

Biomedical science and public health: Intersecting on the silk road



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There are many pathways from research to outcome (and back)

Bench to bedside

- Data from RCTs provide evidence
- Body of evidence informs clinical recommendations; Evidence based recommendations are diffused into clinical practice
- Improved clinical practice results in better care and better outcomes

Beside to community

- Public health data captures incidence and prevalence
- Clinical performance measures capture provider actions
- Patient and population data document behavior and health status
- Multiple measures track outcomes, changes over time.



National Center for Health Statistics

What We Do:

Monitor the nation's health by collecting, analyzing and disseminating health data

- Compare across time, populations, providers and geographic areas
- Identify health problems, risk factors, and disease patterns
- Inform actions and policies to improve the health of the American people

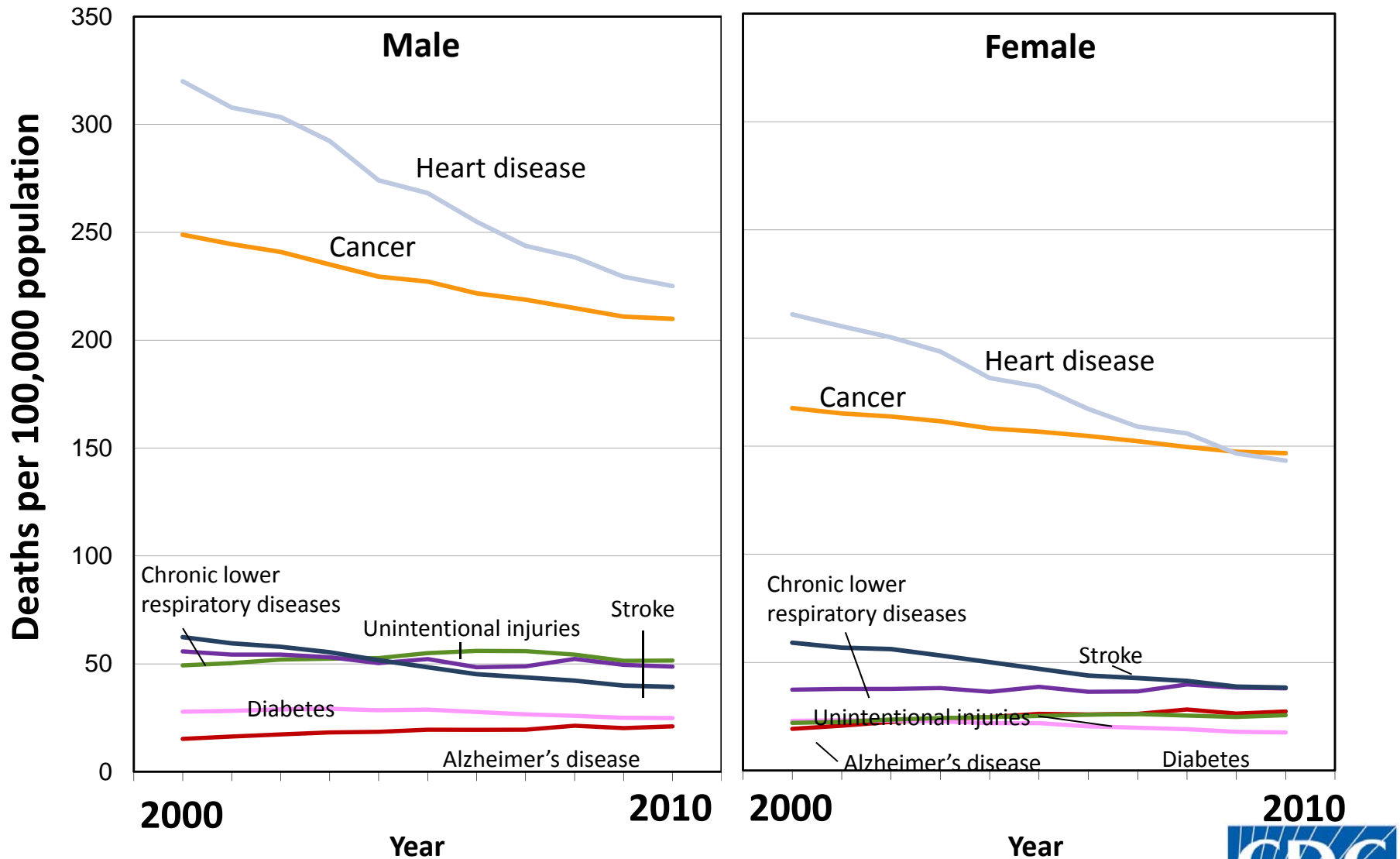


NCHS Data Collection Systems and Surveys Use These Sources ...

