The impact of COVID-19 on District Health Board Diabetes Secondary Care Services in New Zealand

Authors:

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Abstract

The global pandemic of coronavirus 2019 (COVID-19) affected the entire New Zealand health sector. A rapid shift to non face-to-face communication was implemented to protect health care providers and patients from exposure to COVID-19. Emerging evidence identified that people with diabetes were associated with an increase in disease severity and mortality. This study surveyed key Clinical Leads in 18 District Health Boards (DHBs) in New Zealand, as well as members of the New Zealand Society for the Study of Diabetes (NZSSD) to determine what changes occurred in diabetes secondary services as a result of COVID-19, and what changes could be taken forward in the future. The results indicated that despite the significant decrease in staffing levels, non face-to-face communication was largely acceptable to most staff and there was continued use of non face-to-face communication following the relaxation of social distancing policies. Non face-to-face communication methods are tools that could be utilised moving forward, outside of isolation/pandemic restrictions. Barriers to these methods, such as IT problems and patient difficulty in using technology, should be rectified to better provide this type of health service.

Introduction

Diabetes is a significant and increasing health burden in New Zealand. According to the Ministry of Health Virtual Diabetes Register, in 2018, approximately 260,000 New Zealanders had diabetes (1). This represents approximately 5.2% of the total New Zealand population. These are predominantly patients with Type 2 Diabetes (90%) while type 1 diabetes accounts for around 10% of all people with diabetes in New Zealand (2). Diabetes has a much higher prevalence in people of Māori, Pasifika, and South Asian ethnicity and those living in high deprivation areas (2).

In New Zealand, diabetes services are spread over primary, secondary and tertiary providers. Secondary and tertiary services are utilised predominantly for those patients with difficult to manage diabetes, as well as the prevention, monitoring, and management of complications associated with the condition. These services are delivered in varying ways according to District Health Boards (DHBs). However they typically involve a multi-disciplinary team consisting of nurse specialists, nurse practitioners, specialist physicians, ophthalmologists and podiatrists (2).

In March of 2020, the New Zealand Government responded to the global pandemic of COVID-19 by closing the borders to all but New Zealand citizens/ residents and implemented a four level alert system of social distancing to combat transmission (3). Globally healthcare providers have faced the challenge of continuing to deliver healthcare safely without exposing patients or clinicians to the virus. New Zealand healthcare professionals were recommended to use virtual, non-contact consultations where possible under Alert Levels 3 and 4 to minimise the risk of transmission (3). This was a significant and abrupt change for the New Zealand healthcare system, as prior to this, service delivery was primarily conducted face-to-face.

Many secondary care outpatient services and primary care providers in New Zealand responded swiftly by implementing non face-to-face methods of communicating with

patients for the majority of their practice. Non face-to-face communication is also known as telehealth or telemedicine, and refers to the use of technology to enable healthcare to be delivered remotely (4). This response was not unique to New Zealand. Telehealth services have been reported in the United Kingdom, United States, China and Australia. It has also been shown to be useful in other recent viral outbreaks including SARS-CoV (severe acute respiratory syndrome–associated coronavirus), MERS-CoV (Middle East respiratory syndrome coronavirus) and Zika Virus, as well as national disasters (5). Additionally, patients with acute medical conditions that were unable to be managed remotely were seen in-person by healthcare professionals with appropriate infection control practices. This model of care enabled patients to continue to access care when there was a high likelihood of community transmission within New Zealand, while simultaneously minimising travel, reducing the risks of exposure and transmission of COVID-19 for both patients and healthcare providers.

Adopting non face-to-face communication with patients with diabetes during this time was particularly important. Emerging evidence from a consensus statement the Lancet published earlier in 2020 demonstrates the importance of tight glycaemic control as a means of infection prevention (6).Furthermore, data published earlier this year revealed a higher incidence of COVID-19 infection, a higher prevalence of more severe disease (including Acute Respiratory Distress Syndrome (ARDS)), and an increase in mortality in patients with diabetes (6).

Outside of pandemics, non face-to-face patient communication has been successfully used in the management of chronic conditions. Patients and families reported good user experiences and rated them to be of similar satisfaction as standard in-person appointments (7). The provision of healthcare services using non face-to-face communication has also been shown to improve access to specialist care (7,8), improve quality of care and health outcomes, enhance educational opportunities and social support along with being cost effective (8).

Despite this, non face-to-face patient communication has not been widely adopted outside emergent responses. In New Zealand uptake has been primarily limited to the delivery of some specialist outpatient appointments in remote and rural communities. This has similarly been reported in Australia and America (9,10). A range of barriers influencing uptake are reported in the literature such as limited financial reimbursement, organisation of the healthcare system and clinicians' willingness (10,11), providers' concerns regarding the doctor-patient relationship, technology stability, clinical risk, and patients lacking skills and access to technology (7, 8). However, addressing individual factors, such as providing financial incentives for specialist video consultations, have been shown no significant improved uptake. Therefore, barriers are likely multifaceted (12).

Recognising that some patients may lack technological skills, websites such as Health Navigator New Zealand were developed to help patients learn how to use video technologies and interact with clinicians on a video platform, to reduce this barrier to access care delivery in New Zealand (13).

An additional challenge for the COVID-19 response in New Zealand includes awareness of the inequity in access and outcomes experienced by Maori, Pasifika and South Asian people, and those experiencing higher levels of deprivation. Guidelines, changes in service access and provision need to be formulated with these challenges in mind in order to minimise further widening of inequities for these vulnerable groups.

