4. Diabetes

Diabetes (also called diabetes mellitus) is a chronic disease caused by high levels of blood glucose (or blood sugar). Blood glucose levels are controlled by the hormone insulin, which moves glucose from the blood into cells to be used as energy. In type 1 diabetes, the body does not make enough insulin to control blood sugar levels. In type 2 diabetes (the most common type), the body no longer uses insulin efficiently. Although the two forms are different in many ways, the end result of both is high blood sugar. If left untreated, diabetes can damage nearly every tissue in the body, and can cause heart attacks, stroke, blindness, kidney failure, and amputations of toes, feet, or legs.[1]

AI/AN adults have among the highest rates of diabetes in the U.S. From 2010-2012, the age-adjusted percentage of AI/AN adults with diabetes was 15.9%, compared to 7.6% for NHW, 12.8% for Hispanics, and 13.2% for African Americans.[2] AI/AN diabetes rates vary by region, from 6% for Alaska Natives to 24.1% for American Indians in Arizona.[2] Diabetes is the fourth leading cause of death for AI/AN nationwide.

While AI/AN in Washington have higher rates of diabetes than NHW in the state, the prevalence of diabetes among IHS patients is lower in Washington compared to the national IHS average. Diabetes is the fourth leading cause of death for AI/AN in Washington. The death rate from diabetes is three times higher for AI/AN compared to NHW, and AI/AN men have a higher risk of dying from diabetes than AI/AN women. On average, the death rate from diabetes for AI/AN in Washington has increased by 2.3% per year since 1990.

While diabetes is a life-long disease, it can be managed by exercising regularly, eating a healthful diet, taking medications, and getting regular health check-ups. People with pre-diabetes can reduce their risk by getting regular physical activity, losing a moderate amount of weight, and eating a balanced diet. Since 1997, the Special Diabetes Program for Indians (SDPI) has funded initiatives to prevent and treat diabetes in AI/AN communities. These initiatives have resulted in improved access to treatment and prevention services and improved clinical outcomes for diabetes patients.[3]

1. National Diabetes Information Clearinghouse. Your guide to diabetes: Type 1 and Type 2. Available at: http://www.diabetes.niddk.nih.gov/dm/pubs/type1and2/index.aspx.

2. Centers for Disease Control and Prevention. National Diabetes Statistics Report: Estimates of Diabetes and Its Burden in the United States, 2014. Atlanta, GA: US Department of Health and Human Services; 2014.

3. Indian Health Service Division of Diabetes Treatment and Prevention. Special Diabetes Program for Indians: Successful Interventions and Sustained Achievements (2012). Available at: http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=resourcesFactSheets#2

Self-Reported Diabetes

Figure 4.1 shows the prevalence of self-reported diabetes among AI/AN and NHW adults in Washington. From 2006-2012, AI/AN males and females had similar rates of diabetes (13%). This was higher than the rate among NHW males (8%) and females (7%). The rate of gestational diabetes was the same for females of both races (2%), and the rate of pre-diabetes was similar across race and sex.

Figure 4.1: Self-reported diabetes by race and sex, Washington, 2006-2012.
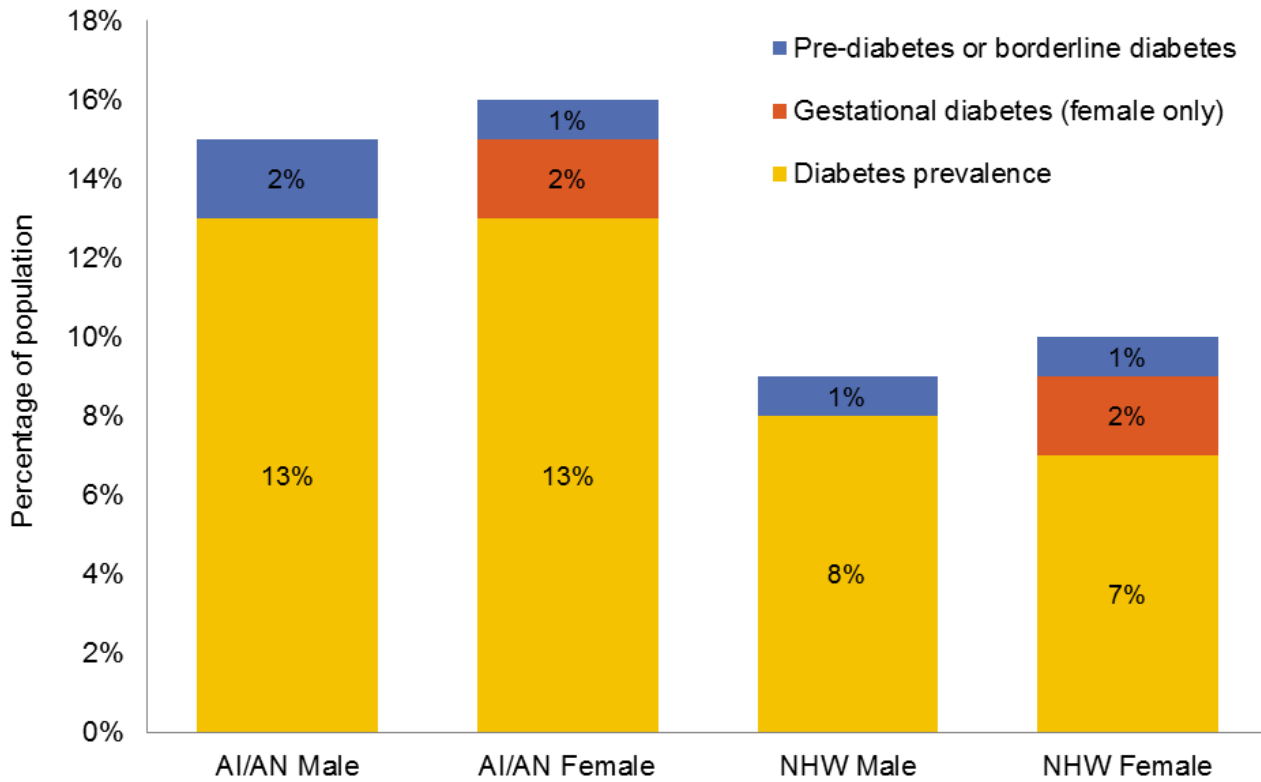

Sample sizes (n): AI/AN males=783; AI/AN females=1,148; NHW males=49,342; NHW females=77,177.

