

Use of Services and Complications among the Cree Population with Diabetes: A Linkage Study with Quebec Administrative Data

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INTRODUCTION

Diabetes (DM) prevalence is 3 to 4 times higher in Aboriginals than in other Canadians. In the adult Cree population of James Bay (Québec), the crude prevalence doubled from 10.7% in 1997 to 21.4% in 2009¹. The Cree Diabetes Information System (CDIS) was put into place in 1996 to respond to the growing problem of diabetes in Eeyou Istchee (**Figure 1**). The system incorporates data on all individuals with diabetes, prediabetes, or gestational diabetes who have consulted in a local clinic. The CDIS is the main management and surveillance tool in Eeyou Istchee; however, it is not able to track the use of health services by Cree patients outside the region. On the other hand, the capacity of the Quebec administrative data to capture cases in the Cree population is limited due to the remuneration mode of physicians working in remote regions. A linkage project, completed in 2004, did not allow for temporal trends analysis. To bridge these gaps, the CDIS was linked to Quebec administrative data from January 1st, 1996 to March 31st, 2009.

AIMS

- To link the records of the CDIS with Quebec health administrative data;
- To assess, among Cree diabetes cases:
 - rates of hospitalizations and medical visits
 - temporal trends in use of health services
 - prevalence of selected diabetes complications

METHODS

Eligible cases: all aboriginal adults with type 1 or type 2 diabetes registered in the CDIS with a valid health insurance number (HIN) (**Figure 2**).

Study period: January 1st, 1996 to March 31st, 2009.

Use of health services

- Only one consultation per day per speciality
- Services were reported starting from the year of diabetes diagnosis
- Ophthalmologists' consultations were reported separately
- Pregnancy related hospitalizations were excluded
- Age/sex standardization using 2001 census data of the Cree territory as the reference population

Complications

- Diagnosis and procedure codes from hospital discharge abstracts were used to identify cardiovascular disease, renal failure and lower limb amputations
- Comorbidities occurring before diabetes diagnosis were reported separately

RESULTS

Of the 1930 matched diabetes cases, 1773 were prevalent in 2008-2009. Among those prevalent cases, 18% had been hospitalized during the year (Table 1). The proportion of cases hospitalized appeared higher among women while their average length of stay was slightly shorter than that of men. However, these differences were not significant.

In 2008-2009, rates of visits to specialists (excluding ophthalmologists) reached 4 visits per year (data not shown). Overall, respectively 53% and 28% of Eeyouch with diabetes had visited a specialist or an ophthalmologist during the year. In addition, 28% of diabetes cases had visited a general practitioner outside the region.

The annual proportion of individuals hospitalized among Cree diabetes cases was about twice the rate observed in the whole population of the territory (**Figure 3**). Standardized hospitalization rates were fairly stable over the period, both in the individuals with diabetes and in the overall population of the territory. However, the annual number of hospitalizations among Cree diabetes cases tripled from 202 to 630 during the period, paralleling the important increase in diabetes prevalence (data not shown). In 2008-2009, Cree individuals with diabetes represented 21% of the population, but they accounted for 53% of the hospitalizations of the region.

Age-specific hospitalization rates are consistently higher among Cree individuals with diabetes than among the overall population of the territory (**Figure 4**). The pattern of increase is similar in people with diabetes and in the overall population.

Figure 1 James Bay Cree territory (Eeyou Istchee)



