



Digital Health & Care
Innovation Centre

Transforming Diabetes Care Through Innovation Survey Results

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Executive Summary

More than 1 in 20 people living in Scotland currently have a diagnosis of diabetes. Diabetes can be associated with various negative health outcomes, and the treatment of complications arising from diabetes is costly. Many of these complications are highly preventable, but the economic burden of diabetes will increase rapidly if action is not taken.

The Digital Health & Care Innovation Centre (DHI) were commissioned by the Scottish Government to lead a consultation supporting the acceleration of digital diabetes innovation across Scotland. As part of this request the DHI created an online survey, which was distributed in summer 2022.

The survey was open to diabetes health and care professionals and people with lived experience of diabetes. It aimed to gather data on the key challenges facing diabetes care and capture innovation ideas on how to deal with these challenges. This information would then be used to identify promising diabetes innovations and to guide the development of new innovations.

In total, 275 people participated in the survey. Just over half of these were people with lived experience of diabetes or their families, while around a third were NHS health and care professionals (HCPs). The rest of the respondents comprised of other professionals involved with diabetes care, researchers, and academics.

The diabetes improvement plan (Scottish Government, 2021) highlights eight priority themes for improvement in diabetes services and care. This survey found that, among both professionals and non-professionals, 'Person-Centred Care' was ranked as the most important theme for innovation. The need for care which is more-person centred was highlighted by many respondents as a key challenge in diabetes care, and several intervention ideas discussed methods offering greater personalisation in diabetes care. Another prominent theme in the data was the importance of access to innovative diabetes technologies, such as continuous glucose monitoring, insulin pumps, and closed-loop systems. Many people with diabetes felt that enhanced access to these technologies was essential for the quality of life of people living with diabetes, but that access was not being provided quickly enough. HCPs understood how important access to these technologies is, but some thought that people with diabetes had unrealistic expectations about what could reasonably be provided.

Additionally, many respondents focused on the importance of mental health and wellbeing support for people living with diabetes. Offering personalised and tailored supported was recognised by respondents as a major challenge, and innovation ideas included enhanced use of group sessions and new innovative ways to offer peer support for people living with diabetes.

This survey highlighted several key challenges facing diabetes services and gathered innovation ideas with the potential to help address these challenges. This information will be used to guide future stages of this consultation by highlighting themes for Open Innovation Calls and stakeholder engagement workshops.

Introduction

More than one in every twenty people in Scotland – a total of 317,128 – currently have a diagnosis of diabetes (Scottish Diabetes Data Group, 2021). It is estimated that a further 10% of cases remain undiagnosed (ScotPHO, 2018). People with diabetes have increased risk of heart attacks and stroke, and common complications of diabetes include renal disease, loss of sight, and circulatory issues (Scottish Diabetes Data Group, 2021).

Increasing demand, capacity pressures and funding of diabetes care continues to pose significant challenge to healthcare systems. In the UK alone, diabetes costs the NHS £23.7 billion pounds per year, making up 10% of the NHS budget; around 80% of costs attributed to diabetes related complications. This is predicted to increase to 17% of the budget by 2035 (Hex et al, 2012) . Almost 90% of diabetes cases in Scotland are type 2 diabetes (Scottish Diabetes Data Group, 2021). Type 2 diabetes is highly preventable through lifestyle management, with diet, physical activity, and weight loss interventions able to reduce risk by around 50% (Diabetes UK).

Over the past 10 years, digital tools and innovative therapies have become game-changers in diabetes prevention, management, and patient empowerment. NHS Scotland remains at the forefront of this digital transformation journey which, if supported by new models of care, has the potential to more effective use of resources and improve the quality and continuity of care for people with diabetes. This work serves to further inform policy, clinicians, and innovation decision makers to help reimagine how innovation through collaboration can transform diabetes care.



Survey Background

The Digital Health & Care Innovation Centre (DHI), working in partnership with the Scottish Diabetes Innovation and Technologies Group (SDITG), Scottish Health Industry Partnership (SHIP) and Scottish Government, were invited to lead a consultation to support acceleration of digital diabetes innovation across Scotland.

DHI have a commission from the Technology Enabled Care Programme, Digital Health and Care Directorate, and Scottish Government to provide leadership for collaborations in digital health and care innovation. In addition, DHI has experience in the design and delivery of digital diabetes initiatives utilising codesign, design thinking, and collaborative development of Innovation Challenges.

SHIP has a focus on strengthening Scotland’s innovation activities to solve real world problems and improve the quality, efficiency, and sustainability of healthcare services. One of the ways in which SHIP drives forward innovation is to fund Open Innovation Calls, which bring together NHS, industry, and academia to accelerate the adoption of innovation technologies and approaches. During 2022/2023, two diabetes challenge calls will be funded by SHIP. Outputs from this work are anticipated to inform the details one of these calls.

In response to the above request, a survey was commissioned in summer 2022, with the purpose of engaging with the diabetes community across Scotland to seek feedback on innovation priorities and challenge themes. It was agreed that the themes set out in the Diabetes Improvement Plan (DIP; Scottish Government, 2021) Figure 1 would serve as an important framework from which to prioritise the responses for innovation.

The DIP sets out key priorities and actions for improvement of diabetes prevention, treatment, and care, along with target outcomes for services and individuals with diabetes.

Refreshed in 2021, this plan continues to highlight the role of digital technologies and innovation, particularly regarding remobilisation and recovery from COVID-19. The eight main priorities identified in the DIP are outlined below:



Figure 1. Diabetes Improvement Plan Priorities, Scottish Government, 2021

Survey Aims and Design

This survey was designed as the first stage of an engagement approach led by DHI to explore diabetes innovation. The survey aimed to offer insights into the key challenges facing diabetes health and care services in Scotland, and to gather innovative ideas for how digital technologies could potentially be used to meet these challenges. The survey was primarily targeted at healthcare professionals. People living with diabetes (Non-Professionals) were also invited to participate, both to share innovation perspectives and to provide insights into their lived experiences.

