

예방의학교육에서의 핵심역량과 학습내용 개발 사례(미국)

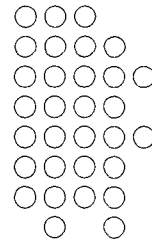
천 병 철

고려대학교 의과대학 예방의학교실

예방의학 교육의 핵심역량과 학습내용 -외국사례

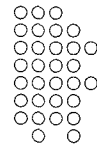


천병철
고려대학교 의과대학 예방의학교실



내 용

- 핵심역량기반의 교육
- ATPM의 예방의학 핵심역량과 학습내용
- Patient, Doctors & Society (PDS) curriculum
- UCLA의 Preventive Medicine & Epidemiology



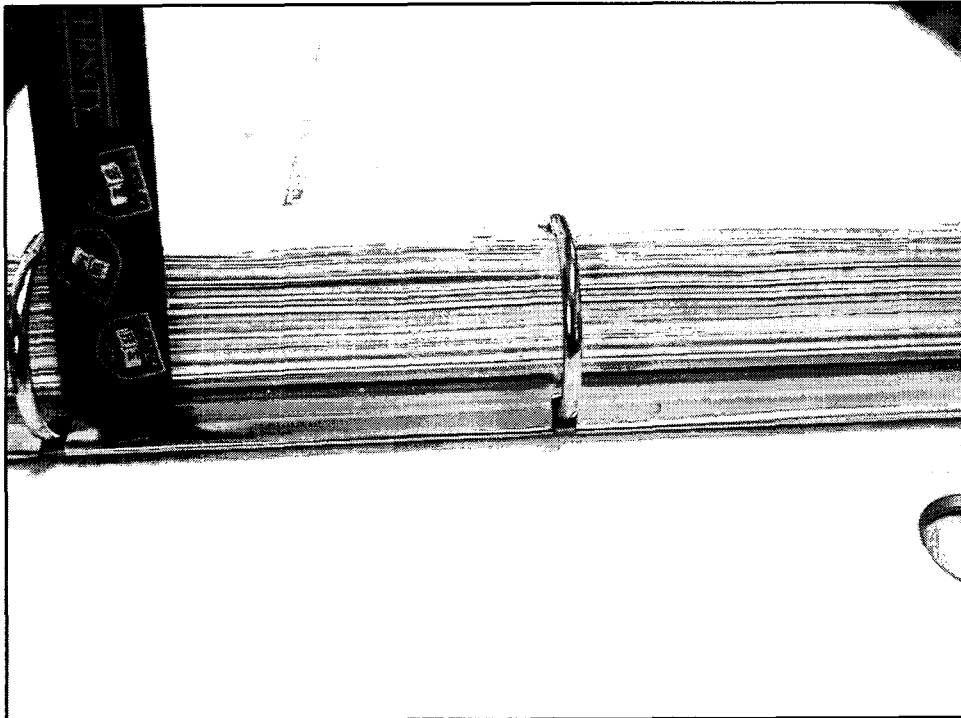
UCLA Preventive Medicine & Epidemiology



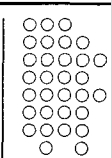
BIOMEDICAL SCIENCES 241

PREVENTIVE MEDICINE AND EPIDEMIOLOGY

Fall, 1997-1998



PREVENTIVE MEDICINE AND EPIDEMIOLOGY BIOMEDICAL SCIENCES 241 Fall, 1997				PREVENTIVE MEDICINE / EPIDEMIOLOGY BIOMEDICAL SCIENCES 241 Fall Quarter, 1997-98					
DATE	TIME	TOPIC	LECTURER	DATE	TIME	TOPICS	LECTURER		
Th	10/30/97	9:00am	Clinical Epidemiology: Introduction	Vadheim	Th	9/18/97	9:00am	Introduction	Vadheim
		11:00am	Diagnosis and screening				9:00am	Basic Concepts, Definitions	
			Office Hour - after class		F	9/19/97	1:00pm	Virtual Office Hour - (310) 222-3842	
F	10/31/97	1:00pm	Virtual Office Hour - (310) 222-3842		Th	9/25/97	9:00am	Evaluating Studies and Results	Vadheim
Th	11/6/97	9:00am	Community interventions/preventive medicine	Vadheim			11:00am	Clinical Trials & Biomedical Experiments	
		11:00am	Evaluating interventions					Office Hour - after class	
			Office Hour - after class		F	9/26/97	1:00pm	Virtual Office Hour - (310) 222-3842	
Th	11/13/97	9:00am	Choosing and evaluating therapies	Vadheim	Th	10/2/97	9:00am	Cohort Studies	Vadheim
		11:00am	hand in outline of Methods for Project				11:00am	Cross-sectional studies	
			Office Hour - after class					Other Descriptive Studies	
								Office Hour - after class	
F	11/14/97	1:00pm	Virtual Office Hour - (310) 222-3842		F	10/3/97	1:00pm	Virtual Office Hour - (310) 222-3842	
Th	11/20/97	9:00am	Health in the 1990's	Vadheim	Th	10/9/97	9:00am	Investigating an Outbreak	Prendergast
		11:00am	Screening, ethical and other issues					Disease Surveillance	
			Office Hour - after class					Public Health Department	
F	11/21/97	1:00pm	Virtual Office Hour - (310) 222-3842		F	10/10/97	1:00pm	Virtual Office Hour - (310) 222-3842	
Th	12/4/97	11:00am	Health priorities	Vadheim	Th	10/16/97	9:00am	Designing a study	Vadheim
		11:00am	Health delivery and finance				11:00am	Evaluating a study/journal article	
			Office Hour - after class					Introduction to hypothesis testing	
F	12/05/97	1:00pm	Virtual Office Hour - (310) 222-3842					hand in draft of Background, Aims	
								Office Hour - after class	
Th	12/11/97	9:00am	FINAL EXAM		Th	10/23/97	9:00am	Hypothesis testing	Vadheim
F	12/12/97	12:00pm	FINAL DRAFT OF PROPOSAL DUE				11:00am	Approach to analysis	
								hand in Problem Set	
								Office Hour - after class	



