

Using NCHS Resources for Teaching and Research

Robert E. McKeown, PhD

Board of Scientific Counselors

National Center for Health Statistics

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Objectives

- Provide several examples of using of NCHS publications and data to teach epidemiologic concepts and methods
- Encourage greater use of NCHS resources in teaching and research
- Encourage centralized access for teaching resources from NCHS

Genesis

- Trolling NCHS website for latest statistics to use in intro epidemiology classes
 - Focus on vital statistics
 - Concepts (rate, proportion, risk) as well as the actual numbers
- Discovered publications with explanations and tables and graphics
- Then discovered the real data (on CDs then)

Evolution

- Found technical notes and pubs on methods useful as supporting materials
- Downloadable resources were gifts
 - Excel tables
 - PowerPoint slides
 - Downloadable raw data
 - Documentation and tutorials

National Vital Statistics Reports



Volume 63, Number 9

August 31, 2015

Deaths: Final Data for 2012

by Sherry L. Murphy, B.S.; Kenneth D. Kochanek, M.A.; Jiaquan Xu, M.D.; and
Melonie Heron, Ph.D., Division of Vital Statistics

National Vital Statistics Reports



Volume 64, Number 10

August 31, 2015

Deaths: Leading Causes for 2012

by Melonie Heron, Ph.D., Division of Vital Statistics

Table 1. Deaths, percentage of total deaths, and death rates for the 10 leading causes of death in selected age groups, by race and sex: United States, 2012

[Rates are per 100,000 population in specified group. Data for races other than white and black should be interpreted with caution because of misreporting of race on death certificates; see Technical Notes. An asterisk (*) preceding a cause-of-death code indicates that the code is not included in the *International Classification of Diseases, Tenth Revision* (ICD-10); see Technical Notes]

Rank ¹	Cause of death (based on ICD-10), race, sex, and age	Number ²	Percent of total deaths	Death rate ²	Rank ¹	Cause of death (based on ICD-10), race, sex, and age	Number ²	Percent of total deaths	Death rate ²
All races, both sexes, all ages ³					All races, both sexes, 10–14 years				
...	All causes	2,543,279	100.0	810.2	...	All causes	2,866	100.0	13.9
1	Diseases of heart(I00–I09,I11,I13,I20–I51)	599,711	23.6	191.0	1	Accidents (unintentional injuries)(V01–X59,Y85–Y86)	807	28.2	3.9
2	Malignant neoplasms(C00–C97)	582,623	22.9	185.6	2	Malignant neoplasms(C00–C97)	472	16.5	2.3
3	Chronic lower respiratory diseases(J40–J47)	143,489	5.6	45.7	3	Intentional self-harm (suicide)(*U03,X60–X84,Y87.0)	306	10.7	1.5
4	Cerebrovascular diseases(I60–I69)	128,546	5.1	40.9	4	Assault (homicide)(*U01–*U02,X85–Y09,Y87.1)	173	6.0	0.8
5	Accidents (unintentional injuries)(V01–X59,Y85–Y86)	127,792	5.0	40.7	5	Congenital malformations, deformations and chromosomal abnormalities(Q00–Q99)	160	5.6	0.8
6	Alzheimer’s disease(G30)	83,637	3.3	26.6	6	Diseases of heart(I00–I09,I11,I13,I20–I51)	108	3.8	0.5
7	Diabetes mellitus(E10–E14)	73,932	2.9	23.6	7	Chronic lower respiratory diseases(J40–J47)	56	2.0	0.3
8	Influenza and pneumonia(J09–J18)	50,636	2.0	16.1	8	Cerebrovascular diseases(I60–I69)	51	1.8	0.2
9	Nephritis, nephrotic syndrome and nephrosis(N00–N07,N17–N19,N25–N27)	45,622	1.8	14.5	9	Influenza and pneumonia(J09–J18)	41	1.4	0.2
10	Intentional self-harm (suicide)(*U03,X60–X84,Y87.0)	40,600	1.6	12.9	10	In situ neoplasms, benign neoplasms and neoplasms of uncertain or unknown			
...	All other causes(residual)	666,691	26.2	212.4					

