



Cancer Surveillance in American Indian and Alaska Natives: What the Data Are Telling Us and Future Directions

Looking back and looking ahead: Collaborating to Advance Cancer Control in American Indian/Alaska Native Communities

April 26-28, 2016

Traverse City, Michigan

David Espey – CDC/NCCDPHP

Key Topics

- **Status of cancer surveillance for AI/AN populations**
- **Regional patterns of cancer: what's next?**
- **Liver Cancer: need and opportunities for prevention**
- **The case for primary prevention**

Cancer Incidence

National Center for Chronic Disease Prevention and Health Promotion
Division of Cancer Prevention and Control



(Cancer) Mortality

National Longitudinal Mortality Study



SAFER • HEALTHIER • PEOPLE™

Vital and Health Statistics

Series 2, Number 148

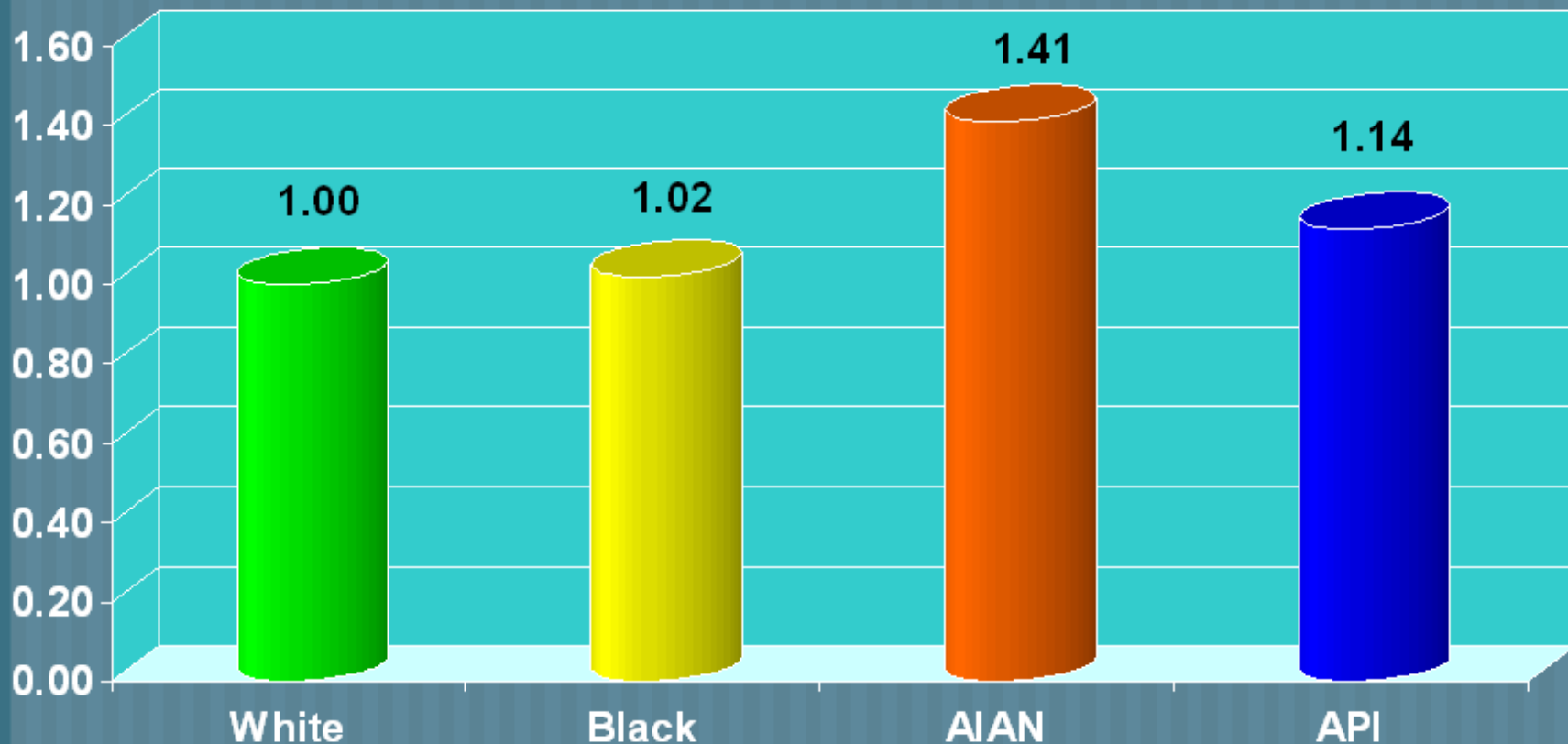
October 2008

The Validity of Race and Hispanic Origin Reporting on Death Certificates in the United States



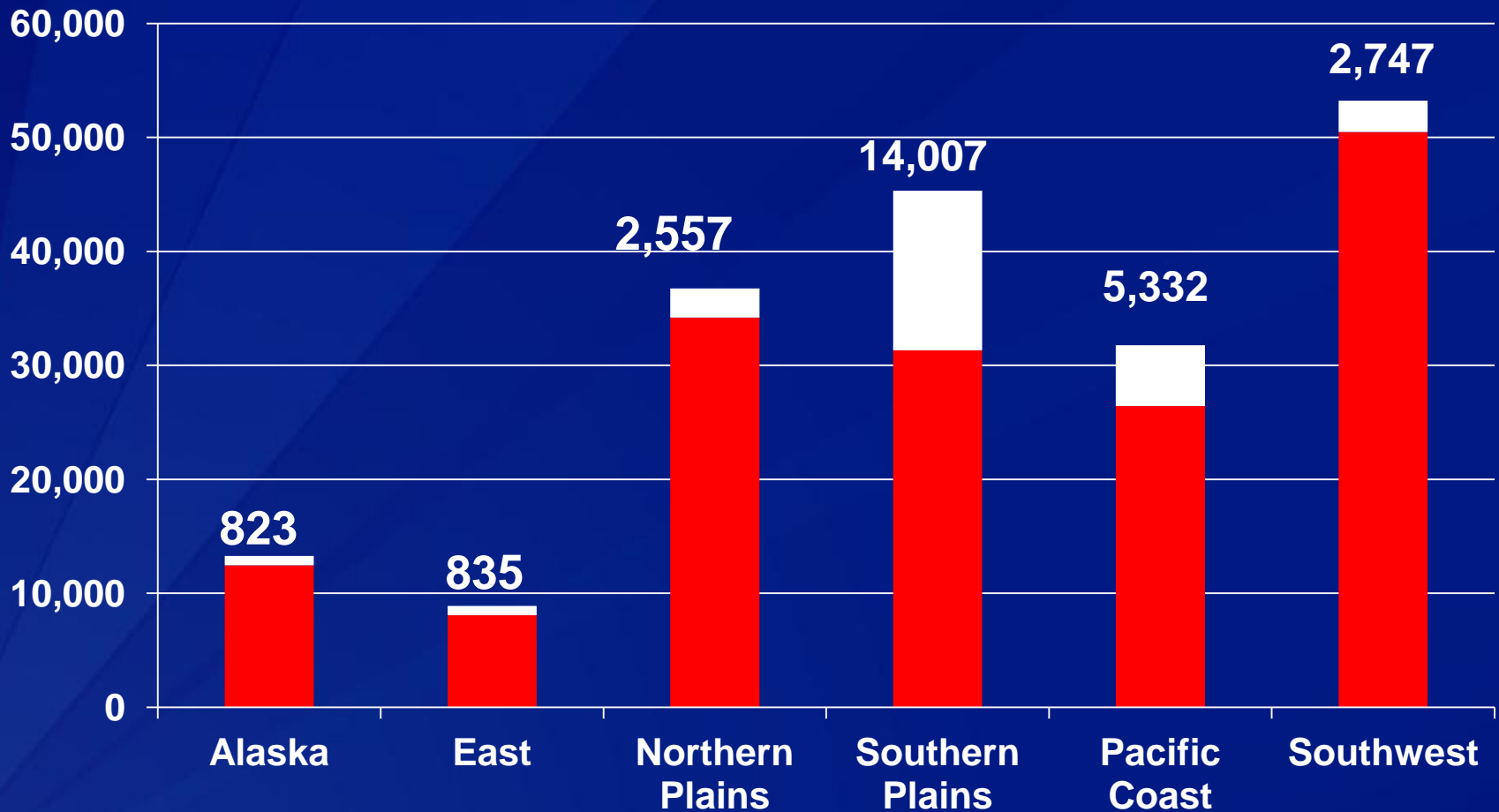
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Center for Health Statistics

Ratios for Race Categories



Number of individuals identified by IHS linkage with NDI, CHSDA counties, 1990-2008

■ Pre-link ■ Post-link



SUPPLEMENT TO

American Journal of
**PUBLIC
HEALTH**

A PUBLICATION OF
AMERICAN PUBLIC HEALTH ASSOCIATION

Geographic Variation in Colorectal Cancer Incidence and Mortality | Perspectives on Mortality Data From the Indian Health Service | Racial Misclassification of American Indians



and Alaska Natives | **AMERICAN INDIAN AND ALASKA NATIVE MORTALITY** | Disparities in Cancer Mortality and Incidence Among AI/AN People | American Indian Health Policy | The Alcohol-Attributable Death Rate Disparity Between American Indians and Alaska Natives and Non-Hispanic Whites | What Are the Causes of Suicide Among Young Alaska Native Men?



Top 10 Leading Causes of Death for AI/AN men compared with White men: CHSDA, US, 1999-2009

Cause of Death	AI/AN Rank (White)	AI/AN Rate (White)	AI/AN:White RR
All causes	...	1381.8 (948.8)	1.46*
Heart disease	1 (1)	320.9 (262.5)	1.22*
Cancer	2 (2)	248.4 (224.7)	1.11*
Unintentional injury	3 (4)	141.3 (55.6)	2.54*
Diabetes	4 (6)	75.5 (23.6)	3.19*
Chronic liver disease	5 (11)	50.0 (12.9)	3.88*
Suicide	6 (7)	34.7 (23.2)	1.49*
CLRD	7 (3)	61.4 (56.4)	1.09*
Stroke	8 (5)	59.3 (49.6)	1.20*
Homicide	9 (21)	18.5 (3.8)	4.85*
Flu and Pneumonia	10 (8)	42.7 (22.4)	1.90*

* Statistically significant

Espey DK, Jim MA, Cobb N, Bartholomew M, Becker T, Haverkamp D, Plescia M. Leading Causes of Death and All-Cause Mortality in American Indians and Alaska Natives. *Am J Public Health*. 2014;104:S303-S311.

Top 10 Leading Causes of Death for AI/AN women compared with White women: CHSDA, US, 1999-2009

Cause of Death	AI/AN Rank (White)	AI/AN Rate (White)	AI/AN:White RR
All causes	...	991.5 (678.6)	1.46*
Cancer	1 (2)	185.8 (159.1)	1.17*
Heart disease	2 (1)	204.8 (167.2)	1.22*
Unintentional injury	3 (6)	65.6 (27.0)	2.43*
Diabetes	4 (8)	69.2 (17.1)	4.04*
Stroke	5 (3)	58.9 (49.3)	1.20*
Chronic liver disease	6 (12)	34.6 (6.4)	5.36*
CLRD	7 (4)	45.4 (43.9)	1.03
Flu and pneumonia	8 (7)	31.7 (17.2)	1.84*
Kidney disease	9 (9)	25.0 (9.2)	2.72*
Septicemia	10 (10)	18.6 (7.8)	2.38*

* Statistically significant

Espey DK, Jim MA, Cobb N, Bartholomew M, Becker T, Haverkamp D, Plescia M. Leading Causes of Death and All-Cause Mortality in American Indians and Alaska Natives. *Am J Public Health*. 2014;104:S303-S311.

Top 10 causes of cancer death for AI/AN men compared with White men: CHSDA, US, 1999-2009

Cause of Cancer Death	AI/AN Rank (White)	AI/AN Rate (White)	AI/AN:White RR
All malignant cancers	...	248.4 (224.7)	1.11*
Lung	1 (1)	67.5 (67.0)	1.01
Colorectal	2 (3)	26.0 (20.6)	1.26*
Prostate	3 (2)	27.6 (25.2)	1.09*
Liver	4 (8)	13.4 (6.3)	2.12*
Kidney	5 (10)	11.3 (5.9)	1.92*
Pancreas	6 (4)	11.8 (12.2)	0.96
Stomach	7 (14)	10.8 (4.3)	2.49*
Esophagus	8 (6)	8.6 (8.1)	1.06
NHL	9 (5)	7.9 (9.4)	0.82*
Brain	10 (9)	3.9 (6.1)	0.63*

* Statistically significant

White MC, Espey DK, Swan J, Wiggins CL, Ehemann C, Kaur JS. Disparities in Cancer Mortality and Incidence Among American Indians and Alaska Natives in the United States. *Am J Public Health*. 2014;104:S377-S387.

