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The impact of COVID-19-related health measures and offloading on the follow-up of patients living with type II diabetes: a 4-year retrospective cohort study

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Prevalence and consequences

- In Canada, 29% of the population live with diabetes or prediabetes,¹ with an estimated prevalence of 7.6% of Canadian population.²
- It is estimated that the mortality rate among Canadians living with diabetes is twice higher than for those who living without diabetes.³
- Diabetes contributes to 30% of strokes, 40% of heart attacks, 50% of kidney failure, and 70% of all nontraumatic leg and foot amputations.⁴

1. Diabetes statistics in Canada are estimates generated by the Canadian Diabetes Cost Model. Ottawa: Diabetes Canada. 2016.

2. Greiver M et al. Prevalence and epidemiology of diabetes in Canadian primary care practices: a report from the Canadian Primary Care Sentinel Surveillance Network. *Canadian Journal of Diabetes*. 2014

3. Twenty Years of Diabetes surveillance using the Canadian Chronic Disease Surveillance System [Internet]. Ottawa: Public Health Agency of Canada. 2019

4. Hux J, Booth G, Slaughter P, Laupacis A. Diabetes in Ontario: An ICES practice atlas. Toronto, ON: Institute for Clinical Evaluative Sciences; 2003. In:2003.

Diabetes and COVID-19

- Continuity of care for people living with diabetes is necessary to avoid poor glycemic control and diabetes-related complications.^{1,2}
- Average follow-up consultations for those patients is usually once every 3 to 6 months.³
- Average of in-person consultations was restricted with the global guidance of the COVID-19 pandemic that has raised major concern for vulnerable populations.^{4,5}
- In USA, a recent web-based survey showed that 38% of people with diabetes reported worsening symptoms during the pandemic.⁶

1.Ruszala V. Ensuring continuity of care for patients with diabetes mellitus. *Nursing standard (Royal College of Nursing (Great Britain): 1987.*

2.Alromaihi D et al. Sustainable diabetes care services during COVID-19 pandemic. *diabetes research and clinical practice.*2020.

3.Kiran T et al. Managing type 2 diabetes in primary care during COVID-19. *Canadian Family Physician.*2020.

4.Beran D et al. Beyond the virus: Ensuring continuity of care for people with diabetes during COVID-19. *Primary care diabetes.*2021.

5.Berlin DA et al. Severe covid-19. *New England Journal of Medicine.*2020.

6.Ismail H et al. The impact of the COVID-19 pandemic on medical conditions and medication adherence in people with chronic diseases. *Journal of the American Pharmacists Association.*2022.

Rational and objectives

Rational

No research has yet explored the impact of the COVID-19 on people living with diabetes.

Objectives

- To compare patients' follow-up in primary care before and during the COVID-19 pandemic.
- To evaluate the impact of COVID-19 pandemic on patients' health outcome

Methods

Research Design

A before and after, 3-year retrospective cohort study on people living with type II diabetes receiving care from 2018 and 2021 in the province of Quebec, Canada.

Study population

Patients who diagnosed with type-II diabetes receiving primary care services in the province of Quebec.

Study sample

Patients diagnosed with type II diabetes enrolled in the Canadian Primary Care Sentinel Surveillance Network (CPCSSN) in the province of Quebec.

Methods (cont.)

Eligibility criteria

- Patients should be ≥ 18 year-old
- Patients diagnosed with type-II diabetes before 2018.

Data Extraction

- Data were extracted from CPCSSN database.
- Data were collected between January 2018 and July 2021.
- Demographic data (e.g., age and gender).
- Health services accessibility data
- Health-related outcomes data.

Outcome measures

Primary outcomes:

- # Consultations per month
- Mode of consultations during 2018-2021 (virtual consultation and in-person consultation)