Diabetes Prevalence

From 2009-2013, AI/AN patients who received care at Indian health facilities in Washington had a lower prevalence of diabetes compared to all Portland Area IHS patients and IHS patients nationwide (Figure 4.2). The diabetes prevalence in the Washington patient population has remained relatively stable during this time period, while the prevalence rates in the Portland Area and national IHS patient population have increased over time.

Data Source: Portland Area Indian Health Service.

Data Notes: Data labels only shown for Washington clinics. 2013 data not available for IHS All Areas. Washington clinics include non-urban federal and tribal Indian health facilities in Washington. Portland Area IHS clinics include non-urban federal and tribal Indian health facilities in Idaho, Oregon, and Washington.

Figure 4.2: Diabetes prevalence among IHS patients, 2009-2013.
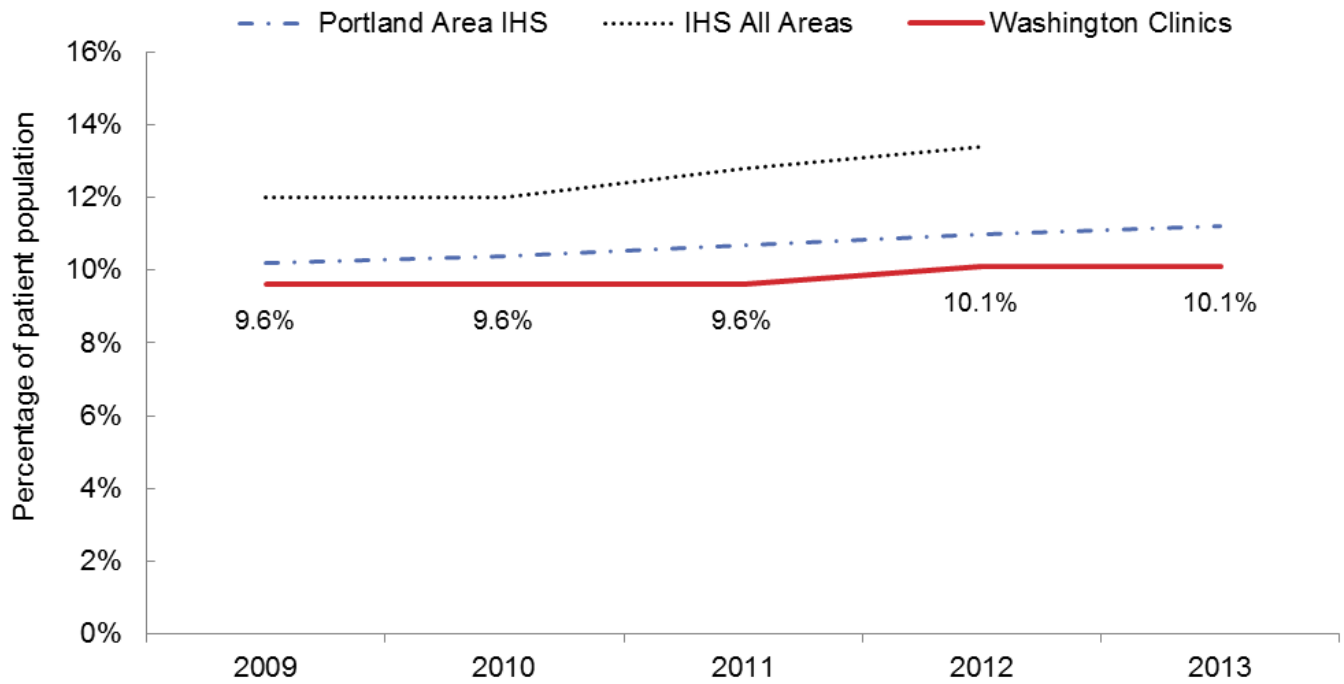
# Diabetes Control and Management: Blood Sugar Control

Blood sugar control, as measured by hemoglobin A1c, is an important indicator of how well diabetes patients are managing their disease. The U.S. has a Healthy People 2020 goal for 58.9% of adults with diabetes to have a hemoglobin A1c level below 7%, which is considered to be ideal blood sugar control.

Until 2012, IHS defined ideal blood sugar control as having a hemoglobin A1c level below 7%. This treatment goal was changed in 2013 to a hemoglobin A1c result below 8%. From 2009 to 2012, between 33-35% of AI/AN diabetes patients seen in Washington clinics had ideal blood sugar levels. In 2013, this increased to 48.9% as a result of the definition change. Washington clinics have a slightly lower percentage of patients with controlled blood sugar compared to the Portland Area IHS overall, but exceed the national IHS average.

Data Source: Portland Area Indian Health Service.

Data Notes: Data labels only shown for Washington clinics. Washington clinics include non-urban federal and tribal Indian health facilities in Washington. Portland Area IHS clinics include non-urban federal and tribal Indian health facilities in Idaho, Oregon, and Washington.

