Urban Indian Health Institute
Urban Indian Health Institute
A Division of the Seattle Indian Health Board

Urban Diabetes Care and Outcomes Summary Report: Aggregate Results from Urban Indian Health Organizations, 2009-2013

April 2014

The mission of the Urban Indian Health Institute is to support the health and well-being of urban Indian communities through information, scientific inquiry and technology.

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Please contact the Urban Indian Health Institute with your comments by emailing elizabethk@uihi.org, calling (206) 812-3030 or visiting us online at www.uihi.org.

ACKNOWLEDGEMENTS

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EXECUTIVE SUMMARY

Introduction

The Urban Indian Health Institute (UIHI) developed the Urban Diabetes Care and Outcomes Summary Report to provide a summary of the Indian Health Service (IHS) Diabetes Care and Outcomes Audit (Diabetes Audit) data collected by participating IHS funded Urban Indian Health Organizations (UIHOs). This report's format is based on the IHS Diabetes Best Practice Guidelines. Included in the report are select key measures from the Best Practice Guidelines, with accompanying aggregated data from participating UIHOs. Three individual programs are also highlighted, to spotlight examples of some of the innovative work currently taking place around the country.

Methods

The data for this analysis were obtained from the Diabetes Audit performed at participating UIHOs from 2009 through 2013. Data collected and submitted to the IHS by participating UIHOs were provided to the UIHI by the IHS Division of Diabetes Prevention and Treatment for analysis and reporting purposes.

Results

For the 2013 Diabetes Audit, there were 3,611 American Indian/Alaska Native (AI/AN) patients in diabetes registries across 31 UIHO facilities. Below are some of the key findings from the analysis:

- The percent of patients in UIHO Diabetes Registries who were included in the Diabetes Audit increased from 54% in 2009 to 76% in 2013.
- In 2013, 65% of audited patients received both nutrition and physical activity education, up from 55% in 2009.
- In 2013, 69% of audited patients had a record of a complete cardiometabolic risk profile that included multiple lab values and clinical measurements.
- In 2013, similar to previous years, 55% of audited patients had their most recent Hemoglobin A1c value under 8.0%.
- Screening for depression continues to increase: 82% of audited patients without a diagnosis of depression were screened, up from 68% in 2009.
- Dental exams and eye exams continue to be well below HP2020 targets: in 2013, only 43% of audited patients had a record of an annual eye exam and only 28% had a record of a dental exam.

Discussion

This report summarizes trends in diabetes services and clinical outcomes among AI/AN patients with diabetes at UIHOs participating in the Diabetes Audit from 2009 through 2013. These findings do not reflect changes experienced by individual patients, but instead highlight areas of progress and challenge across patients seen at urban facilities. Over the 2009-2013 period, UIHOs have maintained or experienced improvements in important diabetes clinical care outcomes and receipt of critical screening and education services. Urban diabetes programs also have struggled to effect change in specific areas. Each facility is unique, and it is difficult to determine why some indicators are not improving over time. These data bring awareness to UIHO staff and other stakeholders about challenges and opportunities in diabetes care across the urban programs. This report can motivate information-sharing around potential innovations or areas of need in clinical care, educational interventions, data collection or other efforts focused on improving UIHO patients' diabetes care and outcomes.

INTRODUCTION

Background: Diabetes Mellitus is a major public health problem among American Indians and Alaska Natives (AI/ANs), and the prevalence of diabetes among AI/AN adults is twice that of non-Hispanic white adults.[1] In an effort to reduce the burden of diabetes among AI/ANs, Congress established the Special Diabetes Program for Indians (SDPI) in 1997.[2] The SDPI provides funding specifically to aid in the prevention and treatment of diabetes in AI/AN communities.

To better understand the trends in diabetes services and outcomes among AI/AN patients with diabetes, Indian health agencies nationwide conduct an annual medical chart audit, also known as the Indian Health Service (IHS) Diabetes Care and Outcomes Audit (or "Diabetes Audit"). Information collected by these agencies is submitted to the IHS Division of Diabetes Treatment and Prevention. This information is used for diabetes surveillance and to provide a clinical overview of diabetes care and services throughout the Indian health system. The Diabetes Audit is based on consensus-derived standards of care, also known as the Standards of Care and Clinical Practice Recommendations: Type 2 Diabetes.[3]

The Urban Indian Health Institute, in collaboration with the IHS Division of Diabetes Treatment and Prevention, developed the Urban Diabetes Care and Outcomes Summary Report to provide a summary of the annual Diabetes Audit data collected by participating SDPI recipients that are part of the network of IHS-funded Title V Urban Indian Health Organizations (UIHOs).

Report Content: This report is based on 2011 IHS Diabetes Best Practices, including the 2014 Addendum.[4] First developed in 2001 by a workgroup coordinated by the IHS Division of Diabetes Treatment and Prevention, the Best Practices are based on the latest scientific research as well as diabetes success stories and experiences within AI/AN communities. The Best Practices are focused on both clinical (e.g. weight management) and community (e.g. school health) settings. This report provides information about clinical Best Practices only. "Key Measures" were selected by the IHS workgroup for each Best Practice topic area as important indicators that can be used to measure a diabetes program's progress and outcomes. When Diabetes Audit data can be used to evaluate these Key Measures, a graph of aggregate UIHO data is presented. Other sources of data are needed to measure progress on those Key Measures that cannot be assessed using current IHS Diabetes Audit data. For Best Practice II: Cardiovascular Disease, three "Alternative Measures" are also included in this report. These can provide additional tracking opportunities.

When applicable, 2013 IHS Government Performance and Results Act (GPRA) Goals[5] and Healthy People 2020[6] Targets are also included. These are universal targets and not treatment goals for individual patients. They are provided to help describe how patients collectively across UIHO diabetes programs compare with national benchmarks. Official GPRA results are prepared and distributed by the IHS Planning and Evaluation office.

UIHO diabetes programs offer a wide variety of services, from referral-only sites to comprehensive out-patient care centers. Three examples of diabetes programs are described in this report, which highlight different ways that staff have used their Diabetes Audit data to make improvements in service delivery.

Tables with additional Diabetes Audit data are available in Appendix A.

A glossary of related terms is included in Appendix B.

INTRODUCTION

Data Collection and Analysis: The data for this analysis were obtained from the Diabetes Audit performed at participating UIHOs from 2009 through 2013. Each year, participating UIHOs submit data from AI/AN patients in their registry who received diabetes health care services and had at least one primary care visit during the past 12 months. Some facilities audit 100% of AI/AN patients medical records who meet eligibility criteria, while other facilities use a systematic random sampling scheme to provide estimates.[7]

Percentages shown are computed as a proportion of all audited records, unless otherwise specified. Patients with missing values (indicated as "not tested or no valid result" or "not documented") for a particular measure are included in the denominator. UIHO aggregate estimates in the report are weighted to account for differing sampling approaches used across facilities. Several measures included in this report were calculated by the IHS Division of Diabetes Treatment and Prevention and were not directly reported from the facilities. Values determined to be data errors have been removed. Statistical tests to compare changes in percentages over time were not performed. Stata version 13.1 (Stata Corp., College Station, Texas) was used to perform all statistical analyses.

Considerations: Trends across years should be interpreted with caution, as the patient population in the registry as well as those audited may differ from year-to-year. These data cannot be used to track individual patients and their changes over time.

Some measures have a high proportion of missing values; this can affect the results. Reducing the amount of missing data at each facility will improve the quality of future reports. The proportion of missing data for a given facility may be related to the patients' use of multiple health care providers in different health care systems, making it challenging for the facility to capture data.

While the Diabetes Audit can show changes in diabetes care and patient outcomes, there may be important indicators not captured by these data that better represent the achievements and challenges of each program. Examples of potential indicators include setting and achieving individual patient goals, diet changes and cultural connectedness.

Each UIHO service provider is unique, and the range of services offered varies considerably from site to site. An aggregate report of UIHO data cannot encompass all the nuances each individual program experiences, however the intent is to bring awareness about opportunities and challenges in diabetes care across the urban programs.

DIABETES REGISTRIES: Urban Indian Health Organizations

The following graph displays the number of urban facilities reporting each year, the number of patients audited and the number of patients included in the diabetes registries from all participating facilities.

FIGURE 1

Patients in Diabetes Registries, Urban Indian Health Organizations, 2009 - 2013
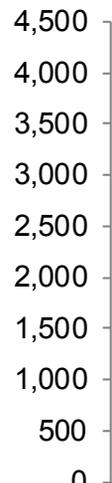
	2009	2010	2011	2012	2013
Total number in Registries*	3,657	3,849	3,512	3,603	3,611
Number of Patients Audited^	1,970	2,132	2,432	2,591	2,752
Percent of Patients Audited+	54%	55%	69%	72%	76%
Number of Facilities#	31	30	31	30	31

*Sum of all patients in each registry
^Sum of all patients in Audit
+(Number of patients audited/number of patients in registry) ×100
#Number of Urban Indian Health Organizations participating. Data from IHS demonstration sites not included.

Description of Graphic: For the 2013 Diabetes Audit, there were 3,611 AI/AN patients in diabetes registries across 31 UIHO facilities. The percent of diabetes patients audited from diabetes registries has increased from 54% in 2009 to 76% in 2013. This change is possibly due to an increasing number of UIHOs moving from a manual audit to an electronic audit, where data are extracted from an electronic health record system and then uploaded to a central database via the WebAudit's upload tool. This allows a larger number of patients to be included without increased effort or resources.

BEST PRACTICE I: Adult Weight Management

Overview: Overweight and obesity can lead to poor health outcomes in individuals with diabetes by increasing insulin resistance and raising blood glucose levels.[8] Diet and exercise together provide the best approach for weight loss and maintenance. Even modest weight loss can improve glycemic outcomes and have a beneficial effect on blood pressure and blood lipids for individuals with diabetes and insulin resistance.[9] On a community level, changes to physical and food environments may provide opportunities to eat healthy foods and to be physically active on a daily basis.[10]

KEY MEASURE 1: Percent of individuals with diabetes in the target population with a documented assessment for overweight or obesity within grantee specified time period.