The main purposes of this survey were to:

- offer insights into the key diabetes challenges faced by NHS Scotland
- generate new ideas for diabetes innovation
- engage with NHS Scotland Health and Care professionals and people with lived experience of diabetes

This data could then be used to:

- inform the development of new innovation challenges
- identify existing innovations which would benefit from further investment, development, or evaluation
- identify priority themes for innovation investment and funding

The design of the survey centred on identification of innovation priorities aligned to the Diabetes Improvement Plan themes. Respondents were also asked to highlight their top three challenges currently facing diabetes care services and given the opportunity to summarise their own innovation ideas for improving diabetes outcomes and care experiences. The survey contained seven questions, with two of the questions being optional and requiring free text responses. The full list of questions is provided in Appendix A.

The survey was electronically distributed across the diabetes network using SurveyMonkey. Data collection was carried out over a six-week period in the summer of 2022 and analysis undertaken by a Research Assistant based within DHI.

Survey Results

Respondents

A total of 275 people submitted a response to the survey. This was a higher response rate than any previous diabetes survey commissioned by the DHI. Of the 275 respondents, 171 (62.2%) answered every non-optional question, with 44 respondents (16%) also answering both optional questions. Although the survey was primarily targeted at professionals working with diabetes (in research, care provision, etc.), the majority of the respondents (149; 54.5%) were not professionally involved in diabetes care: 136 of these respondents were people with lived experience of diabetes, while 13 were relatives of individuals with diabetes. NHS health and care professionals (HCPs) were the next largest group, with 89 respondents (32.1%). A further 12 respondents were academics or researchers (4.4%), while the remaining 25 came from other professional backgrounds (9.1%). These professionals included people from third sector organisations involved in diabetes care/management and people working in the Scottish Government.

Respondents were not asked for any further demographic information; this was done to streamline the survey as much as possible with the aim of maximising response rate and survey completion.

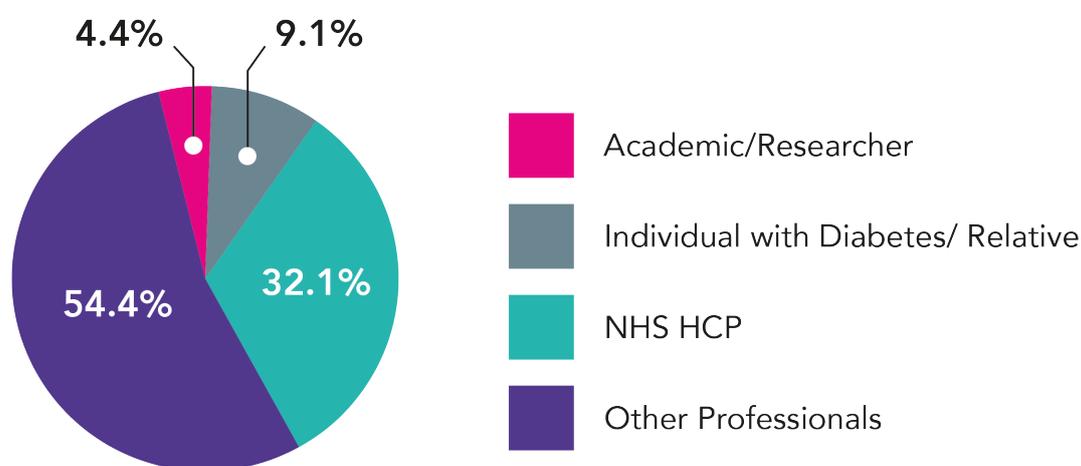


Figure 2: Breakdown of survey respondents by involvement in diabetes care

Q1. Experience in Diabetes Innovation Projects

All respondents answered the question “Do you have experience in Diabetes Innovation projects?”. Altogether, 74 respondents (27%) said yes. Involvement in innovation projects was highest among those with academic backgrounds, with 10 of 12 (83.3%) of academics and researchers being involved. Non-professionals were the least likely to be involved in innovation projects, with 12 of 149 (8%) indicating involvement.

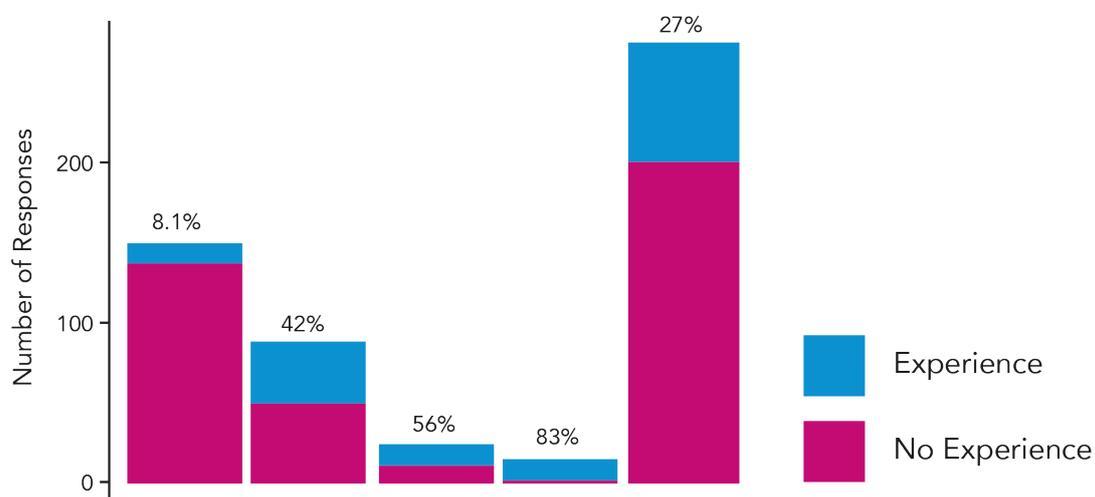


Figure 3: Number of respondents in each role, stacked by innovation experience

Q1a. Level of innovation experience

Respondents involved in diabetes innovation (73) were asked to specify the type of innovation experience they had, choosing from ‘Support/lead development and delivery of Innovation Projects’, ‘Contribute to Innovation Projects’, or ‘Limited involvement but have ideas’. Out of those with previous innovation experience, 93% of respondents (68 of 73) answered this question. A total of 36 (49.3%) were involved in development and delivery, 23 (31.5%) were contributors, and 9 (12.3%) had limited involvement. Academics/researchers were the most likely to be involved in the development and delivery of innovation projects, with 10 of 12 respondents (83.3%) falling into this category.

