



Urban Indian Health  
Organization Aggregate  
Diabetes Care and Outcomes  
Audit Report  
2004-2008

This report was prepared  
by the Urban Indian Health Institute  
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To learn more about the UIHI, please visit, [www.uihi.org](http://www.uihi.org).



Urban Indian Health Institute, a Division of the Seattle Indian Health Board  
PO Box 3364 Seattle, WA 98114 Ph. (206) 812-3030 Fx. (206) 812-3044

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## **Background**

Diabetes Mellitus is one of the leading causes of chronic disease among American Indians and Alaska Natives (AI/AN).<sup>1</sup> The prevalence of diagnosed diabetes among AI/AN adults (aged 20 years and older) is more than twice that of the overall U.S. adult population.<sup>1</sup> In an effort to reduce the burden of diabetes among AI/AN, Congress established the Special Diabetes Program for Indians (SDPI) in 1998.<sup>2</sup> Guided by Public Law 107-360, the program provides funding to specifically aid in the prevention and treatment of diabetes among AI/AN located in reservation/rural and urban areas. Partly as a result of this funding, national data on diabetes among AI/AN living in or near urban areas has become available for analysis.

Over the past three decades, American Indians and Alaska Natives have increasingly relocated from reservation/rural areas to urban areas.<sup>3</sup> Reports from 2000 Census data revealed that 67 percent of AI/AN now reside in urban areas.<sup>4</sup> Most of the published information around the burden of diabetes is derived from data collected about AI/AN who live on or near reservations and as a consequence, may not represent those who live in urban areas.<sup>4</sup> Moreover, it has been found that much of the available AI/AN health data is plagued with errors of racial misclassification, under-reporting, and other systematic biases.<sup>5</sup> As the AI/AN population continues to shift from reservation/rural to urban areas, there is an increasing need for diabetes health-related services in these urban areas, as well as surveillance-related activities that monitor diabetes outcomes and measures.

A potential source of health services with diabetes-related care for AI/AN living in or near urban areas is the network of urban Indian health organizations (UIHO). These organizations are independent, non-profit, Indian-controlled health facilities which contract with the Indian Health Service (IHS) to provide health care services and assistance to off-reservation urban AI/AN. These organizations provide a wide array of culturally appropriate and sensitive health care services to AI/AN and low-income patients. While the scope and delivery of health care services varies between facilities, all receive SDPI funding to provide diabetes standard of care services.

In an attempt to gain a greater understanding of the trends in diabetes services and outcomes among AI/AN people, Indian health facilities nationwide conduct an annual medical chart review, also known as the Diabetes Care and Outcomes Audit. The IHS Standards of Care for Patients with Type 2 Diabetes is utilized in the annual medical review and drives the collection of data.<sup>6</sup> The information obtained by these facilities and submitted to the IHS Division of Diabetes Treatment and Prevention (DDTP) is used for diabetes surveillance and for helping to create a clinical picture of the AI/AN population who receive diabetes care and services through the SDPI.

The purpose of this report is to provide a descriptive summary of the annual diabetes audit data collected by the urban SDPI-funded programs. Directed by a memorandum of agreement with the IHS, the Urban Indian Health Institute (UIHI) collaborated with the IHS DDTP in the development of this report. Funding for this report was made possible from a grant through the IHS Office of Urban Indian Health Program.

## **Materials and Methods**

### *Study Design*

The data examined for this report were collected for the annual IHS Diabetes Care and Outcomes Audit of medical records performed at participating UIHO from 2004 through 2008. Guided by written instructions, diabetes coordinators or trained staff at each of the participating organizations performed the audit. Patient charts were selected using a systematic random sampling scheme with a sufficient sample size to provide estimates within 10 percent of the true estimate.<sup>7</sup>

### *Target Population*

The data analyzed in this report come from patient registries of the urban sites that participated in the annual IHS Diabetes Care and Outcomes Audit. The organizations were instructed to include data from AI/AN patients with diagnosed diabetes who received diabetes health care services and who had a least one primary care visit in the last 12 months, and to exclude patients who met any of the following criteria: received primary referral or contract care paid by IHS, arranged other health care services with non-IHS monies, received primary care at another IHS or tribal facility, lived in a jail or nursing home and received care there, attended a dialysis unit (if on-site dialysis was not available), had gestational diabetes, had pre-diabetes only, or had moved, died or were non-contactable after three tries in 12 months.

