

# 4. Diabetes

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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 because of non-healing infections.<sup>1</sup>

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.<sup>2</sup> AI/AN diabetes rates vary by region, from 6% for Alaska Natives to 24.1% for American Indians in Arizona.<sup>2</sup>

Diabetes is the fourth leading cause of death for AI/AN nationwide.

While AI/AN in Oregon have higher rates of diabetes than NHW in the state, the prevalence of diabetes among IHS patients is

lower in Oregon compared to the national IHS average. Diabetes is the fifth leading cause of death for AI/AN in Oregon. The death rate from diabetes is nearly 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.

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.<sup>3</sup>

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=resource&FactSheets#2>

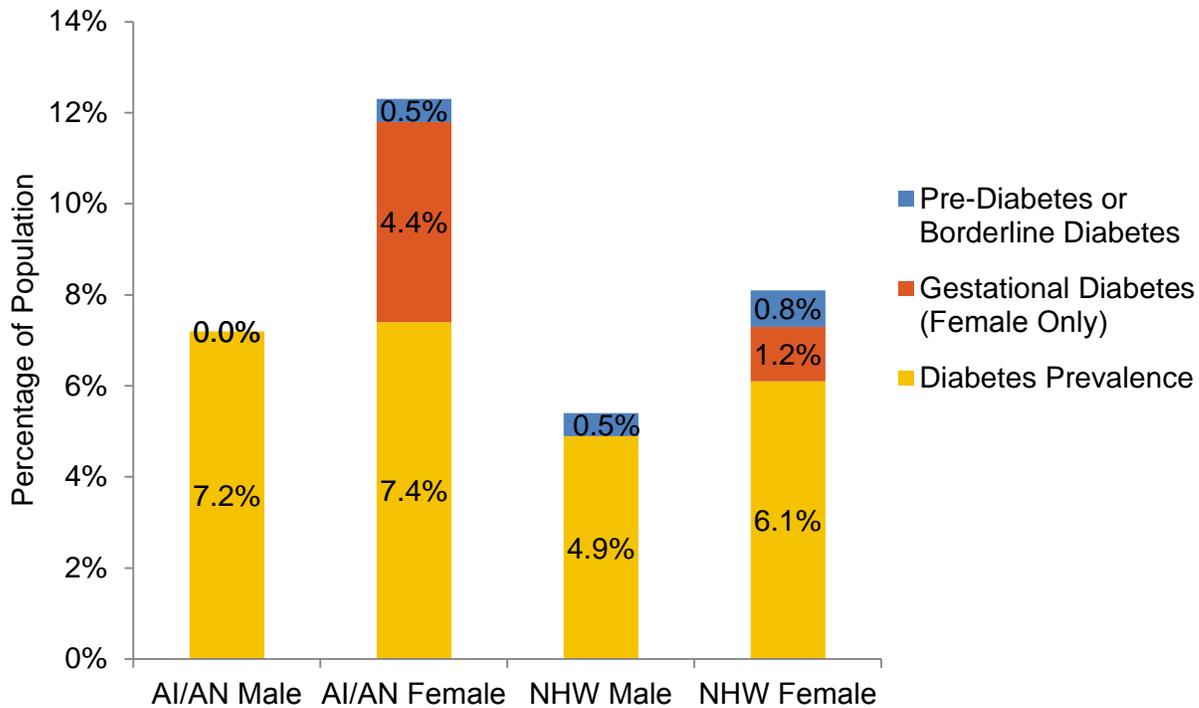
# Self-Reported Diabetes

Figure 4.1 shows the prevalence of self-reported diabetes among AI/AN and NHW adults in Oregon. From 2006-2012, AI/AN males and females had the same rate of diabetes (7%). This was higher than the rate among NHW males (5%) and females (6%). The rate of gestational diabetes was higher for AI/AN females (4%) than NHW females (1%). The rate of pre-diabetes was the same for AI/AN and NHW females, and slightly higher for AI/AN males compared to NHW males.

**Data Source:** CDC Behavioral Risk Factor Surveillance System (BRFSS), 2006-2012.

**Data Notes:** The BRFSS prevalence estimates (shown as a percentage) are weighted to make the survey responses representative of the Oregon population. The sample sizes presented below the figures are the unweighted number of people who answered this question for the indicated years.