During Alert Level 3 and 4 restrictions developed by the Government in March, there was a dramatic shift from the majority of care being delivered in-person, to delivering care remotely via technology. Given the lack of national guidelines surrounding the specific delivery of healthcare during Alert Level 3 and 4, initiatives developed in response may have differed between District Health Boards in New Zealand. Therefore, this study aims to:

1. Identify the impacts of COVID-19 on the Diabetes Secondary Care Outpatient Service in New Zealand, and what changes occurred as a result of these.

2. Identify changes that can or should be taken forward for the future delivery of Diabetes Secondary Care Outpatient Service.

This study hopes to not only contribute to the evolving literature in this field, but to also inform future best-practice.

Methods & Materials

This study attempted to answer the aims through conducting two separate surveys. One survey was designed to determine the impact and responses of secondary care diabetes outpatient services to the COVID-19 Alert Level 3 and 4 limitations, and identify initiatives that should continue to be implemented in future practice. Purposive sampling was used to select a single representative (Clinical Lead) working in diabetes secondary care services at each DHB in New Zealand. Clinical Leads were selected as the most knowledgeable person regarding the different responses that occurred across the range of diabetes secondary care services provided at their DHB and could accurately represent the range of experiences across multiple disciplines. This sampling process was undertaken by the key stakeholders involved in the survey design process as their roles within diabetes care in New Zealand meant that they were best positioned to identify representatives at each DHB that met this criteria.

A second survey was developed with the knowledge that a disparity may exist between the experience and views of individual healthcare practitioners and those held by Clinical Leads. The survey was designed to capture the views of individual members within the New Zealand Society for the Study of Diabetes (NZSSD). This is a group of 404 healthcare professionals working within primary and secondary Diabetes Services in New Zealand. This group was identified as a means to capture the experience and views of a range of healthcare professionals working in secondary care diabetes services throughout New Zealand. Participants were survey respondents who agreed to the parameters of the survey.

The surveys were developed *de novo* by a research team of eleven final year undergraduate medical students at the University of Otago under the supervision of an epidemiologist working in the Department of Preventive and Social Medicine at the University of Otago. Oversight, guidance and expert consensus was provided by key stakeholders in diabetes secondary care services within New Zealand including representatives from the Ministry of Health, New Zealand Society for the Study of Diabetes and a Diabetes Physician.

Both surveys contained questions derived from the study's aims, as well as demographic data, such as the participant's DHB of employment, current practising role and whether they delivered diabetes care to paediatric and/or adult populations.

The surveys included multi-select, sliding scales and free-text questions. Options for multi-select questions were informed by the literature review and expert consensus. In addition, free-text questions were also included to enable issues to be raised by participants that may not have been considered by the researchers. Clinical Leads were encouraged to seek additional information from other members within their DHB multidisciplinary service. 'Not applicable' or 'I don't know' options were included to accommodate when questions did not apply to the respondent DHB, or the information was unavailable.

SurveyMonkey, an electronic web-based platform, was used to implement the surveys. Participants were recruited via email containing a link to the survey. Email addresses for Clinical Leads of each DHB were provided by the key stakeholders. Email addresses for NZSSD members were obtained from the NZSSD database. All members were emailed an invitation to participate in the study, and were instructed to only complete the survey if they worked in a secondary care diabetes outpatient service. 200 of the 404 healthcare professionals registered on the NZSSD database were identified to work within DHB led services and were eligible to participate.

Data was collected from the 24th July to 6th August 2020. Alert Level 3 ended ten weeks and one day prior to the survey commencing on 24th July 2020. At the end of the initial seven day collection period, Clinical Leads that had not completed the survey were followed up with a reminder phone-call and email. NZSSD members received a reminder email. The survey was closed seven days after these interventions.

Statistical analysis

Descriptive statistics were used to describe the data. R and Microsoft Excel were used to produce the tables and figures. Quantitative data in the clinical lead survey was analysed using Microsoft Excel. Responses to questions in the clinical lead survey that were answered “not applicable” were excluded from analysis.

Free-text questions were informally analysed to identify recurring themes. As the qualitative data was mainly for interest and additional to the quantitative data, formal thematic saturation evaluation was outside the scope of this project.

RESULTS:

Survey Completed by Clinical Leaders

Responses to the Clinical Lead survey were collected from 90% of New Zealand's DHBs (18 out of 20). The majority of respondents were Diabetes physicians; clinical nurse managers, nurse specialists and nurse practitioners made up the minority of respondents.

Role	Staffing level continuing usual clinical work on site			Usual caseload not able to be undertaken		
	Mean percentage	SD	No. of responses, n (%)	Mean percentage	SD	No. of responses, n (%)
Nurse practitioners	72%	26%	7 (39%)	38%	26%	6 (33%)
Nurse specialists	63%	31%	16 (89%)	28%	25%	16 (89%)
Diabetes physicians	82%	28%	15 (83%)	46%	34%	14 (78%)
Midwives	75%	50%	4 (22%)	30%	45%	5 (28%)
Dietitians	63%	33%	15 (83%)	43%	32%	14 (78%)
Health psychologists	50%	55%	6 (33%)	11%	9%	5 (28%)
Obstetricians	90%	18%	8 (44%)	13%	25%	4 (22%)
Ophthalmologists	66%	45%	4 (22%)	51%	46%	5 (28%)
Optometrists/Retinal screeners	2%	6%	10 (56%)	88%	31%	10 (56%)
Podiatrists	68%	38%	12 (67%)	55%	29%	10 (56%)

Figure 1: The percentage of staff that continued to work on site and the percentage of usual caseload work that was not able to be undertaken by diabetes subspecialty.