FIGURE 2

Body Mass Index Assessment and Results among Audited Urban Patients with Diabetes

	2009	2010	2011	2012	2013
BMI Not Assessed	2%	2%	2%	1%	1%
Normal (BMI<25)	7%	7%	7%	8%	8%
Overweight (BMI 25-29)	22%	21%	22%	20%	20%
Obese (BMI 30-39)	47%	46%	46%	48%	49%
Morbidly Obese (BMI 40+)	23%	24%	23%	23%	22%

■ Morbidly Obese (BMI 40+)   ■ Obese (BMI 30-39)   ■ Overweight (BMI 25-29)
■ Normal (BMI<25)   ■ BMI Not Assessed
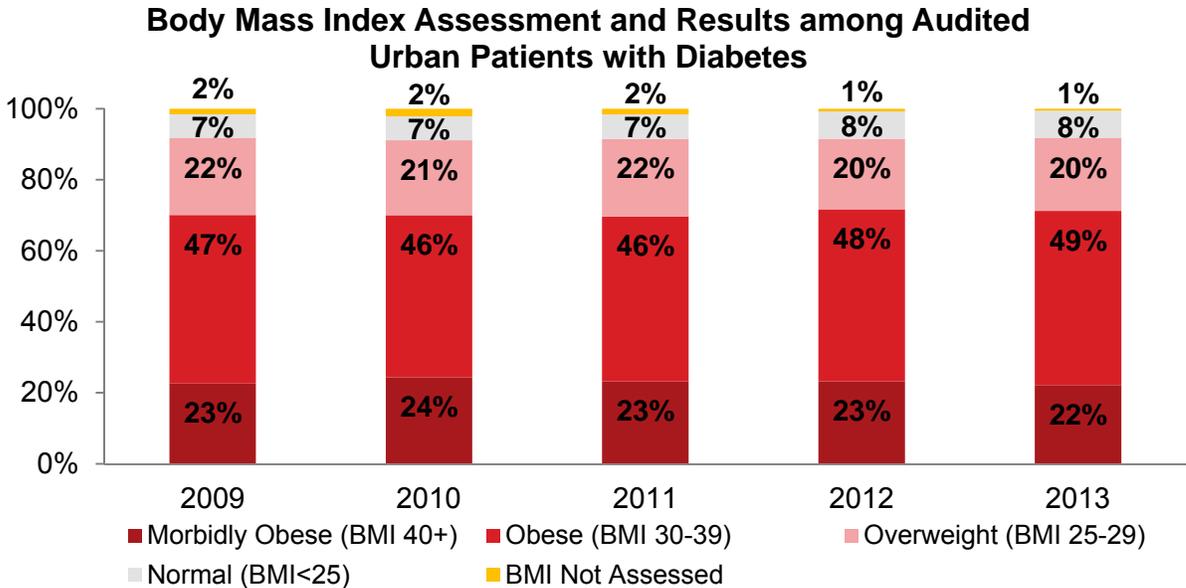
Description of Graphic: In 2013, approximately half (49%) of audited patients were considered obese (BMI 30-39) and 22% were considered morbidly obese (BMI 40+). Rates are similar across the five-year period. Body Mass Index (BMI) assessment is almost universal among audited patients, with 98-99% of patients having a BMI recorded between 2009 and 2013.

BEST PRACTICE I: Adult Weight Management

> **KEY MEASURE 2:** Percent of individuals with diabetes in the target population with documented nutrition and physical activity education by a Registered Dietitian or other provider within grantee specified time period.

FIGURE 3

Nutrition and Physical Activity Education among Audited Urban Patients with Diabetes
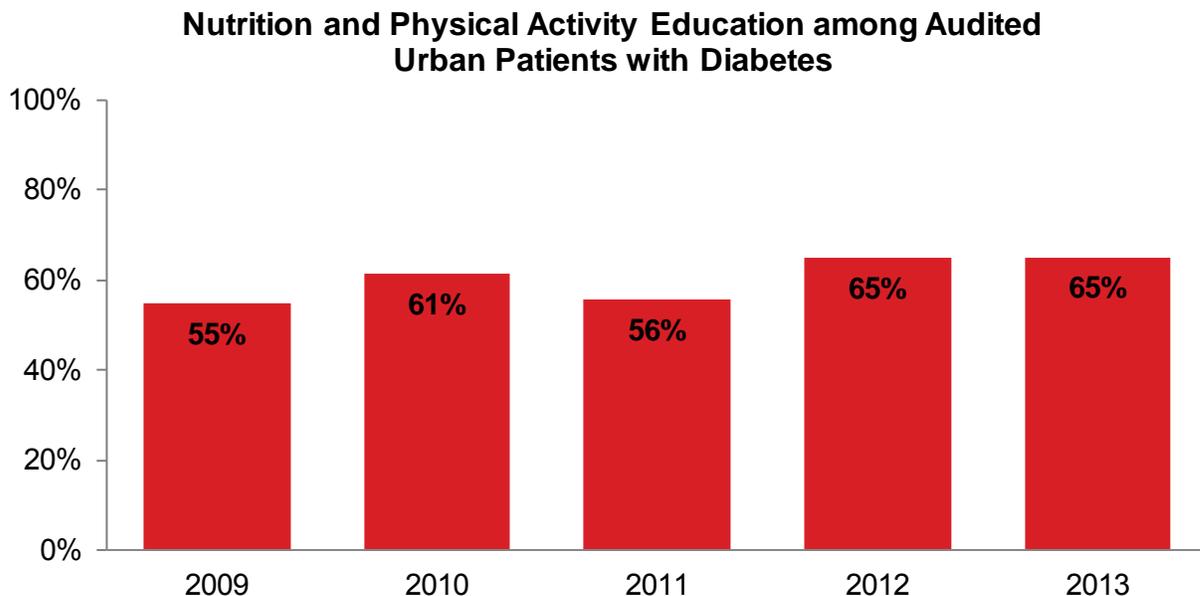
Description of Graphic: In 2013, 65% of audited patients received both nutrition and physical activity education, a 19% increase from 2009. An even greater percentage received just nutrition or physical activity education alone: in 2013, 75% of audited patients received nutrition education from a registered dietician or other provider, and 69% received exercise instruction (data not shown).

> **KEY MEASURE 3:** Percent of individuals with diabetes in the target population who achieved both their nutritional goal(s) and physical activity goal(s) within grantee specified time period.
>
> *This key measure cannot be assessed using current IHS Diabetes Audit data.*

> **KEY MEASURE 4:** Percent of individuals with diabetes in the target population who achieved their weight loss goal within grantee specified time period.
>
> *This key measure cannot be assessed using current IHS Diabetes Audit data.*

BEST PRACTICE I: Adult Weight Management

KEY MEASURE 5: Percent of individuals with diabetes in the target population who had, in addition to measurement of body weight, body mass index (BMI) and blood pressure, documented laboratory measures of cardiometabolic risk including all of the following within grantee specified time period:

- Non-HDL-cholesterol
- Triglycerides
- LDL- and HDL-cholesterol
- Fasting glucose
- Hemoglobin A1c (HbA1c)

No graphic presented: *Only 2013 Diabetes Audit data captures all measures of cardiometabolic risk so data from previous years are not reported.*

Description of Data: In 2013, 69% of audited patients had a record of complete laboratory assessments for cardiometabolic risk that included non-HDL cholesterol, triglycerides, LDL and HDL cholesterol and Hemoglobin A1c. Note: fasting glucose is not included here.

BEST PRACTICE II: Cardiovascular Disease

Overview: Cardiovascular Disease (CVD) is the leading cause of death in the United States in general[11] and for AI/AN adults.[14] Adults with diabetes have heart disease death rates about two to four times higher than adults without diabetes.[12] Tobacco use, poor diet, obesity, excessive alcohol use, high cholesterol and other risk factors can put individuals at higher risk for developing CVD.[13]

KEY MEASURE 1: Percent of individuals with diabetes in the target population with documented tobacco use status within grantee specified time period.

KEY MEASURE 2: Percent of individuals with diabetes in the target population who smoke who received tobacco cessation intervention(s) within grantee specified time period.

FIGURE 4

Current Tobacco Use and Cessation Counseling among Audited Urban Patients with Diabetes

Legend: ■ Report Current Tobacco Use —■— Tobacco Users Receiving Counseling and/or Referral
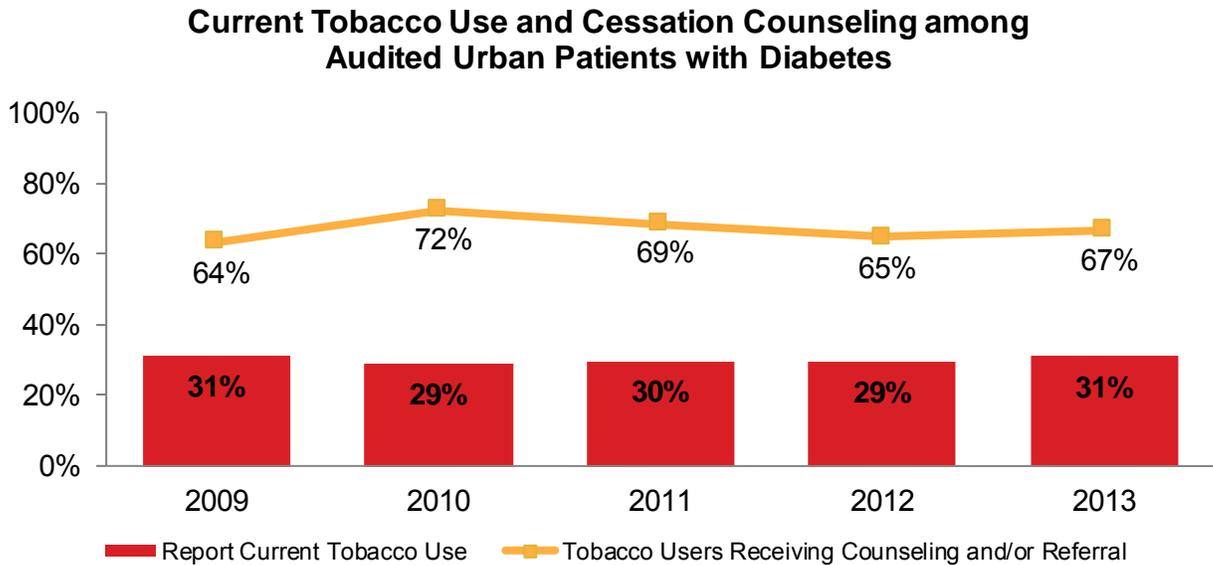
Description of Graphic: In 2013, 98% of audited patients had a documented tobacco use status, up from 94% in 2009 (data not shown). From 2009 to 2013, there was little change in the percentage of patients who used tobacco, with approximately 30% of audited patients reporting current tobacco use. In 2013, 67% of audited patients who used tobacco received cessation counseling and/or referrals for counseling. The percentage of tobacco users who received counseling has fluctuated from year to year, but approximately two-thirds of tobacco users each year receive cessation counseling. The Diabetes Audit does not contain information about the percentage of patients who quit using tobacco, but it may be inferred from the persistent rates of tobacco usage that few tobacco users are quitting.

BEST PRACTICE II: Cardiovascular Disease

KEY MEASURE 3: Percent of individuals with diabetes in the target population who smoke who quit smoking within grantee specified time period.

This key measure cannot be assessed using current IHS Diabetes Audit data.

KEY MEASURE 4: Percent of individuals with diabetes in the target population with mean blood pressure at <140/<90 within grantee specified time period.