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



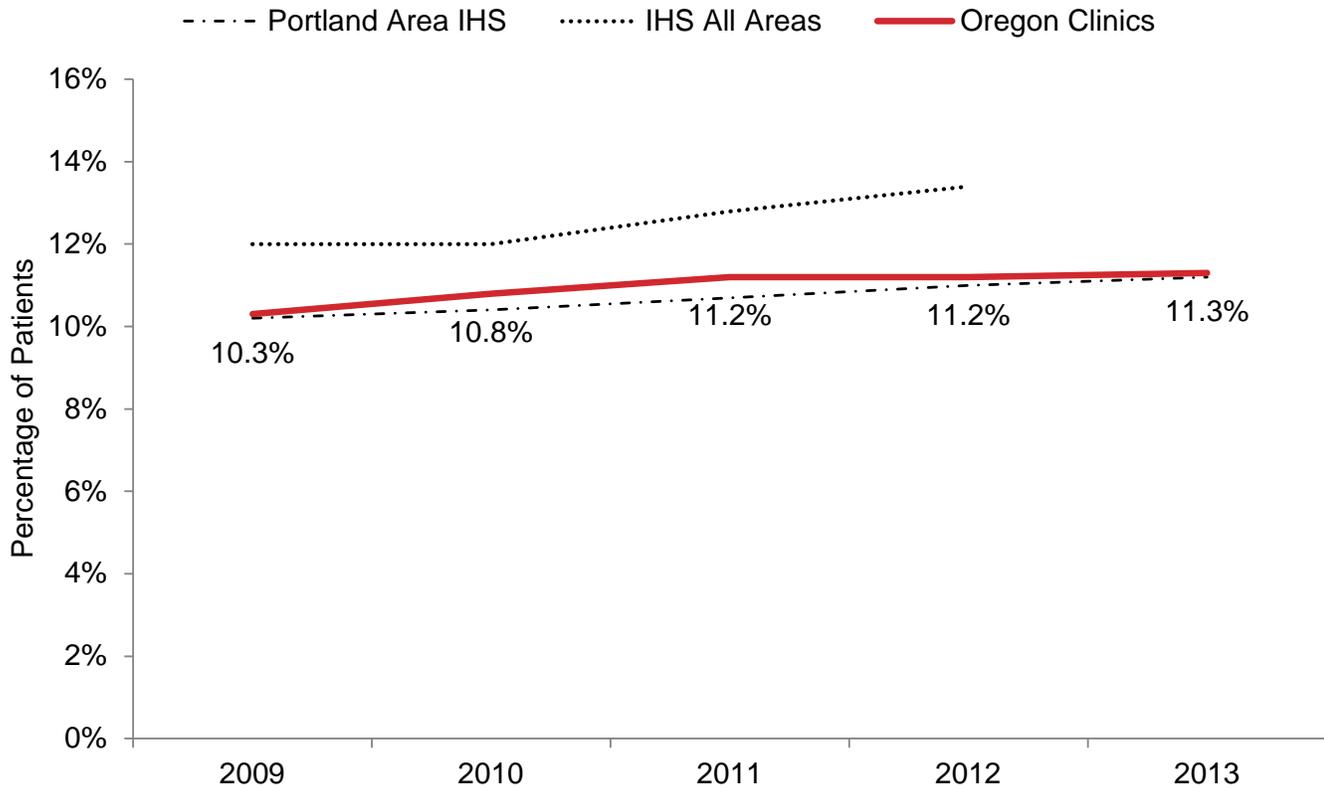
Sample sizes (n): AI/AN males=170; AI/AN females=221; NHW males=13,060; NHW females=19,475.

# Diabetes Prevalence

From 2009-2013, AI/AN patients who received care at Indian health facilities in Oregon had a lower prevalence of diabetes compared to IHS patients nationwide, and similar prevalence to Portland Area patients (Figure 4.2). The diabetes prevalence in the Oregon patient population followed the Portland Area IHS trend, with approximately a 1% increase over the 5 years, while the prevalence in the national IHS patient population saw a larger increase over the same time period.