All diabetes secondary care services experienced a reduction in staff who continued their usual clinical work on-site during COVID-19 Alert Level 3 and 4 (see Figure 1). The largest reduction was seen by optometrists/retinal screeners with only 2% continuing their usual work on-site. Obstetricians, nurse practitioners and diabetes physicians had the smallest reduction, with 90% of obstetricians, 82% of diabetes physicians and 72% of nurse practitioners continuing their usual clinical work on-site.

All diabetes DHB secondary care services experienced a reduction in the amount of their usual case load that they were able to undertake during COVID-19 Alert Level 3 and 4. Optometrists/retinal screening were the most affected, only able to complete 12% of their usual case load. Podiatrists and ophthalmologists were the next most affected, undertaking 45% and 49% of their usual case load respectively. Diabetes physicians completed 54% of their usual caseload, dieticians 57%, nurse practitioners 62%, midwives 70%, and nurse specialists 72%. Least affected were obstetricians and health psychologists who still managed to complete 87% and 89% of their usual workload respectively.

72% of Clinical Leads reported that staffing levels decreased during COVID-19 Alert Levels 3 and 4. The remaining 28% of respondents reported staffing levels did not change. No Clinical Leads reported an increase in staffing levels.

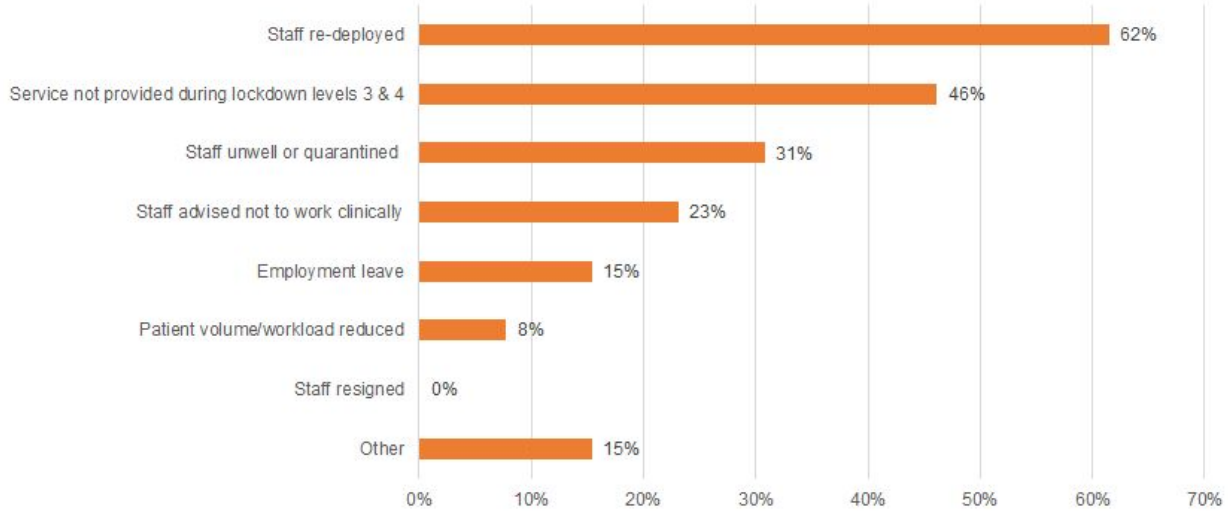

Figure 2: The reasons Clinical Leads attributed to a decrease in staff levels during COVID-19 Alert Levels 3 and 4 (n=13).

Clinical Leads were able to select multiple options to identify reasons staffing levels decreased during COVID-19 Alert Levels 3 and 4 (see Figure 2). Staff being re-deployed to other services (62%) was the most commonly selected reason. This was closely followed by the service not being provided (46% of respondents). Staff sickness (any kind) or staff being quarantined was identified to contribute to the reduction in staffing levels by 31% of Clinical Leads, while 23% reported that staff being advised not to work clinically also impacted staffing levels. 15% of respondents selected 'other reasons' which they stated in free-text was due to staff having to stay home to provide childcare for their children. They did not state whether these staff members continued to work remotely in some capacity.

Over half (56%) of all administration staff worked off-site during Alert Levels 3 and 4. The majority (90%) of Clinical Leads felt the administration staff working off-site affected

their clinical work to some extent. Ten percent said it did not affect them at all, 40% said it affected them a little, and 50% a moderate amount.

61% of Clinical Leads reported decreases in “Did Not Attend” rates (DNAs) while 22% said the rate was unchanged, and 17% said it had increased.