### *Survey Design*

The IHS Diabetes Care and Outcomes Audit is based on consensus-derived standards of care, also known as the IHS Standards of Care for Patients with Type 2 Diabetes.<sup>7</sup> These standards were first developed in 1986, and are regularly reviewed by the IHS DDTP and updated as needed.<sup>7</sup> Using the audit, health facilities can assess their performance on a number of key measures known to describe the health of people with diabetes, including: demographic characteristics, vital statistics, examinations and educational services, therapy services, immunizations, and laboratory data.

The following measures were examined for this report:

- Age, sex, diabetes type
- Body Mass Index (based on height and last recorded weight)
- Hypertension (either recorded diagnosis or current prescription medication)
- Blood Pressure (mean of last three recorded blood pressures)
- Annual Eye Exam (qualified retinal examination), Foot Exam, and Dental Exam
- Annual Diet, Exercise and other Diabetes Instruction
- Annual Influenza immunization
- Pneumovax (ever in lifetime)
- Tetanus/diphtheria immunization in last 10 years
- Tuberculosis Status (PPD positive, PPD negative, no record)
- ECG (ever)
- Current diabetes therapy
- Chronic Aspirin/Antiplatelet Therapy
- Current use of ACE Inhibitor
- Current use of Lipid Lowering Agent
- Record of following labs in past year: A1c, creatinine, LDL cholesterol, triglycerides, urinalysis (2004 – 2007 only)
- Values for following labs in past year: A1c; creatinine; total, HDL, and LDL cholesterol; triglycerides
- Current tobacco use and referral to cessation counseling for users
- Current diagnosis of depression and annual screening for those without diagnosis

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*Data Collection*

Two options for data collection were made available to the health organizations: 1) a manual diabetes audit or 2) a computerized diabetes audit. The manual diabetes audit data were collected by gathering information from paper charts using the IHS DDTP audit data collection form.

The computerized diabetes audit extracts data from the IHS Resource and Patient Management System (RPMS), an integrated electronic method for the management of clinical, business practice, and administrative information used by the IHS.

Starting in 2008, all participating programs submitted data via a secure web application (the WebAudit) directly to the IHS DDTP. In previous years, some programs submitted data to their local IHS area office. Partly as a result of this change, more urban programs are represented in this national report in 2008 than in earlier years, although they may have collected and submitted data previously.

The audit data collected and submitted by participating urban Indian health organizations through 2008 were provided to the UIHI by the IHS DDTP.

Some audit measures change over time or are not collected in all years. Urinalysis measures changed in 2008, and results from this year are not comparable to earlier years. For this reason, urinalysis results are not provided for 2008 in these tables. Depression diagnosis and referral information were not collected in 2004, and so are not displayed for that year.

*Descriptive Statistics*

Stata 10 (StataCorp LP, College Station, Texas) was used to perform all statistical analyses. Because some facilities audit a random sample of their patients with diabetes, a weighting procedure was applied to calculate accurate estimations of audit statistics (percents and means, in this report). This is necessary when combining data from multiple sites and when not all patients are audited.

Because percents are rounded, the total may not add up to 100%.

The estimates reported represent the number and weighted percent of the of the total urban audit sample having each attribute or having received a particular standard of care with the exception of the following:

- Record of ECG: Patients age 30 and older only
- Chronic Aspirin: Patients age 30 and older only
- Tobacco Cessation Referral: Patients who report current tobacco use
- Depression Screening: Patients without current diagnosis of depression

*Comparison to National Standards: GPRA and HP 2010*

A comparison of select indicators to national standards is also included in this report. Passed in 1993, the Government Performance Results Act (GPRA) was designed to address a broad range of concerns regarding government accountability and performance. The general purpose of GPRA is to improve the confidence of Americans in Federal government by holding Federal agencies accountable for achieving program results.<sup>8</sup>

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By receiving funding from the IHS, urban Indian health organizations are considered grantees of federal government programs and are therefore subject to performance measurement as part of the grant requirements. Performance measurements include setting goals, providing data to support the accomplishment of those goals, and indicating results.

Healthy People 2010 (HP 2010) is a national health promotion and disease prevention initiative established by Health and Human Services. More specifically, it is a set of health objectives for the nation to achieve over the first decade of the new century. HP 2010 was designed to measure health-related outcomes and progress over time and was developed through a broad consultation process, built on scientific knowledge and other government health initiatives pursued over the past two decades.

HP 2010 was designed to achieve two overarching goals: to help individuals of all ages increase life expectancy and improve their quality of life and to eliminate health disparities. In addition to these overarching goals, there are twenty-eight focus areas, of which one is diabetes. The goal of the diabetes focus area is: *“Through prevention programs, reduce the disease and economic burden of diabetes, and improve the quality of life for all persons who have or are at risk for diabetes.”*<sup>9</sup>

The diabetes focus area and its goals to reduce disease and improve the quality of life are further detailed within seventeen objectives, five of which can be tracked using data from this diabetes audit.