학습목표

7-1997 11:10AM FROM UCLA VACCINE CENTER 310 782 8776

MAJOR COURSE OBJECTIVES

Overall Objectives

1. To enable you to read and evaluate the medical literature critically and intelligently
2. To acquaint you with some key concepts involved in the analysis and interpretation of medical data
3. To introduce you to the idea of preventive medicine, and show you how it can be used in your practice of medicine

Methods in Epidemiology

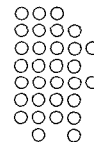
학습목표



Methods in Epidemiology

4. To acquaint you with methods used for measuring and describing the impact of infectious diseases on a population
5. To familiarize you with resources and methods available for the investigation and control of disease outbreaks
6. To familiarize you with types of study designs commonly encountered in the medical literature
7. To sensitize you to the strengths and weaknesses of certain common study designs
8. To demonstrate to you the contributions of epidemiology to an understanding of disease pathogenesis and control
9. To show you how epidemiology can aid in understanding disease etiology and plan for health care delivery
10. To present basic genetic concepts which will allow you to interpret genetic information on risks for certain diseases
11. To give you an appreciation for the role of individual (host) factors in the pathogenesis of disease

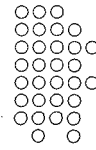
학습목표



Clinical Epidemiology and Preventive Medicine

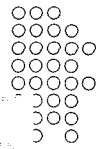
12. To help you develop an appreciation for the logical application of diagnostic tests
13. To aid you in developing an approach to incorporating new medical knowledge into your clinical practice (including such areas as diagnostic and screening tests and new therapies)
14. To show you how preventive medicine is being used today
15. To give you insights into how you may apply preventive medicine principles to your own practice of medicine.
16. To inform you about the major health problems in the US and the world.
17. To introduce you to the current health goals of the US.
18. To give you insights into the major preventable health risk factors.
19. To explore differences in disease prevalence in sub-populations in the US.
20. To introduce you to some of the important issues in health care today including: health care priorities, the delivery of care and medical economics.

Course Organization : 3 sections



- Lecture (2 hr)
- Active/Interactive work in small groups of 2–7 students : Readings, In-class problem Sets/ Exercise, Discussion sessions
- Project proposal : project protocol

Example 1 : Case-Control Study



LECTURE NOTES - SESSION 3 continued

IV. DESIGN OF CASE-CONTROL STUDIES

A. Definition

B. The Nestor Paradigm

C. Advantages and Uses of the Case-Control Study

D. Case-control Studies as the Classroom Experiment

LECTURE OUTLINE - SESSION 3 continued

E. Strengths and weaknesses

1. strengths

2. weaknesses

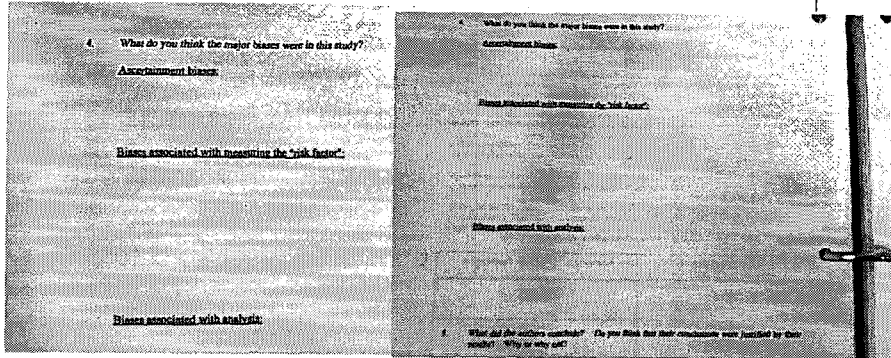
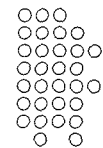
F. Analysis of Results

1. Main comparisons

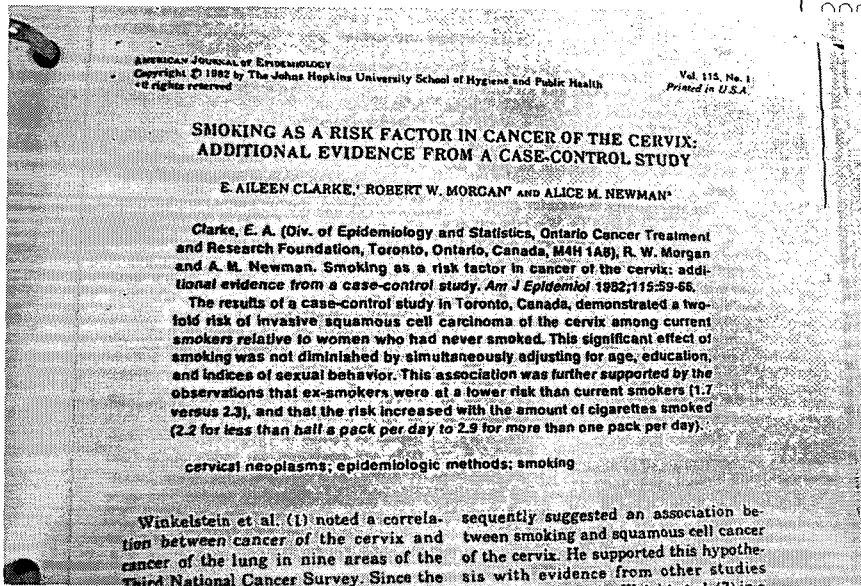
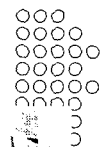
2. Comparative Measures of Risk: ODDS RATIO