Figure 4.3: Percentage of IHS diabetes patients with ideal blood sugar control, 2009-2013.
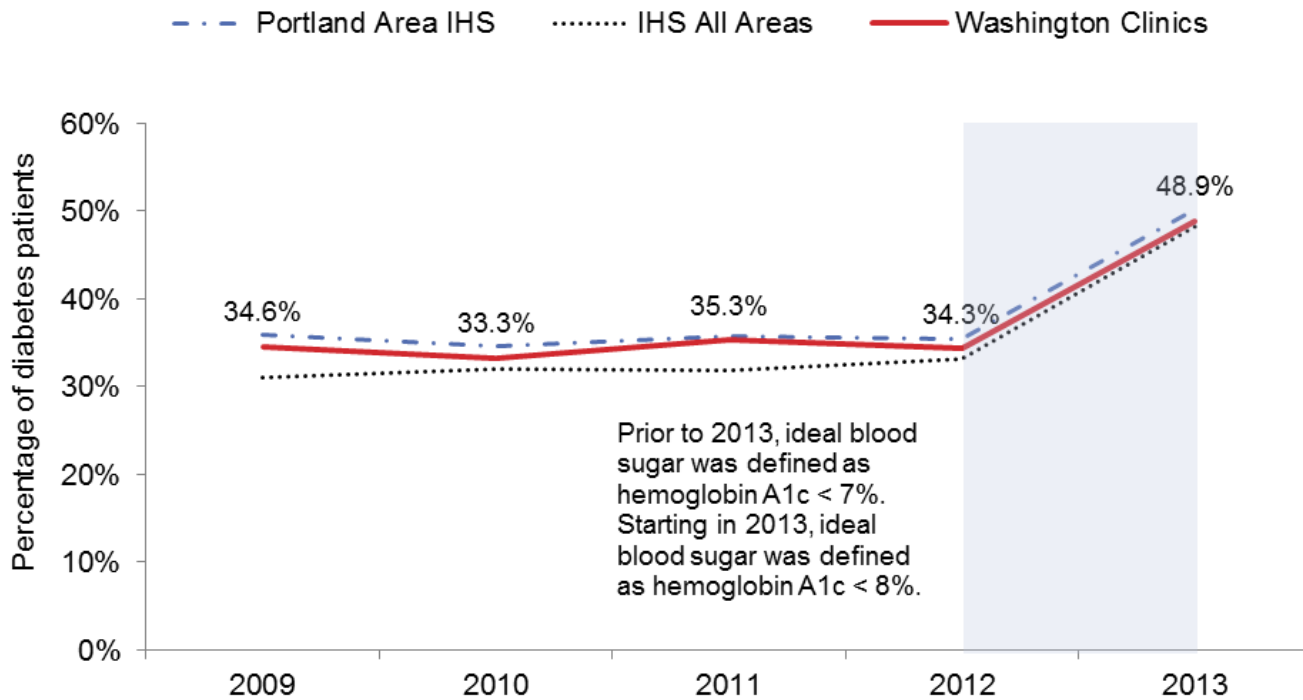
Note: The shaded area shows the year when the definition for ideal blood sugar control changed.
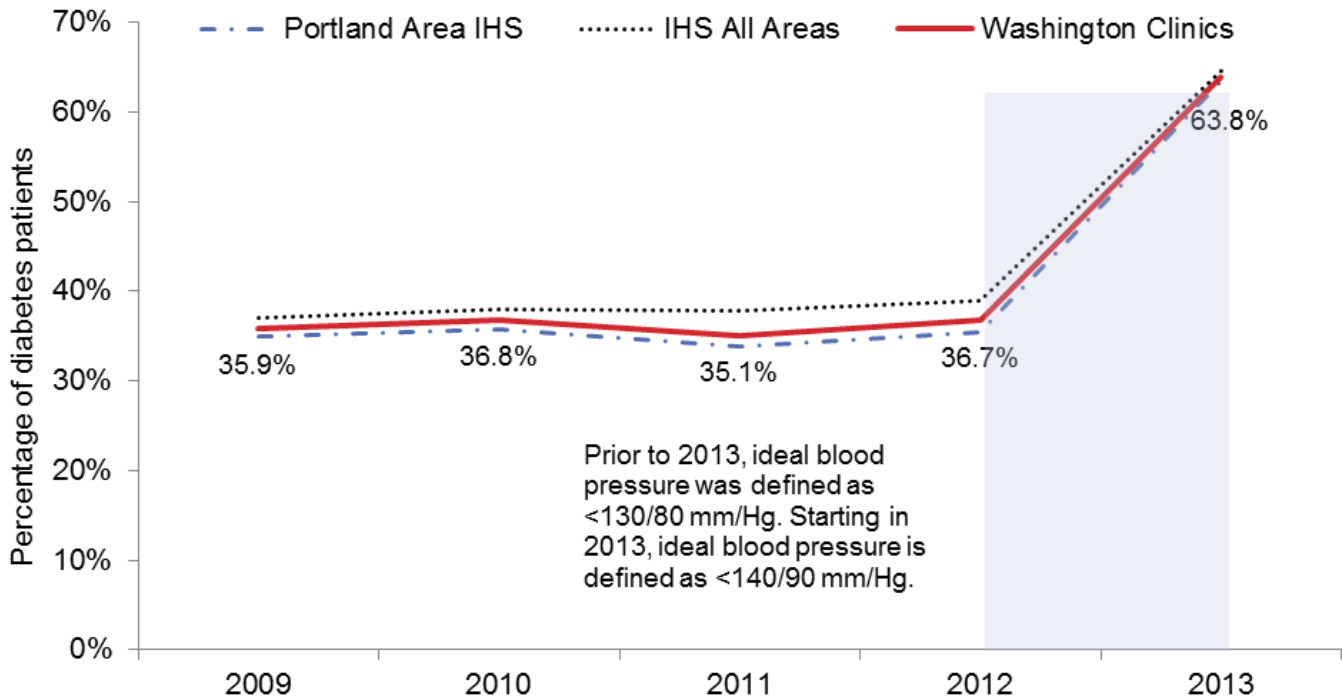
Blood Pressure Control

Diabetes patients have increased risks for heart disease, and can reduce these risks by managing their blood pressure. The U.S. has a Healthy People 2020 goal for 57% of adults with diabetes to have their blood pressure under control.

Until 2012, IHS defined ideal blood pressure control as having a blood pressure level below 130/80 mm Hg. This definition changed in 2013 to a blood pressure level below 140/90 mm Hg. From 2009 to 2012, approximately 36% of AI/AN diabetes patients seen in Washington clinics had ideal blood pressure levels (Figure 4.4). In 2013, this increased to 63.8% as a result of the definition change. Washington clinics had a lower percentage of patients with controlled blood sugar compared to all IHS areas, but exceeded the Portland Area IHS average.

