

# LEADING CAUSES OF DEATH

DEATH CERTIFICATES

leading causes of death

mortality data

## Public Health Data

OUR SILENT PARTNER

# TEEN PREGNANCY

deaths due to smoking

## Student Guide

pregnancy rate

birth rate

# SMOKING AND HEALTH

population-based surveys

*prevalence rate*



U. S. DEPARTMENT OF HEALTH & HUMAN SERVICES  
Public Health Service  
Centers for Disease Control  
and Prevention (CDC)  
National Center for Health Statistics  
Public Health Practice Program Office  
Atlanta, Georgia 30333

## **Continuing Education Credit Information**

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**Public Health Data: Our Silent Partner**, course number **VC0024**, is accredited as a self-study course.

### **Continuing Medical Education (CME)**

*The Centers for Disease Control and Prevention (CDC) is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.*

*CDC designates this educational activity for a maximum of 7 hours in category 1 credit towards the AMA Physician's Recognition Award. Each physician should claim only those hours of credit that he/she actually spent in the educational activity.*

### **Continuing Nursing Education (CNE)**

*A maximum of 8.4 contact hours is provided by CDC for this activity. CDC is accredited as a provider of continuing education in nursing by the American Nurses Credentialing Center's Commission on Accreditation.*

### **Continuing Education Unit (CEU)**

*CDC is approved as an Authorized Provider of continuing education and training programs by the International Association for Continuing Education and Training and awards .7 Continuing Education Units (CEUs).*

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## How to Use This Course

Welcome to **Public Health Data: Our Silent Partner**.

This course is designed to help public health professionals use data in their jobs. This course can be used as a facilitator-guided course or as a self-study course. Either way, make sure that you have a complete set of course materials. Facilitators should have and review the materials in a, b, c, and d below. Self-study students need the materials in a, b, and c.

- a. A copy of the videotape
- b. A copy of the workbook\*, **Public Health Data: Our Silent Partner** which includes the following sections:
  - **Introduction**
  - **Module 1 – Leading Causes of Death**
  - **Module 2 – Teen Pregnancy**
  - **Module 3 – Smoking and Health**
- c. A copy of this **Student Guide**\* which includes the following sections:
  - Continuing Education Credit Information
  - How to Use This Course
  - How to Obtain Continuing Education Credit
  - Course Evaluation and Exam
  - Answer Key to Exercises (Appendix A)
  - Answer to Exam Questions (Appendix B)
- d. A copy of the **Facilitator Guide**\* (Only facilitators need this document).

\* The printed materials can be downloaded from the National Center for Health Statistics (NCHS) web site: <http://www.cdc.gov/nchs/products/training/phd-osp.htm>

### Facilitator-guided:

If you are taking this course in a classroom setting with a facilitator, please bring some pencils and a calculator to class. You may also want some scratch paper. Get a good night's sleep before each session, eat a good breakfast and arrive on time.

Your instructor will provide you with the **Workbook** and guide you through the course. He or she will also provide you with a copy of the **Student Guide**.

The **Answer Keys** for the exercises in modules 1, 2 and 3 are included in Appendix A of the **Student Guide** for your reference. The Course Evaluation and Exam and the Answers to the Exam Questions are also included in the **Student Guide**.

You may wish to apply for continuing education credits for this course. If you are interested in receiving CME, CNE or CEU credits, review the instructions on page 3 of the **Student Guide, How to Obtain Continuing Education Credit**. Once you have completed the course, follow the directions on those pages to apply for credit.

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### **Self-study:**

If you are taking this course on your own (self-study) without a facilitator, please follow the instructions below.

1. Make sure that you have a complete set of course materials (all three modules of the **Workbook**, the **Student Guide**, and the videotape.
2. You will need a videocassette recorder (VCR), some pencils, a calculator, and some scratch paper.
3. Begin the course by placing the videotape in your VCR and watching the introductory section. Then follow the narrator's cues. Periodically the narrator will instruct you to go to the **Workbook**. Similarly, at the end of each section of the **Workbook**, you will be instructed to return to the videotape.
4. As you read the **Workbook**, you may wish to underline sections or make notes in the margin.
5. As you complete each **Workbook** exercise, compare your answers with those in the **Answer Key (Appendix A)**. Circle any questions that you answered incorrectly or did not understand completely. Take the time to review relevant sections of the **Workbook** to clarify anything that was confusing.
6. When you finish the course, complete the **Course Evaluation and Exam**.
7. Follow the instructions on how to obtain continuing education credit on the next page and submit your completed course exam and evaluation to CDC.
8. If you have any other questions or comments about the content of this course, please send them to the address/fax #/e-mail address below.  
State and Local Support Branch  
National Center for Health Statistics  
6525 Belcrest Rd. Rm 770  
Hyattsville, MD 20782  
Fax: (301) 436-3572 E-mail: [nchspub@cdc.gov](mailto:nchspub@cdc.gov)
9. If you have questions on Continuing Education Credit, please contact CDC at:  
Email: [CE@cdc.gov](mailto:CE@cdc.gov)  
Phone: 800-41-TRAIN

## How to Obtain Continuing Education Credit

In order to obtain continuing education credit, you will need to officially register for the course and complete the Course Evaluation and Exam.