Top 10 causes of cancer death for AI/AN women compared with White women: CHSDA, US, 1999-2009

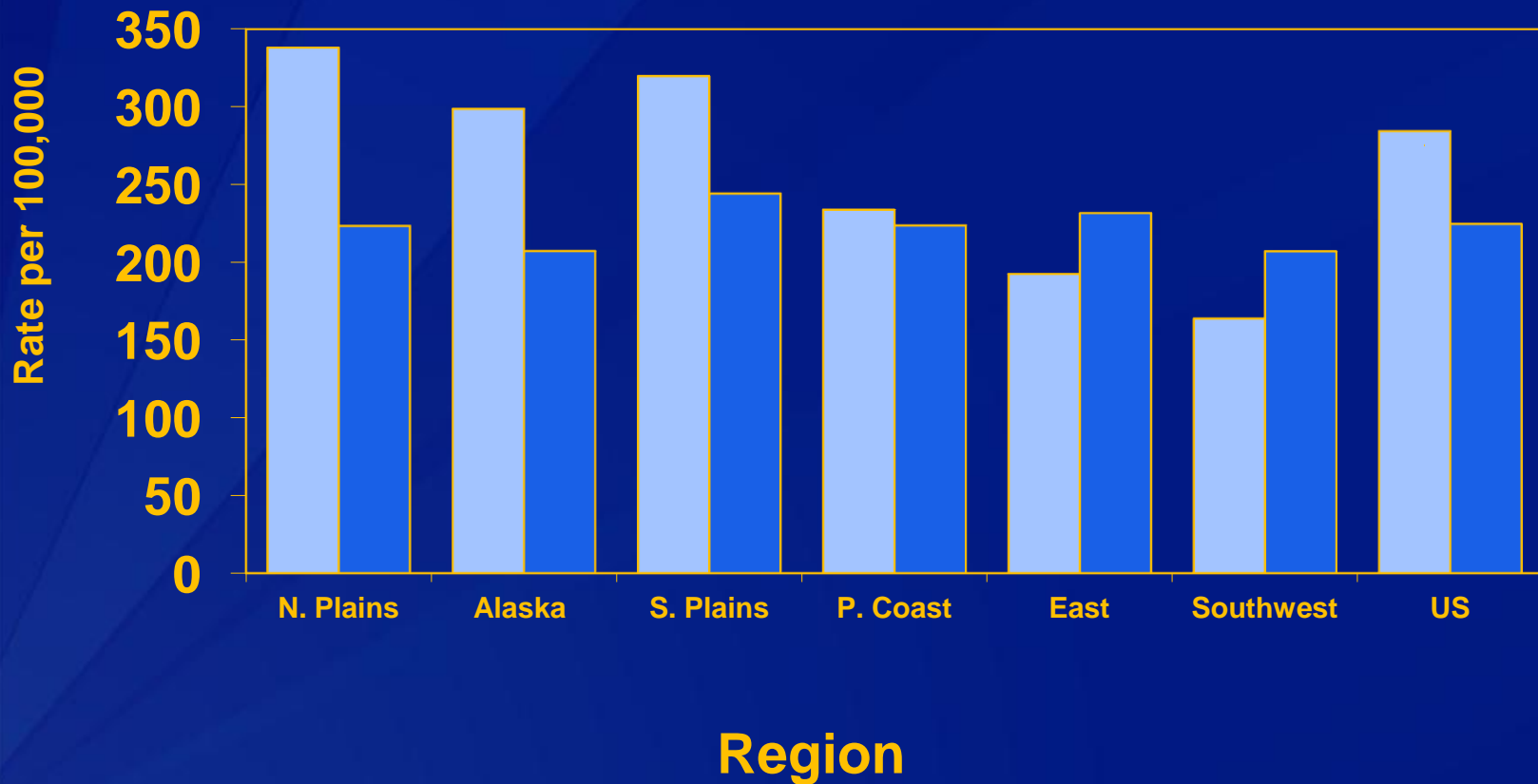
Cause of Cancer Death	AI/AN Rank (White)	AI/AN Rate (White)	AI/AN:White RR
All malignant cancers	...	185.8 (159.1)	1.17*
Lung	1 (1)	46.2 (43.4)	1.06*
Breast	2 (2)	22.2 (24.1)	0.92*
Colorectal	3 (3)	19.3 (14.7)	1.31*
Pancreas	4 (4)	10.1 (9.3)	1.08
Ovary	5 (5)	9.0 (9.2)	0.98
Liver	6 (10)	7.7 (2.7)	2.84*
NHL	7 (6)	6.4 (6.0)	1.07
Stomach	8 (14)	5.9 (2.1)	2.77*
Kidney	9 (12)	5.4 (2.7)	2.02*
Cervix	10 (19)	4.2 (2.0)	2.11*

* Statistically significant

White MC, Espey DK, Swan J, Wiggins CL, Ehemann C, Kaur JS. Disparities in Cancer Mortality and Incidence Among American Indians and Alaska Natives in the United States. *Am J Public Health*. 2014;104:S377-S387.

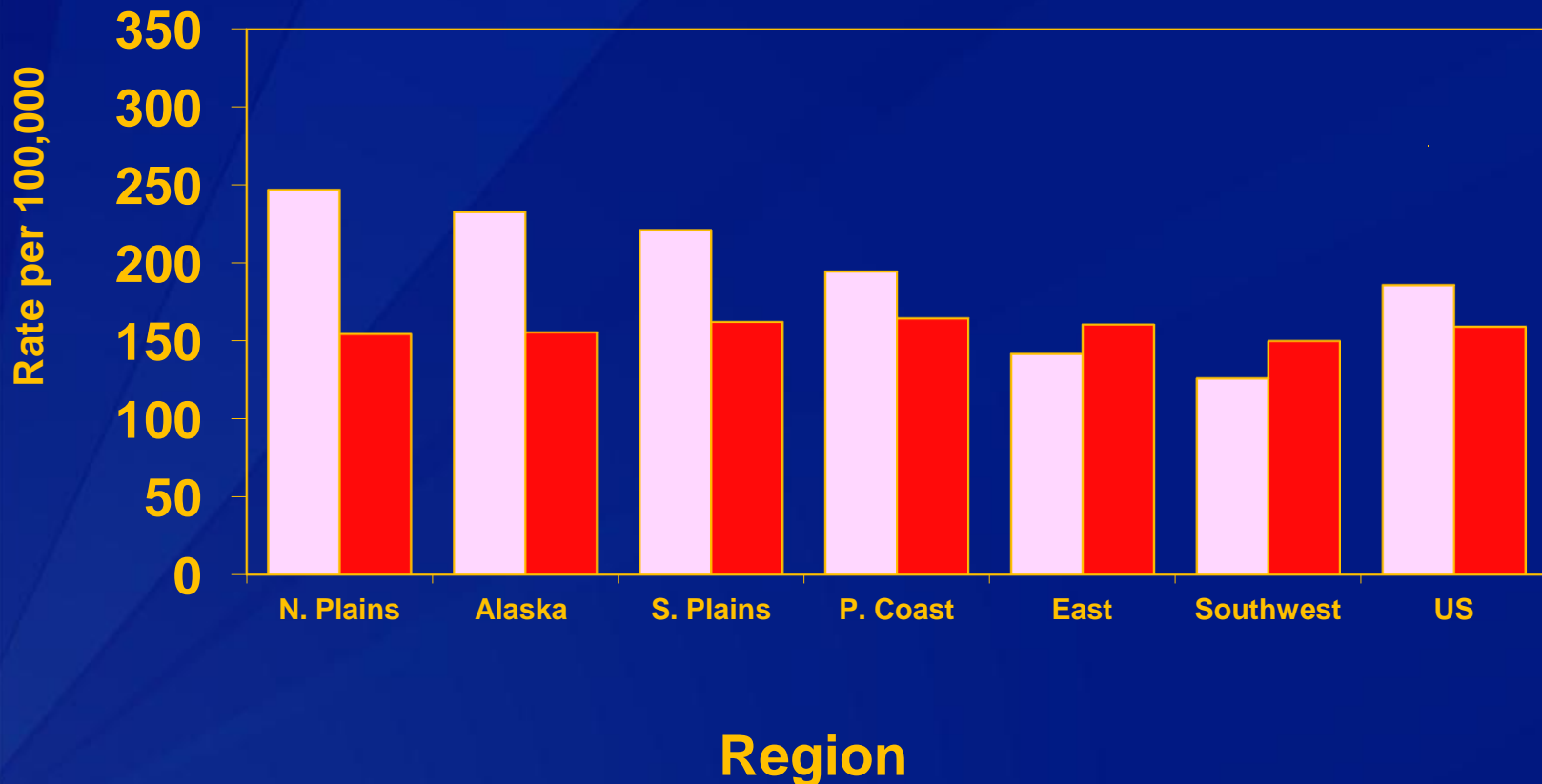
AI/AN and NHW death rates, all malignant cancers combined, by region, males, 1999-2009

■ AI/AN ■ NHW

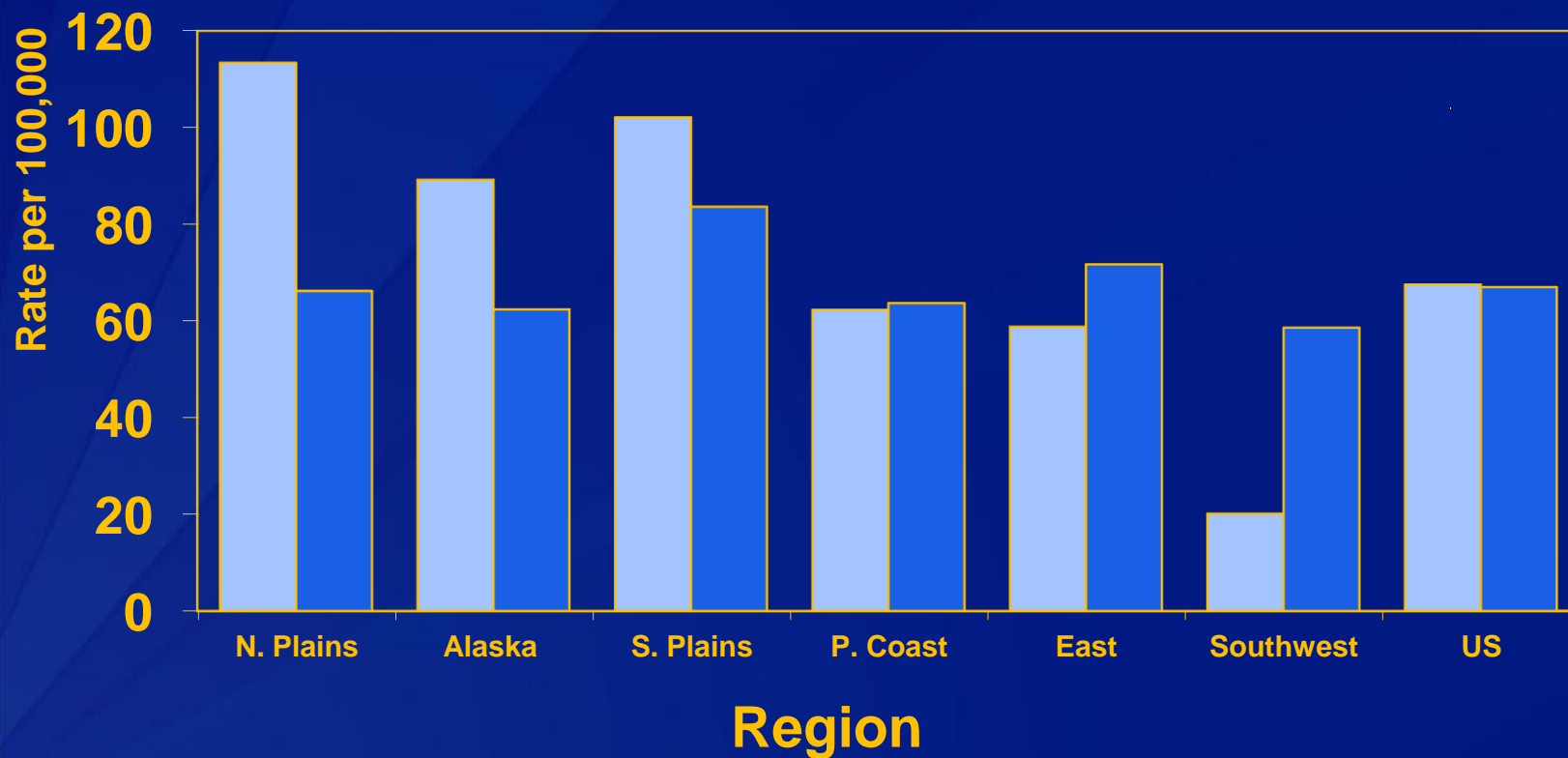


AI/AN and NHW death rates, all malignant cancers combined, by region, females, 1999-2009

