BURDEN OF DIABETES
AMONG AMERICAN INDIANS
AND ALASKA NATIVES
IN WISCONSIN
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In the U.S., American Indians/Alaska Natives are disproportionally affected by diabetes and diabetic complications compared to other racial/ethnic groups. American Indians/Alaska Natives are twice as likely to have a diabetes diagnosis compared to non-Hispanic whites. The likelihood of an American Indian/Alaska Native youth aged 10-19 being diagnosed with type 2 diabetes is nine times higher than that of non-Hispanic whites. In Wisconsin, the diabetes mortality rate for American Indians/Alaska Natives is statistically significantly higher than for the Wisconsin all races population. Despite improvements in healthcare delivery and access, diabetes remains a major cause of mortality and morbidity among American Indian/Alaska Native people in Wisconsin and across the country.

The Great Lakes Inter-Tribal Epidemiology Center (GLITEC) has supported Tribal communities in their efforts to improve the health of their people by assisting with their data needs through partnership development, community-based research, and technical assistance since 1996. GLITEC has produced or assisted with a variety of area-wide and Tribe-specific health reports for the 34 Tribes, three Service Units, and four Urban Indian Health Programs it serves. This report uses data from the states of Wisconsin, Minnesota, and Michigan. In addition to a system-wide query within the Indian Health Service (IHS)’s electronic health records system, Resource and Patient Management System (RPMS) for patients with diabetes, data from the annual diabetes audit for specific diabetic related indicators was employed. Annual diabetes audit data is a sample of diabetic patients on the diabetes registry at each Tribal clinic. There is no information for undiagnosed individuals or for American Indian/Alaska Native individuals who did not visit a Tribal health facility, and there are incomplete and missing reports.

This report is intended to:

- Provide an accurate and comprehensive report of diabetes among American Indians/Alaska Natives in Wisconsin
- Encourage the use of these data in local strategic planning efforts to reduce the burden of diabetes
- Encourage the reporting of important diabetes-related health indicators at the local level
According to the U.S. Census, the total U.S. population grew by 9.7 percent from 2000 to 2010. In comparison, the American Indian/Alaska Native alone population increased almost twice as fast as the total U.S. population, growing by 18 percent from 2.5 million people in 2000 to 2.9 million in 2010.1

Diabetes is a major factor for the leading causes of death among American Indians/Alaska Natives, heart disease and stroke.2 The risk of stroke is about two to four times higher among adults with diabetes than people without diabetes.1 In the U.S., 67% of adults with diabetes also have high blood pressure. Diabetes can lead to complications such as vision loss, kidney failure, and amputations of extremities. Effective glucose control, often measured by HbA1c levels, and blood pressure control can prevent or delay complications. On average, a person with diabetes has medical expenses that are twice as high as those for a person without diabetes.3 In 2007, the estimated cost of diabetes in the United States was $116 billion for direct medical care costs and $58 billion for indirect costs such as disability, lost productivity, and premature death.3 Direct costs for diabetes care in Wisconsin were estimated at $3.46 billion and $1.73 billion for indirect costs in 2007.4

In the U.S., American Indians/Alaska Natives are disproportionately affected by diabetes and diabetic complications compared with other racial/ethnic groups.5,6 American Indians/Alaska Natives are 2.3 times more likely to have a diabetes diagnosis compared to non-Hispanic whites (16.1% vs.7.1%)2 and the likelihood of an American Indian/Alaska Native youth aged 10-19 diagnosed with type 2 diabetes is 9 times higher than non-Hispanic whites (1.74 per 1000 vs. 0.19 per 1000).7 In 2004, the prevalence of diabetes was 16.3% among American Indians/Alaska Natives aged 20 years and older.8 Diabetes is the fourth leading cause of death among American Indians/Alaska Natives, and mortality due to diabetes is four times higher among American Indian/Alaska Native than the U.S. all races population.9 In Wisconsin, the diabetes mortality rate for American Indians/Alaska Natives is statistically significantly higher than that of the Wisconsin all races population.10
<table>
<thead>
<tr>
<th>Race and Location</th>
<th>Number of Deaths</th>
<th>Population</th>
<th>Age-Adjusted Mortality Rate</th>
<th>95% Confidence Interval</th>
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</thead>
<tbody>
<tr>
<td>Wisconsin</td>
<td></td>
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<tr>
<td>AI/AN</td>
<td>109</td>
<td>270,812</td>
<td>73.2</td>
<td>59.4–86.9</td>
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<tr>
<td>All Races</td>
<td>6,073</td>
<td>27,842,960</td>
<td>19.8</td>
<td>19.3–20.3</td>
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<td>3-State Area*</td>
<td></td>
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<td></td>
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<tr>
<td>AI/AN</td>
<td>352</td>
<td>592,201</td>
<td>71.5</td>
<td>64.1–79.0</td>
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<td>103,892,387</td>
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<td>All Races U.S. 2006</td>
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<td></td>
<td>23.3</td>
<td></td>
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</tbody>
</table>