One of my favorite graphs

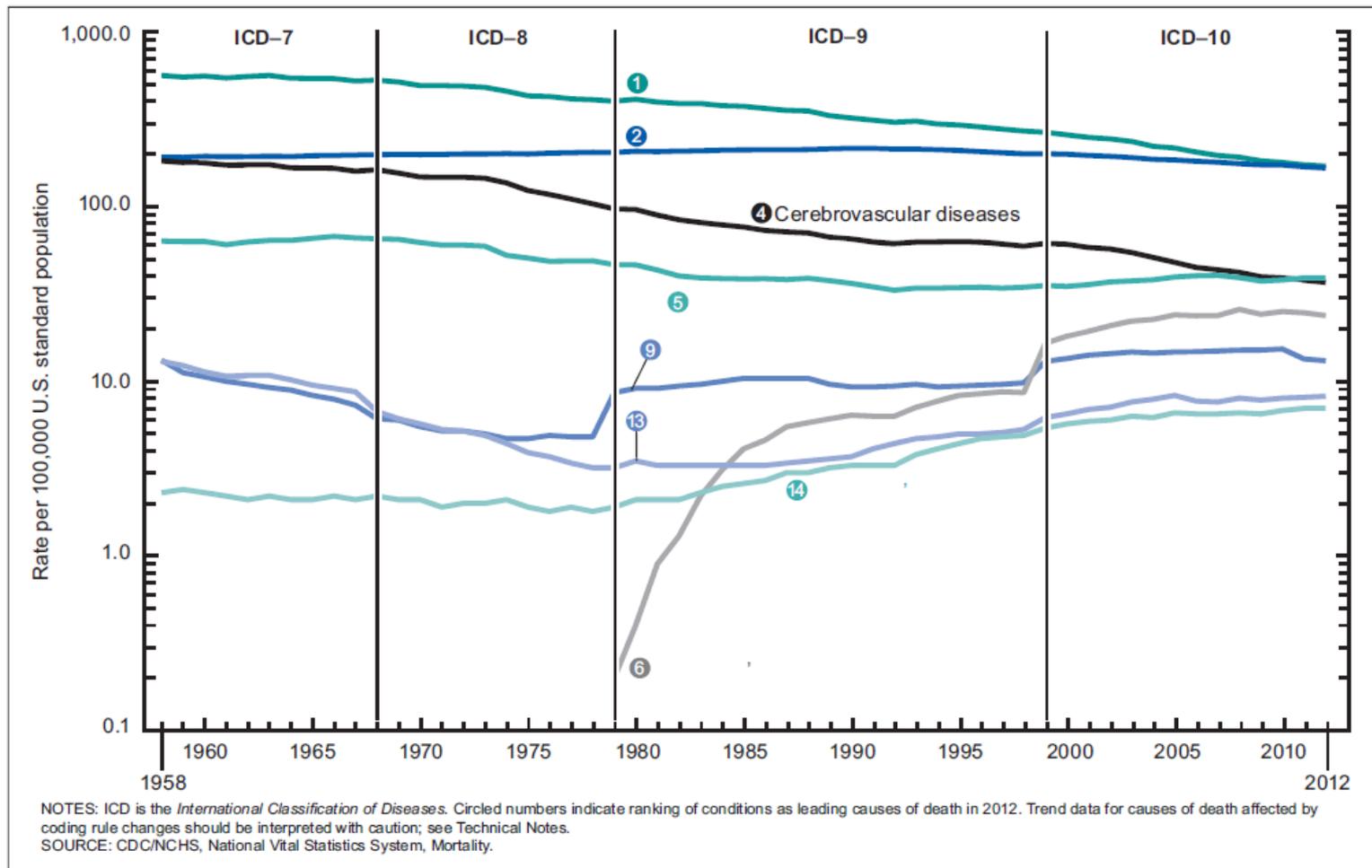


Figure 6. Age-adjusted death rates for selected leading causes of death: United States, 1958–2012

Here's the key

Leading causes of death

The 15 leading causes of death in 2012 accounted for 79.4% of all deaths in the United States ([Tables B and 9](#)). The leading causes of death in 2012 remained the same as in 2011. Causes of death are ranked according to the number of deaths; for ranking procedures, see [Technical Notes](#). By rank, the 15 leading causes in 2012 were:

1. Diseases of heart (heart disease)
2. Malignant neoplasms (cancer)
3. Chronic lower respiratory diseases
4. Cerebrovascular diseases (stroke)
5. Accidents (unintentional injuries)
6. Alzheimer's disease
7. Diabetes mellitus (diabetes)
8. Influenza and pneumonia
9. Nephritis, nephrotic syndrome and nephrosis (kidney disease)
10. Intentional self-harm (suicide)
11. Septicemia
12. Chronic liver disease and cirrhosis
13. Essential hypertension and hypertensive renal disease (hypertension)
14. Parkinson's disease
15. Pneumonitis due to solids and liquids

Definitions & surprising finds

■ Mechanism vs manner or intent of injury deaths

Poisoning—In 2012, 46,150 deaths occurred as the result of poisonings, 24.2% of all injury deaths (Table 18). The age-adjusted death rate for poisoning in 2012 (14.6 deaths per 100,000 U.S. standard population) did not significantly change from the rate in 2011 (14.7). The majority of poisoning deaths were either unintentional (78.7%) or suicides (14.6%). However, 6.5% of poisoning deaths were of undetermined intent. The rate from unintentional poisoning in 2012 (11.5) did not change significantly from the rate in 2011 (11.6) but has more than doubled since 1999 (data prior to 2012 are not shown but are available through CDC WONDER at <http://wonder.cdc.gov/>).