Data Source: Portland Area Indian Health Service.

Data Notes: Data labels only shown for Washington clinics. Washington clinics include non-urban federal and tribal Indian health facilities in Washington. Portland Area IHS clinics include non-urban federal and tribal Indian health facilities in Idaho, Oregon, and Washington.

Figure 4.4: Percentage of IHS diabetes patients with ideal blood pressure, 2009-2013.

Note: The shaded area shows the year when the definition for ideal blood pressure control changed.
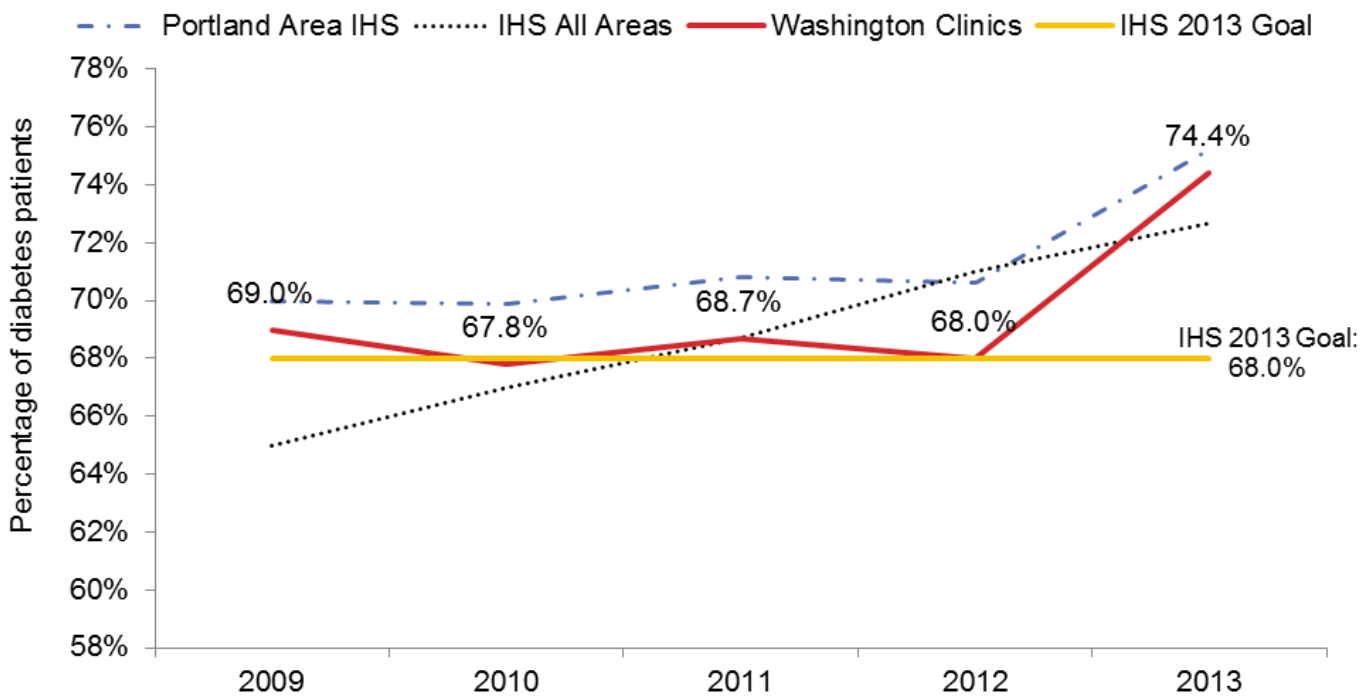
Recommended Screening - LDL Assessment

Diabetes patients are at increased risk for heart disease, kidney disease, eye problems, and other health issues. Diabetes patients can reduce their risk for these complications by receiving regular screening and monitoring exams. Routine physical examinations and tests can help patients and their healthcare providers to manage diabetes and related health issues. The IHS has performance goals to measure how many diabetes patients receive yearly exams for LDL (low density lipoprotein) cholesterol (related to heart disease risk), nephropathy (related to kidney disease risk), and diabetic retinopathy (or diabetic eye disease).

LDL Cholesterol Assessment: From 2009-2012, approximately 68.0% of AI/AN diabetes patients seen in Washington clinics had their LDL cholesterol levels assessed. This increased to 74.4% in 2013, which exceeded the IHS goal of 68.0% (Figure 4.5). Since 2009, the Portland Area IHS has performed better on this measure than Washington clinics alone. The national IHS average has increased since 2009 and also exceeded 2013 goal.

Data Source: Portland Area Indian Health Service.

Data Notes: Data labels only shown for Washington clinics. Washington clinics include non-urban federal and tribal Indian health facilities in Washington. Portland Area IHS clinics include non-urban federal and tribal Indian health facilities in Idaho, Oregon, and Washington.