More about GPRA and HP 2010 and their target measures can be found in Appendix A.

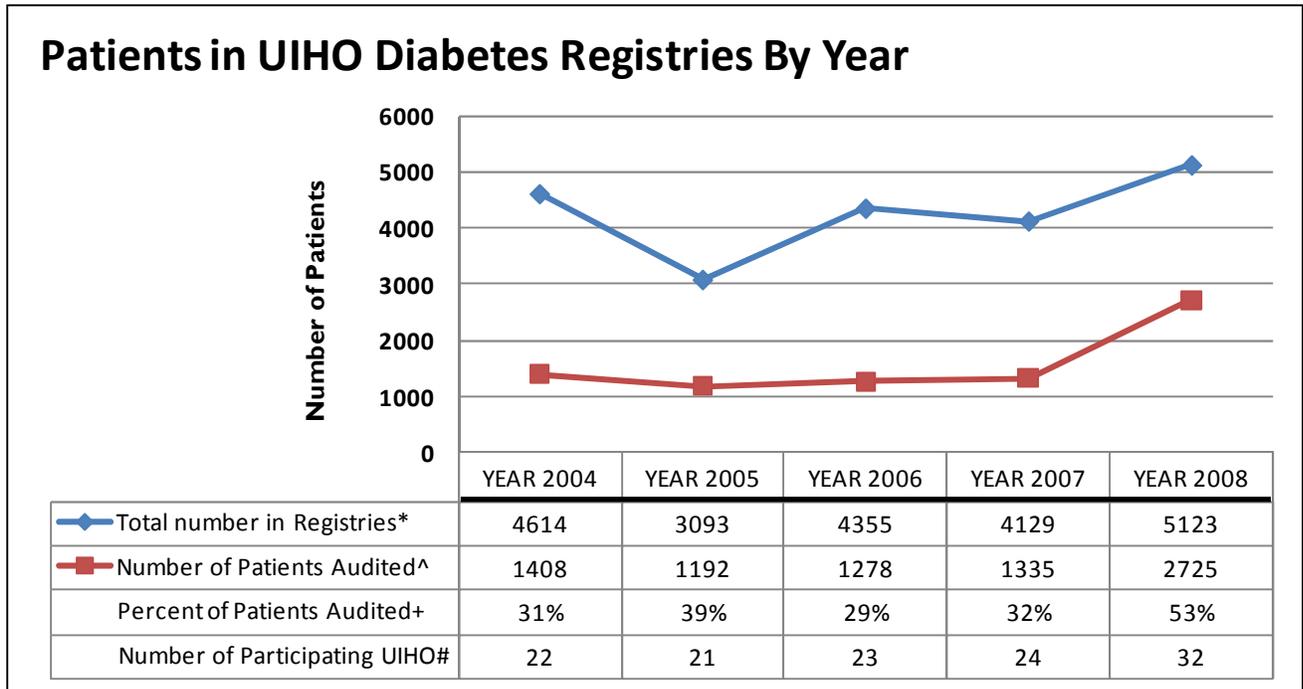
#### *Limitations*

One of the limitations of the data included in this report is that not all UIHO facilities participate each year. As a result, these data may not reflect a representative audit sample. In light of this, conservative interpretation of the findings is recommended. Identifying and understanding the obstacles and facilitators to site participation may provide insight around the accuracy of the estimates.

Another limitation pertains to the lack of general demographic data for all registry patients. The audit does not collect information on the socioeconomic indicators of education, income, employment status, or mobility. Understanding the baseline distribution of these variables and changes over time, could provide important information concerning the diabetes registry and hence, the audit population.

Furthermore, the amount of missing information for a few select variables should be considered. Most of the variables with 20 percent or more missing data were from laboratory results. It is important to note that the array of health care services offered varies by facility. For example, not all sites provide clinical services. Additionally, the availability of laboratory-related services may be either lacking or done off-site, and retrieving follow up laboratory values may pose challenges. Therefore, a breakdown of the clinical capability and capacity of each UIHO to report on the entire audit categories (e.g. laboratory-related) would be helpful in interpreting these results.