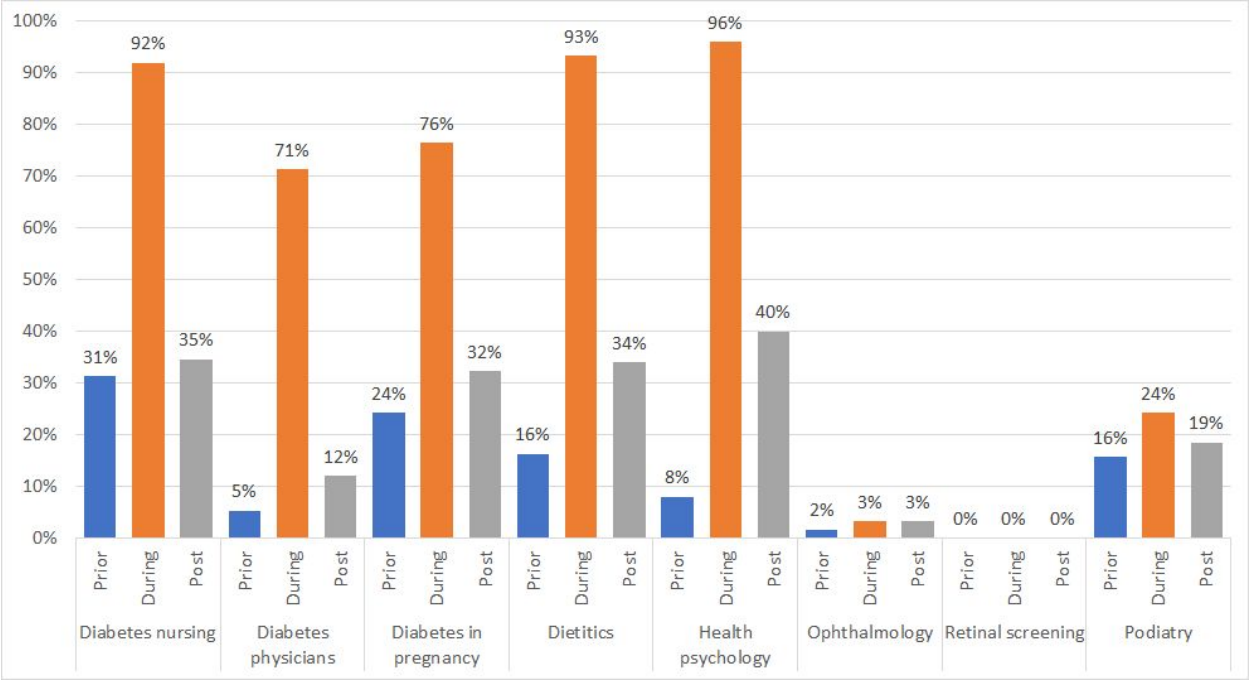

Figure 3: The percentage of routine clinic appointments completed by non face-to-face patient communication prior to, during, and following COVID-19 lockdowns level 3 & 4 by diabetes secondary care services (n=8-15 per service).

The next set of questions enquired about clinical staff’s use of non face-to-face methods to communicate with patients during COVID-19 Alert Level 3 and Level 4 periods. Clinical Leads indicated that the percentage of routine clinical appointments completed using non face-to-face methods of communicating with patients increased for almost all diabetes services during this period. More than 90% of routine clinic appointments undertaken by health psychologists, dieticians and diabetes nurses were conducted by non face-to-face methods of patient communication. As seen in figure 3, diabetes retinal screening was the only service to have never utilised non face-to-face patient communication during routine clinic appointments.

Clinical Leads reported that use of non face-to-face methods to communicate with patients decreased across all services after COVID-19 Alert Level 3 and Level 4 ended. The exception to this was ophthalmology (see Figure 3). The biggest decline (approximately 60%) in the continued use of non-face-to-face methods of communication was experienced by dietetics and diabetes physicians (see Figure 3). However, the overall use of non face-to-face patient communication since COVID-19 Alert Level 3 and 4 ended has increased compared to baseline use prior to COVID-19. Health psychologists demonstrated the largest increase in use of non face-to-face patient communication compared with pre-COVID-19 use.

All Clinical Leads reported that their staff communicated with patients by phone during COVID-19 Alert Level 3 and Level 4 periods. 78% also indicated that their staff communicated with patients via video conferencing, email and text. No other forms of non face-to-face communication were reported to be used by staff delivering diabetes services to patients during the COVID-19 Alert Level 3 and Level 4 in New Zealand.