- **Birth and death records** (National Vital Statistics System)
- **Personal interviews** in the home and via phone (National Health Interview Survey, National Survey of Family Growth, State and Local Area Integrated Telephone Survey)
- **Physical examinations and laboratory testing** in mobile exam centers (National Health and Nutrition Examination Survey)
- **Medical records** from hospitals, emergency rooms, outpatient clinics, physicians' offices, nursing homes and hospice and home care agencies (National Health Care Surveys)
- **Interviews with health care providers** in hospitals, physicians' offices and long term care agencies (National Health Care Surveys)



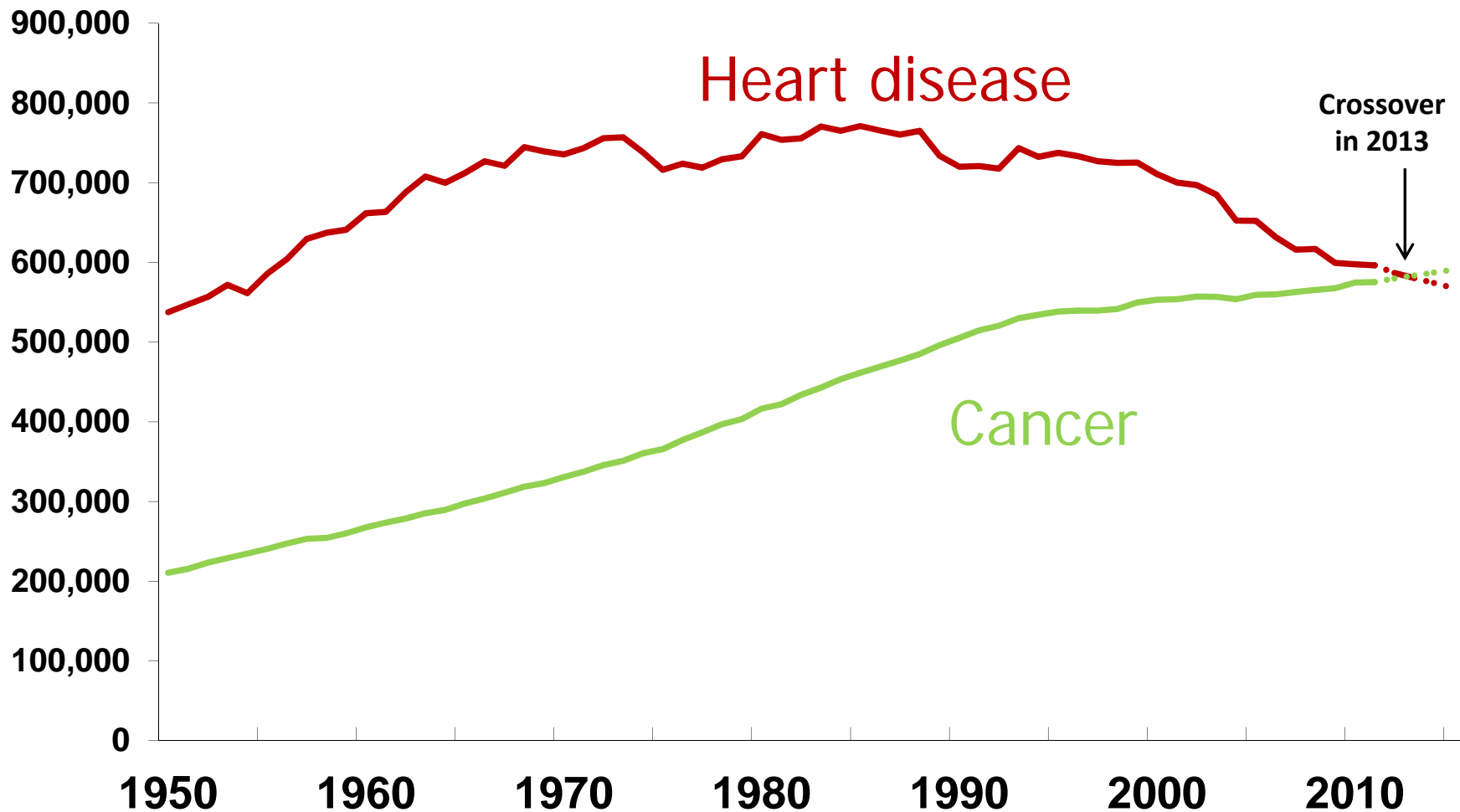
Age-adjusted death rates for selected causes of death for all ages, by sex: United States, 2000–2010



SOURCE: CDC/NCHS, *Health, United States*. Data from the National Vital Statistics System.