### **How to complete registration and course evaluation and exam**

Request a Registration and Evaluation packet for course number VC0024. You can do this by:

- Email: [CE@cdc.gov](mailto:CE@cdc.gov). Be sure to provide your name, address, daytime phone number, and the course number.
- Fax: Place a toll-free call from a touch tone phone to 888-CDC-FAXX (888-232-3299). When prompted, enter document number 564007 and a request form will be sent to your 10-digit fax number. Complete the request form and return it by fax to 404-639-0800.
- Phone: Call 800-41-TRAIN, follow the prompts, and state your request for a continuing education packet.

You should receive your CE registration packet in 2 to 3 weeks.

CDC's on-line registration will be available in the near future. Once the on-line system is active, we will announce its availability on PHTN web site: <http://www.cdc.gov/phtn>. Then you can complete your registration and evaluation for the course on-line.

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**Course Evaluation and Exam****Public Health Data: Our Silent Partner (VC0024)****Goals:**

The goal of this course is to improve the ability of public health professionals to understand and use data routinely in their jobs.

**Objectives:**

After completing Module 1, participants will be able to:

- Define public health data.
- Explain data typically included on a death certificate, and discuss the value and limitations of those data.
- Explain ICD codes.
- Describe the difference between numbers of deaths (counts) and death rates.
- Identify and analyze leading causes of death.
- Calculate general death rates and specific types of death rates, including age-specific, cause-specific and sex-specific death rates.
- Use rates to examine differences in causes of death by sex.
- Analyze changes in rates over time (trends) and changes in underlying causes over time.
- Determine effective ways to present data.

After completing Module 2, participants will be able to:

- Describe the respective roles of health departments and the media in providing information to the public on health-related issues.
- State the definitions of teen pregnancy and live birth, and describe the difference.
- Describe the difference between occurrence and residence data.
- Identify sources of data on teen pregnancy, and discuss the strengths and limitations of those data.
- Calculate age-specific pregnancy and live birth rates.
- Determine percentage changes in rates over time.
- Use confidence limits and statistical significance to interpret variability.

After completing Module 3, participants will be able to:

- Describe the Behavioral Risk Factor Surveillance System (BRFSS), including its purpose and potential uses, its methodology, and its strengths and limitations.
- Explain prevalence rates and how they differ from incidence rates.
- Compare aggregate smoking prevalence data across years in a region (multi-county) with the state as a whole.
- Define the concepts of relative and attributable risk.
- Estimate the number of deaths attributable to smoking in a state and region.

Use the red CDC Answer Sheet to complete the following questions.  
Completely blacken the circle on the optical scan form that corresponds to your answer.

**Tell us about yourself:**

Please answer ALL questions. If none of the responses seem appropriate, please enter: None of the above or Not applicable.

**1. What type of continuing education credit do you wish to receive?**

- A. Continuing Medical Education (CME)
- B. Continuing Nursing Education (CNE)
- C. Continuing Education Unit (CEU)
- D. None of the above

**2. Are you a**

- A. Nurse
- B. Physician
- C. Veterinarian
- D. None of the above

**3. Have you had more than one year of experience or academic training in the use of public health data?**

- A. Yes
- B. No

**4. What is your highest level of education?**

- A. High school
- B. Associate degree
- C. Bachelor degree
- D. Master degree
- E. Doctoral degree
- F. Other

Please answer **BOTH** questions 5 and 6, but choose only **ONE** profession. Your answer to one of these question will be: *None of the above*.  
Example: If you are a health educator, your answers for questions 5 and 6 should be:

**5. (B)          6. (D)**

**5. Which of the following best describes your current occupation?**

- A. Epidemiologist
- B. Health Educator
- C. Laboratorian
- D. Pharmacist
- E. Physician Assistant
- F. None of the above

**6. Which of the following best describes your current occupation?**

- A. Administrator
- B. Program Manager
- C. Public Health Practitioner
- D. None of the above

**7. Which of the following best describes your current work setting?**

- A. Academic (public and private)
- B. Hospital / medical center
- C. Managed care practice
- D. Private office practice
- E. Public health
- F. Other work setting

**8. Which of the following best describes the type of organization in which you currently work?**

- A. Federal government
- B. State government
- C. County government
- D. Local government
- E. Non-government agency
- F. Other type of organization