3. Other Measures: EFFICACY

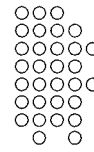
Example 1 : Case-Control Study



Example 1 : Case-Control Study



Example 1 : Case-Control Study



Part I. Paper 1: Siciliana et al

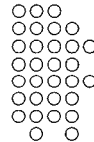
1. How were cases defined?

2. How were controls defined? Selected? (Be sure to define both the source and study populations)

3. What potential confounders were evaluated in the study? (Complete table)

Potential Confounder	How Defined	How Assessed	How Controlled For

Example 1 : Case-Control Study

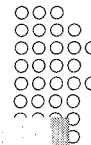


3. For each of the studies, define the target population and the source population (for both cases and controls, if different). Do you feel that the authors chose an appropriate source population(s) for the intended target population(s)? Why or why not?

4. What were the important differences in the choice of potential confounders, the definitions of these confounders, and/or the way the authors dealt with these confounders between the two studies?

5. Compare the conclusions reached by the two studies. Which of the two, in your estimation, reached the sounder (more believable) conclusion? Why? (cite your evidence; hint: think about the "4 Questions")

Example 2 : Screening



**The New England
Journal of Medicine**

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Volume 331SEPTEMBER 1, 1994Number 9

**USE OF A RAPID ASSAY OF SUBFORMS OF CREATINE KINASE MB TO DIAGNOSE
OR RULE OUT ACUTE MYOCARDIAL INFARCTION**

PETER R. PULEO, M.D., DENISE MEYER, B.S., CHEVEL WATREN, B.S., CYRIL B. TAWA, M.D.,
SUSAN WHEELER, M.D., ROBERT J. HAMBURG, M.D., NADIR ALI, M.D., STEVEN D. OBERMUELLER, M.D.,
J. FERNANDO TRIANA, M.D., JANICE L. ZIMMERMAN, M.D., M. BENJAMIN PERRYMAN, Ph.D.,
AND ROBERT ROBERTS, M.D.

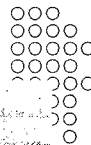
Abstract. *Background.* Ruling out myocardial infarction in patients coming to the emergency room with chest pain is hindered by the lack of a specific early diagnostic marker. Less than 30 percent of patients admitted to coronary care units have infarction, resulting in substantial unnecessary expenditures. We developed a rapid assay of the subforms of creatine kinase MB (CK-MB) and prospectively analyzed its sensitivity and specificity in diagnosing myocardial infarction in the first six hours after the onset of chest pain.

Methods. In 1110 consecutive patients who came to the emergency room with chest pain, blood samples were collected every 30 to 60 minutes until at least 6 hours after the onset of symptoms; in patients who were then admitted to the hospital, samples were collected every 4 hours for up to 48 hours. The samples were analyzed for CK-MB subforms, and the diagnosis of myocardial infarction was confirmed by conventional CK-MB analysis.

Results. Of the 1110 patients evaluated, 121 had myocardial infarction. The sensitivity of the assay of CK-MB subforms to detect myocardial infarction in the first six hours after the onset of symptoms was 95.7 percent, as compared with only 48 percent for the conventional CK-MB assay; the specificity was 93.9 percent among patients hospitalized without myocardial infarction and 96.2 percent among those sent home. Among the patients with myocardial infarction, definitive results of the subform assay were available a mean (\pm SD) of 1.22 ± 1.17 hours after their arrival in the emergency room.

Conclusions. The assay of CK-MB subforms reliably detected myocardial infarction within the first six hours after the onset of symptoms, and its use could reduce admission to the coronary care unit by 50 to 70 percent, thereby reducing costs. (N Engl J Med 1994;331:581-6.)

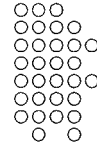
Example 2 : Screening



Read the article by Puleo et al, then answer the following questions:

1. What was the "gold standard" diagnosis to which the new assay is being compared?
2. Was the test evaluated in an appropriate spectrum of patients with and without the target disease, as well as in individuals with disorders that might be confused with the target disease?
3. What was the reproducibility of the test result?
4. How was an "abnormal" result (for CK-MB subforms) defined?
5. What was the: sensitivity of the test:
specificity of the test:
false positive rate:
false negative rate:
6. What was the incidence of acute MI in the study population?
7. If the incidence of acute MI was only 1% that in the study population, what would the effect be on the:
sensitivity of the test:
specificity of the test:
false positive rate:
false negative rate:
8. You are evaluating using this new test in your HMO (a large cap, like Kaiser). Will you choose to use it? Why or why not?