**Data Source:** Portland Area Indian Health Service.

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

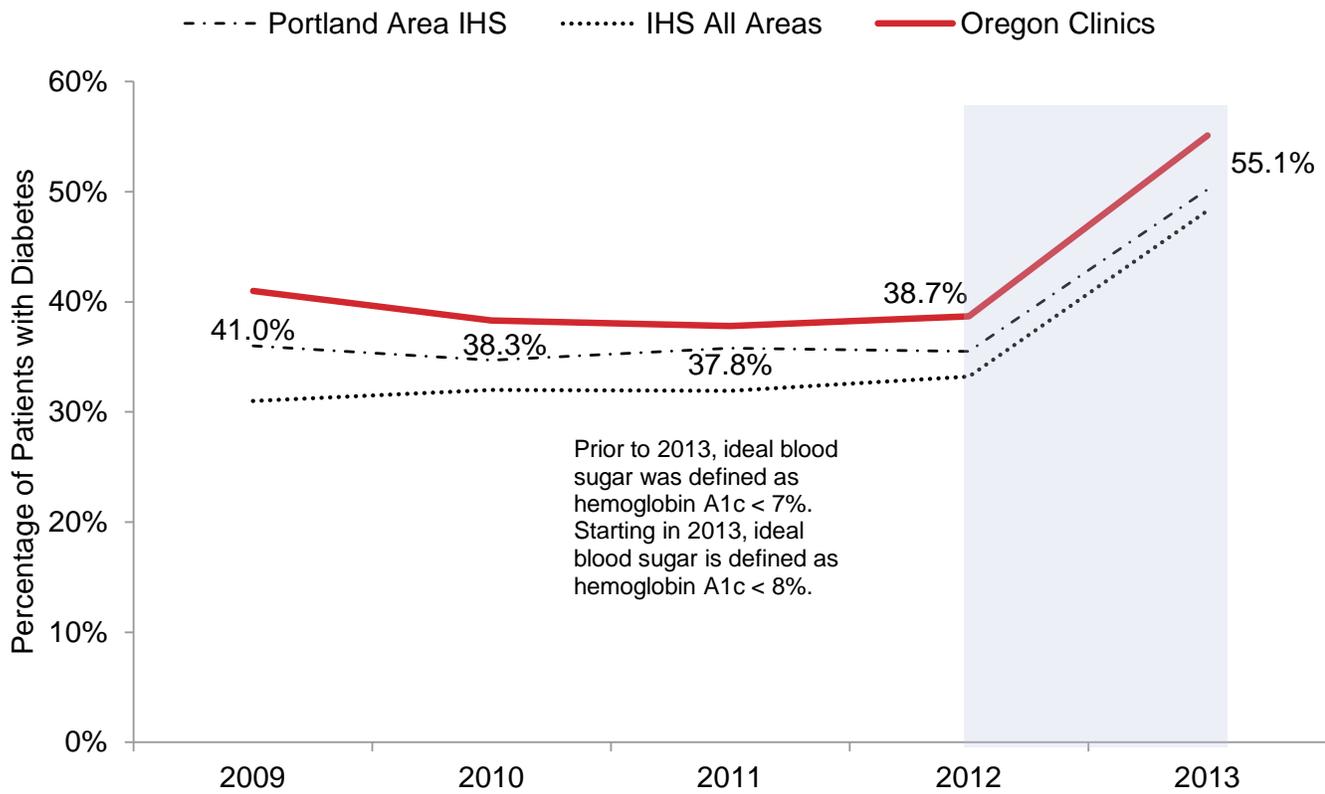
Blood sugar control, as measured by the Hemoglobin A1c, is an important indicator of how well diabetes patients are managing their disease. The U.S. goal is for 58.9% of adults with diabetes to have a hemoglobin A1c level below 7% (Healthy People 2020). Until 2012, IHS defined ideal blood sugar control as having a hemoglobin A1c level below 7%. This treatment goal was relaxed in 2013 to a hemoglobin A1c result below 8%.

From 2009 to 2012, between 38-41% of AI/AN diabetes patients seen in Oregon clinics had ideal blood sugar levels. In 2013, this increased to 55.1% as a result of the definition change. Over all years, Oregon clinics have a higher percentage of patients with controlled blood sugar compared to both the Portland Area IHS overall, national IHS average.

**Data Source:** Portland Area Indian Health Service.

**Data Notes:** The shaded area shows the year when the definition for ideal blood control changed. Data labels only shown for Oregon clinics. Oregon clinics include non-urban federal and tribal Indian health facilities in Oregon. 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.**