**Tell us about the course:**

- 9. How did you first learn about this course?**
- A. State publication
  - B. From a colleague
  - C. CDC Internet site or homepage
  - D. PHTN source (PHTN homepage, catalog, blast fax announcement, mailing list)
  - E. Public Health Foundation catalog or marketing
  - F. Other marketing materials
- 10. What was the most important factor in your decision to participate in this course?**
- A. Content
  - B. Continuing education credit
  - C. Supervisor recommended
  - D. Previous experience with CDC courses
  - E. Convenience of format
  - F. Other
- 11. How much time did you spend completing this course?**
- A. Less than 3 hours
  - B. 3 - 6 hours
  - C. >6 - 9 hours
  - D. >9 - 12 hours
  - E. More than 12 hours
- Please use the scale below to rate your agreement with the following statements about this self study course:**
- A. Agree
  - B. No opinion
  - C. Disagree
  - D. Not applicable
- 12. The objectives are relevant to the goal.**
- 13. I will recommend this course to my colleagues.**
- 14. Participation in this course is likely to improve my professional effectiveness.**
- 15. The level of technical information met my needs.**
- 16. The case studies in the videotape helped me understand the content.**
- 17. The exercises in the workbook helped me understand the content.**
- 18. The time allocated for the program was appropriate.**
- 19. The PHTN promotional material for this course adequately described the course and its content.**
- 20. Ordering the course (workbook and videotape) from the Public Health Foundation was user-friendly.**
- 21. Ordering the course enrollment materials from (800) 41-TRAIN was user-friendly.**
- 22. Obtaining the course evaluation and exam from the PHTN web site was user-friendly.**
- 23. The cost for the course material (workbook and videotape) was appropriate.**
- 24. I feel confident that I can define public health data.**
- 25. I feel confident that I can explain data typically included on a death certificate.**
- 26. I feel confident that I can discuss the value and limitations of data included on a death certificate.**

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27. I feel confident that I can explain ICD codes.
28. I feel confident that I can describe the difference between numbers of deaths (counts) and death rates.
29. I feel confident that I can identify and analyze leading causes of death.
30. I feel confident that I can calculate general death rates and specific types of death rates, including age-specific, cause-specific and sex-specific death rates.
31. I feel confident that I can use rates to examine differences in causes of death by sex.
32. I feel confident that I can analyze changes in rates over time (trends) and changes in underlying causes over time.
33. I feel confident that I can determine effective ways to present data.
34. I feel confident that I can describe the respective roles of health departments and the media in providing information to the public on health-related issues.
35. I feel confident that I can state the definitions of teen pregnancy and live birth, and describe the difference.
36. I feel confident that I can describe the difference between occurrence and residence data.
37. I feel confident that I can identify sources of data on teen pregnancy, and discuss the strengths and limitations of those data.
38. I feel confident that I can calculate age-specific pregnancy and live birth rates.
39. I feel confident that I can determine percentage changes in rates over time.
40. I feel confident that I can use confidence limits and statistical significance to interpret variability.
41. I feel confident that I can describe the Behavioral Risk Factor Surveillance System (BRFSS), including its purpose and potential uses, its methodology, and its strengths and limitations.
42. I feel confident that I can explain prevalence rates and how they differ from incidence rates.
43. I feel confident that I can compare aggregate smoking prevalence data across years in a region (multi-county) with the state as a whole.
44. I feel confident that I can define the concepts of relative and attributable risk.
45. I feel confident that I can estimate the number of deaths attributable to smoking in a state and region.

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**Following are exam questions for this course. Please circle *ONLY ONE* answer for each of the following questions.** (Answer key is included on the last page of this booklet)

46. Which of the following is the best example of population-based data?
- A. A patient's medical record
  - B. Death certificates
  - C. Mammogram screening results
47. Which of the following is NOT included in a standard death certificate?
- A. Hispanic origin
  - B. County in which death occurred
  - C. The decedent's blood type
48. The International Classification of Diseases (ICD) is used to:
- A. Classify all diseases that are not preventable
  - B. Register births and deaths
  - C. Translate all of the causes of death on a death certificate into an underlying cause of death
49. True or false: Counts help you compare the risk of death in one population with the risk of death in another population.
- A. True
  - B. False
50. True or false: Counts can be used to rank the leading causes of death in a population. A.
- A. True
  - B. False
51. What is the death rate from Heart diseases (ICD-9 Nos. 390-398, 402, 404-429) in 1997 if the total number of deaths from heart disease was 3007 and the total population was 2,059,000?
- A. 146 per 100,000
  - B. 146 percent
  - C. 0.07 per 100,000
52. What is the ratio of death rates due to cerebrovascular diseases (ICD-9 Nos. 430-438) among males compared to females in 1997 if the death rate for males was 47.8 per 100,000, and the death rate for females was 71.2 per 100,000?
- A. 1.48
  - B. 2 to 1
  - C. 0.67