FIGURE 5

Blood Pressure Categories* among Audited Urban Patients with Diabetes

Year	<130/<80	130/80 - <140/<90	140/90 or higher	BP Not Recorded
2009	41%	28%	17%	13%
2010	46%	30%	17%	7%
2011	41%	30%	19%	10%
2012	42%	31%	20%	7%
2013	39%	32%	21%	8%
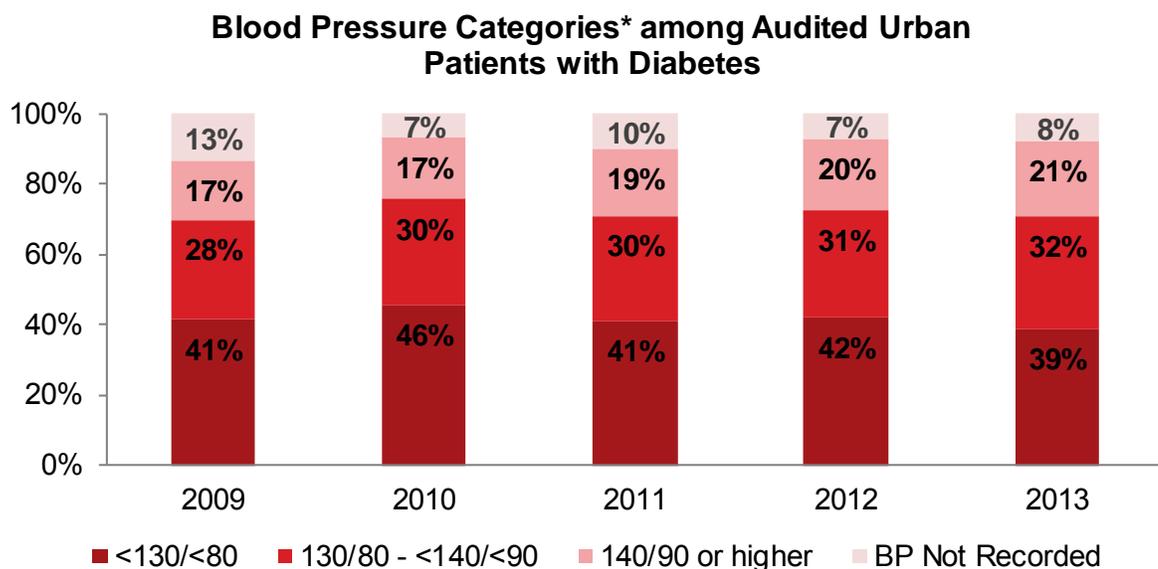
*Average of last two or three blood pressures

HP2020 Target: 57% of patients with diabetes achieve blood pressure control (<130/<80)^

^ Not shown on graph because target does not align with Key Measure

Description of Graphic: In 2013, 71% of audited patients had recorded mean blood pressure under 140/90. This was similar to previous years. In the same year, 39% had met the HP2020-defined target blood pressure (<130/<80). HP2020 Targets are universal goals and should not be interpreted as treatment goals for individual patients. Individualized blood pressure treatment goals should be set for patients based on age, duration of diabetes, comorbidities and other factors. In 2013, 92% of patients with diabetes had a mean blood pressure recorded, an improvement from 87% 2009.

BEST PRACTICE II: Cardiovascular Disease

KEY MEASURE 5: Percent of individuals with diabetes in the target population with documented cardiovascular disease (CVD) or hypertension education within grantee specified time period.

This key measure cannot be assessed using current IHS Diabetes Audit data.

KEY MEASURE 6: Percent of individuals with diabetes in the target population who had most recent lipid measurements at target within grantee specified time period.

This key measure cannot be assessed using current IHS Diabetes Audit data.

ALTERNATIVE MEASURE 1: Mean blood lipid values of individuals with diabetes in the target population within grantee specified time period.

FIGURE 6

Mean Blood Lipid Values among Audited Urban Patients with Diabetes
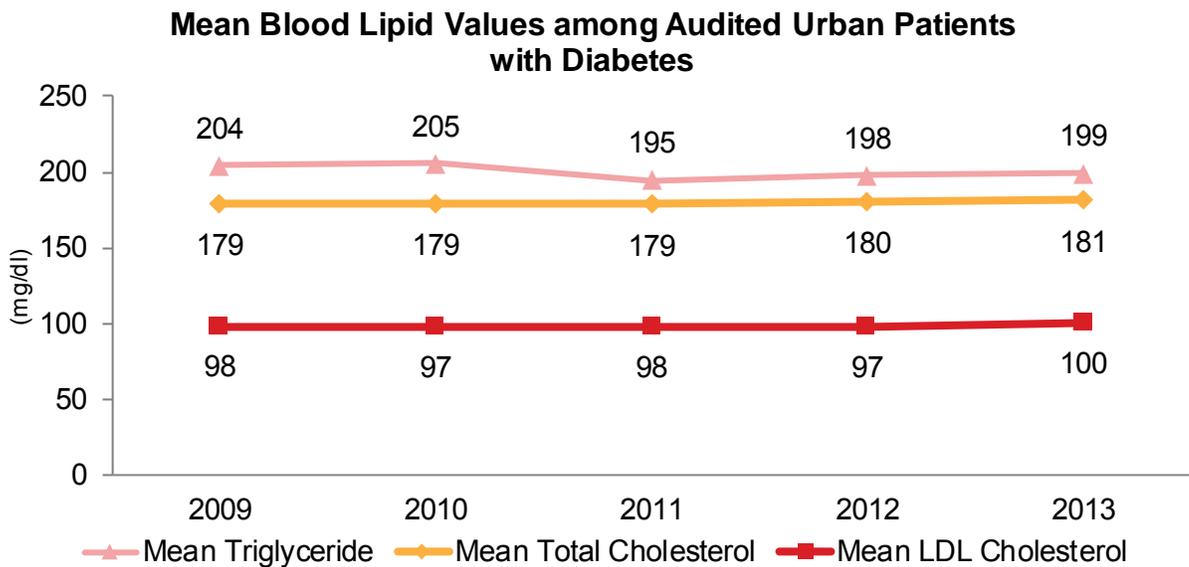
Description of Graphic: Mean total cholesterol has remained relatively constant over the five-year period and was consistently within the targeted range (ideal total cholesterol is 200 mg/dl or less). Mean LDL cholesterol values for audited patients also have remained at or below ideal levels (less than 100 mg/dl) during the time period. However, mean triglyceride values ranged from 195-205 between 2009 and 2013. Ideal triglyceride values are less than 150 mg/dl.

BEST PRACTICE II: Cardiovascular Disease

ALTERNATIVE MEASURE 2: Percent of individuals with diabetes in the target population who were screened for low-density lipoprotein (LDL) cholesterol.

FIGURE 7

LDL Cholesterol Assessed among Audited Urban Patients with Diabetes
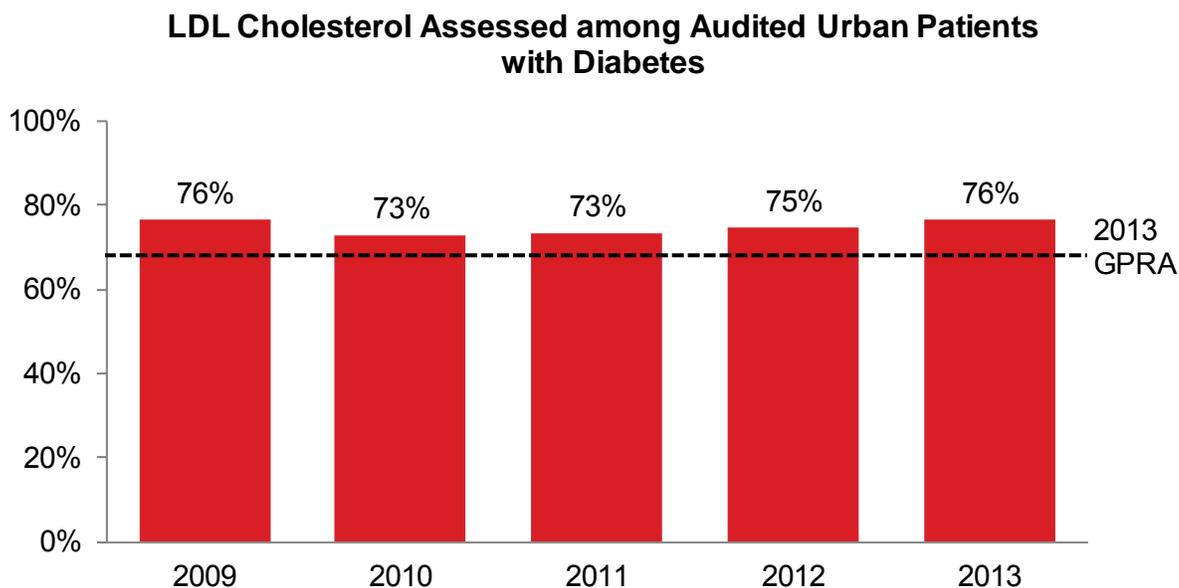
2013 IHS GPRA goal: 68.0% of diabetes patients receive at least one assessment of LDL cholesterol annually.

Description of Graphic: In 2013, 76% of audited patients had their LDL cholesterol assessed, similar to previous years. This surpasses the 2013 IHS GPRA goal for 68% of diabetes patients to receive at least one assessment of LDL cholesterol each year.

KEY MEASURE 7: Percent of individuals with diabetes in the target population with a positive assessment for albuminuria (i.e., measures of albuminuria) who received treatment within grantee specified time period.

This key measure cannot be assessed using current IHS Diabetes Audit data.

KEY MEASURE 8: Percent of individuals with diabetes in the target population with improvements in A1c within grantee specified time period.

This key measure cannot be assessed using current IHS Diabetes Audit data.

BEST PRACTICE II: Cardiovascular Disease

ALTERNATIVE MEASURE 3: Percentage of individuals with diabetes in the target population who had most recent Hemoglobin A1c at target (A1c<8.0%) within grantee specified time period.

FIGURE 8

Hemoglobin A1c Categories among Audited Urban Patients with Diabetes

Legend: ■ <7.0% ■ 7.0 - <8.0 ■ 8.0 or higher □ A1c not recorded

Year	<7.0%	7.0 - <8.0	8.0 or higher	A1c not recorded
2009	39%	18%	36%	7%
2010	35%	20%	38%	7%
2011	37%	19%	38%	6%
2012	38%	17%	38%	6%
2013	36%	19%	39%	6%
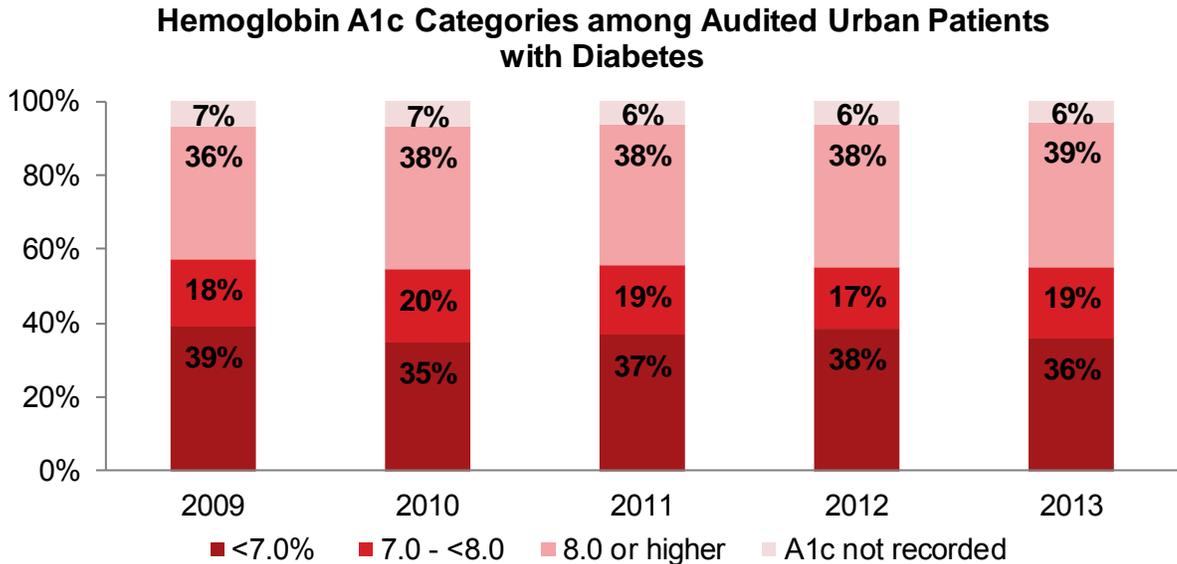
HP2020 Target: 58.9% of diabetes patients have <u>ideal</u> glycemic control (hemoglobin A1c <7.0%)^

HP2020 Target: 16.1% (or less) of diabetes patients have <u>poor</u> glycemic control (hemoglobin A1c>9.0%)^

^Not shown on graph because target does not align with key measure

Description of Graphic: In 2013, 55% of patients with diabetes had their most recent Hemoglobin A1c measure under 8.0%, similar to previous years. In the same year, 36% met the HP2020-defined glycemic control measure (A1c<7.0%). HP2020 goals are universal targets that may not be appropriate for all patients. Hemoglobin A1c goals for individual patients should be adjusted based on duration of diabetes, comorbidities and other factors. In 2013, 94% of patients were assessed for Hemoglobin A1c, similar to previous years.