Figure 4.5: Percentage of IHS diabetes patients who received an LDL assessment, 2009-2013.
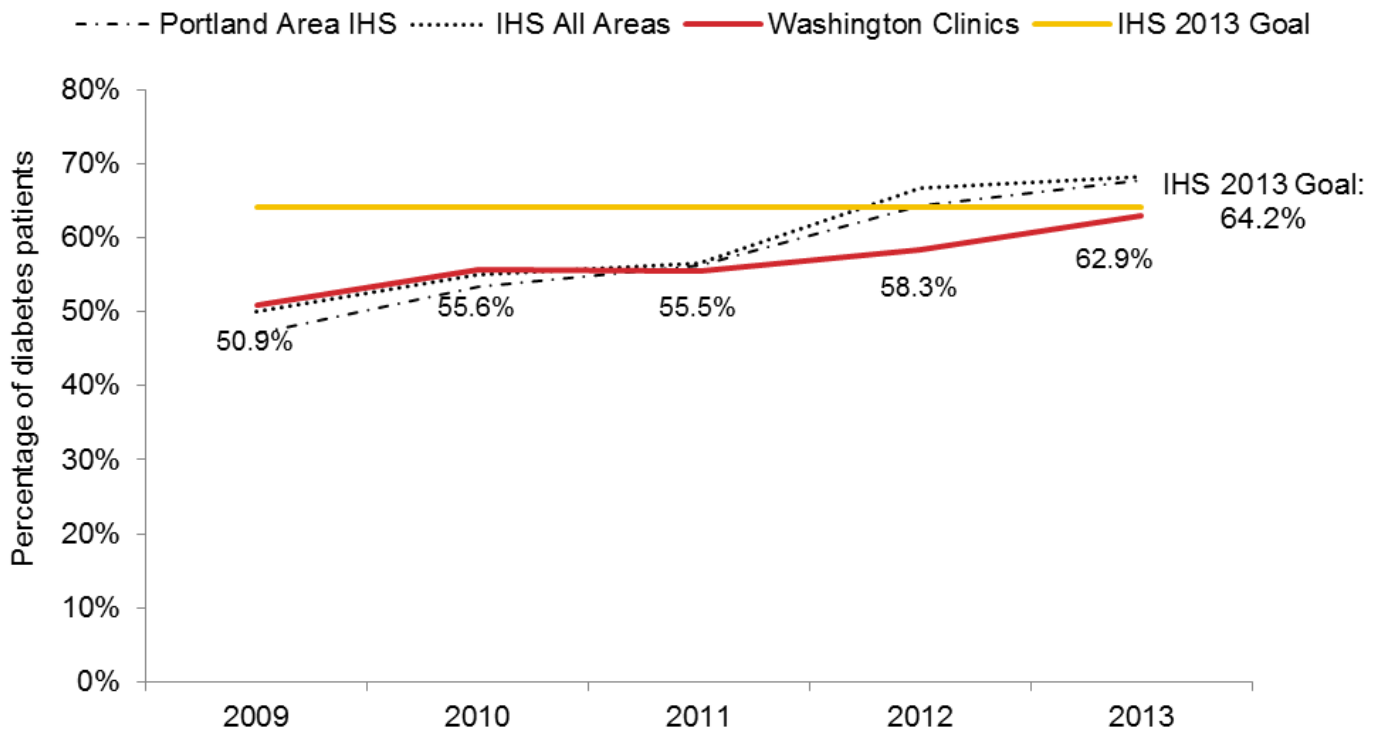
Recommended Screening - Nephropathy Assessment

Diabetic Nephropathy: The percentage of Washington AI/AN diabetes patients who had a diabetic nephropathy assessment has increased from 50.9% in 2009 to 62.9% in 2013 (Figure 4.6). Washington clinics did not meet the IHS goal of 64.2% in 2013. In recent years, Washington clinics have had a lower percentage of patients who received this recommended screening compared to the Portland Area IHS and national IHS. Both the Portland Area and national IHS exceeded the 2013 goal for this measure.

Data Source: Portland Area Indian Health Service.

Data Notes: Data labels only shown for Washington clinics. Washington clinics include non-urban federal and tribal Indian health facilities in Washington. Portland Area IHS clinics include non-urban federal and tribal Indian health facilities in Idaho, Oregon, and Washington.

Figure 4.6: Percentage of IHS diabetes patients who received a nephropathy assessment, 2009-2013.

Recommended Screening - Retinopathy Assessment

Diabetic Retinopathy: The U.S. has a Healthy People 2020 goal for 58.7% of adults with diabetes to have had a dilated eye exam in the past year. The percentage of Washington AI/AN diabetes patients who had a diabetic retinopathy exam has increased from 37.9% in 2009 to 44.7% in 2013. Since 2009, Washington clinics have had a lower percentage of patients who received this recommended screening compared to the Portland Area IHS and national IHS (Figure 4.7). Washington clinics and the Portland Area IHS did not meet the IHS goal of 56.8% in 2013. The national IHS average has increased over time and met the 2013 goal for this measure.

Data Source: Portland Area Indian Health Service.

Data Notes: Data labels only shown for Washington clinics. Washington clinics include non-urban federal and tribal Indian health facilities in Washington. Portland Area IHS clinics include non-urban federal and tribal Indian health facilities in Idaho, Oregon, and Washington.