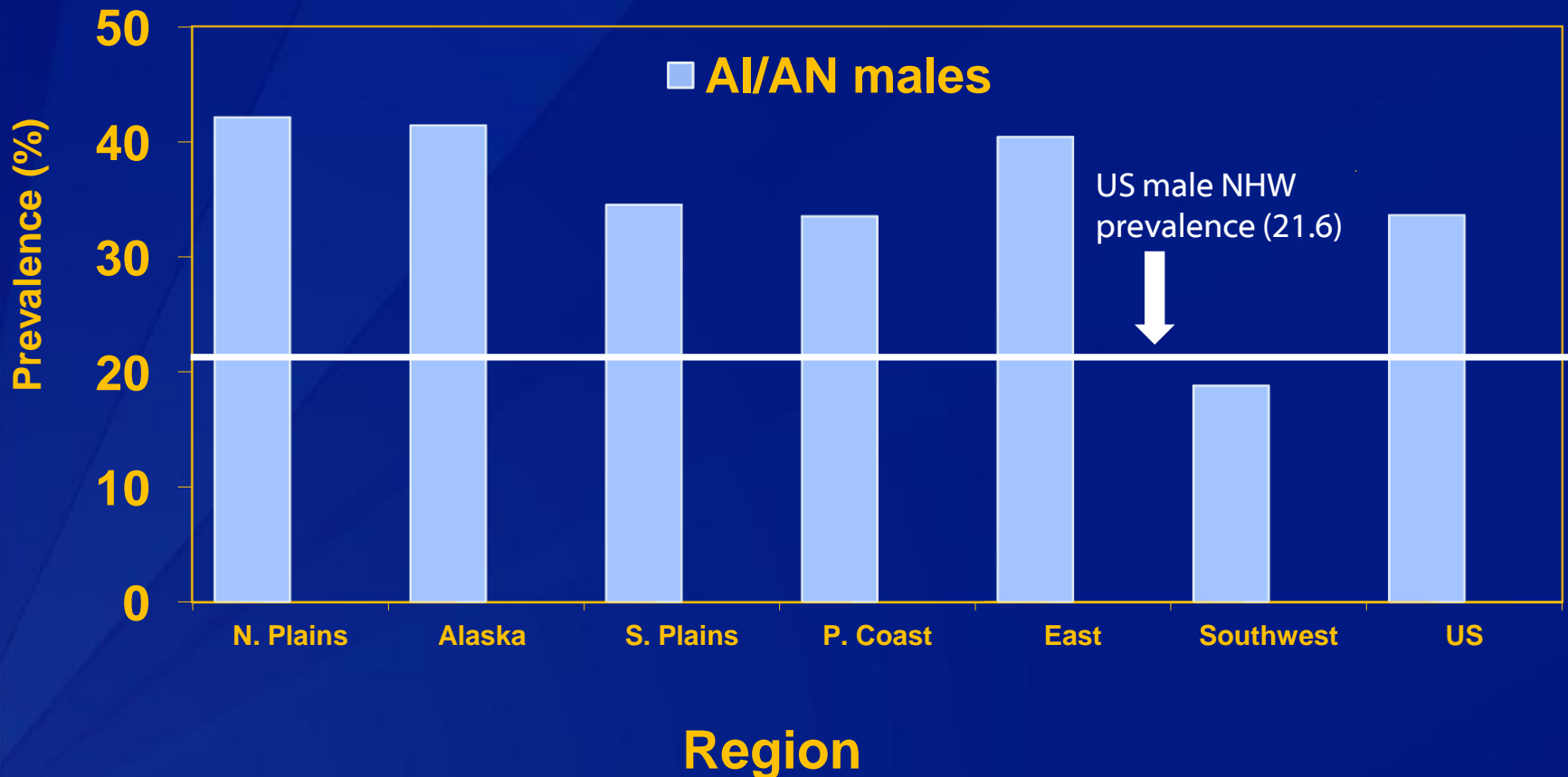
AI/AN NHW



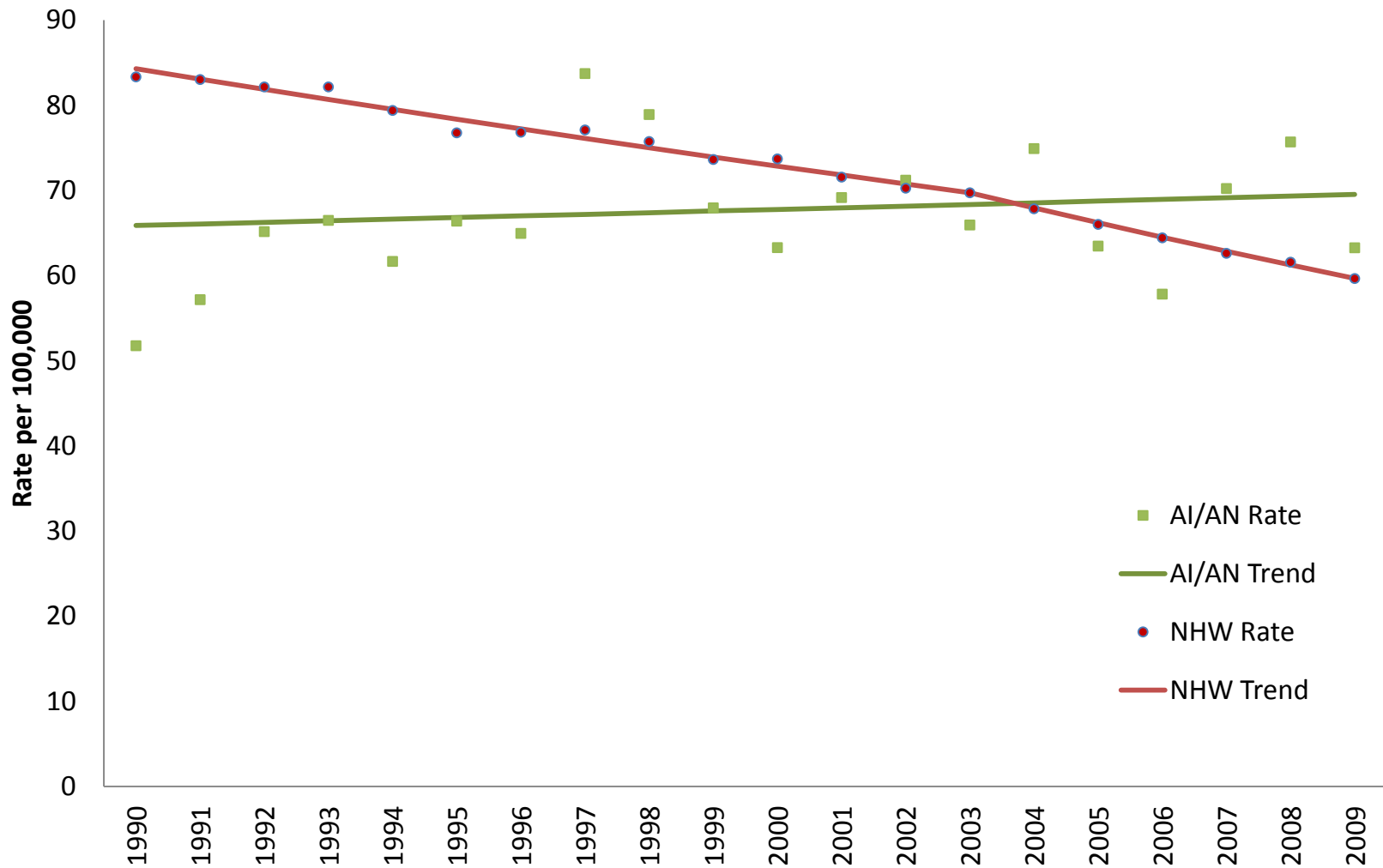
AI/AN and NHW death rates, lung and bronchus cancer by region, males, 1999-2009



AI/AN and NHW estimated prevalence of **current smokers**,
Behavioral Risk Factor Surveillance System,
Contract Health Service Delivery Areas, males,
2000-2010

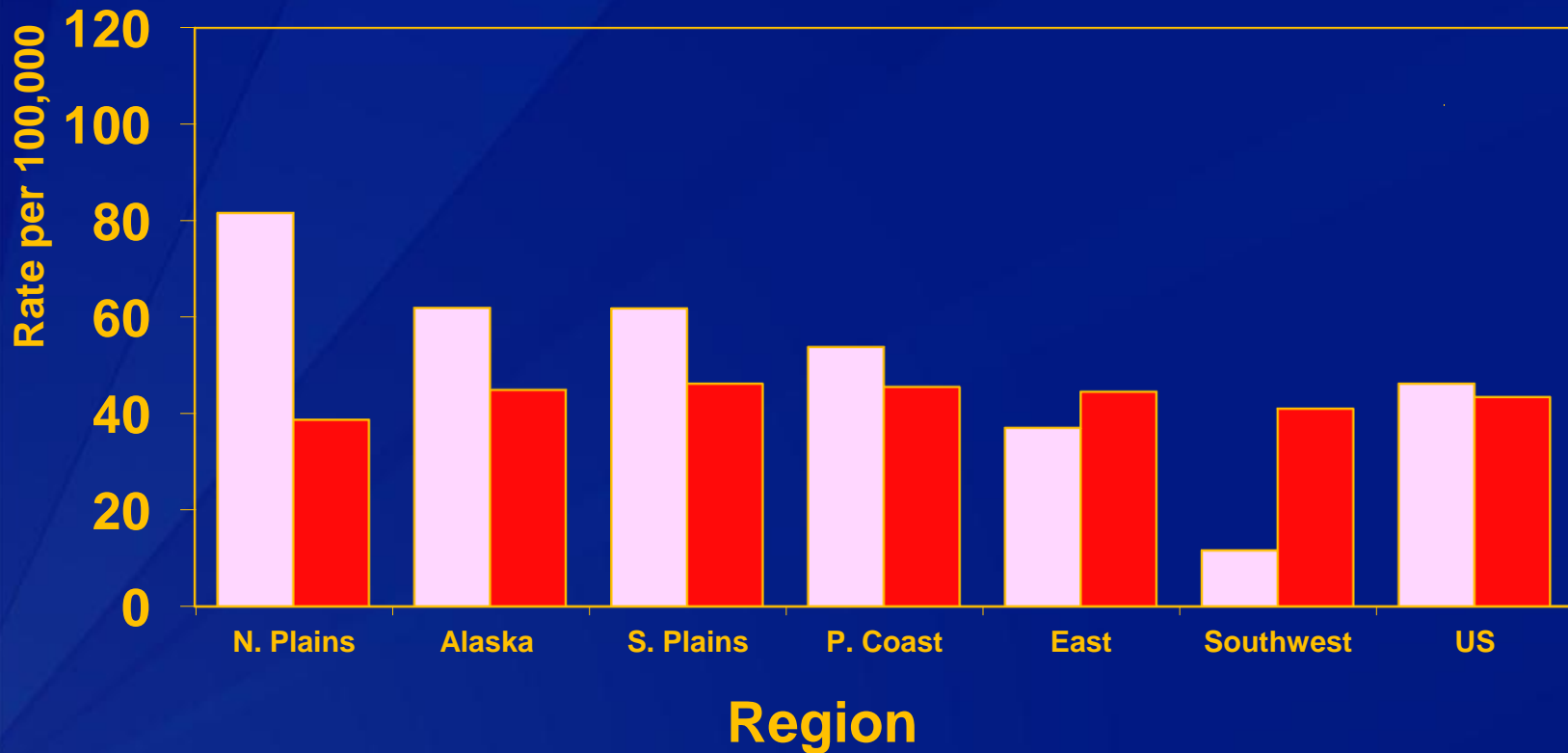


Age-adjusted Lung Cancer Death Rates and Joinpoint Trend Lines in CHSDA Counties, 1990-2009, Males