Figure 2 Description of the study population

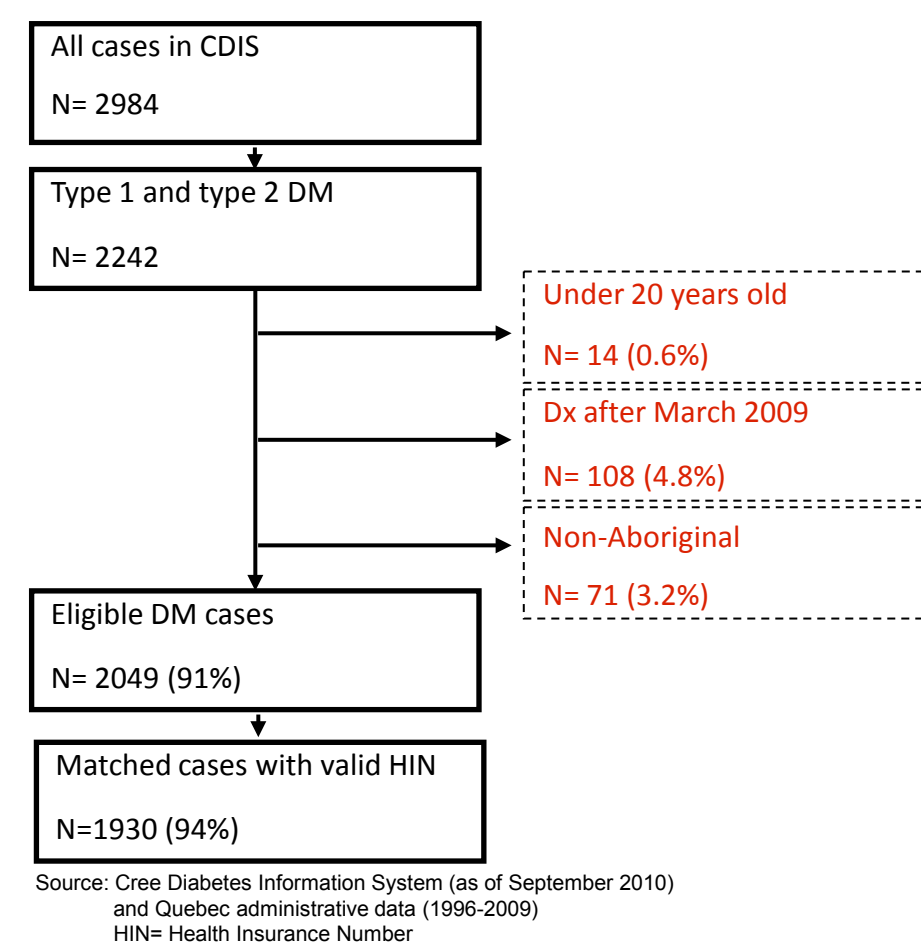


Table 1 Proportion of cases hospitalized* and average length of stay by sex, Eeyouch 20 years and older, 2008-2009

	Proportion of cases hospitalized (95 % CI)	Average length of stay (95% CI)
Male	17.1% (15.7-18.5)	10.4 (6.6-14.1)
Female	18.7% (17.5-19.9)	9.1 (6.1-12.1)
Total	18.1 % (17.2-19.0)	9.6 (7.3-11.9)

Source: CDIS and MED-ECHO
*Excluding pregnancy related hospitalizations
95% CI= 95% confidence interval

REFERENCE

¹ Kuzmina E, Dannenbaum D, and Torrie J (2010) Cree Diabetes Information System (CDIS) 2009 Annual Report, Public Health Department, Cree Board of Health and Social Services of James Bay. Revised version January 2011. Chisasibi. 31p.