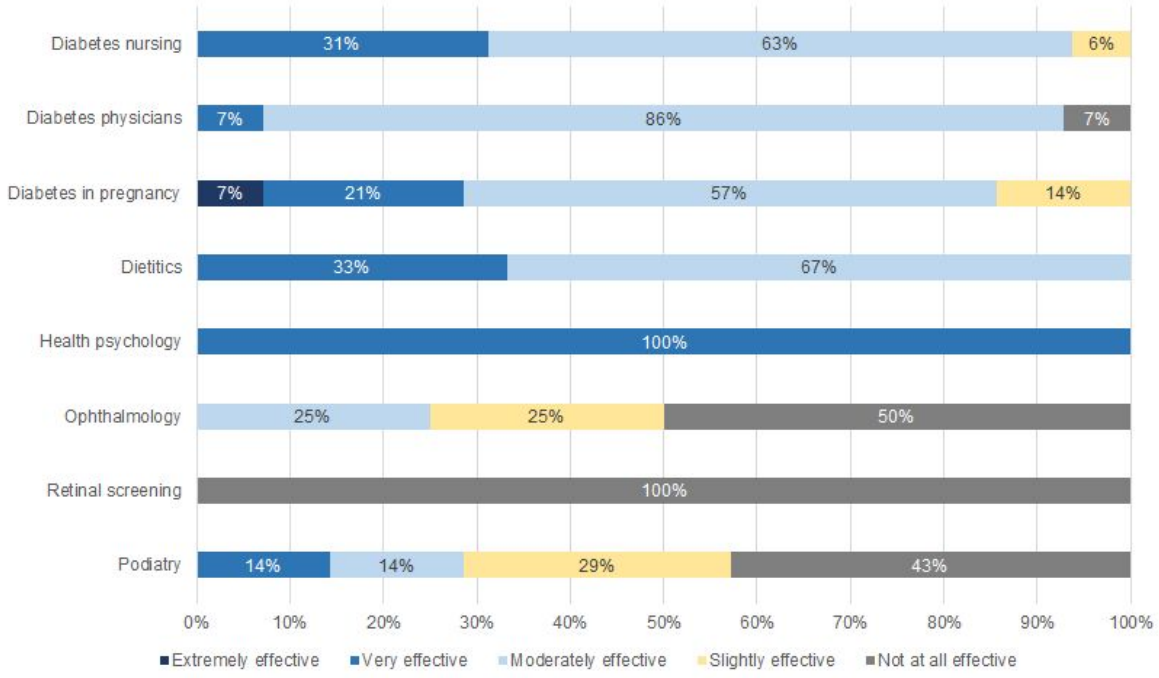

Figure 4: The percentage of Clinical Leads that rated the non face-to-face patient communication as extremely effective, very effective, moderately effective, slightly effective or not at all effective for each Diabetes Service delivered in Secondary Care in New Zealand (n=4-16 per service).

Clinical Leads were asked to rate the effectiveness of non face-to-face communication for each diabetes secondary care service (Figure 4). All Clinical Leads rated non face-to-face communication to be *'very effective'* for Health psychology services. The majority of clinical leads rated non face-to-face communication to be *'moderately effective'* for the delivery of diabetes nursing, diabetes medicine, diabetes in pregnancy, and dietetics services. Non face-to-face communication was rated as *'not at all effective'* by most or all Clinical Leads for the delivery of ophthalmologic, retinal screening and podiatry services.

All Clinical Leads thought that phone calls should continue to be used to deliver diabetes services, and that this method should be developed in the future. Clinical Leads also strongly supported the continued use and future development of video conferencing (83%), email (78%) and text (not including reminders) (72%) as means of communicating with patients.

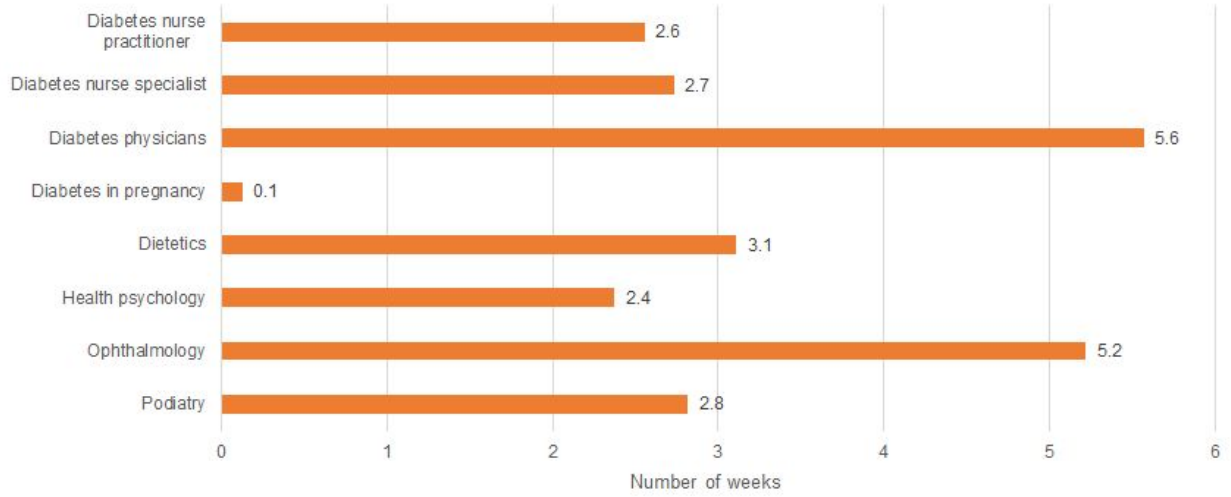

Figure 5: Average delay in Diabetes Secondary Care Services in weeks following COVID-19 Alert Level 3 and Level 4 in New Zealand (n=8-15 per service).

Following the COVID-19 Alert Level 3 and Level 4, Clinical Leads reported that there were significant delays in services for diabetes physicians and ophthalmology (5.6 and 5.2 weeks respectively) (Figure 5). Additionally, one Clinical Lead reported a significant delay in their ophthalmology service, but did not specify an absolute value of the length of delay. The service with the least reported delay was diabetes in pregnancy service (0.1 week). Clinical leads reported there were moderate delays, ranging between 2.4 and 3.1 weeks, for diabetes nurse practitioners, diabetes nurse specialist, dietetics, health psychology and podiatry services.

NZSSD Membership survey results

The response rate for the survey completed by the NZSSD members was 50% with 100 of the 200 members deemed to be eligible to participate completing the survey within the study period. Respondents to the NZSSD membership survey were spread widely across all DHBs and roles within diabetes services with the majority of respondents being either diabetes nurse specialists or physicians. The majority (73%) continued to work mostly on-site during Alert Level 3 and Level 4.