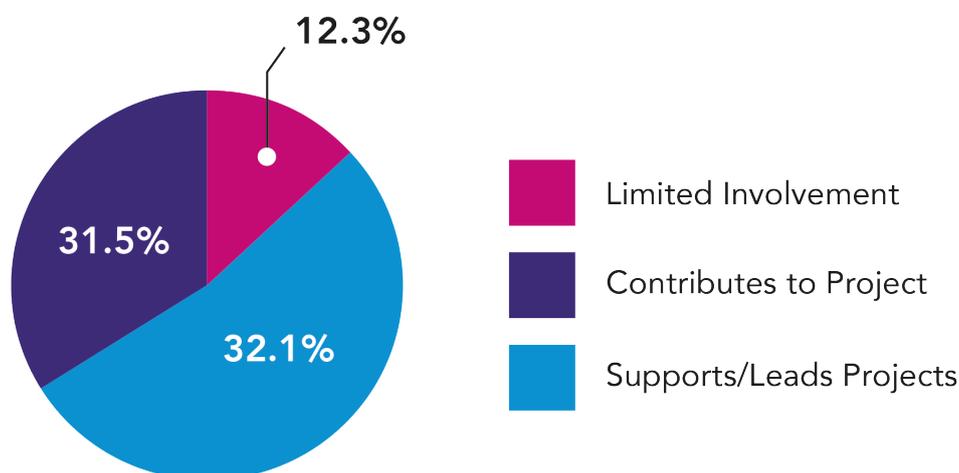


Figure 4: Level of innovation experience for respondents who had experience in diabetes innovation projects

Q2. Priorities for Innovation

The Diabetes Improvement Plan (**Scottish Government, 2014, 2021**) set out eight key priority areas for improving patient experience and clinical outcomes. Respondents selected their top three DIP themes out of the seven presented to identify which were the most important priorities for an innovation challenge.¹ For this question, 179 respondents (65.1%) provided an answer.

‘Person-centred care’ was the theme most consistently identified as important, with 27% of participants rating it as a key target. ‘Prevention and Early Detection’ was ranked second, chosen by 20.2% of respondents, and ‘Type 1 Diabetes’ was third at 15.5%. ‘Inpatient diabetes’ was rarely selected, with only 2.6% of participants choosing it as a priority.

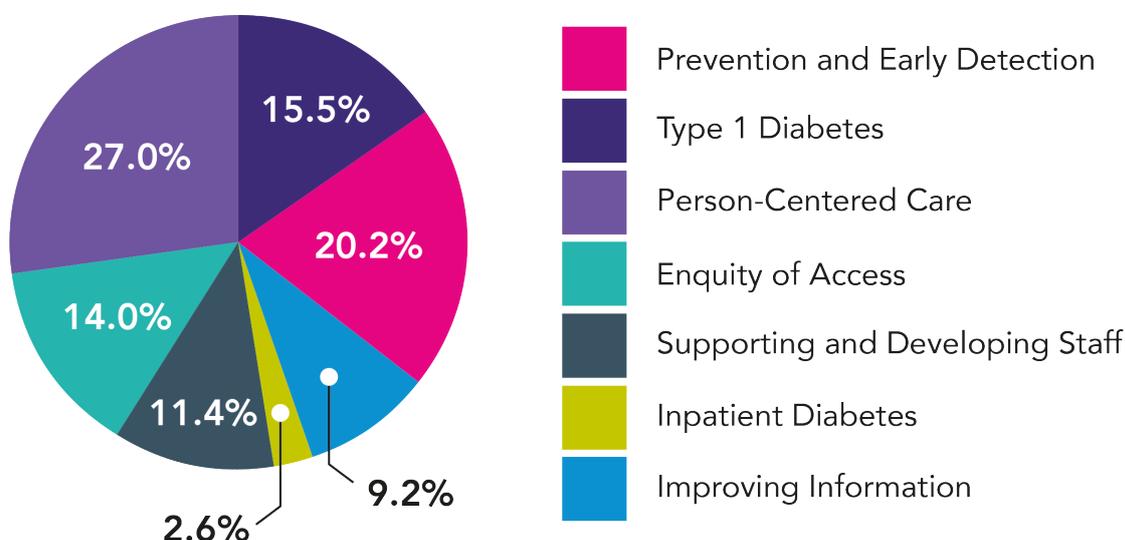


Figure 5: Top priorities for diabetes innovation, by frequency chosen

¹ The ‘Innovation’ theme was excluded from this question due to redundancy.

Priorities for innovation were largely similar between professionals and non-professionals, with most priorities showing little difference between groups. Both groups ranked person centred care as the top innovation priority (29.9%/ 27.0%), and both ranked inpatient diabetes as the lowest (4.0%/ 1.4%). The largest difference between groups was that non-professionals selected type 1 diabetes much more frequently than professionals (21.4% vs 8.84%). On the other hand, diabetes professionals more frequently prioritised supporting and developing staff (14.46% vs 8.77%) and equity of access (16.9% vs 11.58%).

Q3. Key Challenges in Diabetes Services and Care

Respondents were asked for their opinion on the top three challenges currently facing diabetes services and care. A total of 173 participants (63%) listed at least one challenge.

An inductive thematic analysis (Braun & Clarke, 2006) was performed to identify the most prominent themes in the data. The wide range of stakeholders included in the survey resulted in very rich and diverse data. Initial coding identified broad themes, which were then broken down into more specific issues. Four main themes were identified: demand on services, access to resources, need for support, and care structure.



Figure 6. Key Challenge Themes Identified in survey

Access to Diabetes Resources

Access to diabetes resources was the broadest and most frequently occurring theme, with almost three quarters (126 of 173; 72.8%) of respondents finding some form of resource access to be a key challenge. This theme was prioritised by both professional and non-professional respondents, with 75 of 91 non-professionals (82.4%) and 51 of 82 professionals (62.2%) identifying it as a challenge.