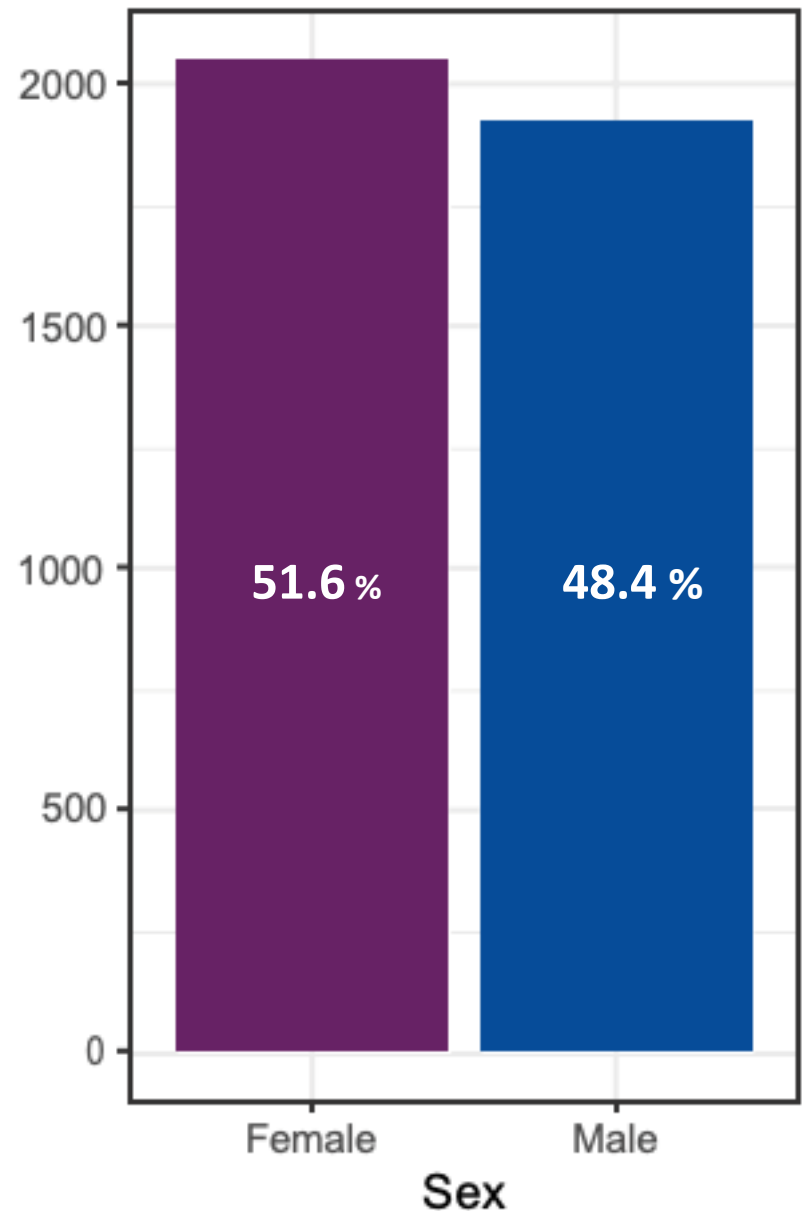
Secondary outcomes:

- Glycated hemoglobin (HbA1c)
- Creatine serum
- Creatinine Plasma Creatinine Clearance (PCC)
- Low density lipoprotein cholesterol
- Urine albumin
- Blood pressure
- Body mass index

Results

Data of 3971 patients were included in this study.

