes – that is, both the primary and secondary drivers – from the change ideas that we could actually test.

The leadership group arranged the ideas into categories to begin with. After that, their arrangement of the Post-it notes was left in an area of the practice where others could look at it and contribute, changing the groupings if they chose.



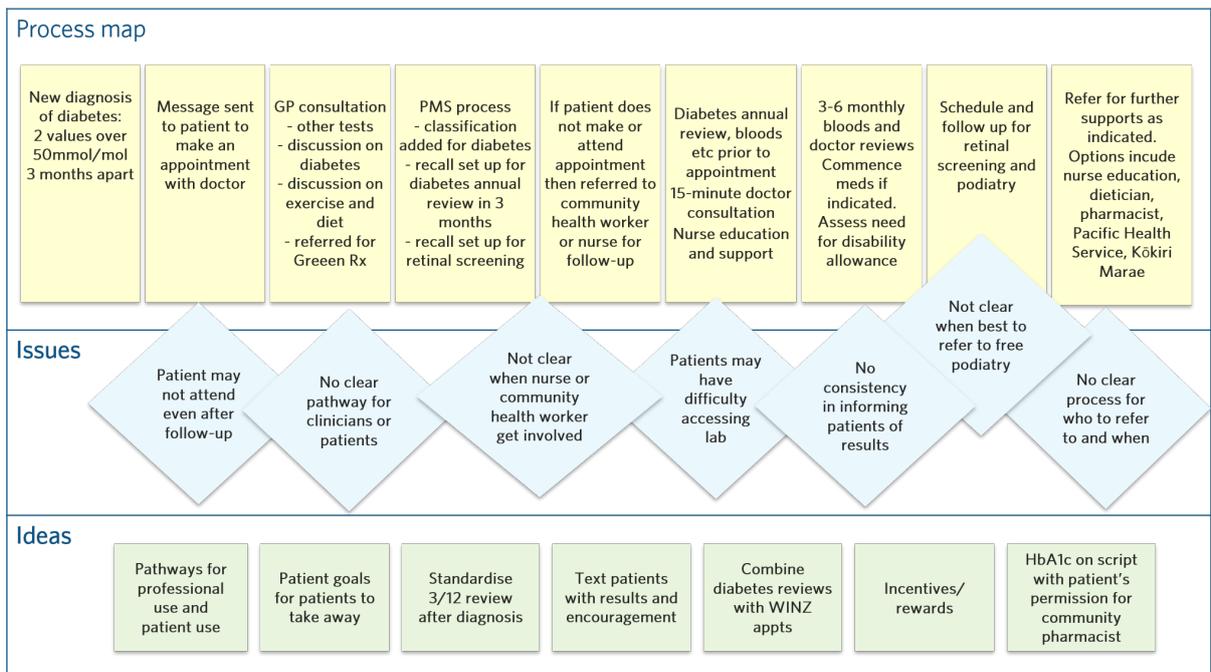
Both the fishbone tool and the affinity tool were critical to the development of our theory of change and change ideas presented in the driver diagram (see the '[Drivers of change](#)' section above).