The most common subtheme, highlighted by 66 respondents (26%), was access to diabetes professionals. The most common concern within this subtheme was access to regular appointments. Many people with experience of diabetes reported a desire for more regular check-ups, and some stated that they lacked access to any regular appointments outside of annual reviews. Both people with diabetes and HCPs reported that reviews were often backlogged and delayed due to COVID-19. People with diabetes also mentioned delays in accessing specialist care, particularly podiatry.

Several respondents stated that when appointments were available, they were often remote, and people living with diabetes expressed a desire for more face-to-face contact. On the other hand, some professionals highlighted the need for better delivery of remote care. Twenty-six respondents (15%) thought that there were simply too few staff to provide adequate access to health professionals. Just over 10 respondents specifically noted that a lack of face-to-face contact as a challenge; one NHS HCP thought there was a need for “effective remote care delivery”, while another thought that it was important to offer face to face, phone, and video calls as options.

Access to diabetes technology (such as continuous glucose monitoring, insulin pumps, and closed loop systems) was also a very common subtheme, highlighted by 52 respondents. Access to up-to-date diabetes technology was particularly important for people with diabetes and their families but was also highlighted by several professionals. On the other hand, several professionals identified people with diabetes’ unrealistic expectations as a challenge, with one HCP saying that “Patients wants/needs and expectations [are] not in line with what is able to be provided by NHS budget”.

Forty-three respondents (24.9%) highlighted the importance of educational or self-management resources. Many people with lived experience of diabetes felt the need for better access to resources which would help them to manage their diet, and several highlighted lacking knowledge on food choices. Both people with diabetes and professionals thought there was a need for better access to resources which would help people with diabetes to manage their diet, exercise, and lifestyle. Some respondents highlighted limited access to self-management courses, difficulty in accessing online resources or apps, or a lack of clarity about where to find help. HCPs thought that diabetes patients’ engagement with self-management was an important challenge.

Inequalities in resource access was an important trend within this theme, highlighted by 23 respondents (13.1%).

Some respondents mentioned a ‘postcode lottery’, indicating a disparity in access to resources. HCPs found that even when people were given access to knowledge and self-management resources, poverty and economic challenges were a barrier towards lifestyle change.

Services not meeting Demand

One of the most prominent overarching themes in the data was the concern that demand for diabetes services outstripped available resources. A total of 99 respondents included this theme as a concern, meaning that over half (57.2%) thought it was a key challenge. This theme was evenly represented among both health and care professionals and people with diabetes.

Lack of funding was the most commonly occurring subtheme, with 57 respondents (32.9%) selecting it as a concern. Respondents felt that a lack of funding led to a shortage of staff, difficulty in accessing services, and reduced access to diabetes technology. Technology was the most frequently mentioned resource here, mentioned by 27 respondents (15.6%); this mirrors the heavy focus on technology described under the access to diabetes resource’s theme, above.

A frequently occurring subtheme was a lack of staff training, listed by 32 respondents (18.5%). People with diabetes expressed that staff lacked the comprehensive knowledge of diabetes required to deliver effective treatment (13 of 83; 15.7%). NHS HCPs (13 of 62; 21%) found that there was a shortage of staff who were trained in the management of diabetes. They also highlighted difficulty in keeping up with changing diabetes technologies, and that time pressures made it difficult to fit in the necessary training.

Fifteen respondents (8.7%) found that COVID-19 had created an additional strain on diabetes services. A third of these respondents specified that there was an increased demand for services post-pandemic, with greater numbers of patients and more serious illness.

Respondents also found that the changes to service delivery caused by COVID-19 were challenging, with close to half reporting that services had not fully recovered to pre-pandemic functionality.

Need for Support

Fifty respondents (mostly people living with diabetes; 28.9%) highlighted a general lack of support as a challenge. This subtheme describes feelings that the mental burden of living with lifelong chronic condition is not properly accounted for. These feelings often co-occurred with the theme of access to diabetes professionals, and people living with diabetes typically felt unsupported because they had limited time to interact with HCPs.

Twenty respondents (11.6%), both professional and non-professional, suggested that there was an increased need for access to mental health and wellbeing support. Some respondents thought that easier access to a psychologist was required, while others thought that easier access to diabetes support groups would be most beneficial.

Care Structure

A general dissatisfaction with the structure and management of diabetes care was discussed by 27 respondents (15.6%). More professionals listed this as a priority than non-professionals. Overall, this theme describes desire for a more holistic, integrated, and patient-centred approach to diabetes care. Eight respondents thought that communication and coordination of care were key challenges, and some (fewer than five) respondents identified a limited knowledge of diabetes within other specialties as a concern. Some professionals (fewer than five) listed the need for stronger management and leadership of diabetes services.

“Pressures on frontline services/ care gateways can become merry-go-rounds” – NHS HCP

It was generally felt that the diabetes care pathway was not integrated across specialities with one respondent observing that ‘services seem fractured’ and that a ‘one-stop-shop’ was needed. Some respondents suggested that multidisciplinary teams could improve integration and communication, resulting in a more consistent patient pathway.

Key Challenges Summary

Overall, the above analysis suggests that:

- The main challenge for people with diabetes is a general lack of diabetes resources. People with lived experience of diabetes displayed a desire for:
 - better access to self-management resources
 - more contact with health professionals/ appointments
 - access to services for mental health support.
- The data suggests a lack of resources may be caused by limitations in NHS funding and by the structuring of diabetes care.
- Respondents showed dissatisfaction with the organisation, management, and communication within diabetes care pathways. Alongside limited contact with HCPs, this contributed to feelings that staff were unsupportive and that care was not person-centred.

There was substantial overlap between the challenges identified between professionals and non-professionals, with a few key differences.

- Non-professionals more frequently mentioned the importance of access to diabetes resources, particularly regarding diabetes technology.
- In contrast, professionals were more likely to emphasize inequality in access to resources as a challenge.
- Non-professionals were much more likely to highlight the need to feel supported and access to mental health support

A full breakdown of the differences in themes highlighted between professional and non-professional respondents are displayed in figure 5 (Appendix B).



Q4. Additional Diabetes Priorities

The survey gave respondents the option to provide suggestions for any additional themes that they did not feel were covered sufficiently by the DIP. This question was answered by 55 participants (20%). Respondents discussed both suggestions for new priorities and gaps in existing priorities.