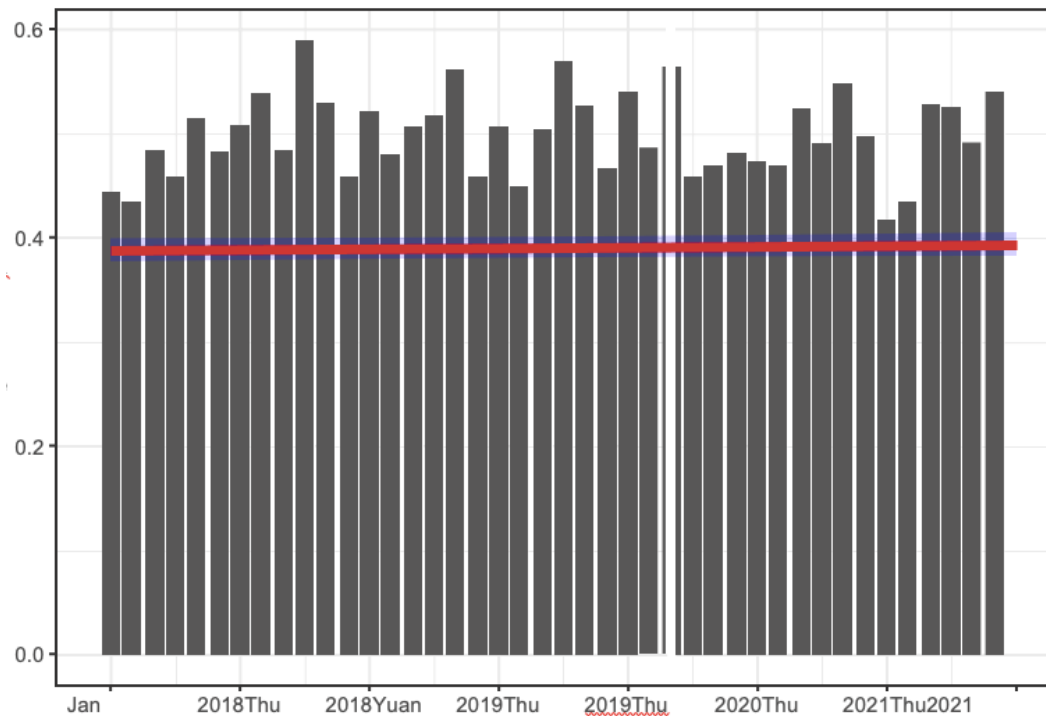
Mean age (SD) was 60.5 (14.9) years



Primary outcomes

(1) The number of consultation per month

- The mean monthly visit rate was estimated to be 0.39 visits/month, which translates to just under 5 visits per year.
- No difference found pre and post pandemic.