Figure 4.7: Percentage of IHS diabetes patients who received a retinopathy assessment, 2009-2013.
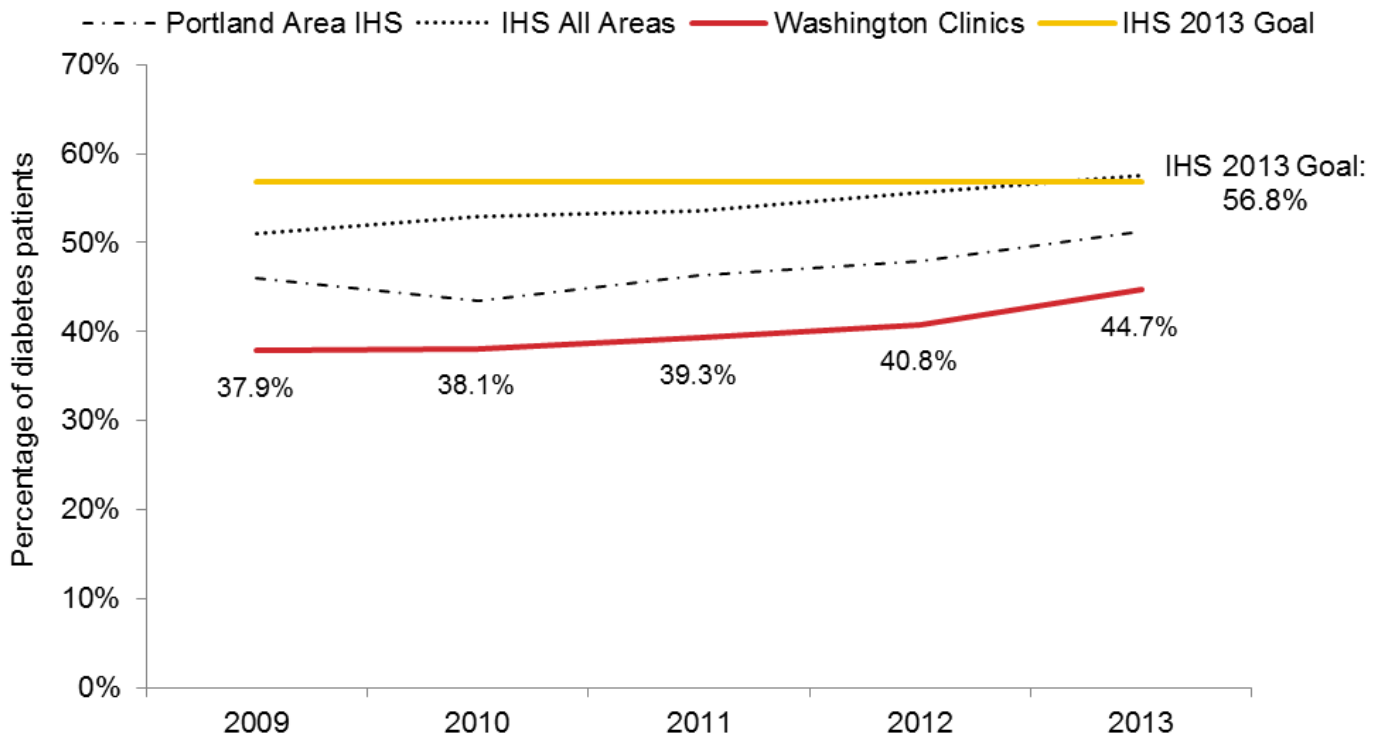
Diabetes Hospitalizations

In 2011, there were 260 hospitalizations for diabetes mellitus (types I and II) among AI/AN in Washington (Table 4.1). Diabetes accounted for a higher proportion of all hospitalizations for AI/AN compared to NHW (0.2% vs. 0.1%). For both races, males had a higher proportion of diabetes-related hospitalizations than females. The age-adjusted hospitalization rate for diabetes mellitus was higher for AI/AN males than females (Figure 4.8). The rate of diabetes hospitalizations for AI/AN of both sexes was over twice that of NHW.

Data Source: Washington state hospital discharge data (CHARS), 2011, corrected for misclassified AI/AN race by the IDEA-NW Project.

Data Notes: Principal diagnosis codes categorized using the Agency for Healthcare Research and Quality's Clinical Classification Software. The following level-2 principal diagnosis codes were included: 3.2 (diabetes mellitus without complications), and 3.3 (diabetes mellitus with complications).

Table 4.1: Inpatient hospital discharges for diabetes mellitus by race and sex, Washington, 2011.

Sex	AI/AN N (%)[†]	NHW N (%)[†]
Male	153 (2.7%)	2,504 (1.6%)
Female	107 (1.2%)	2,087 (1.0%)
Both Sexes	260 (0.2%)	4,591 (0.1%)

[†]N = number of inpatient hospitalizations. The percentages were calculated using the total inpatient hospitalizations for each group: AI/AN male (5,731), AI/AN female (8,741), AI/AN total (14,472), NHW male (159,142), NHW female (212,276), NHW Total (371,418)

Figure 4.8: Age-adjusted hospital discharge rates for diabetes by race and sex, Washington, 2011.
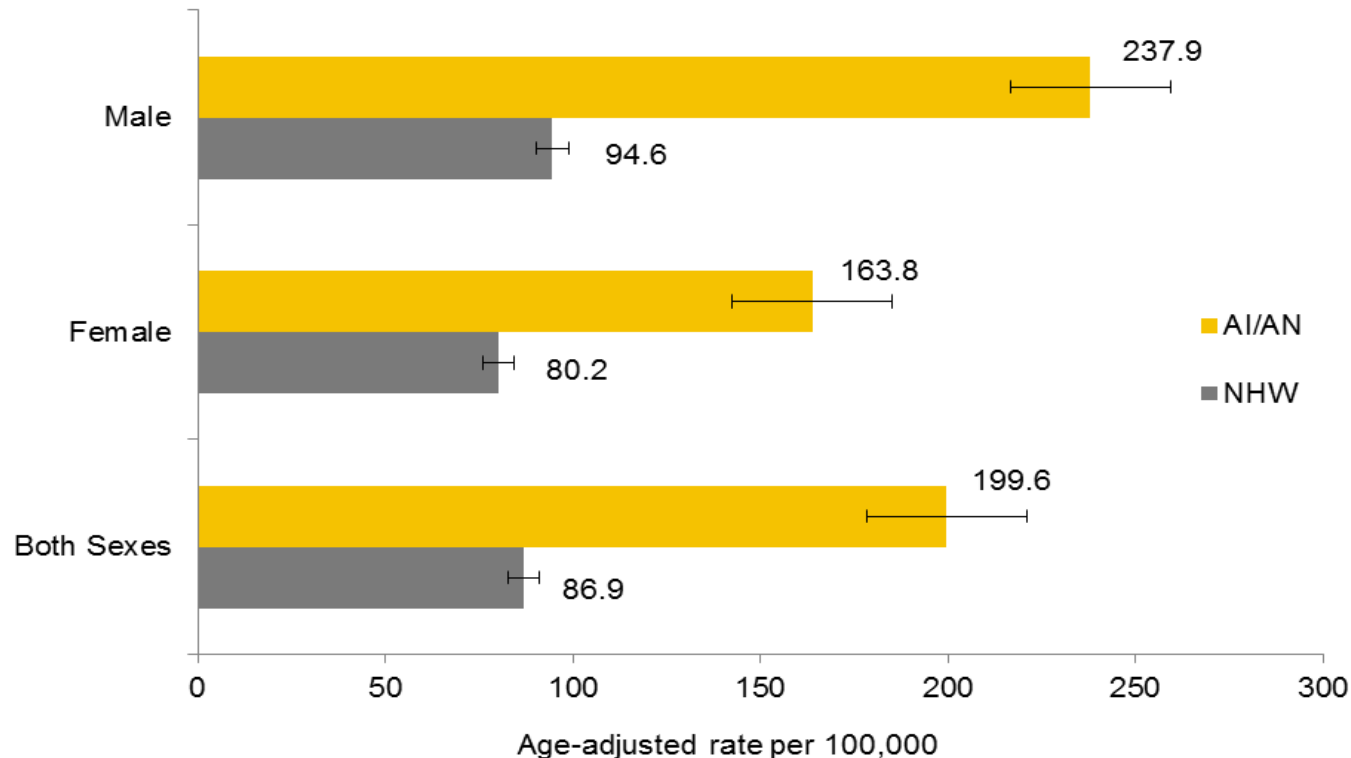
Diabetes Mortality