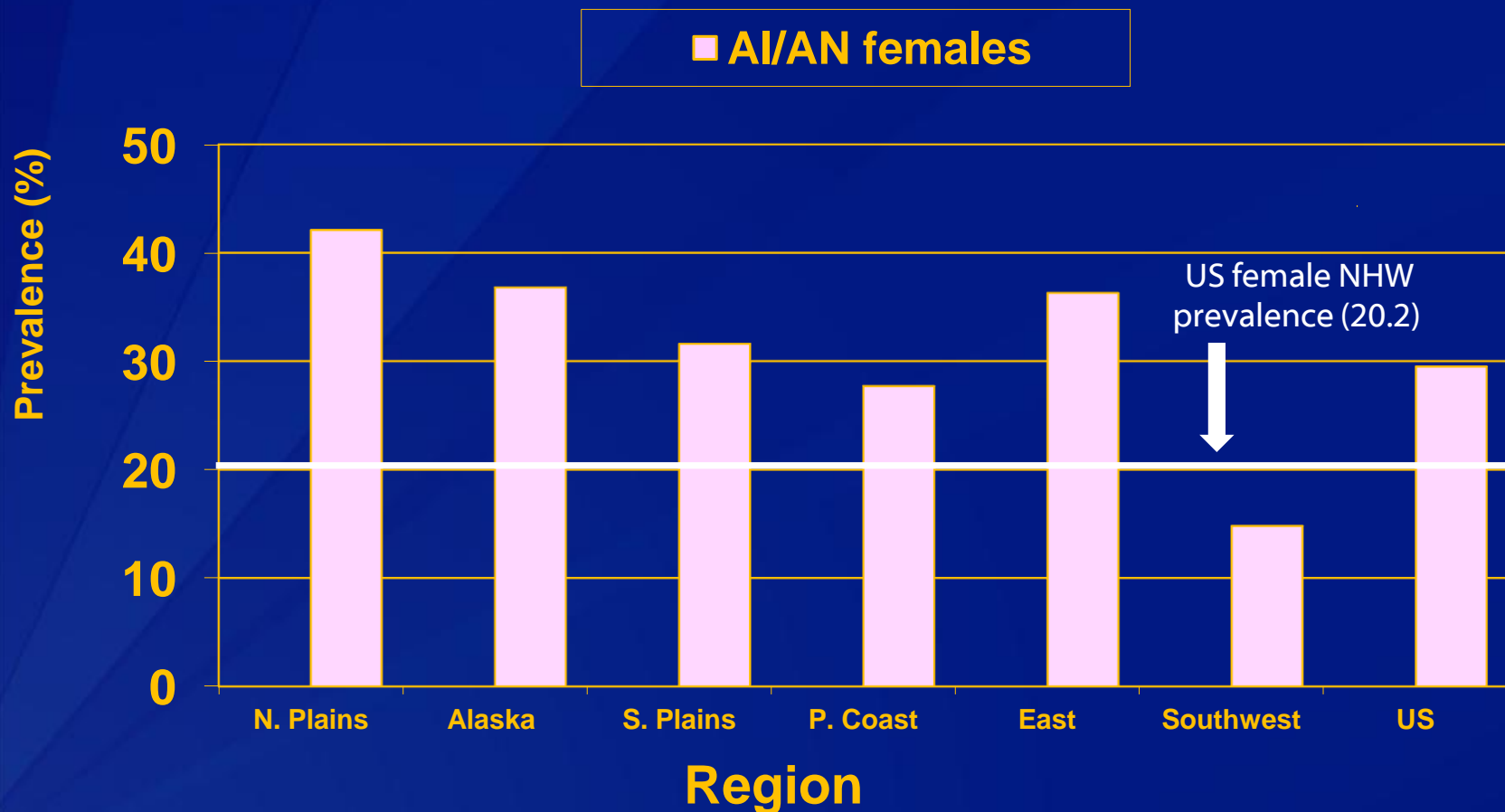


AI/AN and NHW death rates, lung and bronchus cancer by region, females, 1999-2009

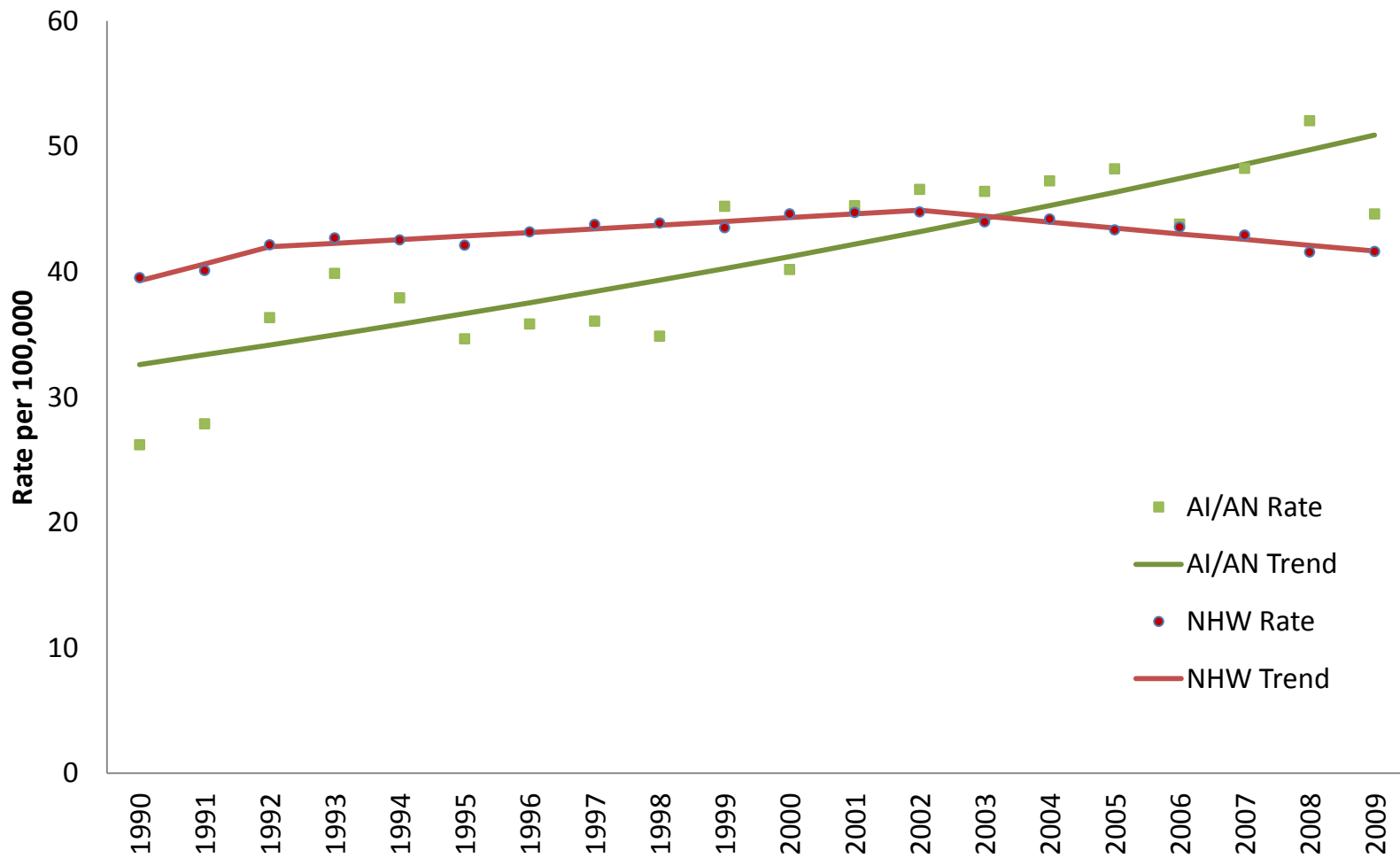
AI/AN NHW



AI/AN and NHW estimated prevalence of **current smokers**,
Behavioral Risk Factor Surveillance System,
Contract Health Service Delivery Areas, females,
2000-2010

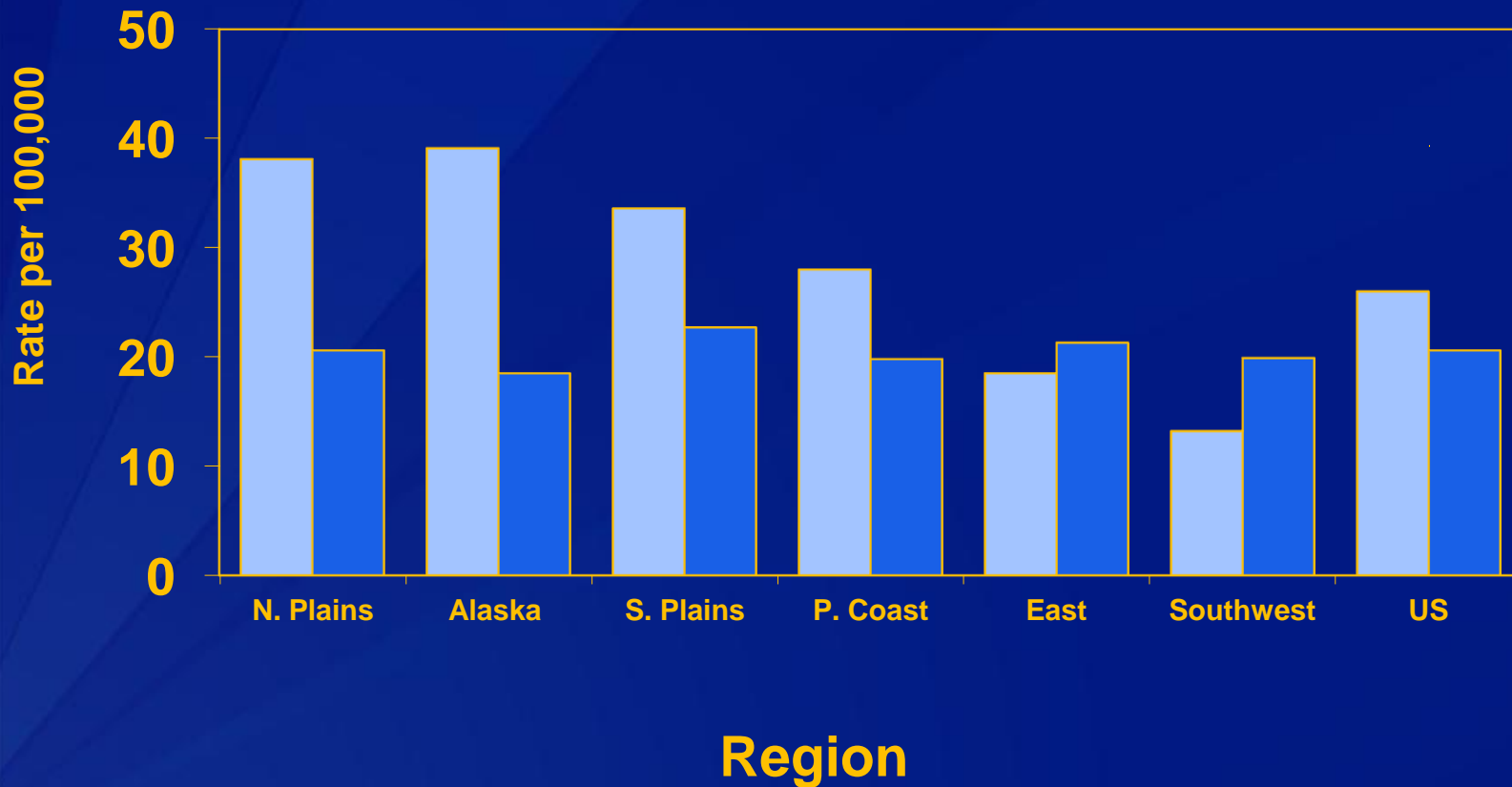


Annual age-adjusted lung cancer mortality rates and Joinpoint trend lines in CHSDA counties, 1990-2009, Females