PROGRAM HIGHLIGHT

Denver Indian Health and Family Services

Overcoming the expense of hepatitis B vaccination by exploring new funding sources

Kathy Canclini, RN MN CDE, the Diabetes Program Manager at Denver Indian Health and Family Services, observed from a review of Diabetes Audit data that very few DIHFS diabetes patients were receiving hepatitis B vaccinations. In 2012, only five people received the full hepatitis B series. Patients with diabetes are at an increased risk for contracting hepatitis B, but the clinic simply could not afford the vaccines so increasing the vaccination rate seemed like an unattainable goal. In late 2012, Ms. Canclini set to work to find a solution.

After consulting with Bernadine Toya, MSN RN CDE, Albuquerque Area IHS Diabetes Program Audit Coordinator, Ms. Canclini queried the Colorado Department of Public Health and Environment and found that a certain portion of their budget was mandated to provide immunization materials to AI/AN populations. DIHFS was then able to obtain hepatitis B vaccines through this provision. In the spring of 2013, the clinic staff began administering the three-part, six-month vaccine series for hepatitis B to patients with diabetes. The acceptance rate has been very high, with a large number of people returning for the two follow-up shots at one and six months. If other diabetes program coordinators are looking for ways to improve access to the vaccine, Ms. Canclini recommends seeking out alternative ways of obtaining this immunization, with the State Department of Health being the first place to investigate.

> *"When we pick what to work on, I consult with [healthcare providers] for what is appropriate. We like to fix things that we can actually change."*
>
> Kathy Canclini, DIHFS Diabetes Program Manager

Denver Indian Health and Family Services

www.dihfs.org

The Denver Indian Health and Family Services (DIHFS) clinic is an Urban Indian Health Organization, serving AI/ANs all along the Colorado Front Range urban corridor from Fort Collins to Pueblo.

The Diabetes Program SDPI grant supports a full-time Certified Diabetes Nurse Educator (RN CDE) and a half-time Diabetes Prevention Specialist who is also a certified personal trainer. It also supplements many other personnel in the clinic. DIHFS also offers Behavioral Health and Dental Programs under separate grant funding.

The DIHFS Diabetes Program's *Fork 'n' Road* focuses on adult weight management. It offers nutritional and behavioral content by the RN CDE, and exercise content and practice by a personal trainer. The *CrossRoads* is a two-part class that offers the rest of the diabetes self-management education by the RN CDE. *Balancing Your Life and Diabetes* curriculum is used for the classes.

PROGRAM HIGHLIGHT

One of the biggest challenges in administering vaccines in a series is ensuring accurate tracking and patient follow-up. In order to be maximally effective, the three shots should be administered at designated times. The conversion of the clinic's charts to electronic health records (EHR) has made it significantly easier to help keep patients on this schedule. EHRs allow the clinic to track the vaccines that patients have received, which makes it easier for providers to determine the inoculations patients still need. For patients who say they have received the series elsewhere, DIHFS attempts to verify their status using the Colorado Immunization Program on-line records or other medical provider resource. When verification is lacking, the clinic performs hepatitis B antibody titers to ensure adequate immunity. The clinic also provides vaccine information sheets and engages patients in discussions about vaccination, including the rationale and timing of the series. These discussions help with scheduling subsequent immunization clinic visits.

Denver Indian Health and Family Services strives to meet diabetes standards of care and public health benchmarks, and the Diabetes Audit has allowed them to target areas most in need of improvement. Thanks to the efforts of Kathy Canclini and the Diabetes Program, as well as the diligent clinic staff and University of Colorado Pharmacy Interns, DIHFS expects to see a significant increase in hepatitis B vaccination among AI/AN patients with diabetes.

BEST PRACTICE III: Chronic Kidney Disease

Overview: Chronic kidney disease (CKD) is the loss of kidney function caused when blood vessels in the kidneys are damaged over time and hinder the kidney's ability to filter blood, which increases waste in the body's blood supply.[15] If CKD is not treated, it can progress to kidney failure or end stage renal disease, which can decrease quality of life and lead to premature death.[16] Diabetes is the leading cause of kidney disease and kidney failure, and accounted for 44% of new cases of kidney failure in the United States in 2008.[12] The threat to those with diabetes and their families is great, but CKD also impacts allocation of resources: 24% of total Medicare diabetes costs are from patients with CKD and end stage renal disease.[17] Fortunately, CKD and most health conditions related to diabetes can be managed with diet, exercise and a combination of medications that can help lower and stabilize blood glucose and blood pressure levels.[12]

KEY MEASURE 1: Percent of individuals with diabetes in the target population who were screened for chronic kidney disease by using urine albumin to creatinine ratio (UACR) and estimated Glomerular Filtration Rate (eGFR) within grantee specified time period.

No graphic presented: Estimated-GFR assessment changed in the 2013 Diabetes Audit so data from previous years are not reported.

Description of Data: In 2013, 41% of patients with diabetes had both a UACR and eGFR to screen for chronic kidney disease.

KEY MEASURE 2: Percent of individuals with diabetes in the target population with mean blood pressure at <140/<90 (or have comorbidities that dictate a higher target) within grantee specified time period.

See Best Practice II Cardiovascular Disease, Key Measure 4, page 10 for a similar measure.

BEST PRACTICE III: Chronic Kidney Disease

KEY MEASURE 3: Percent of individuals with diabetes and hypertension in the target population who were treated with an angiotensin converting enzyme (ACE) inhibitor or angiotensin II receptor blocker (ARB) (or have a documented allergy/intolerance) within grantee specified time period.

FIGURE 9

Hypertension and Use of ACE Inhibitors/ARBs among Audited Urban Patients with Diabetes

■ Patients with Hypertension ━◆━ ACE Inhibitor/ARB Use among Patients with Hypertension
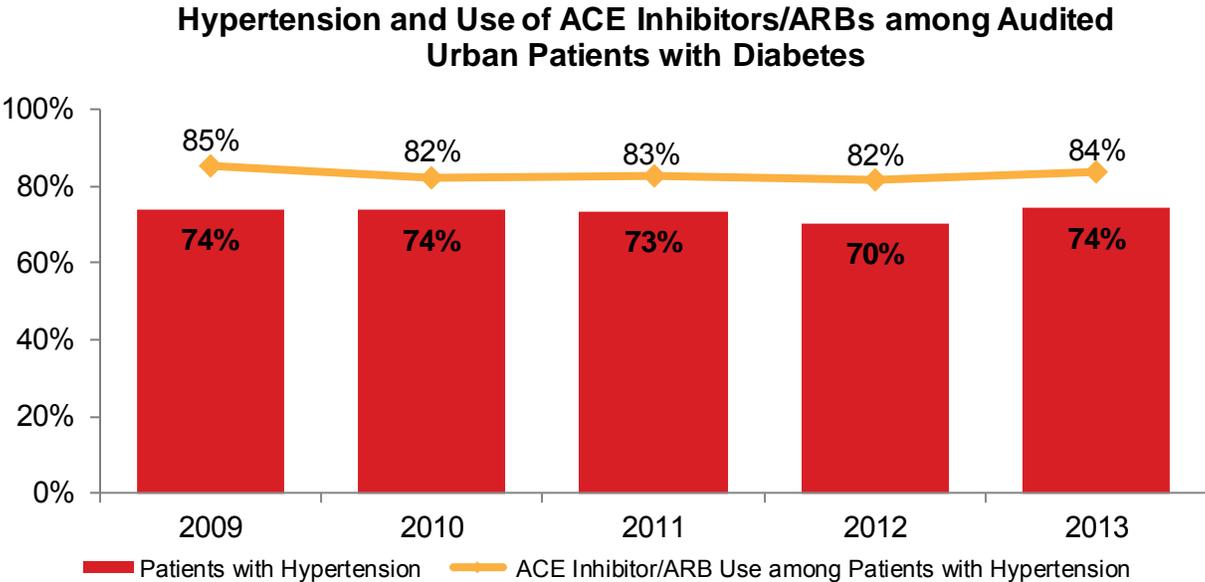
Description of Graphic: The percentage of audited patients with hypertension ranged between 70-74% over the five-year period. In 2013, 84% of audited patients with hypertension were treated with an ACE inhibitor or ARB. These numbers, however, should be interpreted with caution. Because the Diabetes Audit question used to assess hypertension allows the reporter to respond affirmatively if there is a diagnosis or a record of medication, these estimates may overestimate the burden of hypertension if patients were using the medication for prevention of kidney disease rather than treatment of hypertension.

BEST PRACTICE IV: Depression

Overview: Although diabetes is associated with an increased risk of depression, depression remains undiagnosed and untreated in about two-thirds of patients who have both conditions.[18] The comorbidity of depression and diabetes is particularly challenging, as the debilitating effects of depression may influence an individual's ability to successfully manage diabetes. Recent studies have suggested that AI/AN people with depression and diabetes have worse glycemic control than AI/AN people who have diabetes alone.[19] Routine depression screening for people with diabetes is recommended, yet screening must be incorporated into an effective collaborative care system that includes ongoing treatment, care coordination and psychoeducation.[20]

KEY MEASURE 1: Percentage of individuals with diabetes in the target population who were screened for depression within grantee specified time period.