Eight respondents focused on the importance of holistic care. These responses focused on the multi-morbidity of diabetes and care throughout the life course. Four responses suggested that most focus is on people newly diagnosed with diabetes, and that there should be more attention to how diabetes develops over time. Other respondents felt that improving the interconnectedness of diabetes care systems is important and should be highlighted under person-centred care.

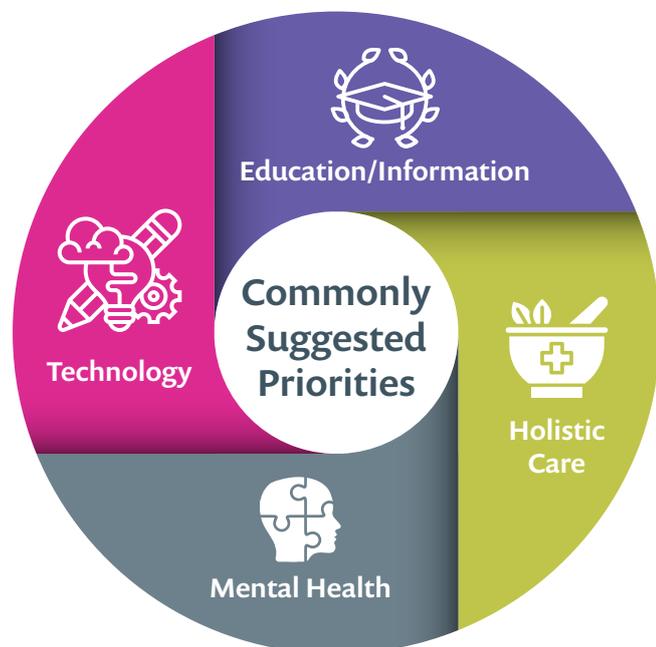


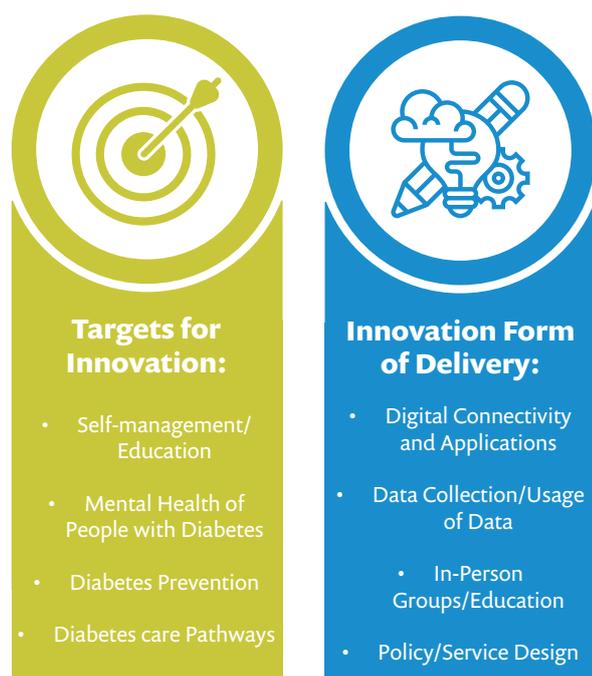
Figure 7. Additional Themes identified in survey

The most frequently mentioned priority was diabetes education/information, with 18 of 55 responses emphasizing this area (32.7%). Only two of these responses were from HCPs, with the rest from people with lived experience of diabetes and their families. Five respondents thought there was a need for better dietary information, and another two wanted better weight management resources. Two respondents thought that knowledge of diabetes among healthcare professionals still needs improvement, while another three highlighted the importance of diabetes education in wider society, including schools and the workplace.

The inclusion of diabetes technology as a priority was suggested by 10 respondents, all of whom were non-professionals. Most responses focused on ensuring diabetes technology is available to everyone who wants it and minimising unfairness and inequality, with three respondents also mentioning the importance of good information on diabetes technology.

Q5. Innovation Ideas

Another optional question asked survey respondents to provide their own ideas for innovations surrounding diabetes. This question had 91 responses, but 21 responses did not focus on innovation ideas; most of these responses were requests for better access to the most recent diabetes technology or for additional funding/resources for diabetes care. This left 70 responses addressing innovations (25.5%). A full list of these responses is available [here](#)



Common topics of innovation ideas

Figure 8. Common topics for Innovation Ideas

Targets for Innovation

The most common focus of innovative ideas was on education or self-management, with 28 responses mentioning this theme. Most of these responses focus on innovative approach to accessing supported self management education and self-management, with six responses discussing education for health professionals or public awareness. A frequent suggestion among these responses was increased support for managing diet, with many respondents suggesting this could be done through a diet management app. Respondents also mentioned access to cooking, weight loss, or exercise groups.

Twenty-six of the suggested innovations involved changes in diabetes care pathways or service delivery. These responses covered a diverse range of innovations. Topics included person-centred care, multidisciplinary care, long-term support, alternative ways to access person held data, services or screening tools and changes to prescription management. More specific examples include:

- Changing care pathways to join up diabetes treatment between specialist healthcare professionals
- The option to hire or trial diabetes technology to grant better access and ensure people find the most appropriate option for them
- Access to diabetes screening through allied health professionals and digital tools to support lifestyle choices
- Providing staff with additional training on person-centred care and optimising virtual care models with service users

Innovations in mental health and wellbeing support were suggested by 10 respondents. Most of these responses proposed diabetes support groups. Responses also discussed better integration of digital mental health support into diabetes care. Examples:

- A safe and secure platform for communication between people with lived experience of diabetes
- Tools to capture PROMS and PREMs for people with diabetes
- Group work opportunities for children and young people

Eight responses discussed diabetes prevention and better use of data and artificial Intelligence to support decision making. Seven of these ideas were from diabetes professionals, with only one from an individual living with diabetes. Responses focused on using data - driven innovation for both type 1 and type 2 and this becoming part of usual care.

Type of Innovation

Nineteen innovations ideas centred specifically on digital services. Fifteen of these ideas (78.9%) came from diabetes professionals; other forms of innovation delivery were suggested equally by professionals and non-professionals. These responses discussed usage of MHEALTH Apps to provide patient resources and to organise data, expanded digital delivery of diabetes services, and the use of online platforms for mental health and well being support.

