INDIAN HEALTH SERVICE
TRACKING REGIONAL INDIAN HEALTH STATUS OBJECTIVES

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

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Overview

The Indian Health Service (IHS), an agency within the U.S. Department of Health and Human Services (DHHS), is responsible for providing federal health services to American Indian and Alaska Native (AI/AN) people. The provision of health services to federally recognized Indians grew out of a special relationship between the federal government and Indian Tribes. This government-to-government relationship is based on Article I, Section 8, of the United States Constitution, and has been given form and substance by numerous treaties, laws, Supreme Court decisions, and Executive Orders.

The Indian Health program became a primary responsibility of the HHS under P.L. 83-568, the Transfer Act, on August 5, 1954. This Act provides "that all functions, responsibilities, authorities, and duties . . . relating to the maintenance and operation of hospital and health facilities for Indians, and the conservation of Indian health . . . shall be administered by the Surgeon General of the United States Public Health Service."

IHS is the federal health care provider and health advocate for AI/AN people and its goal is to assure that comprehensive, culturally-acceptable personal and public health services are available and accessible to AI/AN people. The mission of IHS, in partnership with AI/AN people, is to raise their physical, mental, social, and spiritual health to the highest level. It is also the responsibility of the IHS to work with the people involved in the health delivery programs so they may be cognizant of entitlements of AI/AN people, as American citizens, to all federal, state, and local health programs, in addition to IHS and Tribal services. IHS also acts as the principal federal health advocate for AI/AN people in the building of health coalitions, networks, and partnerships with Tribal nations and other government agencies as well as with non-federal organizations, e.g., academic medical centers and private foundations.

IHS has carried out its responsibilities through developing and operating a health services delivery system designed to provide a broad-spectrum program of preventive, curative, rehabilitative, and environmental services. This system integrates health services delivered directly through IHS facilities, purchased by IHS through contractual arrangements with providers in the private sector, and delivered through Tribally-operated programs and Urban Indian Health Programs.

The 1975 Indian Self-Determination Act, P.L. 93-638 as amended, builds upon IHS policy by giving Tribes the option of staffing and managing IHS programs in their communities, and provides for funding for improvement of Tribal capability to contract under the Act. The 1976 Indian Health Care Improvement Act, P. L. 94-437 as amended, was intended to elevate the health status of AI/AN people to a level equal to that of the general population through a program of authorized higher resource levels in the IHS budget. Appropriated resources were used to expand health services, build and renovate medical facilities, and step up the construction of safe drinking water and sanitary disposal facilities. It also established programs designed to increase the number of Indian health professionals for Indian needs and to improve health care access for Indian people living in urban areas.

The operation of IHS health services delivery system is managed through local administrative units called service units. A service unit is the primary level of health organization for a geographic area served by the IHS program, just as a county or city health department in a state health department.

A few service units cover a number of small reservations; some large reservations are divided into a number of service units. The service units are grouped into larger cultural-demographic-geographic management jurisdictions administered by Area Offices.

Tracking Regional Indian Health Status Objectives, 2018

Introduction

"Tracking Regional Indian Health Status Objectives, 2018" provides an overview of Indian Health Service progress in meeting a special set of health status objectives. This report uses narrative (analysis), tables, and charts to describe specific American Indian and Alaska Native health status measures as specified in Healthy People 2010 (HP2010) and focuses on a core set of 17 objectives.

Healthy People 2010, which was formally unveiled in 2000, established a wide array of national health improvement objectives for the United States to attain between 2000 and 2010. HP2010 was designed to make progress in two broad areas: (1) to assist individuals of all ages to increase life expectancy and improve their quality of life, and (2) to eliminate health disparities among different segments of the population. Unlike HP2000 the HP2010 guidelines identified a single national target for each objective which was applicable to all population groups. Several different strategies were used by HP2010 to establish these targets. Most population-based objectives in HP2010 utilized a "better than the best" approach, which set a target that would exceed the baseline level of the demographic group with the best health status. This target-setting method ensured that the HP2010 targets allowed for improvements for all racial/ethnic groups, with the goal of reducing health disparities. For objectives that were deemed unlikely to achieve non-disparity within the decade regardless of the degree of intervention, the HP2010 targets were set at a level that would represent an improvement for a substantial proportion of the U.S. population.

The objectives established in HP2010 have now transitioned into new objectives set forth by HP2020. IHS remains committed to achieving the health promotion and disease prevention objectives that were outlined in HP2010 and updated in HP2020. The Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics (NCHS) tracked HP2010 objectives for the entire nation, and final national results for all objectives have been published in the "Healthy People 2010 Final Review." IHS tracked these health status objectives only for AI/AN people residing in the specific counties in which IHS has responsibilities, which comprises approximately 56 percent of all AI/AN residing in the United States. This *"Tracking Regional Indian Health Status Objectives, 2018"* provides the final decade-based results for HP2010 that were achieved through 2009-2011. The report does not address all of the objectives in HP2010 but focuses on a core set of 17 objectives. (Future IHS

reports will report on the progress occurring in the current decade toward the new targets established by HP2020.) Throughout this report, current regional differences and trends over time are depicted and comparisons to the general population are made when appropriate. Additional general purpose health statistics for the IHS service population can be ascertained in the IHS publications entitled: *"Trends in Indian Health"* and *"Regional Differences in Indian Health."*

Sources and Limitations of Data

Population Statistics

IHS service population estimates are based on official U.S. Census Bureau county data, representing self-identified AI/AN people who may or may not use IHS services. IHS service populations between census years (e.g., 2000 and 2010) are estimated using a smoothing technique in order to show a gradual transition between census years. This normally results in upward revisions to service population figures projected prior to a census, since each Census tends to do a better job in enumerating AI/AN people. IHS service populations beyond the latest census year (2010) are projected through linear regression techniques, using the most current ten years of AI/AN birth and death data provided by the National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention (CDC).

State birth and death certificates do not provide information on use of IHS services, IHS service population figures are used in calculating AI/AN vital event rates for the IHS service areas.

IHS Service Population

Definition

IHS service population figures are based on the 2010 census with bridged-race categories (at the county level) file. The Census Bureau enumerates those individuals who identify themselves as AI/AN. The IHS service population consists of those enumerated AI/ANs who reside in the geographic areas in which IHS has responsibilities ("on or near" reservations, i.e., contract health service delivery areas (CHSDAs)).

Description of Service Population Calculation

The Division of Program Statistics (DPS) produces service populations for IHS Areas, service units, and counties. Since state birth and death certificates do not provide information on use of IHS services, the IHS service population counts are used as the denominator when calculating AI/AN vital event rates for IHS service areas.

IHS service populations between census years (e.g., 2000 and 2010) are estimated using a smoothing technique in order to illustrate a gradual transition between census years. This normally results in upward revisions to service population figures projected prior to a census, since each census tends to conduct a better job in enumerating AI/AN people. IHS service

populations beyond the latest census years (2010) are projected through linear regression techniques, using the most current ten years of AI/AN birth and death data provided by NCHS. The IHS service population is based on the 2010 Census with bridged-race categories.

> *Beginning with the 2000 Census allowed respondents to report more than one race category to describe themselves and household members. This was a result of the revised Office of Management and Budget (OMB) guidelines issued on October 30, 1997. All other censuses prior to 2000 had offered the respondent with the option for self-identification of a single race with which the respondent most closely identified. As a result of the aforementioned OMB revised standards, a methodology was developed to "bridge" the 2000 Census with previous decennial censuses. This impacted the manner in which the total AI/AN population was counted.*

The U.S. Census Bureau and the Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS) are credited for developing the bridging methodology to address the inconsistencies for identifying race between the 2000 Census and the previous censuses. The 2000 Census with bridged-race categories re-categorizes more than one race responses to a single race response. The 2000 Census's (with bridged-race categories) single race corresponds with the single race categories used on the birth and death certificates.

Information detailing the bridge race categories can be found in the document entitled: "United States Census 2000 Population with Bridged Race Categories:" (https://www.cdc.gov/nchs/data/series/sr_02/sr02_135.pdf)

Using the 2010 Census with bridged-race categories increased the AI/AN population denominators resulting in an AI/AN population of 3.9 million for the entire U.S., thereby slightly decreasing the IHS mortality rates.

The population of interest for this report is all AI/AN residing in the IHS service area. The IHS service area consists of counties on and near federal Indian reservations. The AI/AN people residing in the service area comprise about 56 percent of all AI/AN people (alone) residing in the U.S. It is estimated to be approximately 2.2 million in 2017 compared to 3.9 million in the entire U.S.

IHS service populations beyond the latest census (2010) are projected through linear regression techniques using the latest ten years of AI/AN birth and death data provided by NCHS. The estimated natural change for a county (number of births minus the number of deaths) is applied accumulatively to the latest census enumeration for each county and each year beyond the census. DPS produces a new set of IHS service population projections each year.

IHS service populations are produced for the IHS area, service unit, and county levels. If a county is split between and/or among service units and/or IHS service areas, DPS allocates the county population to the affected service units and/or service areas. These population allocations are based on percentage splits developed and agreed by the affected IHS areas. A letter of agreement describing the formal arrangement (including a valid authorization by all authorities for the population allocation) is sent to DPS and kept on file. These percentage splits are calculated using sub-county census data and census maps.

DPS also generates AI/AN population estimates and projections, utilizing an identical methodology, for non-service IHS counties. Therefore, DPS produces census-based AI/AN population figures for every U.S. county and all 50 states.

Changes in Methodologies

DPS used updated methodologies to produce age-adjusted mortality rates. These applied methodologies coincide with methodologies used by NCHS, CDC and the U.S. Census Bureau. Using these updated methodologies enabled AI/AN mortality rates to be compared to U.S. all-races mortality rates produced by the aforementioned agencies.

Age-adjusted mortality rates for this report are **NOT** comparable to previously published mortality rates calculated for "*Tracking Regional Indian Health Status Objectives, 1996"*. This is due to several changes in the methodology used to calculate the age-adjusted mortality rate produced by DPS.

DPS calculates data that are comparable by using the following updated methodologies. Major methodologies applied by DPS include:

U.S. Census Populations with Bridged Race Categories (2010 Census Bridged File)

The 2010 U.S. Census Population with Bridged-Race Categories (2010 Census Bridged File) for AI/ANs was used by IHS to calculate mortality and natality age-adjusted rates. The 2010 Census allowed respondents to report more than one race category to describe their race. Vital event totals are used in the numerator and the 2010 Census bridged population is used in the denominator to produce the birth or death rates that occur in the population of interest. The denominator data are based on the 2010 Census Bridged File, which re-categorizes responses to a single race where more than one race was reported. This corresponds to the single race categories used on birth and death certificates.

Age Adjustment Based on the 2000 Standard Population

DHHS recommended that all DHHS agencies use the 2000 Census standard population to age-adjust mortality rates. IHS calculates age-adjusted rates based on the 2000 standard population to comply with this HHS recommendation.

Vital Event Statistics

AI/AN vital event statistics are derived from data provided annually to IHS by NCHS. Vital event statistics for the U.S. population were derived from data reported in various NCHS publications as well as from some unpublished data from NCHS.[1] NCHS obtains birth and death records for all U.S. residents from state health departments, based on information reported on official birth and death state certificates. The records NCHS provides to IHS contain the same

basic demographic items as the vital event records maintained by NCHS for all U.S. residents, but with names, addresses, and record identification numbers deleted. It should be noted that Tribal identity is not recorded on these records.

The natality and mortality data are only as accurate as the reporting by the states to NCHS. NCHS does perform numerous edit checks, applies verification methods, and imputes values for non-responses.

Misreporting of AI/AN race on state death certificates occurs, especially in areas distant from traditional AI/AN reservations. In order to determine the degree and scope of the misreporting, IHS conducted a study utilizing the National Death Index (NDI) maintained by NCHS. The study involved matching IHS patient records of those patients who could have died during 1986 through 1988 with all death records of U.S. residents for 1986 through 1988 as contained on the NDI. The results were published in a document entitled, *Adjusting for Miscoding of Indian Race on State Death Certificates*, November 1996. The study revealed that on 10.9 percent of the matched IHS-NDI records, the race reported for the decedent was other than AI/AN. The percentage of records with inconsistent classification of race ranged from 1.2 percent in the Navajo Area to 28.0 and 30.4 percent in the Oklahoma and California Areas, respectively.[2]

The results of the NDI study provide sufficient numbers to calculate adjustments for each IHS Area, IHS overall and selected age groups. In addition to these adjustments based on the study findings, IHS assumed the following: (a) the results from 1986-88 apply to other years; (b) IHS age-group adjustments applied also to each Area; and (c) the Area adjustments applied to the causes of death used in this publication, i.e., if an Area's total deaths needed to be increased by ten percent, than the deaths for each cause of death would also increase by this same rate. These assumptions cannot be statistically supported by the results of the study. However, it was necessary to adjust all the death rates in this publication to provide a meaningful and comprehensive look at health status.

These NDI adjustments were used for the first time in the 1997 edition of the *Trends in Indian Health* publication. Both unadjusted and adjusted information is shown, as applicable. The adjustments were applied to the results obtained from using an unadjusted death file.

IHS has more specific adjustment factors for the age group less than one year. These are derived from the linked birth/infant death data sets produced by the NCHS.[3] In this edition unadjusted and adjusted infant mortality rates will be shown. These adjustments based on the linked data sets take precedent over the NDI adjustments for the under one-year age group, described above.

Natality statistics are based on the total file of birth records occurring in the U.S. each year. Mortality statistics are based on the total file of registered deaths occurring in the U.S. each year. Tabulations of vital events for IHS Areas are by place of residence.

The AI/AN population is considerably younger than the U.S. all-races population. Therefore, the death rates presented in this publication have been age-adjusted where applicable so that appropriate comparisons can be made between these population groups. All age-adjusted death rates calculated using a small number of deaths should be interpreted with caution as the

observed rate may be quite different from the true underlying rate. Any rate based upon fewer than 20 deaths may not be reliable as the sample will be too small.

Age-Adjustment

The age-adjusted death rates presented in this publication were computed by the direct method, that is, by applying the age-specific death rate for a given cause of death to the standard population distributed by age. The total population as enumerated in 2000 was selected as the standard since this is the standard used by NCHS.[4] The rates for the total population and for each race-sex group were adjusted separately, by using the same standard population. The age-adjusted rates were based on ten-year age groups. It is important **not** to compare age-adjusted death rates with crude rates.

Glossary

Age-Adjustment (*direct method)*—The application of age-specific rates in a population of interest to a standardized age distribution in order to eliminate differences in observed rates that result from age differences in population composition. This adjustment is usually done when comparing two or more populations at one point in time or one population at two or more points in time.

Area—A defined geographic region for Indian Health Service (IHS) administrative purposes. Each Area Office administers several service units.

Cause of Death—For the purpose of national mortality statistics, every death is attributed to *one* underlying condition, based on information reported on the death certificate and using the international rules for selecting the underlying cause of death from the conditions stated on the death certificate. The underlying cause is defined by the World Health Organization (WHO) as the disease or injury that initiated the train of events leading directly to death, or the circumstances of the accident or violence, which produced the fatal injury. Generally, more medical information is reported on death certificates than is directly reflected in the underlying cause of death. The conditions that are not selected as underlying cause of death constitute the non-underlying cause of death, also known as multiple cause of death. Cause of death is coded according to the appropriate revision of the International Classification of Diseases (ICD). Effective with deaths occurring in 1999, the United States began using the Tenth Revision of the ICD (ICD-10).

Race—Federal Register Notice (October 30, 1997), Revision to the Standards for the Classification of Federal Data on Race and Ethnicity. The revised standards have five minimum categories for data on race: American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, and White. There will be two categories for data on ethnicity: "Hispanic or Latino" and "Not Hispanic or Latino." Persons are offered the option to select one or more races.[5,6]

Residence—Usual place of residence of person to whom an event occurred. For births and deaths, residence is defined as the mother's place of residence.

Service Area—The geographic areas in which IHS has responsibilities—"on or near" reservations, i.e., contract health service delivery areas.

Service Population—AI/AN people identified to be eligible for IHS services.

References

[1] Murphy SL, Xu JQ, Kochanek KD. Deaths: Final data for 2010. National Vital Statistics Reports; Vol 61 No 4. Hyattsville, MD: National Center for Health Statistics. 2013.

[2] Indian Health Service, Division of Program Statistics, Adjusting for Miscoding of Indian Race on State Death Certificates. November, 1996.

[3] http://www.cdc.gov/nchs/linked.htm

[4] Anderson RN, Rosenberg, HM. Age Standardization of Death Rates: Implementation of the Year 2000 Standard; National Vital Statistics Reports, Vol 47 No 3. Hyattsville, Maryland: National Center for Health Statistics. 1998.

[5] https://www.gpo.gov/fdsys/pkg/FR-2016-09-30/pdf/2016-23672.pdf

[6] https://regulations.justia.com/regulations/fedreg/2016/09/30/2016-23672.html

Sources of Copies and Additional Information

Additional AI/AN health status information can be obtained from the IHS Division of Program Statistics. Specific responsibilities are as follows:

General Information
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CORONARY HEART DISEASE

Reduction in heart disease was identified as a major focal area for Healthy People 2010. Coronary heart disease (CHD) accounts for a major proportion of all heart disease deaths. The Healthy People 2010 goal was set at 156.0 deaths (per 100,000 population) for all population groups including the AI/AN population.

Table 1 presents age-adjusted CHD mortality rates for 1999-2001, 2004-2006, and 2009-2011 for the IHS population by Service Area. Mid-year rates for each period (corresponding to 2000, 2005, and 2010) for the U.S. all races and U.S. white populations are also shown. Figure 1 illustrates the changes that have taken place in CHD mortality rates between the baseline and final measurement periods for each IHS Area.

The results shown in Table 1 and Figure 1 demonstrate that improvements in CHD mortality have occurred for all IHS Areas. In the baseline period (1999-2001) only four IHS Areas—Alaska, Albuquerque, Navajo, and Tucson – had CHD mortality rates that were "*at or below"* the target rate. By 2009-2011 all but three IHS Areas – Bemidji, Great Plains, and Oklahoma – had reached the HP 2010 target goal. Of the IHS Areas showing improvement, Nashville showed the greatest percentage change (40.7% reduction in the CHD mortality rate between 1999-2001 and 2009-2011). Bemidji, Great Plains, and Oklahoma, while showing improvement, did not reach the target goal established by Healthy People 2010.

The improvement seen for individual IHS Areas is also apparent in the total IHS CHD mortality rate which declined from 181.1 at baseline to 139.7 in 2009-2011, corresponding to a 22.9% improvement and the attainment of the Healthy People 2010 target. Despite this improvement, Table 1 indicates that disparities between AI/AN and other U.S. populations are present. While the U.S. all races and white populations had higher CHD mortality rates than the AI/AN population at baseline, these populations experienced greater percentage declines (-36.7% and -36.6% respectively) than IHS, and the U.S. all races and white populations ended the decade with CHD mortality rates that were lower than the IHS rate. Therefore, despite substantial success in reaching the Healthy People 2010 goal, further improvements are still needed in order to reduce population disparities in CHD mortality.