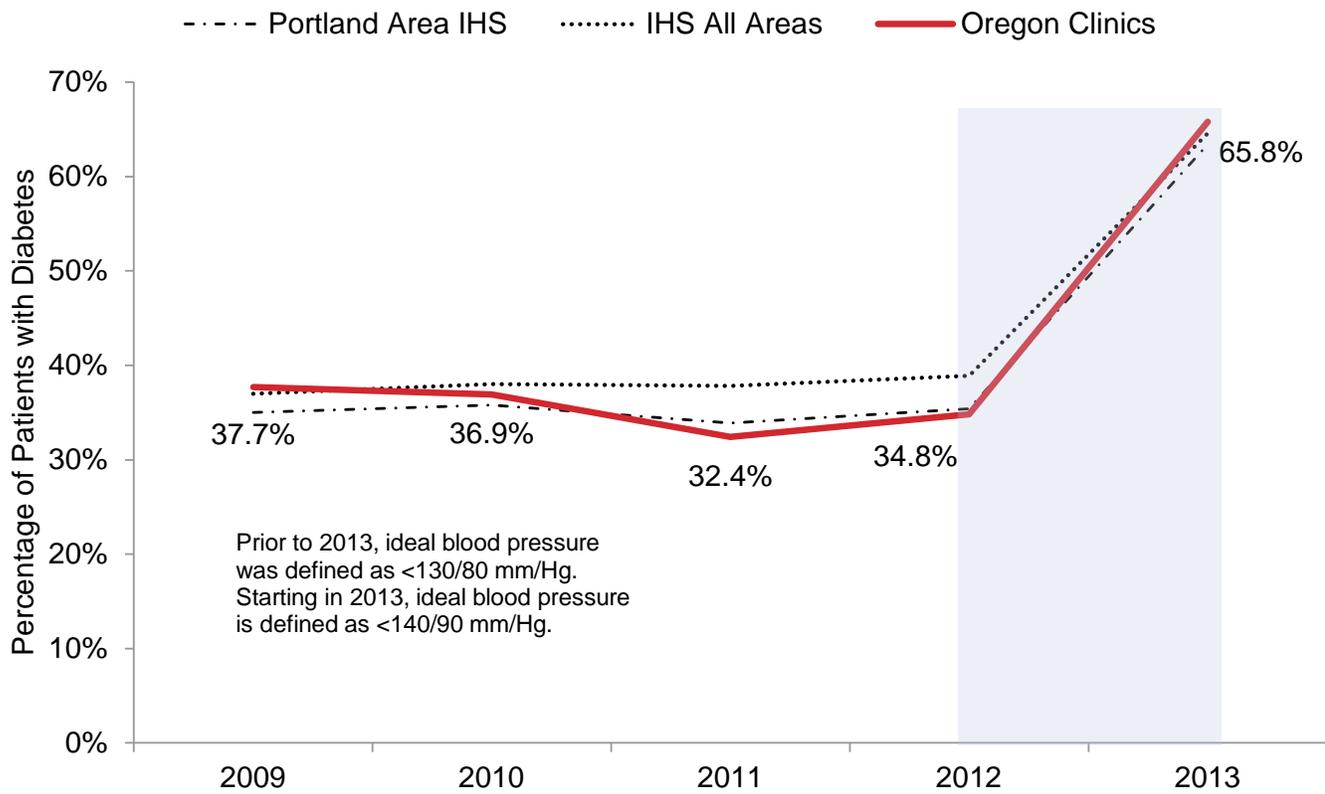
# Blood Pressure Control

Diabetes patients have increased risks for heart disease, and can reduce these risks by managing their blood pressure. The U.S. goal is for 57% of adults with diabetes to have their blood pressure under control (Healthy People 2020). Until 2012, IHS defined ideal blood pressure control for diabetes patients as having a blood pressure level below 130/80 mm Hg. This treatment goal was relaxed in 2013 to a blood pressure level below 140/90 mm Hg.

From 2009 to 2012, approximately between 34-38% of AI/AN diabetes patients seen in Oregon clinics had ideal blood pressure levels. In 2013, this increased to 55.8% as a result of the definition change. Oregon clinics have a lower percentage of patients with controlled blood sugar compared to all IHS areas, but are approximately equal to the Portland Area IHS average.

**Data Source:** Portland Area Indian Health Service.

**Data Notes:** The shaded area shows the year when the definition for ideal blood control changed. Data labels only shown for Oregon clinics. Oregon clinics include non-urban federal and tribal Indian health facilities in Oregon. 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.**