Fifteen innovations were based around use of diabetes data or improving data collection. These responses discussed accessibility of data from diabetes devices/technology, unused sources of diabetes data, data usage for predictive algorithms, and using data to personalise diabetes care.

Fourteen responses involved in-person groups or education. Included were suggestions for virtual and/ or hybrid diabetes groups for mental health and wellbeing or self-management support, and ideas based around providing diabetes education and support within schools.

Twenty-four respondents suggested innovations involving changes to policy or the structure of diabetes services. These responses included changes to screening/testing, streamlining of diabetes prescriptions, and various other suggestions surrounding diabetes services and models of care.

Trends Across Qualitative Data and Responses

Several trends emerged which were largely consistent across responses for all three qualitative questions.



Figure 9. Themes trending across Qualitative Data in survey

Provision of Diabetes Technology

One prominent theme was the desire for free and equal access to diabetes technology (e.g., insulin pumps and continuous glucose monitors), particularly from people with diabetes but also from HCPs. Access to technology was a commonly identified challenge for diabetes care; many respondents emphasized that access to technology was essential for achieving the highest quality of life for people living with diabetes, but also highlighted the funding challenges in providing universal access. Respondents also talked about inequalities and unfairness in the provision of technology, resulting from both criteria for accessing technology and regional differences. Technology was a common suggestion for an additional priority for the DIP.² Finally, the need for better access to technology was also highlighted in many of the responses for the question on innovation ideas, with two respondents suggesting options for trial or hire access.

² Diabetes technologies are currently included under the innovation priority (Scottish Government, 2021).

Holistic Care

Another overarching trend was the desire for a more holistic model of diabetes care. Respondents considered person-centred care to be the most important priority in the DIP. This trend was also observed amongst qualitative responses, with the importance of patient-centred care being highlighted in the key challenges, additional priorities, and innovation ideas answers. However, respondents also highlighted areas which are less well-covered by the DIP. Several respondents identified the multi-morbidity of diabetes as a challenge for diabetes care. People with diabetes found that diabetes treatment often required access to various specialists, but that healthcare professionals not directly involved with diabetes often had limited knowledge of the condition. Respondents emphasised the importance of strong communication between diabetes care and other areas. Similarly, respondents thought that “reduce[ing] siloed working” should be a theme for innovation, and that people with diabetes should have a more structured journey through diabetes care.

“How Diabetes Care is managed when there is multi-morbidity - how can we deliver a personalised approach to care across the whole system?” - NHS HCP

Mental Health & Wellbeing

Access to mental health support is currently included as a diabetes priority under person-centred care, but many respondents thought there was a need for a greater focus on the wellbeing of people living with diabetes. In the key challenges section people with diabetes highlighted a lack of understanding and support from healthcare professionals, while HCPs found that they lacked “quality time” with patients. People with diabetes also reported a lack of mental health services, support groups, and psychologists to be a challenge, and several respondents suggested that mental health should be a priority for innovation. Group work and peer support opportunities were proposed as innovation ideas to support mental wellbeing, and respondents thought that such opportunities should be better integrated into diabetes care.

Patient Education & Self-Management

In the key challenges section people with diabetes often reported feeling that they lacked easy access to the knowledge or tools required for effective self-management. They also mentioned difficulty in accessing advice and uncertainty surrounding how they should manage their diabetes. Professional groups highlighted access to lifestyle management courses and resources as a challenge. Self-management, particularly of diet, was also frequently mentioned by people with diabetes in the additional themes responses. Finally, self-management initiatives were the most frequently presented innovation ideas, with several respondents suggesting digital education/self-management tools or diabetes groups for supporting self-management.

Public/Professional Education

The importance of educating both HCPs and the public was mentioned in responses for each qualitative question. Both people with diabetes and professionals identified education of HCPs as a priority, particularly for updating knowledge of diabetes technology and for refreshing diabetes knowledge following the COVID-19 pandemic. Some respondents included comprehensive diabetes education for staff as an additional priority. Education of the wider public, particularly within schools, was suggested as an innovation idea by people with diabetes.

Discussion

Most respondents were non-professionals, either having personal experience with diabetes or being related to an individual with diabetes; therefore, the results of this survey most strongly reflect the opinions of non-professionals. However, there was considerable overlap between the responses of non-professional respondents and of HCPs (the next largest group). The large response from people living with diabetes and their families demonstrates the high levels of interest in this area.

Limitations

This survey did not primarily target academics/researchers, and only a small percentage of survey respondents were from academic backgrounds. The priorities of this group tended to differ from people with diabetes and from professional groups, with a greater focus on prevention of type 2 diabetes, but this perspective was not widely represented in this sample.

This survey did not collect data on respondent location. This means there is some uncertainty on how much these results can be generalised throughout the Scottish context, particularly with respondents' comments on regional differences in care.

Additionally, respondents were not asked to specify what types of diabetes they had experience with, and questions did not distinguish between diabetes types. Further engagement with individuals living with different types of diabetes may offer further insights into innovation priorities.

General discussion

Many of the challenges in diabetes care identified in this survey have been previously identified and are being addressed by the DIP. This suggests that current policy is broadly effective at identifying areas which could be targeted to improve diabetes experiences and outcomes. This survey adds to existing evidence by specifying in greater detail which areas of diabetes care have the greatest demand for change, improvement, and innovation investment.

Person-centred care was the most highly prioritised theme from those included in the DIP, with 27% of participants selecting it as a priority. This trend was continued in respondents' free-text answers, with person-centred care discussed in answers to every question. Furthermore, commitments listed under person-centred care include access to structured education and mental health support, which independently emerged as prominent themes throughout the survey. These results support a focus on person-centred care as one of the most important priorities of the DIP.

Notably, the data suggests that health and care professionals may be more open to digitally enabled care models than people living with diabetes. People with diabetes reported limited access to in-person appointments was a challenge, while HCPs were more likely to prioritise the effective delivery of online consultations. Diabetes professionals were also more likely to suggest innovations focused on digital connectivity than non-professionals. This may be an interesting avenue for future research.