Table 1
Age-Adjusted Mortality Rates for Deaths Due to Coronary Heart Disease[1/]
Among American Indian and Alaska Native Population, by IHS Area
1999-2001, 2004-2006, and 2009-2011
(Rate per 100,000 Population)

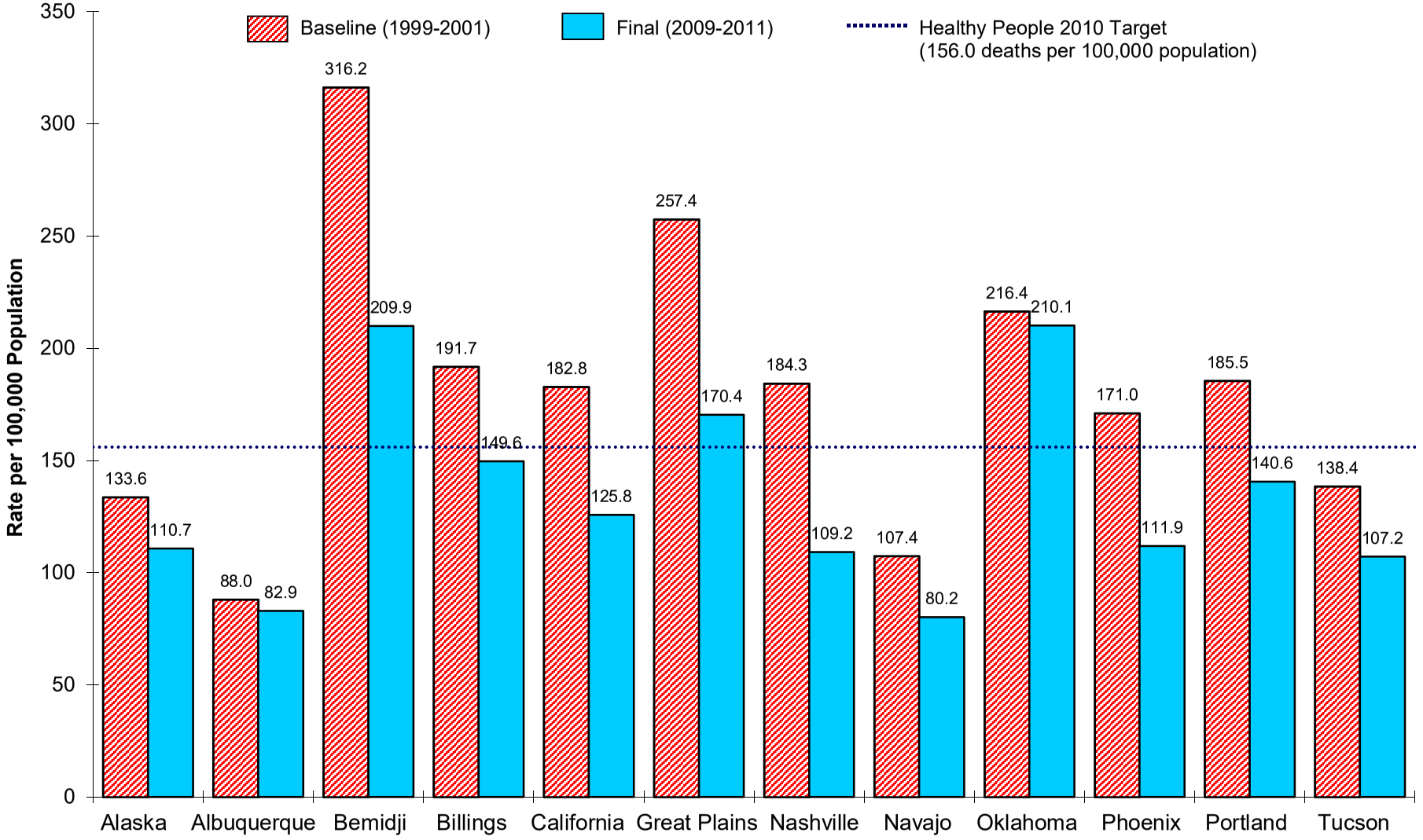
IHS Area	1999-2001 (Baseline)	2004-2006 (Mid-Decade)	2009-2011 (Final)	2010[2/] Target Goal	% Change Between Baseline and Final Rate
IHS Total	181.1	167.5	139.7	156.0	-22.9%
Alaska	133.6	120.2	110.7	156.0	-17.1%
Albuquerque	88.0	83.7	82.9	156.0	-5.8%
Bemidji	316.2	242.4	209.9	156.0	-33.6%
Billings	191.7	151.1	149.6	156.0	-22.0%
California	182.8	141.3	125.8	156.0	-31.2%
Great Plains	257.4	240.0	170.4	156.0	-33.8%
Nashville	184.3	150.5	109.2	156.0	-40.7%
Navajo	107.4	103.6	80.2	156.0	-25.3%
Oklahoma	216.4	255.3	210.1	156.0	-2.9%
Phoenix	171.0	143.4	111.9	156.0	-34.6%
Portland	185.5	145.0	140.6	156.0	-24.2%
Tucson	138.4	128.7	107.2	156.0	-22.5%
U.S. Mid-Year Rates	*(2000)*	*(2005)*	*(2010)*		
All Races	195.3	153.8	123.6	156.0	-36.7%
White	192.7	151.7	122.2	156.0	-36.6%

[1/] Includes ICD-10 codes I11 and I20-I25.

[2/] Healthy People 2010 Objective No. 12-1. Reduce coronary heart disease deaths. For all populations, the HP 2010 target rate is 156.0 deaths per 100,000 population.

NOTE: Rates are age-adjusted to the year 2000 standard population and are adjusted to compensate for misreporting of AI/AN race on state death certificates.

Figure 1
Age-Adjusted Coronary Heart Disease Death Rates by IHS Area and Time Period



Notes: Rates are age-adjusted to the year 2000 standard population, and are adjusted to compensate for misreporting of AI/AN race on state death certificates. The 2010 target is based on a single goal of 156.0 coronary heart disease deaths/100,000 population, which was established for all demographic groups.

CEREBROVASCULAR DISEASE

Healthy People 2010 outlined a number of objectives related to cerebrovascular disease or stroke. One important goal was to reduce the number of deaths caused by stroke. The Healthy People 2010 target rate of 50 stroke deaths (per 100,000 population) applies to all U.S. population groups including the AI/AN population.

Table 2 presents age-adjusted stroke mortality rates for 1999-2001, 2004-2006, and 2009-2011 for the IHS population by Service Area. Mid-year rates for each period (corresponding to 2000, 2005, and 2010) for the U.S. all races and U.S. white populations are also shown. Figure 2 illustrates the changes that have taken place in stroke mortality rates between the baseline and final measurement periods for each IHS Area.

The results shown in Table 2 indicate that significant improvements in stroke mortality have occurred for the total IHS population, as well as for the U.S. all races and white populations. While all three populations had mortality rates above the Healthy People target at the beginning of the last decade, all three achieved the Healthy People 2010 target by the end of the decade. Age-adjusted stroke mortality rates for the U.S. all races and U.S. white populations have decreased by 35.8% and 35.9%, respectively, whereas the total IHS population has decreased by 31.6% since baseline.

Table 2 and Figure 2 also show substantial improvements in stroke mortality across all IHS Areas, with percentage reductions ranging from -10.8% (Oklahoma) to -58.6% (Nashville). At baseline, three Areas (Navajo, Phoenix, and Albuquerque) were at the target level. In 2009-2011, seven of the twelve Areas have stroke mortality rates that are below the Healthy People 2010 target. Several other Areas have 2009-2011 mortality rates that are above the target rate but have made substantial progress in reducing stroke mortality. For example, the Billings Area had the highest stroke mortality rate at baseline (91.4 stroke deaths) but has since achieved a 42.6% reduction to reach a final mortality rate of 52.5 stroke deaths. Similarly, the Portland Area had the second highest stroke mortality rate at baseline (88.7 stroke deaths) but has achieved a 35.7% reduction to a final mortality rate of 57.0, which remains higher than the Healthy People 2010 target. (Mortality rates are per 100,000 U.S. standard population.)

Other IHS Areas with large percentage reductions in stroke mortality include Nashville and Tucson, both of which experienced reductions greater than 50% (-58.6% and -51.2% respectively) and have 2009-2011 mortality rates below the Healthy People 2010 target level.

Table 2
Age-Adjusted Mortality Rates for Deaths Due to Cerebrovascular Disease[1/]
Among American Indian and Alaska Native Population, by IHS Area
1999-2001, 2004-2006, and 2009-2011
(Rate per 100,000 Population)

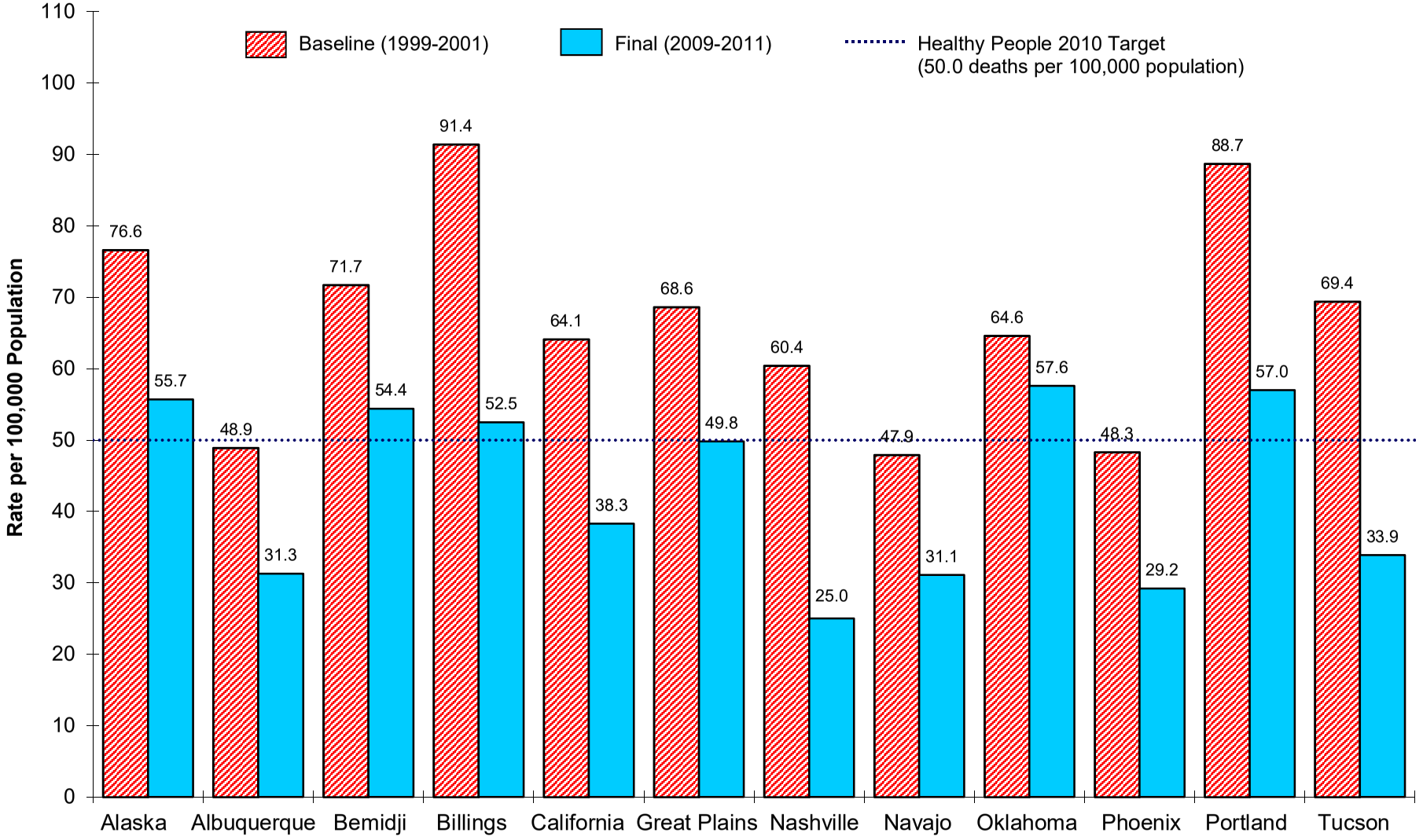
IHS Area	1999-2001 (Baseline)	2004-2006 (Mid-Decade)	2009-2011 (Final)	2010[2/] Target Goal	% Change Between Baseline and Final Rate
IHS Total	63.7	51.9	43.6	50.0	-31.6%
Alaska	76.6	82.1	55.7	50.0	-27.3%
Albuquerque	48.9	32.3	31.3	50.0	-36.0%
Bemidji	71.7	65.7	54.4	50.0	-24.1%
Billings	91.4	63.5	52.5	50.0	-42.6%
California	64.1	43.8	38.3	50.0	-40.2%
Great Plains	68.6	55.8	49.8	50.0	-27.4%
Nashville	60.4	49.1	25.0	50.0	-58.6%
Navajo	47.9	29.6	31.1	50.0	-35.1%
Oklahoma	64.6	65.6	57.6	50.0	-10.8%
Phoenix	48.3	28.4	29.2	50.0	-39.5%
Portland	88.7	67.2	57.0	50.0	-35.7%
Tucson	69.4	47.6	33.9	50.0	-51.2%
U.S. Mid-Year Rates	*(2000)*	*(2005)*	*(2010)*		
All Races	60.9	46.6	39.1	50.0	-35.8%
White	58.8	44.7	37.7	50.0	-35.9%

[1/] Includes ICD-10 codes I60-I69.

[2/] Healthy People 2010 Objective No. 12-7. Reduce stroke deaths. For all populations, the HP 2010 target rate is 50.0 deaths per 100,000 population.

NOTE: Rates are age-adjusted to the year 2000 standard population and are adjusted to compensate for misreporting of AI/AN race on state death certificates.

Figure 2
Age-Adjusted Cerebrovascular Disease Death Rates by IHS Area and Time Period



Notes: Rates are age-adjusted to the year 2000 standard population, and are adjusted to compensate for misreporting of AI/AN race on state death certificates. The 2010 target is based on a single goal of 50.0 cerebrovascular disease deaths/100,000 population, which was established for all demographic groups.

CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Chronic obstructive pulmonary disease (COPD), which includes bronchitis and emphysema, is a significant cause of disability and mortality. COPD also represents an important target area for intervention efforts aimed at smoking reduction, early diagnosis, and appropriate medical therapy. A stated goal of Healthy People 2010 was to reduce the number of deaths caused by COPD. Healthy People 2010 identified a target goal of 62.3 COPD deaths (per 100,000 population aged 45 and older). This target goal applies to all U.S. population groups including the AI/AN population.

The COPD rate computations used by Healthy People 2010 differ from those reported in mortality publications by the National Center for Health Statistics (NCHS) and also differ from statistics reported in other IHS publications, including "Trends in Indian Health" and "Regional Differences in Indian Health." While NCHS and IHS publications report age-adjusted COPD deaths using data from all age groups, Healthy People 2010 computations are based only on adults aged 45 and older. As a result, the COPD rates provided in this report are higher than those reported in other IHS publications.

Table 3 presents age-adjusted COPD mortality rates for 1999-2001, 2004-2006, and 2009-2011 for the IHS population by Service Area. Mid-year rates for each period (corresponding to 2000, 2005, and 2010) for the U.S. all races and U.S. white populations are also shown.

As shown in Table 3, COPD mortality rates for the total IHS population, the U.S. all races population, and the U.S. white population were all higher than the Healthy People 2010 target at baseline and at the final measurement point. The overall IHS COPD mortality rate increased by 12.3% between the baseline and final periods (increasing from 114.2 to 128.3 COPD deaths per 100,000 population aged 45 and older.) The U.S. all races and white populations experienced small declines in COPD mortality (-3.2% and -1.9%, respectively) but also ended the decade substantially above the Healthy People 2010 target goal.

Table 3 and Figure 3 indicate that while there is variability across IHS Areas, most Areas are still above the Healthy People 2010 target. Only the Albuquerque and Navajo Areas (27.4 and 34.4 respectively) have 2009-2011 rates below the target level. Four IHS Areas, Alaska, Bemidji, Great Plains, and Oklahoma, have 2009-2011 COPD mortality rates above 190.0 (per 100,000 population aged 45 and older). The 2009-2011 rate of 190.7 for Oklahoma reflects an 82.3% increase since 1999-2001. These results suggest that considerable progress must still be made in reducing COPD deaths.

Table 3

Age-Adjusted Mortality Rates for Deaths Due to Chronic Obstructive Pulmonary Disease[1/] Among American Indian and Alaska Native Population, by IHS Area 1999-2001, 2004-2006, and 2009-2011 (Rate per 100,000 Population Aged 45+)

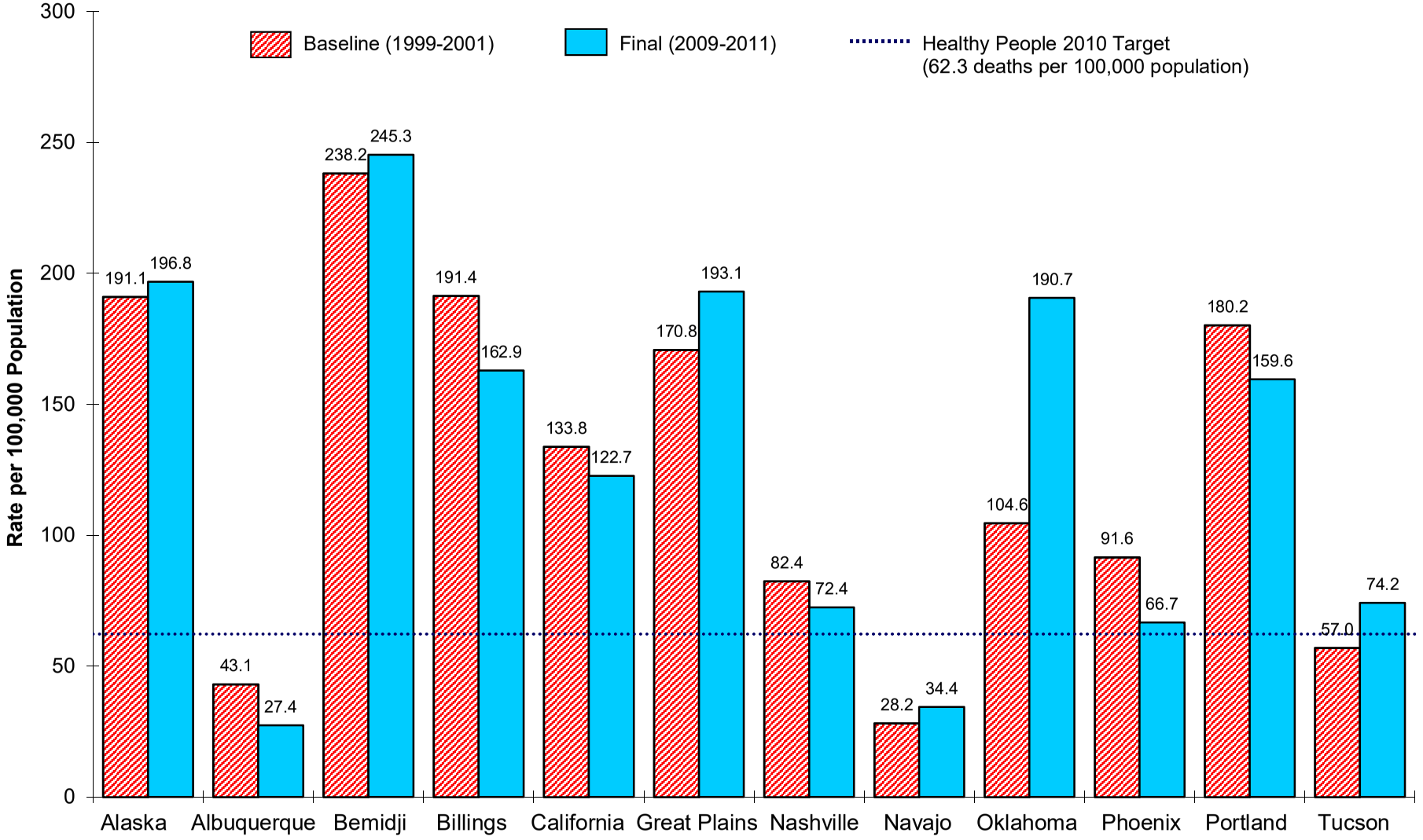
IHS Area	1999-2001 (Baseline)	2004-2006 (Mid-Decade)	2009-2011 (Final)	2010[2/] Target Goal	% Change Between Baseline and Final Rate
IHS Total	114.2	118.7	128.3	62.3	12.3%
Alaska	191.1	174.2	196.8	62.3	3.0%
Albuquerque	43.1	53.1	27.4	62.3	-36.4%
Bemidji	238.2	218.3	245.3	62.3	3.0%
Billings	191.4	150.3	162.9	62.3	-14.9%
California	133.8	117.6	122.7	62.3	-8.3%
Great Plains	170.8	211.8	193.1	62.3	13.1%
Nashville	82.4	97.9	72.4	62.3	-12.1%
Navajo	28.2	13.8	34.4	62.3	22.0%
Oklahoma	104.6	168.3	190.7	62.3	82.3%
Phoenix	91.6	43.3	66.7	62.3	-27.2%
Portland	180.2	158.4	159.6	62.3	-11.4%
Tucson	57.0	44.9	74.2	62.3	30.2%
U.S. Mid-Year Rates	*(2000)*	*(2005)*	*(2010)*		
All Races	120.5	118.8	116.6	62.3	-3.2%
White	126.6	125.8	124.2	62.3	-1.9%

[1/] Includes ICD-10 codes J40-J44.