Overall, members estimated they completed approximately 72 % of their usual workload.

The most common methods to conduct non face-to-face consultations were phone calls (99%), followed by emails (78%), text messages (64%), and video calls (51%). The majority of staff (53%) were either *satisfied* or *very satisfied* with the care they were able to provide. The remainder were either *ambivalent* (23%), *dissatisfied* (17%), while only 7% were *extremely dissatisfied*.

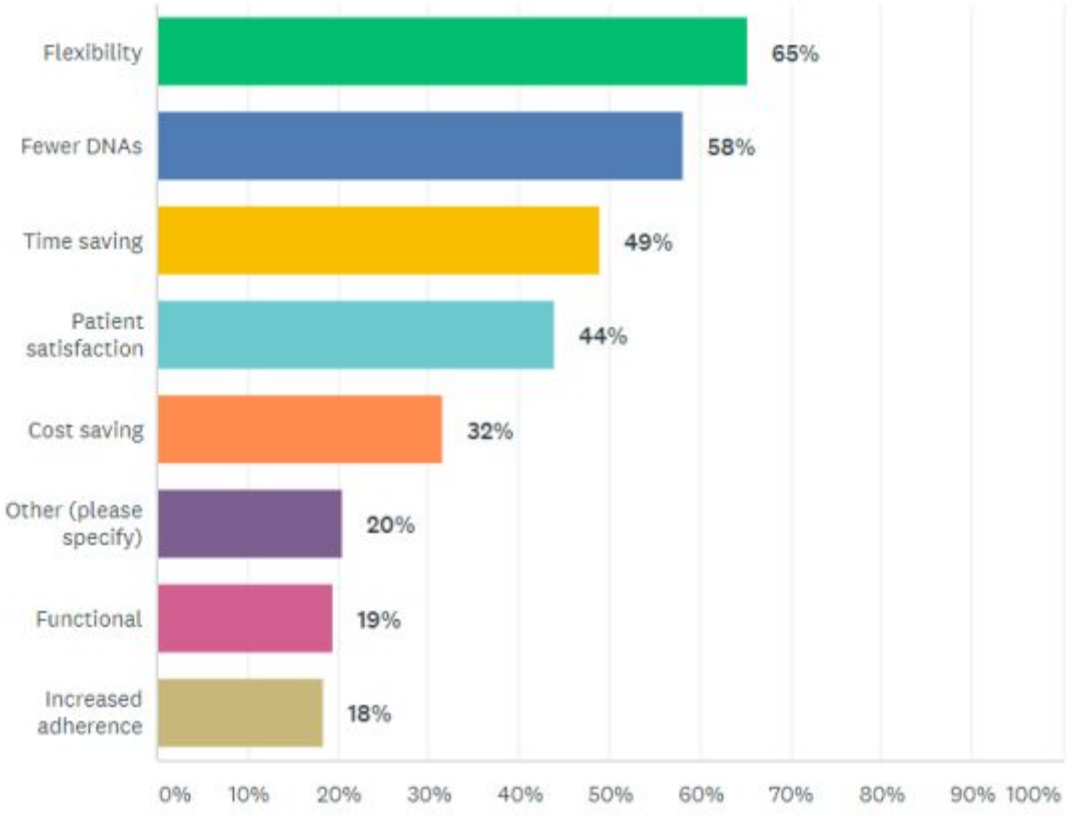

Figure 6: The perceived benefits of non face-to-face patient communication.

The most common advantages identified by members were flexibility and fewer DNAs (Figure 6). Substantial numbers also listed time saving and patient satisfaction as significant benefits. Although the option wasn't included in the questionnaire, three members noted reduced viral transmission as another key benefit.