Process map

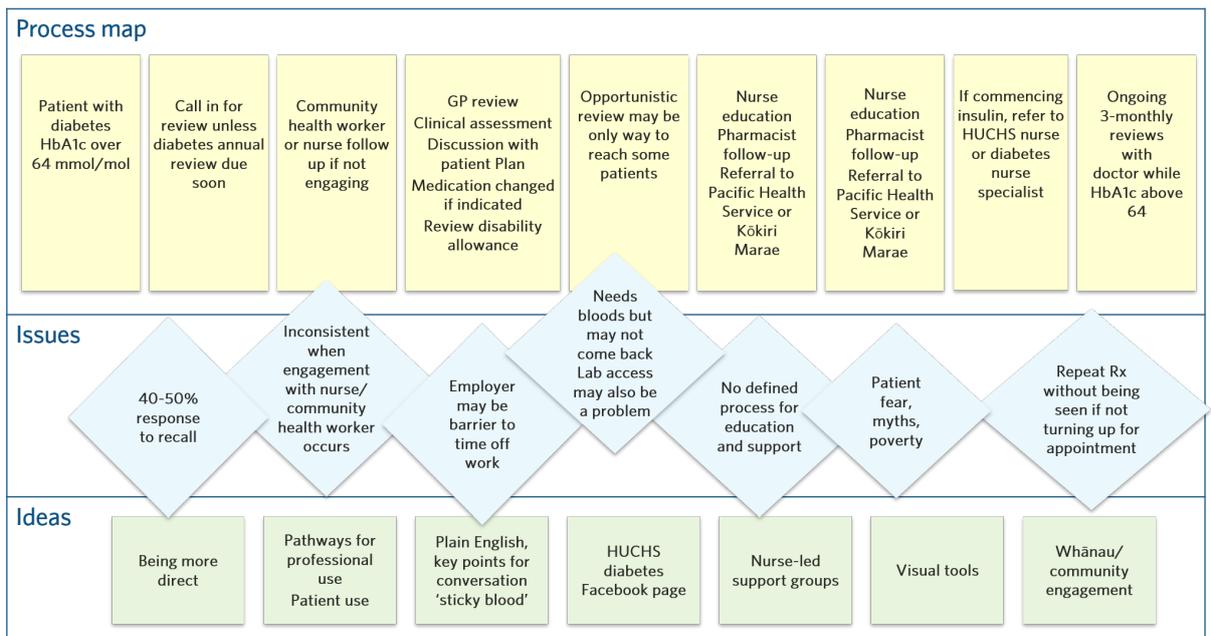
We used the process map tool to understand our processes for patients with diabetes. It was useful in that it tested the assumption that everyone knew the processes and was following them consistently. Involving a consumer representative was another way of testing this assumption by comparing it with their actual experience. This tool was incredibly useful in identifying the variation in the current process as well as gaps.

We developed two process maps: one to look at the process for a newly diagnosed patient with diabetes; and the other to look at processes when the HbA1c result was higher than 64 mmol/mol (see below). This tool led to the development of our change ideas of diabetes care pathways, care plans and medication information.

Process mapping - new diagnosis of diabetes



Process mapping - HbA1c above 64 mmol/mol

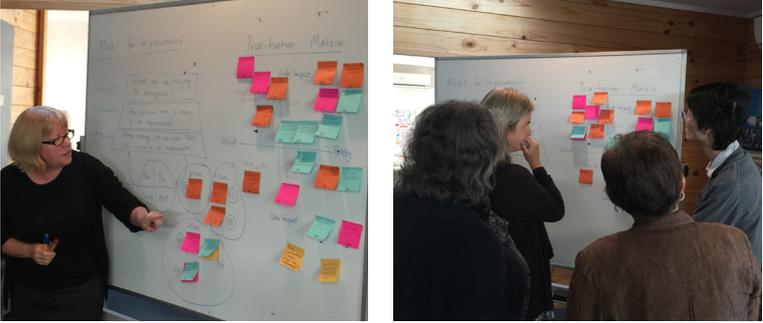


Prioritisation matrix

All practice staff used the prioritisation matrix (see below) to prioritise the change ideas that had already been generated as well as any new changes ideas that staff came up with when meeting that day. The meeting time used was an existing time slot blocked for all staff to meet. The strength of using this tool with all practice staff was that every staff member knew something about the project and had input in generating possible solutions to the challenge of increasing the glycaemic control of patients with diabetes.

Prioritisation matrix

High ▲	Must haves	Quick wins
Impact ↓	Money pits	Low-hanging fruit
Low		
	Hard	Easy
	Ease of implementation →	



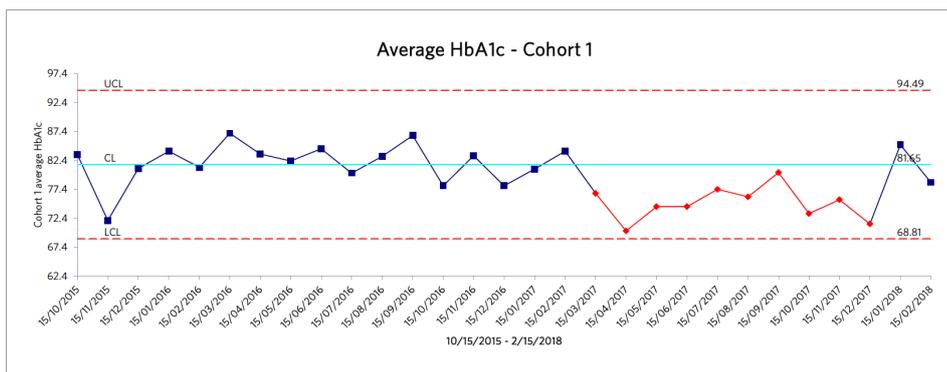
What changes did you test that worked?