[2/] Healthy People 2010 Objective No. 24-10. Reduce deaths caused by chronic obstructive pulmonary disease. For all populations, the HP 2010 target rate is 62.3 deaths per 100,000 population aged 45+.

NOTE: Rates are age-adjusted to the year 2000 standard population and are adjusted to compensate for misreporting of AI/AN race on state death certificates.

Figure 3
Age-Adjusted Chronic Obstructive Pulmonary Disease Death Rates by IHS Area and Time Period



Notes: Rates are age-adjusted to the year 2000 standard population, and are adjusted to compensate for misreporting of AI/AN race on state death certificates. The 2010 target is based on a single goal 62.3 COPD deaths/100,000 population, which was established for all demographic groups.

DIABETES-RELATED DEATHS

Healthy People 2010 recognized diabetes as a major health challenge and a source of significant health disparities. The increasing prevalence of diabetes, as well as increases in complications associated with diabetes, represents a significant and growing problem for the AI/AN population. An important objective of Healthy People 2010 was to reduce the number of deaths caused by diabetes. Healthy People 2010 established a target rate of 46 diabetes-related deaths (per 100,000 population) for all populations, including the AI/AN population.

It is important to note that the computation of diabetes-related deaths differs from the computations used for most other Healthy People 2010 mortality objectives. While most mortality computations focus on the principal "underlying" cause of death recorded on the death certificate, Healthy People 2010 computations of diabetes-related deaths also considers all "contributing" causes noted on the death certificate. For Healthy People 2010, any death with a mention of diabetes as either an "underlying" or "contributing" cause is therefore counted as diabetes-related. As a result, diabetes mortality rates reported here are higher than those reported in other IHS publications which are based solely on the "underlying" cause.

Table 4.A presents age-adjusted diabetes-related mortality rates for the IHS population by Area and time period. Figure 4.A illustrates the changes that have taken place in Area mortality rates between the baseline and final periods. When using the Healthy People 2010 method of diabetes-related mortality computation, AI/AN rates cannot be simultaneously adjusted for the misreporting of race on state death certificates. Therefore, the diabetes-related mortality data presented in Table 4.A and Figure 4.A are <u>not</u> further adjusted for race misreporting.

The results shown in Table 4.A and Figure 4.A indicate that significant health disparities exist between the IHS population and other U.S. populations. During 2009-2011 the age-adjusted diabetes-related mortality rate for the total IHS population was 137.5 deaths (per 100,000 persons). This rate was over two times that observed in the U.S. white population. Two IHS Areas (Bemidji and Great Plains) have 2009-2011 diabetes-related mortality rates above 200.0 (per 100,000 population). However, nine of the 12 IHS Areas showed mortality decreases over the time period examined with the Nashville Area having the sharpest decline of 45.1%.

For reference, Table 4.B and Figure 4.B present diabetes mortality rates using only the principal "underlying" cause of death, which is consistent with other IHS publications. A comparison of Table 4.A and Figure 4.A with Table 4.B and Figure 4.B suggests that the overall patterns of population differences are similar. However, the diabetes mortality rates when only the "underlying" cause is evaluated are much lower. The total IHS mortality rate for 2009-2011 based on the "underlying" cause is 66.0, in comparison to the rate of 137.5 when all "contributing" causes are also considered. These results indicate that when the definition of diabetes-related deaths is broadened to capture any mention of diabetes on the death certificate, the resultant diabetes mortality rates are even higher than previously reported.

Table 4.A
Age-Adjusted Diabetes-Related Mortality Rates[1/]
(Diabetes Recorded as the Underlying or a Contributing Cause of Death)
Among American Indian and Alaska Native Population, by IHS Area
1999-2001, 2004-2006, and 2009-2011
(Rate per 100,000 Population)

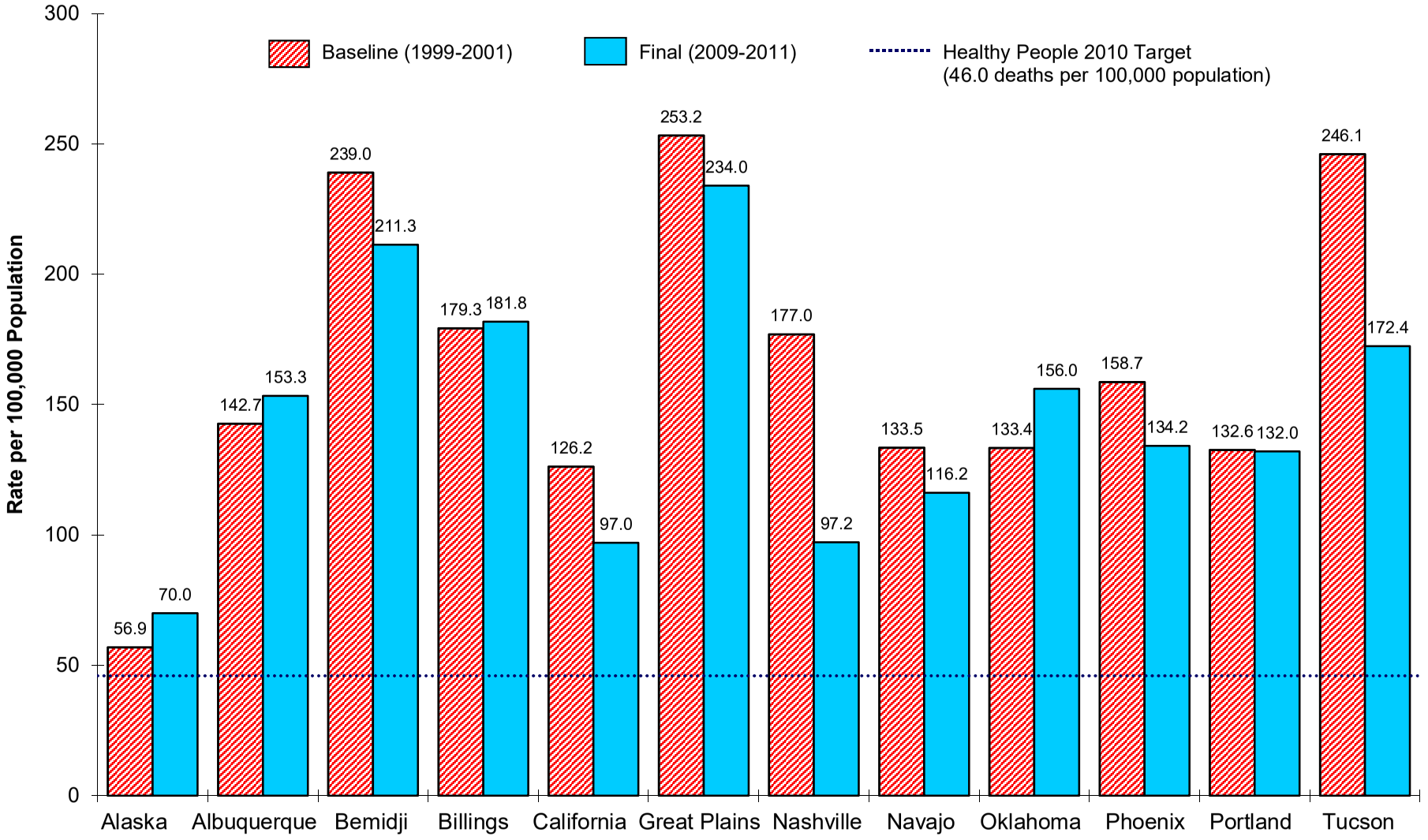
IHS Area	1999-2001 (Baseline)	2004-2006 (Mid-Decade)	2009-2011 (Final)	2010[2/] Target Goal	% Change Between Baseline and Final Rate
IHS Total	148.6	143.4	137.5	46.0	-7.5%
Alaska	56.9	70.3	70.0	46.0	23.0%
Albuquerque	142.7	137.7	153.3	46.0	7.4%
Bemidji	239.0	233.3	211.3	46.0	-11.6%
Billings	179.3	177.8	181.8	46.0	1.4%
California	126.2	105.1	97.0	46.0	-23.1%
Great Plains	253.2	296.9	234.0	46.0	-7.6%
Nashville	177.0	135.3	97.2	46.0	-45.1%
Navajo	133.5	120.0	116.2	46.0	-13.0%
Oklahoma	133.4	149.0	156.0	46.0	16.9%
Phoenix	158.7	122.2	134.2	46.0	-15.4%
Portland	132.6	143.5	132.0	46.0	-0.5%
Tucson	246.1	176.4	172.4	46.0	-29.9%
U.S. Mid-Year Rates	*(2000)*	*(2005)*	*(2010)*		
All Races	77.0	76.6	70.7	46.0	-8.2%
White	71.5	71.3	66.4	46.0	-7.1%

[1/] Includes ICD-10 codes E10-E14 recorded as the underlying cause of death or listed among any of the multiple causes of death on the death certificate. The Healthy People 2010 case definition results in higher rates than those shown in other IHS publications which report the underlying cause of death.

[2/] Healthy People 2010 Objective No. 5-5. Reduce diabetes death rates. For all populations, the HP 2010 target rate is 46.0 deaths per 100,000 population.

NOTE: Rates are age-adjusted to the year 2000 standard population.

Figure 4.A
Age-Adjusted Diabetes-Related Death Rates
(Diabetes Recorded as the Underlying or a Contributing Cause of Death)
by IHS Area and Time Period



Notes: Rates are age-adjusted to the year 2000 standard population. Diabetes-related deaths include all deaths with any mention of diabetes on the death certificate as either the underlying cause or a contributing cause. The 2010 target is based on a single goal of 46.0 diabetes-related deaths/100,000 population, which was established for all demographic groups.

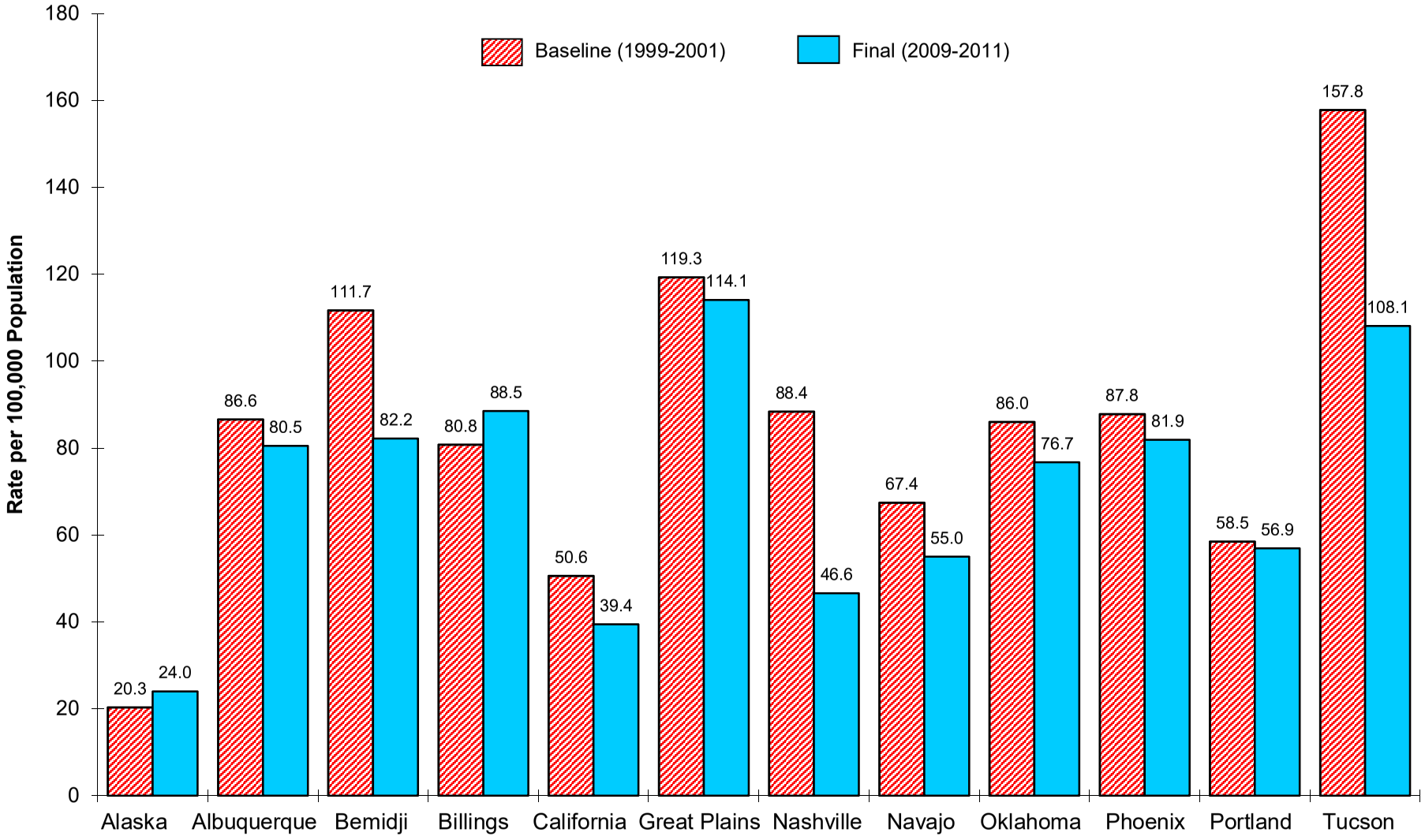
Table 4.B
Age-Adjusted Diabetes Mortality Rates[1/]
(Diabetes Recorded as the Underlying Cause of Death)
Among American Indian and Alaska Native Population, by IHS Area
1999-2001, 2004-2006, and 2009-2011
(Rate per 100,000 Population)

IHS Area	1999-2001 (Baseline)	2004-2006 (Mid-Decade)	2009-2011 (Final)	2010 Target Goal	% Change Between Baseline and Final Rate
IHS Total	77.7	72.2	66.0	—	-15.1%
Alaska	20.3	20.3	24.0	—	18.2%
Albuquerque	86.6	77.5	80.5	—	-7.0%
Bemidji	111.7	110.5	82.2	—	-26.4%
Billings	80.8	102.0	88.5	—	9.5%
California	50.6	45.5	39.4	—	-22.1%
Great Plains	119.3	141.0	114.1	—	-4.4%
Nashville	88.4	60.2	46.6	—	-47.3%
Navajo	67.4	52.8	55.0	—	-18.4%
Oklahoma	86.0	89.6	76.7	—	-10.8%
Phoenix	87.8	64.9	81.9	—	-6.7%
Portland	58.5	67.3	56.9	—	-2.7%
Tucson	157.8	99.2	108.1	—	-31.5%
U.S. Mid-Year Rates	*(2000)*	*(2005)*	*(2010)*		
All Races	25.0	24.6	20.8	—	-16.8%
White	22.8	22.5	19.0	—	-16.7%

[1/] Includes ICD-10 codes E10-E14 recorded as the underlying cause of death on the death certificate. This case definition is consistent with other IHS publications but differs from the Healthy People 2010 definition which considers all contributing causes of death in addition to the underlying cause.

NOTE: Rates are age-adjusted to the year 2000 standard population and are adjusted to compensate for misreporting of AI/AN race on state death certificates.

Figure 4.B
Age-Adjusted Diabetes Death Rates
(Diabetes Recorded as the Underlying Cause of Death)
by IHS Area and Time Period



Notes: Rates are age-adjusted to the year 2000 standard population, and are adjusted to compensate for misreporting of AI/AN race on state death certificates. Includes deaths with diabetes recorded as the underlying cause of death on the death certificate. Target information is not shown because the Healthy People definition of diabetes-related deaths is based on all underlying and contributing causes of death recorded on the death certificate (see Table 4A and Figure 4A).

CANCER (ALL SITES)

As the second leading cause of death in the U.S., cancer was identified as an important focal area for Healthy People 2010. A number of objectives aimed at reducing cancer deaths were outlined in Healthy People 2010, including a reduction in the overall cancer death rate. An age-adjusted target goal of 158.6 deaths (per 100,000 population) was established for all population groups including the AI/AN population.

Table 5 presents age-adjusted cancer mortality rates for 1999-2001, 2004-2006, and 2009-2011 for the IHS population by Service Area. Mid-year rates for each period (corresponding to 1999, 2005, and 2010) for the U.S. all races and U.S. white populations are also shown. Figure 5 illustrates the changes that have taken place in cancer mortality rates between the baseline and final Healthy People 2010 measurement periods for each IHS Area.

As shown in Table 5, all three total population groups (U.S. all races, U.S. white, and total IHS) showed declines in cancer mortality rates between 1999-2001 and 2009-2011. However, the percent reduction for the total IHS population (-3.1%) was less than that seen in either the U.S. all races or U.S. white populations (-13.4% and -12.6% respectively). The final total IHS rate of 178.4 is still 12% above the target value of 158.6. Rates for the U.S. all races and white populations are also above the target. (Mortality rates are per 100,000 U.S. standard population.)

Table 5 and Figure 5 illustrate that substantial variability in cancer mortality exists among IHS Areas. In 2009-2011, five IHS Areas have attained the Healthy People 2010 target, and seven IHS Areas remain above the target. The lowest cancer mortality rate (104.5) for 2009-2011 is observed in the Albuquerque Area, which experienced an 11.1% reduction since baseline. The greatest reduction since baseline occurred in the Billings Area (297.1 vs. 203.0, a 31.7% decrease). The next largest change since baseline occurred in the Navajo Area which decreased from 132.5 cancer deaths to 109.5 deaths (per 100,000) persons, a 17.4% reduction. In contrast to these reductions, three Areas – California, Oklahoma, and Tucson – showed increases in cancer mortality between 1999-2001 and 2009-2011.

In summary, some IHS Areas achieved or progressed toward achieving the cancer mortality reduction goal established by Healthy People 2010. However, further reduction must still occur in order for the IHS population to reduce cancer mortality to target levels.