Motor vehicle traffic—In 2012, motor vehicle traffic-related injuries resulted in 34,935 deaths, accounting for 18.3% of all injury deaths (Table 18). The age-adjusted death rate for these injuries increased 2.8%, from 10.6 per 100,000 standard population in 2011 to 10.9 in 2012.

Firearm—In 2012, 33,563 persons died from firearm injuries in the United States (Tables 18 and 19), accounting for 17.6% of all injury deaths in that year. The age-adjusted death rate from firearm injuries (all intents) increased 2.9%, from 10.2 in 2011 to 10.5 in 2012. The two major component causes of firearm injury deaths in 2012 were suicide (61.6%) and homicide (34.6%). The age-adjusted death rate for firearm homicide increased 5.6%, from 3.6 in 2011 to 3.8 in 2012. The rate for firearm suicide did not change significantly.

United States Life Tables, 2011

by Elizabeth Arias, Ph.D., Division of Vital Statistics

- The information on current life expectancy and comparisons
- Methods
- Exercises using the data and tables
- Survival curves

Eventually birth to death

- Annual birth publications
- Birth data and linked birth death files
- Multiple uses
 - Used for current statistics
 - Datasets created for individual and class projects
 - Graphics to teach concepts
 - U-shaped curves (maternal age, gestational age)
 - Trends in characteristics

Vital Records Documents

- Standard birth and death certificates
 - Processes
 - Content
 - Available data
- Other vital records documents and data

Updated population estimates

- Decennial census and interim estimates
- Standard population distributions
- Both by sex, age, race, ethnicity
- Used to teach concepts, methods, and provide exercises with actual data

Another useful type of report

National Vital Statistics Reports

From the CENTERS FOR DISEASE CONTROL AND PREVENTION
National Center for Health Statistics
National Vital Statistics System



Volume 47, Number 3

October 7, 1998

Age Standardization of Death Rates: Implementation of the Year 2000 Standard

by Robert N. Anderson, Ph.D., and Harry M. Rosenberg, Ph.D.

1940 and 2000 U.S. Standard Populations

Age	1940		2000	
	Number	Weight	Number	Weight
All ages.	1,000,000	1.000000	1,000,000	1.000000
Under 1 year.	15,343	0.015343	13,818	0.013818
1-4 years.	64,718	0.064718	55,317	0.055317
5-14 years.	170,355	0.170355	145,565	0.145565
15-24 years.	181,677	0.181677	138,646	0.138646
25-34 years.	162,066	0.162066	135,573	0.135573
35-44 years.	139,237	0.139237	162,613	0.162613
45-54 years.	117,811	0.117811	134,834	0.134834
55-64 years.	80,294	0.080294	87,247	0.087247
65-74 years.	48,426	0.048426	66,037	0.066037
75-84 years.	17,303	0.017303	44,842	0.044842
85 years and over.	2,770	0.002770	15,508	0.015508