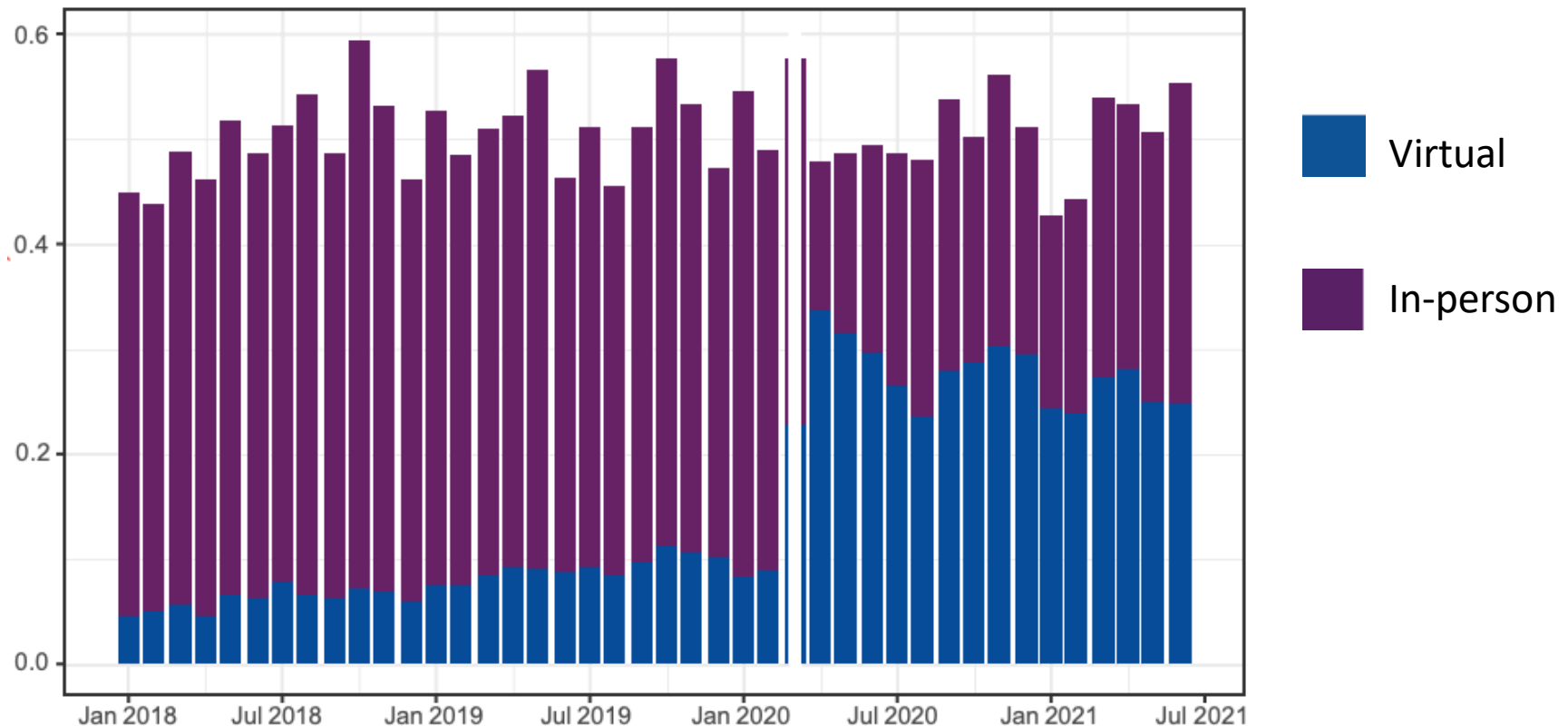


Primary outcomes

(2) The mode of consultation

The virtual visit rate exploded during the pandemic.

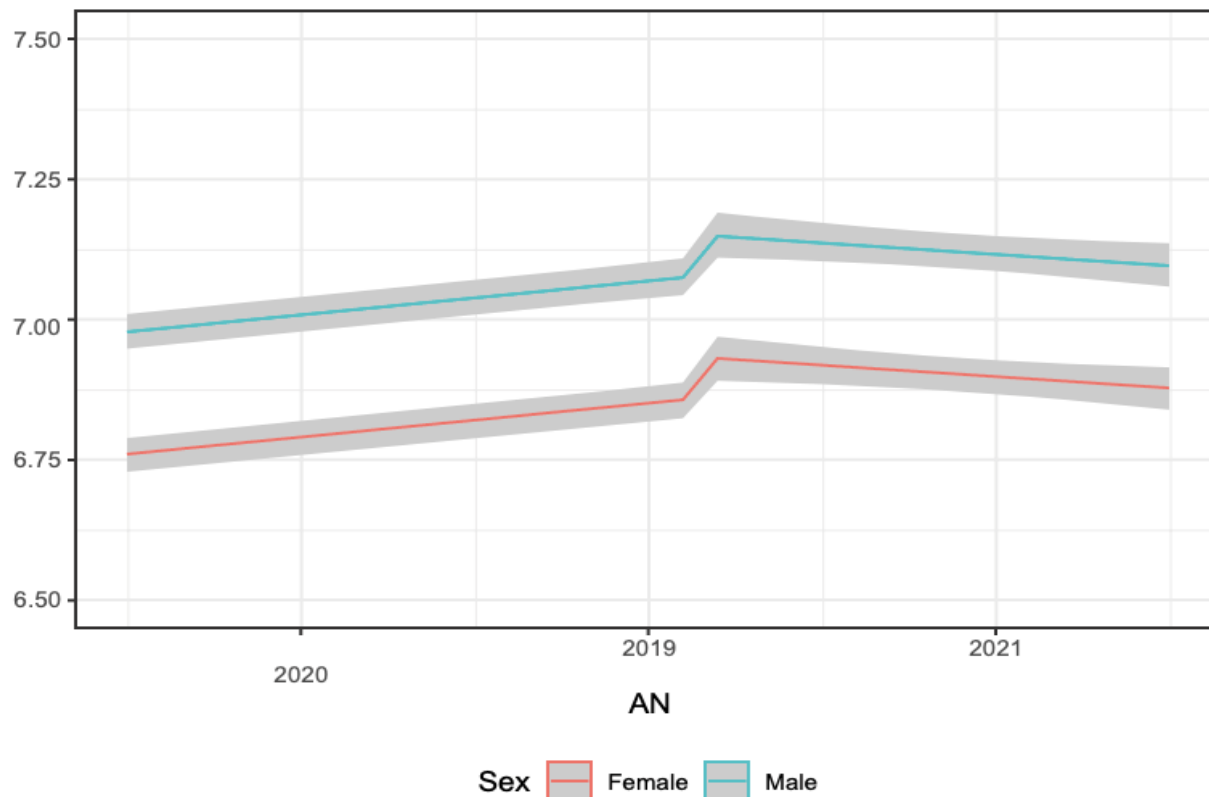
The rate of virtual visits increased from 0.06 to 0.22 visits/month, which corresponds to a **335%** increase in virtual visits.