학습방법의 원칙



	인지 사실검지식	인지 문제해결	정서 태도	정동 수기, 능력	정동 행동, 수행
강의	+++	+	+	+	+
토론	++	++	+++	+	+
문제중심학습	++	+++	+		+
프로젝트학습	+++	+++	+	+	+
역할모델		+	++	+	++
현실체험	+	++	++	+++	+++
모의체험	+	++	++	+++	+
행동/환경개입			+	+	+++

+++ 매우 적합 ++ 적합 + 미흡

Using the Case-discussion Method to Teach Epidemiology and Biostatistics

Paul R. Marantz, MD, MPH, William Burton, PhD, and Penny Steiner-Grossman, EdD, MPH

ABSTRACT

Medical students must learn the principles of epidemiology and biostatistics to critically evaluate the medical literature. However, this subject has traditionally been difficult to teach. In 1997 at the Albert Einstein College of Medicine, the required first-year course in epidemiology and biostatistics was revised to use the case-discussion teaching method. In preparation for the course, experienced faculty participated in an intensive, two-day training workshop. The course, taught to 163 first-year medical students, was structured in two parts: (1) three lectures complemented by a detailed syllabus, followed by a multiple-choice midterm exam; and (2) six case-discussion seminars, followed by a short answer/essay final exam. There were seven case-discussion groups with 23-24 students each. The program was evaluated using subjective faculty feedback, examination scores, and student evaluation questionnaires. Faculty

noted excellent student preparation and participation. Multiple-choice exam scores were comparable to those from earlier years, and a short answer/essay exam demonstrated good student mastery of the required material. Student evaluation was overwhelmingly positive, and significantly improved from prior years of the course. Positive student evaluations of the course using this teaching method continued over the next four years; National Board of Medical Examiners examination scores indicated success in mastery of the material; and student assessment of the course improved on the AAMC Graduation Questionnaire. This favorable experience suggests that case-discussion teaching can be employed successfully in teaching principles of epidemiology and biostatistics to medical students.

Acad. Med. 2003;78:365-371.

Paper critique as an educational method in epidemiology

NEAL ALEXANDER

*Infectious Disease Epidemiology Unit, Department of Infectious and Tropical Diseases,
London School of Hygiene and Tropical Medicine, UK*

SUMMARY *A common method in the teaching of epidemiology at the London School of Hygiene and Tropical Medicine is 'paper critique'. This refers to a close reading of published research articles, in which students are asked to assess their coherence and validity. The intention is to improve the students' analytic and writing skills, as well as acting as a form of summative assessment. In this paper, the author links his experience of this method to concepts such as rhetoric, myth and semiology, and uses them to try to develop paper critique as an educational method.*

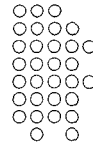
activity in which materials—such as a list of specific questions, and a 'model answer'—are prepared for a particular journal article.

Burnett's (1997) book is devoted to the exercise of criticism in higher education, although contains little on textual analysis as a mode of criticism. However, its division of criticism into three aspects (pp. 16–19) may be useful:

- 'Critical thinking' means 'cognitive acts undertaken by individuals'.
- 'Critical thought' is 'collaborative in character', being a

Medical Teacher, Vol. 25, No. 3, May 2003, pp. 287–290

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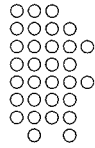
CORE COMPETENCIES IN DISEASE PREVENTION AND HEALTH PROMOTION FOR UNDERGRADUATE MEDICAL EDUCATION

Created by the Association of Teachers of Preventive Medicine-Health Resources and Services
Administration Task Force, October 1997

SUPPLEMENT TO ACADEMIC MEDICINE
Volume 75, Issue 7, July 2000

* ATPM의 예방의학 핵심역량은 한글로 번역하여 부록으로 첨부하였습니다.

ATPM을 통한 예방의학 교육의 학습내용과 학습방법의 공유

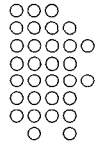


The screenshot displays the ATPM website interface. At the top, there is a navigation bar with the ATPM logo and the text 'ASSOCIATION OF TEACHERS OF PREVENTIVE MEDICINE'. Below this, the page is divided into sections:

- Order Publications Online**: A section for purchasing materials.
- CURRICULUM MATERIALS**: A section listing various educational resources:
 - Updated curriculum for Medical Education**: Case-based teaching modules for medical education.
 - Immunization: You Call the Shots**: A comprehensive web-based self-study product in development.
 - The first module entitled "Understanding the Basics: General Recommendations for Vaccination"**: Will be available spring 2005.
 - Other modules in this series include**: Diphtheria, Tetanus, Pertussis; Poliovirus; Hemophilus influenzae Type B (Hib); Measles, Mumps, Rubella; Hepatitis A, Hepatitis B, Infectious Mononucleosis; Varicella; Meningococcal; Vaccine Administration Practices; Overview of Immunization.
 - Teaching Immunization Practices (TIM) for Nurses**: A comprehensive, ready-to-use immunization curriculum for all levels of nursing education. Includes a link to [Download a free copy](#).
 - Increase Adult Vaccination Rates: What Works**: Provides primary care providers strategies to increase immunization rates among adult patients.
- CURRICULUM GUIDELINES**: A section listing various curriculum guides:
 - Curriculum of Immunization and Child Protection for Nurses, Prevention and Health Education**: A planning curriculum guide for undergraduate medical education that defines the components of disease prevention/health promotion appropriate for general education of all physicians.
 - Core Competencies in Disease Prevention and Health Promotion for Undergraduate Medical Education**
 - Essentials of Clinical Prevention and Population Health Curriculum Framework**: A product of the Health Practice Curriculum Task Force providing a structure

TEACHING IMMUNIZATION

→ for Medical Education (TIME)



REVISED BY
Richard Kent Zimmerman, MD, MPH
 October 2004

SPONSORED BY
 Association of Teachers of Preventive Medicine
 Centers for Disease Control and Prevention

Background on the Multistation Clinical Teaching Scenarios (MCTS) Method	page 5
Suggested Schedule for MCTS Session	page 5
Objectives	page 6

Module Pages

- Scenario 1 page 7
- Scenario 2 page 9
- Scenario 3 page 11
- Scenario 4 page 14
- Scenario 5 page 16
- Scenario 6 page 18

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INFLUENZA PREVENTION

Small-Group Booklet

The project was supported by funding from the Centers for Disease Control and Prevention (CDC), National Immunization Program, through Cooperative Agreement 5U49CE000418 to the Association of Teachers of Preventive Medicine.