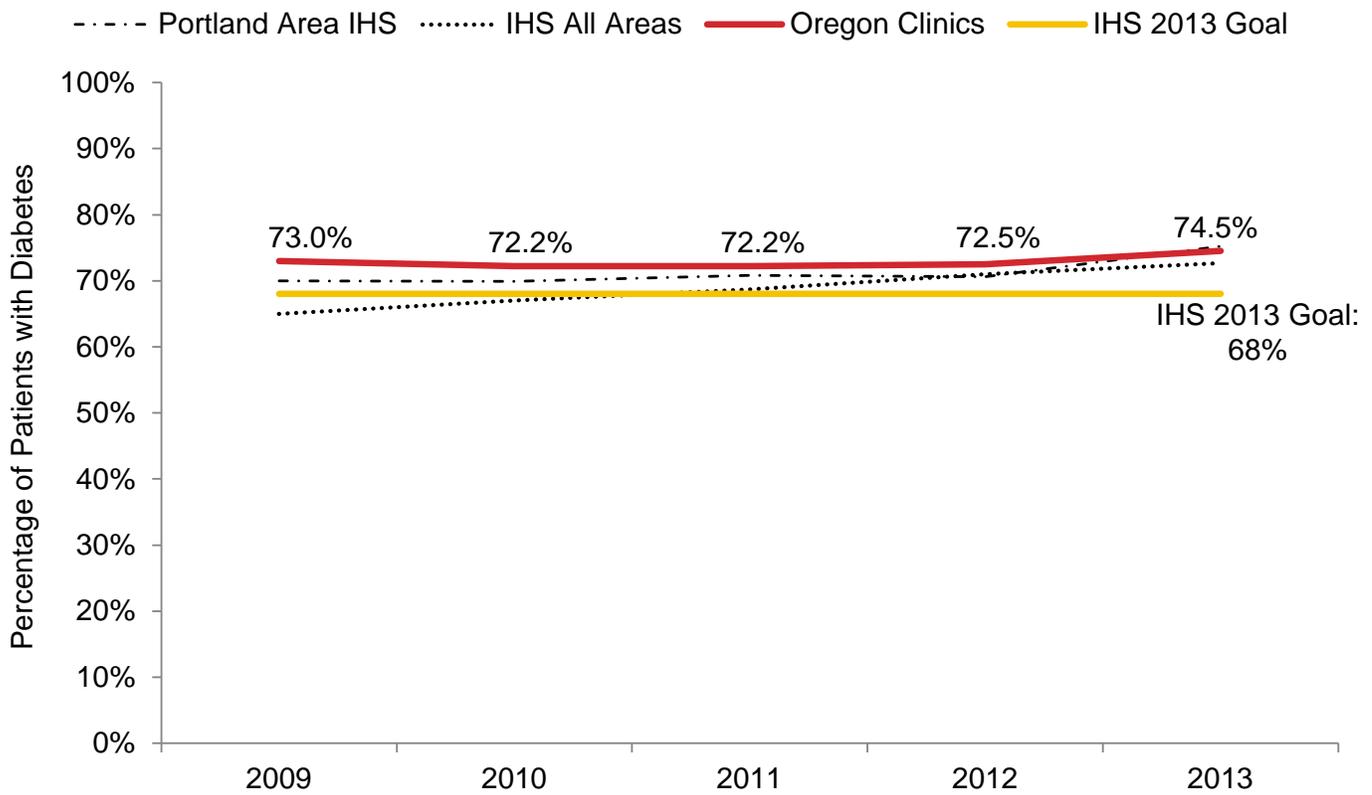
# Screening - LDL Cholesterol Assessment

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. Routine physical examinations and test can help patients and their healthcare providers to manage diabetes and related health issues. IHS has performance goals to measure how many diabetes patients are examined yearly 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 73% of AI/AN diabetes patients seen in Oregon clinics had their LDL cholesterol levels assessed. This increased to 74.5% in 2013, which exceeded the IHS goal of 68% (Figure 4.5). Since 2009, Oregon clinics have matched or performed better than both Portland Area and national IHS patients. The national IHS average has increased since 2009, and also exceeded the 2013 goal.

**Data Source:** Portland Area Indian Health Service.

**Data Notes:** Data labels only shown for Oregon clinics. Oregon clinics include non-urban federal and tribal Indian health facilities in Oregon. 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.**