Table 5
Age-Adjusted Mortality Rates for Deaths Due to Cancer (All Sites)[1/]
Among American Indian and Alaska Native Population, by IHS Area
1999-2001, 2004-2006, and 2009-2011
(Rate per 100,000 Population)

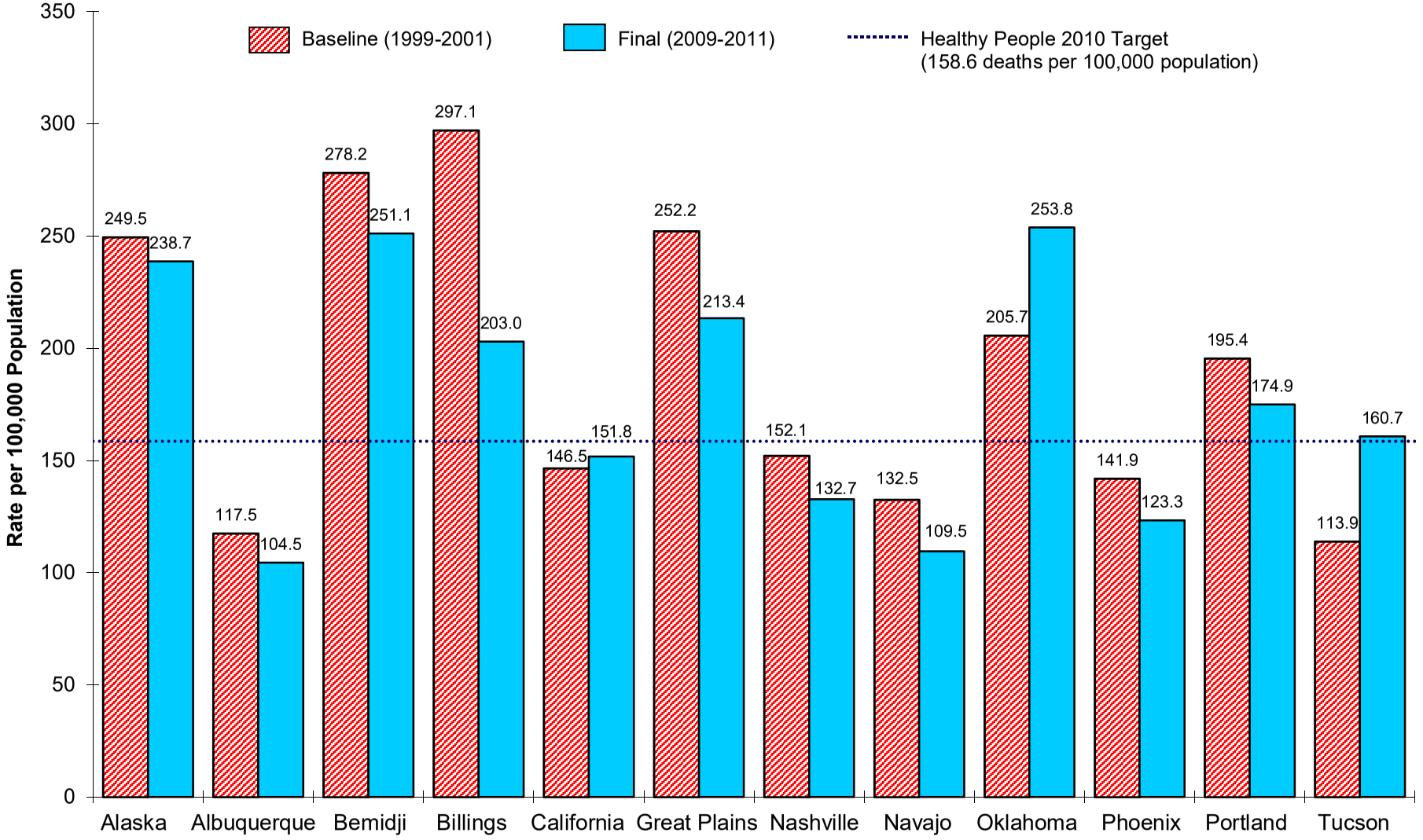
IHS Area	1999-2001 (Baseline)	2004-2006 (Mid-Decade)	2009-2011 (Final)	2010[2/] Target Goal	% Change Between Baseline and Final Rate
IHS Total	184.1	186.4	178.4	158.6	-3.1%
Alaska	249.5	255.6	238.7	158.6	-4.3%
Albuquerque	117.5	110.5	104.5	158.6	-11.1%
Bemidji	278.2	314.3	251.1	158.6	-9.7%
Billings	297.1	273.7	203.0	158.6	-31.7%
California	146.5	132.8	151.8	158.6	3.6%
Great Plains	252.2	264.3	213.4	158.6	-15.4%
Nashville	152.1	157.4	132.7	158.6	-12.8%
Navajo	132.5	122.7	109.5	158.6	-17.4%
Oklahoma	205.7	246.7	253.8	158.6	23.4%
Phoenix	141.9	105.4	123.3	158.6	-13.1%
Portland	195.4	181.2	174.9	158.6	-10.5%
Tucson	113.9	141.4	160.7	158.6	41.1%
U.S. Mid-Year Rates	*(2000)*	*(2005)*	*(2010)*		
All Races	199.6	183.8	172.8	158.6	-13.4%
White	197.2	182.6	172.4	158.6	-12.6%

[1/] Includes ICD-10 codes C00-C97.

[2/] Healthy People 2010 Objective No. 3-1. Reduce cancer death rates. For all populations, the HP 2010 target rate is 158.6 deaths per 100,000 population.

NOTE: Rates are age-adjusted to the year 2000 standard population and are adjusted to compensate for misreporting of AI/AN race on state death certificates.

Figure 5
Age-Adjusted Cancer (All Sites) Death Rates by IHS Area and Time Period



Notes: Rates are age-adjusted to the year 2000 standard population, and are adjusted to compensate for misreporting of AI/AN race on state death certificates. The 2010 target is based on a single goal of 158.6 cancer deaths/100,000 population, which was established for all demographic groups.

LUNG CANCER

In addition to objectives aimed at reducing the overall cancer death rate, Healthy People 2010 also addressed several major types of cancer including lung cancer. Lung cancer is currently the most common cause of cancer deaths for both genders. Healthy People 2010 established a target goal of 43.3 lung cancer deaths (per 100,000 population) for all population groups including the AI/AN population.

Table 6 presents age-adjusted lung cancer mortality rates for years 1999-2001, 2004-2006, and 2009-2011 for the IHS population by Service Area. Mid-year rates for each period (corresponding to 2000, 2005, and 2010) for the U.S. all races and U.S. white populations are also shown. Figure 6 illustrates the changes that have taken place in lung cancer mortality rates between the baseline and final measurement periods for each IHS Area.

The baseline rate of 49.1 observed for the total IHS population was lower than either the U.S. all races or white population rates. However, while the U.S. all races and white populations both experienced reductions (-15.2% and -14.1% respectively) between baseline and follow-up, the total IHS rate decreased by a lesser amount (-3.3%). At the final Healthy People 2010 measurement point in 2009-2011, all three populations remain above the 2010 target goal.

Large differences are apparent among IHS Areas both in baseline rates and in changes occurring between the baseline and final measurement periods. As of 2009-2011, five Areas had reached the Healthy People 2010 target, and seven Areas remain above the target. The Navajo Area had the lowest lung cancer mortality rate both at baseline (5.8) and at the final measurement period (6.0), with both rates being well below the Healthy People 2010 target of 43.3. The next lowest Area at baseline, Albuquerque, had a baseline rate of 11.6 which decreased to 8.6. Other Areas, however, experienced either high rates at baseline or substantial increases between baseline and follow-up. The highest baseline rate (119.9) was observed for Billings. However, the Billings Area has experienced a substantial decrease (-51.7%) in lung cancer mortality since the baseline period, resulting in a 2009-2011 rate of 57.9. In contrast, the Bemidji Area had the second highest baseline rate (102.9) and experienced a further increase of 3.4%, resulting in a 2009-2011 rate of 106.4 which is the highest rate observed among all Areas. Of additional concern is the lung cancer mortality increase of 31.8% in the Oklahoma Area. (All mortality rates are age-adjusted per 100,000 U.S. standard population.)

In summary, while some IHS Areas either achieved or made significant progress toward achieving the Healthy People 2010 target, further efforts are still needed to reduce lung cancer mortality rates.

Table 6
Age-Adjusted Mortality Rates for Deaths Due to Lung Cancer[1/]
Among American Indian and Alaska Native Population, by IHS Area
1999-2001, 2004-2006, and 2009-2011
(Rate per 100,000 Population)

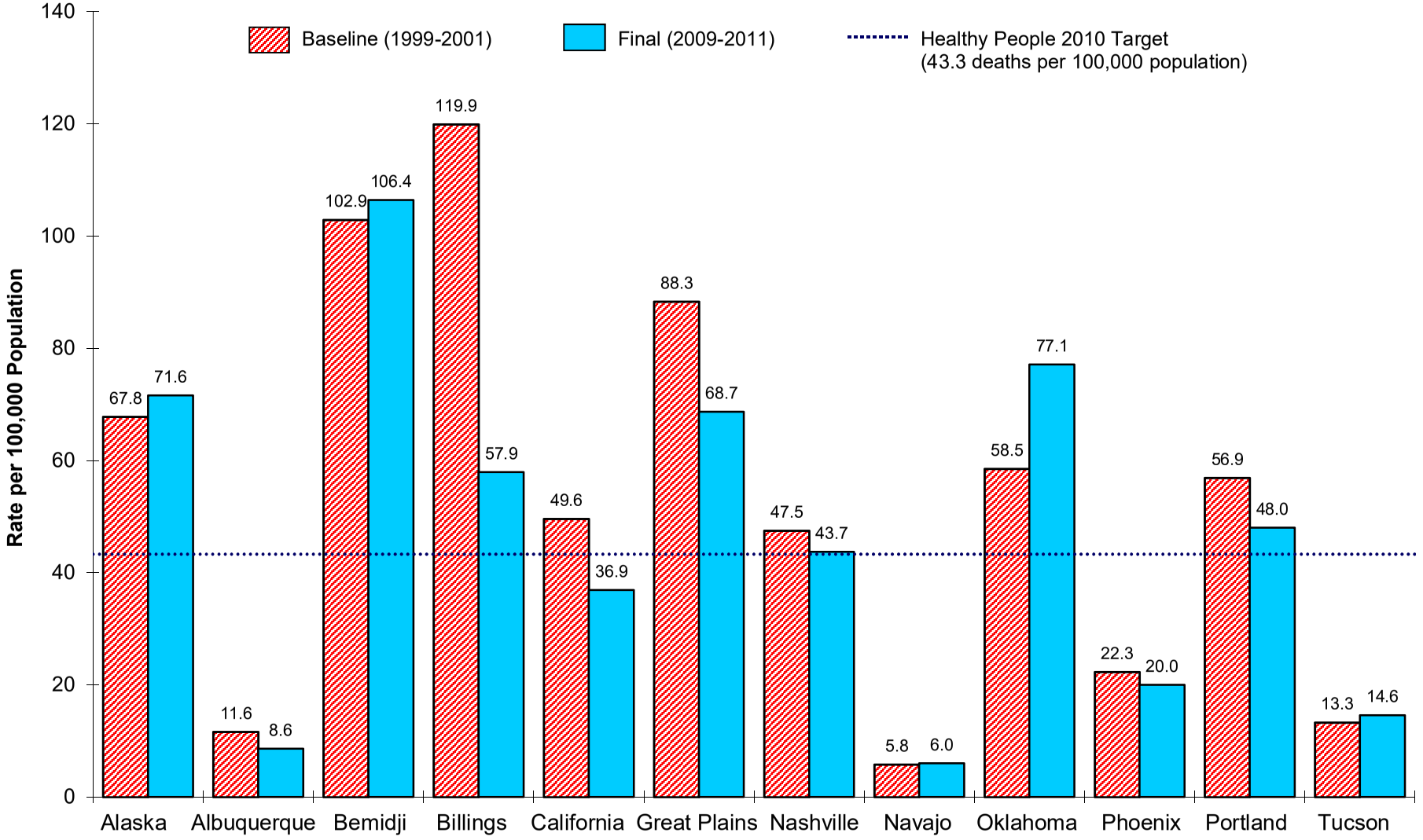
IHS Area	1999-2001 (Baseline)	2004-2006 (Mid-Decade)	2009-2011 (Final)	2010[2/] Target Goal	% Change Between Baseline and Final Rate
IHS Total	49.1	50.4	47.5	43.3	-3.3%
Alaska	67.8	77.7	71.6	43.3	5.6%
Albuquerque	11.6	13.2	8.6	43.3	-25.9%
Bemidji	102.9	118.9	106.4	43.3	3.4%
Billings	119.9	63.7	57.9	43.3	-51.7%
California	49.6	35.9	36.9	43.3	-25.6%
Great Plains	88.3	93.0	68.7	43.3	-22.2%
Nashville	47.5	44.5	43.7	43.3	-8.0%
Navajo	5.8	10.2	6.0	43.3	3.4%
Oklahoma	58.5	77.0	77.1	43.3	31.8%
Phoenix	22.3	18.7	20.0	43.3	-10.3%
Portland	56.9	47.1	48.0	43.3	-15.6%
Tucson	13.3	8.7	14.6	43.3	9.8%
U.S. Mid-Year Rates	*(2000)*	*(2005)*	*(2010)*		
All Races	56.1	52.6	47.6	43.3	-15.2%
White	56.2	53.1	48.3	43.3	-14.1%

[1/] Includes ICD-10 codes C33-C34.

[2/] Healthy People 2010 Objective No. 3-2. Reduce lung cancer death rates. For all populations, the HP 2010 target rate is 43.3 deaths per 100,000 population.

NOTE: Rates are age-adjusted to the year 2000 standard population and are adjusted to compensate for misreporting of AI/AN race on state death certificates.

Figure 6
Age-Adjusted Lung Cancer Death Rates by IHS Area and Time Period



Notes: Rates are age-adjusted to the year 2000 standard population, and are adjusted to compensate for misreporting of AI/AN race on state death certificates. The 2010 target is based on a single goal of 43.3 lung cancer deaths/100,000 population, which was established for all demographic groups.

COLORECTAL CANCER

Among cancers affecting both men and women, colorectal cancer is the second leading cause of cancer death in the United States. Healthy People 2010 established a target age-adjusted colorectal mortality rate of 13.7 deaths (per 100,000 population), which applies to all populations including the AI/AN population.

Table 7 presents age-adjusted colorectal cancer mortality rates for 1999-2001, 2004-2006, and 2009-2011 for the IHS population by Service Area. Mid-year rates for each period (corresponding to 2000, 2005, and 2010) for the U.S. all races and U.S. white populations are also shown. Figure 7 illustrates the changes that have taken place in colorectal cancer mortality rates between the baseline and final measurement periods for each IHS Area.

The results shown in Table 7 indicate that, as of 2009-2011, colorectal cancer rates for the AI/AN, U.S. all races, and U.S. white populations all remain above the 2010 target goal. However, substantial declines in colorectal cancer mortality have occurred in the U.S. all races and white populations (-24.0% and -24.3%, respectively). The total IHS population has not experienced a similar decline. For the total IHS population, the colorectal cancer mortality rate increased by 4.2%, from a baseline rate of 18.9 to the final rate of 19.7. This rate is higher than both the final U.S. all races and white race rates (15.8 and 15.3, respectively). The IHS 2009-2011 rate is also substantially higher than the Healthy People 2010 target goal of 13.7. (All mortality rates are age-adjusted per 100,000 U.S. standard population.)

Eight IHS Areas had rate increases between baseline and follow-up ranging from 1.1% to 25.6%. The eight Areas with increases were Alaska (1.1%), Phoenix (12.7%), Albuquerque (17.4%), California (19.4%), Tucson (20.8%), Great Plains (21.6%), Navajo (25.6%), and Oklahoma (25.6%). Four IHS Areas had rate decreases: Nashville (-9.2%), Portland (-14.7%), Billings (-31.3%), and Bemidji (-36.5%). As of 2009-2011, three Areas had achieved the Healthy People 2010 target goal of 13.7. These Areas include Navajo (10.3), Phoenix (11.5) and Albuquerque (13.5). All other Areas remain above the Healthy People 2010 target rate.

Overall these results suggest that all U.S. populations would need further reductions in colorectal cancer mortality in order to reach the goals that were established by Healthy People 2010. The total IHS population has not experienced the mortality rate decreases that have been attained by the U.S. all races and U.S. white populations. Individual IHS Areas vary in their colorectal cancer mortality rates and in the amount of progress that occurred in achieving the Healthy People 2010 goal.

Table 7
Age-Adjusted Mortality Rates for Deaths Due to Colorectal Cancer[1/]
Among American Indian and Alaska Native Population, by IHS Area
1999-2001, 2004-2006, and 2009-2011
(Rate per 100,000 Population)

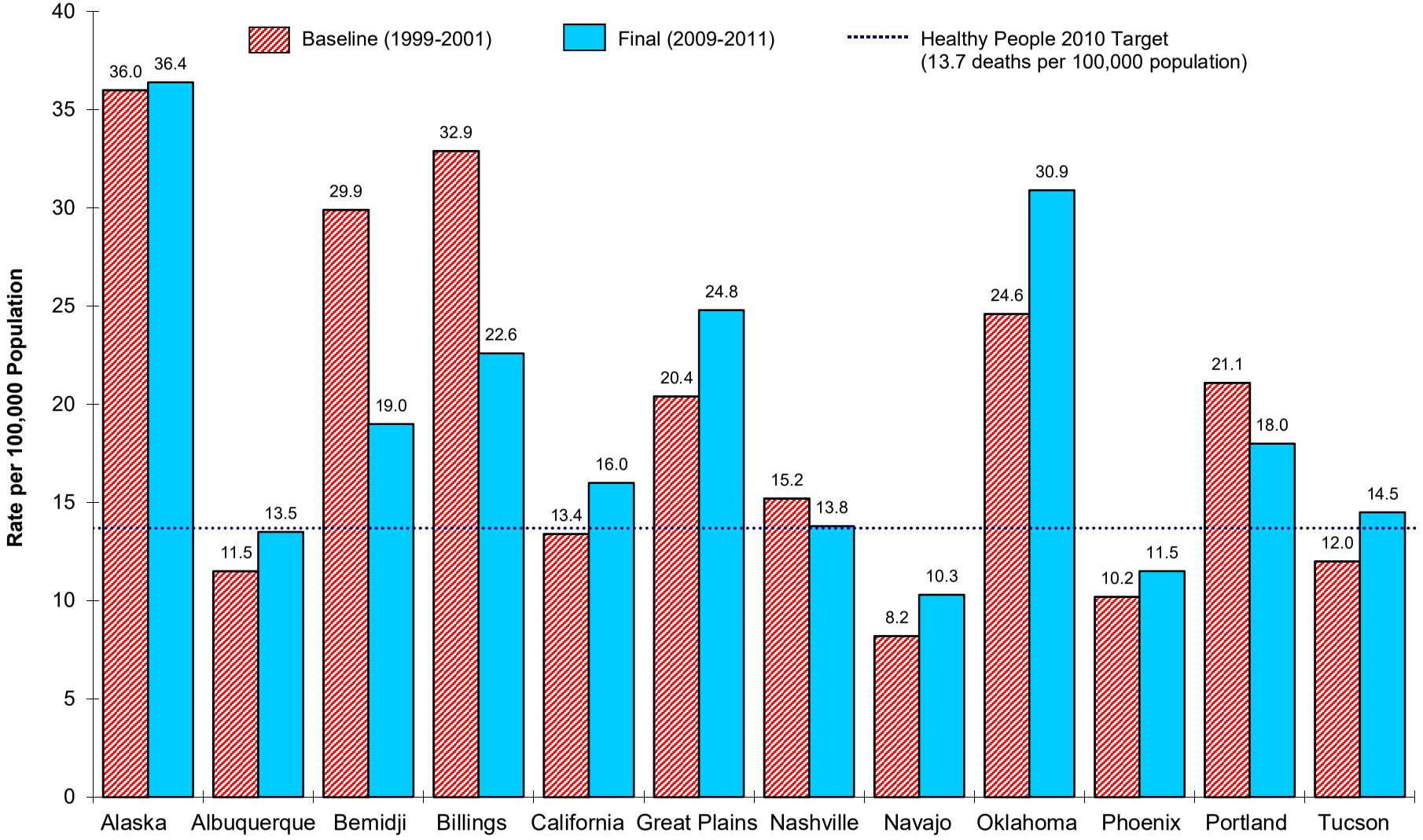
IHS Area	1999-2001 (Baseline)	2004-2006 (Mid-Decade)	2009-2011 (Final)	2010[2/] Target Goal	% Change Between Baseline and Final Rate
IHS Total	18.9	18.8	19.7	13.7	4.2%
Alaska	36.0	31.8	36.4	13.7	1.1%
Albuquerque	11.5	12.6	13.5	13.7	17.4%
Bemidji	29.9	31.9	19.0	13.7	-36.5%
Billings	32.9	25.6	22.6	13.7	-31.3%
California	13.4	18.1	16.0	13.7	19.4%
Great Plains	20.4	17.6	24.8	13.7	21.6%
Nashville	15.2	19.0	13.8	13.7	-9.2%
Navajo	8.2	11.2	10.3	13.7	25.6%
Oklahoma	24.6	25.6	30.9	13.7	25.6%
Phoenix	10.2	8.4	11.5	13.7	12.7%
Portland	21.1	17.1	18.0	13.7	-14.7%
Tucson	12.0	2.9	14.5	13.7	20.8%
U.S. Mid-Year Rates	*(2000)*	*(2005)*	*(2010)*		
All Races	20.8	17.5	15.8	13.7	-24.0%
White	20.2	16.9	15.3	13.7	-24.3%

[1/] Includes ICD-10 codes C18-C21.

[2/] Healthy People 2010 Objective No. 3-5. Reduce colorectal cancer death rates. For all populations, the HP 2010 target rate is 13.7 deaths per 100,000 population.

NOTE: Rates are age-adjusted to the year 2000 standard population and are adjusted to compensate for misreporting of AI/AN race on state death certificates.

Figure 7
Age-Adjusted Colorectal Cancer Death Rates by IHS Area and Time Period



Notes: Rates are age-adjusted to the year 2000 standard population, and are adjusted to compensate for misreporting of AI/AN race on state death certificates. The 2010 target is based on a single goal of 13.7 colorectal cancer deaths/100,000 population, which was established for all demographic groups.