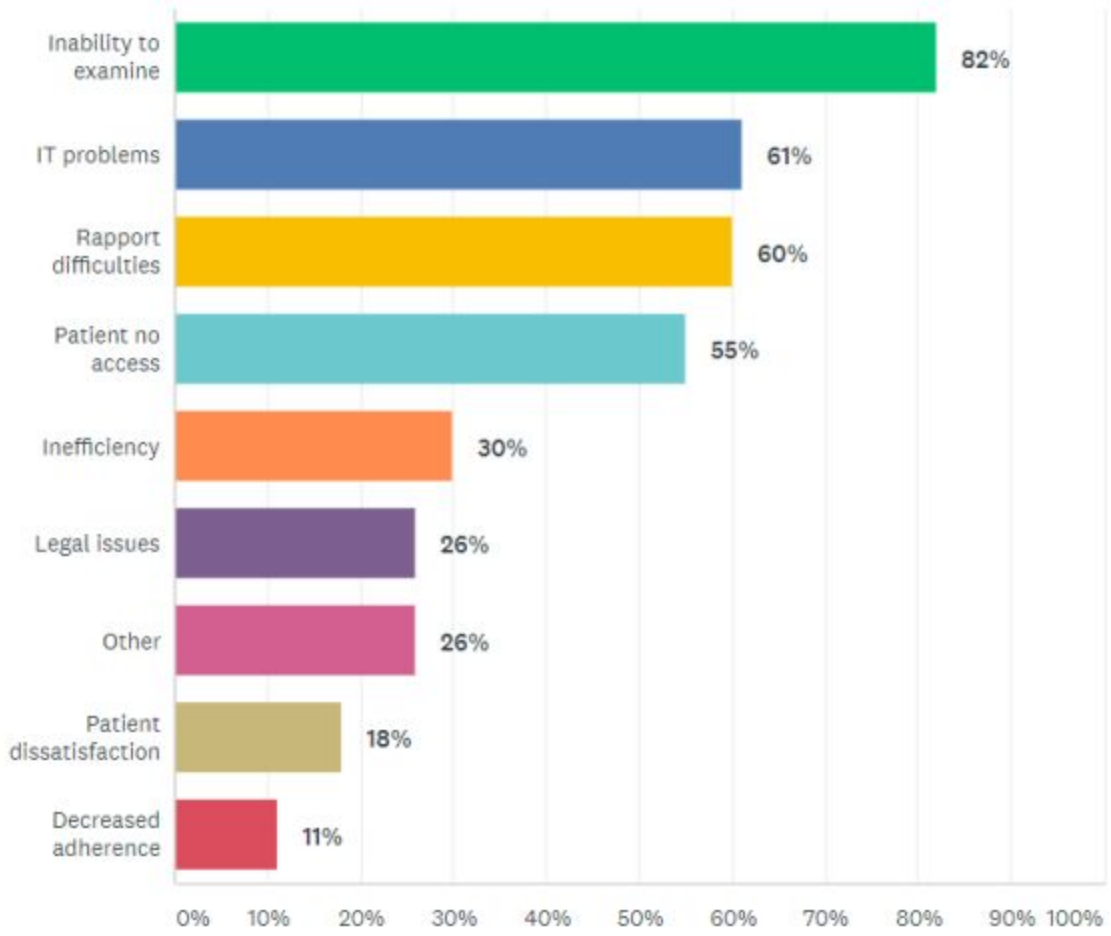

Figure 7: The perceived disadvantages of non face-to-face consultations.

Major drawbacks identified included the inability to physically examine patients (82%), IT problems (61%) and difficulties for patients using or accessing the technology (55%) (see Figure 7). The majority of members (60%) also reported issues with patient rapport using non face-to-face communication. Of note, 30% of staff found non face-to-face communication methods to be inefficient. Given the problems with access identified above, surprisingly few listed patient dissatisfaction as a major issue.

Many of the barriers identified were associated with technical problems, such as access to mobile data or internet, problems uploading glucose data, and difficulties encountered by those with limited vision or hearing. Proposed solutions included training and support for clinicians and patients, and identifying specific patients who

would benefit from an in-person consultation. Another frequent complaint was unanswered phone calls, although there were no suggestions about how to decrease this.

Despite the difficulties identified above, an encouraging 48% of respondents reported continuing to use non face-to-face communication more or a lot more than prior to the adoption of strict social distancing measures.

DISCUSSION:

This study aimed to find out how COVID-19 Alert Levels 3 and 4 changed diabetes service provision in secondary care. Of particular interest was determining what changes occurred to staffing levels, what methods of communication were used with patients, and what effects these changes had on service delivery, waiting times, and rate of DNAs.

As predicted it was found that overall diabetes secondary care services offered to patients decreased during Alert Levels 3 and 4. This was due to various factors, including staff redeployment, a reduction in non-urgent clinics, staff illness or self-isolation, a lack of childcare available during Alert Level 3 and 4, as well as an anticipated reduction in outpatient work. (14)

While sustained management of glycaemic control is a non-urgent medical problem, COVID-19 is likely to be affecting service delivery for many months if not years to come. Specialist input is of paramount importance for maintaining good glycaemic control, and this is essential to restrain the debilitating effects of poorly controlled diabetes. The associated consequences of diabetes come at a huge cost to both society and the health system, and are especially prevalent among Māori, Pasifika, South East Asian, rural, and poorly resourced communities.

As mentioned previously it has been shown that people with diabetes are at a higher risk during the COVID-19 pandemic. This risk includes a higher likelihood of experiencing severe disease if they contract COVID-19 and a two-fold higher rate of dying from the disease. Some evidence also exists showing an association with higher HbA1C and poorer outcomes for people with diabetes who contract COVID-19 (15). These facts make the on-going management of people with diabetes in New Zealand even more important in this current time.

Diabetes, particularly type 2 diabetes, is a disease that benefits from sustained intervention by health care providers and this has been shown by multiple randomised controlled studies (and their follow up studies) in the past two decades (16). It is partly because of this evidence, that we have the myriad of diabetes secondary care services working today in New Zealand, attempting to positively impact on the many serious macro and microvascular complications that arise.

The decrease in service provision found here will likely have impacted on the care that people with diabetes received over this time-period. Moving forward as New Zealand has recently experienced a re-emergence of COVID-19 community transmission and has re-entered an Alert Level 3 on the 12th of August 2020, all attempts should be made by the healthcare sector to minimise further disruptions to diabetes secondary care services.

To cope with the reduction of in-person clinics, non face-to-face communication was employed by many services, mostly by phone; email, text messaging, and video calls were also frequently used. Staff reactions to non face-to-face consultations were mixed, but most were satisfied with the level of service they were able to deliver. Increased flexibility, time saving, patient satisfaction, and fewer DNAs were the most commonly reported benefits. Patient satisfaction was based on clinician reporting, and needs to be confirmed directly in the patient population. While the majority of respondents reported

fewer DNAs using non face-to-face appointments, 17% of respondents reported an increase. It is important to investigate why this might be, and how this might be reduced. Otherwise we may risk further disadvantaging patient groups who already struggle to access conventional health services.

