

Chapter 12

Gestational Diabetes in Alberta



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GESTATIONAL DIABETES IN ALBERTA

KEY MESSAGES

- Rates of gestational diabetes mellitus have increased by 50% in the past decade.
- Rates of GDM are substantially higher in women over the age of 35 years.
- Aboriginal women have greater rates of GDM compared to the general population.



BACKGROUND

Gestational Diabetes Mellitus (GDM) is defined as glucose intolerance first recognized during pregnancy, typically found in the second or third trimesters. Although it is generally a temporary condition and resolves post partum, it is an established risk factor for the subsequent development of type 2 diabetes. It is estimated that women with GDM have a 50 – 60% risk of developing diabetes mellitus (DM) within 15 years of the index pregnancy; nearly tenfold the risk in the general population.⁽¹⁻³⁾ Thus GDM is a valuable marker of a high-risk status for future DM and all its attendant risks in terms of complications.

Much of the current research on the prevalence and incidence of GDM has focused on specific groups such as Status Aboriginal populations or patients enrolled in private insurance-based health maintenance organizations.⁽⁴⁻¹¹⁾ Evidence from these studies suggests that GDM rates have increased over time. The increase in GDM has important population health implications. The presence of GDM is of potential prognostic importance for the onset of vascular abnormalities and therefore offers a unique opportunity to develop strategies to defer or prevent the onset of chronic disease or vascular abnormalities in a population that is most at risk.

The primary objective of this chapter is to examine trends in the incidence of GDM in Alberta between 1998 and 2009. We will also compare GDM rates across specific age categories and between the Status Aboriginal and the general population.

This is the first time that the ADSS has included the surveillance of GDM. In order to assess the accuracy of the algorithm used to identify GDM cases from administrative databases, we sought an independent source to estimate GDM prevalence. The Alberta Perinatal Health Program (APHP) is a clinical registry focused on the perinatal health of infants and their mothers, healthy or at risk, in the context of their families and communities.⁽¹²⁾ In Alberta, pregnancies are generally screened for GDM between 24 and 28 weeks of gestation. The presence of GDM is routinely captured in the APHP database. The ADSS and the APHP therefore provide independent means for GDM surveillance in Alberta. A secondary objective of this chapter was to compare the incidence of GDM in the ADSS data against that observed in the APHP data.

METHODS

Data from the Alberta Health and Wellness Discharge Abstract Database (DAD) and Physician Claims databases were utilized for these analyses. The DAD records information including dates, diagnoses and procedures on all admissions to any acute care facility in Alberta. The Physicians Claims database captures demographic, diagnostic, and procedural information for all physician visits completed in an inpatient or outpatient environment.

GDM cases were identified as follows: women between the ages of 10 and 54 with an incident diagnosis of DM in any DAD diagnosis field or as a primary diagnosis in the Physician Claims database between 1998 and 2009 were identified. The time period between 120 days prior to and 180 days following the DM diagnosis was examined for the presence of any hospital gynecology/obstetric codes (see appendix for a list of codes). Patients with a gynecology/obstetric code during this time period were considered to have GDM.

The number of GDM cases was calculated for each year for the time period 1998–2009. This number was then divided by the number of women (aged 10 to 54 years) who had an in-hospital live birth in the province to arrive at the crude GDM rate. Women who had a home birth or a still-birth were not included in the denominator. Similar methodology was used to calculate the age-specific GDM rates for the year 2009. GDM rates among Status Aboriginal patients were compared with those among the general population.

For the second objective, the annual number of GDM cases based on the ADSS algorithm was compared to the annual number of GDM cases identified in the APHP registry. APHP numbers were only available until the year 2007 at the time this Atlas was published.

FINDINGS

In the 12 years of observation, the absolute number of cases of GDM has doubled, from 710 cases in 1998 to 1,420 cases in 2009 (Figure 12.1). Correspondingly, population rates of GDM have increased from 2% to approximately 3% during the same time period (Figure 12.2).