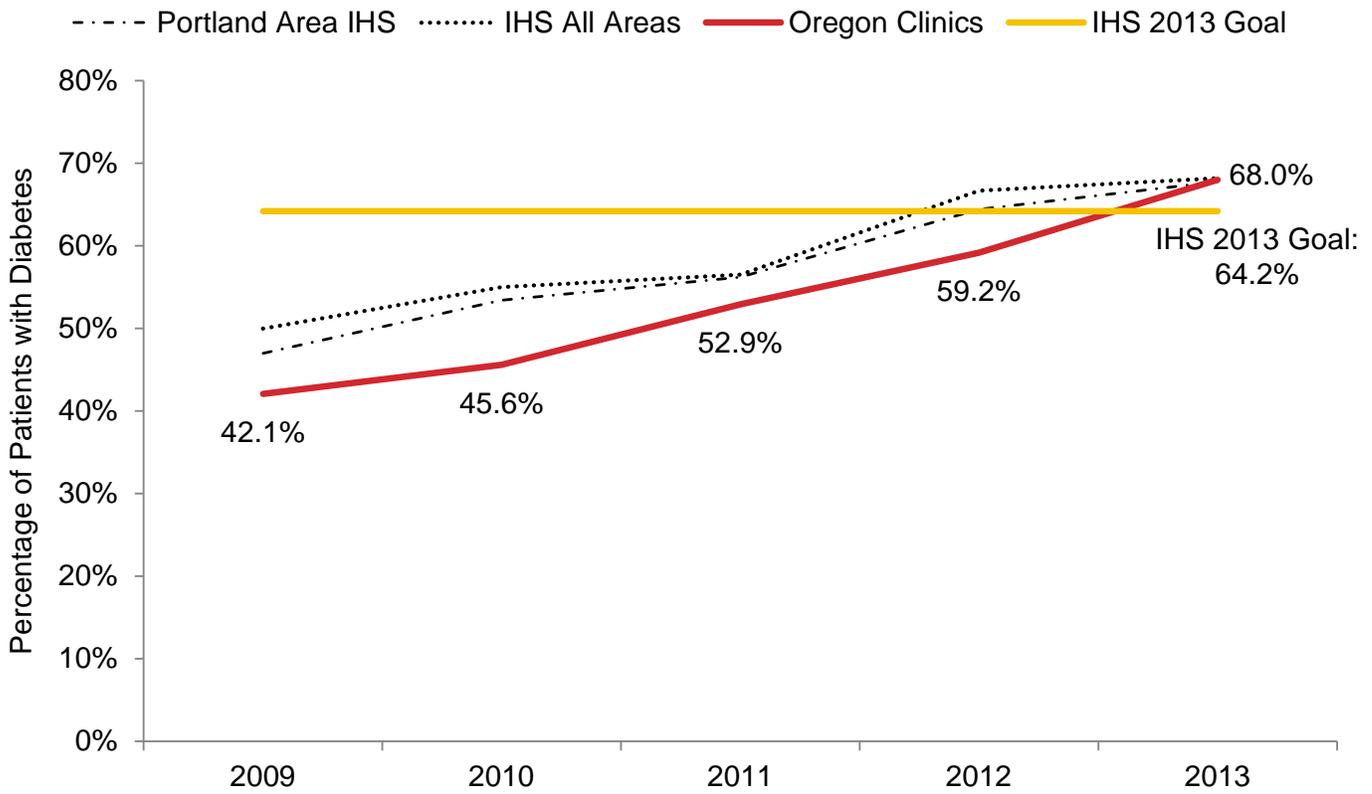
# Screening - Nephropathy Assessment

*Diabetic Nephropathy:* The percentage of Oregon AI/AN diabetes patients who had a diabetic nephropathy assessment has increased from 42.1% in 2009 to 68% in 2013, exceeding the IHS 2013 goal of 64.2%. Until 2013, Oregon clinics have had a lower percentage of patients who received this recommended screening compared to both the Portland Area IHS and national IHS. By 2013, Oregon clinics are performing on par with both Portland Area and national IHS, all of which are exceeding the national goal.

**Data Source:** Portland Area Indian Health Service.

**Data Notes:** Data labels only shown for Oregon clinics. Oregon clinics include non-urban federal and tribal Indian health facilities in Oregon. 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.**



# Screening - Retinopathy Assessment

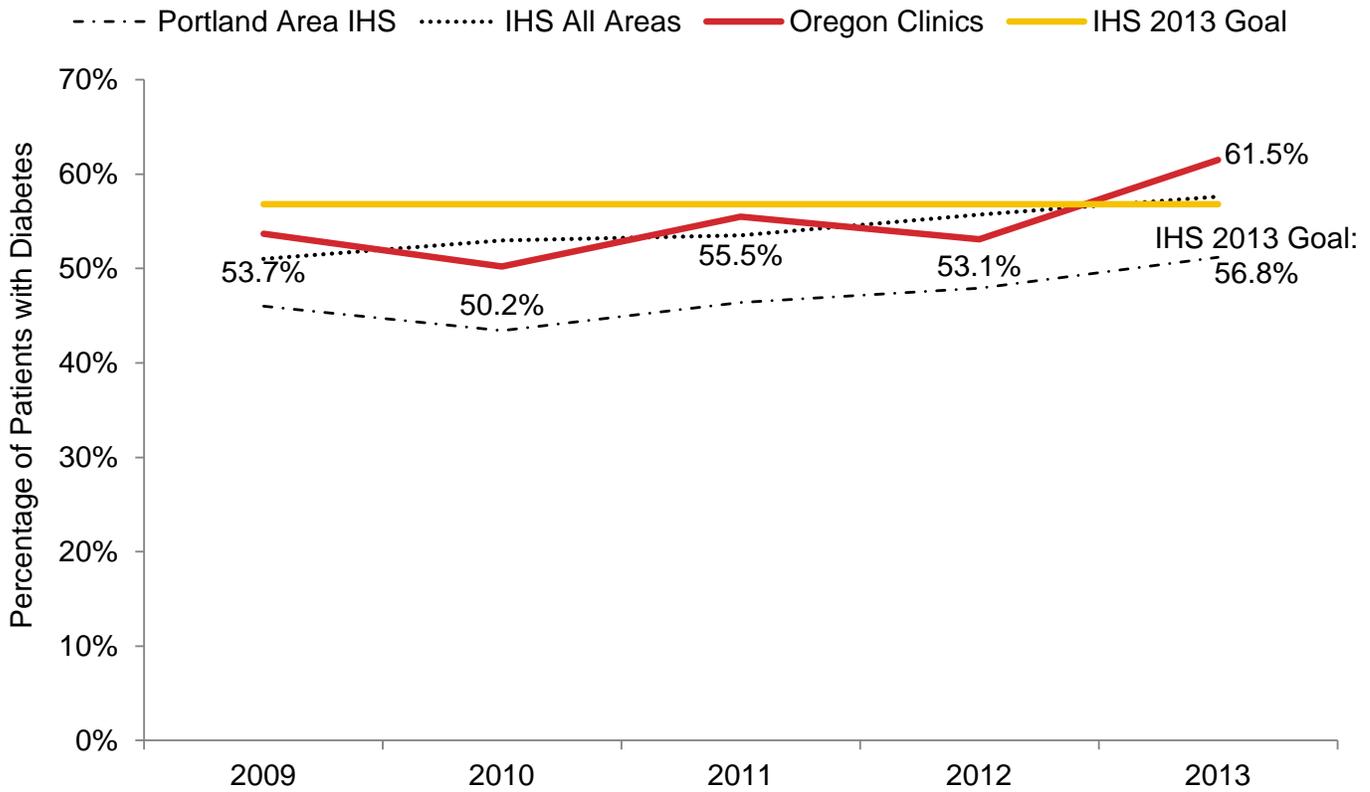
*Diabetic Retinopathy:* The U.S goal is for 58.7% of adults with diabetes to have had a dilated eye exam in the past year, (Healthy People 2020), and the IHS goal for 2013 was for 56.8% to have received this recommended screening.