BREAST CANCER

Although breast cancer is the most common type of cancer diagnosed in women, breast cancer mortality can be greatly reduced with proper screening, diagnosis, and treatment. Healthy People 2010 identified breast cancer mortality reduction as an important goal and established a target breast cancer mortality rate of 21.3 deaths (per 100,000 females). This target of 21.3 was established for all populations including the AI/AN population.

Table 8 presents age-adjusted breast cancer mortality rates for 1999-2001, 2004-2006, and 2009-2011 for the IHS population by Service Area. Mid-year rates for each period (corresponding to 2000, 2005, and 2010) for the U.S. all races and U.S. white populations are also shown. Figure 8 illustrates the changes that have taken place in breast cancer mortality between the baseline and final measurement periods for each IHS Area.

The age-adjusted breast cancer mortality rate for the total IHS population was lower, both at baseline and at follow-up, than the U.S. all races and U.S. white population rates. In addition, the total IHS rates for the baseline and final measurement periods were below the Healthy People 2010 target. In contrast, breast cancer mortality rates in the U.S. all races and U.S. white populations were consistently above the Healthy People 2010 target goal for all measurement periods, although mortality declines between the baseline and final periods occurred in both of these reference populations (-17.5% and -18.3%, respectively).

The results shown in Table 8 and Figure 8 also indicate that variability exists among individual IHS Areas. While ten of the twelve Areas had rates in 2009-2011 that were below the Healthy People 2010 target, two Areas – Alaska and Oklahoma (with rates of 27.7 and 27.8, respectively) – had breast cancer mortality rates that were above the target goal.

Overall these results suggest that the IHS population as a whole successfully achieved the Healthy People 2010 target. However, some individual Areas still have breast cancer mortality rates higher than the Healthy People 2010 goal. Intervention efforts should continue to ensure that progress in reducing breast cancer mortality is attained across all IHS Areas.

Table 8
Age-Adjusted Mortality Rates for Deaths Due to Breast Cancer Among Women[1/]
Among American Indian and Alaska Native Population, by IHS Area
1999-2001, 2004-2006, and 2009-2011
(Rate per 100,000 Females)

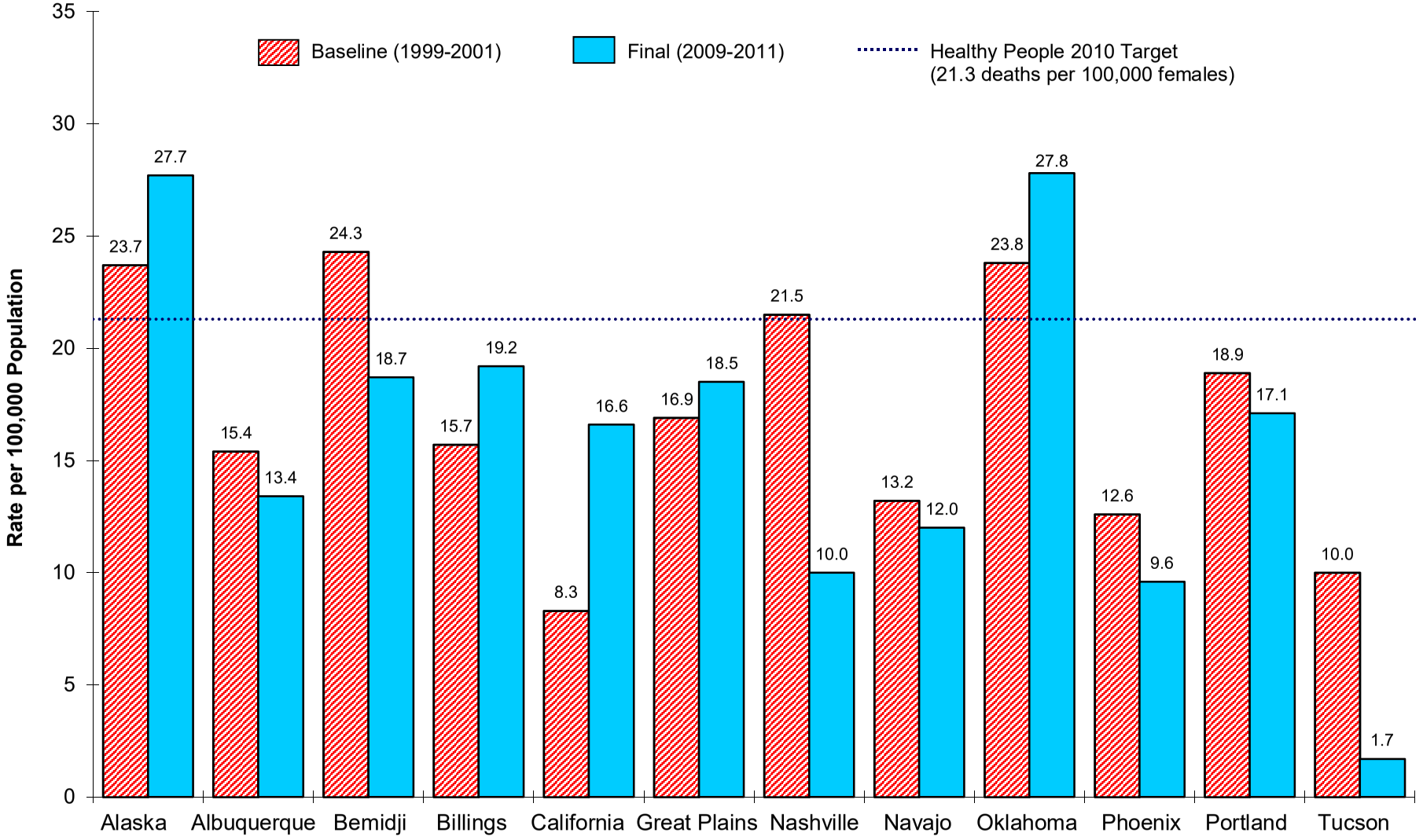
IHS Area	1999-2001 (Baseline)	2004-2006 (Mid-Decade)	2009-2011 (Final)	2010[2/] Target Goal	% Change Between Baseline and Final Rate
IHS Total	17.5	21.8	17.7	21.3	1.1%
Alaska	23.7	29.3	27.7	21.3	16.9%
Albuquerque	15.4	14.4	13.4	21.3	-13.0%
Bemidji	24.3	25.9	18.7	21.3	-23.0%
Billings	15.7	35.9	19.2	21.3	22.3%
California	8.3	18.8	16.6	21.3	100.0%
Great Plains	16.9	30.4	18.5	21.3	9.5%
Nashville	21.5	14.9	10.0	21.3	-53.5%
Navajo	13.2	11.9	12.0	21.3	-9.1%
Oklahoma	23.8	30.9	27.8	21.3	16.8%
Phoenix	12.6	11.6	9.6	21.3	-23.8%
Portland	18.9	27.4	17.1	21.3	-9.5%
Tucson	10.0	15.4	1.7	21.3	-83.0%
U.S. Mid-Year Rates	*(2000)*	*(2005)*	*(2010)*		
All Races	26.8	24.1	22.1	21.3	-17.5%
White	26.3	23.4	21.5	21.3	-18.3%

[1/] Includes ICD-10 code C50.

[2/] Healthy People 2010 Objective No. 3-3. Reduce the breast cancer death rate. For all populations, the HP 2010 target rate is 21.3 deaths per 100,000 females.

NOTE: Rates are age-adjusted to the year 2000 standard population and are adjusted to compensate for misreporting of AI/AN race on state death certificates.

Figure 8
Age-Adjusted Breast Cancer Death Rates by IHS Area and Time Period



Notes: Rates are age-adjusted to the year 2000 standard population, and are adjusted to compensate for misreporting of AI/AN race on state death certificates. The 2010 target is based on a single goal of 21.3 breast cancer deaths per 100,000 females, which was established for all demographic groups.

CERVICAL CANCER

Healthy People 2010 noted that most cervical cancer deaths could be prevented with regular cervical cancer screening. Healthy People 2010 identified a target goal of 2.0 deaths (per 100,000 females) – this target was based on a "better than the best" approach ensuring that all population groups would experience improvement if the target were achieved. The target goal was established for all populations including the AI/AN population.

Table 9 represents age-adjusted cervical cancer mortality rates for 1999-2001, 2004-2006, and 2009-2011 for IHS population by Service Area. Mid-year rates for each period (corresponding to 2000, 2005, and 2010) for the U.S. all races and U.S. white populations are also shown. Figure 9 illustrates the changes that have taken place in cervical cancer mortality between the baseline and final measurement periods for each IHS Area.

The results shown in Table 9 suggest some important disparities in cervical cancer mortality. At baseline, the U.S. all races and white population mortality rates (2.8 and 2.5, respectively) were both lower than the IHS total population mortality rate of 3.8. The U.S. all races and white populations experienced declines (-17.9% and -16.0%, respectively) between baseline and follow-up. In contrast, the overall IHS cervical cancer mortality rate at the final measurement point was equal to the rate at baseline (3.8). This suggests that very little progress has occurred for cervical cancer mortality in the IHS population as a whole since the baseline period of 1999-2001. More efforts are needed to reduce the population disparities that are present.

The data shown in Table 9 and Figure 9 also suggest that variability exists among IHS Areas in cervical cancer mortality. Only one Area, Portland, had a mortality rate below the target level during the final measurement period (2009-2011). The Areas with the highest cervical cancer mortality rates in 2009-2011 are Great Plains (6.4) and Billings (5.2). Three Areas experienced increases in cervical cancer mortality rates of at least 100% between the baseline and final periods. These Areas include California (166.7%), Alaska (221.4%), and Albuquerque (244.4%). Several other IHS Areas demonstrated substantial reductions in cervical cancer mortality rates since baseline. These Areas include Phoenix (-41.4%), Great Plains (-44.8%), and Bemidji (-75.6%). However, because the numbers of deaths contributing to the Area-specific cervical cancer mortality rates are relatively small, these observed Area-specific changes over time should be interpreted with caution.

Table 9
Age-Adjusted Mortality Rates for Deaths Due to Cervical Cancer[1/]
Among American Indian and Alaska Native Population, by IHS Area
1999-2001, 2004-2006, and 2009-2011
(Rate per 100,000 Females)

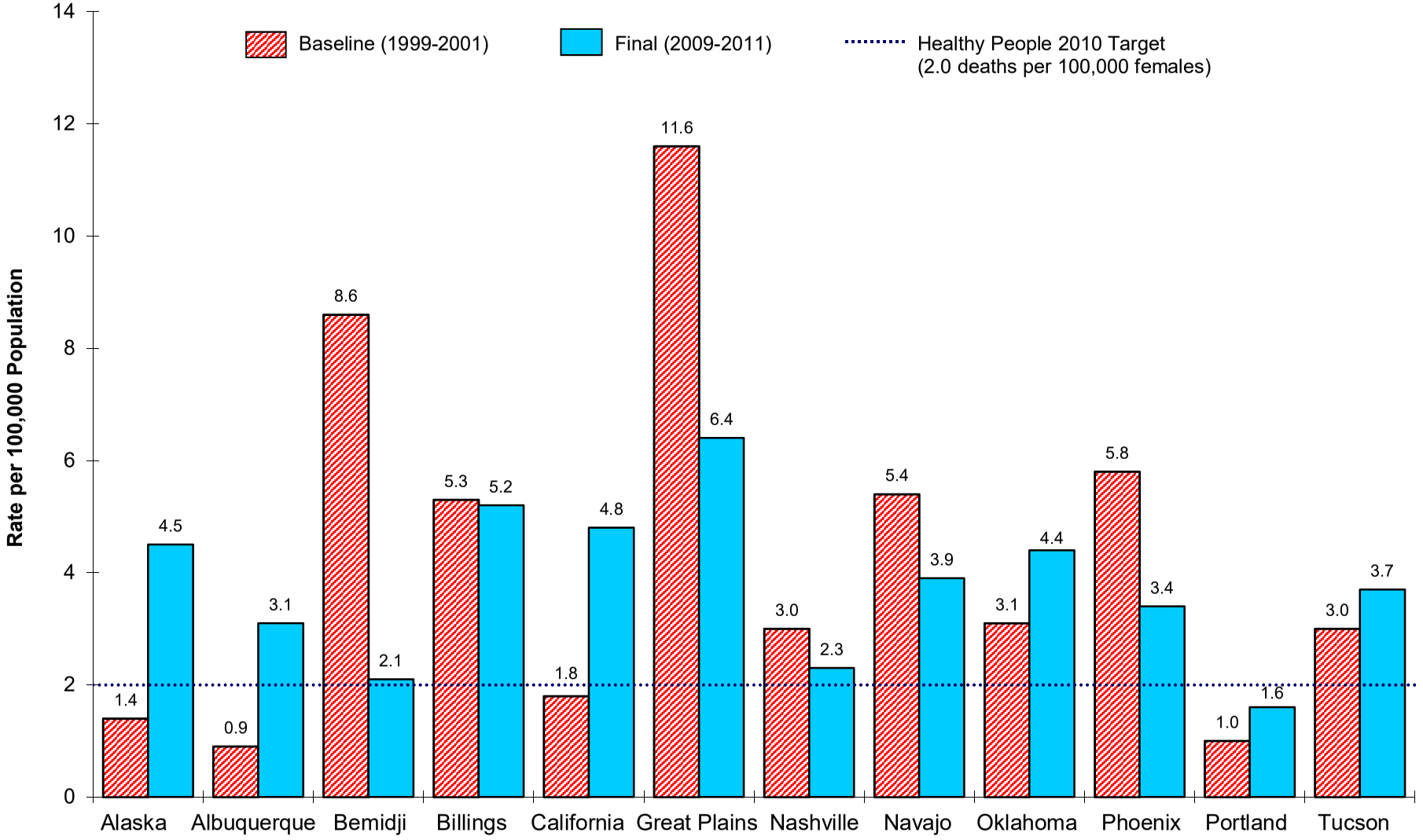
IHS Area	1999-2001 (Baseline)	2004-2006 (Mid-Decade)	2009-2011 (Final)	2010[2/] Target Goal	% Change Between Baseline and Final Rate
IHS Total	3.8	3.3	3.8	2.0	0.0%
Alaska	1.4	3.0	4.5	2.0	221.4%
Albuquerque	0.9	5.0	3.1	2.0	244.4%
Bemidji	8.6	5.8	2.1	2.0	-75.6%
Billings	5.3	5.0	5.2	2.0	-1.9%
California	1.8	0.9	4.8	2.0	166.7%
Great Plains	11.6	6.3	6.4	2.0	-44.8%
Nashville	3.0	2.5	2.3	2.0	-23.3%
Navajo	5.4	3.8	3.9	2.0	-27.8%
Oklahoma	3.1	2.9	4.4	2.0	41.9%
Phoenix	5.8	2.2	3.4	2.0	-41.4%
Portland	1.0	2.6	1.6	2.0	60.0%
Tucson	3.0	5.2	3.7	2.0	23.3%
U.S. Mid-Year Rates	*(2000)*	*(2005)*	*(2010)*		
All Races	2.8	2.4	2.3	2.0	-17.9%
White	2.5	2.2	2.1	2.0	-16.0%

[1/] Includes ICD-10 code C53.

[2/] Healthy People 2010 Objective No. 3-4. Reduce the death rate from cancer of the uterine cervix. For all populations, the HP 2010 target rate is 2.0 deaths per 100,000 females.

NOTE: Rates are age-adjusted to the year 2000 standard population and are adjusted to compensate for misreporting of AI/AN race on state death certificates.

Figure 9
Age-Adjusted Cervical Cancer Death Rates by IHS Area and Time Period



Notes: Rates are age-adjusted to the year 2000 standard population, and are adjusted to compensate for misreporting of AI/AN race on state death certificates. The 2010 target is based on a single goal of 2.0 cervical cancer deaths per 100,000 females, which was established for all demographic groups.

PROSTATE CANCER

Many prostate cancer deaths could be prevented with early detection and treatment. Healthy People 2010 identified a target goal of 28.2 deaths (per 100,000 males), which was established for all populations including the AI/AN population.

Table 10 presents age-adjusted prostate cancer mortality rates for 1999-2001, 2004-2006, and 2009-2011 for the IHS population by Service Area. Mid-year rates for each period (corresponding to 2000, 2005, and 2010) for the U.S. all races and U.S. white populations are also shown. Figure 10 illustrates the changes that have taken place in prostate cancer mortality between the baseline and final measurement periods for each IHS Area.

The results shown in Table 10 indicate that the total IHS prostate cancer mortality rate was already below the Healthy People 2010 target goal at baseline and decreased by 5.0% between the baseline and final time periods. For the total IHS population the 2009-2011 rate of 23.0 (per 100,000 males) is 18% below the Healthy People 2010 target goal of 28.2 (per 100,000 males). This rate is also below the 2010 U.S. all races rate of 21.9 (per 100,000 males) as well as the white rate of 20.2 (per 100,000 males). However, the U.S. all races and white populations have experienced decreases (-28.0% and -27.3%, respectively) in prostate cancer mortality rates since baseline, and are also now below the Healthy People 2010 target.

Despite the encouraging progress observed in the total IHS population, there is still substantial variability in prostate cancer mortality rates among IHS Areas. Five Areas showed increases in rates as compared to baseline: Tucson (151.6%), California (47.8%), Phoenix (37.9%), Oklahoma (34.7%), and Navajo (7.9%). All other Areas showed declines in rates compared to baseline ranging from -8.6% (Nashville) to -75.4% (Billings). Portland has the lowest 2009-2011 rate of 11.9 (per 100,000 males) and has made substantial progress with an overall reduction of 44.7% as compared to baseline.

These results indicate that IHS as a whole was successful in meeting the prostate cancer mortality goals established by Healthy People 2010. Still, some additional progress is needed in several Areas to ensure that all IHS Areas meet the mortality reduction goal that was set forth in Healthy People 2010.

Table 10
Age-Adjusted Mortality Rates for Deaths Due to Prostate Cancer[1/]
Among American Indian and Alaska Native Population, by IHS Area
1999-2001, 2004-2006, and 2009-2011
(Rate per 100,000 Males)

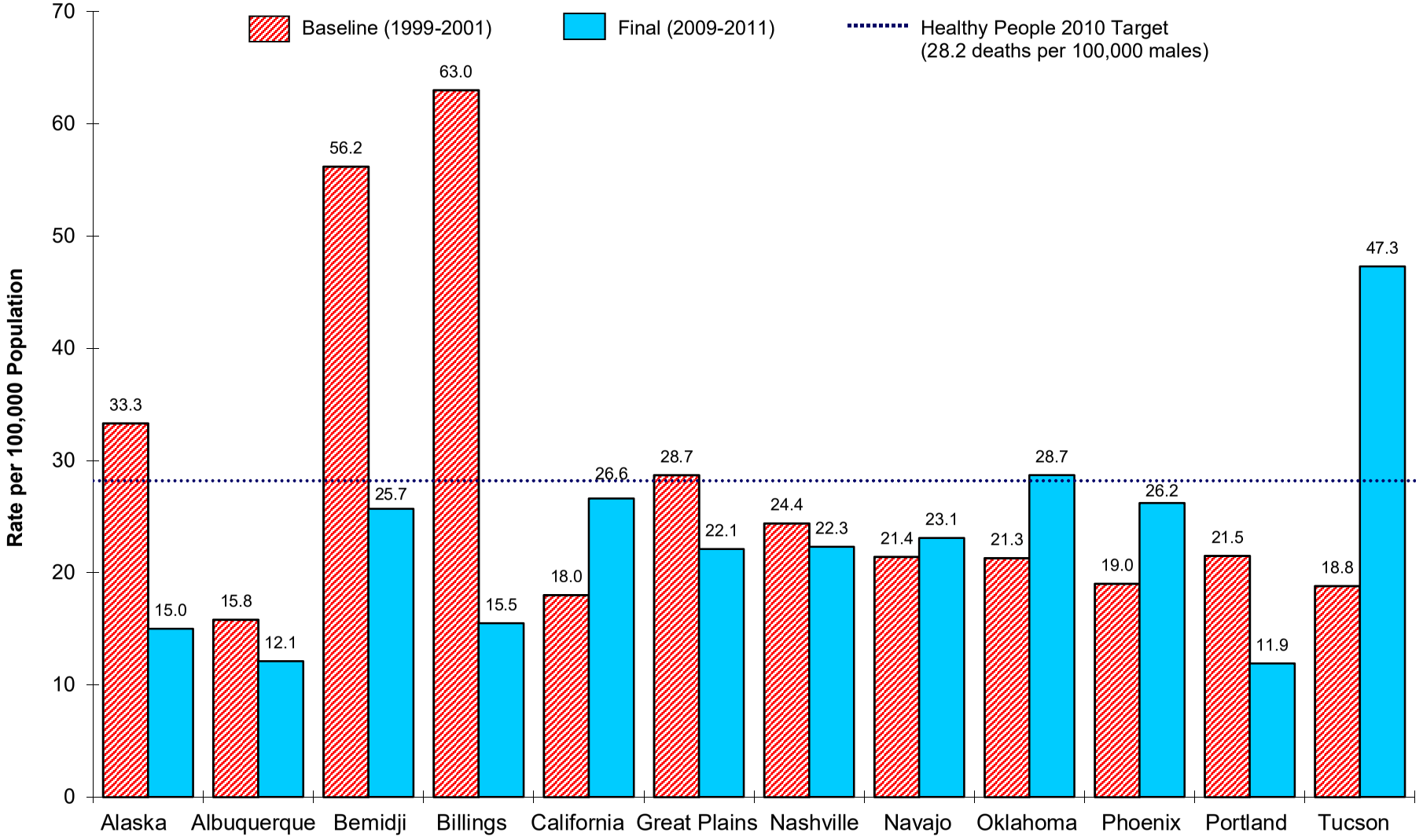
IHS Area	1999-2001 (Baseline)	2004-2006 (Mid-Decade)	2009-2011 (Final)	2010[2/] Target Goal	% Change Between Baseline and Final Rate
IHS Total	24.2	25.2	23.0	28.2	-5.0%
Alaska	33.3	23.7	15.0	28.2	-55.0%
Albuquerque	15.8	19.5	12.1	28.2	-23.4%
Bemidji	56.2	44.7	25.7	28.2	-54.3%
Billings	63.0	43.9	15.5	28.2	-75.4%
California	18.0	13.7	26.6	28.2	47.8%
Great Plains	28.7	26.3	22.1	28.2	-23.0%
Nashville	24.4	19.4	22.3	28.2	-8.6%
Navajo	21.4	23.1	23.1	28.2	7.9%
Oklahoma	21.3	29.3	28.7	28.2	34.7%
Phoenix	19.0	17.7	26.2	28.2	37.9%
Portland	21.5	32.1	11.9	28.2	-44.7%
Tucson	18.8	26.8	47.3	28.2	151.6%
U.S. Mid-Year Rates	*(2000)*	*(2005)*	*(2010)*		
All Races	30.4	24.5	21.9	28.2	-28.0%
White	27.8	22.6	20.2	28.2	-27.3%

[1/] Includes ICD-10 code C61.