Sources: 2004-2008 Mortality Files from Michigan Department of Community Health, Minnesota Center for Health Statistics, and Wisconsin Bureau of Health Information, Wisconsin Interactive Statistics on Health (WISH); U.S. Census Bureau 6 race groups; CDC/NCHS, National Vital Statistics System

*3-State Area includes Michigan, Minnesota, and Wisconsin

**TABLE 2**
Wisconsin American Indians/Alaska Natives Diagnosis Prevalence by Year, 2006-2010

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Cases</td>
<td>Number of Cases</td>
<td>Number of Cases</td>
<td>Number of Cases</td>
<td>Number of Cases</td>
</tr>
<tr>
<td>Pre-Diabetes</td>
<td>377 (1.1)</td>
<td>429 (1.2)</td>
<td>411 (1.1)</td>
<td>408 (1.1)</td>
<td>339 (0.9)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>4109 (11.5)</td>
<td>4596 (12.5)</td>
<td>4328 (11.6)</td>
<td>4079 (10.8)</td>
<td>3813 (10.0)</td>
</tr>
<tr>
<td>Metabolic Syndrome</td>
<td>41 (0.1)</td>
<td>32 (0.1)</td>
<td>39 (0.1)</td>
<td>29 (0.1)</td>
<td>28 (0.1)</td>
</tr>
</tbody>
</table>

Sources: Query of the Bemidji Area Indian Health Service (IHS)’s Resource Patient Management System (RPMS) using the International Classification of Diseases (ICD) 9 for primary diagnosis codes, 2010 Bemidji Area Headquarters User Population Report
Chronic Kidney Disease

Chronic kidney disease (CKD) is a condition with serious health implications associated with premature mortality, decreased quality of life, and increased healthcare expenditures. Left untreated, CKD can result in the need for dialysis or kidney transplantation. Those at risk for CKD include individuals with cardiovascular disease, diabetes, hypertension, or obesity. Diabetes is the leading cause of kidney failure. Proper diabetes management has been demonstrated to prevent or delay the onset of kidney disease, with adequate blood glucose control decreasing the risk of kidney disease by 40% in people with diabetes. Blood pressure control decreases the risk of kidney disease by approximately 33%. Additionally, treating patients with early diabetic kidney disease by decreasing blood pressure can reduce the decrease in kidney function by 30% to 70%.

The medical care needs of diabetic American Indians/Alaska Natives are often complicated by an earlier age of onset of type 2 diabetes and higher rates of comorbidities. Since the implementation of the Special Diabetes Program for Indians in 1997, which provides funds for IHS and Tribally-operated health facilities for diabetes prevention and treatment programs, there have been notable improvements in clinical outcome measures and a decrease in the incidence of diabetes-related end-stage renal disease (ESRD). This suggests that diabetes management among American Indians/Alaska Natives has improved. Among American Indians/Alaska Natives, the age-adjusted ESRD incidence increased from 358.6 per million population in 1994 to a peak of 440.4 in 1999. In 2004, the incidence decreased to 362.4 per million. Despite these improvements on the national level, American Indians/Alaska Natives in Wisconsin continue to have significantly higher age-adjusted mortality rates of nephritis, nephrotic syndrome, and nephrosis compared to the all races population.

TABLE 3
Nephritis, Nephrotic Syndrome, and Nephrosis Age-Adjusted Mortality Rates, 2004-2008 (per 100,000)

<table>
<thead>
<tr>
<th>Race and Location</th>
<th>Number of Deaths</th>
<th>Population</th>
<th>Age-Adjusted Mortality Rate</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wisconsin</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>AI/AN</td>
<td>47</td>
<td>270,812</td>
<td>37.8</td>
<td>27.0–48.7</td>
</tr>
<tr>
<td>All Races</td>
<td>4,789</td>
<td>27,842,960</td>
<td>22.2</td>
<td>21.6–22.8</td>
</tr>
<tr>
<td>3-State Area*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AI/AN</td>
<td>138</td>
<td>592,201</td>
<td>32.0</td>
<td>26.7–37.3</td>
</tr>
<tr>
<td>All Races</td>
<td>16,369</td>
<td>103,892,387</td>
<td>14.6</td>
<td>14.4–14.8</td>
</tr>
<tr>
<td>All Races U.S. 2006</td>
<td></td>
<td></td>
<td>14.5</td>
<td></td>
</tr>
</tbody>
</table>

Sources: 2004-2008 Mortality Files from Michigan Department of Community Health, Minnesota Center for Health Statistics, and Wisconsin Bureau of Health Information, Wisconsin Interactive Statistics on Health (WISH); U.S. Census Bureau 6 race groups; CDC/NCHS, National Vital Statistics System

*3-State Area includes Michigan, Minnesota, and Michigan
Selected Health Indicators for Diabetic American Indian/Alaska Natives, 2008-2012