INFLUENZA PREVENTION MCTS

SCENARIO SIX

Scott is a 19-month-old with chronic lung disease caused by premature birth. He is in the office today (November) for a well-child care visit. He has received three doses of inactivated poliovirus vaccine (IPV), three doses of diphtheria and tetanus toxoids and acellular pertussis vaccine (DTaP), four doses of *Haemophilus influenzae* type b (Hib) conjugate vaccine, three doses of hepatitis B vaccine, and four doses of pneumococcal conjugate vaccine.

• Learning Aids

1. Prevention and Control of Influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP); sections: Recommendations for Using Inactivated and Live, Attenuated Influenza Vaccines; Target Groups for Vaccination; Timing of Annual Influenza Vaccination; and Dosage. (<http://www.cdc.gov/nip/publications/ACIP-list.htm>)

• Questions for Learners

1. Does Scott need influenza vaccination?
2. Given that Scott has never received influenza vaccine, if he were to be vaccinated, how many doses would he need? What type of vaccine should he receive?
3. Can influenza vaccine be administered simultaneously with other vaccines?
4. Do any of Scott's contacts need influenza vaccine?

CASE STUDIES \$ 6.00 per case study; \$108.00 per set

- A Cluster of Group A Streptococcal Postoperative Wound Infections (1989)
- A Measles Outbreak in a Highly Vaccinated Population: Health Sector Muyinga, Burundi 1988-1989 (1992)
- A Mixed Bag in Michigan (The PBB Story) (1991)
- An Epidemic Disease in South Carolina (1992)
- An Outbreak of Appendicitis in Oneida (1988)
- An Epidemic of Thyrotoxicosis (1992)
- An Outbreak of Enteritis During a Pilgrimage to Mecca (1991)
- An Outbreak of Hemorrhagic Fever in Africa ("Ebola") (1992)
- An Outbreak of Jaundice in a Rural County (1992 update)
- An Outbreak of Neurologic Syndrome Among Factory Workers (1991 update)
- Cigarette Smoking and Lung Cancer (1992 update)
- Epidemic Measles in a Divided City (Texarkana) (1990)
- Injury Surveillance (1990 update)
- Listeriosis in Costa Rica (1990)
- L-Tryptophan and Eosinophilia-Myalgia Syndrome (1992 update)
- Oral Contraceptive Use and Ovarian Cancer (1992 update)
- "Oswego:" An Outbreak of Gastrointestinal Illness Following a Church Supper (1992 update)
- Screening for Antibody to the Human Immunodeficiency Virus (1992 update)
- Suspected Legionnaires' Disease in Bogalusa (1991)
- Tampons and Toxic Shock Syndrome (1992 update)
- Vinyl Chloride and Cancer (1988)
- Comparing the Effects of Cholesterol Screening and Treatment Programs (1993)
- Evaluating Programs Designed to Increase the Use of Bicycle Helmets (1993)
- Health Economics: Options for a STD Clinic (1993)
- Mammography for Women 40-49 Years Old and Impact on Breast Cancer Mortality (1993)
- Meta-Analysis of Alcohol and Breast Cancer (1992)

Case Study Example

Oral Contraceptive Use and Ovarian Cancer



Student's Guide

Learning Objectives

After completing this case study, the participant should be able to:

- Outline the sequence of an epidemiologic analysis;
- Discuss the biases of particular concern in case-control studies and ways to minimize their influence;
- Describe why and when to use crude and adjusted odds ratios and 95% confidence intervals, and how to interpret them; and
- Define and recognize effect modification and confounding.

This case study was developed by Richard Dicler and Peter Layde in 1981. Current version updated by Richard Dicler with input from the EIS Summer Course instructors.



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service



Case Study Example

Several studies had noted an increased risk of ovarian cancer among women of low parity, suggesting that pregnancy exerts a protective effect. By preventing pregnancy, oral contraceptives (OCs) might be expected to increase the risk of ovarian cancer. On the other hand, by simulating pregnancy through suppression of pituitary gonadotropin release and inhibition of ovulation, OCs might be expected to protect against the subsequent

To study the relationship between oral contraceptive use and ovarian cancer (as well as breast and endometrial cancer), CDC initiated a case-control study – the Cancer and Steroid Hormone (CASH) Study in 1980. Case-patients were enrolled through eight regional cancer registries participating in the Surveillance, Epidemiology, and End Results (SEER) program of the National Cancer Institute.



Question 1: Which investigations need to be reviewed by an institutional review board? Does this investigation need to be reviewed?