[2/] Healthy People 2010 Objective No. 3-7. Reduce the prostate cancer death rate. For all populations, the HP 2010 target rate is 28.2 deaths per 100,000 males.

NOTE: Rates are age-adjusted to the year 2000 standard population and are adjusted to compensate for misreporting of AI/AN race on state death certificates.

Figure 10
Age-Adjusted Prostate Cancer Death Rates by IHS Area and Time Period



Notes: Rates are age-adjusted to the year 2000 standard population, and are adjusted to compensate for misreporting of AI/AN race on state death certificates. The 2010 target is based on a single goal of 28.2 prostate cancer deaths/100,000 males, which was established for all demographic groups.

HUMAN IMMUNODEFICIENCY VIRUS (HIV)

Despite major advancements in the treatment of HIV/AIDS, the disease remains an important cause of disability and death. One goal of Healthy People 2010 was to reduce HIV/AIDS deaths through efforts aimed at prevention, diagnosis, and treatment. Using a "better than the best" approach, Healthy People 2010 established a target rate of 0.7 HIV deaths (per 100,000 population). This target goal applies to all population groups including the AI/AN population.

Table 11 presents age-adjusted HIV mortality rates for 1999-2001, 2004-2006, and 2009-2011 for the IHS population by Service Area. Mid-year rates for each period (corresponding to 2000, 2005, and 2010) for the U.S. all races and U.S. white populations are also shown. Figure 11 illustrates the changes that have taken place in HIV mortality between the baseline and final measurement periods for each IHS Area.

The results shown in Table 11 indicate that the total IHS, U.S. all races and U.S. white population rates are all above the Healthy People 2010 goal of 0.7 HIV deaths (per 100,000 population) for all time periods. The 2009-2011 HIV mortality rate in the IHS population (2.2) is higher than the U.S. white population rate (1.4) but is lower than the U.S. all races rate (2.6). Only two IHS Areas (Tucson and California) had HIV mortality rates in 2009-2011 that met the Healthy People 2010 objective. The highest IHS Area rate for years 2009-2011 is seen for the Great Plains Area, for which the age-adjusted HIV mortality rate of 3.6 is considerably above the Healthy People 2010 target. Other Areas with relatively high rates in 2009-2011 are Portland (3.1) and Albuquerque (3.0). It is also apparent that a substantial amount of variability across time periods is present for individual Areas. As a result of the absolute number of Area-specific HIV deaths being small, period-to-period variability should be interpreted with caution.

These results indicate that further progress is needed for all U.S. populations, including the IHS population, in order to meet the HIV mortality reduction objective set forth by Healthy People 2010.

Table 11
Age-Adjusted Mortality Rates for Deaths Due to HIV Infection[1/]
Among American Indian and Alaska Native Population, by IHS Area
1999-2001, 2004-2006, and 2009-2011
(Rate per 100,000 Population)

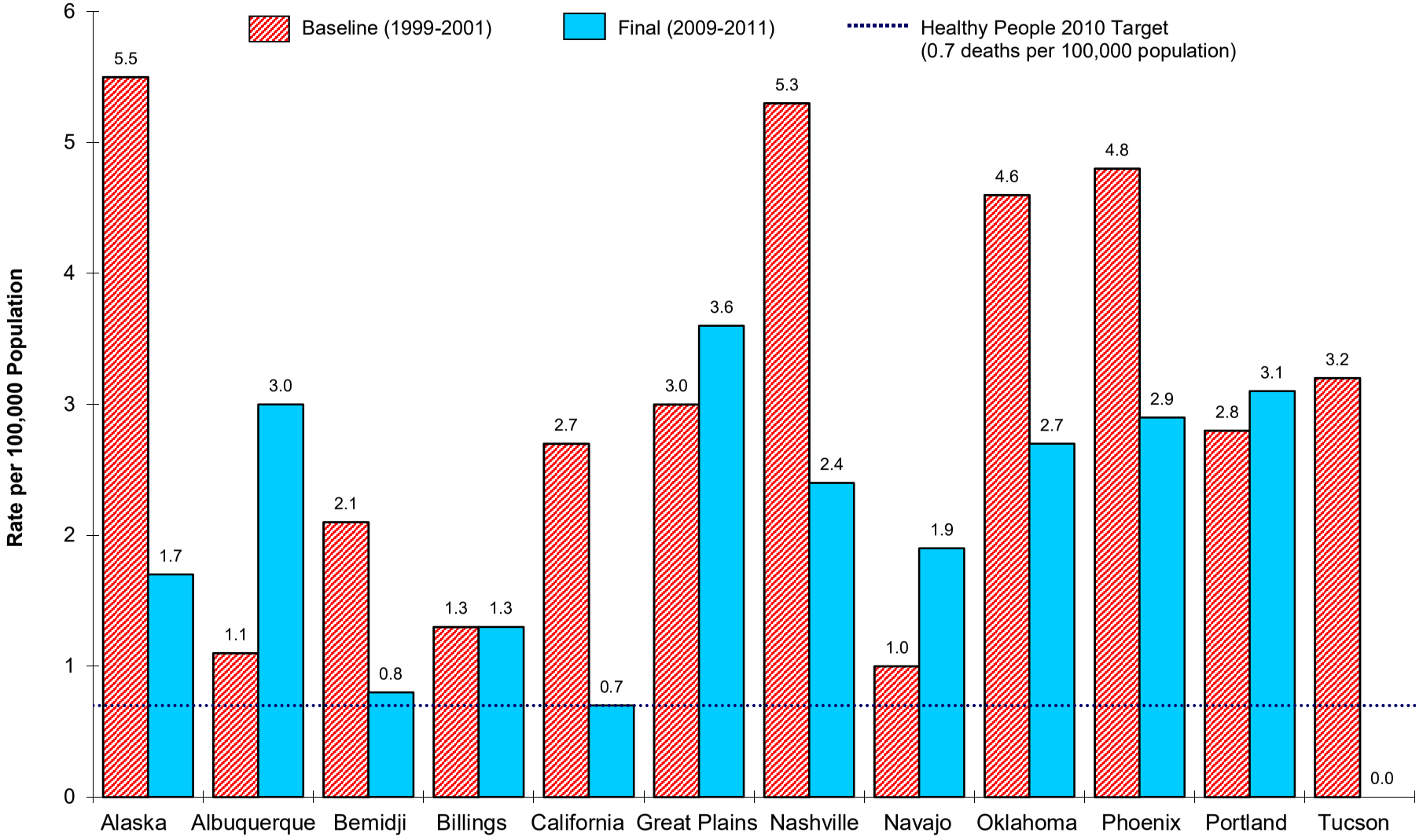
IHS Area	1999-2001 (Baseline)	2004-2006 (Mid-Decade)	2009-2011 (Final)	2010[2/] Target Goal	% Change Between Baseline and Final Rate
IHS Total	3.3	2.9	2.2	0.7	-33.3%
Alaska	5.5	3.2	1.7	0.7	-69.1%
Albuquerque	1.1	2.0	3.0	0.7	172.7%
Bemidji	2.1	0.6	0.8	0.7	-61.9%
Billings	1.3	0.0	1.3	0.7	0.0%
California	2.7	3.0	0.7	0.7	-74.1%
Great Plains	3.0	3.9	3.6	0.7	20.0%
Nashville	5.3	4.1	2.4	0.7	-54.7%
Navajo	1.0	2.8	1.9	0.7	90.0%
Oklahoma	4.6	3.4	2.7	0.7	-41.3%
Phoenix	4.8	1.7	2.9	0.7	-39.6%
Portland	2.8	4.6	3.1	0.7	10.7%
Tucson	3.2	3.2	0.0	0.7	-100.0%
U.S. Mid-Year Rates	*(2000)*	*(2005)*	*(2010)*		
All Races	5.2	4.2	2.6	0.7	-50.0%
White	2.8	2.2	1.4	0.7	-50.0%

[1/] Includes ICD-10 codes B20-B24.

[2/] Healthy People 2010 Objective No. 13-14. Reduce deaths from HIV infection. For all populations, the HP 2010 target rate is 0.7 deaths per 100,000 population.

NOTE: Rates are age-adjusted to the year 2000 standard population and are adjusted to compensate for misreporting of AI/AN race on state death certificates.

Figure 11
Age-Adjusted HIV Infection Death Rates by IHS Area and Time Period



Notes: Rates are age-adjusted to the year 2000 standard population, and are adjusted to compensate for misreporting of AI/AN race on state death certificates. The 2010 target is based on a single goal of 0.7 HIV deaths/100,000 population, which was established for all demographic groups.

UNINTENTIONAL INJURIES

Healthy People 2010 identified deaths due to unintentional injuries as an important area for mortality reduction. Using a "better than the best" approach, Healthy People 2010 established a target goal of 17.1 injury deaths (per 100,000 population). This target applies to all population groups including the AI/AN population.

Table 12 presents age-adjusted unintentional injury mortality rates for 1999-2001, 2004-2006, and 2009-2011 for the IHS population by Service Area. Mid-year rates for each period (corresponding to 2000, 2005, and 2010) for the U.S. all races and U.S. white populations are also shown. Figure 12 illustrates the changes that have taken place in unintentional injury mortality between the baseline and final measurement periods for each IHS Area.

The results shown in Table 12 suggest that all U.S. populations experience greater unintentional injury mortality than the goal outlined in Healthy People 2010. Therefore, progress needs to be made across all populations. However, it is also clear that the IHS population experiences significantly more unintentional injury mortality than the U.S. all races and U.S. white populations. During the final measurement period of 2009-2011, the overall IHS age-adjusted rate was 93.7, which was more than twice that seen for either the U.S. all races or U.S. white populations, and more than five times the Healthy People 2010 goal of 17.1. The U.S. all races and U.S. white populations have not shown recent progress toward the Healthy People 2010 goal (both rates increased over the measurement period, by 8.9% and 14.8%, respectively). The IHS total population unintentional injury mortality rate has also increased by 5.4%.

The IHS Area-specific data shown in Table 12 and Figure 12 also indicate that there is important variation across IHS Areas in unintentional injury mortality rates. Four Areas appear to have unintentional injury mortality rates that are consistently very high: Alaska, Billings, Great Plains, and Navajo. The lowest IHS rate is consistently seen in the Nashville Area. However, although this Area displays the lowest IHS unintentional injury mortality rate (48.8 during 2009-2011), the rate is still well above the Healthy People 2010 goal of 17.1. (Mortality rates are age-adjusted per 100,000 population.)

The greatest percentage reductions in unintentional injury mortality have occurred in Tucson (-21.9%) and Phoenix (-19.2%). In contrast, rates in the California and Oklahoma Areas have substantially increased since baseline (by 62.4% and 40.3% respectively).

These results indicate that prevention efforts must be continued to reduce IHS population disparities in unintentional injury mortality, and that more progress is necessary to attain the unintentional injury reduction objective that was established in Healthy People 2010.

Table 12
Age-Adjusted Mortality Rates for Deaths Due to Unintentional Injuries[1/]
Among American Indian and Alaska Native Population, by IHS Area
1999-2001, 2004-2006, and 2009-2011
(Rate per 100,000 Population)

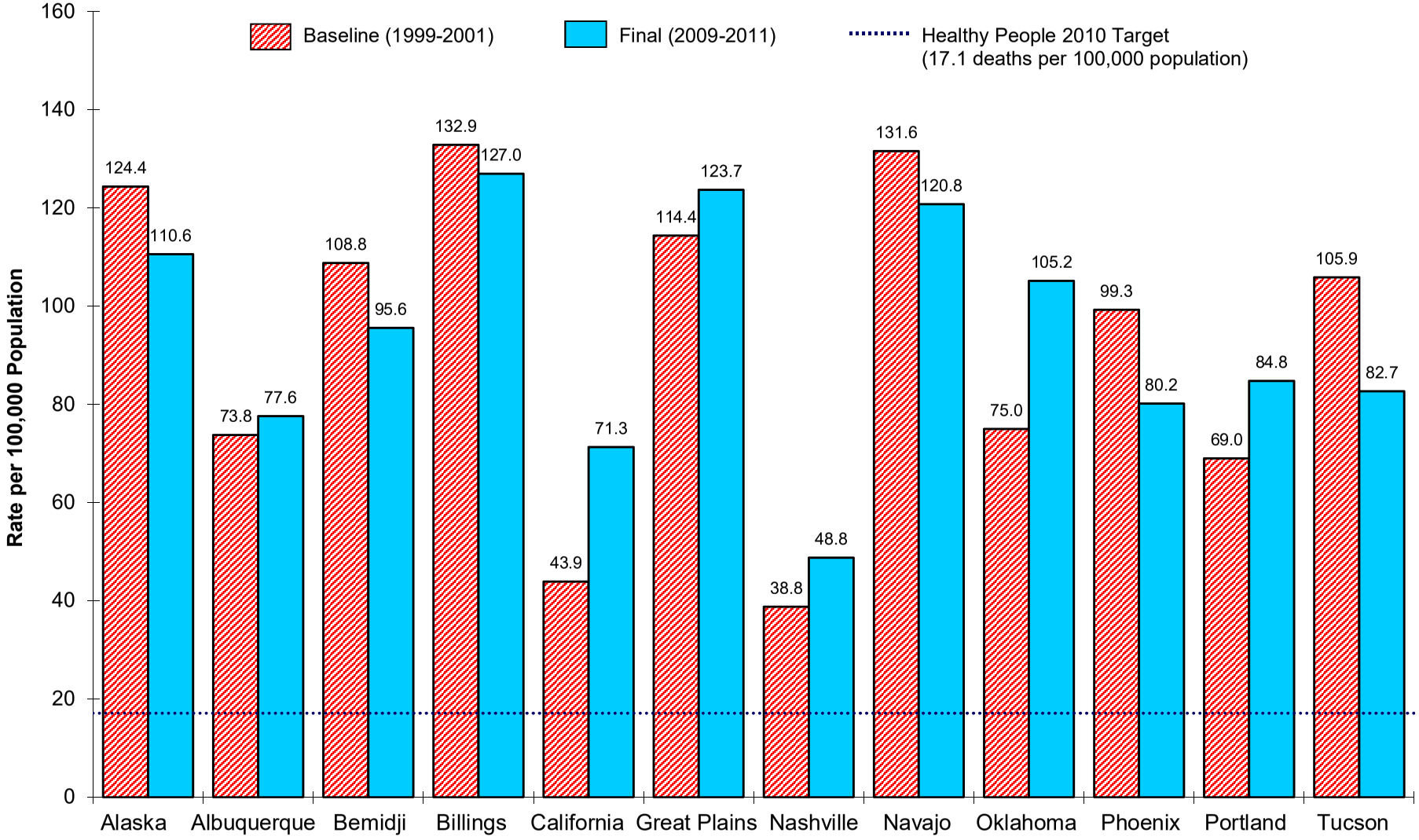
IHS Area	1999-2001 (Baseline)	2004-2006 (Mid-Decade)	2009-2011 (Final)	2010[2/] Target Goal	% Change Between Baseline and Final Rate
IHS Total	88.9	92.5	93.7	17.1	5.4%
Alaska	124.4	105.3	110.6	17.1	-11.1%
Albuquerque	73.8	80.6	77.6	17.1	5.1%
Bemidji	108.8	94.3	95.6	17.1	-12.1%
Billings	132.9	131.6	127.0	17.1	-4.4%
California	43.9	46.0	71.3	17.1	62.4%
Great Plains	114.4	140.6	123.7	17.1	8.1%
Nashville	38.8	58.9	48.8	17.1	25.8%
Navajo	131.6	133.5	120.8	17.1	-8.2%
Oklahoma	75.0	102.9	105.2	17.1	40.3%
Phoenix	99.3	78.5	80.2	17.1	-19.2%
Portland	69.0	78.0	84.8	17.1	22.9%
Tucson	105.9	103.0	82.7	17.1	-21.9%
U.S. Mid-Year Rates	*(2000)*	*(2005)*	*(2010)*		
All Races	34.9	39.1	38.0	17.1	8.9%
White	35.1	40.1	40.3	17.1	14.8%

[1/] Includes ICD-10 codes V01-X59 and Y85-Y86.

[2/] Healthy People 2010 Objective No. 15-13. Reduce deaths caused by unintentional injuries. For all populations, the HP 2010 target rate is 17.1 deaths per 100,000 population.

NOTE: Rates are age-adjusted to the year 2000 standard population and are adjusted to compensate for misreporting of AI/AN race on state death certificates.

Figure 12
Age-Adjusted Unintentional Injury Death Rates by IHS Area and Time Period



Notes: Rates are age-adjusted to the year 2000 standard population, and are adjusted to compensate for misreporting of AI/AN race on state death certificates. The 2010 target is based on a single goal of 17.1 unintentional injury deaths/100,000 population, which was established for all demographic groups.

HOMICIDE

Violence prevention including a reduction in homicides was identified as an important aim of Healthy People 2010. Using a "better than the best" approach, Healthy People 2010 established a target rate of 2.8 homicides (per 100,000 population). The target rate applies to all population groups including the AI/AN population.

Table 13 presents age-adjusted homicide rates for 1999-2001, 2004-2006, and 2009-2011 for the IHS population by Service Area. Mid-year rates for each period (corresponding to 2000, 2005, and 2010) for the U.S. all races and U.S. white populations are also shown. Figure 13 illustrates the changes that have taken place in homicide rates between the baseline and final measurement periods for each IHS Area.

The results shown in Table 13 indicate that homicide rates are greater in the IHS population than in the U.S. all races or white populations. For years 2009-2011 the IHS population homicide rate (11.4) is more than twice that of the U.S. all races population (5.3) and is four times the Healthy People 2010 target of 2.8 homicides (per 100,000 population). While the U.S. all races and white populations have experienced homicide rate decreases (-10.2% and -8.3% respectively), the 2009-2011 IHS homicide rate of 11.4 is the same as the baseline 1999-2001 rate.