**Results**



\*Sum of all patients in each registry

^Sum of all patients reviewed by each site

+Number of patients audited/number of patients in registry

#Number of urban Indian health organizations participating

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<b>Table I. Demographics of Audited Patients with Diabetes, 2004-2008</b>										
<b>UIHO Aggregate</b>										
<b>Year</b>	<b>2004</b>		<b>2005</b>		<b>2006</b>		<b>2007</b>		<b>2008</b>	
No. charts audited	1,408		1,192		1,278		1,335		2,725	
	No.	% <sup>+</sup>								
<b>Sex</b>										
Male	534	36%	475	39%	488	38%	522	41%	1049	40%
Female	874	64%	717	61%	790	62%	813	59%	1676	60%
<b>Age (years)</b>										
< 15 years	0	0%	0	0%	1	0.1%	2	0.1%	4	0.2%
15-44 years	397	25%	328	26%	339	24%	379	28%	708	26%
45-64 years	777	55%	655	56%	726	58%	723	53%	1508	56%
≥ 65 years	234	19%	209	18%	212	18%	231	19%	505	17%
Mean Age <sup>+</sup>	52.7		53.0		53.2		52.4		52.5	
<b>Diabetes duration (years)</b>										
< 5 years	571	38%	512	44%	500	41%	525	40%	1,091	40%
5 – 9 years	351	25%	319	26%	320	22%	344	24%	698	25%
≥ 10 years	350	28%	300	26%	348	29%	365	28%	754	27%
Missing	136	8%	61	5%	110	8%	101	7%	182	8%
Mean duration <sup>+</sup>	8.0		7.1		7.8		7.6		7.4	
<b>Diabetes Type</b>										
Type 1	31	3%	31	3%	23	2%	41	4%	72	3%
Type 2	1376	97%	1160	97%	1254	98%	1292	96%	2650	96%
Missing	1	0%	1	0%	1	0%	2	0%	3	0.1%

+Weighted estimate

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<b>Table 2. Vital Statistics of Audited Patients with Diabetes, 2004-2008</b>										
<b>UIHO Aggregate</b>										
<b>Year</b>	<b>2004</b>		<b>2005</b>		<b>2006</b>		<b>2007</b>		<b>2008</b>	
No. charts audited	1,408		1,192		1,278		1,335		2,725	
	No.	% <sup>+</sup>								
<b>Body Mass Index (BMI)*</b>										
< 25	114	9%	99	9%	84	6%	89	7%	202	7%
25 - 29	329	24%	259	22%	281	23%	303	23%	574	21%
≥ 30	883	62%	794	67%	874	69%	910	68%	1879	68%
Missing	82	5%	40	3%	39	2%	33	1%	70	3%
Mean BMI <sup>+</sup>	34.0		34.2		34.7		34.4		34.8	
<b>Hypertension <sup>^</sup></b>										
Yes	838	67%	800	70%	850	70%	941	74%	2038	74%
No	521	27%	367	27%	415	28%	390	26%	675	26%
Missing	49	5%	25	3%	13	1%	4	0.1%	12	1%
<b>Blood pressure (mmHg)</b>										
<120/<70	86	6%	112	8%	103	8%	110	8%	259	8%
120/70 - <130/<80	393	29%	387	35%	389	31%	404	33%	780	28%
130/80 - <140/<90	425	32%	351	31%	404	35%	376	28%	726	29%
140/90 - <160/<95	213	17%	143	13%	146	11%	155	13%	331	14%
160+/95+	75	5%	42	4%	36	3%	50	4%	80	3%
Missing	216	10%	157	10%	200	12%	240	14%	549	18%
Mean Systolic <sup>+</sup>	130		128		128		127		128	
Mean Diastolic <sup>+</sup>	79		77		77		77		77	

+Weighted estimate

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

<sup>^</sup>Documented diagnosis or taking prescription medication

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<b>Table 3. Exams in Past Year among Audited Patients with Diabetes, 2004-2008</b>										
<b>UIHO Aggregate</b>										
<b>Year</b>	<b>2004</b>		<b>2005</b>		<b>2006</b>		<b>2007</b>		<b>2008</b>	
No. charts audited	1,408		1,192		1,278		1,335		2,725	
	No.	% <sup>+</sup>								
<b>Eye Exam</b>										
Yes	672	54%	630	52%	585	49%	642	50%	1339	48%
No	686	42%	495	41%	618	45%	676	49%	1330	49%
Refused	41	3%	63	7%	64	5%	17	1%	41	2%
Missing	9	1.0%	4	0.3%	11	1.1%	0	0%	15	0.8%
<b>Foot Exam</b>										
Yes	845	67%	760	64%	843	68%	903	68%	1854	68%
No	544	31%	401	32%	390	28%	415	31%	849	31%
Refused	12	1%	28	3%	39	3%	15	0.7%	13	0.5%
Missing	7	0.9%	3	0.2%	6	0.6%	2	0.1%	9	0.6%
<b>Dental Exam</b>										
Yes	372	26%	350	30%	399	28%	418	26%	784	27%
No	975	70%	771	63%	798	66%	892	73%	1847	69%
Refused	52	3%	64	7%	71	5%	24	1%	70	3%
Missing	9	0.9%	7	0.7%	10	1.0%	1	0.0%	24	1.3%