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53. The most important thing to remember when calculating causes of death by sex is:
- A. To use the same sex in the numerator and denominator
  - B. To multiply times 10
  - C. To know the ratio of males to females in the population
54. Leading causes of death are based on:
- A. Immediate causes of death
  - B. Underlying causes of death
  - C. Intermediate causes of death
55. A bar chart:
- A. Should always have vertical bars
  - B. Should have one bar that represents 100 percent.
  - C. Can display information in any natural order, such as alphabetically or by increasing age, or in an order that will produce increasing or decreasing bar lengths
56. True or false: The number of pregnancies is always larger than the number of births.
- A. True
  - B. False
57. Births, fetal deaths, and abortions are registered by:
- A. The location in which the mother lives
  - B. The location in which the baby lives
  - C. The location in which the event occurs
58. Which of the following is NOT a source of data on teen pregnancy?
- A. Census
  - B. Birth certificates
  - C. Abortion reports
59. The age group used to calculate a total pregnancy rate is:
- A. 21-35
  - B. 15-44
  - C. 13-45
60. What is the live birth rate for females, age 15-44, in 1998, if the number of live births was 720, the number of fetal deaths was 180, and the population was 12,314?
- A. 58.5 per 1,000
  - B. 73.1 per 1,000
  - C. 14.6 per 1,000

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61. What is the percent difference between the pregnancy rate among females age 15-19 and females age 20-24, if the pregnancy rate in the older age group is 215 pregnancies per 1,000 women and the rate in the younger group is 85 pregnancies per 1,000 women?
- A. 130% higher
  - B. 2.5 times higher
  - C. 152.9% higher
62. The most common confidence interval is the range of values that you would expect:
- A. 85% of the time
  - B. 95% of the time
  - C. 99% of the time
63. If we calculated the confidence interval for the live birth rate for teens in New York City, New York State and the United States, which rate would have the smallest confidence interval?
- A. United States
  - B. New York State
  - C. New York City
64. The Behavioral Risk Factor Surveillance System (BRFSS) is based on:
- A. Interviews conducted by telephone
  - B. House-to-house interviews
  - C. Mailed questionnaires
65. Data collected in a survey are weighted to adjust for:
- A. Sampling error
  - B. Representativeness of the sample
  - C. Survey design errors
66. The proportion of individuals in a population who exhibit a particular behavior at a given point in time is called the:
- A. Prevalence
  - B. Incidence
  - C. Frequency
67. A generally accepted rule of thumb for BRFSS data is to aggregate or combine data if the sample size is less than:
- A. 10 respondents
  - B. 35 respondents
  - C. 50 respondents

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- 68.** If the relative risk of dying of lung cancer for smokers compared to nonsmokers is 8, this tells us:
- A. 8 out of 10 smokers die of lung cancer
  - B. The death rate for lung cancer among smokers is 8 times the rate for nonsmokers.
  - C. Smokers are 8 times more likely to die than any other group.
- 69.** An example of attributable risk is defined as:
- A. The proportion of lung cancer deaths among smokers that can be attributed to smoking
  - B. The increased risk among smokers of dying from lung cancer
  - C. The percentage of lung cancer deaths in Washington State that is attributable to smoking
- 70.** Which of the following CANNOT be estimated using SAMMEC?
- A. Disease rates due to smoking
  - B. Costs due to smoking
  - C. Years of potential life lost due to smoking

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**Appendix A**

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**Answer Key to Exercises in Module 1** ..... **ii**

**Answer Key to Exercises in Module 2** ..... **ix**

**Answer Key to Exercises in Module 3** ..... **xiv**

**MODULE I. LEADING CAUSES OF DEATH**

**Exercise 1: Information from Death Certificates**

1. Complete the table below using the data on the three death certificates.

**Table 2**  
**Death Certificate Information**

<b>Questions</b>	<b>Robert Wilson</b>	<b>Harold Barstow</b>	<b>Sharon Black</b>
What was the decedent's: a. Age b. Place of death c. Marital status d. Occupation e. Education	16 <i>Hospital-DOA</i> <i>Never married</i> <i>Student</i> 10	15 <i>Hospital-ER</i> <i>Never married</i> <i>Student</i> 9	19 <i>Hospital-Inpatient</i> <i>Never married</i> <i>Sales Clerk</i> 12
What was the <b>immediate</b> cause of death?	<i>Cerebral hemorrhage</i>	<i>Cerebral hemorrhage</i>	<i>Pulmonary hemorrhage</i>
What was the <b>intermediate</b> cause of death, if any?	<i>Fractured skull</i>		
What was the <b>underlying</b> cause of death?	<i>Auto accident</i>	<i>Gunshot wound, head</i>	<i>Stab wound of lung</i>
Were there any other <b>contributing</b> causes of death?			<i>Several stab wounds of abdomen</i>
What was the <b>manner</b> of death?	<i>Accident</i>	<i>Suicide</i>	<i>Homicide</i>
What additional information is provided under " <b>Describe how injury occurred</b> "?	<i>Driver in auto - auto collision</i>	<i>Bullet wound to right side of head; self-inflicted with handgun</i>	<i>Stabbed by sharp instrument</i>

2. In what ways are the data on these death certificates similar? How are they different?

*Similarities: All are teenagers, have never been married, and are living with a parent. Robert and Harold have the same immediate cause of death (cerebral hemorrhage)*

*All three died at the hospital of unnatural causes.*

*Differences: The underlying causes of death and manner of death differ for all three.*