- Supplying providers with diabetes data
- Sticky blood letter ([Appendix 2](#)) - we send this letter to patients who have not responded to the usual methods of communication (texts and generic recall or reminder letters). It played a role in engaging just over 50 percent of the people it was sent to and has been adopted into the newly developed diabetes pathway to engage all patients who do not respond to a recall for a diabetes-related appointment the first time
- Pathway for patients with diabetes ([Appendix 3](#))
- Care plan for patients with diabetes ([Appendix 4](#))
- Diabetes medication information leaflet ([Appendix 5](#))
- Te Kete Hauora - patient advisory group (see workplan in [Appendix 6](#))
- Toiora Diabetes Exercise Group

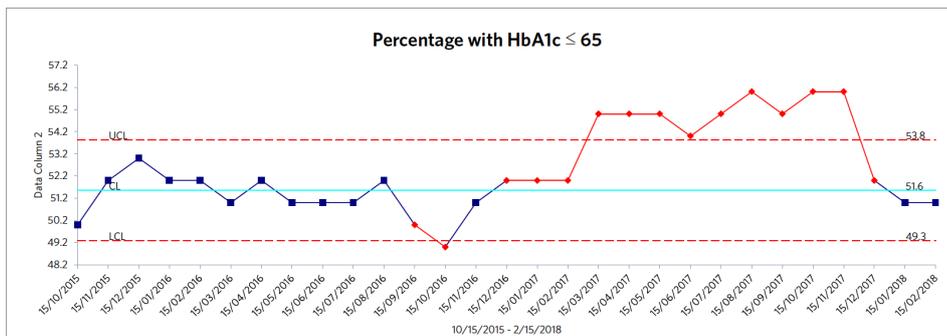
The results

1 What outcome measures improved?

The average HbA1c in patients with diabetes from Cohort 1 was reduced after the change ideas were implemented (see graph below). As we expected, this reduction was not sustained over December and January but we did not continue to collect this data after this point.



The following graph shows that the number of patients in the practice with an HbA1c below 64 mmol/mol increased but again the change was not sustained over December and January.

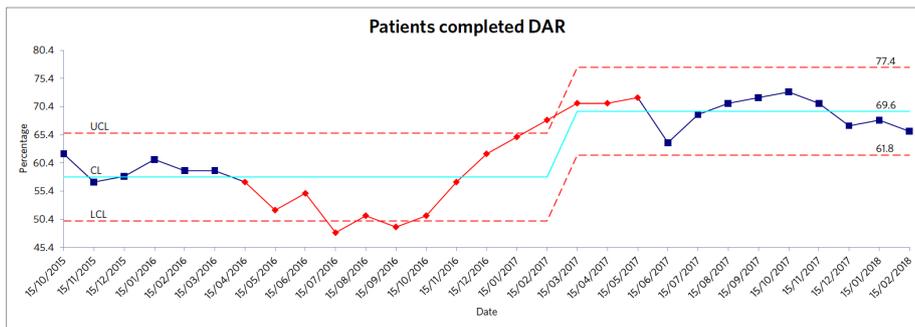


2 What equity measures improved?

After the initial data analysis, we did not continue to track our data by ethnicity because we found that that over 75 percent of the population with HbA1c greater than 64 mmol/mol were either Māori or Pacific peoples, which reflects the ethnic spread of our total population.

3 What process measures improved?

We aimed to increase the percentage of patients with diabetes completing a diabetes annual review from 56 percent to 75 percent by 31 December 2017. The graph opposite shows progress towards this goal, although the high point reached in October 2017 had dropped by December 2017.



4 Were there any unintended consequences such as unexpected benefits, problems or costs associated with this project?

We tracked our 'third next available appointments' for nurses and doctors. Although we saw the expected increase in these appointments over the winter months, the implementation of the diabetes project did not seem to have any effects on this measure.

5 Is there evidence that the knowledge of quality improvement science in the team or in the wider organisation improved?

Everyone at HUCHS, including our consumers involved in the project work, now thinks about problem-solving, improvement and change differently. We use our favourite quality improvement tools to help solve quality problems when they arise.