+Weighted estimate

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<b>Table 4. Diabetes Education among Audited Patients with Diabetes, 2004-2008</b>										
<b>UIHO Aggregate</b>										
<b>Year</b>	<b>2004</b>		<b>2005</b>		<b>2006</b>		<b>2007</b>		<b>2008</b>	
No. charts audited	1,408		1,192		1,278		1,335		2,725	
	No.	% <sup>+</sup>								
<b>Diet Instruction</b>										
By Registered Dietician	391	32%	299	30%	300	27%	291	26%	532	26%
By Other Staff	438	26%	326	25%	305	19%	445	27%	800	26%
By Both RD and Other	168	9%	201	13%	223	13%	197	13%	319	8%
No Diet Instruction	377	31%	324	27%	415	38%	390	34%	1042	38%
Refused	31	2%	38	4%	32	3%	11	0.6%	25	1.2%
Missing	3	0.7%	4	0.5%	3	0.2%	1	0.0%	7	0.4%
<b>Exercise Instruction</b>										
Yes	864	56%	802	67%	747	52%	841	55%	1451	54%
No	525	42%	378	31%	401	41%	477	44%	1239	44%
Refused	16	1.0%	9	0.9%	123	6%	16	0.5%	24	1.1%
Missing	3	0.7%	3	0.3%	7	1%	1	0%	11	0.6%
<b>Diabetes Education (other)</b>										
Yes	1071	68%	943	79%	938	64%	1029	70%	1730	67%
No	312	29%	238	20%	245	30%	296	30%	957	31%
Refused	20	2%	9	0.8%	90	5%	10	0.4%	26	1.3%
Missing	5	1.2%	2	0.1%	5	0.6%	0	0%	12	0.7%

+Weighted estimate

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<b>Table 5. Immunizations among Audited Patients with Diabetes, 2004-2008</b>										
<b>UIHO Aggregate</b>										
<b>Year</b>	<b>2004</b>		<b>2005</b>		<b>2006</b>		<b>2007</b>		<b>2008</b>	
No. charts audited	1,408		1,192		1,278		1,335		2,725	
	No.	% <sup>+</sup>								
<b>Influenza Vaccine in past yr</b>										
Yes	723	55%	713	58%	710	57%	726	55%	1759	60%
No	610	37%	412	36%	483	37%	532	41%	804	34%
Refused	60	5%	64	6%	75	5%	74	4%	147	6%
Missing	15	3%	3	0.4%	10	0.8%	3	0.2%	15	0.7%
<b>Pneumococcal Vaccine ever</b>										
Yes	848	67%	757	66%	762	61%	809	65%	1861	65%
No	507	28%	407	31%	475	36%	483	32%	753	31%
Refused	35	3%	26	2%	29	3%	41	3%	92	3%
Missing	18	2%	2	0.1%	12	1.0%	2	0.0%	19	0.7%
<b>Td Vaccine in past 10 years</b>										
Yes	799	65%	705	63%	732	61%	790	66%	1846	65%
No	572	32%	462	34%	512	35%	519	33%	825	33%
Refused	14	0.8%	20	2%	14	2%	20	1.4%	36	1.2%
Missing	23	2%	5	0.3%	20	2%	6	0.3%	18	0.8%
<b>TB Status (PPD)</b>										
Positive	170	13%	163	13%	154	13%	150	12%	320	9%
Negative	512	38%	459	36%	429	28%	490	33%	815	27%
Refused	15	1%	19	2%	27	2%	10	1%	31	1%
Unknown	695	46%	540	48%	650	55%	681	53%	1528	62%
Missing	16	1.3%	11	0.8%	18	2%	4	0.2%	31	1.4%
<b>ECG ever*</b>										
Yes	774	66%	707	66%	767	70%	846	74%	1792	67%
No	572	34%	434	34%	467	30%	438	26%	822	33%