FIGURE 10

Depression Diagnosis and Screening among Audited Urban Patients with Diabetes

Legend: Diagnosed with Depression | Depression Screening among those without Current Diagnosis
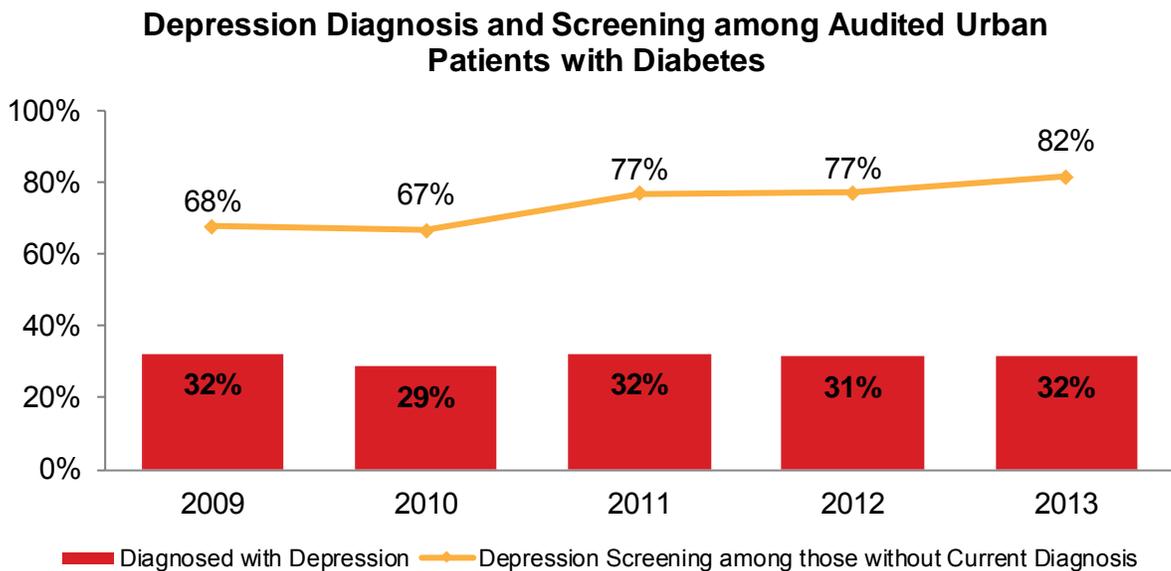
Description of Graphic: In 2013, 32% of audited patients had a diagnosis of depression in their medical chart. Although rates of depression remain relatively constant throughout the five-year period, the percentage of audited patients (without a current depression diagnosis) who were screened for depression increased 20% during the five-year time period, from 68% in 2009 to 82% in 2013. This increase may not be due to an actual increase in screening, but instead might reflect an increase in the documentation of screening that previously was not fully captured in the Diabetes Audit.

KEY MEASURE 2: Percentage of individuals with diabetes in the target population with documented depression that received treatment for depression within grantee specified time period.

This key measure cannot be assessed using current IHS Diabetes Audit data.

BEST PRACTICE V: Eye Care

Overview: Diabetes is the leading cause of new cases of blindness among adults aged 20-74 years old.[12] Diabetes can increase complications from diabetic retinopathy (DR), cataracts, glaucoma and even disrupt brain functions associated with vision that lead to vision loss and blindness.[21] Since initial eye damage can occur without symptoms, regular vision screenings and patient education on the importance of regular exams can reduce the risk of vision loss from diabetes.[22]

KEY MEASURE 1: Percentage of individuals with diabetes in the target population with a documented qualifying eye exam within grantee specified time period.

FIGURE 11

Eye Exam in Past Year among Audited Urban Patients with Diabetes
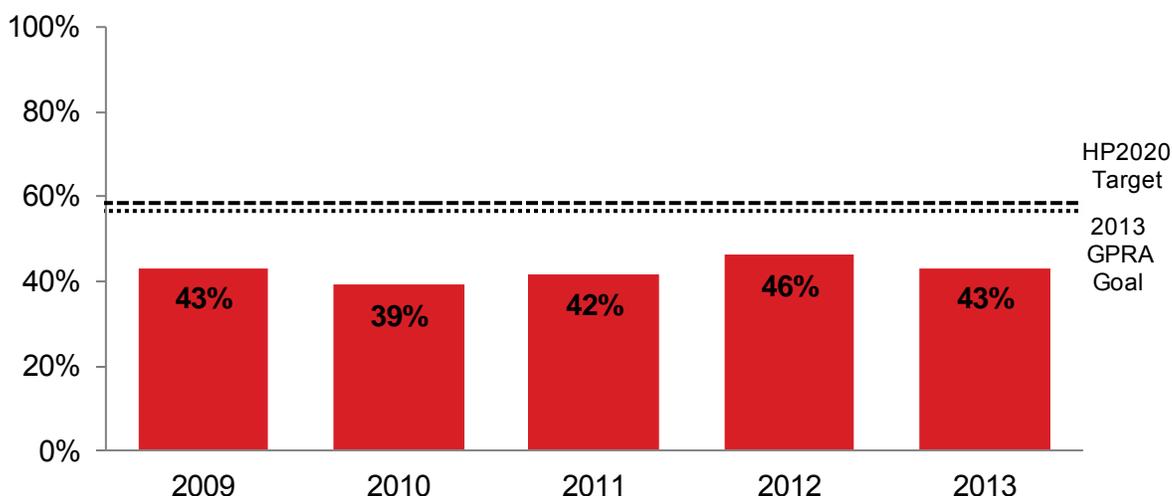
HP2020 Target: 58.7% of diabetes patients receive an annual eye exam.

2013 IHS GPRA goal: 56.8% of diabetes patients receive an annual eye exam.

Description of Graphic: In 2013, 43% of audited patients received a qualifying eye exam. During the 2009-2013 time period, the percentage of audited patients who received eye exams remained below both the 2013 IHS GPRA goal and HP2020 target. Access to specialty care, recognized as a widespread barrier for urban AI/ANs, may be a factor in obtaining an eye exam. Additionally, these figures may underestimate the number of patients that received eye exams if patients received exams outside the UIHOs that were not documented in patient records.

KEY MEASURE 2: Percentage of individuals with diabetes in the target population with abnormal retinal screening exam who received appropriate specialty follow up within grantee specified time period.

This key measure cannot be assessed using current IHS Diabetes Audit data.

PROGRAM HIGHLIGHT

Indian Health Center of Santa Clara Valley, Inc.

Incorporating a successful third-party retinal screening program into an in-house service

A few years ago Dr. Jorge Cuadros, O.D. PhD, local optometrist and diabetic retinal screening pioneer, began offering retinal screening for patients at the Community Wellness Outreach Center, a division of the Indian Health Center of Santa Clara Valley. This service was so helpful that Community Wellness Outreach Director Ramin Naderi and Chief Medical Officer Dr. Ria Paul decided to turn it into an in-house operation.

Thanks to support from IHS, they were able to obtain a retinal screening camera for their medical clinic in 2011. This made it easier for diabetes patients who were seeing healthcare providers at the medical clinic to get a retinopathy screening in addition to their checkup, eliminating the need to travel to the separate Community Wellness Outreach Center. Dr. Cuadros helped train medical assistants to operate the retinal camera, and it became a routine part of all diabetes checkups.

This initiative has resulted in nearly 70% of diabetes patients receiving retinal screenings. Mr. Naderi and Ms. Marie Piazza, IHC QI Manager, attribute a large part of this success to the weekly meetings between the community outreach and medical teams. The discussions between healthcare providers and those who are working to support the community have helped foster a dialogue that supports comprehensive patient care. A multidisciplinary team of medical professionals, registered dieticians, certified diabetes educators, fitness instructors, case managers and others provides a system of care that extends beyond the doctor's office. When the Medical and Community Outreach departments are communicating well and supporting each other, they

> *"Close work between the diabetes program, the medical department, and the diabetes coordinators at IHS can help other [UIHOs] make similar changes."*
>
> Marie Piazza, IHC QI Manager

Indian Health Center of Santa Clara Valley, Inc.

www.indianhealthcenter.org

The Indian Health Center of Santa Clara Valley, Inc. serves the AI/AN population in Santa Clara County. They operate a primary medical and dental clinic, a Community Wellness Outreach Center, multiple WIC offices and a sweat lodge.

The Community Wellness Outreach Center has helped foster community and culture by offering many wellness and education services to the community. The Center offers a modern fitness program, a gym, and diet and exercise education, all housed inside a Wellness Center, along with cultural events and even a farmers market near the Center.

They combine cultural enrichment activities and health education to foster a healthier AI/AN community in Santa Clara County. These programs are designed to help empower patients and members of the community to make lifestyle changes that will have a positive impact on health.

PROGRAM HIGHLIGHT

support the client's needs, thereby providing care that truly is patient-centered: a 'patient-centered medical home'.

The importance of the Diabetes Audit and data in general is recognized at the Indian Health Center, where weekly data reviews ensure being on track to meet annual goals. The switch to electronic health records allowed for identification of patients in need of specific services, including if they are due for a retinal screening. The center helps coordinate transportation, and the in-house program at the medical clinic means that everything can be accomplished in one visit. This reduces the time and inconvenience of obtaining these services, and thereby increases the rate at which patients obtain them. This initiative wouldn't have been possible without the resources and education provided by the IHS. This is an example of the excellent services that can be provided when accessing care is streamlined. The primary challenge the Indian Health Center still faces is the difficulty that arises when they need to refer patients out for additional services they cannot provide.

Retinal screening at the Indian Health Center of Santa Clara Valley is an excellent example of what can happen when community outreach and medical professionals work together to respond to an identified need. Open communication between community outreach and the medical center, along with regular data reviews, allows the center to respond quickly and in a targeted approach.

BEST PRACTICE VI: Foot Care

Overview: Approximately eight percent of patients with type 2 diabetes have acute foot problems such as numbness, pain, burning, and reduced feeling in the feet and legs.[23] Foot ulcers and amputation are common complications from diabetes, yet are preventable when identified early through regular foot examinations. Foot complications can be managed and prevented by providing foot care self-management education that includes information about smoking cessation, daily foot care, appropriate footwear, avoiding foot trauma, and controlling blood glucose, blood pressure and lipids.[24]

KEY MEASURE 1: Percent of individuals with diabetes in the target population with documented foot exams within grantee specified time period.

FIGURE 12

Documented Foot Exam in Past Year among Audited Urban Patients with Diabetes
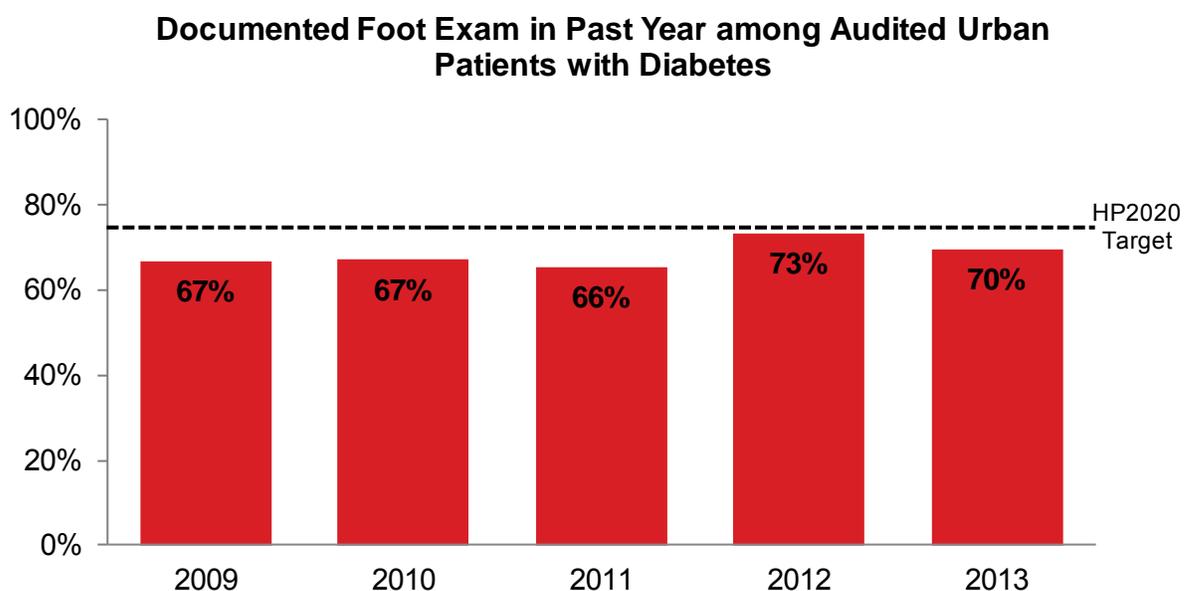
HP2020 Target: 74.8% of diabetes patients receive at least one annual foot exam.