3. How does this death certificate form differ from the form used in your state or locality?  
*The answer will vary, depending on course location.*

**Exercise 2: Determining Leading Causes of Death**

**Table 3**  
**Selected Causes of Death, Helen's State, 1992-1996**  
**Age 15-24**

Cause	Deaths	Rank	Rate
Suicide (E950-E959)	329	2	21.09
Unintentional injuries (E800-E949)	577	1	37.00
Cancer (140-208)	56	4	3.59
Heart Disease (390-398, 402, 404-429)	26	5	1.66
Homicide (E960-E978)	65	3	4.16
Congenital Anomalies (740-759)	23	6	
HIV infection (*042-*044)	20	7	
Note: Deaths are 5-year totals			

- What were the 5 leading causes of death for adolescents 15-24 years of age in Helen's State during the time period 1992-1996? In the rank column, label each cause from 1 to 5, with 1 being the leading cause of death.  
*Unintentional injuries, suicide, homicide, cancer, heart disease.*
- Based on population estimates, Helen's State had 1,559,370 residents in the 15-24 age group for the 5-year period, 1992-1996. Using this figure, calculate the age-cause-specific death (mortality) rates for each of the top 5 causes identified in Question 1 and record them on Table 3. Show your answers with two decimal places.  
*See Table 3, above.*
- What are the 5 leading causes of death based on age-cause-specific mortality rates?  
*Unintentional injuries, suicide, homicide, cancer, heart disease.*
- Are your answers to Questions 1 and 3 the same or different? Why?  
*The answers are the same because the denominator (total number of 15-24 year olds in Helen's State, 1992-1996) is the same for all rates.*

**Exercise 3: Determining Gender Differences**

**Table 4**  
**Selected Causes of Death, Helen's State, 1992-1996**  
**Age 15-24, by Gender**

Cause	Males		Females	
	Deaths	Rate	Deaths	Rate
Suicide (E950-E959)	297	38.78	32	4.03
Unintentional injuries (E800-E949)	416	54.32	161	20.31
Cancer (140-208)	34	4.44	22	2.77
Heart disease (390-398, 402, 404-429)	18	2.35	8	1.00
Homicide (E960-E978)	49	6.39	16	2.01
Note: Deaths are 5-year totals				

1. Calculate the age-sex-cause-specific death rates for each cause of death and for both sex groups. Show your answers rounded to two decimal places. Record your answers on Table 4.

*See Table 4, above.*

2. Is the leading cause of death the same for males and females?

*Yes, the leading cause of death for both males and females is unintentional injuries.*

3. Rank the causes of death separately for males and females. Do the causes rank in the same order?

*Ranking for males: Unintentional injuries, suicide, homicide, cancer, heart disease.*

*Ranking for females: Unintentional injuries, suicide, cancer, homicide, heart disease.*

*The causes DO NOT rank in the same order.*

4. Is the suicide rate greater for males or females? What is the ratio of the suicide rate for males to the suicide rate for females? How could you express this ratio in common language?

*The suicide rate is greater for males than females. The male:female ratio for suicides is 9.6:1 ( $38.78 \div 4.03 = 9.6$ ). In common language, you could say that males commit suicide 10 times as often as females.*

5. What is the ratio of the homicide rate for females to the homicide rate for males? How could you express this ratio in common language?

*The female:male ratio for homicides is 0.32:1 ( $2.01 \div 6.39 = 0.315$ ). In common language, females die from homicide one-third as often as males.*

Exercise 4: Comparing Rates Over Time

**Table 5**  
**Selected Causes of Death in Helen's State, 1987-1991**  
**Age 15-24, by Gender**

Cause	Males		Females	
	Deaths	Rate	Deaths	Rate
Suicide (E950-E959)	195	26.35	39	5.21
Unintentional injuries (E800-E949)	446	60.27	168	22.45
Cancer (140-208)	34	4.59	27	3.60
Heart Disease (390-398, 402, 404-429)	16	2.16	16	2.13
Homicide (E960-E978)	38	5.13	20	2.67
Note: Deaths are 5-year totals				

- What were the three leading causes of death for males 15-24 years of age during the time period 1987-1991? What were the three leading causes for females?

*Males: Unintentional injuries, suicide, homicide.*

*Females: Unintentional injuries, suicide, cancer.*
- Have the three leading causes of death for male adolescents changed over the past 10 years? For females? If so, how?

*No, the leading causes have not changed for either gender.*
- For which of the five leading causes did the risk of death for 15-24 year olds decrease between 1987-91 and 1992-96?

*a. Males: Unintentional injuries and cancer.*

*b. Females: All causes.*
- For which of the five leading causes did the risk of death increase for 15-24 year olds between 1987-91 and 1992-96?