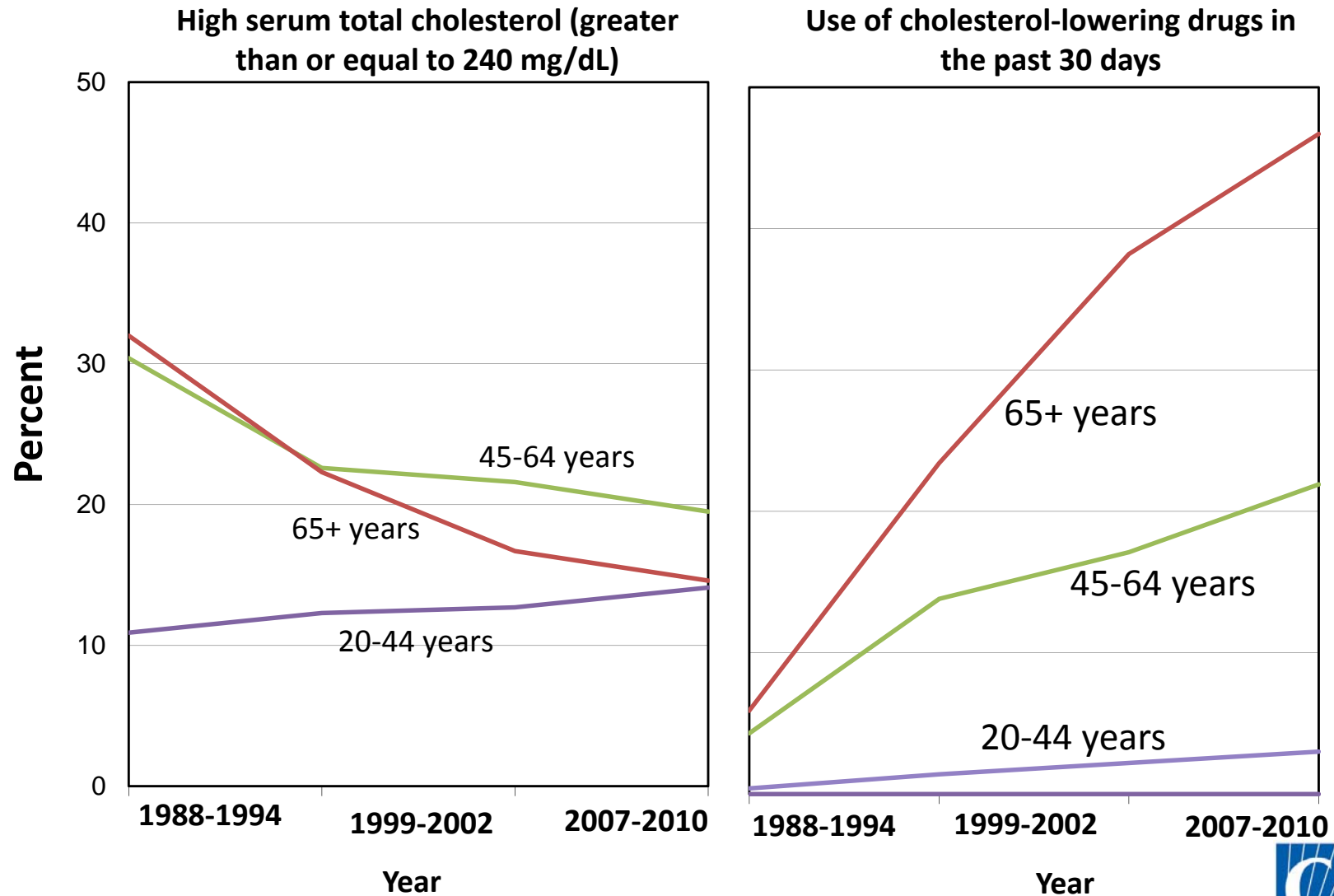
Number of Deaths Due to Heart Disease and Cancer: United States, 1950-2015



NOTE: Data for 2011 are preliminary data from the National Vital Statistics System. Data for 2012-2015 are based on a simple linear projection of data for 2008-2011.