+Weighted estimate

\*Among patients age 30 and older

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<b>Table 6. Laboratory Services among Audited Patients with Diabetes, 2004-2008</b>										
<b>UIHO Aggregate</b>										
<b>Year</b>	2004		2005		2006		2007		2008	
No. charts audited	1,408		1,192		1,278		1,335		2,725	
	No.	% <sup>+</sup>								
<b>Labs done in past year:</b>										
A1c	1289	95%	1122	96%	1149	96%	1227	96%	2556	94%
Creatinine	1123	88%	946	85%	994	84%	1047	87%	2275	84%
LDL Cholesterol	1012	81%	889	79%	942	78%	1020	81%	2029	78%
Triglycerides	1071	85%	947	84%	986	81%	1080	85%	2095	81%
Urinalysis	1034	83%	823	77%	937	82%	1061	87%		

+Weighted estimate

2008 urinalysis results not comparable to earlier years – results not shown

<b>Table 7. Laboratory Results among Audited Patients with Diabetes, 2004-2008</b>										
<b>UIHO Aggregate</b>										
<b>Year</b>	2004		2005		2006		2007		2008	
No. charts audited	1,408		1,192		1,278		1,335		2,725	
	No.	% <sup>+</sup>								
<b>A1c (%)</b>										
<7.0	472	37%	486	44%	515	46%	542	43%	1222	44%
7.0 – 9.5	557	42%	457	39%	440	36%	458	38%	896	34%
≥ 9.5	260	16%	179	13%	194	13%	227	15%	438	17%
Missing	119	5%	70	4%	129	4%	108	4%	169	6%
Mean A1c <sup>+</sup>	7.8		7.5		7.5		7.6		7.8	
<b>Creatinine (mg/dl)</b>										
< 2.0	1095	85%	928	83%	976	83%	1022	84%	2189	81%
≥ 2.0	28	3%	18	2%	18	1%	25	2%	86	3%
Missing	285	12%	246	15%	284	16%	288	13%	450	16%
Mean Creatinine <sup>+</sup>	0.96		0.95		0.95		0.97		0.98	

+Weighted estimate

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<b>Table 7 cont. Laboratory Results among Audited Patients with Diabetes, 2004-2008</b>										
<b>UIHO Aggregate</b>										
<b>Year</b>	<b>2004</b>		<b>2005</b>		<b>2006</b>		<b>2007</b>		<b>2008</b>	
No. charts audited	1,408		1,192		1,278		1,335		2,725	
	No.	% <sup>+</sup>								
<b>Total Cholesterol (mg/dl)</b>										
< 200	723	59%	680	62%	700	60%	752	61%	1519	59%
200 – 239	245	17%	184	14%	213	15%	228	16%	385	14%
≥ 240	138	11%	96	9%	84	6%	93	8%	189	7%
Missing	302	14%	232	15%	281	18%	262	16%	632	20%
Mean Total Cholesterol <sup>+</sup>	188		183		178		180		179	
<b>LDL Cholesterol (mg/dl)</b>										
< 100	514	45%	478	45%	529	46%	565	47%	1125	44%
100 – 129	297	22%	260	22%	269	21%	293	22%	561	21%
130 – 160	140	10%	114	9%	107	8%	110	7%	240	9%
> 160	61	4%	37	3%	37	2%	49	4%	103	4%
Missing	396	19%	303	21%	336	22%	318	19%	696	22%
Mean LDL Cholesterol <sup>+</sup>	97		99		95		98		98	
<b>HDL Cholesterol (mg/dl)</b>										
< 35	217	17%	199	16%	190	17%	203	15%	378	15%
35 – 45	397	30%	373	32%	385	33%	420	34%	810	31%
46 – 55	228	16%	223	21%	236	19%	240	19%	538	21%
> 55	220	20%	150	14%	167	12%	208	16%	376	15%
Missing	346	16%	247	17%	300	19%	264	16%	623	19%
Mean HDL Cholesterol <sup>+</sup>	50		45		44		46		46	
<b>Triglyceride (mg/dl)</b>										
< 150	435	38%	373	35%	393	34%	500	42%	1041	40%
150 – 199	232	18%	222	20%	249	20%	212	16%	422	16%
200 – 400	306	21%	281	23%	280	22%	297	22%	514	20%
> 400	98	8%	71	6%	64	5%	71	5%	118	5%
Missing	337	15%	245	16%	292	19%	255	15%	630	19%
Mean Triglyceride <sup>+</sup>	206		206		202		199		184	