Figure 12.1 **Gestational Diabetes Cases, 1998-2009**

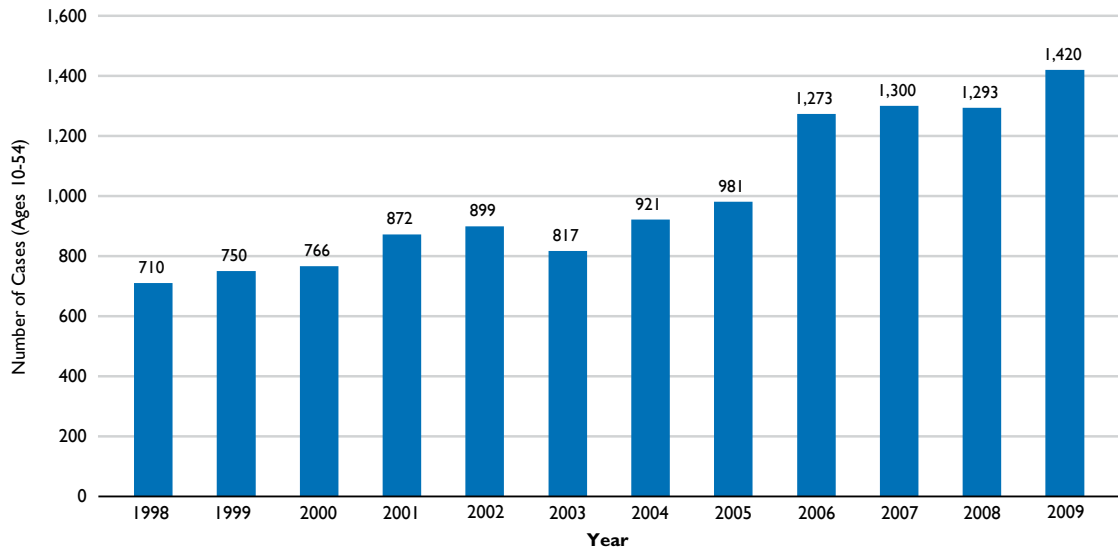
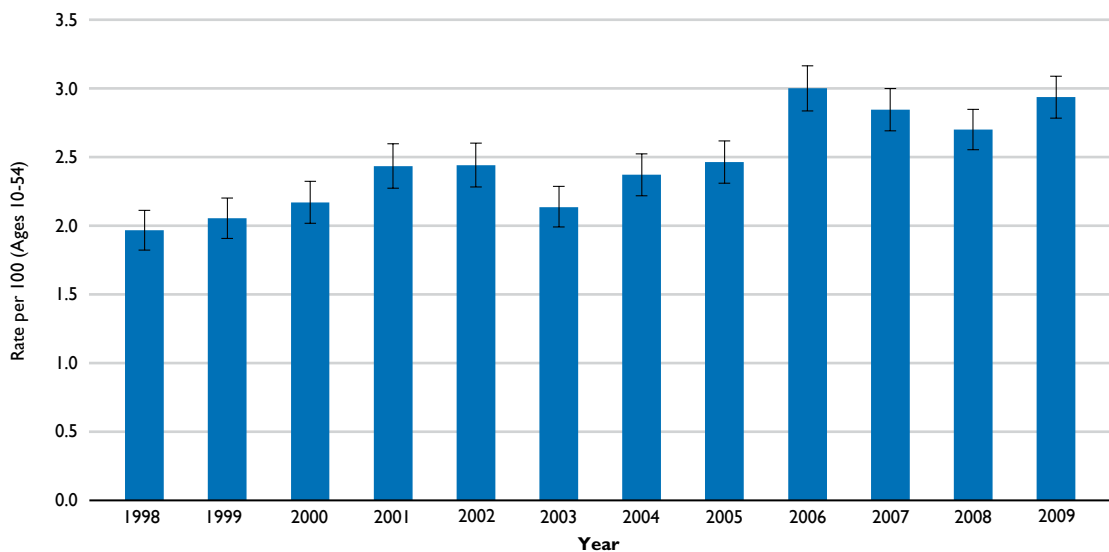
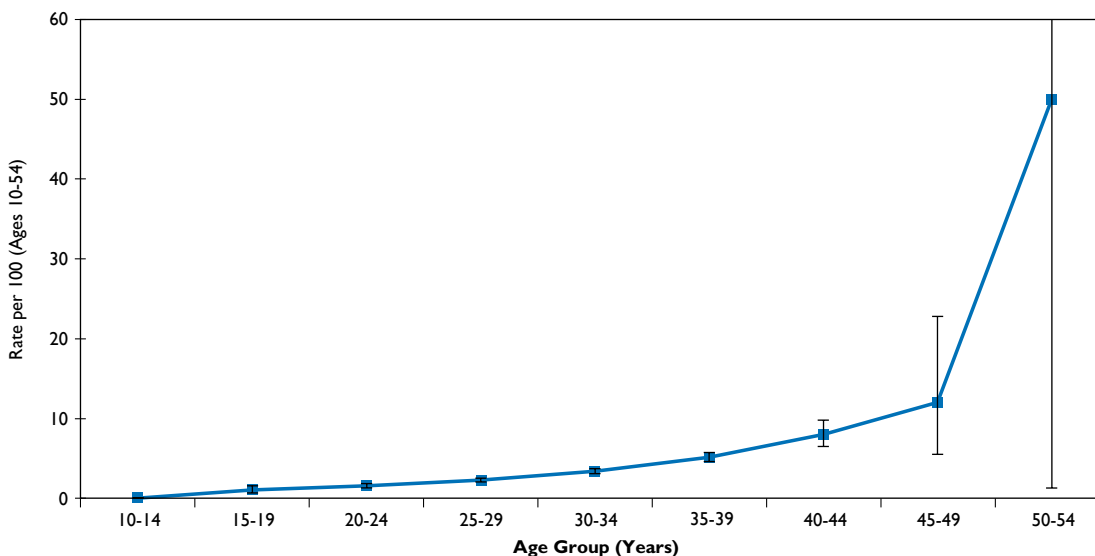