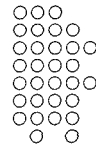
Table 1. Ever-use of oral contraceptives among ovarian cancer cases and controls, Cancer and Steroid Hormone Study, 1980-1981

USE OF OCs	CASE-CONTROL STATUS		Total
	Case	Control	
Ever	a = 83	b = 259	H ₁ = 1052
Never	c = 96	d = 593	H ₀ = 789
Total	V ₁ = 179	V ₀ = 1642	T = 1821

Question 4: From these data, can you calculate the risk of ovarian cancer among oral contraceptive users? Why or why not?

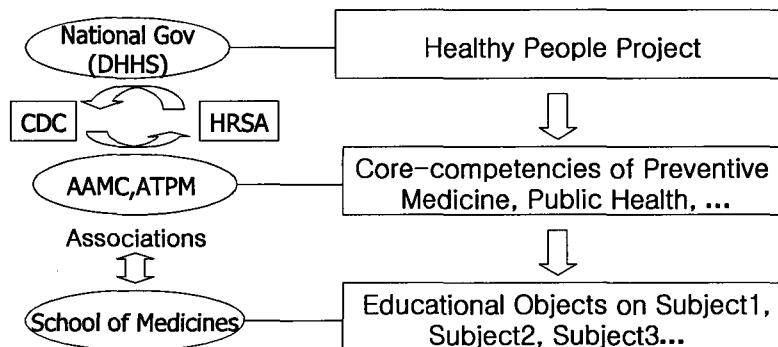
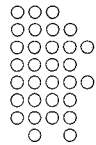
Question 5: Describe the rationale behind using the odds ratio as an estimate of the risk ratio. When is the odds ratio not an appropriate estimate of the risk ratio?

예방의학 분야의 학습목표 설정과 교육내용의 공유기관



- ATPM
- ACPM
- AAMC
- CDC
- HRSA
- Public Health Leadership Institute(PHLI)
- Public Health Training Network(PHTN)
- Council on Education in Public Health

Competency-based Education



- AAMC : American Ass of Medical College
- ATPM : Ass of Teachers of Preventive Medicine,
- HRSA : Health Resource and Service Administration

Education of Preventive Medicine & PH



- **1945 : AAMC & APHA recommendation**
 - All medical Schools should have Dept of Preventive Medicine
 - All medical students : epidemiology, biostatistics, environmental health

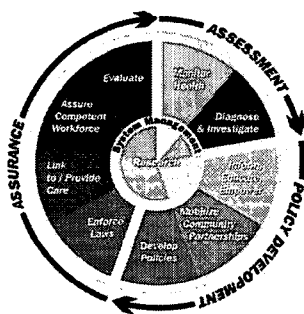
- **1984 : ATPM & CDC**
 - An inventory of Knowledge and skills relating to Dz Prevention & Health Promotion (DPHP) : written guide for curriculum

- **1995 : CDC & HRSA, "Prevention in Medical Education for the year 2000"**
 - 구체적인 전략보고서 : ATPM, AAMC conference

- **1997 : AAMC report (MSOP)**
 - Adequate Dz prevention & health promotion education : 54% in 1993, 76% in 1997

- **1998: AAMC: MSOP report for medical informatics and population health**
- **1998 : ATPM & HRSA : Core competencies in DPHP for undergraduate ME**

Ten Essential Services (TES) of Public Health



1. MONITOR HEALTH status to identify community health problems.
2. DIAGNOSE AND INVESTIGATE health problems and health hazards in the community.
3. INFORM, EDUCATE, AND EMPOWER people about health issues.
4. MOBILIZE COMMUNITY PARTNERSHIPS to identify and solve health problems.
5. DEVELOP POLICIES and plans that support individual and community health efforts.
6. ENFORCE LAWS and regulations that protect health and ensure safety.
7. LINK people TO needed personal health SERVICES AND assure the provision of health CARE when otherwise unavailable.
8. ASSURE a COMPETENT public health and personal health WORKFORCE.
9. EVALUATE effectiveness, accessibility, and quality of personal and population-based health services.
10. RESEARCH for new insights and innovative solutions to health problems.

Essential Services and Core Public Health Competencies



	Analytic Skills	Comm. Skills	Pol. Dev. Skills	Cultural Skills	Basic PH Science	Ldrshp. Systems	Mgmt. Skills
Monitor Health	****	**		**	****	*	*
Diagnose/Investigate	****	****	*	****	****	*	
Inform Community	*	****	*	****	*	**	*
Mobilize Partners		****	*	****		****	*
Develop Policy	*	***	****	****	*	****	**
Enforce Laws		***	*	*	*	**	*
Link to/Provide Care	*	**	*	***	**	*	*
Assure Competent Workforce	*	**		*	**	**	*
Evaluate	****	**	*	**	***	*	*
Research	****	**		**	***		

능력요구도 도메인과 교육수요자의 직위별 매트릭스의 예

Domain #1: Analytic Assessment Skills



Specific Competencies	Front Line Staff	Senior Level Staff	Supervisory and Management Staff
1. Defines a problem	Knowledgeable to proficient	Proficient	Proficient
2. Determines appropriate uses and limitations of both quantitative and qualitative data	Aware to knowledgeable	Proficient	Proficient
3. Selects and defines variables relevant to defined public health problems	Aware to knowledgeable	Proficient	Proficient
4. Identifies relevant and appropriate data and information sources	Knowledgeable	Proficient	Proficient
5. Evaluates the integrity and comparability of data and identifies gaps in data sources	Aware	Proficient	Proficient
6. Applies ethical principles to the collection, maintenance, use, and dissemination of data and information	Knowledgeable to proficient	Proficient	Proficient
7. Partners with communities to attach meaning to collected quantitative and qualitative data	Aware to knowledgeable	Proficient	Proficient
8. Makes relevant inferences from quantitative and qualitative data	Aware to knowledgeable	Proficient	Proficient
9. Obtains and interprets information regarding risks and benefits to the community	Aware to knowledgeable	Proficient	Proficient
10. Applies data collection processes, information technology applications, and computer systems storage/retrieval strategies	Aware to knowledgeable	Knowledgeable to proficient	Knowledgeable to proficient
11. Recognizes how the data illuminates ethical, political, scientific, economic, and overall public health issues	Aware	Knowledgeable to proficient	Proficient

Elements for Basic Competency in Public Health.