Post-project implementation and sustainability

1 Have the successful changes been embedded into day-to-day practice? How have you managed this?

We have embedded most of the changes from this project into our usual practice. One exception is that we no longer supply clinicians with a list of their patients with high HbA1c as it was felt that they had put in place the required actions at that time. In addition, Te Kete Hauora has not continued due to a lack of personnel resourcing.

The other changes are set up on our Patient Management System and we continue to use them. Some of the patients who were involved have continued to be active in other forums such as our Community Board and the Hutt Valley District Health Board (DHB) Consumer Advisory Board.

2 How did you communicate your progress and results to others?

We used the storyboards we created for Ko Awatea and the Health Quality & Safety Commission, as well as the measures dashboard displayed in our staffrooms, to communicate about and discuss the project with other practice staff. These were an effective visual engagement tool.

We entered this project in, and won, the Hutt Valley DHB Quality Award for Excellence in Process and Systems.

We made the following external project presentations in 2017:

- 7-9 September – Practice Managers and Administrators New Zealand Conference
- 8 November – Ministry of Health staff (Diabetes Programme Manager Sian Burgess, along with Catherine Lofthouse and Dr Paul Drury) visited HUCHS to find out more about our Whakakotahi project
- 15 November – presentation at the Primary Healthcare Symposium
- 28 November – presentation of the Diabetes Improvement Project to the Hutt Valley DHB Long Term Conditions Clinical Network
- 29 November – presentation of the Diabetes Improvement Project to the Health Quality & Safety Commission's Primary Care Expert Advisory Group.

In addition, in 15 September 2018 we made a presentation to delegates at the Medicine Information and Clinical Pharmacy Special Interest Group Seminar, hosted by the New Zealand Hospital Pharmacists' Association.

Summary and discussion

1 What were the lessons learnt?

Having two people to co-lead the project really helped to share the workload and maintain the enthusiasm. It also meant that we could use individual skills where they were best suited.

Keep the scope of the project as small as possible initially to ease the workload and complexity.

Finding the time to do improvement work on top of the usual workload is always going to be a challenge.

It was inspiring to witness the success of Toiora – an initiative co-designed by Te Kete Hauora and the practice. We are learning that the co-design approach leads to success that seems to come about easier than it would if our practice went at it on our own. With this approach, the community drives and supports the improvement project and the practice is there to cheer them on.

2 What would you recommend to a team somewhere else that wants to take on a similar project?

Involve your community.

3 The team

- Sally Nicholl – practice manager and project co-leader
- Sandy Bhawan – clinical pharmacist (PHO practice based) and project co-leader
- Rowena Sosich – general practitioner
- Kim Baker – general practitioner
- Nita Vaofusi – registered nurse
- Leanne Long – registered nurse
- Mere Te Paki – community health worker
- Tai Pairama – consumer
- Tria Tamaka – consumer
- Muriel Tunoho – Community Board Chair

4 Do you have any teamwork lessons or tips that you wish to share?

Having a diverse team in terms of skills and background really added value. Most of the team, including the consumers, knew each other well before the project began and those strong relationships helped. Having the decision-makers on the team was also particularly helpful.

Appendix 1: Measures (operational definitions and query builds)

1 Reduce the average HbA1c in HUCHS patients with diabetes by 31 December 2017

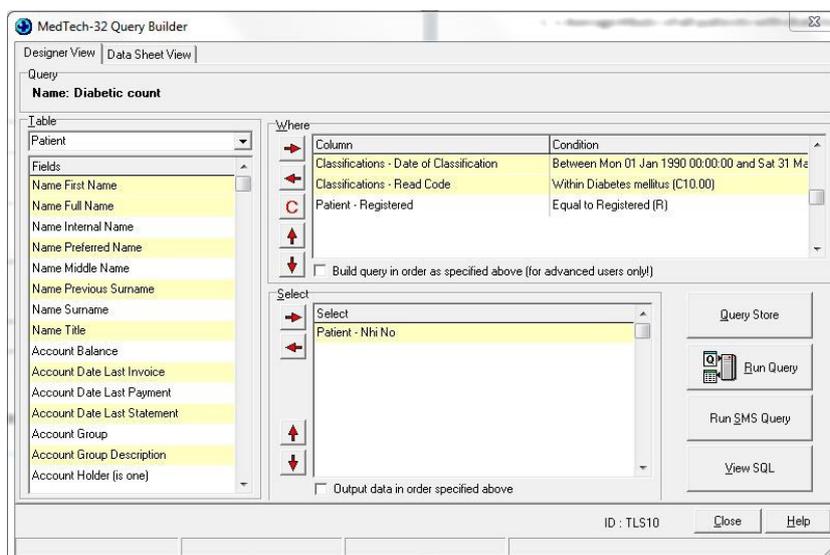
- Operational definition: All patients with a classification of diabetes who have had an HbA1c test in **that** month.
- Data source: Medtech query build.