Description of Graphic: In 2013, 70% of audited patients received a foot exam. The percentage of patients receiving an annual foot exam was only slightly below the HP2020 objective for 74.8% of diabetes patients to receive at least one annual foot exam.

BEST PRACTICE VI: Foot Care

KEY MEASURE 2: Percent of individuals with diabetes in the target population with documented risk-appropriate foot care education within grantee specified time period.

This key measure cannot be assessed using current IHS Diabetes Audit data.

KEY MEASURE 3: Percent of individuals with diabetes in the target population with foot ulcers who received treatment within grantee specified time period.

This key measure cannot be assessed using current IHS Diabetes Audit data.

PROGRAM HIGHLIGHT

Native American Rehabilitation Association of the Northwest

Streamlining service for patients allows providers more time for podiatric exams

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Alison Goerl, the Diabetes Program Manager at the Native American Rehabilitation Association of the Northwest (NARA), pays special attention to the Diabetes Audit data to determine what best practices need improvement at the clinic. In 2009, the diabetes team identified foot care as an area where progress could be made. Foot examination rates were around 58%, close to the average for medical providers in the area. But that still meant that nearly half of NARA's patients with diabetes were not receiving examinations.

In the past, NARA brought in a podiatrist to provide foot examinations as part of their Diabetes Days, a program where medical care, dietary information, physical activity education and screenings for different measures are provided all in one Saturday Clinic. This program allowed patients to obtain care in a convenient, one-stop way. This helped increase access to foot care, but in order to make serious gains in their screening rates, more foot examinations were needed at the primary care clinic. To address why this need was not being met, Ms. Goerl and the diabetes team sat down with providers to talk about what barriers were preventing this screening and how they could be overcome.

The main barrier providers identified was inadequate time with patients. To streamline the foot care process, procedures and incentives were put in place. Medical assistants now instruct patients to remove their shoes and socks before seeing their provider. To help support the healthcare professionals, many of the administrative details are divided among other staff. For example, when a patient with diabetes enters the clinic, their patient care summary is printed and any screenings for which they

> *"We are very data-driven…we use Diabetes Audit data early and often. We foster relationships with providers and provide them with regular Audit data feedback."*
>
> Alison Goerl, NARA Diabetes Program Manager

PROGRAM HIGHLIGHT

are due are highlighted. If the provider cannot offer those additional services during the visit, the staff will try to ensure that patients are able to obtain these before leaving or will schedule appropriate follow-up appointments. The Diabetes Audit data on foot screening is announced at monthly staff meetings and providers who are especially successful in performing the examinations are publicly acknowledged. They even offer Starbucks gift cards to providers based on improved screening rates.

Over a three-year period, the clinic saw an increase in the rate of foot exams every year, peaking at over 80% of patients receiving foot examinations in 2012. NARA has made improvements in other areas as well, including an award-winning retinal imaging program, and is working to have their diabetes self-management program certified. According to Ms. Goerl, the best way for diabetes programs to improve is to use the Diabetes Audit data early and often, running reports of who is due for what service and using an all-hands-on-deck approach to reach out to those who are due for screenings or appointments.

A strong relationship between the diabetes program and the healthcare providers means the clinic is more likely to have a strong relationship with patients. By working hard on improving communication between the diabetes program and the medical clinic, and listening to what was preventing providers from accomplishing what needed to be done, NARA has been able to improve their provision of care as they work to serve the urban AI/AN people of the Portland area.

BEST PRACTICE VII: Oral Health

Overview: Poorly controlled glucose levels increase the risk for periodontal disease, tooth decay, infections and other serious oral health problems.[25] Infection and inflammation associated with periodontitis also can increase risk for diabetes complications such as cardiovascular disease, coronary artery disease and chronic kidney disease.[26] Oral health education and regular oral evaluations can prevent, detect and treat periodontal disease and dental caries early.[26]

KEY MEASURE 1: Percent of individuals with diabetes in the target population who had documented oral health patient education (done by any provider) within grantee specified time period.

This key measure cannot be assessed using current IHS Diabetes Audit data.

KEY MEASURE 2: Percent of individuals with diabetes in the target population who had a documented dental exam within grantee specified time period.

FIGURE 13

Documented Dental Exam in Past Year among Audited Urban Patients with Diabetes
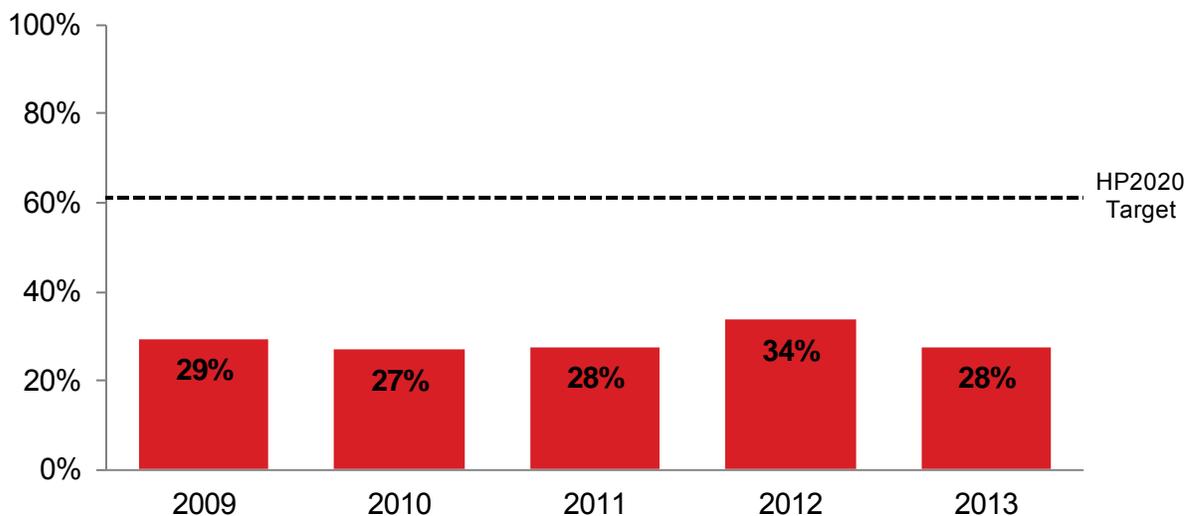
HP2020 Target: 61.2% of diabetes patients receive an annual dental exam.

Description of Graphic: In 2013, 28% of patients received a dental exam. The rate of patients receiving dental exams was less than half of the HP2020 target throughout the five-year period. These figures may underestimate the number of patients that received dental exams if patients received exams outside the UIHOs that were not documented in patient records. Additionally, access to and cost of dental care may be a significant factor in a patient's ability to obtain these services.

KEY MEASURE 3: Percent of individuals with diabetes in the target population identified as needing dental treatment (cleaning and caries) who received it within grantee specified time period.

This key measure cannot be assessed using current IHS Diabetes Audit data.

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The following tables display urban aggregate data for the years 2009-2013. Both raw numbers and weighted percentages are included. Because percentages are rounded, the total may not add up to 100%. Cells are left blank if data were not collected for that indicator for a given year.

Table 1. Demographics of Audited Patients with Diabetes, 2009-2013										
Year	2009		2010		2011		2012		2013	
No. charts audited	1,970		2,132		2,432		2,591		2,752	
	No.	%+	No.	%+	No.	%+	No.	%+	No.	%+
Sex										
Male	779	41%	852	40%	972	40%	1,028	40%	1,100	41%
Female	1,191	59%	1,280	60%	1,460	60%	1,563	60%	1,652	59%
Age (Years)										
< 18	5	0%	8	1%	2	0%	2	0%	5	0%
18-44	563	28%	608	28%	677	28%	679	28%	693	26%
45-64	1,095	56%	1,193	56%	1,389	56%	1,496	56%	1,609	58%
> 65	307	16%	323	16%	363	16%	414	16%	445	17%
Mean age+	52.0		51.8		52.0		51.8		52.5	
Diabetes Duration (Years)										
< 5	703	35%	829	39%	931	38%	977	41%	879	34%
5 – 9	468	25%	506	26%	636	26%	680	26%	653	24%
> 10	526	28%	585	29%	713	27%	840	31%	905	32%
Not documented	273	13%	212	7%	152	8%	94	3%	315	10%
Mean duration+	7.8		7.6		7.4		7.7		8.5	
Diabetes Type										
Type 1	36	2%	46	2%	47	2%	53	2%	47	2%
Type 2	1,934	98%	2,086	98%	2,384	98%	2,538	98%	2,705	98%

+ Weighted Estimate

APPENDIX A

Table 2. Vital Statistics of Audited Patients with Diabetes, 2009-2013										
Year	2009		2010		2011		2012		2013	
No. charts audited	1,970		2,132		2,432		2,591		2,752	
	No.	%[+]	No.	%[+]	No.	%[+]	No.	%[+]	No.	%[+]
Body Mass Index (BMI)*										
< 25	134	7%	139	7%	155	7%	183	8%	206	8%
25 - 29	443	22%	447	21%	542	22%	538	20%	590	20%
30 - 39	918	47%	970	46%	1,121	46%	1,223	48%	1,320	49%
> 40	438	23%	524	24%	577	23%	626	23%	618	22%
Not tested or no valid result	37	2%	52	2%	37	2%	21	1%	18	1%
Mean BMI[+]	34.9		35.4		34.8		35.1		34.9	
Hypertension^										
Yes	1,433	74%	1,528	74%	1,778	73%	1,872	70%	2,053	74%
No	537	26%	604	26%	654	27%	719	30%	699	26%
Blood Pressure (mmHg)										
<130/<80	795	41%	968	46%	988	41%	1,060	42%	1,028	39%
130/80 – <140/<90	514	28%	608	30%	750	30%	801	31%	872	32%
140+/90+	331	17%	393	17%	451	19%	548	20%	621	21%
Not tested or no valid result	330	13%	163	7%	243	10%	182	7%	231	8%
Mean systolic[+]	128.3		127.7		127.9		128.6		129.2	
Mean diastolic[+]	77.1		76.5		76.5		77.3		77.9	
Cardiovascular Disease										
Yes									329	12%
No									2,423	88%

[+] Weighted Estimate

* Weight in kilograms/(height in meters)^2; normal < 25, overweight 25-29, obese ≥30