*a. Males: Suicide, homicide, and heart disease.*

*b. Females: None.*
- Calculate the following ratios, showing your answers rounded to two decimal places.

a. Ratio of the male homicide rate in 1987-91 to the rate in 1992-96:  
 $5.13 \div 6.39 = .80$ ; male homicide rate in 1987-91 is .80 times the rate in 1992-96.

b. Ratio of the male suicide rate in 1987-1991 to the rate in 1992-96:  
 $26.35 \div 38.78 = .68$ ; male suicide rate in 1987-91 is .68 times the rate in 1992-96.

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- c. Ratio of male to female homicide rates in 1992-96:

$6.39 \div 2 = 3.20$ ; in 1992-96, the male homicide rate is 3.18 times the rate for females.

- d. Ratio of male to female suicide rates in 1992-96:

$38.78 \div 4.03 = 9.62$ ; in 1992-96, the male suicide rate is 9.62 times the rate for females (or almost 10 times greater).

**Exercise 5: Analyzing Causes of Death**

**Table 6**  
**Methods of Suicide, Helen's State, 1992-1996**  
**Age 15-24**

Methods	1992-1996	
	Number	%
Poison solid/liquid (E950)	24	7.3
Poison - gas domestic (E951)	0	0
Poison - other gas/vapor (E952)	20	6.1
Hanging/strangulation/suffocation (E953)	56	17.0
Submersion (drowning) (E954)		
Firearms/explosives (E955)	0	0
Cutting/piercing (956)	220	66.9
Jumping (E957)	2	0.6
Other/unspecified (E958)	3	0.9
	4	1.2
<b>Total</b>	<b>329</b>	<b>100</b>

1. Calculate the percentage of suicides due to each type of method. Record your answers in Table 6. Show your work rounded to one decimal place.  
*See Table 6, above.*
2. Which two methods of suicide were used most often in 1992-96?  
*Firearms/explosives and hanging/strangulation/suffocation.*

**Exercise 6: More Analysis**

**Table 7**  
**Types of Firearms and Explosives Used for Suicide, Helen's State, 1992-1996**  
**Age 15-24**

Type	1992-1996	
	Number	%
Handgun (E955.0)	110	50.0
Shotgun (E955.1)	33	15.0
Hunting rifle (E955.2)	44	20.0
Military firearms (E955.3)	0	0
Other unspecified firearm (E955.4)	33	15.0
Explosives (E955.5)	0	0
Unspecified (E955.9)	0	0
Total	220	100

1. Complete Table 7 by calculating the percent of suicides caused by each of the various types of firearms and explosives. Show your work rounded to one decimal place.

*See Table 7, above.*

2. Which three specific types of firearms or explosives were used most often to commit suicides in 1992-96?

*Handguns, hunting rifles, and shotguns. Other unspecified firearms is tied with shotguns but includes a variety of types of firearms.*

3. How can this information be useful for program planning?

*This information can help target programmatic activities towards appropriate methods.*

**Exercise 7: Analyzing Past Presentations**

*The answers to this exercise are highly variable, depending on personal experience.*

**Exercise 8: Planning a Presentation**

*Again, the answers to this exercise are highly variable.*

## MODULE 2. TEEN PREGNANCY

### Exercise 1: Past Experience in Sharing Data

*The answers to this exercise are highly variable, depending on personal experience.*

### Exercise 2: Calculating Teen Birth and Pregnancy Rates

1. What is the birth rate for females in Burrows County, age 15-17, in 1997?  
22.5 per 1,000 ( $210 \div 9314 \times 1000$ ).
2. What is the pregnancy rate for females in Burrows County, age 15-17, in 1997?  
47.1 per 1,000 ( $[210 + 6 + 223] \div 9314 \times 1000$ ).
3. Suppose that Michael, by mistake, calculated the pregnancy rate for females age 15-17 using abortions by place of occurrence. What would the pregnancy rate be then?  
85.7 per 1,000 ( $[210 + 6 + 582] \div 9314 \times 1000$ ).
4. Are your rates the same as the rates quoted by Michael in the article? If not, how do they differ? How can you explain any differences?  
*The birth rate is the same as the rate in the article; however, the pregnancy rate is not. The actual pregnancy rate is 47.1 per 1,000, while the rate in the article is 86 per 1,000. The mistake was made because Michael used occurrence abortion rather than residence abortion.*

### Exercise 3: Comparing Teen Birth and Pregnancy Rates

1. What is the birth rate for females, age 15-17, in 1996?  
26.3 per 1,000 ( $241 \div 9167 \times 1000$ ).
2. What percent of females age 15-17 had a live birth in 1996? In 1997?  
2.6% in 1996 ( $249 \div 9167 \times 100$ ).  
2.3% in 1997 ( $249 \div 9314 \times 100$ ).
3. What is the pregnancy rate for females, age 15-17, in 1996?  
51.1 per 1,000 ( $[241 + 1 + 226] \div 9167 \times 1000$ ).
4. What is the percentage change in birth rates from 1996 to 1997 among 15-17 year olds?  
-14.4% ( $[22.5 - 26.3] \div 26.3 \times 100$ ).
5. What is the percentage change in pregnancy rates from 1996 to 1997 among 15-17 year olds?  
-7.8% ( $[47.1 - 51.1] \div 51.1$ ).