+Weighted estimate

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<b>Table 8. Use of Standard Therapies among Audited Patients with Diabetes, 2004-2008</b>										
<b>UIHO Aggregate</b>										
<b>Year</b>	<b>2004</b>		<b>2005</b>		<b>2006</b>		<b>2007</b>		<b>2008</b>	
No. charts audited	1,408		1,192		1,278		1,335		2,725	
	No.	% <sup>+</sup>								
<b>Diabetes Treatment</b>										
Diet/Exercise Alone	163	7%	123	9%	162	11%	162	10%	392	11%
Oral Agent Only	867	67%	763	65%	782	65%	745	56%	1549	55%
Insulin Only	140	10%	111	11%	112	8%	156	14%	292	14%
Oral Agent and Insulin	206	15%	177	15%	192	15%	235	18%	466	19%
Refused/Unknown	29	1.0%	18	0.7%	30	1.3%	28	0.9%	26	0.9%
Missing	3	0.1%	0	0%	0	0%	9	0.5%	0	0%
<b>Chronic Aspirin*</b>										
Yes	884	72%	799	71%	810	65%	853	70%	1835	71%
No	435	26%	318	26%	386	32%	420	30%	746	28%
Refused/Adverse Rx	11	1%	19	2%	21	1%	11	0.5%	18	1%
Missing	16	1%	5	1%	17	2%	0	0%	15	1%
<b>Lipid Lowering Agent</b>										
Yes	682	53%	654	57%	703	61%	730	60%	1154	49%
No	698	44%	520	41%	553	38%	582	39%	1520	49%
Refused/Adverse Rx	12	1.0%	11	0.9%	14	0.7%	22	1.0%	33	1.1%
Missing	16	2%	7	0.7%	8	0.8%	1	0.0%	18	0.8%
<b>ACE Inhibitor</b>										
Yes	867	71%	808	73%	823	71%	902	72%	1962	72%
No	515	27%	371	25%	430	27%	426	27%	735	27%
Refused/Adverse Rx	8	1%	12	1.3%	11	0.7%	6	0.3%	15	0.7%
Missing	18	2%	1	0.1%	14	1.1%	1	0.0%	13	0.4%

+Weighted estimate

\*Among patients 30 years and older

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<b>Table 9. Tobacco Use among Audited Patients with Diabetes, 2004-2008</b>										
<b>UIHO Aggregate</b>										
<b>Year</b>	<b>2004</b>		<b>2005</b>		<b>2006</b>		<b>2007</b>		<b>2008</b>	
No. charts audited	1,408		1,192		1,278		1,335		2,725	
	No.	% <sup>+</sup>								
<b>Current tobacco use</b>										
User	404	32%	367	32%	390	32%	411	33%	791	30%
Non-user	901	62%	762	64%	843	65%	860	65%	1870	68%
Not documented	89	4%	61	4%	45	2%	64	3%	64	2%
Missing	14	2%	2	0.1%	0	0%	0	0%	0	0%
<b>Cessation referral*</b>										
Yes	233	47%	206	49%	204	39%	238	44%	490	56%
No	118	28%	113	31%	158	52%	152	51%	252	34%
Refused	36	13%	39	17%	11	2%	16	4%	36	6%
Missing	17	12%	9	2%	17	7%	5	1%	13	3%

+Weighted estimate

\*Among current tobacco users

<b>Table 10. Depression among Audited Patients with Diabetes, 2004-2008</b>										
<b>UIHO Aggregate</b>										
<b>Year</b>	<b>2004</b>		<b>2005</b>		<b>2006</b>		<b>2007</b>		<b>2008</b>	
No. charts audited	1,408		1,192		1,278		1,335		2,725	
	No.	% <sup>+</sup>								
<b>Active Diagnosis of Depression</b>										
Yes			285	25%	368	29%	397	27%	765	28%
No			811	63%	899	70%	936	72%	1948	72%
Missing			96	12%	11	1%	2	0.2%	12	0.4%
<b>Depression Screening*</b>										
Yes			120	20%	408	47%	479	57%	1,323	60%
No			688	79%	482	52%	448	42%	571	36%
Refused			0	0%	6	0.5%	5	0.2%	13	1%
Missing			3	0%	3	0.2%	4	0.3%	41	4%

Depression data were not collected in 2004

+Weighted estimate

\*Among those without diagnosis of depression

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The table below provides information on how audited patients at all UIHO combined compare with the 2008 IHS GPRA goals and Healthy People 2010 targets.