The percentage of Oregon AI/AN diabetes patients who had a diabetic retinopathy exam has increased from 53.7% in 2009 to 61.5% in 2013. Since 2009, Oregon clinics have had a higher percentage of patients who received this recommended screening compared to the Portland Area IHS (Figure 4.7). In 2013, Oregon clinics exceeded the IHS 2013 Goal of 56.8%. 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 Oregon clinics. Oregon clinics include non-urban federal and tribal Indian health facilities in Oregon. 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

From 2010 to 2011, 1.8% of AI/AN inpatient hospitalizations in Oregon had a primary diagnosis of diabetes (with or without complications); this percentage is almost two times greater than for NHW (1.0%) (Table 4.1). Males had a higher percentage than females for both race groups, with AI/AN males having the highest percentage of hospitalizations for diabetes (2.6%). The age-adjusted hospital discharge rate for diabetes mellitus was higher for AI/AN than NHW regardless of sex, with the widest gap seen among females – the rate for AI/AN females was nearly twice that of NHW females.

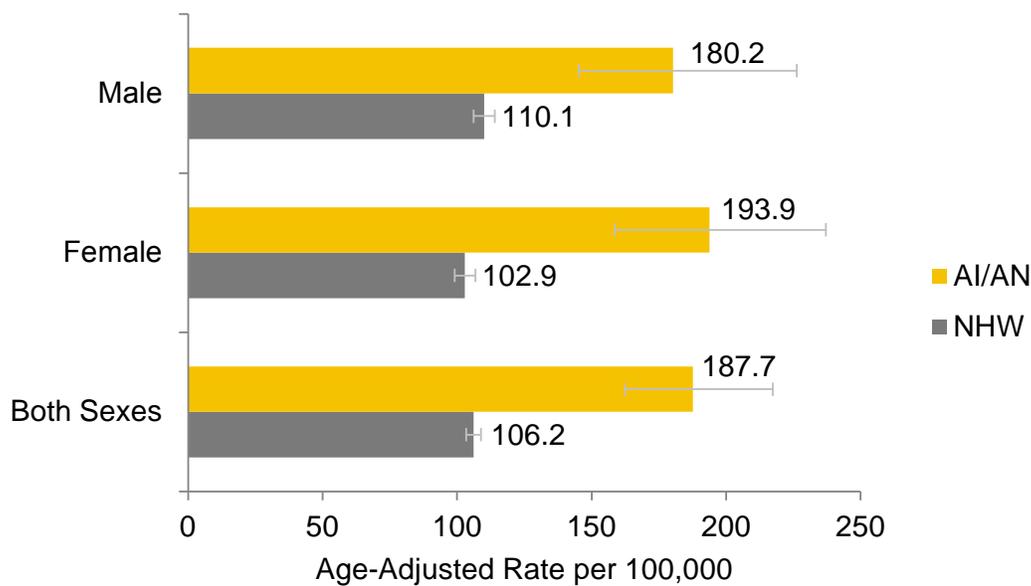
**Data Source:** Oregon inpatient hospital discharge data (2010-2011), corrected for misclassified AI/AN race, IDEA-NW Project, NPAIHB.

**Data Notes:** Data are from the Oregon Office for Health Policy and Research; race-corrected and compiled by the IDEA-NW Project, NPAIHB. AI/AN includes any mention of AI/AN in either the OR state hospital discharge data or the Northwest Tribal Registry (NTR), which is maintained by the IDEA-NW Project at NPAIHB.