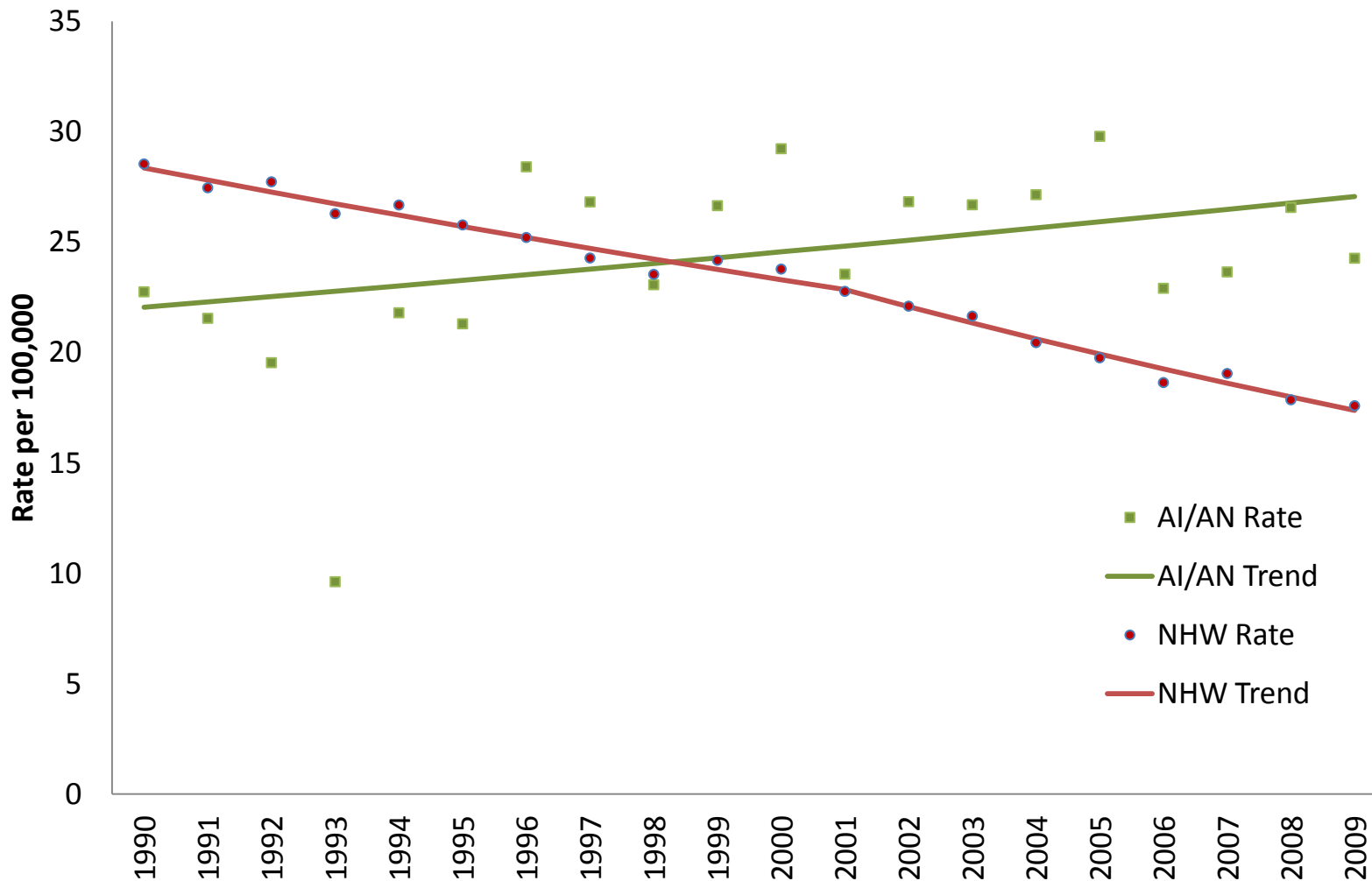


AI/AN and NHW death rates, colorectal cancer, by region, males, 1999-2009

■ AI/AN ■ NHW

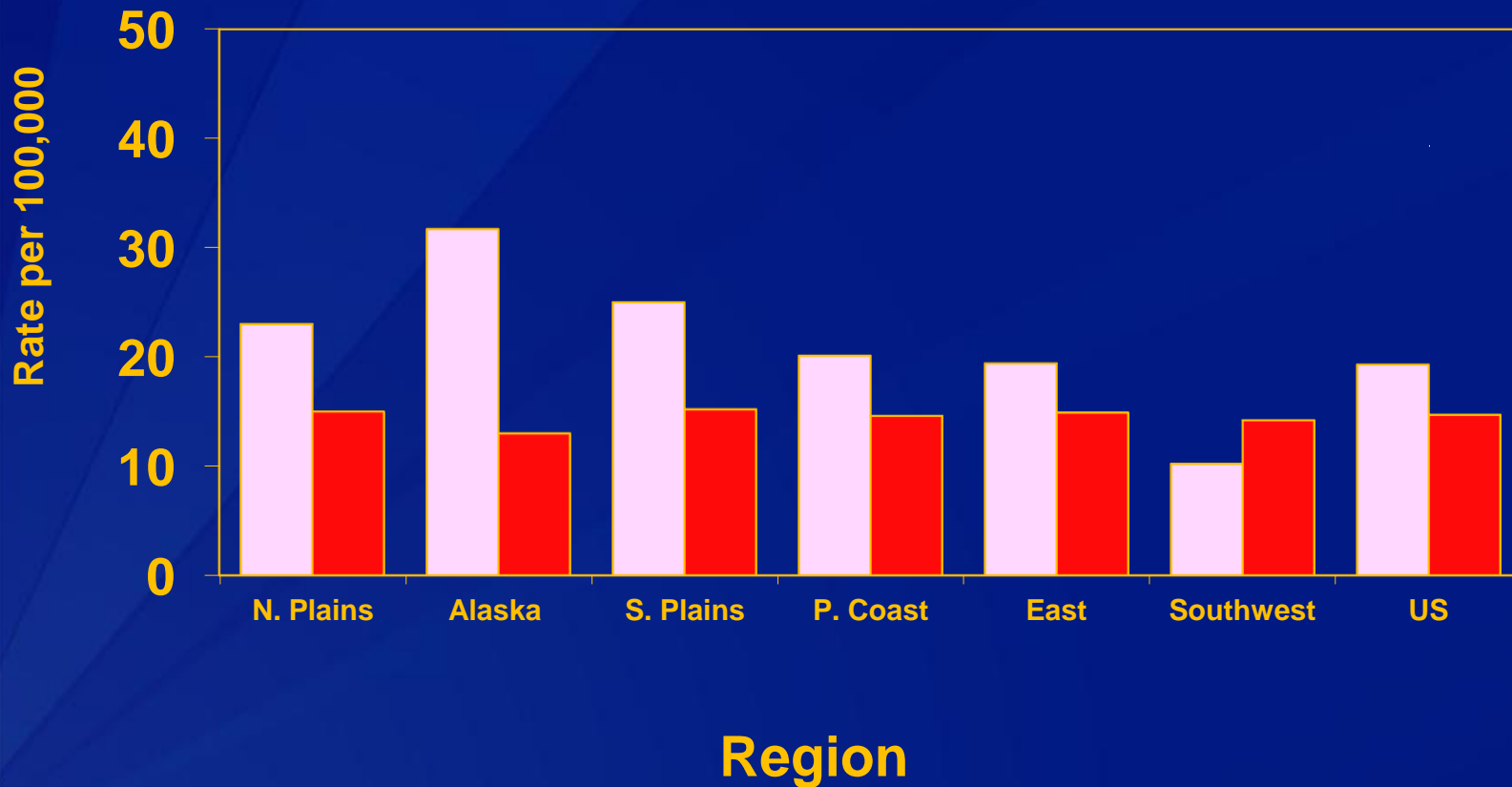


Age-adjusted Colorectal Cancer Death Rates and Joinpoint Trend Lines in CHSDA Counties, 1990-2009, Males