**GRAPH 1**
Age distribution*

Source: Bemidji Area Indian Health Service (IHS)'s Resource Patient Management System (RPMS): Diabetes Care and Outcomes Audit Report *Sample of American Indian/Alaska Native diabetic patients on the diabetes registry in Wisconsin

**GRAPH 2**
Body Mass Index (BMI) distribution*

Source: Bemidji Area Indian Health Service (IHS)'s Resource Patient Management System (RPMS): Diabetes Care and Outcomes Audit Report *Sample of American Indian/Alaska Native diabetic patients on the diabetes registry in Wisconsin
Source: Bemidji Area Indian Health Service (IHS)'s Resource Patient Management System (RPMS): Diabetes Care and Outcomes Audit Report
*Sample of American Indian/Alaska Native diabetic patients on the diabetes registry in Wisconsin
**GRAPH 5**
Annual Preventative Exams**+

Source: Bemidji Area Indian Health Service (IHS)’s Resource Patient Management System (RPMS): Diabetes Care and Outcomes Audit Report *Sample of American Indian/Alaska Native diabetic patients on the diabetes registry in Wisconsin
+Does not total 100%

**GRAPH 6**
Documentation of Estimated Glomerular Filtration Rate (eGFR)*

Source: Bemidji Area Indian Health Service (IHS)’s Resource Patient Management System (RPMS): Diabetes Care and Outcomes Audit Report *Sample of American Indian/Alaska Native diabetic patients on the diabetes registry in Wisconsin
**GRAPH 7**

Quantitative urine protein testing: Creatinine*

![Bar chart showing percentage of creatinine levels across different years.](image)

Source: Bemidji Area Indian Health Service (IHS)'s Resource Patient Management System (RPMS): Diabetes Care and Outcomes Audit Report *Sample of American Indian/Alaska Native diabetic patients on the diabetes registry in Wisconsin

**GRAPH 8**

Total cholesterol*

![Bar chart showing percentage of cholesterol levels across different years.](image)

Source: Bemidji Area Indian Health Service (IHS)'s Resource Patient Management System (RPMS): Diabetes Care and Outcomes Audit Report *Sample of American Indian/Alaska Native diabetic patients on the diabetes registry in Wisconsin
**Technical Notes**

**Census**
Data from the 2000 U.S. Census were gathered using the Census Bureau’s website [http://www.census.gov](http://www.census.gov). Annual estimates used in Tables 1 and 3 were used to calculate the age-adjusted mortality rate.

**Vital Statistics**
Vital statistics (mortality) SAS files were obtained from Michigan, Minnesota, and Wisconsin and used to generate data presented in this report. The three states have differences in the formatting and completeness in their vital records files.
Resource and Patient Management System (RPMS) Diabetes Data

Health indicators (Graphs 1-9) were recorded in the annual diabetes audit (electronic or manual) and reported to the IHS Bemidji Area Office using Resource and Patient Management System (RPMS). IHS Tribally-administered clinics (operating units) receiving or applying for Special Diabetes Program for Indians (SDPI) funding submit data to the diabetes audit. The diabetes audit takes a sample of eligible users from the diabetes registry.

- Number of patients audited by year (sample size):
  - 2008: (n=1,023) 2009: (n= 592) 2010: (n=1,051) 2011: (n=1,008) 2012: (n=1,063)

- Data in Table 2 was derived through an RPMS query of unduplicated (within the year) patients having an ICD 9 diagnosis of prediabetes (790.21, 790.22, and 790.29) diabetes (250.0-250.9), or metabolic syndrome (277.7). Patients who had more than one diagnosis of interest within their visit(s), could appear in multiple categories (within each year). This query was independent of the diabetes audit.

- In Graph 5, patients could be in multiple categories within each year. Undocumented patient exams are not reported in the graph.

- Undocumented patient exams are not reported in Graph 6.

Type II Diabetes Recommendations

Indian Health Service Division of Diabetes Treatment and Prevention. Standards of Care and Clinical Practice Recommendations: Type 2 Diabetes. 2011.

Glycemic Control:

HbA1c is a “weighted” measure of glycemic control over the preceding 120 days. The more recent days contribute a greater percentage to the measure than the distant days. Specifically, the mean level of blood glucose in the 30 days immediately preceding the test contributes approximately 50% of the final result.

- In general, the HbA1c goal is < 7%
- More stringent goals (e.g., < 6.5-7%) for younger, healthier patients
- Less stringent goals (e.g., < 7-8%, 8-9%) for those with increased risks with tight control

  According to the IHS “While intensive glycemic control in newly diagnosed patients is beneficial, tight control in the general diabetes population has not demonstrated the same benefits...”

Blood Pressure:

For most diabetic patients, the target blood pressure is < 130/80 mmHg, or < 140/90mmHg. The target could be higher depending on symptoms and comorbidities present.
References


