

COVID-19 and Diabetes

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SPECIAL REPORT

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In this review:

- Infection risk vs. disease severity and mortality
- Type 1 versus type 2 diabetes
- ACE inhibitors and ARBs
- Influenza vaccination
- Moving from lockdown level 4 to 3

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Welcome to this special report on COVID-19 (2019 coronavirus disease) in diabetes.

It has now been 4 months since the world became aware of a new virus originating from Wuhan in China, which we now know to be another coronavirus that has bridged the divide between an animal host and humans. Since then we have observed the greatest global impact of an infectious disease since the influenza pandemic of 1918. On March 11, the WHO declared a global pandemic for COVID-19, and on March 26, NZ went into a lockdown to attempt to eradicate COVID-19 from this country.

From a scientific perspective we are learning about the virus, its activity and pathogenic effects every day. However, there are still many unknowns that will only become apparent over time. What is known is that people with chronic diseases such as diabetes experience the effects of the virus more than others. The Ministry of Health and multiple media sources have stated that people with diabetes are at greater risk of COVID-19 than the general population. This has generated concern and uncertainty amongst patients with diabetes, their families, employers and health professionals.

The purpose of this Research Review Special Report is to summarise **what is currently reported in the literature as of April 15, 2020**, recognising that this is a rapidly evolving situation. There are currently very few published studies addressing the specific questions below, and my comments must be taken as a personal perspective and guide based on what is available, and interpreted with the NZ context in mind. I have not covered the general information about COVID-19 public health messages that apply to everyone with or without diabetes.

Best regards,

Professor Jeremy Krebs

jeremykrebs@researchreview.co.nz

Risk of infection versus risk of severity of disease and mortality

Individuals with diabetes are at greater risk of infection generally, including other viral infections such as influenza. However, **there is currently not enough data to conclude whether individuals with diabetes are more likely to contract COVID-19 than the general population.** One meta-analysis of six studies from China (n=1527) found that 9.7% (6.9–12.5%) of patients with confirmed COVID-19 had diabetes.¹ A separate meta-analysis of eight studies, which included the previous four (48,000 people with COVID-19), reported that 8% of people admitted to hospital had diabetes.² However, what is not clear is the background population rate of diabetes, which may be as low as 4.3% or up to 11%, making an assessment of relative risk impossible. There is still a paucity of data from other countries, particularly those with predominantly European populations.

What is known and important is that **if people with diabetes get COVID-19, they are more at risk of severe disease and mortality.** In China, people with diabetes had much higher rates of serious complications and death than people without diabetes if they got COVID-19. In general, the more health conditions someone has, the higher their chance of getting serious complications from COVID-19.¹ In February, the Chinese Centre for Disease Control and Prevention reported increased mortality in people with diabetes (7.3% vs. 2.3% overall) in a series of 72,314 cases.³ An early analysis from China, including 1590 confirmed cases of COVID-19 until the end of January 2020, reported a hazard ratio of 1.59 (CI 1.03, 2.45) for the combined outcome of ICU admission, assisted ventilation or death.⁴ In a more recent report from March 24 from Louisiana, USA, 41% of those who died from COVID-19 had diabetes as a comorbidity, the highest rate reported so far. Furthermore, 34% had chronic kidney disease, 28% were obese and 23% had cardiac disease – all common additional risks with type 2 diabetes in particular. Obesity has been identified as a risk factor for ICU admission and requirement for ventilation.⁵ What remains unclear is the interaction of these common comorbidities and other factors such as age or ethnicity. It is unknown whether the observed increased risk of severe infection for people with diabetes is independent of these other factors, or whether there is an additive synergistic effect. **Prevention against getting COVID-19 is very important for people with diabetes.**



Covid-19 Response: Our heartfelt thanks

All of us at Research Review want to thank you for the part you are playing in the Covid-19 crisis. Our hats go off to you, and we are proud to be associated with you. Our role in all of this is to support you by keeping you informed and up to date as much as we possibly can.

Type 1 versus type 2 diabetes

It is still unknown whether there is a difference in risk between patients with type 1 and type 2 diabetes. However, there is a general expert opinion that age, additional comorbidities and management of diabetes all play important roles when assessing complication risks. An important message for patients is that if they effectively manage their diabetes, the risk of getting severely sick from COVID-19 is about the same as the general population. Therefore, in the current pandemic, it **is even more important for people with either type 1 or type 2 diabetes to focus on achieving tight glycaemic control.**⁶

It is important that people with **type 1 diabetes** frequently measure their glucose level, and check for ketones if they are unwell and their glucose level is >15 mmol/L. They **should have a 'sick day plan' and follow this.** It has been reported that more people with type 1 diabetes are being hospitalised with ketoacidosis during the pandemic than actually having COVID-19.