The data shown in Table 13 and Figure 13 also indicate that there is considerable variability across IHS Areas in homicide rates. During 2009-2011 the highest rates were observed in Tucson (24.8), Navajo (16.2), and Oklahoma (14.5). The lowest 2009-2011 rate is observed in Nashville which at 4.9 is the only IHS Area rate that approaches the Healthy People 2010 goal of 2.8. The IHS Area-specific results also indicate that there is year-to-year variability in homicide rates. Looking at change since baseline, five Areas have experienced reductions in homicides: Alaska (-50.5%), Nashville (-47.9%), Phoenix (-23.9), Great Plains (-15.0%), and Billings (-11.3%). Several other Areas experienced substantial increases between 1999-2001 and 2009-2011, including Tucson (68.7%), Albuquerque (37.2%), and Oklahoma (31.8%). However, given the year-to-year variability that is present, the percentage differences between 1999-2001 and 2009-2011 should be interpreted with caution.

Collectively these results suggest that the IHS population continues to experience higher homicide rates than either the U.S. all races or U.S. white populations, and consistently experiences homicide rates well in excess of the goal set forth by Healthy People 2010. Further efforts aimed at violence prevention are needed to reduce this important population health disparity.

Table 13
Age-Adjusted Mortality Rates for Deaths Due to Homicide[1/]
Among American Indian and Alaska Native Population, by IHS Area
1999-2001, 2004-2006, and 2009-2011
(Rate per 100,000 Population)

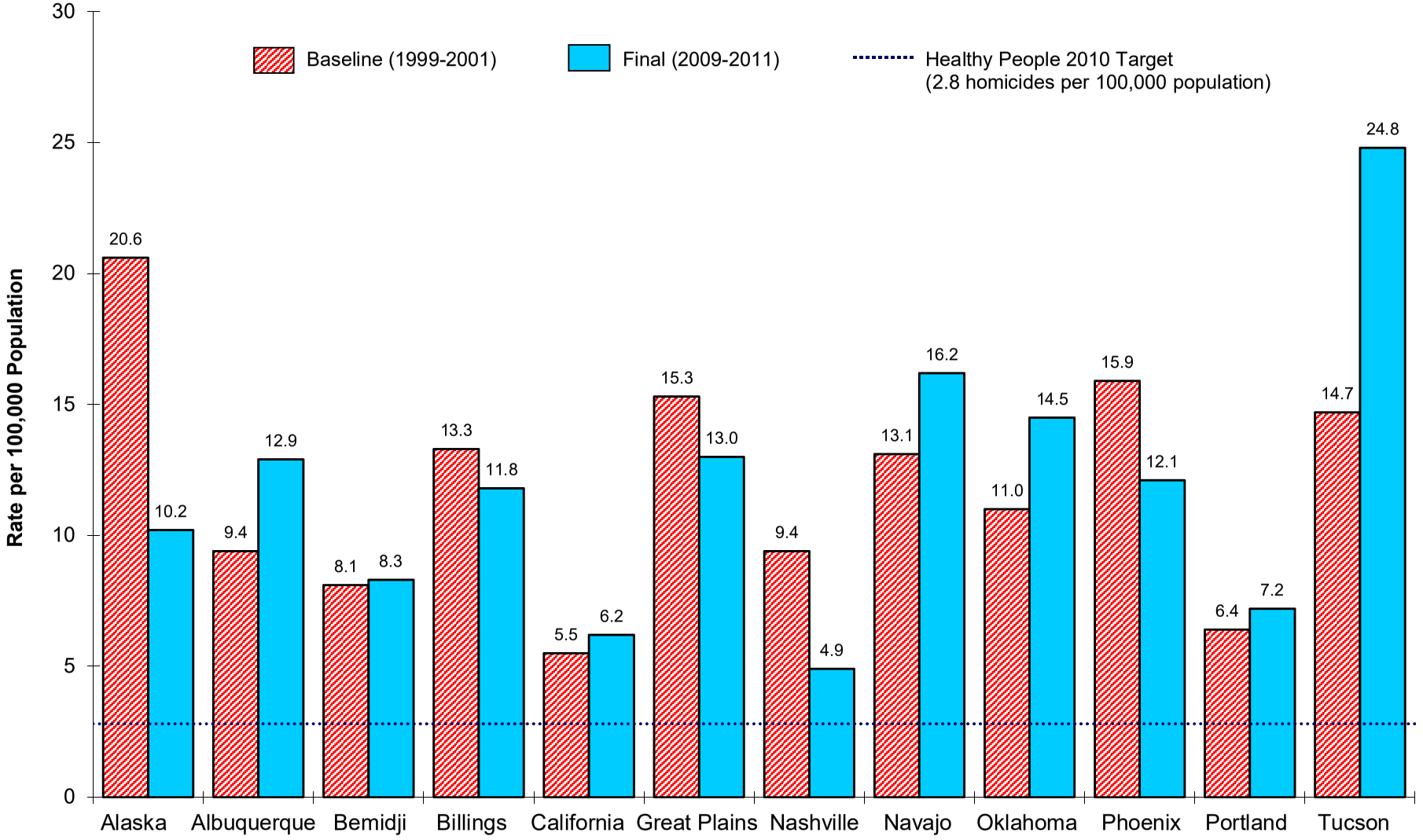
IHS Area	1999-2001 (Baseline)	2004-2006 (Mid-Decade)	2009-2011 (Final)	2010[2/] Target Goal	% Change Between Baseline and Final Rate
IHS Total	11.4	10.8	11.4	2.8	0.0%
Alaska	20.6	9.9	10.2	2.8	-50.5%
Albuquerque	9.4	12.3	12.9	2.8	37.2%
Bemidji	8.1	11.7	8.3	2.8	2.5%
Billings	13.3	16.4	11.8	2.8	-11.3%
California	5.5	6.9	6.2	2.8	12.7%
Great Plains	15.3	16.1	13.0	2.8	-15.0%
Nashville	9.4	4.5	4.9	2.8	-47.9%
Navajo	13.1	14.4	16.2	2.8	23.7%
Oklahoma	11.0	11.8	14.5	2.8	31.8%
Phoenix	15.9	12.0	12.1	2.8	-23.9%
Portland	6.4	7.7	7.2	2.8	12.5%
Tucson	14.7	12.4	24.8	2.8	68.7%
U.S. Mid-Year Rates	*(2000)*	*(2005)*	*(2010)*		
All Races	5.9	6.1	5.3	2.8	-10.2%
White	3.6	3.7	3.3	2.8	-8.3%

[1/] Includes ICD-10 codes U01-U02, X85-Y09, and Y87.1.

[2/] Healthy People 2010 Objective No. 15-32. Reduce homicides. For all populations, the HP 2010 target rate is 2.8 homicides per 100,000 population.

NOTE: Rates are age-adjusted to the year 2000 standard population and are adjusted to compensate for misreporting of AI/AN race on state death certificates.

Figure 13
Age-Adjusted Homicide Rates by IHS Area and Time Period



Notes: Rates are age-adjusted to the year 2000 standard population, and are adjusted to compensate for misreporting of AI/AN race on state death certificates. The 2010 target is based on a single goal of 2.8 homicides/100,000 population, which was established for all demographic groups.

SUICIDE

Suicide reduction was identified by Healthy People 2010 as an important objective within the domain of mental health. Using a "better than the best" approach, Healthy People 2010 established a target rate of 4.8 suicides (per 100,000 population). The target rate of 4.8 applies to all population groups including the AI/AN population.

Table 14 presents age-adjusted suicide mortality rates for 1999-2001, 2004-2006, and 2009-2011 for the IHS population by Service Area. Mid-year rates for each period (corresponding to 2000, 2005, and 2010) for the U.S. all races and U.S. white populations are also shown. Figure 14 illustrates the changes that have taken place in suicide rates between the baseline and final measurement periods for each IHS Area.

The 2009-2011 total IHS age-adjusted suicide rate of 20.4 (per 100,000 persons) is considerably above the age-adjusted U.S. all races rate (12.1) and the U.S. white rate (13.6). All of these population rates are still substantially above the 2010 target goal of 4.8 deaths (per 100,000 persons). Moreover, the overall IHS suicide rate increased by 20% between 1999-2001 and 2009-2011.

Table 14 and Figure 14 show that there is considerable variability in suicide rates according to IHS Area, but all IHS Areas have suicide rates that are higher than the Healthy People target of 4.8 deaths (per 100,000 persons). Alaska and Billings have the highest final rates (39.0 and 31.4, respectively). The lowest final rates are seen in Nashville (9.4) and Phoenix (12.4). Mortality rates are per 100,000 U.S. standard population).

Variability also exists among IHS Areas in the degree of change that occurred between the baseline and final measurement periods. Age-adjusted suicide rates increased in all but two of the twelve Areas: Phoenix (-25.3%) and Tucson (-28.1%). The highest increase occurred in the California Area, which had the lowest rate at baseline at 5.5 (per 100,000 persons), but which increased by 163.6% to 14.5 (per 100,000 persons). The Oklahoma and Billings Areas also experienced increases of greater than 50% (56.6% and 50.2%, respectively).

These results suggest that little progress has been attained in meeting the suicide reduction objectives of Healthy People 2010. Population disparities with respect to suicide continue to affect the IHS population, and further efforts are needed to reduce suicide rates in all IHS Areas.

Table 14
Age-Adjusted Mortality Rates for Deaths Due to Suicide[1/]
Among American Indian and Alaska Native Population, by IHS Area
1999-2001, 2004-2006, and 2009-2011
(Rate per 100,000 Population)

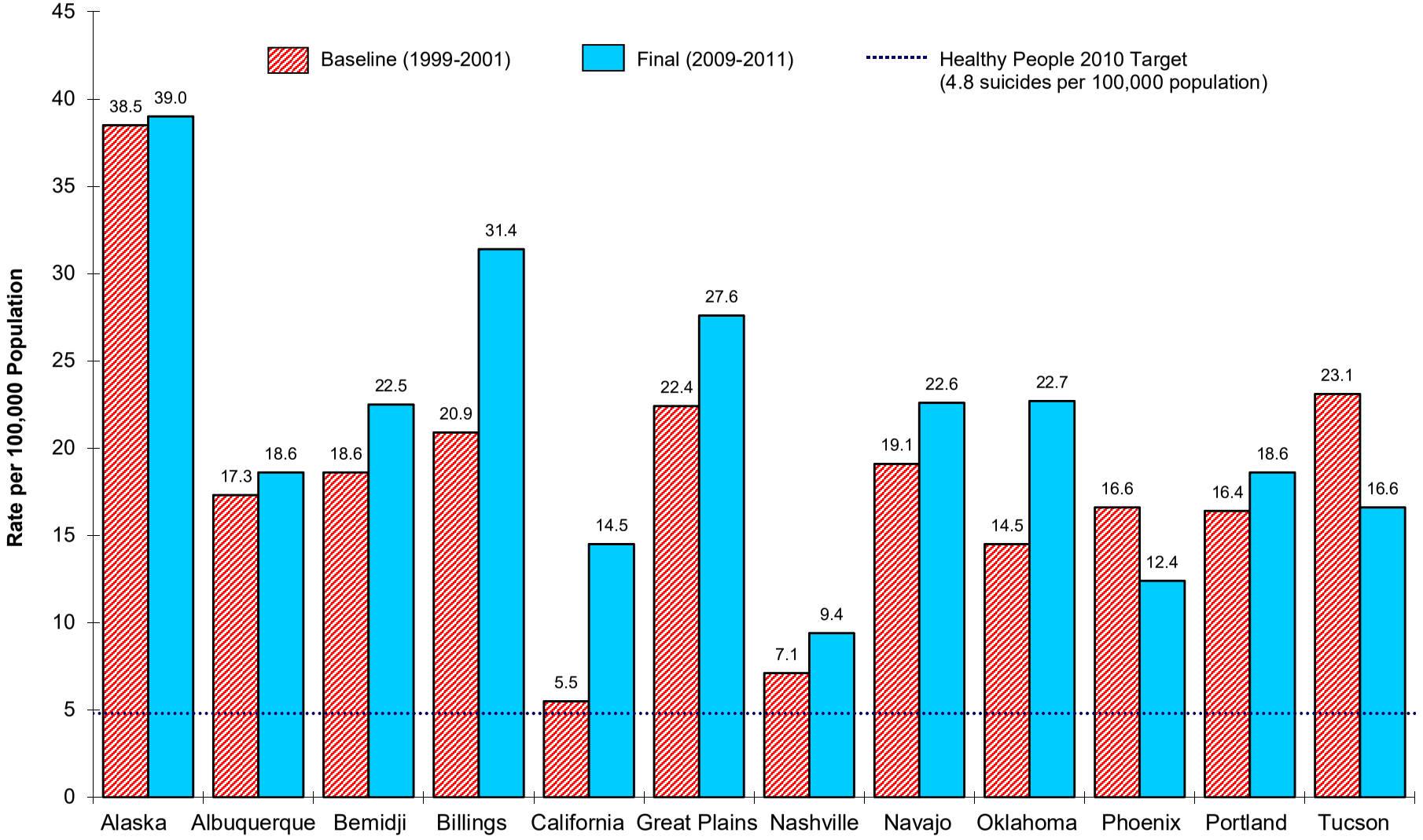
IHS Area	1999-2001 (Baseline)	2004-2006 (Mid-Decade)	2009-2011 (Final)	2010[2/] Target Goal	% Change Between Baseline and Final Rate
IHS Total	17.0	19.2	20.4	4.8	20.0%
Alaska	38.5	48.6	39.0	4.8	1.3%
Albuquerque	17.3	13.0	18.6	4.8	7.5%
Bemidji	18.6	26.9	22.5	4.8	21.0%
Billings	20.9	28.8	31.4	4.8	50.2%
California	5.5	9.0	14.5	4.8	163.6%
Great Plains	22.4	28.6	27.6	4.8	23.2%
Nashville	7.1	7.7	9.4	4.8	32.4%
Navajo	19.1	20.3	22.6	4.8	18.3%
Oklahoma	14.5	20.8	22.7	4.8	56.6%
Phoenix	16.6	13.5	12.4	4.8	-25.3%
Portland	16.4	14.7	18.6	4.8	13.4%
Tucson	23.1	16.3	16.6	4.8	-28.1%
U.S. Mid-Year Rates	*(2000)*	*(2005)*	*(2010)*		
All Races	10.4	10.9	12.1	4.8	16.3%
White	11.3	12.0	13.6	4.8	20.4%

[1/] Includes ICD-10 codes U03, X60-X84, and Y87.0.

[2/] Healthy People 2010 Objective No. 18-1. Reduce the suicide rate. For all populations, the HP 2010 target rate is 4.8 suicides per 100,000 population.

NOTE: Rates are age-adjusted to the year 2000 standard population and are adjusted to compensate for misreporting of AI/AN race on state death certificates.

Figure 14
Age-Adjusted Suicide Rates
by IHS Area and Time Period



Notes: Rates are age-adjusted to the year 2000 standard population, and are adjusted to compensate for misreporting of AI/AN race on state death certificates. The 2010 target is based on a single goal of 4.8 suicides/100,000 population, which was established for all demographic groups.

CIRRHOSIS OF THE LIVER

Reducing the number of deaths attributable to liver cirrhosis was identified by Healthy People 2010 as an important goal within the broad domain of substance abuse reduction. Using a "better than the best" target-setting method, Healthy People 2010 established a target goal of 3.2 deaths (per 100,000 persons). The target goal of 3.2 applies to all populations including the AI/AN population.

Table 15 presents age-adjusted cirrhosis of the liver mortality rates for 1999-2001, 2004-2006, and 2009-2011 for the IHS population by Service Area. Mid-year rates for each period (corresponding to 2000, 2005, and 2010) for the U.S. all races and U.S. white populations are also shown. Figure 15 illustrates the changes that have taken place in cirrhosis mortality rates between the baseline and final time periods for each IHS Area.

The IHS age-adjusted cirrhosis death rates shown in Table 15 are in sharp contrast to the U.S all races and U.S. white rates. The 2009-2011 total IHS rate of 42.9 is more than four times the U.S. all races and U.S. white rates and is 13.4 times the Healthy People 2010 target goal of 3.2. The IHS Area-specific data shown in Table 15 and Figure 15 also illustrate that there is substantial heterogeneity across IHS Areas in cirrhosis mortality rates. The IHS Areas with the highest 2009-2011 rates are Tucson, Billings, and Great Plains (82.6, 78.7, and 74.1 respectively). The Alaska Area has consistently shown the lowest rate but Alaska's final age-adjusted rate of 22.8 is still more than seven times the Healthy People 2010 goal. (Rates are age-adjusted per 100,000 population).

Although the IHS total and Area-specific rates indicate that cirrhosis remains an important area of health disparity, the results also suggest that progress has been made in some IHS Areas. Five of the 12 IHS Areas experienced declines in cirrhosis mortality between 1999-2001 and 2009-2011. The most dramatic reductions occurred in Nashville (-56.4%) and Albuquerque (-27.0%). However, these reductions are largely offset by cirrhosis mortality increases in several other Areas, most notably Navajo (42.5%), Billings (41.8%) and Bemidji (40.9%). These results suggest that although progress is being made in some Areas, additional intervention efforts are still necessary to reduce mortality associated with cirrhosis of the liver.

Table 15
Age-Adjusted Mortality Rates for Deaths Due to Cirrhosis of the Liver[1/]
Among American Indian and Alaska Native Population, by IHS Area
1999-2001, 2004-2006, and 2009-2011
(Rate per 100,000 Population)

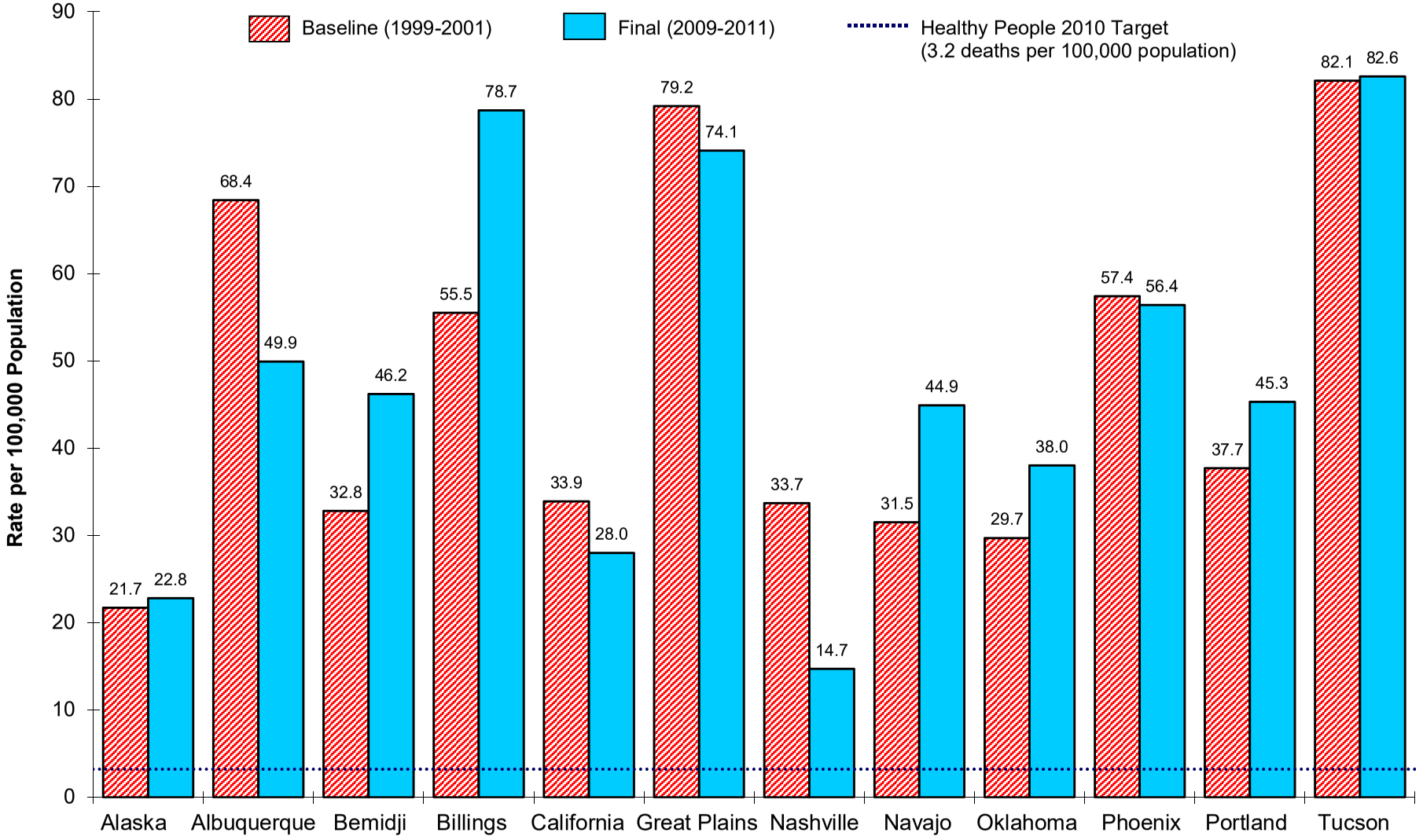
IHS Area	1999-2001 (Baseline)	2004-2006 (Mid-Decade)	2009-2011 (Final)	2010[2/] Target Goal	% Change Between Baseline and Final Rate
IHS Total	40.6	37.7	42.9	3.2	5.7%
Alaska	21.7	16.6	22.8	3.2	5.1%
Albuquerque	68.4	42.6	49.9	3.2	-27.0%
Bemidji	32.8	39.0	46.2	3.2	40.9%
Billings	55.5	70.6	78.7	3.2	41.8%
California	33.9	26.6	28.0	3.2	-17.4%
Great Plains	79.2	80.1	74.1	3.2	-6.4%
Nashville	33.7	26.4	14.7	3.2	-56.4%
Navajo	31.5	35.5	44.9	3.2	42.5%
Oklahoma	29.7	33.8	38.0	3.2	27.9%
Phoenix	57.4	45.1	56.4	3.2	-1.7%
Portland	37.7	33.1	45.3	3.2	20.2%
Tucson	82.1	66.2	82.6	3.2	0.6%
U.S. Mid-Year Rates	*(2000)*	*(2005)*	*(2010)*		
All Races	9.5	9.0	9.4	3.2	-1.1%
White	9.6	9.2	9.9	3.2	3.1%

[1/] Includes ICD-10 codes K70 and K73-K74.