US Population Pyramids 1940 and 2000

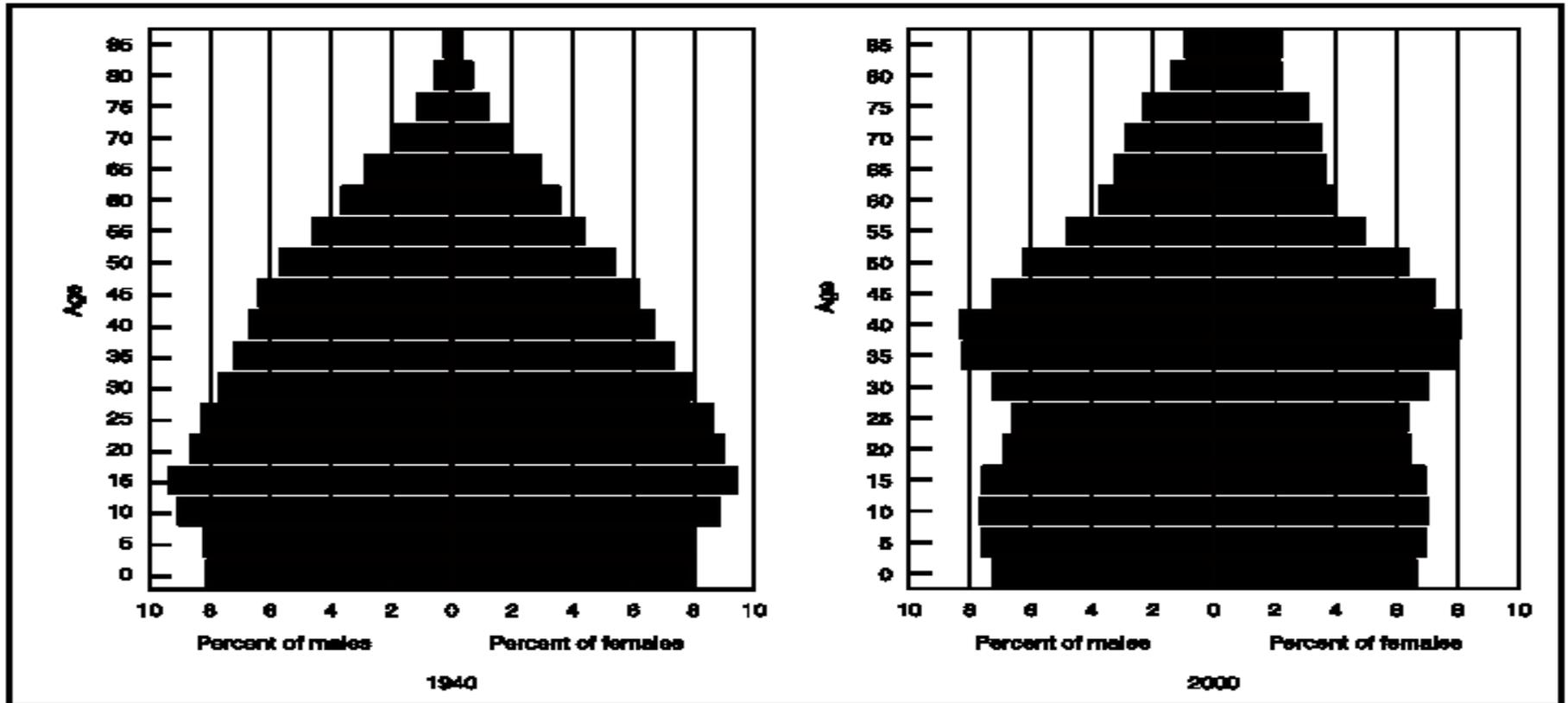


Figure 1. Population pyramids for the 1940 and 2000 U.S. populations expressed as a percent of total population