The number of patients tested each month varies. One reason for the variation is that new patients come into the service or are newly diagnosed while others move out of our service. Additionally, from month to month different patients have HbA1c blood tests, according to their test schedule (usually every three to six months for patients with diabetes). This measure tracks the process improvement of our service rather than improvement of specific patients.

We collected this data also for the 12 months before starting the project to give us a baseline.

Collecting the data

- Run a Medtech query to collect the HbA1c test results of all diabetes patients at the beginning of each month for the previous month, changing the month and extending the date of classification to the end of the period. (We collect HbA1c results from screening so need to map the data from inbox to screening and file monthly results.)
- Export the data to a spreadsheet. Remove duplicates and calculate count, mean and standard deviation. Add the results to the monthly table and insert them into a chart.



2 Reduce the average HbA1c in HUCHS Cohort 1 patients with diabetes by 31 December 2017

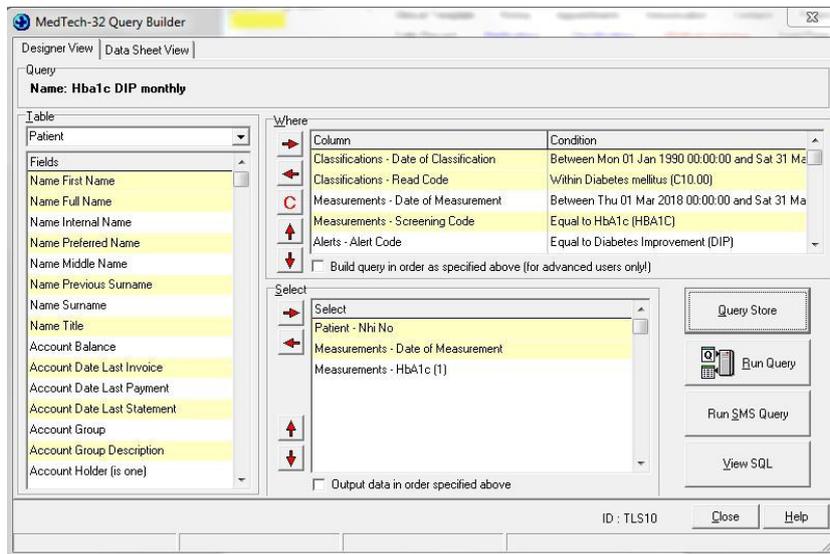
- Operational definition: All patients with a classification of diabetes who have had an HbA1c >64 mmol/mol as at 1 October 2016 and have had a HbA1c test in that month. (These patients are identified by an alert on Medtech 'DIP'.)
- Data source: Medtech query build.

Only Cohort 1 patients are captured in this data. The number of patients tested each month varies according to their schedule for having HbA1c blood tests (usually every three to six months for patients with diabetes), and patients leave this cohort if they exit our service for any reason.

We collected this data also for the 12 months before starting the project to give us a baseline.

Collecting the data

- Run a Medtech query to collect the HbA1c test results of all Cohort 1 patients at the beginning of each month for the previous month, changing the month. (We collect HbA1c from screening so need to map it from inbox to screening and file monthly results.)
- Export the data to a spreadsheet. Remove duplicates and calculate count, mean and standard deviation. Add the results to the monthly table and insert them into a chart.