The survey found that there is very high demand and expectation for diabetes technology from people with diabetes, and that there are concerns surrounding the fairness and equality of how technology is made available. Professionals likewise recognised the life-changing effects that modern diabetes technology can have. However, the survey also identified a tension between heavy patient demand, available funding, and the more realistic views of HCPs.

Although diabetes technology in general is not a specific priority in the DIP, the 'Type 1 Diabetes' priority includes the commitment 'appropriate and timely access to technologies to improve glycaemic control and quality of life for people living with type 1 diabetes' (Scottish Government, 2021). The Innovation priority is heavily focused on the implementation of and access to existing diabetes technologies, and an overall commitment to technology is highlighted throughout the report. Despite this, this survey identified many requests for better access and a greater focus on technology.

This suggests it may be necessary to reorganise how the government's commitment to technology is communicated, ensuring a widespread awareness of the commitment to diabetes technology and innovations among people with diabetes and HCPs.

Another important finding was that people with diabetes reported feeling unsupported, and that there was a high demand for accessible mental health and wellbeing services. Respondents thought that more opportunities to communicate with other people with experience of diabetes would benefit their mental wellbeing. This data suggests that the mental health and wellbeing of people with diabetes could be a good focus for diabetes innovation.

Health and Social Care Alliance Scotland (ALLIANCE; 2022) recently published outcomes of a focused engagement programme with people living with diabetes who are contributing to the redesign of diabetes education and supported self-management services currently being undertaken across Scotland. Notably, this report also found that mental health and emotional wellbeing support is highly prioritised by people with lived experience of diabetes, with similar concerns of feeling unsupported, not feeling understood, and needing more access to psychologists. Additionally, both this report and ALLIANCE found that people with diabetes thought that timely and accessible information was important for overcoming the challenges of living with diabetes.

Finally, many people with diabetes felt that better access to diabetes information and self-management resources was important. They reported uncertainty in how they should manage their lifestyle to deal with diabetes throughout the survey, with a particular focus on food choices. Professionals also thought that better access to resources was important, and some HCPs thought that patients typically engaged poorly with self-management. Many respondents thought that self-management was a good area for innovation, suggesting a focused challenge on optimising self-management could be effective.

Conclusion and Next Steps

This survey offered insights into several prominent challenges for diabetes care and provided data on which areas people view as the greatest priorities for innovation, with an emphasis on the perspectives of people with lived experience of diabetes and NHS health and care professionals.

This information will be used to guide the next stages of this consultation by informing future Diabetes Innovation Challenge themes for Open Innovation Calls in 2022/23, and stakeholder engagement workshops which will be held in 2022. This process will assist in the identification and design of new digital innovations within diabetes services and care, to improve prevention, treatment, and quality of life for people living with diabetes.

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Appendix A – List of Survey Questions

Q0: “Which best describes your involvement in diabetes care?”

Q1: “Do you have experience in Diabetes Innovation projects?”

Q1a: “What type of involvement do you or your organization have in Innovation Projects?”

Q2: “In your opinion, what are the top three challenges currently facing diabetes services/care?”

Q3: “The Diabetes Improvement Plan describes several priority areas for improvement in diabetes care. Of the following themes, which would you consider to be the top three priorities for an Innovation Challenge?”

Q4 (Optional): “Is there anything we missed? If there are any additional diabetes innovation themes that you think are important, please write them in the box below.”

Q5 (Optional): “We are looking for YOUR innovation ideas on how we can improve the lives of people living with diabetes in Scotland or the care models that we offer. If you have any innovation ideas, please summarize them below in 1 or 2 sentences.”