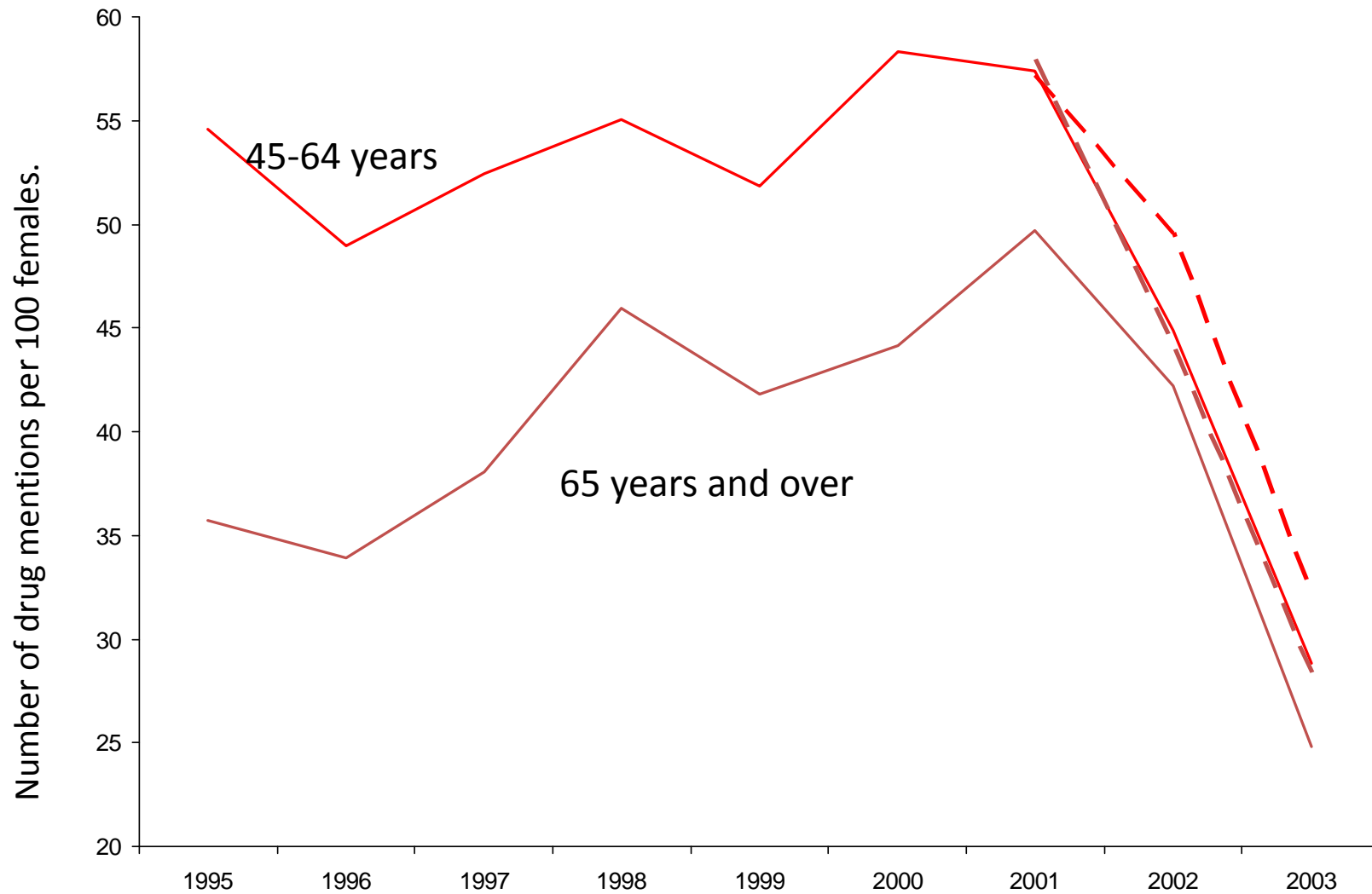
High serum total cholesterol and use of cholesterol-lowering drugs: 1988-1994 through 2007-2010



SOURCE: CDC/NCHS, *Health, United States*. Data from the National Health and Nutrition Examination Survey.