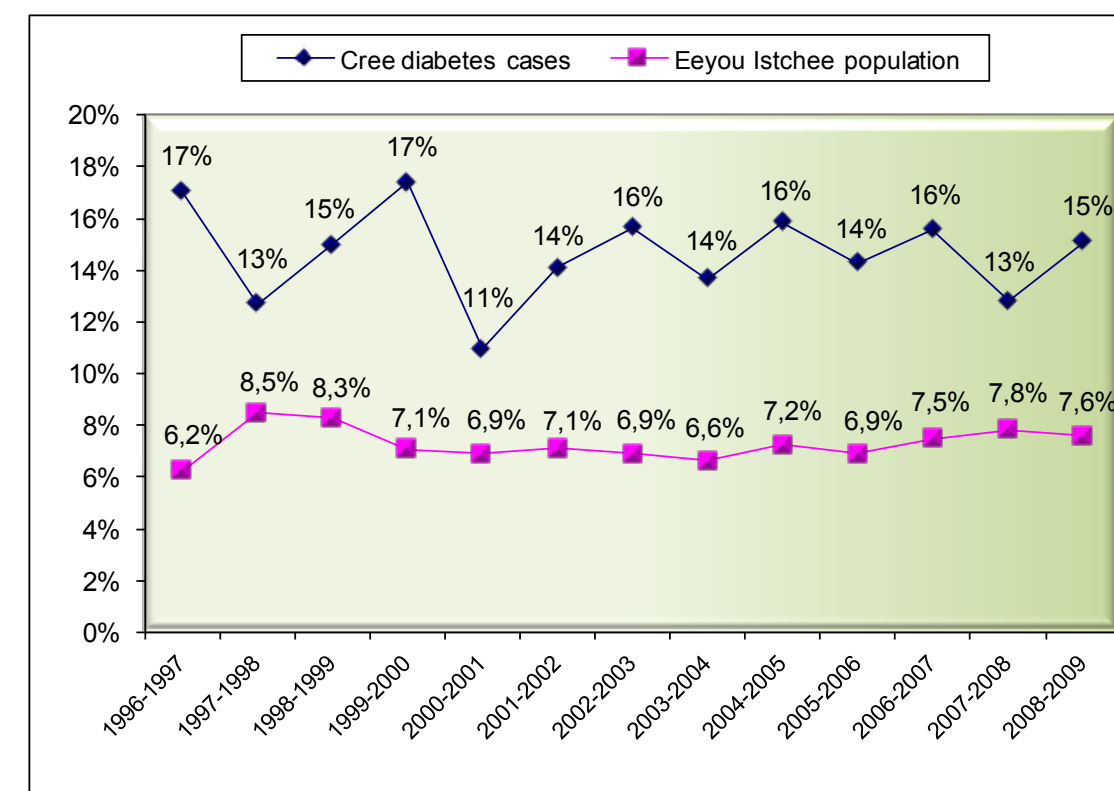
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The rate of physician visits (general practitioners and specialists) increased in the second half of the period (**Figure 5**). This may reflect the rise in medical visits outside the region due to a shortage of general practitioners within the territory in 2002. The mean number of visits increased over time reaching 3.3 per case in 2008-2009. Rate of visits among women remained about 50% higher than among men across all age groups (data not shown).

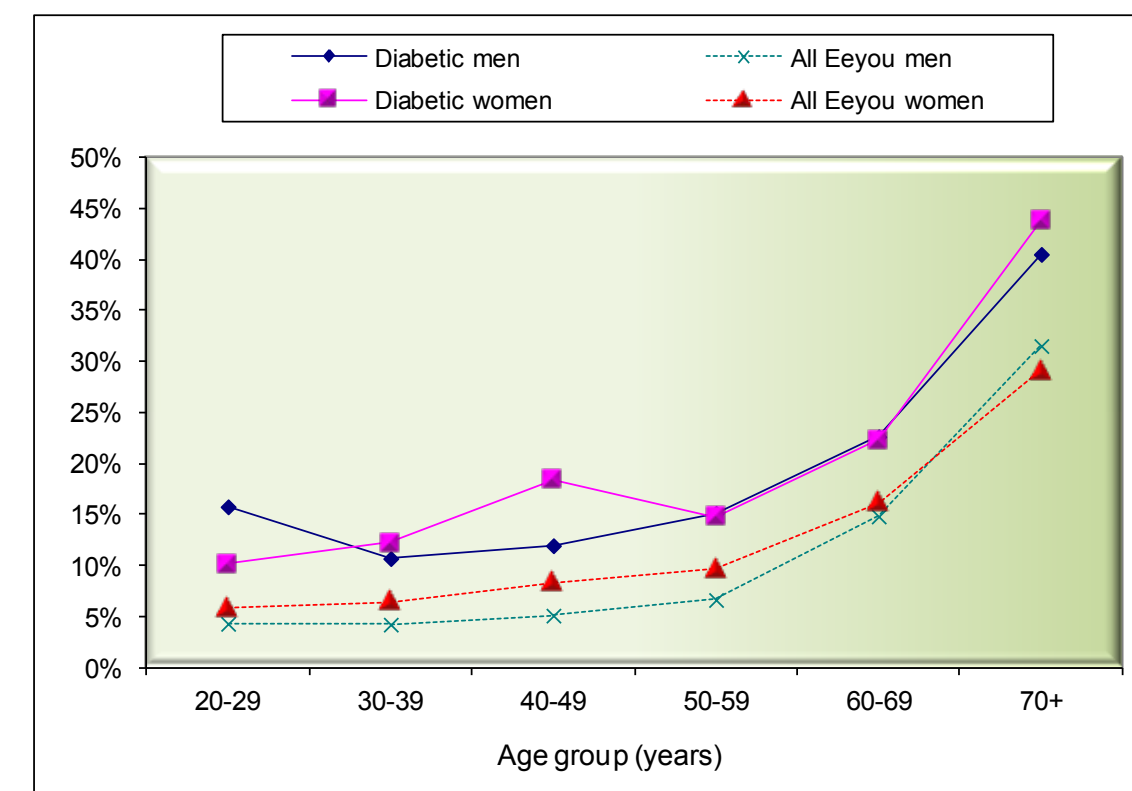
Based on hospital diagnosis and procedure codes, 27.6% of Cree diabetes cases prevalent in 2008-2009 (**Figure 6**) have been hospitalized with at least one complication after their diabetes diagnosis. That proportion reached 35.9% when comorbidities occurring before the diabetes diagnosis were considered. Hypertension was the condition most frequently observed (32.0%); the proportions for cardiovascular disease (excluding hypertension only), chronic renal disease, and lower limb amputations were 19.7%, 4.2%, and 1.2% respectively. However, these values are underestimations of the percentage of cases diagnosed with these conditions.