Figure 12.2 **Crude Gestational Diabetes Rates, 1998-2009**



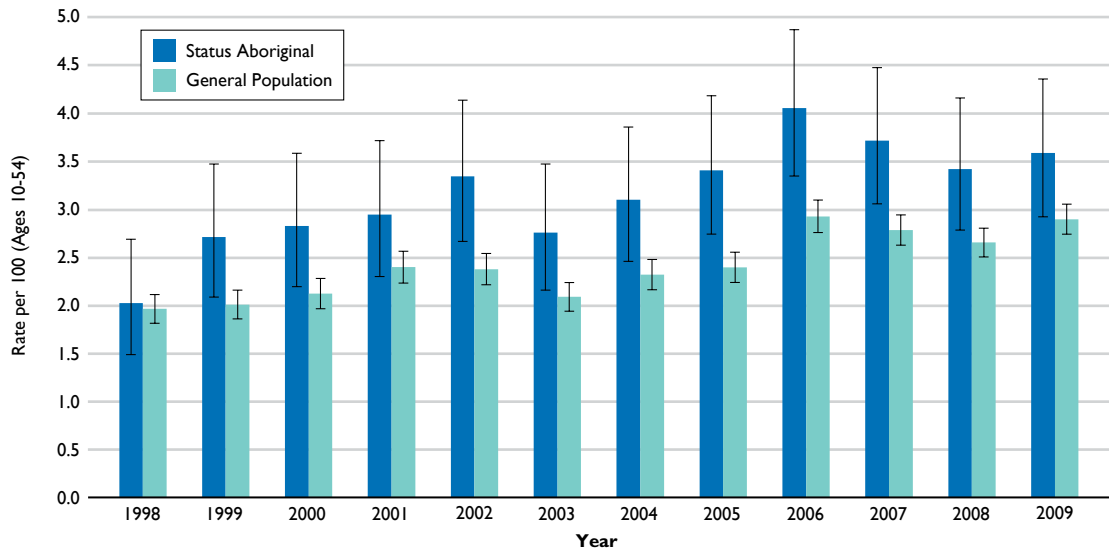
The number of GDM cases is substantially higher with increasing maternal age (Figure 12.3). The GDM rate was less than 5% among women under the age of 35 years and over 10% among women with ages between 45 and 49 years. The GDM rate was highest among women aged over 50 years (50%); however the relatively small number of GDM cases in this age group results in the very wide confidence intervals.