Trends in estrogen/progestin drug mention population rates at physician office visits by patient's age: United States, 1995-2003

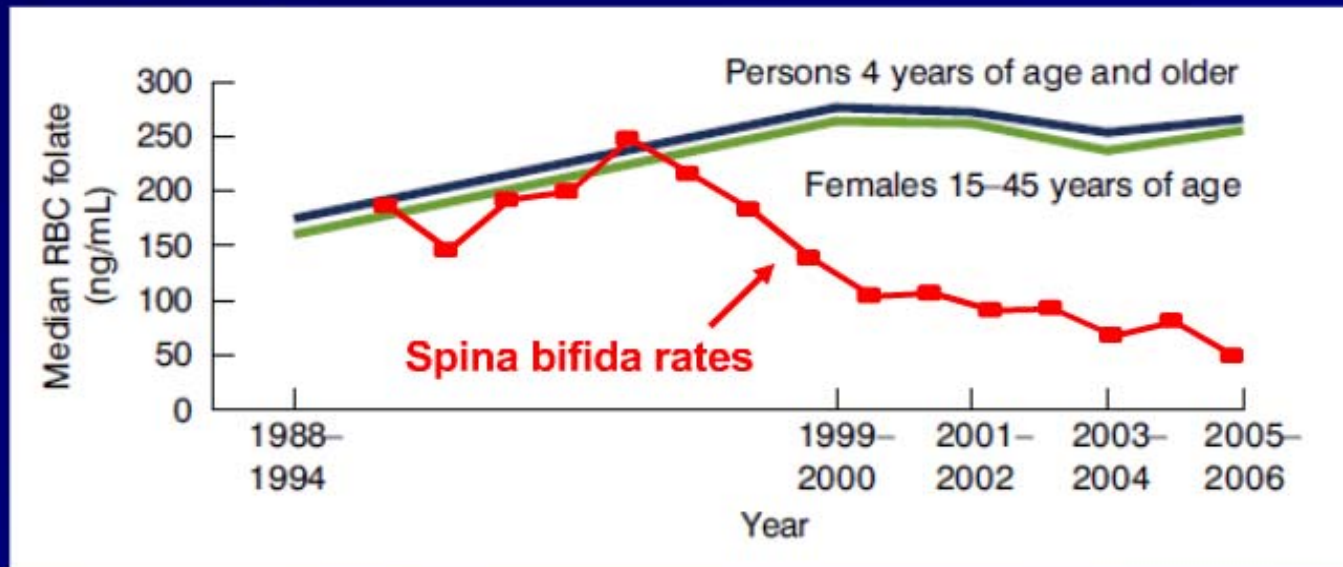


NOTES: Rates based on visits made by females. Trend for 65 years and over 1995-2000 is significant. All trends for 2001-2003 are significant ($p < 0.05$). Rate computed with revised 2001-03 weight indicated by dotted line; original weight indicated by solid line. The revised weight includes adjustment for variation in the typical number of weeks worked annually and for variation in visit volume in a work week, whereas the weights for 2000 and earlier do not.



3. Evaluating Folic Acid Fortification

- FDA regulation to fortify grain products with folic acid (1998)
- NHANES data pre- and post- fortification showed increased blood folate levels in young women
- Vital Statistics data showed ultimate impact with declines in Spina Bifida rates
- Continuing data collection allows evaluation of fortification policy safety

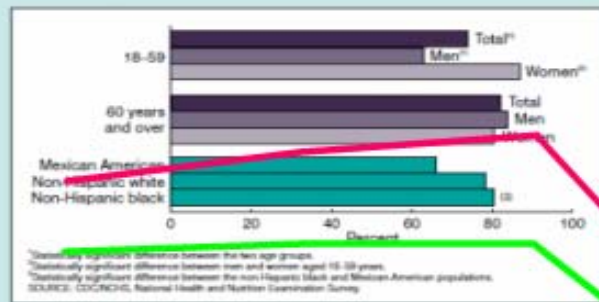


10. Tracking Hypertension



- Used to track hypertension prevalence by Joint National Committee on Detection Evaluation and Treatment of High Blood Pressure since 1980
 - Decline between 1976-80 and 1988-1994
 - Increase between 1988-94 and 1999-2000
- Since 1988-94 interview plus measured blood pressure data allow estimation of awareness, treatment, and control of hypertension

Figure 4. Awareness of hypertension among hypertensives adults: United States, 2005-2006



*Statistically significant difference between the two age groups.
 *Statistically significant difference between men and women aged 18-59 years.
 †Statistically significant difference between the non-Hispanic black and Mexican American populations.
 SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey.*

