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# BEYOND SINGLE OUTCOMES: A population-based comparison of 20 patient-important risks in Type 2 Diabetes

*A Canadian-based cohort study*

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# Background

- Feared outcomes of diabetes: blindness, amputations, end-stage renal disease
    - Less so: risk of cardiovascular disease[1,2]
- Systematic review of 120 cohort studies: absolute and relative risks of complications of newly diagnosed type 2 diabetes[3]
    - Highest absolute risk: mortality and major adverse cardiovascular events
        - Highest relative risk: amputation and end-stage renal disease
            - Very limited data for visual or neuropathic outcomes
- Limitations of prior research: few outcomes examined, few patients,[4,5] historical cohorts,[6,7] no comparison to matched controls[8]

# Aims

- Using linked administrative health data from Alberta, Canada, we undertook a large population-based cohort study, to quantify both the:
    - 1. absolute incidence, and
    - 2. relative risk
- Of 20 clinically important complications
- In adults with newly diagnosed diabetes, matched to controls

# Methods

- Data sources: Linked electronic health databases in Alberta, Canada (population ~5 million)
- Cases: >18yrs, new diagnosis of diabetes between April 1, 2005 and March 31, 2024
- Controls matched 1:1 on age, sex, hypertension status, modified Charlson Comorbidity index score, Pampalon material deprivation quintile, urban/rural residence, index year

- Outcomes identified from: ICD-9, ICD-10, Canadian Classification of Health Interventions, physician billing codes
- Measures: Rates per 1000 person years, rate ratios

# Results

| | Diabetes<br>N=456 193 | No diabetes<br>N=456 193 |
|---|---|---|
| | | |
| | | |

# Results

- Adults with diabetes had higher rates of ALL outcomes

## Highest absolute incidence

## Largest relative burden

| Outcome | Diabetes |
|---|---|

# Limits

- Reliance on administrative data
  - Potential for misclassification, e.g. retinopathy, neuropathy
- Unable to access data on glycemic control, blood pressure, body-mass index, smoking status, or ethnicity
  - Could not control for the impact of these factors
- Person-time estimated using mean cohort follow-up (not outcome-specific time at risk), no competing-risk modelling done
  - Potential to attenuate risk ratios for high-incidence outcomes

# Conclusions

- Mortality and cardiovascular outcomes much more common than blindness, dialysis/end-stage renal disease, or amputations, even accounting for the excess risk attributable to having diabetes
- Skin ulcerations occurred in approximately 1/5 persons with diabetes over the 7-year follow-up period, and carry a 6-fold risk increase in persons with diabetes

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