^ Documented diagnosis or taking prescription medication

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Table 3. Exams in Past Year among Audited Patients with Diabetes, 2009-2013										
Year	2009		2010		2011		2012		2013	
No. charts audited	1,970		2,132		2,432		2,591		2,752	
	No.	%[+]	No.	%[+]	No.	%[+]	No.	%[+]	No.	%[+]
Eye Exam										
Yes	886	43%	901	39%	998	42%	1,171	46%	1,186	43%
No	1,039	54%	1,166	58%	1,366	55%	1,363	51%	1,566	57%
Refused	45	2%	64	3%	68	3%	57	3%		
Foot Exam										
Yes	1,257	67%	1,379	67%	1,626	66%	1,883	73%	1,965	70%
No	695	32%	735	32%	789	34%	698	26%	787	30%
Refused	18	1%	17	1%	17	1%	10	0%		
Dental Exam										
Yes	621	29%	612	27%	710	28%	828	34%	830	28%
No	1,269	67%	1,432	70%	1,632	69%	1,659	62%	1,922	72%
Refused	80	4%	86	4%	90	3%	104	4%		

[+] Weighted Estimate

Table 4. Diabetes Education among Audited Patients with Diabetes, 2009-2013										
Year	2009		2010		2011		2012		2013	
No. charts audited	1,970		2,132		2,432		2,591		2,752	
	No.	%[+]	No.	%[+]	No.	%[+]	No.	%[+]	No.	%[+]
Diet Instruction										
By registered dietitian only	326	17%	376	19%	340	16%	343	17%	459	18%
By other staff only	789	36%	942	42%	1,024	41%	1,080	40%	1,254	44%
By both RD and other staff	229	11%	273	13%	249	9%	455	16%	336	13%
No diet instruction	575	32%	493	25%	769	33%	699	27%	703	25%
Refused	51	4%	47	1%	50	2%	14	1%		
Exercise Instruction										
Yes	1,269	61%	1,467	67%	1,511	62%	1,827	69%	1,907	69%
No	667	37%	621	32%	844	36%	749	30%	845	31%
Refused	34	2%	43	1%	76	2%	15	1%		
Diabetes Education (other)										
Yes	1,483	71%	1,693	79%	1,909	77%	2,247	85%	2,362	86%
No	449	25%	400	20%	483	22%	332	14%	390	14%
Refused	38	3%	38	1%	40	2%	12	1%		

[+] Weighted Estimate

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Table 5. Immunizations among Audited Patients with Diabetes, 2009-2013										
Year	2009		2010		2011		2012		2013	
No. charts audited	1,970		2,132		2,432		2,591		2,752	
	No.	%[+]	No.	%[+]	No.	%[+]	No.	%[+]	No.	%[+]
Influenza Vaccine in Past Year										
Yes	1,191	60%	1,122	55%	1,360	56%	1,528	56%	1,571	56%
No	639	33%	889	40%	909	38%	891	38%	990	38%
Refused	140	7%	119	5%	163	6%	172	6%	191	6%
Pneumococcal Vaccine Ever										
Yes	1,277	65%	1,351	64%	1,640	67%	1,747	64%	1,794	63%
No	618	31%	711	32%	704	30%	778	34%	898	35%
Refused	75	4%	68	3%	87	3%	66	2%	60	2%
Td Vaccine in Past 10 Years										
Yes	1,207	64%	1,311	66%	1,582	63%	1,654	62%	1,784	64%
No	733	34%	780	33%	779	34%	862	36%	895	34%
Refused	30	1%	39	1%	69	2%	75	2%	73	3%
TB Status (PPD)										
Positive, INH complete	82	4%	65	3%	87	3%	83	3%	75	2%
Positive, not treated	93	5%	67	3%	106	5%	82	3%	78	3%
Negative, up to date	509	23%	497	22%	592	22%	661	23%	635	21%
Negative, outdated	74	3%	96	4%	116	4%	100	4%	92	3%
Negative, date unknown	58	3%	108	3%	22	1%	16	1%	26	1%
Status unknown	1,154	62%	1,299	66%	1,473	63%	1,649	66%	1,846	70%
Not tested or no valid result	0	0%	0	0%	36	2%	0	0%	0	0%
Hepatitis B Series										
Ever completed series							134	6%	239	10%
Never completed series							2,385	92%	2,396	87%
Refused							72	2%	117	3%

[+] Weighted Estimate

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Table 6. Laboratory Services among Audited Patients with Diabetes, 2009-2013										
Year	2009		2010		2011		2012		2013	
No. charts audited	1,970		2,132		2,432		2,591		2,752	
	No.	%[+]	No.	%[+]	No.	%[+]	No.	%[+]	No.	%[+]
Labs Done in Past Year										
A1c	1,806	93%	1,957	93%	2,282	94%	2,422	94%	2,594	94%
Total cholestrol	1,484	78%	1,577	76%	1,907	76%	2,068	77%	2,172	77%
LDL cholesterol	1,475	76%	1,542	73%	1,851	73%	2,010	75%	2,125	76%
Triglycerides	1,501	79%	1,570	76%	1,911	76%	2,066	77%	2,175	78%
HDL cholesterol	1,491	79%	1,564	75%	1,899	76%	2,058	77%	2,165	77%
Non-HDL cholesterol									2,162	77%
Creatinine	1,534	81%	1,682	79%	1,977	79%	2,119	81%	2,212	81%

[+] Weighted Estimate

Table 7. Laboratory Results among Audited Patients with Diabetes, 2009-2013										
Year	2009		2010		2011		2012		2013	
No. charts audited	1,970		2,132		2,432		2,591		2,752	
	No.	%[+]	No.	%[+]	No.	%[+]	No.	%[+]	No.	%[+]
A1c (%)										
<7.0	742	39%	775	35%	904	37%	1,000	38%	1,018	36%
7.0 – 8.0	348	18%	395	20%	459	19%	472	17%	545	19%
> 8.0	716	36%	787	38%	919	38%	950	38%	1,031	39%
Not tested or no valid result	164	7%	175	7%	150	6%	169	6%	158	6%
Mean A1c[+]	7.9		8.0		8.0		7.9		8.0	
Creatinine (mg/dL)										
<2.0	1,498	79%	1,649	78%	1,931	77%	2,058	78%	2,170	79%
≥2.0	36	2%	33	2%	46	2%	61	2%	42	2%
Not tested or no valid result	436	19%	450	21%	455	21%	472	19%	540	19%
Mean creatinine[+]	0.9		0.9		1.6		2.1		0.9	

[+] Weighted Estimate

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Table 7 cont. Laboratory Results among Audited Patients with Diabetes, 2009-2013										
Year	**2009**		**2010**		**2011**		**2012**		**2013**	
No. charts audited	1,970		2,132		2,432		2,591		2,752	
	No.	%[+]	No.	%[+]	No.	%[+]	No.	%[+]	No.	%[+]
Total Cholesterol (mg/dl)										
< 200	1,046	57%	1,167	58%	1,434	57%	1,519	56%	1,557	55%
200 – 239	296	14%	272	12%	332	14%	384	14%	433	16%
≥ 240	142	6%	138	6%	141	6%	165	6%	182	7%
Not tested or no valid result	486	22%	555	24%	525	24%	523	23%	580	23%
Mean total cholesterol[+]	179		179		179		180		181	
LDL Cholesterol (mg/dl)										
< 100	800	43%	841	41%	1,053	42%	1,143	42%	1,179	41%
100 – 129	417	21%	459	22%	547	22%	571	21%	598	22%
130 – 160	187	9%	177	8%	174	7%	209	8%	262	9%
> 160	71	3%	65	3%	77	3%	87	3%	86	4%
Not tested or no valid result	495	24%	590	27%	581	27%	581	25%	627	24%
Mean LDL cholesterol[+]	98		97		98		97		100	
HDL Cholesterol (mg/dL)										
<35	287	16%	289	15%	340	13%	407	15%	452	16%
35-45	544	30%	600	29%	739	30%	754	28%	781	28%
46-55	384	20%	396	20%	449	18%	498	19%	519	19%
>55	276	12%	279	12%	371	15%	399	15%	413	14%
Not tested or no valid result	479	21%	568	25%	533	24%	533	23%	587	23%
Mean HDL cholesterol[+]	44		45		46		46		46	
Non HDL Cholesterol (mg/dL)										
<130									1,055	37%
130-159									586	21%
160-190									334	12%
>190									187	7%
Not tested or no valid result									590	23%
Mean non HDL cholesterol[+]									136	
Triglyceride (mg/dl)										
< 150	665	36%	717	35%	893	35%	969	36%	994	36%
150 – 199	342	18%	336	15%	377	15%	431	16%	455	16%
200 – 400	380	20%	418	20%	529	21%	555	20%	593	21%
> 400	114	6%	99	5%	112	5%	111	4%	132	5%
Not tested or no valid result	469	21%	562	24%	521	24%	525	23%	578	22%
Mean triglyceride[+]	204		205		195		198		199	

[+] Weighted Estimate

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Table 8. Standard Therapies among Audited Patients with Diabetes, 2009-2013										
Year	2009		2010		2011		2012		2013	
No. charts audited	1,970		2,132		2,432		2,591		2,752	
	No.	%+	No.	%+	No.	%+	No.	%+	No.	%+
Diabetes Treatment										
Diet/Exercise alone	214	8%	214	8%	284	10%	353	13%	501	15%
Oral/Injectable agent only	1,106	56%	1,154	53%	1,293	52%	1,266	49%	1,280	48%
Insulin only	208	13%	253	15%	277	14%	331	14%	403	15%
Insulin and oral/injectable agent	399	21%	445	21%	540	23%	609	23%	554	21%
Refused/Unknown	24	1%	66	4%	33	1%	32	1%		
Not documented	19	1%	0	0%	5	0%	0	0%	14	1%
Chronic Aspirin*										
Yes									239	70%
No									90	30%
Lipid Lowering Agent										
Yes	1,048	57%	1,077	54%	1,352	56%	1,458	54%	1,556	56%
No/Refused	922	43%	1,055	46%	1,080	44%	1,133	46%	1,196	44%
ACE Inhibitor/ARBs										
Yes	1,388	72%	1,471	69%	1,681	69%	1,815	69%	1,962	72%
No	560	27%	637	30%	728	30%	751	30%	790	28%
Refused/Adverse Reaction	22	1%	24	1%	20	1%	25	1%		

+ Weighted Estimate
* Among patients with diagnosed cardiovascular disease

Table 9. Tobacco Use among Audited Patients with Diabetes, 2009-2013										
Year	2009		2010		2011		2012		2013	
No. charts audited	1,970		2,132		2,432		2,591		2,752	
	No.	%+	No.	%+	No.	%+	No.	%+	No.	%+
Current Tobacco Use										
User	602	31%	616	29%	741	30%	785	29%	877	31%
Non-user	1,233	63%	1,432	66%	1,569	66%	1,736	68%	1,826	67%
Not documented	135	6%	84	5%	122	4%	70	2%	49	2%
Cessation Referral*										
Yes	415	64%	442	72%	481	69%	500	65%	562	67%
No	127	21%	142	23%	230	26%	260	30%	315	33%
Refused	60	15%	32	4%	29	5%	24	5%		

+ Weighted Estimate
* Among current tobacco users

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Table 10. Depression among Audited Patients with Diabetes, 2009-2013										
Year	2009		2010		2011		2012		2013	
No. charts audited	1,970		2,132		2,432		2,591		2,752	
	No.	%[+]	No.	%[+]	No.	%[+]	No.	%[+]	No.	%[+]
Active Diagnosis of Depression										
Yes	715	32%	648	29%	787	32%	834	31%	875	32%
No	1,255	68%	1,483	71%	1,641	68%	1,741	68%	1,877	68%
Depression Screening*										
Yes	819	68%	1,047	67%	1,331	77%	1,391	77%	1,552	82%
No	424	31%	427	33%	293	22%	341	22%	325	18%
Refused	12	1%	9	0%	15	1%	9	1%		