Measured blood pressure

women

men

1960-62

1971-74

1976-80

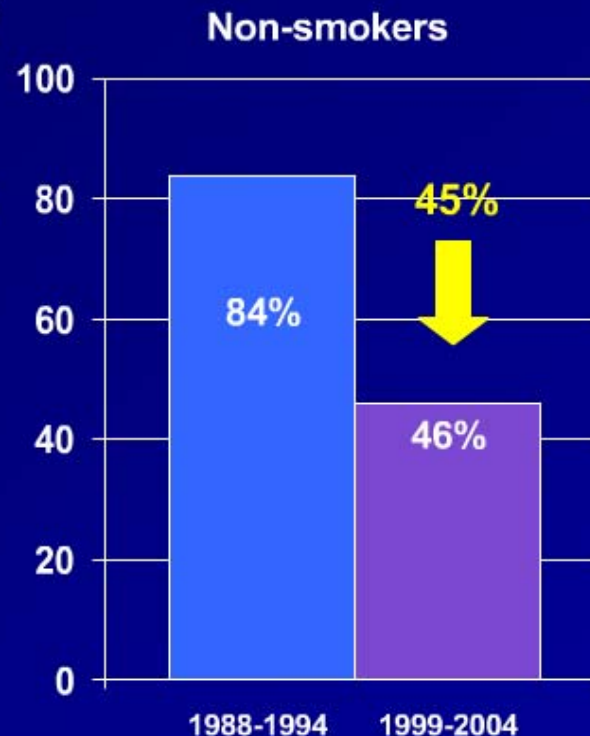
1988-94

1999-02



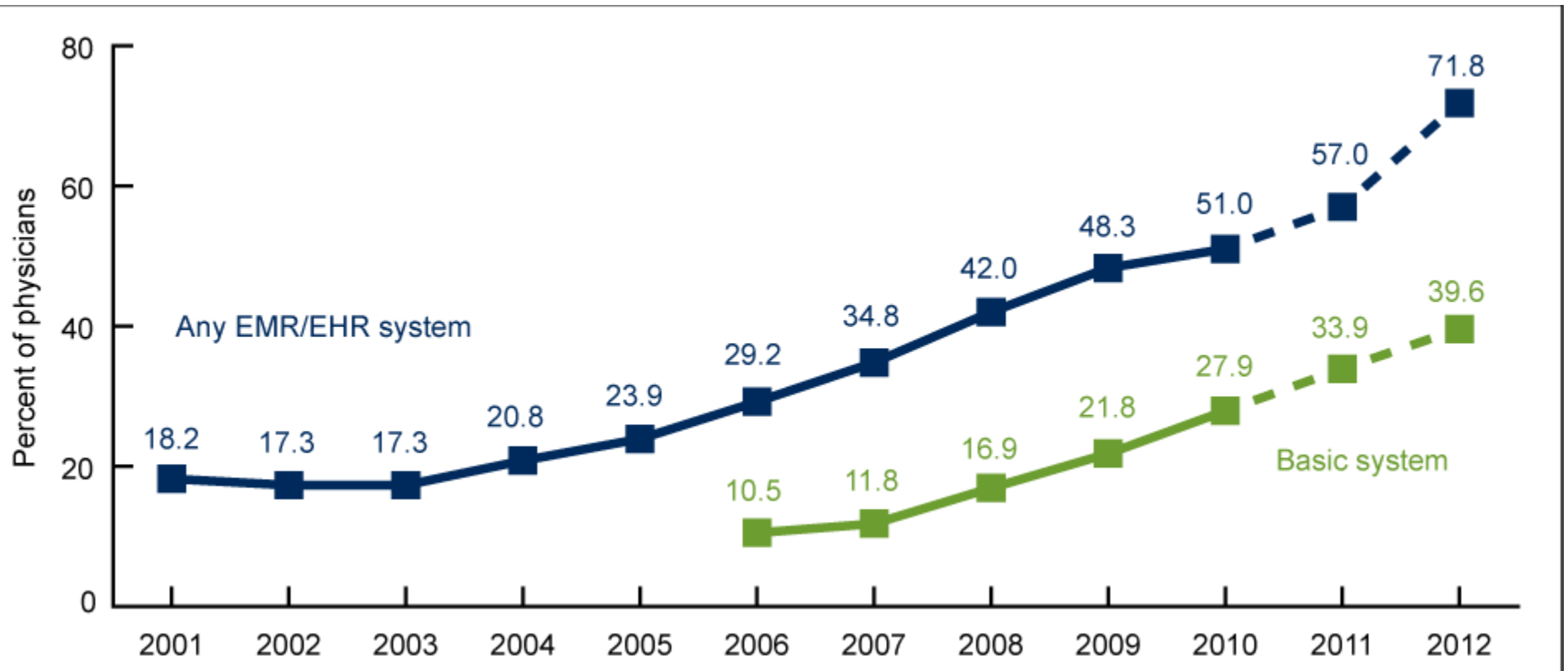
22. Elucidating Exposure to Second Hand Smoke (SHS) & Monitoring Reduction Policies