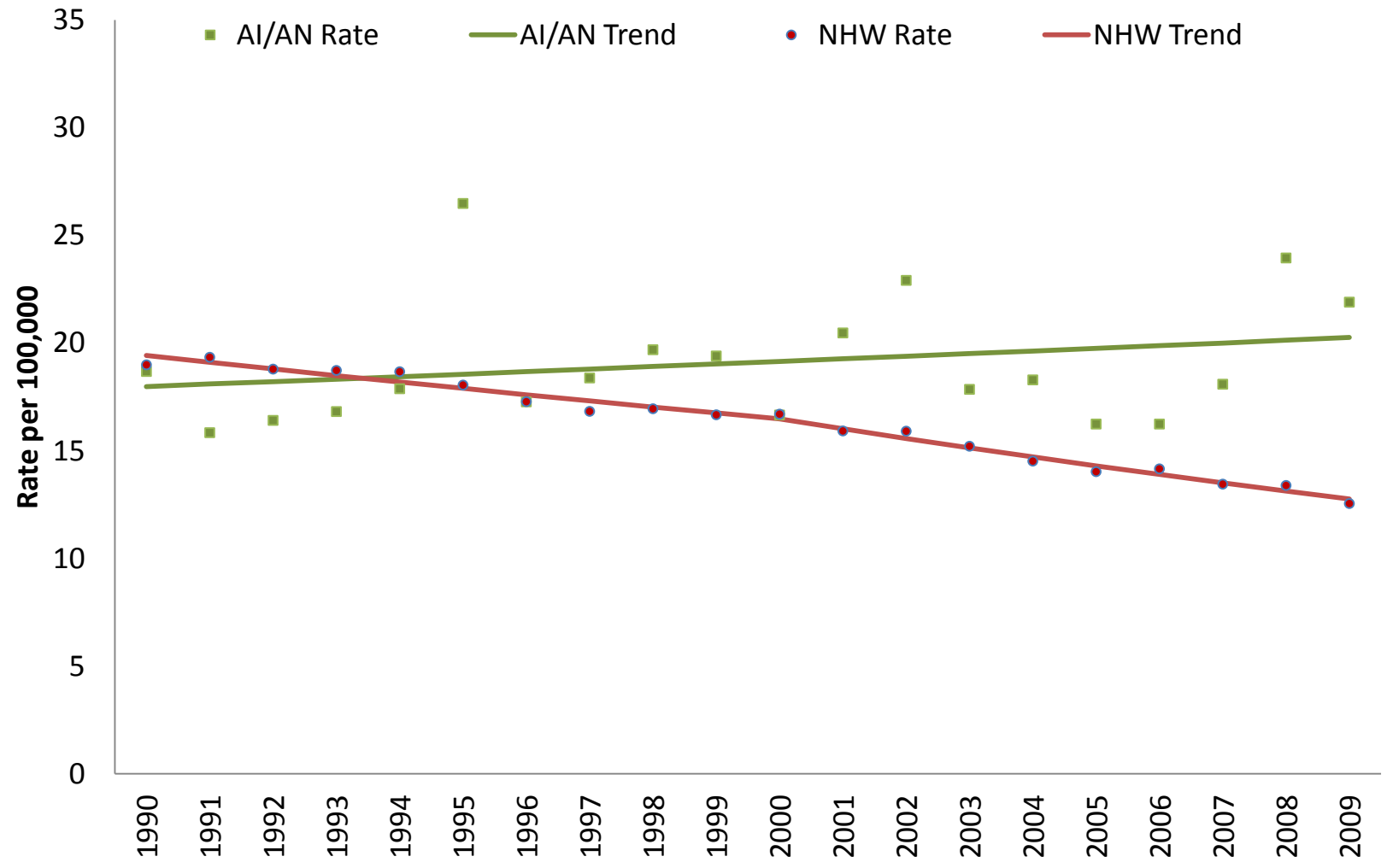


AI/AN and NHW death rates, colorectal cancer, by region, females, 1999-2009

AI/AN NHW

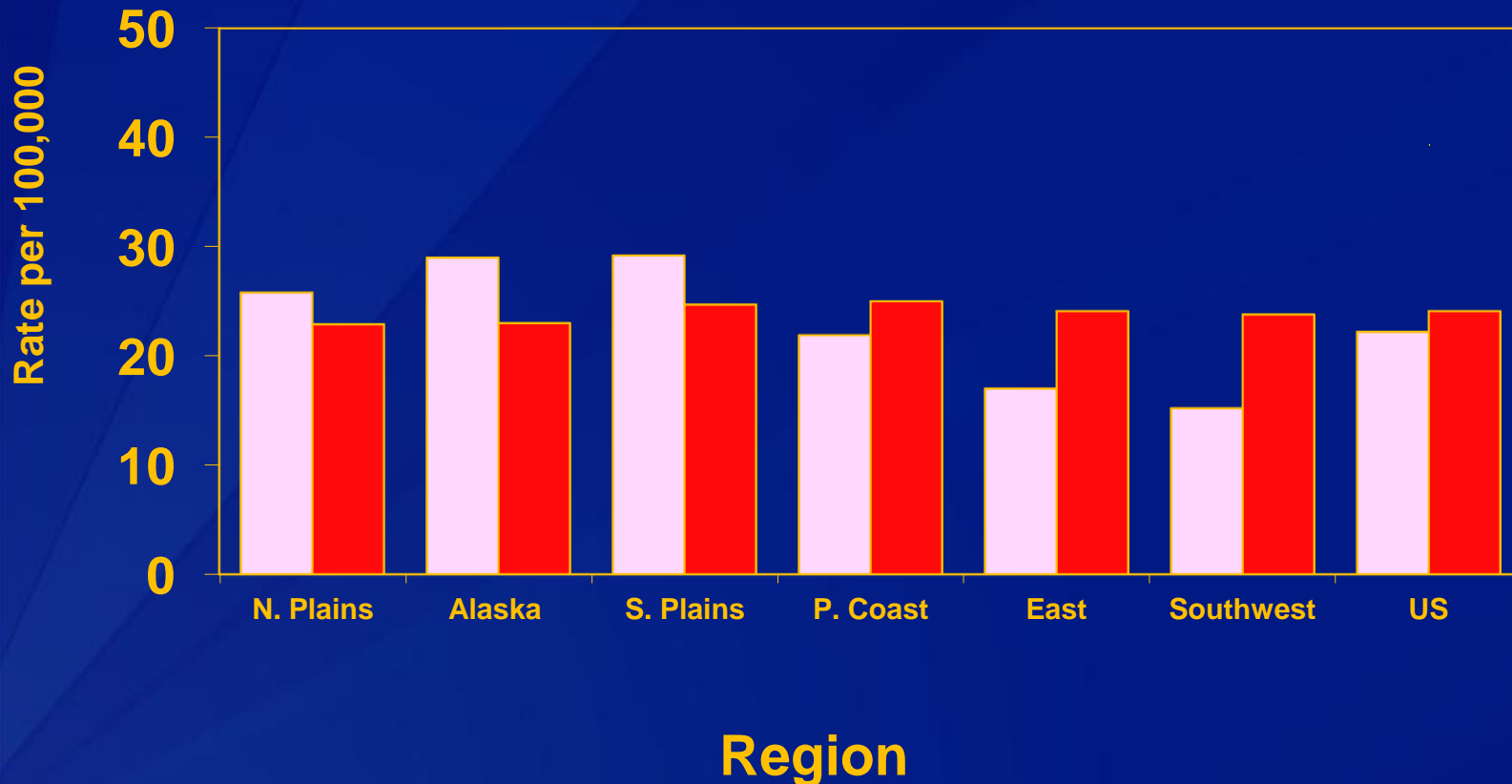


Age-adjusted Colorectal Cancer Death Rates and Joinpoint Trend Lines in CHSDA Counties, 1990-2009, Females

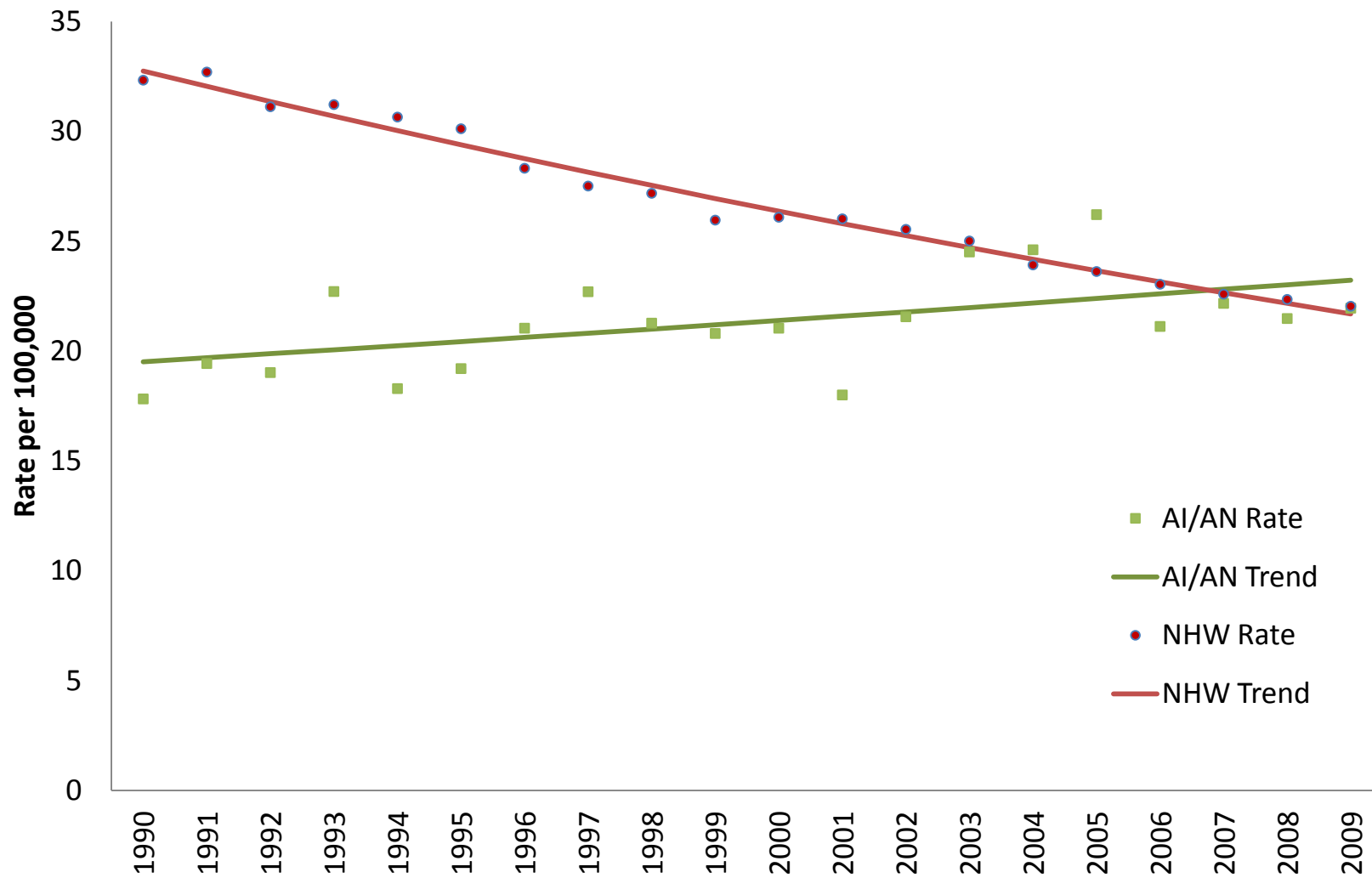


AI/AN and NHW death rates, breast cancer, by region, females, 1999-2009

AI/AN NHW

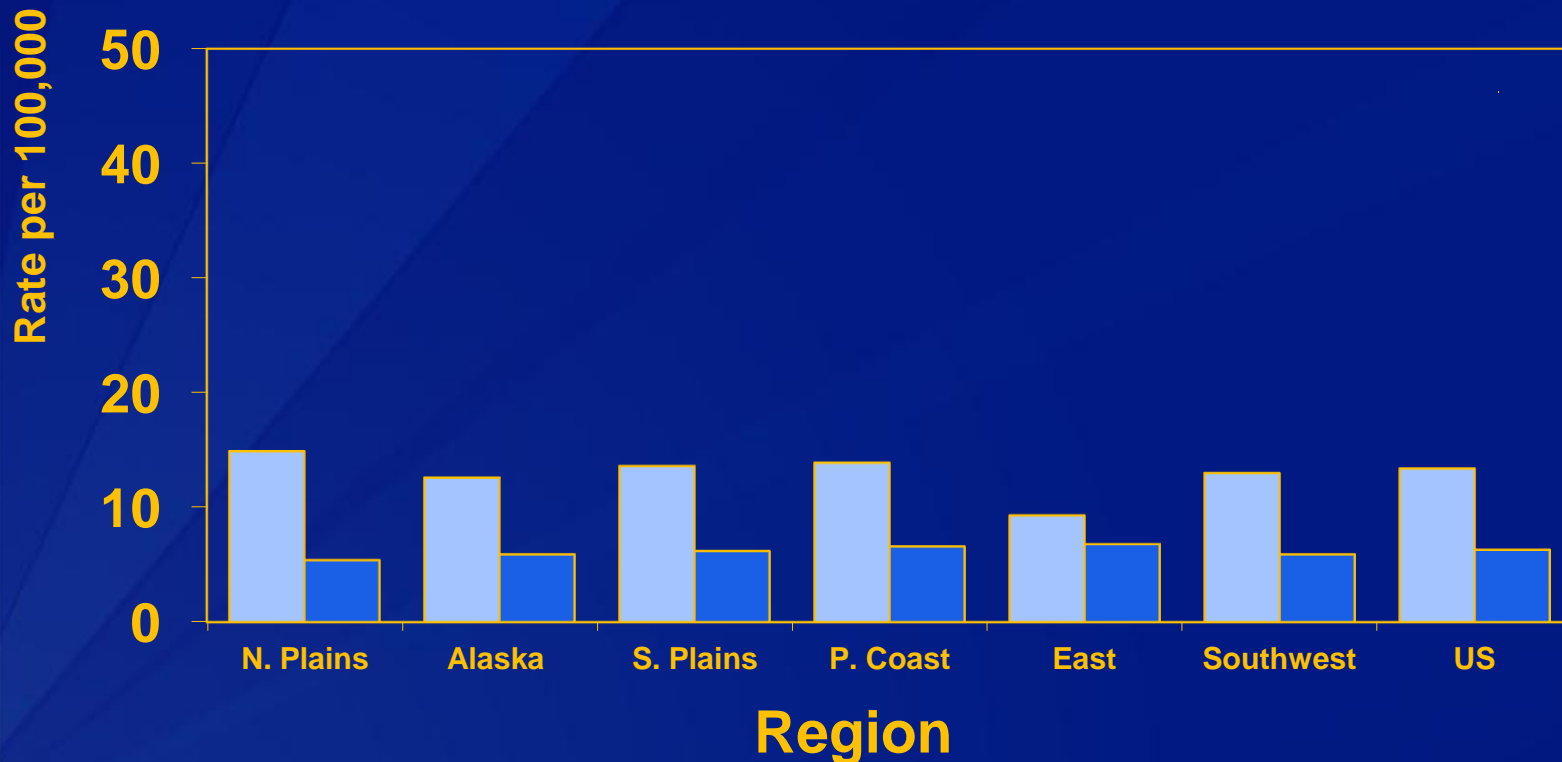


Age-adjusted Breast Cancer Death Rates and Joinpoint Trend Lines in CHSDA Counties, 1990-2009, Females