The disadvantages of non face-to-face communication broadly fell into two groups: the lack of in-person contact, and issues around accessing technology. Future use of non face-to-face communication will need investment in technical infrastructure, clinician and patient education, and patient access to appropriate devices and WiFi / cellular data. In particular we must ensure that patients in rural or resource-deprived settings have access to reliable phone or internet services for non face-to-face appointments. Another factor is that patients with sensory impairments might be unable to easily use digital devices, and might be disadvantaged by some non face-to-face methods. Patients will need to be appropriately triaged based on clinical status and individual factors as to whether non face-to-face communication is appropriate for them.

The lack of in-person contact is potentially a more difficult issue to resolve. Problems with rapport were a common complaint from respondents. Building clinician-patient relationships is important for ongoing engagement of patients with the health system, achieving good adherence and glycaemic control. While patients with limited transport and mobility may benefit from non face-to-face communication, they may potentially suffer from the decreased personal interaction, and in particular elderly patients may feel confused or alienated by the changes. The other issue is that it is very difficult to examine patients remotely, and this is reflected in the low uptake of non face-to-face communication by ophthalmology, retinal screening, and podiatry. There is a substantial challenge in how this can be altered, although promising work is underway in various areas exploring this issue (17).

As might be expected, success of non face-to-face communication varied by discipline. Health psychology appears to be well suited to it, completing almost all of their usual caseload remotely. Physicians and obstetricians managed to complete over 70% of their appointments remotely, but had to defer 10-40% of their usual caseload. Understandably, almost all ophthalmology, retinal screening, and podiatry had to be cancelled or deferred. This explained the increased waiting times currently reported by services, with most services delayed by at least two to three weeks, and ophthalmology and retinal screening delayed by at least five weeks.

Given the challenges of dealing with COVID-19 and the rapid introduction of non face-to-face communication in the clinical setting, it is encouraging to note that many services have continued to use an increased level of non face-to-face communication compared to previously. Health psychology, dietetics, diabetes nursing, and obstetrics have continued to use non face-to-face communication for around 30-40% of their routine appointments since Alert Level 3 was lifted, which is encouraging and exciting when it comes to imagining and planning future service delivery. If the shortcomings are able to be rectified, there appears to be scope for increased use of non face-to-face patient communication in the future. It is important to engage in ongoing monitoring of health outcomes and patient experiences in this area, so that existing health inequalities are not further exacerbated for elderly, rural, Māori, Pasifika, and high-deprivation communities.

Limitations

The high response rate from the Clinical Lead survey suggests that the results are generalisable across New Zealand, and an accurate representation of how secondary care diabetes services adapted to the challenge of providing care whilst maintaining social distancing during COVID-19 Alert Level 3 and Level 4.

The NZSSD members survey which required members involved in secondary diabetes care to self-select and “opt in” is a potential source of selection bias. The possibility of

members who did not work in secondary care completing the survey cannot be excluded. The potential effect of this is unknown. It was also unknown exactly how many of the NZSSD members worked in secondary care in order to calculate a response rate. Of the total membership 200 members were registered with an identifiable DHB associated email address. This gave an approximate pool from which to gauge response rates. If a significant proportion of secondary care workers used a non-DHB email address, it is possible that the response rate was lower than the 50% reported.

Self-selection may also predispose towards responses from people who hold particularly strong views, either positive or negative, regarding the use of non face-to-face communication in the patient setting. This also has the potential to influence the findings.

This study was limited by the relatively short time frame in which to complete the online surveys. To counteract this multiple email reminders were sent to attempt to maximise responses. However if a longer time frame was utilised the membership survey may potentially have had a higher response rate.

Patient satisfaction was identified by 44% of NZSSD membership responses as a benefit of using non face-to-face communication. However there is significant potential for bias as this study did not include any input from patients regarding their experiences. Similarly, objective data was not collected regarding equitable access by vulnerable populations such as Maori and Pasifika who experience worse health outcomes under standard service provision models.

SUMMARY AND RECOMMENDATION:

In conclusion, the COVID-19 restrictions put in place in Alert Level 3 and 4 did impact diabetes service delivery. Across all DHBs there was a significant decrease in the

amount of clinical work able to be undertaken, irrespective of the amount of non face-to-face communication employed.

From both surveys conducted it was clear that non face-to-face communication with patients was a viable option for continuing some, but not all, diabetes secondary care services while adhering to strict social distancing policy. Improvements suggested were mostly relating to technology issues.

Those services that rely heavily upon physical examination or special technology (Ophthalmology and Retinal screening) were the least able to incorporate non face-to-face communication to continue service provision.

Most staff reported that non face-to-face communication was a largely acceptable means to continue patient care and have continued to use it after relaxation of social distancing requirements and the move to Alert Level 1.

It is recommended that all attempts to minimise disruption to diabetes secondary care services are made, and this is based on the fact that people with diabetes are at higher risks during this COVID-19 pandemic. Disruptions serve to further increase this risk, as well as potentially leading to worse outcomes for people with diabetes in the future.

Future research into the use of non face-to-face communication in New Zealand is also recommended and should include a focus on patient experiences and identifying factors that disproportionately prevent minority groups from accessing healthcare.

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