For people with type 2 diabetes who are taking SGLT-2 (sodium glucose cotransporter-2) inhibitors, which remain unfunded in NZ and therefore may only include a relatively small number of patients, some experts are advising a low threshold to stopping these agents if people are suspected of having COVID-19.⁶ This is because of the risk of dehydration and associated increased risk of ketoacidosis in that setting.

For all people with diabetes, ongoing regular self-examination of feet is important, and people should be advised to not delay or avoid consultation if they find evidence of ulceration or infection.

ACE inhibitors and ARBs

Many people with diabetes are taking ACE (angiotensin converting enzyme) inhibitors or ARBs (angiotensin receptor blockers) for the treatment of hypertension and/or microalbuminuria. There is evidence that COVID-19, as with other coronaviruses, binds to its target cells via ACE2, which is expressed in the lung, intestine, kidney and blood vessels. This has raised concerns that people taking ACE inhibitors or ARBs may be more at risk of infection and severity of illness because of an upregulation in these receptors.^{7,8} However, this remains theoretical at this time, and because any worsening of heart failure, hypertension or renal impairment is more detrimental than the potential effect of ACE inhibitors increasing the risk of COVID-19, **it is NOT recommended to stop agents from either of these drug classes, unless there is another compelling reason to do so.**⁹ It may however be prudent to not initiate new ACE inhibitor therapy if other suitable options are available for the clinical context.

Influenza vaccine

It is strongly recommended for all people with diabetes to get the flu vaccination as soon as possible to reduce the risk of co-infection.⁶

What should people with diabetes do when level 4 is reduced to level 3?

The first source of information should be the [Ministry of Health](#), then the [NZSSD](#) (New Zealand Society for the Study of Diabetes) and [DNZ](#) (Diabetes New Zealand). People with diabetes will have many questions about what they can or should do once the lockdown is lifted. Can they safely return to work? Can children with diabetes return to school or university? It is not possible to give standard answers to these questions, and as you will have seen previously, there are still very few data to inform these questions. People should consult with their general practitioner and/or diabetes team to get more individualised recommendations. The following principles may be helpful for those health professionals.

1. The same self-protection recommendations for the general population should apply.
2. There is no evidence that people with diabetes are at greater risk of contracting COVID-19.
3. Those with diabetes who get COVID-19 are at greater risk of a more severe illness, hospitalisation, requirement for intensive care and mortality.
4. Maintaining tight glycaemic control is likely to reduce the risk of severe disease if COVID-19 is contracted.
5. There is no evidence of a distinction between type 1 and type 2 diabetes.
6. Age and additional comorbidities appear to play an important part in this additional risk. Therefore, those who are older (no clear threshold) and those with obesity, hypertension, cardiovascular disease or renal failure should be more cautious in their consideration to return to work or school.

For a pragmatic guideline for health professionals to guide their patients, please see the link on the [NZSSD website](#).

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PATIENT INFORMATION

Useful sites for patients include:

- [DNZ](#) (Diabetes New Zealand)
- [NZSSD](#) (New Zealand Society for the Study of Diabetes)
- [Te Rōpu Whakakaupapa Urutā](#) (National Māori Pandemic Group)
- [International Diabetes Federation](#)
- [Diabetes UK](#)
- [American Diabetes Association](#)

INFORMATION FOR HEALTH PROFESSIONALS

The Centre for Evidence-Based Medicine – [Diabetes and risks from COVID-19](#) (from the University of Oxford)

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Independent commentary
by Professor Jeremy
Krebs MBChB, FRACP, MD



Professor Krebs is an Endocrinologist with a particular interest in obesity and diabetes. He trained in Endocrinology at Wellington Hospital in New Zealand and then did his doctorate with the Medical Research Council - Human Nutrition Research unit in Cambridge England. His thesis was on the impact of dietary factors on obesity and insulin resistance. Professor Krebs returned to New Zealand in 2002 to take up a consultant Endocrinology post at Wellington Hospital, where he was Clinical Leader of Endocrinology and Diabetes. He heads the research group and is Professor with the University of Otago, and former Director of the Clinical Research Diploma at Victoria University - which he established.

As well as clinical and teaching activities, Professor Krebs maintains active research interests in the area of obesity and diabetes, with a particular focus on the association between obesity and type 2 diabetes, both from an aetiology and management perspective, with a focus on nutritional aspects, bariatric surgery and diabetes service delivery.

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