Graphic Comparison of 1940 and 2000 Standards

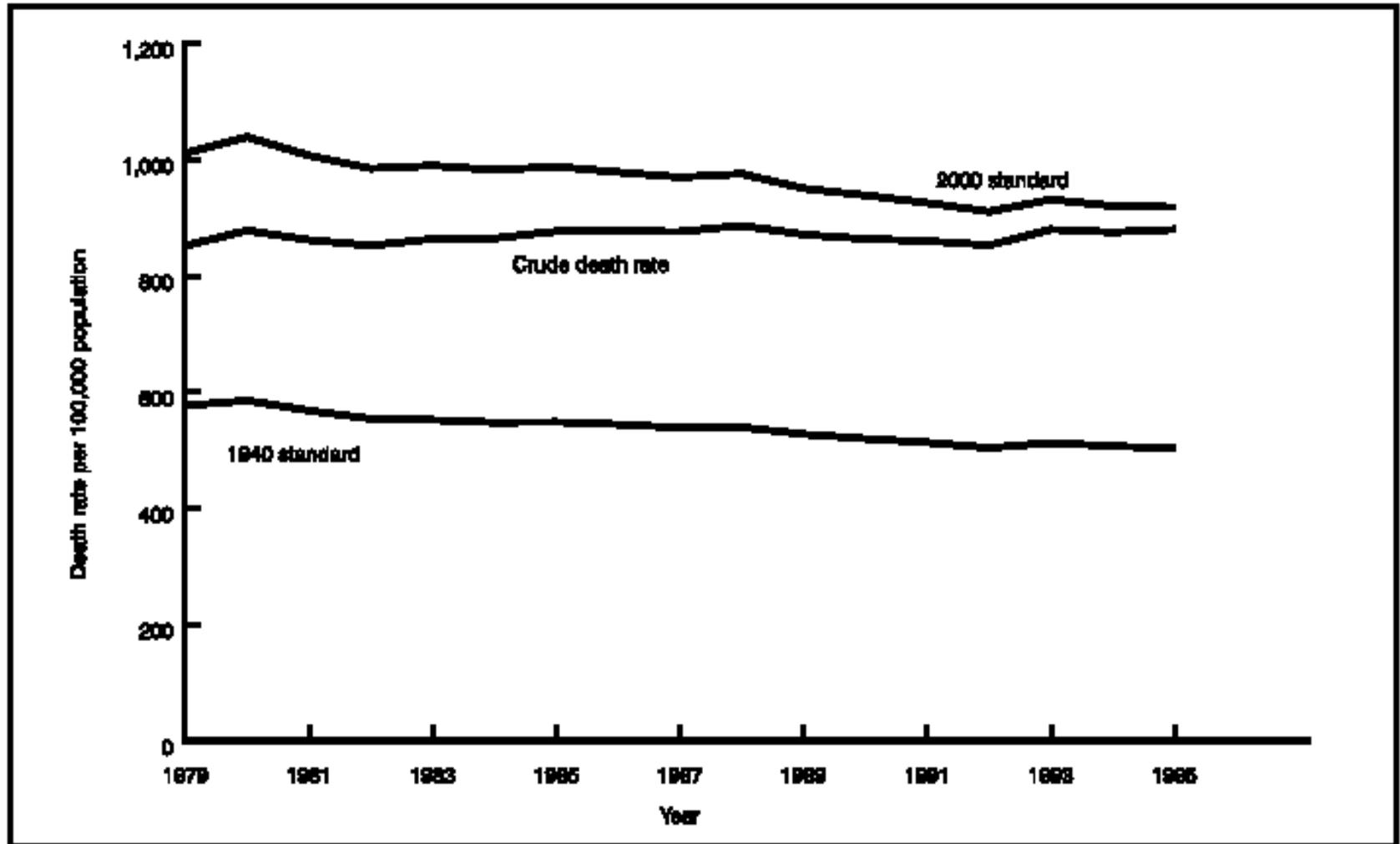


Figure 2. Crude and age-adjusted death rates based on the 1940 and 2000 standard populations: United States, 1979-95

Table F. Age-specific and age-adjusted death rates by race: United States, 1995

[Age-adjusted death rates are per 100,000 standard population. Age-specific rates are per 100,000 population in specified age group]

Rate	White death rate	Black death rate	Ratio
Age-adjusted rates			
1940 standard	476.9	765.7	1.6
2000 standard	890.0	1,224.5	1.4
Age-specific rates			
0–24 years	73.0	149.1	2.0
25–64 years	365.4	691.1	1.9
65 years and over	5,049.3	5,679.2	1.1

Series 2
No. 129



Vital and Health Statistics

From the CENTERS FOR DISEASE CONTROL AND PREVENTION / National Center for Health Statistics

Method for Constructing
Complete Annual
U.S. Life Tables



SAFER • HEALTHIER • PEOPLE™

Vital and Health Statistics

Series 2, Number 165

April 2014

Design and Estimation for the National Health Interview Survey, 2006–2015



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

Why?

- Introduce students to
 - terminology and concepts of complex survey design (there is a glossary)
 - the rationale for doing things
- Demonstrate need to analyze data in ways that take the design into account
- First step to introducing NCHS surveys as sources for research, thesis projects, and class projects

Health, United States, 2014

With Special Feature on Adults Aged 55–64



Resource goldmine

- Copious tables
- Narrative to summarize important findings
- Chartbooks provide graphic illustrations of data
- PDF files back to 1975
- Recent editions provide spreadsheet files AND downloadable slides of graphs
- Recent years have focused on a theme

Examples of using NCHS data for teaching

Vital Records Data

- **Natality Data or Linked Birth – Infant Death Cohort or Period file**
- **Used in data management / SAS class and in Epi methods classes**
- **Often subset to provide more manageable file size**
- **Typically still large file (e.g. 150,000 obs)**

The end product

- Developed and taught a class for several years: Vital Record and Health Survey Data Analysis
 - Focus on management of large, complex datasets
 - Understand documentation and data structures
 - Learn content and possibilities of datasets
 - Learn to access data and build analytic datasets
 - Learning rudiments of survey data analysis

My ideal resource for teaching

- Central site with links to the most valuable publications for teaching common concepts and methods
- Central location for tutorials
- More easily available downloadable tables and slides (help knowing which pubs have them and which don't)
- Web versions of methodological pubs updated and centrally located
- Teaching resource workshops online and at data conference