Secondary outcomes (Jan 2018 to June 2021)

HbA1c (Glycated Hemoglobin) #Sample 2707

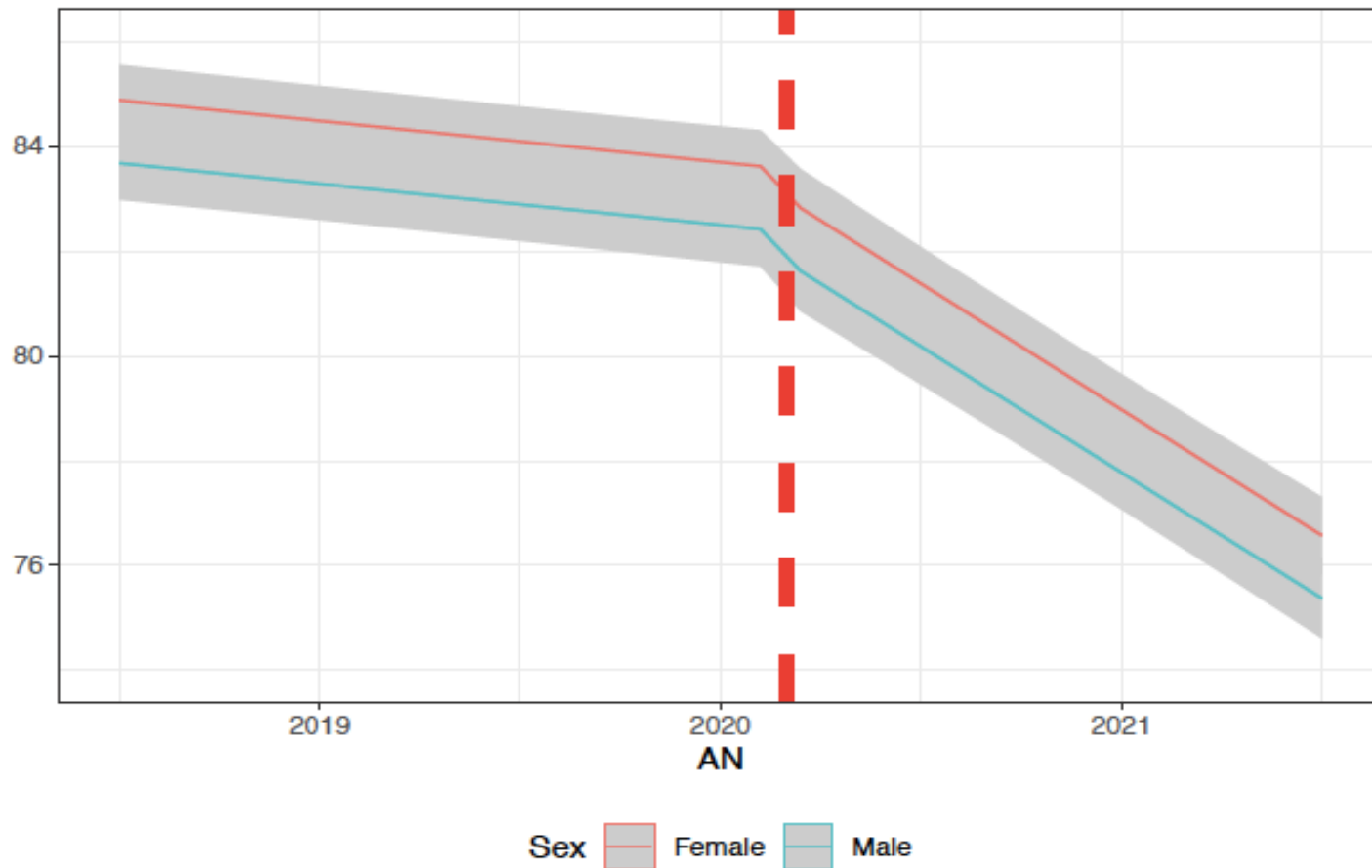
- Average evolution of HbA1c increased at the beginning of the COVID-19 pandemic during confinement but decreased afterwards



Secondary outcomes (Jan 2018 to June 2021)