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6. Are your answers to questions 1, 2, and 3, above, the same as those quoted in the article? If not, how do they differ and why?

*The birth rate and pregnancy rate are the same as in the article. The percent of females having a live birth in 1997 is different (2.3% compared to 22%). This is because Michael forgot that the rate is per 1,000 and is not the same as a percent.*

**Exercise 4: Identifying Common Mistakes with Rates**

1. The newspaper article included the following statements involving or interpreting data. Based on your calculations, indicate which statements were correct and which were erroneous.

Statement	Correct	Incorrect
a. The pregnancy rate for females age 15-17 in 1996 was 51.1 per 1,000 females.	X	
b. The pregnancy rate for females age 15-17 in 1997 was nearly 86 per 1,000 teens.		X
c. The pregnancy rate for females age 15-17 doubled from 1996 to 1997.		X
d. The birth rate for females age 15-17 in 1996 was 26.3 per 1,000 females.	X	
e. The birth rate for females age 15-17 in 1997 was 22.5 per 1,000 females.	X	
f. Twenty-two percent of teens had babies in 1997.		

2. For those statements that were not correct, reword them in the space below so that the revised statements reflect the data more accurately.

- b. The pregnancy rate for resident females age 15-17 in 1997 was 47.1 per 1,000.*
- c. The pregnancy rate for resident females age 15-17 decreased 7.8% from 1996 to 1997.*
- f. Slightly more than 2 percent of resident teens (2.3%) had babies in 1997.*

3. What mistakes did Michael make? What could have been done to avoid them?
- Michael used the overall number of abortions performed in the county (“occurrence” abortions) rather than the number of abortions among county residents.*
  - Michael referred to the teen pregnancy rate as a percentage instead of saying “per 1,000” (when referring to the percentage of teens giving birth in the county).*

4. What could Alicia have done to ensure that Michael understood the data?
  - *Alicia could have asked Michael questions to be sure that he understood the data, knew exactly what to do with it, and knew what to ask when he called the State health department for the abortion data.*
  - *Alicia should have avoided getting “caught up” in Michael’s deadline, and delayed giving him any information until she felt comfortable with the data.*
  - *Alicia could have offered to obtain the abortion data and calculate all of the rates herself, before faxing them to Michael.*

### Exercise 5: Measuring Confidence

1. Which geographic area had the highest and lowest birth rates for women 15-17 from 1985 to 1996?  
*Baker.*
2. Which geographic area had the lowest birth rate in 1989?  
*Jackson.*
3. Which geographic area had the highest birth rate in 1993?  
*Jackson.*
4. Did the birth rate in either of the two counties ever equal the birth rate for the State?  
*Yes, the lines on the graph cross many times.*
5. Which areas do you think are most likely to have the following rates in 1997?
  - a. 25.0 *Baker.*
  - b. 35.0 *Jackson.*
  - c. 31.0 *State.*
6. On what basis did you choose your answers for the question above?  
*Guessed based on rates for earlier years.*

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**Exercise 6: Determining Significance**

1. What are the confidence limits for the number of teen pregnancies in Burrows County in 1997?

$$\begin{aligned} \text{Lower limit} &= 439 - [1.96 \times 20.95] \\ &439 - 41.06 \\ &397.94 \\ &398 \end{aligned}$$

$$\begin{aligned} \text{Upper limit} &= 439 + [1.96 \times 20.95] \\ &439 + 41.06 \\ &480.06 \\ &480 \end{aligned}$$

2. What is the confidence interval for the teen pregnancy rate in Burrows County in 1997?

$$\begin{aligned} \text{Lower limit} &= 47.1 - [1.96 \times 47.1/20.95] \\ &47.1 - [1.96 \times 2.25] \\ &47.1 - 4.41 \\ &42.69 \end{aligned}$$

$$\begin{aligned} \text{Upper limit} &= 47.1 + [1.96 \times 47.1/20.95] \\ &47.1 + [1.96 \times 2.25] \\ &47.1 + 4.41 \\ &51.51 \end{aligned}$$

*The confidence interval is 42.69 to 51.51.*

3. Was the decrease in the teen pregnancy rate in Burrows County from 1996 to 1997 statistically significant?

*The difference between the teen pregnancy rates for 1996 and 1997 is:*

$$51.1 - 47.1 = 4$$

*The statistic is:*

$$\begin{aligned} &1.96 \times \sqrt{[51.1^2/468 + 47.1^2/439]} \\ &1.96 \times \sqrt{[2611.21/468 + 2218.41/439]} \\ &1.96 \times \sqrt{[5.58 + 5.05]} \\ &1.96 \times \sqrt{10.63} \\ &1.96 \times 3.26 \\ &6.39 \end{aligned}$$

*The difference between the two rates (4) is less than the calculated statistic (6.39); thus, the difference is not statistically significant.*