**Table 4.1: Inpatient hospital discharges for diabetes by race and sex, Oregon, 2010-2011.**

Sex	AI/AN N <sup>†</sup> (%)	NHW N <sup>†</sup> (%)
Male	120 (2.6%)	2,830 (1.3%)
Female	85 (1.2%)	2,393 (0.8%)
<b>Both Sexes</b>	<b>205 (1.8%)</b>	<b>5,223 (1.0%)</b>

† N = number of hospitalizations. The percentages were calculated using the total inpatient hospitalizations for each group: AI/AN male (N=4,603), AI/AN female (N=7,015), AI/AN total (N=11,618), NHW male (N=225,270), NHW female (N=303,952), and NHW total (N=529,222).

**Figure 4.8: Age-adjusted hospital discharge rates for diabetes by race and sex, Oregon, 2010-2011.**

# Diabetes Mortality

From 2006-2010, diabetes was the fifth leading cause of death among AI/AN in Oregon. Figure 4.9 shows the age-adjusted death rates for diabetes among AI/AN and NHW in Oregon. AI/AN males were 23% more likely to die from the disease than AI/AN females. Compared to NHW, AI/AN diabetes death rates were 2.8 times higher (Figure 4.9). Throughout the Northwest, AI/AN in all three states had very similar diabetes death rates.

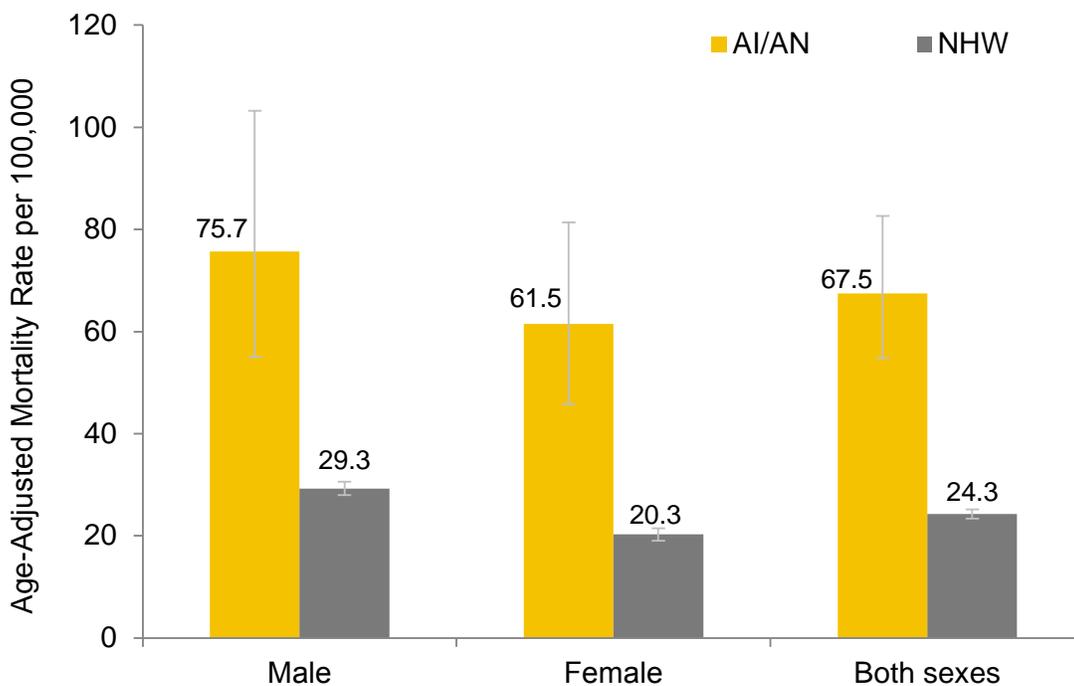
**Data Source:** Oregon state death certificates, 2006-2010, corrected for misclassified AI/AN by the IDEA-NW Project.

**Table 4.2: Age-adjusted diabetes mortality rates by race and sex, Oregon, 2006-2010.**

Sex	AI/AN Rate (95% CI)	NHW Rate (95% CI)	AI/AN vs. NHW Rate Ratio (95% CI)
Male	75.7 (55.0, 103.2)	29.3 (28.0, 30.6)	2.6 (2.0, 3.3) <sup>†</sup>
Female	61.5 (45.8, 81.3)	20.3 (19.0, 21.5)	3.0 (2.4, 3.9) <sup>†</sup>
Both Sexes	67.5 (55.8, 82.6)	24.3 (23.4, 25.2)	2.8 (2.3, 3.3) <sup>†</sup>

CI = confidence interval

<sup>†</sup> Indicates a statistically significant difference (p<.05)

**Figure 4.9: Age-adjusted diabetes mortality rates by race and sex, Oregon, 2006-2010.**

## ***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:

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

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.