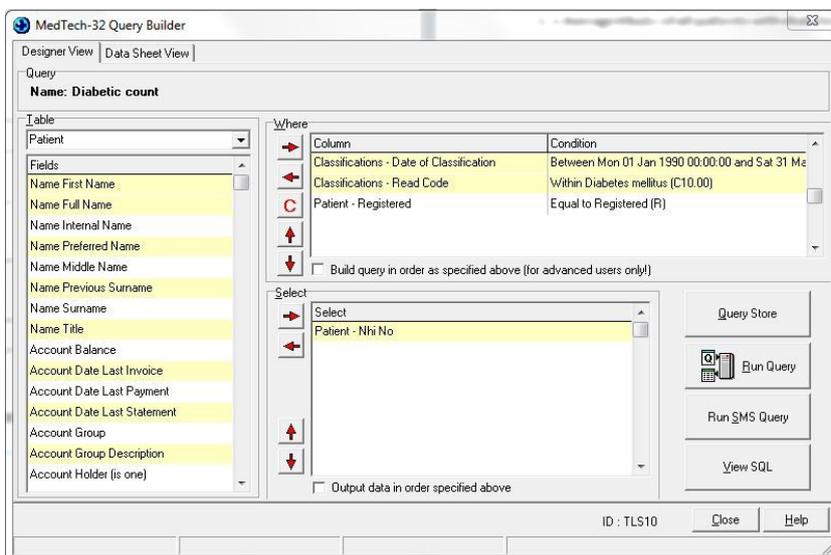


3 Increase the number of patients with an HbA1c \leq 64 mmol/mol by 10 percent by 31 December 2017

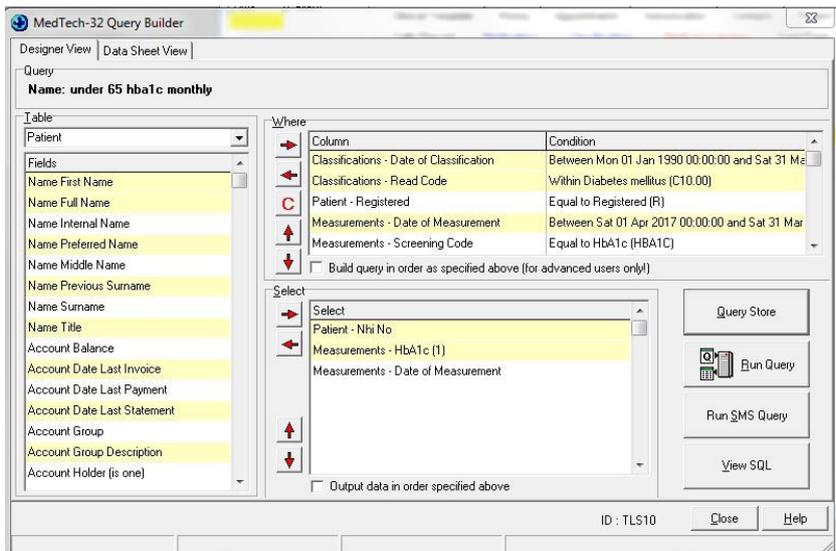
- Operational definition: All patients with a classification of diabetes using the most recent HbA1c test in **the last 12 months**. Calculate the number of patients with an HbA1c of 64 mmol/mol or below as a percentage of the total HUCHS population with diabetes.
- Data source: Medtech query build.

Collecting the data

- Run a Medtech query to collect the number of registered patients with diabetes each month. Export the data to an Excel spreadsheet, remove duplicates and count the total to give the denominator.



- Run a Medtech query to collect HbA1c of all patients with diabetes for **the last 12 months**. (We collect HbA1c from screening so need to map it from inbox to screening and file results.)
- Export the data to a spreadsheet. Sort by date and remove duplicate HbA1c results, leaving only the most recent result for each patient. Sort by HbA1c result and count the number less than or equal to 64 mmol/mol. Calculate the percentage using the denominator as above. Add to the results to the monthly table and insert them into a chart.