Figure 12.3 Age-Specific Gestational Diabetes Rates, 2009



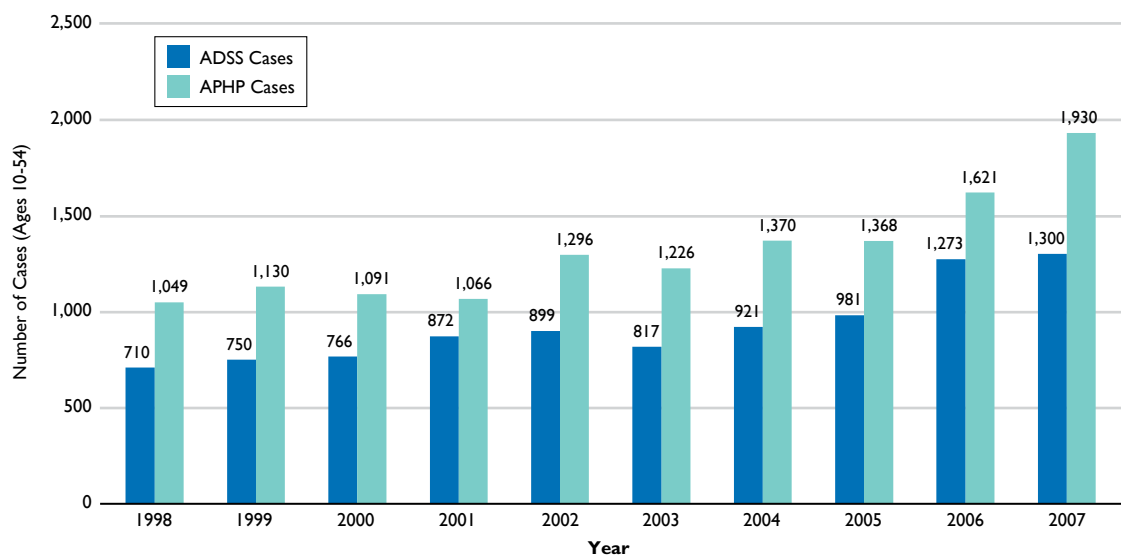
GDM rates among the Status Aboriginal population and the general populations are presented in Figure 12.4. The rates of GDM were consistently higher among Status Aboriginal women compared with women in the general population for the entire time period of study.

Figure 12.4 Crude Gestational Diabetes Rates, Among Status Aboriginal and General Populations, 1998-2009



A comparison of the number of GDM cases identified in the ADSS and the APHP clinical registry is presented in Figure 12.5. In general, the trends over time of GDM cases appear similar in both databases. However, the annual number of GDM cases in APHP appears to be consistently higher than the number identified in the ADSS data.

Figure 12.5 ADSS vs APHP Gestational Diabetes Cases, 1998-2007



DISCUSSION

This is the first time that the ADSS is identifying pregnant women with GDM. Consistent with prior studies examining trends of GDM prevalence,⁽⁴⁻¹¹⁾ the rate of GDM has increased by 50%, from 2% to 3%, over the past decade. Given the general increase in birth rate, this represents a doubling of cases of GDM identified: from 710 cases in 1998 to 1,420 cases in 2009. The reasons for the increase in GDM rates are likely multi-factorial, such as increasing maternal age and obesity, and require further study. An examination of age-specific GDM rates found a substantial increase in the incidence of GDM among women older than 35 years of age.

We found GDM rates to be higher among Status Aboriginal patients compared with rates in the general population. These findings are consistent with those reported previously. Among Pima Indians, a population with the highest rates of type 2 diabetes in the world, GDM has been identified as the factor most responsible for the increase in the prevalence of diabetes in both adults and children over the last 30 years.⁽⁴⁻⁵⁾

The availability of data on GDM cases from an independent provincial data registry offered us a unique opportunity to assess the accuracy of the algorithm used to identify GDM cases within the ADSS. Although the overall trend in GDM cases was similar in the two databases, the annual number of GDM cases was slightly higher in the APHP database relative to the ADSS numbers. The different estimates from the same population suggest a need to examine potential reasons for the discrepancies, such as billing or coding practices.

APPENDIX

Gynecology/obstetric codes

Discharge Abstract Database

ICD-9 (641-676,V27)

ICD-10-CA (01, 021-95, 098, 099, Z37)

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