## MODULE 3. SMOKING AND HEALTH

### Exercise 1: Interpreting Prevalence Estimates

1. What is the sample size for State C? How does this sample size compare with the sample sizes for other states?  
*Sample size for State C is 3,598. Four states have a smaller sample size; the rest are larger.*
2. What is the 95% confidence interval for State C's estimate? What does this mean?  
*22.02 to 25.16; this means that we can be 95% confident that the true prevalence is between 22.02 and 25.16.*
3. What is the current smoking prevalence (%) estimate in State C:
  - a. For all adults?           23.59
  - b. For males?                26.27
  - c. For females?             21.15
4. How do State C's sex-specific current smoking prevalence estimates compare with those of other states?  
*Females: 5 are lower and 4 higher; males: 8 are lower and 1 higher.*
5. The national smoking prevalence among people aged 18 and older is 24.7%. What is the percent difference between State C and the nation as a whole?  
*The state is 4.5% lower than the nation  $[(23.59 - 24.7) \div 24.7 \times 100]$ .*
6. Decide whether each of the following is a measure of incidence or a measure of prevalence.
  - a. In Alabama, 14.4% of persons 18 and over had no health insurance in 1997.  
*Prevalence*
  - b. Among persons 18 and over 15.5% reported that they had no health insurance at some time during 1997.  
*Incidence*
  - c. In State C, 21.15 % of females 18 and older were current smokers.  
*Prevalence*
  - d. Among females 18 and older who were current smokers, 11.45% reported that they had attempted to quit smoking during the last 12 months.  
*Incidence*
  - e. Among females 18 and older who were current smokers, 95% reported that they had attempted to quit smoking at some time in their life.  
*Prevalence*

**Exercise 2: Comparing Regional and State Prevalence Estimates**

1. What is the ratio of the smoking prevalence estimate in District 3 to the State as a whole?  
*27.77 ÷ 22.61 or 1.2:1. District 3 is 1.2 times higher than the State .*
2. Which sex has the higher smoking prevalence in District 3? In the State?  
*Males are higher in both the district and the state.*
3. Do the confidence limits for all adults in District 3 and the State overlap? Is the difference in smoking prevalence in District 3 and the State statistically significant?  
*The confidence limits do not overlap. Their difference is statistically significant.*

**Exercise 3: Calculating the Burden of Risk**

1. Compute the relative risk of dying from lung cancer for males and females who have ever smoked, ages 35-64 and age 65 and older. Record your answer in the Relative Risk column on Table 6, below. Show your answers rounded to two decimal places.
2. Which group of smokers has the strongest association between lung cancer deaths and smoking? Which group has the lowest association? Why do you think the risk might be higher for males?  
*Males over 65 years of age have the strongest association between lung cancer deaths and smoking; females age 35-64 have the lowest association.*
3. Now, calculate the attributable risk of death from lung cancer due to smoking in each sex and age group. Record your answers in the Attributable Risk (Percent) column, showing them as percents rounded to one decimal place.

**Table 6**  
**Burden of Lung Cancer, Health District 3, 1994-1996**

Group	Relative Risk	Attributable Risk (Percent)	Population Attributable Risk
<b>EVER SMOKERS</b>			
<b>Males</b>			
Ages 35-64	4.88	79.5%	67.8%
Ages 65+	10.93	90.8%	81.5%
<b>Females</b>			
Ages 35-64	3.91	74.4%	55.2%
Ages 65+	7.73	87.0%	72.8%

4. What can you conclude from the attributable risk percents?
  - b. *The proportion of lung cancer deaths among smokers probably due to smoking.*
  
5. How many lung cancer deaths could have been averted among males 65 years of age and older?
 
$$90.8\% \times 113 = 103$$
  
6. How many lung cancer deaths could have been averted among males and females 35 years of age and older who smoked?
 
$$(79.5\% \times 41) + (90.8\% \times 113) + (74.4\% \times 20) + (87.1\% \times 51) = 33 + 103 + 15 + 44 = 195$$
  
7. Finally, compute the population attributable risk for each sex and age group. Record your answers in the Population Attributable Risk column as a percent rounded to one decimal place.
  
8. How many lung cancer deaths would have been averted if no one in District 3 over the age of 35 had ever smoked? How does this answer compare with your answer to #6?
 
$$.678 \times (7 + 41) = 33$$

$$.815 \times (13 + 113) = 103$$

$$.552 \times (7 + 20) = 15$$

$$.728 \times (10 + 51) = 44$$

$$33 + 103 + 15 + 44 = 195 \text{ deaths averted}$$

*This answer is identical to that in #6, because all of the deaths are attributable to smoking.*

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**Exercise 4: Preparing a Fact Sheet**

*The answers to this exercise are highly variable.*

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**Appendix B: Answers to Exam Questions**

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46. B	59. B
47. C	60. A
48. C	61. C
49. B	62. B
50. A	63. A
51. A	64. A
52. C	65. B
53. A	66. A
54. B	67. C
55. C	68. B
56. A	69. A
57. C	70. A
58. A	