Examples of core content for "Orientation to Public Health" or "Public Health Prospectives" for state and local health department employees.

History of Modern Public Health - Early Beginnings	<ul style="list-style-type: none"> London Cholera Epidemic 1796 Immunization of U.S. Soldiers for Smallpox Sanitation: safe food, water, and sewage Immunization; public health nursing
Public Health in Transition: Forces of Change	<ul style="list-style-type: none"> Medicaid Health care reform Managed care The Institute of Medicine Report: The Future of Public Health
Public Health: A Dynamic System	<ul style="list-style-type: none"> Public health agency as a learning community Public health as an interdisciplinary practice Core Functions and Essential Services Multi sector partnerships -- roles and functions Organizational and professional standards
Core Functions and Essential Services	<ul style="list-style-type: none"> Definitions Dynamic interaction Competencies needed for 21st century public health practice
Competencies - Definitions and Applications	<ul style="list-style-type: none"> Analytic Communications Policy Development Cultural Basic Public Health Science Visionary Leadership and Systems Thinking Management and Information Mgt. Others-ibid (e.g., Ethics-Confidentiality)
Local Public Health Systems: Working with Communities	<ul style="list-style-type: none"> Definition of community Developing partnerships for public health action Improving community health outcomes- Tools of the Trade- e.g., APEX-CPH-Assessment Protocol for Excellence in Community Public Health; HP 2010



Soc: _____ Epidemiologist _____ Practice Setting: State Health Agcy _____

Level of Responsibility

Entry Intermediate Advanced

Monitor
Investigate
Educate
Mobilize
Develop Policies
Enforcement
Linkage to Services
Prepare Workforce
Evaluate
Research

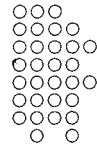
Individual Competencies Needed for Standard Occupational Classification Matrix

Competencies Matrix by Career Level

	Standard Occupational Classification				
	Environ'l Health Specialist	Health Educator	Health Services Admin.	Nurse	Physician
Monitor					
Investigate					
Educate					
Mobilize					
Develop Policy					
Enforcement					
Linkage to Services					
Prepare Workforce					
Evaluate					
Research					

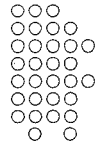


예방의학과 PDS



- Patients, doctors & Society 커리큘럼의 특징
- 예방의학 학습내용과 PDS 커리큘럼
- 예방의학 학습내용과 방법의 공유
Ex) Supercourse

결론



- 새로운 학습목표를 달성하기 위한 새로운 학습내용과 학습도구의 개발 필요
- PBL과 discussion, 모의 훈련 등의 방법도입
- 학습내용 및 학습도구를 학회를 통해서 공유
- 지속적 지원 및 개발
- PDS 커리큘럼의 주체적 참여

미국 예방의학교수협의회(ATPM) 예방의학 학습목표

1. 임상예방 부문

*핵심/최소한의 기대 결과

기본적으로 커리큘럼은 학생들에게 다음과 같은 사항을 준비할 수 있게 해야 한다.

1. 건강 데이터의 현존의 출처들을 사용하면서, 연령과 성별에 기반을 둔 국내 이 환률과 사망률의 주요 원인을 나열하고 중요하게 한정할 수 있는 각각의 위험요인들을 나열할 수 있다.

2. 적합한 지침에 사용되는 환자의 연령, 성, 위험 요소에 근거한 추천된 임상 예방 서비스를 파악하여 설명할 수 있다.(USPSTF(the Preventive Services Task Force), 면역화 실행 자문 위원회, 또 다른 적합한 지침과 같은 것) 여기에는 다음과 같은 것이 포함된다.

a. 일차 의료에 일반적으로 사용되는 선별 검사(예: Pap test, 유방조영술, BP measurement, blood lead)

b. 예방 상담(금연, 식이 조절, 운동, 손상 예방, 생식 건강)

c. 예방접종

d. 예방화학요법 (아스피린, 호르몬 대체 요법, 지방 저하 약물들)

3. 추천된 임상예방서비스를 직접 제공하기에 적합한 의사소통 및 정신신체 술기를 증명(Demonstrate)할 수 있다. 여기에는 다음과 같은 것이 포함된다.

a. 적합한 환자의 병력을 얻을 수 있다. (직업, 환경 노출, 최근 진행, 심리 사회적, 성적, 약물 복용/남용-처방약과 OTC 약을 포함)

b. 선별 검사를 수행(즉, Pap test, clinical breast exam, BP measurement, substance abuse screening(약물 남용 선별))

c. 예방 상담을 할 수 있다.(금연, 식이 조절, 운동, 손상 예방, 가정 폭력, 외상 예방)

d. 예방접종 관리(상담, 예:나타나거나 혹은 잠재된 부작용, 투여 기술)

e. 예방화학요법을 처방한다.(상담, 예: 아스피린 예방의 나타나거나 잠재된 부작용, 호르몬 대체 요법)

f. 항생제의 예방적 사용

4. 임상에서 질병예방과 건강증진 서비스의 통합과 이용을 증가시키기 위한 보건 시스템을 설명할 수 있다.(공급자와 수요자를 위한 remind system의 사용 등)

5. 환례발견(case-finding)과 선별 프로그램과 연관된 다음의 임상, 윤리, 법적 이슈를 설명할 수 있다.