From 2006-2010, diabetes was the fourth leading cause of death among AI/AN in Washington. Table 4.2 and Figure 4.9 show the age-adjusted mortality rates for diabetes among AI/AN and NHW in Washington. AI/AN males were about 40% more likely to die from diabetes than AI/AN females. Diabetes mortality rates for AI/AN were almost three times higher than NHW. Throughout the Northwest, AI/AN in the states of Idaho, Oregon, and Washington have very similar diabetes mortality rates.

Data Source: Washington state death certificates, 2006-2010, corrected for misclassified AI/AN by the IDEA-NW Project.

Table 4.2: Diabetes mortality rates by race and sex, Washington, 2006-2010.

Sex	AI/AN Rate (95% CI)	NHW Rate (95% CI)	AI/AN vs. NHW Rate Ratio (95% CI)
Male	76.8 (60.5, 97.3)	26.6 (25.7, 27.5)	2.89 (2.39, 3.49) [‡]
Female	55.2 (44.1, 68.4)	18.4 (17.5, 19.2)	3.01 (2.46, 3.67) [‡]
Both Sexes	63.7 (54.4, 74.3)	22.0 (21.4, 22.7)	2.89 (2.52, 3.31) [‡]

CI = confidence interval
‡ Indicates a statistically significant difference (p<.05).

Figure 4.9: Age-adjusted diabetes mortality rates by race and sex, Washington, 2006-2010.
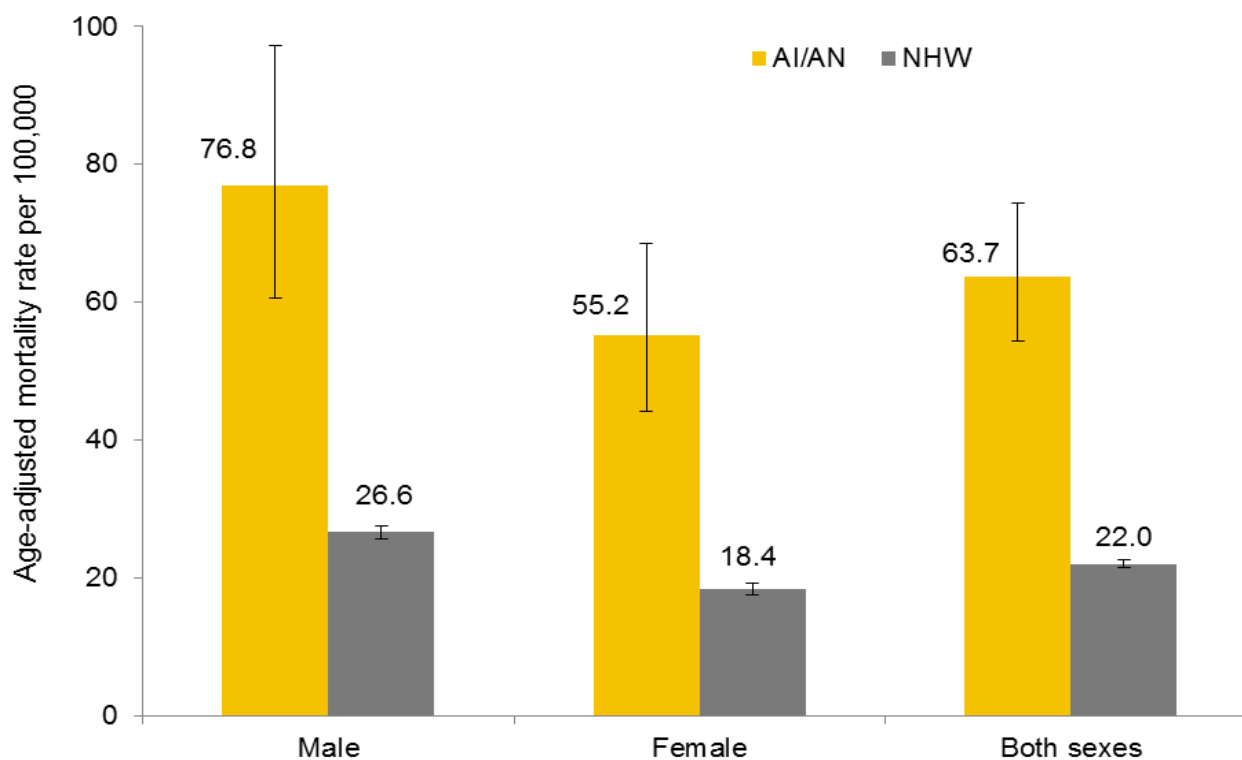
Diabetes Mortality Trends

Figure 4.10 shows diabetes mortality trends for the AI/AN and NHW population in Washington between 1990 and 2010. The yellow shaded section around the AI/AN line represents a 95% confidence interval band.

Both populations have seen increases in diabetes mortality over time, with AI/AN rates increasing on average 2.3% percent per year. The increase in AI/AN rates was driven by increases in male diabetes mortality rates; AI/AN females diabetes mortality rates did not show significant change. While AI/AN rates have been consistently higher than NHW over the time period, the disparity between the two populations has not changed.