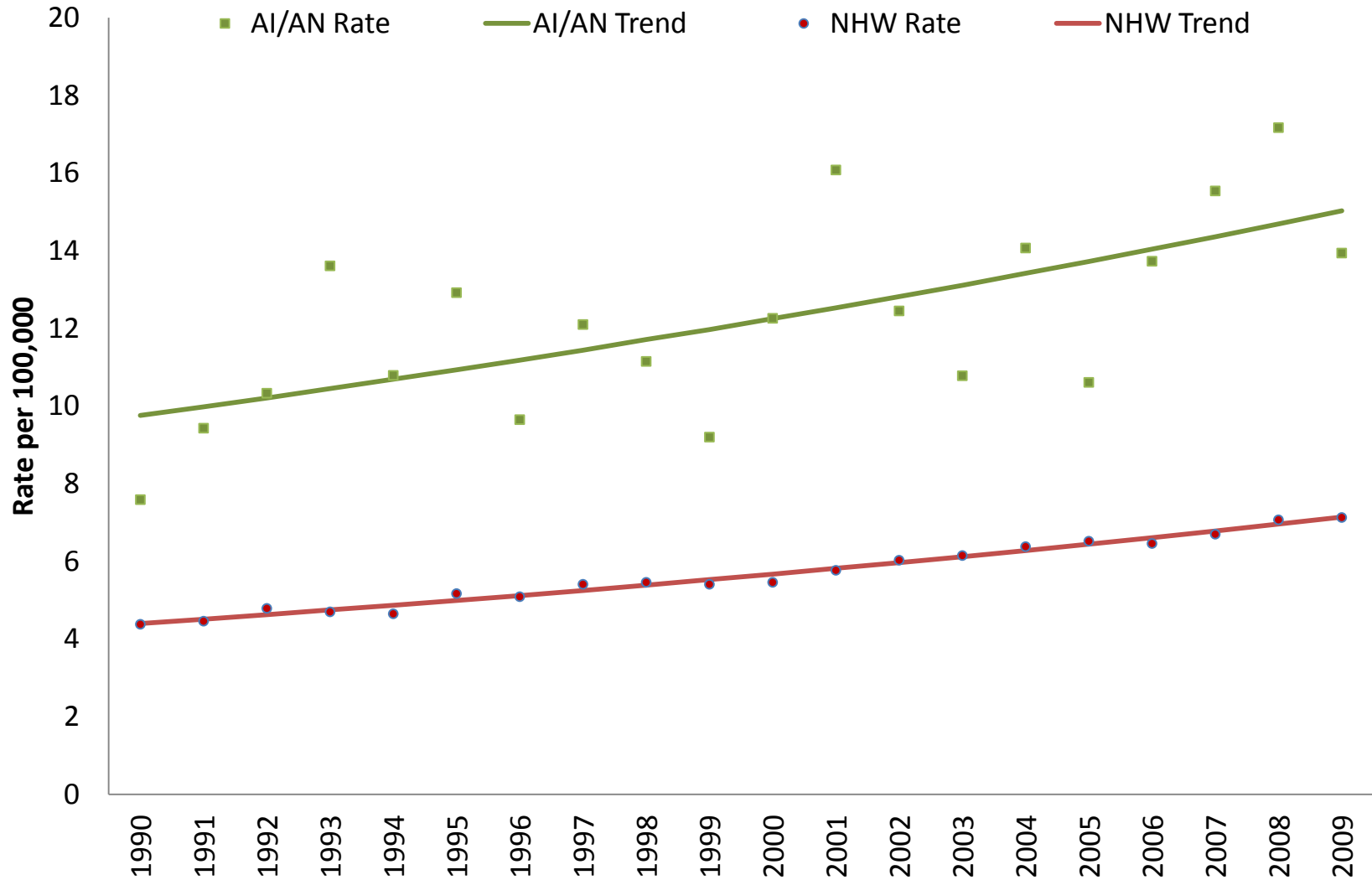


AI/AN and NHW death rates,
liver and intrahepatic bile duct cancer,
by region, males,
1999-2009

■ AI/AN ■ NHW

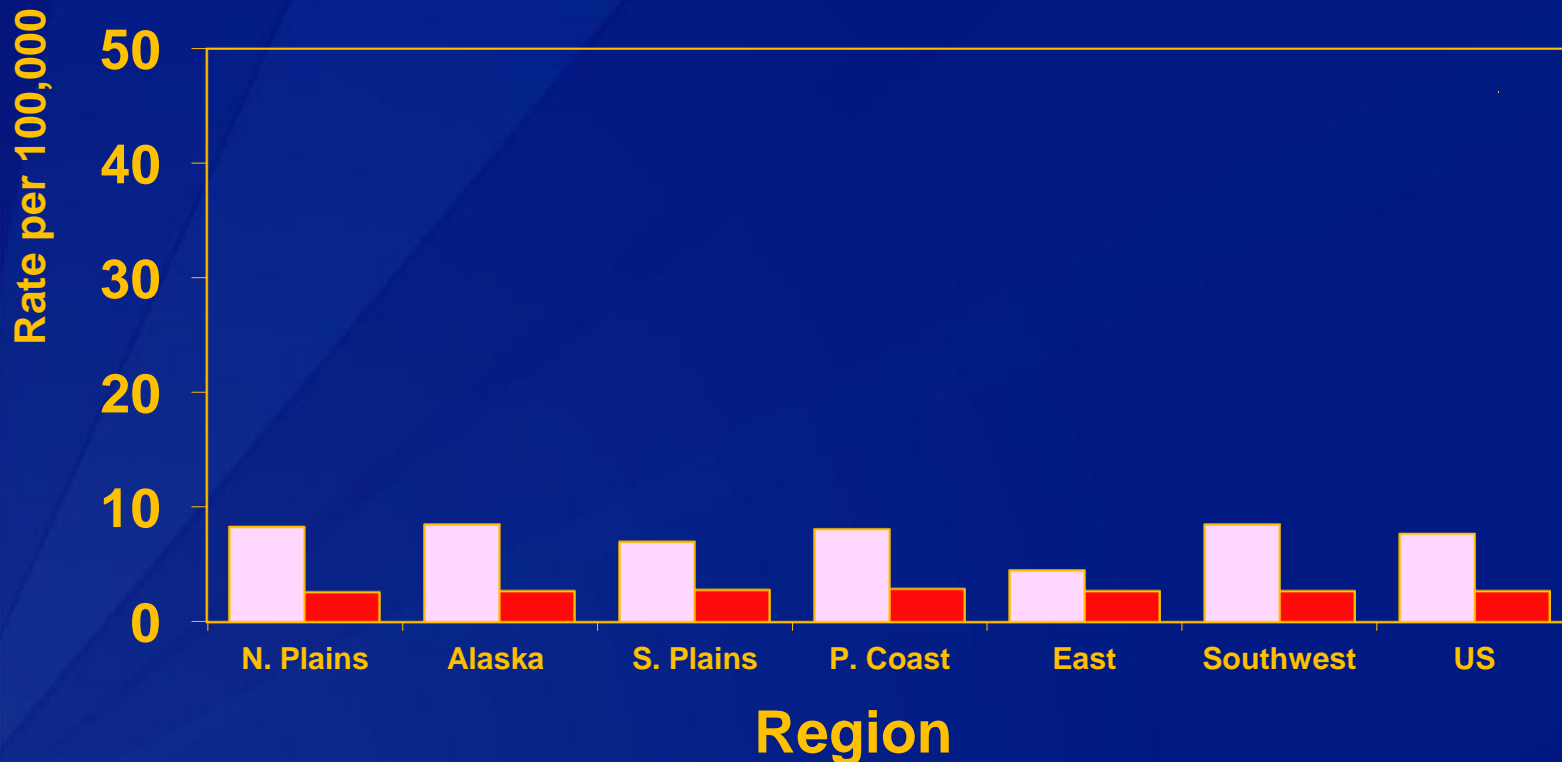


Annual age-adjusted liver and intrahepatic bile duct cancer mortality rates and Joinpoint trend lines in CHSDA counties, 1990-2009, Males

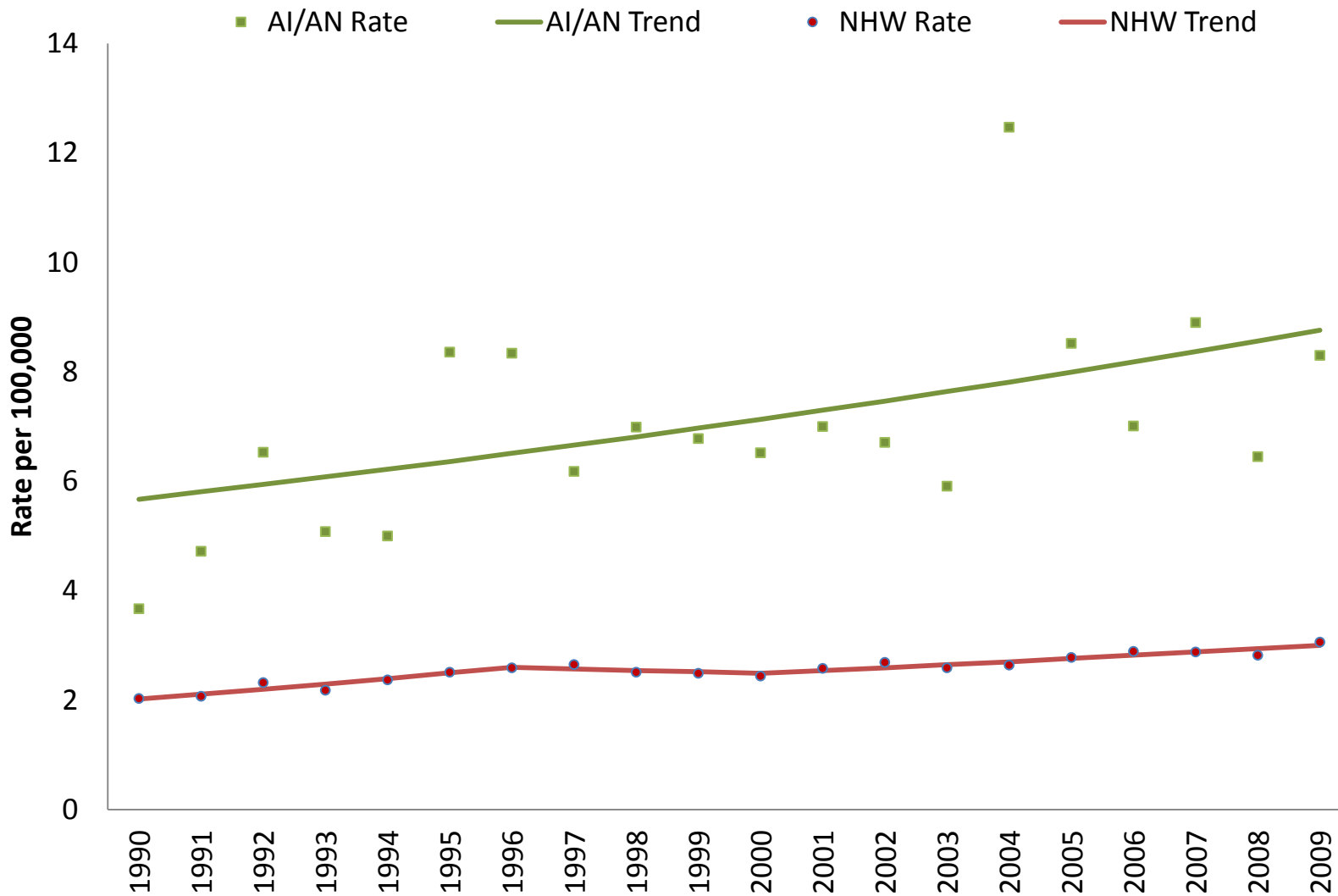


AI/AN and NHW death rates,
liver and intrahepatic bile duct cancer,
by region, females,
1999-2009

■ AI/AN ■ NHW



Annual age-adjusted liver and intrahepatic bile duct cancer mortality rates and Joinpoint trend lines in CHSDA counties, 1990-2009, Females



Annual Report to the Nation on the Status of Cancer, 1975-2012, Featuring the Increasing Incidence of Liver Cancer

A. Blythe Ryerson, PhD, MPH¹; Christie R. Ehemann, PhD, MSHP²; Sean F. Altekruse, DVM, MPH, PhD²; John W. Ward, MD²; Ahmedin Jemal, DVM, PhD³; Reecinda L. Sherman, MPH, PhD, CTR²; S. Jane Henley, MSPH¹; Deborah Holtzman, PhD²; Andrew Lake, BS²; Anne-Michelle Noone, MS²; Robert N. Anderson, PhD²; Jiermin Ma, PhD, MHS⁴; Kathleen N. Ly, MPH²; Kathleen A. Cronin, PhD, MPH²; Lynne Penberthy, MD, MPH²; and Betsy A. Kohler, MPH⁵