Year	2004	2005	2006	2007	2008	2008 IHS GPRA Goal	HP 2010 Target
No. charts audited	1,408	1,192	1,278	1,335	2,725		
	% <sup>+</sup>						
A1c < 7.0%	37.3%	43.9%	46.4%	43.1%	43.7%	31%	
A1c > 9.5% (lower is better)	15.6%	13.4%	13.4%	15.3%	16.7%	16%	
Blood pressure (mmHg) < 130/80	34.9%	42.8%	38.7%	41.7%	35.7%	39%	
LDL Cholesterol done	80.8%	79.2%	78.1%	80.8%	77.7%	61%	
Nephropathy assessment					50.0%	40%	
Retinopathy assessment	56.8%	59.1%	53.8%	51.1%	49.8%	49%	75%
Foot exam	68.1%	67.4%	71.6%	68.8%	68.9%		75%
Dental exam	28.6%	36.4%	33.3%	26.9%	30.1%		75%
Chronic aspirin*	72.8%	72.9%	66.6%	70.3%	71.7%		30%
A1c done	94.8%	96.5%	95.5%	96.3%	94.4%		50%

+Weighted percent

\*Aspirin use among those 30 and older

Nephropathy assessment definition has changed and 2008 data cannot be compared with earlier years. Current definition includes patients with both an estimated glomerular filtration rate (GFR) and a quantitative urinary protein assessment.

## **Conclusion**

Diabetes is a significant and rapidly growing health problem among American Indians and Alaska Natives. More than 15 percent of AI/AN adults (aged 20 years or older) are estimated to have type 2 diabetes and the rate is rising rapidly among children and youth.<sup>10</sup> Diabetes is now the fourth leading cause of death for AI/AN in the United States.<sup>11</sup> Yet it is estimated that nearly one-third of people with diabetes are unaware that they have the illness.<sup>12</sup> Left untreated, diabetes may lead to serious complications, disability, and premature death. For these reasons, the early diagnosis of, treatment for, and surveillance around diabetes-related care, are all key factors to combating the disease.

Data collected for the annual IHS Diabetes Care and Outcomes Audit were used to describe diabetes-related care and services among AI/AN who received care at one of the participating urban Indian health organizations. Participation in the annual diabetes audit continues to grow each year. Comparisons to GRPA and HP 2010 measures demonstrate a high level of accomplishment among all urban health organizations combined: almost all GPRA targets were met or exceeded each year, even when using 2008 targets as the comparison for earlier years. HP 2010 targets for eye, dental, and foot exams were not met; however targets for chronic aspirin use and hemoglobin A1c assessment were greatly surpassed.

The IHS annual audit data collected from 2004 to 2008 provide a unique opportunity to identify and better understand the health status of urban AI/AN with diabetes and the provision of diabetes-related services to this population. This report is a step in addressing the gap in knowledge about diabetes among urban AI/AN. However, it is imperative that surveillance and efforts to increase and maintain participation in the audit continue.

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## Appendix A: GPRA and Healthy People 2010 Indicators

### GPRA Indicators and Definitions

More about IHS GPRA indicators can be found here:

[http://www.ihs.gov/NonMedicalPrograms/quality/index.cfm?module=gpra\\_list](http://www.ihs.gov/NonMedicalPrograms/quality/index.cfm?module=gpra_list)

GPRA Indicators for Diabetes	Definition
Poor Glycemic Control	Last recorded Hemoglobin A1c > 9.5 %
Ideal Glycemic Control	Last recorded hemoglobin A1c < 7.0 %
Ideal Blood Pressure Control	Mean of last three recorded blood pressures <130/ <80 mmHg
Assessed for Dyslipidemia in preceding 12 months	Proportion of audited sample with low density lipoprotein (LDL) cholesterol tested in preceding 12 months
Assessed for Nephropathy in preceding 12 months	Proportion of the audited sample with both an estimated glomerular filtration rate (GFR) and a quantitative urinary protein assessment. <b>The definition of this indicator has recently changed, and 2008 data cannot be compared with earlier years.</b>
Assessed for Retinopathy in preceding 12 months	Proportion of the audited sample in which a retinal exam was documented in the preceding 12 months

### HP 2010 Diabetes Objectives in this report and related Targets

More about HP 2010 can be found here: <http://www.healthypeople.gov/>

HP 2010 Focus Area Diabetes Objectives	Target
5-12. Increase the proportion of adults with diabetes who have a glycosylated hemoglobin measurement at least once a year.	50%
5-13. Increase the proportion of adults with diabetes who have an annual dilated eye examination.	75%
5-14. Increase the proportion of adults with diabetes who have at least an annual foot examination.	75%
5-15. Increase the proportion of persons with diabetes who have at least an annual dental examination.	75%
5-16. Increase the proportion of adults with diabetes who take aspirin at least 15 times per month.	30%