Data Source: Washington state death certificates, 2006-2010, corrected for misclassified AI/AN race by the IDEA-NW Project.

Data Notes: APC = Annual Percentage Change. Cause of death coding on death certificates underwent a change from ICD-9 to ICD-10 between 1998 and 1999. Data shown in the trend charts in this report have not been adjusted to reflect this change. Comparability ratios for the broad categories reported here show that the change did not have a large impact for these statistics, however any abrupt changes between 1998 and 1999 should be interpreted with caution.

Diabetes

Figure 4.10: Age-adjusted diabetes mortality rates, three year rolling averages, by race, Washington, 1990-2010.
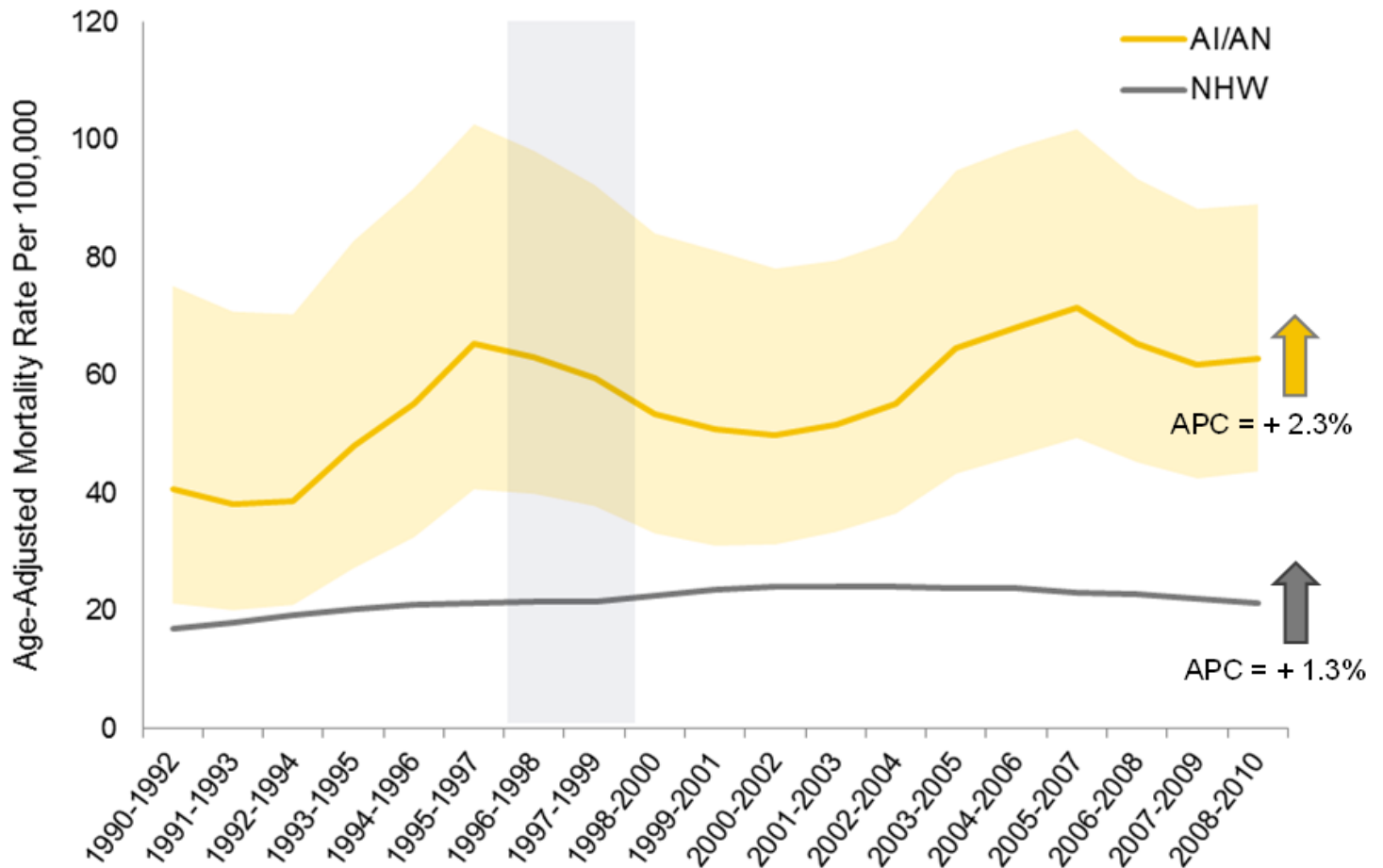
Note: The shaded rectangle indicates the year cause of death coding changed from ICD-9 to ICD-10. Any abrupt changes between 1998 and 1999 should be interpreted with caution.

Program Spotlight: Western Tribal Diabetes Project

The WTDP assists tribal programs in tracking, reporting, and utilizing accurate data on patients with diabetes. This information is used to improve the quality of patient care, gain additional resources, and plan effective intervention programs to reduce the burden of diabetes at the local level. WTDP provides tribes with training, technical assistance, and tools so they can:

- Build a foundation to provide complete and accurate information about patients with diabetes

- Estimate the burden of disease and impact of diabetes by using an electronic diabetes register

- Improve health outcomes by using an electronic diabetes register to make informed decisions about clinical diabetes care

- Prevent diabetes in high-risk individuals.

For more information, please contact:

Kerri Lopez (Tolowa Tribe)

Project Director

klopez@npaihb.org

503-416-3301

WTDP holds regular trainings on the Diabetes Management System, provides technical assistance with completing the Annual IHS Diabetes Audit and maintaining local diabetes registers, prepares tribe and area-level reports on patient care and outcomes, and provides information on best practices to prevent and manage diabetes. WTDP also partners with the Portland Area IHS and Nike to host Nike Native Fitness workshops at the Nike World Headquarters in Beaverton, OR. WTDP is funded by an annual 5% set-aside from the Portland Area's allocation for the Special Diabetes Program for Indians.

http://www.npaihb.org/epicenter/project/wtdp