

# Long-term Effects from the COVID-19 Pandemic on Diabetic Patients in an Ambulatory Family Medicine Clinic Population

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## Background

Patients with chronic illnesses, including diabetes, are a vulnerable patient population during times of restricted access to healthcare services, such as lockdowns due to the COVID-19 pandemic. Also, geographical location, such as rural areas, can be a source of limited access to healthcare services similarly. Whether rural or urban location, or during a pandemic, decreased opportunities to access ambulatory primary care clinics, access to critical medications, or access to healthy food choices, all may contribute to worsening of chronic conditions, especially during pandemic lockdowns. Alternative forms of healthcare delivery could possibly help improve access to critical healthcare for patients with chronic illnesses during pandemics, along with improvement to rural patient populations.

## Methods

This study is an observational retrospective cohort study at the UND CFM clinic in Bismarck, ND and West River Health Services clinic in Hettinger, ND. This included patients with either type 1 or type 2 diabetes mellitus, greater than or equal to 18 years of age. This included both a subjective survey/questionnaire on the effect of the COVID pandemic on their access to healthcare and overall health. Also, it will include an objective retrospective chart review to assess if the COVID pandemic affected their health with regards to BMI, blood pressure, hemoglobin A1C, and lipid panel results, comparing these results before and during the pandemic.

## Sample

Table 1: Details

	Bismarck	Hettinger
Surveys/Consents Sent	778	1274
Valid Consents Received	16	39
Invalid Consents Received	7	33

## Data Points

- Pre and Post BMI
- Pre and Post A1c
- Pre and Post LDL
- Pre and Post Diagnosis of Hypertension

## Survey Questions

Missed, cancelled, or chose not to schedule medical appointments because of the COVID-19 pandemic	Yes	No	
Did not fill or pick up medications late because of the COVID-19 pandemic	Yes	No	
COVID-19 pandemic negatively impacted overall health	Not at all	Somewhat	A great amount
COVID-19 pandemic negatively impacted diabetes control	Not at all	Somewhat	A great amount
Amount of exercise during COVID-19 pandemic compared to before	More than	The same as	Less than
Food consumed during COVID-19 pandemic compared to before	Healthier	No different	Less healthy

## Results

Table 2. Impact of COVID-19 on Overall Health and Diabetes Survey

Healthcare Outcome	Urban N = 16	Rural N = 39
Missed/Cancelled Appointments	Yes = 0 No = 16	Yes=8 No=31
Not fill or late Fill Medications	Yes=2 No=14	Yes=3 No= 34 No Response= 1
Overall Health*	Yes=9 No= 7	Yes=21 No=18
Diabetes Control*	Yes=8 No= 8	Yes=13 No= 26
Exercise**	Same or More=7 Less than=8 No Response= 1	Same or More=26 Less than=13
Food***	No different or Healthier = 13 Less Healthy= 3	No different or Healthier = 35 Less Healthy= 4

\*Combined Somewhat and Great Amount responses  
 \*\* Combined Same amount or more exercise responses  
 \*\*\* Combined No different or healthier diet responses

## Discussion

- None of the respondents from Bismarck site missed or cancelled appointments. About 20% of patient from Hettinger site missed or cancelled appts.
- Less than 10 % of respondents from both urban and rural site did not fill their prescription or filled late.
- Over 50% of respondents from both sites reports that Covid pandemic affected their overall health and Diabetes.
- About 40 % of respondents from both sites exercised less during the study period.
- About 10% of respondents from the rural and urban site ate less healthy during the study period.

## Limitations

- Survey response rate was about 2% in Bismarck and 5% in Hettinger.
- 50% of patients surveys sent back did not have valid consent signed for chart review.
- Data points could not be analyzed due to very small sample size.

## Conclusion

- Consider alternative healthcare delivery during pandemics and emergencies for chronic conditions.
- Plan for potential delays/inadequate care including decreased appointments, monitoring, and prescription management.
- Telemedicine and innovative technologies like CGM can bridge the gap during emergencies like pandemics.
- Implementation of telehealth can improve access to care for rural populations, even without a pandemic.
- Implement contingency plans for future pandemics.
- Telehealth services can be an option to bridge the gap in medical services, especially during future pandemics or for rural patients.