Figure 3 Age/sex standardized hospitalization rates* among diabetes cases 20 years and older compared to the overall Eeyou Istchee population, 1996-1997 to 2008-2009



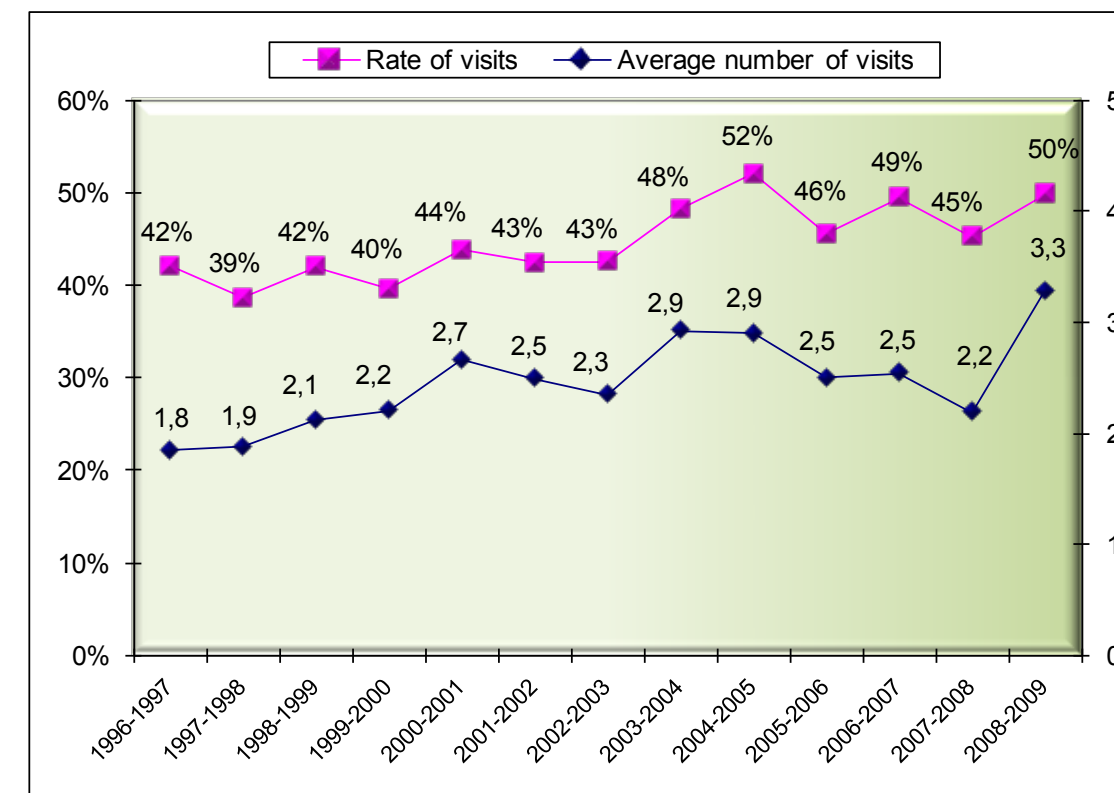
Source: CDIS and MED-ECHO
*Excluding pregnancy related hospitalizations