- 1st measured biological assessment of SHS in US (NHANES III)
- Documented widespread SHS exposure – 84% of non-smokers
- Trend analysis showed decline of 45% among nonsmokers between 1988-94 and 1999-2004



Monitoring the effects of health care policy changes

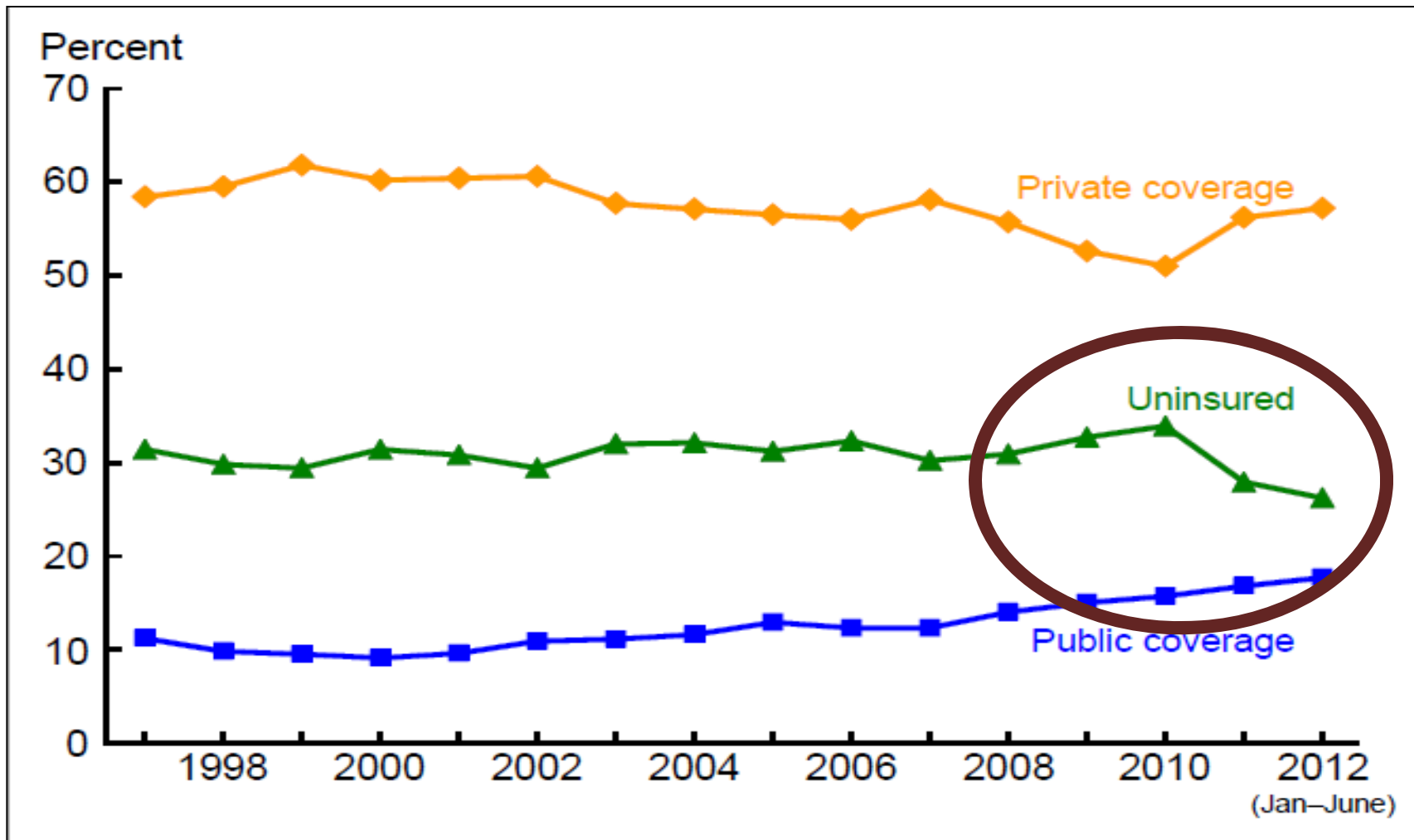
Percentage of Office-based Physicians with Electronic Medical Records