[2/] Healthy People 2010 Objective No. 26-2. Reduce cirrhosis deaths. For all populations, the HP 2010 target rate is 3.2 deaths per 100,000 population.

NOTE: Rates are age-adjusted to the year 2000 standard population and are adjusted to compensate for misreporting of AI/AN race on state death certificates.

Figure 15
Age-Adjusted Cirrhosis of the Liver Death Rates by IHS Area and Time Period



Notes: Rates are age-adjusted to the year 2000 standard population, and are adjusted to compensate for misreporting of AI/AN race on state death certificates. The 2010 target is based on a single goal of 3.2 cirrhosis deaths/100,000 population, which was established for all demographic groups.

DRUG-INDUCED DEATHS

Reducing drug-induced deaths was defined in Healthy People 2010 as an important objective related to substance abuse reduction. The category of drug-induced deaths includes a broad constellation of ICD-10 codes related to drug psychosis, drug dependence, suicide, and intentional or accidental poisoning that may result from drug use. Using a "better than the best" approach, Healthy People 2010 established a target of 1.2 deaths (per 100,000 persons) for all populations including the AI/AN population. However, Healthy People 2010 also acknowledged that meeting this target would require substantial reductions in drug-induced deaths for most population groups.

Table 16 presents age-adjusted drug-induced mortality rates for 1999-2001, 2004-2006, and 2009-2011 for the IHS population by Service Area. Mid-year rates for each period (corresponding to 2000, 2005, and 2010) for the U.S. all races and U.S. white populations are also shown. Figure 16 illustrates the changes that have taken place in drug-induced mortality rates between the baseline and final measurement periods for each IHS Area.

The data shown in Table 16 indicate that the U.S. all races, U.S. white, and IHS populations are all considerably above the Healthy People 2010 target of 1.2 drug-induced deaths (per 100,000 persons). The total IHS population rate (23.4) for years 2009-2011 is substantially higher than both the U.S. all races (12.9) and U.S. white (14.6) rates. In addition, all three populations have experienced large increases in drug-induced mortality. The IHS increase of 154.3% is greater than the increase observed in either the U.S. all races (84.3%) or white (105.6%) population. It does not appear that progress toward the Healthy People 2010 goal was attained in any major population group including the IHS population.

Table 16 and Figure 16 also show that there is variability among IHS Areas. During 2009-2011 the highest age-adjusted drug-induced mortality rates occurred in Bemidji (37.1), Portland (35.1), Oklahoma (33.2), and California (31.1). The lowest rates were seen in the Navajo (9.1) and Great Plains (10.6) Areas. All IHS Areas appear to have experienced increases in the age-adjusted drug-induced mortality rate since baseline except for the Tucson Area. For eight out of 12 IHS Areas, drug-induced mortality rates more than doubled between the baseline and final time periods. Highest relative increases were experienced in California (418.3%) and in Nashville (341.7%).

The large increases in mortality rates seen across most IHS Areas reflect well-recognized national trends in drug-induced mortality. Substantial intervention efforts are necessary to address this important issue and to reduce drug-induced mortality in the IHS population.

Table 16
Age-Adjusted Drug-Induced Death Rates[1/]
Among American Indian and Alaska Native Population, by IHS Area
1999-2001, 2004-2006, and 2009-2011
(Rate per 100,000 Population)

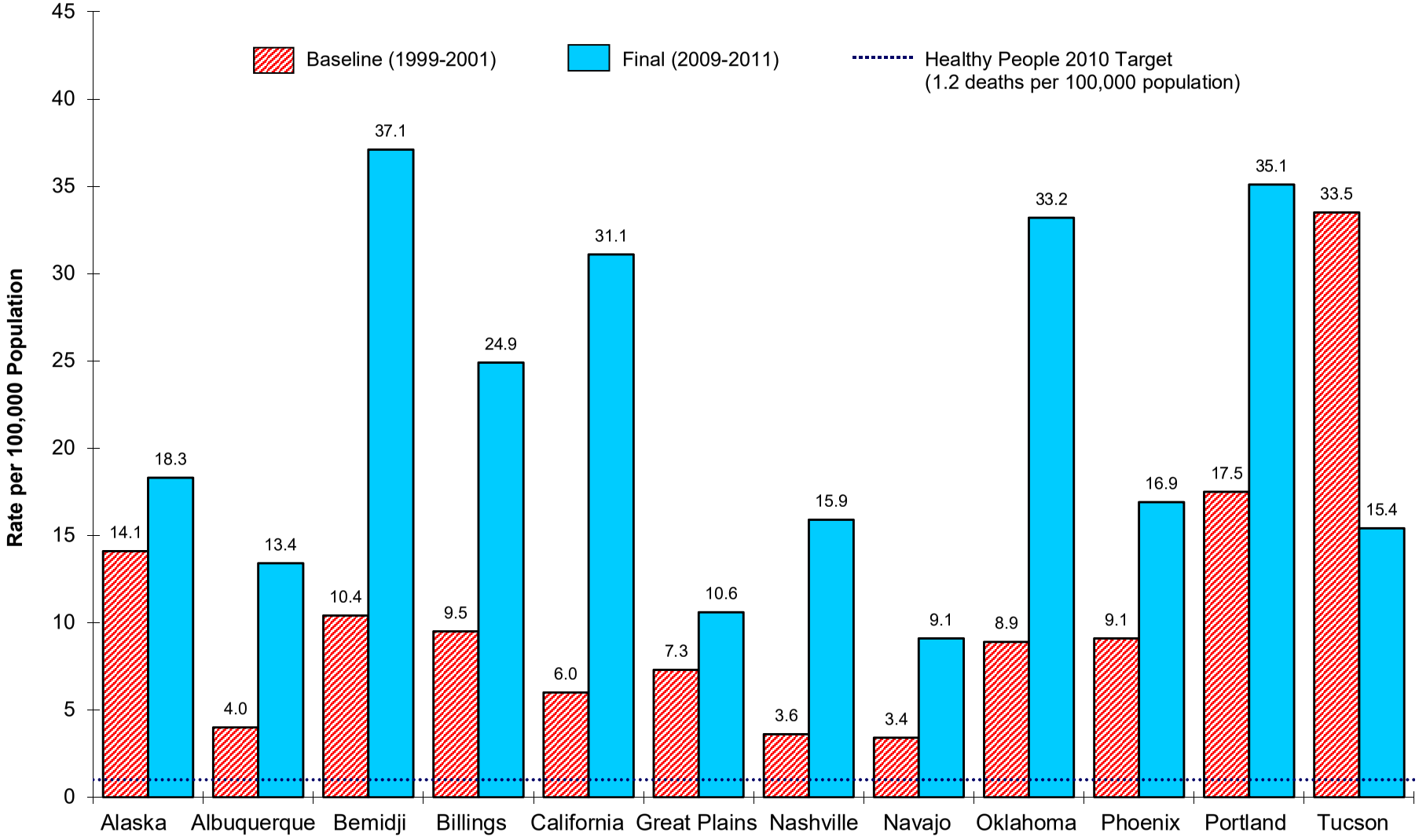
IHS Area	1999-2001 (Baseline)	2004-2006 (Mid-Decade)	2009-2011 (Final)	2010[2/] Target Goal	% Change Between Baseline and Final Rate
IHS Total	9.2	18.9	23.4	1.2	154.3%
Alaska	14.1	19.8	18.3	1.2	29.8%
Albuquerque	4.0	11.2	13.4	1.2	235.0%
Bemidji	10.4	26.7	37.1	1.2	256.7%
Billings	9.5	22.3	24.9	1.2	162.1%
California	6.0	17.3	31.1	1.2	418.3%
Great Plains	7.3	13.6	10.6	1.2	45.2%
Nashville	3.6	11.1	15.9	1.2	341.7%
Navajo	3.4	5.2	9.1	1.2	167.6%
Oklahoma	8.9	28.3	33.2	1.2	273.0%
Phoenix	9.1	16.0	16.9	1.2	85.7%
Portland	17.5	25.9	35.1	1.2	100.6%
Tucson	33.5	30.7	15.4	1.2	-54.0%
U.S. Mid-Year Rates	*(2000)*	*(2005)*	*(2010)*		
All Races	7.0	11.3	12.9	1.2	84.3%
White	7.1	11.9	14.6	1.2	105.6%

[1/] Includes ICD-10 codes D52.1, D59.0, D59.2, D61.1, D64.2, E06.4, E16.0, E23.1, E24.2, E27.3, E66.1, F11.1–F11.5, F11.7–F11.9, F12.1–F12.5, F12.7–F12.9, F13.1–F13.5, F13.7-F13.9, F14.1–F14.5, F14.7–F14.9, F15.1–F15.5, F15.7–F15.9, F16.1–F16.5, F16.7–F16.9, F17.3–F17.5, F17.7–F17.9, F18.1–F18.5, F18.7–F18.9, F19.1–F19.5, F19.7–F19.9, G21.1, G24.0, G25.1, G25.4, G25.6, G44.4, G62.0, G72.0, I95.2, J70.2–J70.4, K85.3, L10.5, L27.0–L27.1, M10.2, M32.0, M80.4, M81.4, M83.5, M87.1, R50.2, R78.1–R78.5, X40–X44, X60–X64, X85, and Y10–Y14.

[2/] Healthy People 2010 Objective No. 26-3. Reduce drug-induced deaths. For all populations, the HP 2010 target rate is 1.2 deaths per 100,000 population.

NOTE: Rates are age-adjusted to the year 2000 standard population and are adjusted to compensate for misreporting of AI/AN race on state death certificates.

Figure 16
Age-Adjusted Drug-Induced Death Rates by IHS Area and Time Period



Notes: Rates are age-adjusted to the year 2000 standard population, and are adjusted to compensate for misreporting of AI/AN race on state death certificates. The 2010 target is based on a single goal of 1.2 drug-induced deaths/100,000 population, which was established for all demographic groups.

MOTOR VEHICLE CRASHES

Healthy People 2010 recognized motor vehicle crashes as a significant health problem for the United States. Because many motor vehicle crash deaths may be prevented through key safety practices, such as wearing seat belts, Healthy People 2010 established motor vehicle crash deaths as an area where significant improvements could be attained by 2010. Healthy People 2010 used a "better than the best" approach to establish a target goal of 8.0 motor vehicle crash deaths (per 100,000 persons).

Table 17 presents age-adjusted motor vehicle crash mortality rates for 1999-2001, 2004-2006, and 2009-2011 for the IHS population by Service Area. Mid-year rates for each period (corresponding to 2000, 2005, and 2010) for the U.S. all races and U.S. white populations are also shown. Figure 17 illustrates the changes that have taken place in motor vehicle crash mortality rates between the baseline and final measurement periods for each IHS Area.

The IHS data shown in Table 17 present a striking contrast to the data for other population groups. The 2009-2011 overall IHS motor vehicle crash mortality rate of 35.8 is more than three times the U.S. all races rate (11.3) and the U.S. white rate (11.7), and is more than four times the target goal. However, the 2009-2011 IHS rate reflects a reduction (-25.4%) from the baseline value. This reduction is in line with the percentage decreases that were experienced over the same time period in the U.S. all races (-26.6%) and white (-25.0%) populations.

The IHS Areas with the highest 2009-2011 rates are Billings (61.2) and Great Plains (59.5). Lowest rates are seen in Alaska (18.8) and Nashville (22.2). Increases in mortality since baseline occurred in two Areas: Oklahoma (11.5%) and California (1.2%). The remaining ten Areas have experienced declining motor vehicle crash rates since the baseline period. The most notable decrease (-50.1%) occurred in the Phoenix Area, where the mortality rate fell from 60.3 in 1999-2001 to 30.1 for years 2009-2011.

Taken in the aggregate, the data shown in Table 17 and Figure 17 indicate that although important mortality reductions have occurred in the IHS population, more progress is still needed in reducing motor vehicle crash deaths.

Table 17
Age-Adjusted Mortality Rates for Deaths Due to Motor Vehicle Crashes[1/]
Among American Indian and Alaska Native Population, by IHS Area
1999-2001, 2004-2006, and 2009-2011
(Rate per 100,000 Population)

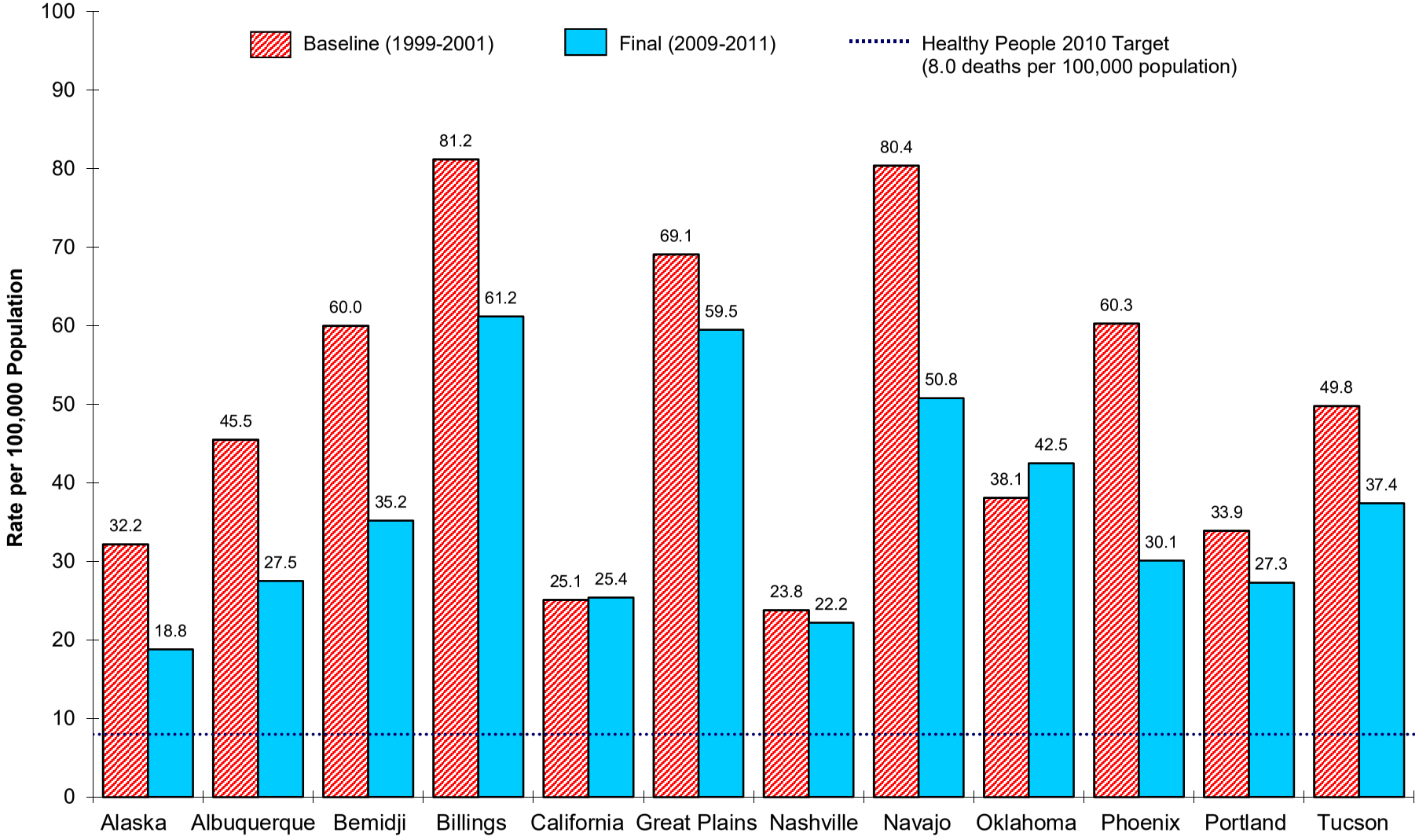
IHS Area	1999-2001 (Baseline)	2004-2006 (Mid-Decade)	2009-2011 (Final)	2010[2/] Target Goal	% Change Between Baseline and Final Rate
IHS Total	48.0	45.2	35.8	8.0	-25.4%
Alaska	32.2	24.0	18.8	8.0	-41.6%
Albuquerque	45.5	44.0	27.5	8.0	-39.6%
Bemidji	60.0	47.2	35.2	8.0	-41.3%
Billings	81.2	81.8	61.2	8.0	-24.6%
California	25.1	21.9	25.4	8.0	1.2%
Great Plains	69.1	76.9	59.5	8.0	-13.9%
Nashville	23.8	31.8	22.2	8.0	-6.7%
Navajo	80.4	72.0	50.8	8.0	-36.8%
Oklahoma	38.1	46.4	42.5	8.0	11.5%
Phoenix	60.3	43.0	30.1	8.0	-50.1%
Portland	33.9	35.7	27.3	8.0	-19.5%
Tucson	49.8	47.3	37.4	8.0	-24.9%
U.S. Mid-Year Rates	*(2000)*	*(2005)*	*(2010)*		
All Races	15.4	15.2	11.3	8.0	-26.6%
White	15.6	15.6	11.7	8.0	-25.0%

[1/] Includes ICD-10 codes V02-V04, V09.0, V09.2, V12-V14, V19.0-V19.2, V19.4-V19.6, V20-V79, V80.3-V80.5, V81.0-V81.1, V82.0-V82.1, V83-V86, V87.0-V87.8, V88.0-V88.8, V89.0, and V89.2.

[2/] Healthy People 2010 Objective No. 15-15. Reduce deaths caused by motor vehicle crashes. For all populations, the HP 2010 target rate is 8.0 deaths per 100,000 population.

NOTE: Rates are age-adjusted to the year 2000 standard population and are adjusted to compensate for misreporting of AI/AN race on state death certificates.

Figure 17
Age-Adjusted Motor Vehicle Crash Death Rates by IHS Area and Time Period



Notes: Rates are age-adjusted to the year 2000 standard population, and are adjusted to compensate for misreporting of AI/AN race on state death certificates. The 2010 target is based on a single goal of 8.0 crash deaths/100,000 population, which was established for all demographic groups.

U.S. Department of Health and Human Services, Indian Health Service. *Tracking Regional Indian Health Status Objectives*, April, 2018.