Figure 4 Age-specific proportion of individuals hospitalized*, by sex, among individuals with diabetes compared to the overall Eeyou Istchee population, 2008-2009



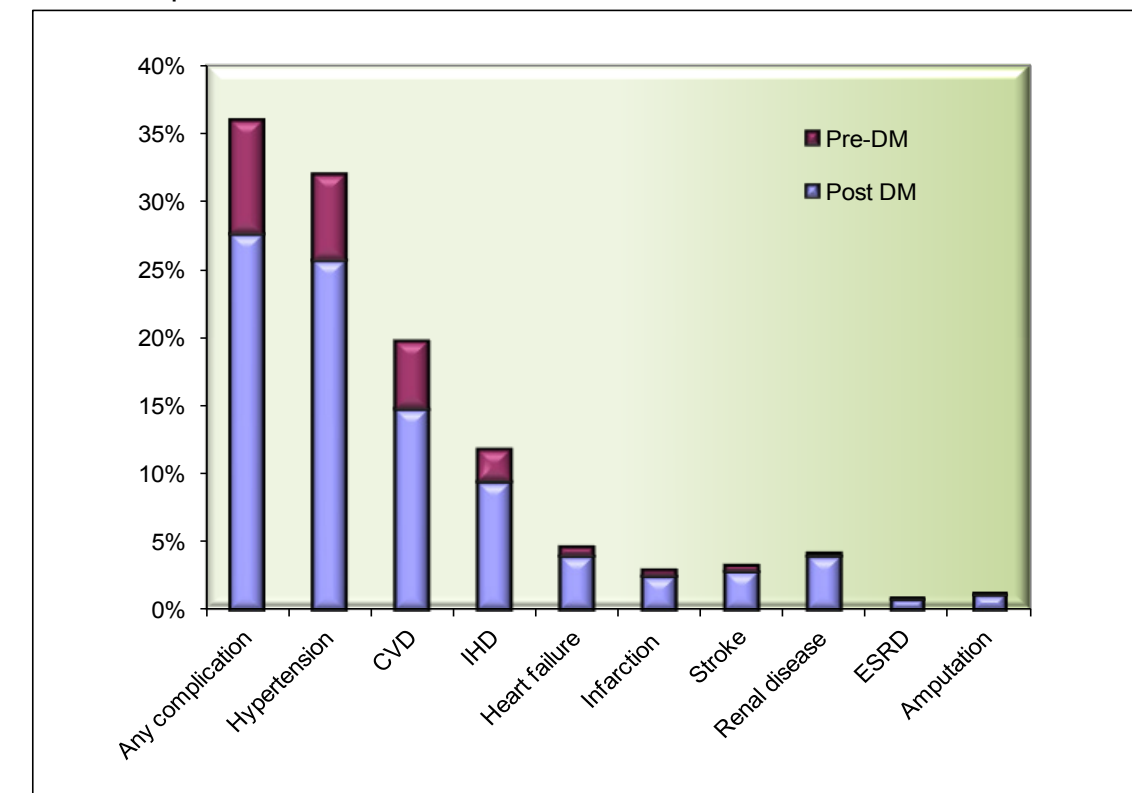
Source: CDIS and MED-ECHO
*Excluding pregnancy related hospitalizations

Figure 5 Age/sex standardized rates of visits and average number of visits in Eeyouch with diabetes 20 years and older, 1996-1997 to 2008-2009



Source: CDIS and Physician claim database
*Excluding ophthalmologist's consultations

Figure 6 Proportion of prevalent cases (2008-2009), 20 years and older, hospitalized with selected comorbid conditions during the study period



Source: CDIS and MED-ECHO
CVD = Cardiovascular disease
(excluding hypertension only)

IHD = Ischemic heart disease
ESRD = End-stage renal disease

CONCLUSION

The results highlight the important needs for comprehensive chronic disease management in this region. Information obtained through this linkage is essential for understanding the impact of diabetes on the health of the Cree population and the effectiveness of prevention and clinical management programs within the region.