BACKGROUND: Annual updates on cancer occurrence and trends in the United States are provided through an ongoing collaboration among the American Cancer Society (ACS), the Centers for Disease Control and Prevention (CDC), the National Cancer Institute (NCI), and the North American Association of Central Cancer Registries (NAACCR). This annual report highlights the increasing burden of liver and intrahepatic bile duct (liver) cancers. **METHODS:** Cancer incidence data were obtained from the CDC, NCI, and NAACCR; data about cancer deaths were obtained from the CDC's National Center for Health Statistics (NCHS). Annual percent changes in incidence and death rates (age-adjusted to the 2000 US Standard Population) for all cancers combined and for the leading cancers among men and women were estimated by joinpoint analysis of long-term trends (incidence for 1992-2012 and mortality for 1975-2012) and short-term trends (2008-2012). In-depth analysis of liver cancer incidence included an age-period-cohort analysis and an incidence-based estimation of person-years of life lost because of the disease. By using NCHS multiple causes of death data, hepatitis C virus (HCV) and liver cancer-associated death rates were examined from 1999 through 2013. **RESULTS:** Among men and women of all major racial and ethnic groups, death rates continued to decline for all cancers combined and for most cancer sites; the overall cancer death rate (for both sexes combined) decreased by 1.5% per year from 2003 to 2012. Overall, incidence rates decreased among men and remained stable among women from 2003 to 2012. Among both men and women, deaths from liver cancer increased at the highest rate of all cancer sites, and liver cancer incidence rates increased sharply, second only to thyroid cancer. Men had more than twice the incidence rate of liver cancer than women, and rates increased with age for both sexes. Among non-Hispanic (NH) white, NH black, and Hispanic men and women, liver cancer incidence rates were higher for persons born after the 1938 to 1947 birth cohort. In contrast, there was a minimal birth cohort effect for NH Asian and Pacific Islanders (APIs). NH black men and Hispanic men had the lowest median age at death (60 and 62 years, respectively) and the highest average person-years of life lost per death (21 and 20 years, respectively) from liver cancer. HCV and liver cancer-associated death rates were highest among decedents who were born during 1945 through 1965. **CONCLUSIONS:** Overall, cancer incidence and mortality declined among men; and, although cancer incidence was stable among women, mortality declined. The burden of liver cancer is growing and is not equally distributed throughout the population. Efforts to vaccinate populations that are vulnerable to hepatitis B virus (HBV) infection and to identify and treat those living with HCV or HBV infection, metabolic conditions, alcoholic liver disease, or other causes of cirrhosis can be effective in reducing the incidence and mortality of liver cancer. *Cancer* 2016;122:3312-37. © 2016 American Cancer Society.

KEYWORDS: cancer, incidence, liver cancer, mortality, National Program of Cancer Registries (NPCR), North American Association of Central Cancer Registries (NAACCR), Surveillance, Epidemiology, and End Results (SEER), survival, trends, viral hepatitis.

INTRODUCTION

This marks the 18th year that the American Cancer Society (ACS), the Centers for Disease Control and Prevention (CDC), the National Cancer Institute (NCI), and the North American Association of Central Cancer Registries

Corresponding author: A. Blythe Ryerson, PhD, MPH, Division of Cancer Prevention and Control, 4770 Buford Highway, NE, F-76, Atlanta, GA 30341-3717; Fax: (770) 488-4759; a.ryerson@cdc.gov

¹Division of Cancer Prevention and Control, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, Georgia; ²Division of Cancer Control and Population Sciences, National Cancer Institute, Bethesda, Maryland; ³Division of Viral Hepatitis, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention, Atlanta, Georgia; ⁴Surveillance Research Program, American Cancer Society, Atlanta, Georgia; ⁵North American Association of Central Cancer Registries, Springfield, Illinois; ⁶Information Management Services, Inc., Rockville, Maryland; ⁷Division of Vital Statistics, National Center for Health Statistics, Centers for Disease Control and Prevention, Hyattsville, Maryland

See Editorial on pages 1343-5, this issue.

We gratefully acknowledge the contributions of the state and regional cancer registry staff for their work in collecting the data used in this study. In addition, we thank Martin Knapch, Rick Firth, and Steve Scoppa of Information Management Services, Inc, for assistance in compiling the data used in this report.

This article has been contributed to by US Government employees and their work is in the public domain in the USA.

The findings and conclusions in this article are those of the authors and do not necessarily represent the official positions of the author's agencies (the Centers for Disease Control and Prevention, the National Cancer Institute, the American Cancer Society, or the North American Association of Central Cancer Registries).

Additional supporting information may be found in the online version of this article.

DOI: 10.1002/cncr.29936, Received: January 8, 2016; Accepted: January 21, 2016, Published online March 9, 2016 in Wiley Online Library (wileyonlinelibrary.com)

Liver cancer

- ❑ AI/AN have high incidence and mortality
- ❑ Opportunities for prevention:
 - Viral hepatitis
 - Obesity
 - Diabetes
 - Alcohol



Primary Prevention

Good Health and Wellness in Indian Country is a 5-year program funded at \$16 million in 2015. The program enlists tribes and tribal organizations as change agents to improve the health of American Indians and Alaska Natives.



How GHWIC Works:

Component 1 vs. Component 2

C1

- Tribes that use community-chosen, culturally adapted policies, systems and environmental improvements (PSE) to achieve GHWIC's long-term goals

C2

- Tribal organizations
- Provide leadership, technical assistance, and resources to sub-awardees and C1s in their IHS Areas

GHWIC - C1

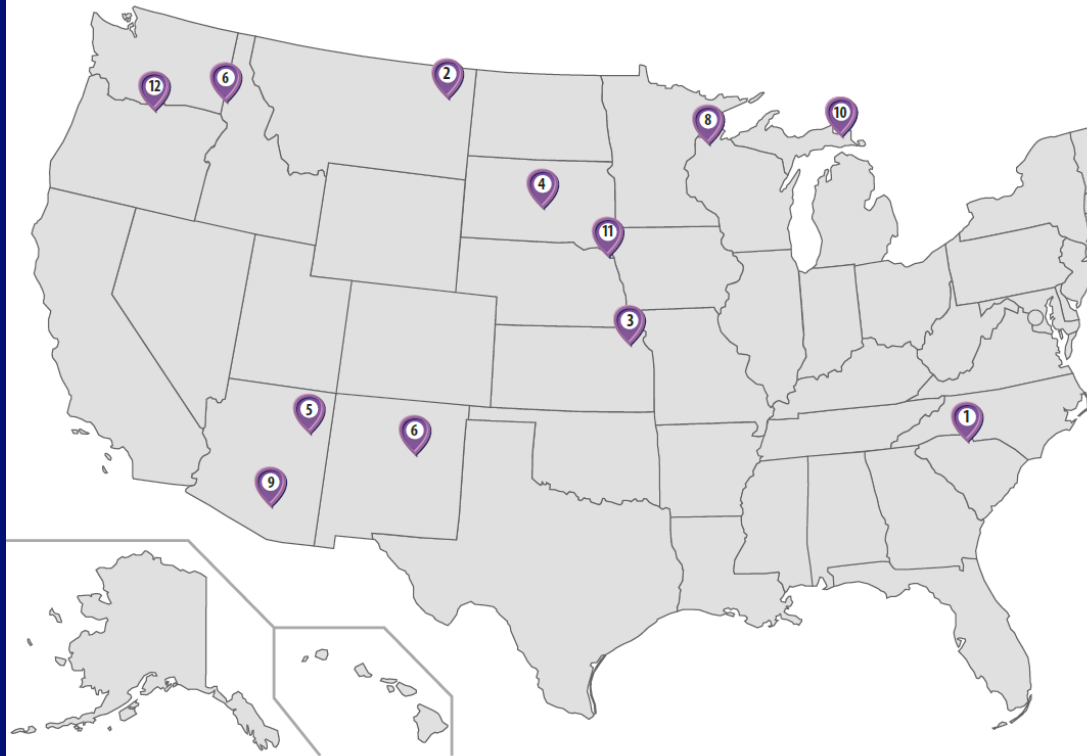
- **12 Tribes work on culturally adapted activities to address the following outcomes**
 - Reduce commercial tobacco use and exposure
 - Improve nutrition and physical activity
 - Increase support for breastfeeding
 - Increase health literacy
 - Strengthen team based care and community based clinical linkages





C1 Map

National Center for Chronic Disease Prevention and Health Promotion
FY 2015 Investments in Indian Country

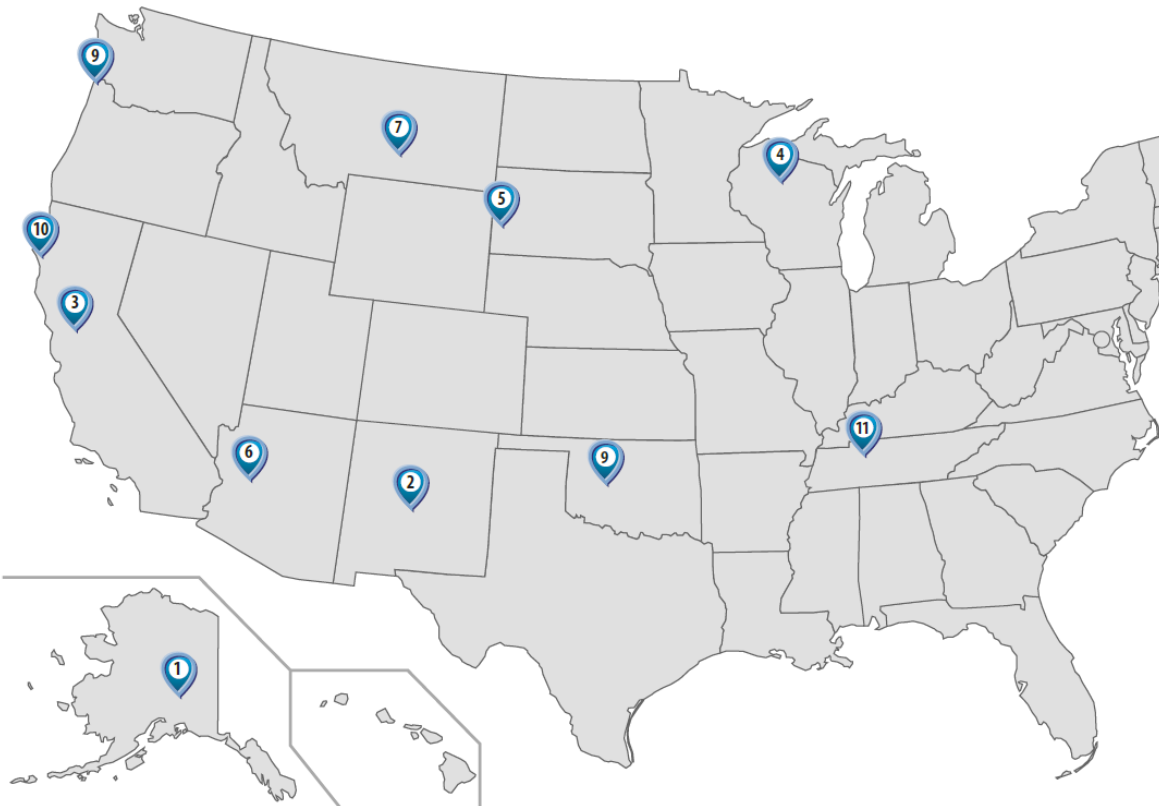


Good Health & Wellness in Indian Country

-  Tribes (Component 1)
1. Catawba Indian Nation
 2. Fort Peck Community College
 3. Kickapoo Tribe in Kansas
 4. Lower Brule Sioux Tribe
 5. Navajo Nation Department of Health
 6. Nez Perce Tribe
 7. Pueblo of Santa Ana
 8. Red Cliff Band of Lake Superior Chippewa
 9. San Carlos Apache Tribe
 10. Sault Ste. Marie Tribe of Chippewa Indians
 11. Winnebago Tribe of Nebraska
 12. YellowHawk Tribal Health Center

C2 Map

National Center for Chronic Disease Prevention and Health Promotion
FY 2015 Investments in Indian Country



Good Health & Wellness in Indian Country

-  Tribal Organizations (Component 2)
1. Alaska Native Tribal Health Consortium
 2. Albuquerque Area Indian Health Board, Inc.
 3. California Rural Indian Health Board, Inc.
 4. Great Lakes Inter-Tribal Council, Inc.
 5. Great Plains Tribal Chairmen's Health Board
 6. Inter-Tribal Council of Arizona, Inc.
 7. Montana and Wyoming Tribal Leaders Council
 8. Northwest Portland Area Indian Health Board
 9. Oklahoma City Area Inter-Tribal Health Board
 10. United Indian Health Services, Inc.
 11. United South and Eastern Tribes, Inc.

Future Directions

- **Cancer surveillance**
- **Regional patterns of cancer incidence and mortality**
- **Liver Cancer**
- **Good Health and Wellness in Indian Country: “it’s cancer control too!” the case for collaborating around primary prevention**

Thank you!

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333

Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348

Visit: www.cdc.gov | Contact CDC at: 1-800-CDC-INFO or www.cdc.gov/info

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.