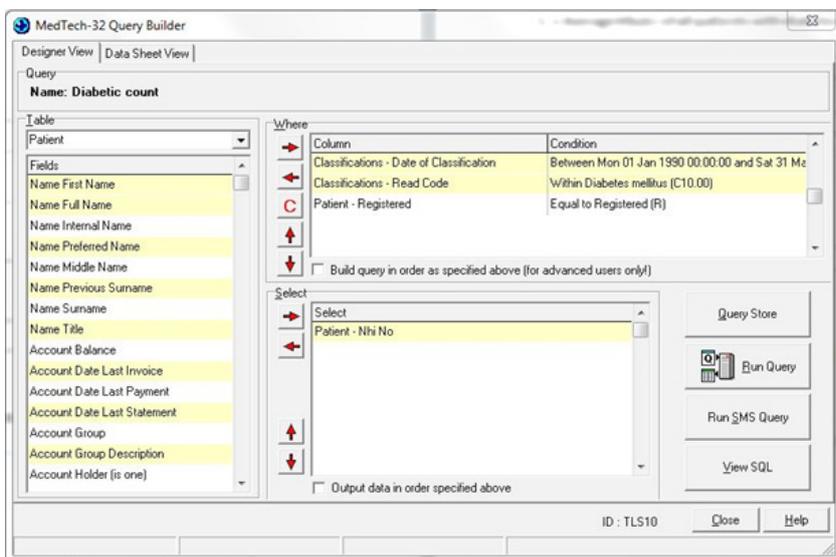


4 Increase the percentage of patients with diabetes who complete a diabetes annual review from 56 percent to 75 percent by 31 December 2017

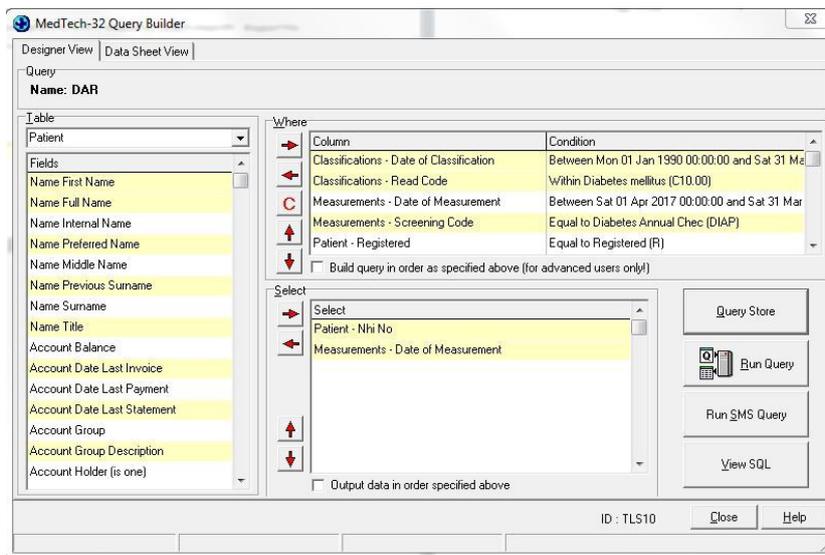
- Operational definition: All patients with a classification of diabetes who have completed a diabetes annual review in the last 12 months. The number completed is calculated as a percentage of the total HUCHS population with diabetes.
- Data source: Medtech query build.

Collecting the data

- Run a Medtech query to collect the number of registered patients with diabetes each month. Export the data to an Excel spreadsheet, remove duplicates and count the total to give the denominator.



- Run a Medtech query to collect HbA1c results of all patients with diabetes for **the last 12 months**. (We collect HbA1c results from screening so need to map it from inbox to screening and file the results.)
- Export the data to a spreadsheet. Sort by date and remove duplicate HbA1c results, leaving only the most recent result for each patient. Sort by HbA1c result and count the number less than or equal to 64 mmol/mol. Calculate the percentage using the denominator as above. Add to the results to the monthly table and insert them into a chart



5 Monitor the average number of days until the third next non-urgent doctor appointment is available

- Operational definition: This data is manually collected for each doctor every Monday morning by counting the number of days until the third next non-urgent appointment is available. (The count of days includes all days – not just weekdays.) We add the total number of days and then divide the total by the number of doctors to get an average.
- Data source: Medtech appointment templates.

6 Monitor the average number of days until the third next non-urgent nurse appointment is available

- Operational definition: This data is manually collected for each nurse every Monday morning by counting the number of days until the third next non-urgent appointment is available. (The count of days includes all days – not just weekdays.) We add the total of number of days and then divide the total by the number of nurses to get an average.
- Data source: Medtech appointment templates.

Appendix 2: Sticky blood letter

Download editable MS Word template [here](#).

Appendix 3: Pathway for patients with diabetes

Download editable MS Word template [here](#).

Appendix 4: Care plan for patients with diabetes

Download editable MS Word template [here](#).

Appendix 5: Diabetes medication information sheet

Download editable MS Word template [here](#).

Appendix 6: Te Kete Hauora workplan

Download editable MS Word template [here](#).