[+] Weighted Estimate
* Among those without diagnosis of depression

Table 11. Chronic Kidney Disease among Audited Patients with Diabetes, 2009-2013										
Year	2009		2010		2011		2012		2013	
Number of charts audited	1,970		2,132		2,432		2,591		2,752	
	No.	%[+]	No.	%[+]	No.	%[+]	No.	%[+]	No.	%[+]
Kidney Function Assessment (eGFR)										
Yes									2,134	79%
No									618	21%
Urine Protein Testing										
UACR			689	29%	916	35%	1,182	42%	1,280	45%
UPCR			51	2%	13	0%	6	0%	6	0%
24hr urine test			2	0%	8	0%	2	0%	6	0%
Microalbumin/creatinine strips			352	17%	474	23%	366	18%	313	14%
Microalbumin only			163	7%	76	2%	157	6%	188	5%
UA dipstick			276	17%	281	11%	260	9%	224	9%
Not documented			599	28%	664	28%	618	25%	735	26%
Kidney Disease										
eGFR≥60	1,349	71%	1,503	71%	1,755	70%	1,829	70%	1,947	71%
eGFR<60	185	10%	179	8%	222	9%	290	11%	265	10%
Not tested or no valid result	436	19%	450	21%	455	21%	472	19%	540	19%

[+] Weighted Estimate

APPENDIX B

Glossary of Terms

Diabetes Best Practices: Consensus-based approaches used to implement or improve diabetes treatment and prevention among AI/ANs. They are based on scientific research, outcomes studies and diabetes success stories and experiences within AI/AN communities. First developed in 2001, they are updated regularly by IHS Division of Diabetes Treatment and Prevention. This report is based on IHS Diabetes Clinical Best Practices. For more information, visit:
http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=toolsBestPracticesTabbed.

Diabetes Registry: List maintained by each UIHO that includes all patients diagnosed with diabetes. All patients on a UIHO diabetes registry may not be included in their Diabetes Audit.

Government Performance and Results Act (GPRA): Passed by Congress in 1993, this act was designed to address government accountability and performance in the management of government-funded programs. The IHS reports on a range of health topics for GPRA, including diabetes. In 2013, there were five IHS GPRA goals related to diabetes and two additional diabetes measures that are reported to Congress:

FY2013 GPRA Indicators for Diabetes	Target
Good Glycemic Control Proportion of patients with diagnosed diabetes with good glycemic control (A1c less than (<) 8.0%).	Baseline year, no target
Blood Pressure Control Proportion of patients with diagnosed diabetes that have achieved blood pressure control (less than (<) 140/90).	Baseline year, no target
LDL Assessment Proportion of patients with diagnosed diabetes assessed for dyslipidemia (LDL cholesterol).	68.0%
Nephropathy Assessment Proportion of patients with diagnosed diabetes assessed for nephropathy (eGFR and quantitative urinary protein assessment OR diagnosis or treatment of ESRD).	64.2%
Retinopathy Proportion of patients with diagnosed diabetes who received an annual retinal examination.	56.8%

Please note that official GPRA results are prepared and distributed by the IHS Planning and Evaluation office. For more information about the IHS GPRA targets and measurements, visit:
http://www.ihs.gov/qualityofcare/index.cfm.

Healthy People 2020 (HP2020): National health promotion and disease prevention initiative established by the U.S. Department of Health and Human Services. HP2020 was designed to measure health-related outcomes and progress over time, and was developed through a broad consultation process. For more information about HP2020, visit www.healthypeople.gov. For diabetes-specific objectives, visit:
http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=8.

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IHS Diabetes Care and Outcomes Audit ("Diabetes Audit"): Annual process to assess care and health outcomes among AI/AN patients with diagnosed diabetes who are seen at a tribal, IHS or urban facility. May be performed manually (form filled out while examining medical record and then entered into on-line portal) or electronically (extraction of data from Electronic Health Record directly to a data file). Data is submitted to the IHS Division of Diabetes Treatment and Prevention for centralized processing and analysis.

IHS Division of Diabetes Treatment and Prevention (DDTP): Developer and administer of Diabetes Audit. The Division was established in 1979 by Congress to address diabetes in AI/AN communities. Its mission is to "develop, document, and sustain clinical and public health efforts to treat and prevent diabetes in American Indians and Alaska Natives." For more information about IHS DDTP, visit http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=peopleDDTP.

Key Measures: Developed by the IHS DDTP for use in monitoring the progress and effectiveness of Best Practices. Each Best Practice area contains one or more Key Measures. This report displays aggregate data on Key Measures that can be analyzed using data collected in the Diabetes Audit.

Special Diabetes Program for Indians (SDPI): Provides funding to aid in the prevention and treatment of diabetes among AI/AN. Established in 1997.

Standards of Care and Clinical Practice Recommendations: Provide guidance to clinicians and educators in the care provided to AI/AN individuals who have or are at risk for type 2 diabetes. For more information, visit: http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=soc

Urban Indian Health Institute (UIHI): A division of the Seattle Indian Health Board, the UIHI provides centralized nationwide management of health surveillance, research and policy regarding the health status of urban AI/AN people. The UIHI serves the national network of 33 UIHOs through scientific inquiry, technology and information. For more information visit: www.uihi.org.

Urban Indian Health Organizations (UIHOs): Network of 33 private, non-profit corporations, funded in part under Title V of the Indian Health Care Improvement Act. The UIHOs serve AI/ANs in select cities by providing a range of health and social services, from referral services to full ambulatory care. For more information about UIHOs and the populations they serve, visit: http://www.uihi.org/about-urban-indian-health-organizations/.

REFERENCES

1. Pleis JR, Lucas JW, Ward BW. (2009). Summary health statistics for U.S. adults: National Health Interview Survey, 2008. *Vital and Health Statistics*, *10*(242), 1-157.
2. Wilson C, Gilliland S, Cullen T, Moore K, Roubideaux Y, Valdez L, Vanderwagen W, Acton K. (2005). Diabetes outcomes in the Indian Health System during the era of the Special Diabetes Program for Indians and the Government Performance and Results Act. *American Journal of Public Health*, *95*(9), 1518-1522.
3. Indian Health Service Division of Diabetes Treatment and Prevention. Standards of Care and Clinical Practice Recommendations: Type 2 Diabetes. Retrieved from http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=soc.
4. Indian Health Service Division of Diabetes Treatment and Prevention. (2011). 2011 Revised Indian Health Diabetes Best Practices. Retrieved from http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=toolsBPList.
5. U.S. Department of Labor. (2011). Government Performance and Results Act Goals. Retrieved from http://www.doleta.gov/performance/goals/gpra.cfm.
6. U.S. Department of Health and Human Services. (2011). Healthy People 2020 Summary of Objectives - Diabetes. Retrieved from http://www.healthypeople.gov/2020/topicsobjectives2020/pdfs/Diabetes.pdf.
7. Indian Health Service Division of Diabetes Treatment and Prevention. (2012). *Audit 2012: IHS Diabetes Care and Outcomes Audit for Quality Assurance and Quality Improvement.* Albuquerque, NM: U.S. Department of Health and Human Services.
8. Indian Health Service Division of Diabetes Treatment and Prevention. (2011). *Indian Health Diabetes Best Practice: Adult Weight and Cardiometabolic Risk Management and Diabetes Guidelines.* Albuquerque, NM: U.S. Department of Health and Human Services.
9. Franz M, Powers A, Leontos C, Holzmeister L, Kulkarni K, Monk A, Wedel N, Gradwell E. (2010). The evidence for medical nutrition therapy for type 1 and type 2 diabetes in adults. *Journal of American Dietetic Association*, *10*, 1852-1889.
10. Keener D, Goodman K, Lowry A, Zaro S, Kettel Khan L. (2009). *Recommended Community Strategies and Measurements to Prevent Obesity in the United States: Implementation and Measurement Guide.* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.
11. Murphy SL, Xu J, Kochanek KD. (2013). Deaths: Final data for 2010. *National Vital Statistics Reports*, *61*(4).
12. Centers for Disease Control and Prevention (CDC). (2011). *National Diabetes Fact Sheet: National Estimates and General Information on Diabetes and Prediabetes in the United States.* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.
13. Centers for Disease Control and Prevention (CDC). *Heart Disease Fact Sheet.* Atlanta, GA: U.S. Department of Health and Human Services.
14. Centers for Disease Control and Prevention (CDC). (2013). *Health, United States, 2012: American Indian and Alaska Native Population.* Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.
15. Centers for Disease Control and Prevention (CDC). (2014). *National Chronic Kidney Disease Fact Sheet, 2014.* Atlanta, GA: U.S. Department of Health and Human Services.
16. Indian Health Service Division of Diabetes Treatment and Prevention. (2011). *Indian Health Diabetes Best Practice: Screening for Chronic Kidney Disease.* Albuquerque, NM: U.S. Department of Health and Human Services.
17. National Institute of Diabetes and Digestive and Kidney Diseases; Division of Kidney Urologic and Hematologic Diseases. (2012). *USRDS 2012 Annual Data Report: Atlas of Chronic Kidney Disease and End-Stage Renal Disease in the United States.* Bethesda, MD: National Institutes of Health.
18. Katon W. (2008). The comorbidity of diabetes mellitus and depression. *The American Journal of Medicine*, *121*(11 Suppl 2), S8-S15.
19. Calhoun D, Beals J, Carter EA, Mete M, Welty TK, Fabsitz RR, Lee ET, Howard BV. (2010). Relationship between glycemic control and depression among American Indians in the Strong Heart Study. *Journal of Diabetes Complications*, *24*(4), 217-222.
20. Indian Health Service Division of Diabetes Treatment and Prevention. (2012). Standards of Care and Clinical Practice Recommendations: Type 2 Diabetes. Retrieved from http://www.ihs.gov/MedicalPrograms/Diabetes/index.cfm?module=SOCMentalHealth.
21. Indian Health Service Division of Diabetes Treatment and Prevention. (2011). *Indian Health Diabetes Best Practice: Eye Care.* Albuquerque, NM: U.S. Department of Health and Human Services.
22. Taylor H, Vu H, McCarty C, Keefe J. (2004). The need for routine eye examinations. *Investigations in Ophthalmology and Visual Science*, *45*, 2539-2542.

REFERENCES

23. Lauterbach S, Kostev K, Kohlmann T. (2010). Prevalence of diabetic foot syndrome and its risk factors in the UK. *Journal of Wound Care.* 2010;*19*(8):333-337. http://www.ncbi.nlm.nih.gov/pubmed/20852505.

24. Indian Health Service Division of Diabetes Treatment and Prevention. (2011). *Indian Health Diabetes Best Practice: Foot Care.* Albuquerque, NM: U.S. Department of Health and Human Services.

25. American Diabetes Association (ADA). (2012). Diabetes and Oral Health Problems. Retrieved from http://www.diabetes.org/living-with-diabetes/treatment-and-care/oral-health-and-hygiene/diabetes-and-oral-health.html.

26. Indian Health Service Division of Diabetes Treatment and Prevention. (2011). *Indian Health Diabetes Best Practice: Oral Health Care.* Albuquerque, NM: U.S. Department of Health and Human Services.