Creatinine Plasma Creatinine Clearance (PCC) #Sample 1775

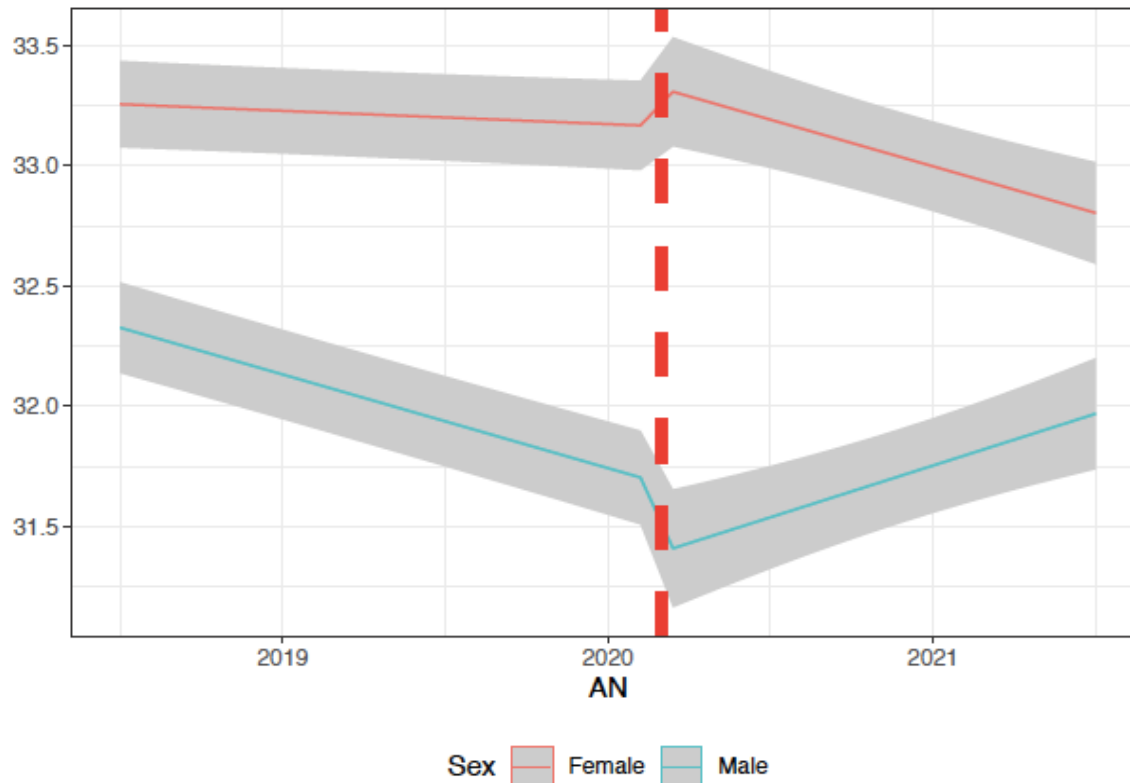
- The decrease in PCC is accelerated after the pandemic.



Secondary outcomes (Jan 2018 to June 2021)

Body Mass index (BMI) #Sample 2955

- Females have a rapid increase followed by a more marked decrease, while males have a decrease at the beginning of the pandemic followed by an increase.



Secondary outcomes (Jan 2018 to June 2021)

No impact of pandemic on

- Creatinine (Serum) → #Sample 2077
- Cholesterol (LDL) → #Sample 2535
- Albumin in urine → #Sample 1888
- Blood pressure → #Sample 3304

Main findings

Primary outcome:

- # Consultations per month (✓ **STABLE**)
- Mode of consultations (↑ virtual consultation and ↓ in-person consultation)

Secondary outcome:

- Glycated hemoglobin (HbA1c) (✓ **slightly increased then stable**)
- Creatinine Plasma Creatinine Clearance (PCC) (✓ **decreased**)
- Body mass index (♀ ↑ ↓ ♂ ↓ ↑)
- Creatine serum (**no impact**)
- Low density lipoprotein cholesterol (**no impact**)
- Urine albumin (**no impact**)
- Blood pressure (BP ≥ 90 mmHg) (**no impact**)

Study limitation

- The study included only patients enrolled from Canadian Primary Care Sentinel Surveillance Network (CPCSSN) database, not population-based.
- Only patients who have completed the laboratory tests and therefore have been followed, were included in the data analysis.

Take home message

Primary care system seems to be able to provide appropriate follow-up to people living with type II diabetes even with the confinement measures and offloading of multiple professionals and no significant decreased in health outcomes was observed.





Thank you

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