Source: National Ambulatory Medical Care Survey



Health Insurance Coverage, Ages 19–25



Source: National Health Interview Survey

NIH and NCHS partnerships

- **Collaborators** on NCHS surveys (e.g., NHANES, NHIS cancer supplement)
- **Methodological partnerships** (National Children's Study)
- **Healthy People workgroups**
 - Objective, target setting
 - Examples include heart disease and stroke, asthma, oral health, and others
- **National reporting efforts**
 - Health US
 - Aging Forum, Children's Forum



New intersections, new partnership opportunities

Vital statistics

- Electronic birth and death records

Health Care

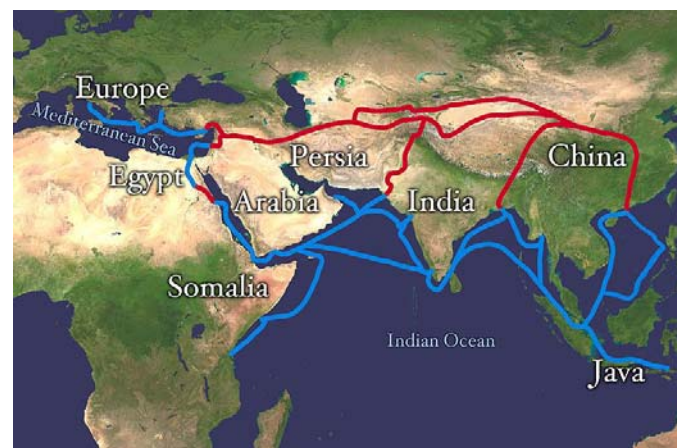
- Expansions in sample size yield state estimates
- New clinical data for EB preventive services

NHANES

- 24-hour urine collection pilot
- Health Measures at home (with NHIS)
- DNA bank

NHIS

- New LBGT data
- More state level estimates





- Linked data enable broader analyses of factors that influence health and health outcomes.
- Surveys are linked with administrative data such as
 - The National Death Index;
 - Claims data from the Centers for Medicare & Medicaid Services; and
 - Supplemental Security Income data from the Social Security Administration
- Linked data are accessed through
 - Public use files
 - the NCHS Research Data Center (for restricted use files)
- OAE conducts research on linkage methods, analytic methods for using the data, and on health and health policy issues.



NCHS Research Data Center

- Provides a mechanism for researchers to access data not released to the public because of nondisclosure or confidentiality reasons
 - Small area or micro data
 - Matches/ links to external data files
- Access is provided either on site or via a remote system
- Plans for an RDC in HHH building



Visit our website at <http://www.cdc.gov/nchs>

U.S. STANDARD CERTIFICATE OF LIVE BIRTH			
LOCAL FILE NO.			BIRTH NUMBER:
C H I L D	1. CHILD'S NAME (First, Middle, Last, Suffix)	2. TIME OF BIRTH (24 hr)	3. SEX
	4. DATE OF BIRTH (Mo/Day/Yr)		
	5. FACILITY NAME (If not institution, give street and number)	6. CITY, TOWN, OR LOCATION OF BIRTH	7. COUNTY OF BIRTH
M O T H E R	8a. MOTHER'S CURRENT LEGAL NAME (First, Middle, Last, Suffix)	8b. DATE OF BIRTH (Mo/Day/Yr)	
	8c. MOTHER'S NAME PRIOR TO FIRST MARRIAGE (First, Middle, Last, Suffix)	8d. BIRTHPLACE (State, Territory, or Foreign Country)	
	9a. RESIDENCE OF MOTHER-STATE	9b. COUNTY	9c. CITY, TOWN, OR LOCATION
	9d. STREET AND NUMBER	9e. APT. NO.	9f. ZIP CODE
			9g. INSIDE CITY LIMITS? <input type="checkbox"/> Yes <input type="checkbox"/> No
F A T H E R	10a. FATHER'S CURRENT LEGAL NAME (First, Middle, Last, Suffix)	10b. DATE OF BIRTH (Mo/Day/Yr)	10c. BIRTHPLACE (State, Territory, or Foreign Country)
C E R T I F I E R	11. CERTIFIER'S NAME: TITLE: <input type="checkbox"/> MD <input type="checkbox"/> DO <input type="checkbox"/> HOSPITAL ADMIN. <input type="checkbox"/> CNM/CM <input type="checkbox"/> OTHER MIDWIFE		12. DATE CERTIFIED MM / DD / YYYY
			13. DATE FILED BY REGISTRAR MM / DD / YYYY



ADMINISTRATIVE USE