Appendix B – Breakdown of Data by Professionals/ Non-Professionals

Figure 5a

Top priorities – diabetes professionals only

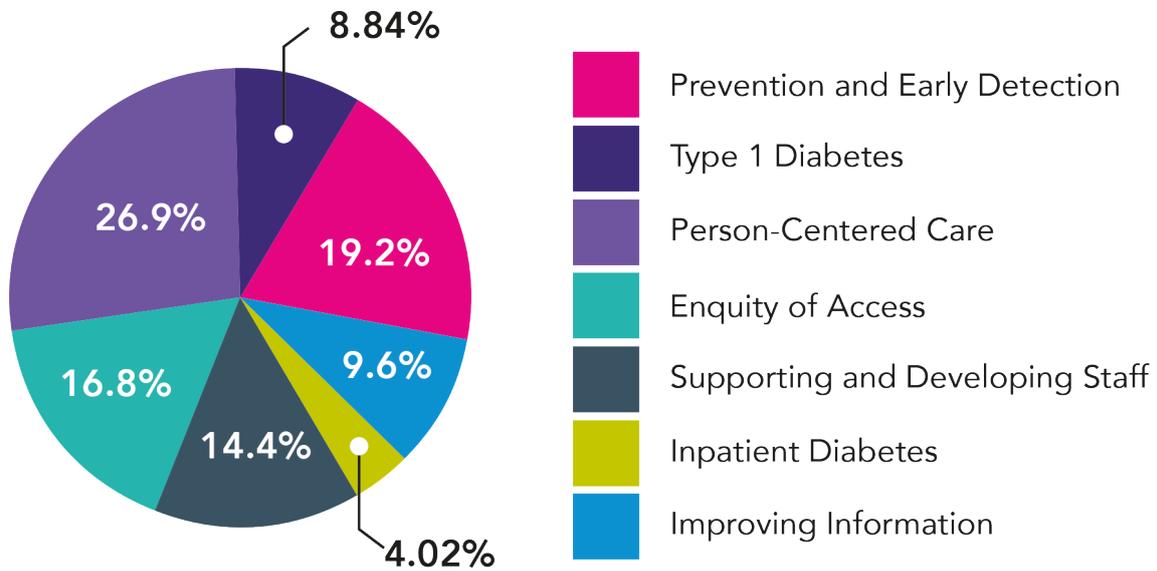


Figure 5b

Top priorities – non-professionals only

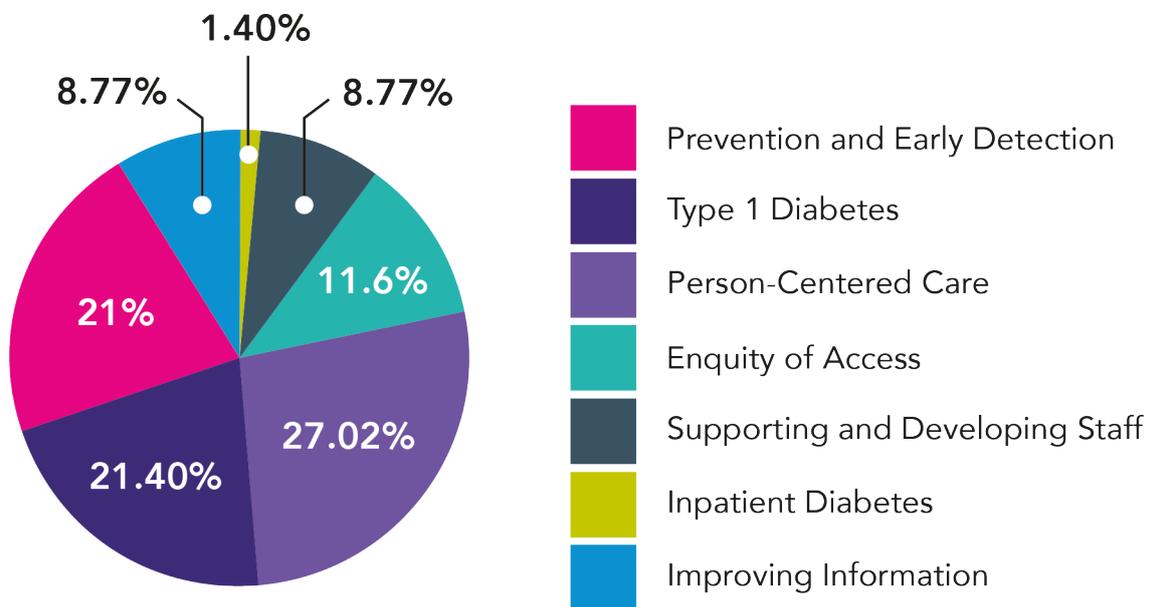


Table 1

Table of differences in key challenges (Q3) between professionals and non-professionals

	Non-Professionals:	% (Non-Professionals)	Professionals:	% (Professionals)
Total	91	100.00%	82	100.00%
Access to Diabetes Resources	75	82.42%	51	62.20%
Access to Professionals	39	42.86%	27	32.93%
Access to technology	35	38.46%	17	20.73%
Access to Self-Management	27	29.67%	16	19.51%
Access Inequality	5	5.49%	18	21.95%
Services not meeting Demand	45	49.45%	44	53.66%
Funding	28	30.77%	29	35.37%
Staff training	17	18.68%	15	18.29%
COVID-19	5	5.49%	10	12.20%
Need for Support	39	42.86%	11	13.41%
Mental Health Access	14	15.38%	6	7.32%
Care Structure	12	13.19%	15	18.29%

Table 2

Table of differences in diabetes priorities (Q4) between professionals and non-professionals

	Non-Professionals:	% (Non-Professionals)	Professionals:	% (Professionals)
Total	91	100.00%	82	100.00%
Access to Diabetes Resources	75	82.42%	51	62.20%
Access to Professionals	39	42.86%	27	32.93%
Access to technology	35	38.46%	17	20.73%
Access to Self-Management	27	29.67%	16	19.51%

Table 3

Table of differences in innovation ideas (Q5) between professionals and non-professionals

	Non-Professionals:	% (Non-Professionals)	Professionals:	% (Professionals)
Total	34	100.00%	36	100.00%
Self-management/ Education	13	38.24%	15	41.67%
Care Pathways	13	38.24%	13	36.11%
Mental Health	3	8.82%	7	19.44%
Prevention	1	2.94%	7	19.44%
Digital Connectivity/ apps	4	11.76%	15	41.67%
Data Use	8	23.53%	7	19.44%
In-Person Groups/ Education	7	20.59%	7	19.44%
Policy/Service Design	15	44.12%	13	36.11%

Appendix C – Response Rates by Question

Figure 11a

Response rate for each survey question, stacked by role

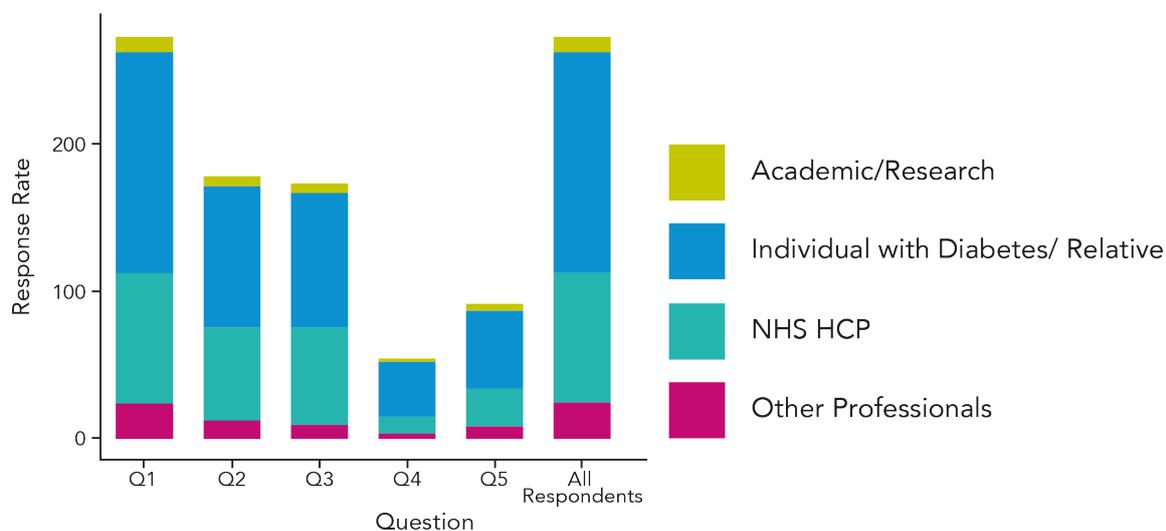


Figure 11b

Response rate for each survey question, stacked by innovation experience