- a. 표지의 잠재적 음성 효과(labeling effect)
- b. 위양성 검사, 위음성 검사의 의미
- c. 치료할 수 없는 상태의 발견시 환자에 대한 대처
- d. 양성 결과의 추적 관찰의 부족시 야기할 수 있는 문제
- e. 선별 검사의 정확도와 관련된 문제

6. 다양한 건강 관리 제공자, 여러 분야가 통합된 건강 관리팀, 상담/의료전달에 필요한 자원, 임상 예방 서비스와 보완대체의료 공급자의 지역사회자원의 역할을 정의할 수 있다.(예: 체중 감량에 dietician의 사용, 아동 학대 케이스의 사회 사업가, 대체의학)

7. 임상 상황에서 질병의 전파를 이해 하고, 일반적 주의(universal precaution) 지침을 취하는데 필요한 지식과 기술을 표시할 수 있다.

2. 계량화 술기 교육 과정

*핵심/최소한의 기대 결과

기본적으로 커리큘럼은 학생들에게 다음과 같은 사항을 준비할 수 있게 해야 한다.

1. 인구집단에서 질병의 부하를 나타내는 방법을 정의하고 해석할 수 있다(발생률, 유행률, 연령보정율, 치명률, 기대여명, 질보정생존연수(quality-adjusted life years)).

2. 질병 유행발생의 개념을 설명하고, 어떻게 유행조사하는지를 demonstrate할 수 있다..

3. 연관성의 측정에 일반적으로 사용되는 지표를 설명할 수 있다(비교위협도, 기여위협도, 교차비, 인과성의 원리).

4. 진단검사와 집단검진에서 계량 역학의 원리를 정의하고 적용할 수 있다(민감도, 특이도, 양성예측치, 타당성, 신뢰도).

5. 의학 및 과학 연구논문을 비평적으로 평가하고 임상적 실행에 직접 적용할 수 있는 기술을 증명할 수 있다. 여기에는 다음과 같은 개념을 포함한다.

- a. 연구설계의 적절성과 정확함
- b. 데이터 수집의 방법
- c. 바이아스(편견)와 혼란변수의 발생요인
- d. 결과의 정확한 해석
- e. 증거의 표준
- f. 예방 시술의 효과크기의 결정

6. 다음과 같은 통계 적용의 기본 개념과 도구들을 기술할 수 있다.

- a. 연속변수와 이산변수의 개념
- b. 중심 경향성의 측정: 범위, 평균, 정중앙, 표준오차, 분산
- c. 연관성과 차이성의 개념: type I errors, type II errors, 인구집단의 차이, 변수 사이의 연관성, 통계적 유의성 검정, 신뢰구간
- d. 인구동태통계의 사용과 수집방법, 건강상태 자료, 건강 서비스자료, 인구 특성을 분석하는 보건 추세, 보건수요
- e. 생존분석의 기본개념을 이해할 수 있다.

7. 의학과 공공보건문헌에 일반적으로 근거한 연구 계획의 기본적인 요소를 기술하고 해석할 수 있다.

- a. 단면조사 연구
- b. 후향 연구(환자-대조군 연구)
- c. 코호트 연구
- d. 무작위 임상 시험
- e. 유사실험연구/후향성 및 진행성

3. 보건 서비스 조직과 전달

*핵심/최소한의 기대 결과

기본적으로 커리큘럼은 학생들에게 다음과 같은 사항을 준비할 수 있게 해야 한다.

1. 공공 보건 체계의 구조와 기능을 정의할 수 있다. 또한 지역사회와 국가 보건 서비스의 의료전달체계에 포함된 다른 기관들(예를 들어 병원 ; 의료 기관; 외래, 회복, 그리고 장기(적인) 의료 시설들 ; 자택 요양 기관들)을 모니터링하고 유지하는 공공 보건 기관의 역할을 정의할 수 있다(평가assessment, 정책 개발policy development, 보장assurance).

2. 예방, 치료, 재활 서비스를 위한 보건의료재정 확보에 사용하는 일반적 방법을 설명할 수 있다.

3. 건강수준과 보건의료서비스를 결정하는 주는 사회적, 경제적, 정치적 영향력을 나열할 수 있다.

4. 보건의료의 질을 평가하는데 사용되는 방법을 나열할 수 있다(HEDIS, 환자 만족도조사, 동료 조사 체제(PROs), 의료이용평가(UA), CQI)

5. 보건의료 전문가와 그 서비스가 어떻게 조절되고 관리되는지 설명할 수 있다. (예: principles of tort liability, informed consent, 기밀성, 개업인가, 임상특권, ethical standards in research)

6. 보건의 서비스의 접근도, 의료이용, 의료의 질 등이 건강결과(health outcome)에 어떻게 영향을 주는지 설명할 수 있다(산전진찰의 접근과 이용에 기초한 출산결과 등)

7. 경제적 분석의 기본원리와 중요성을 설명할 수 있다(비용효과분석, 비용편익 분석)

4. 지역 사회 차원의 의료서비스에 대한 학습목표

*핵심/최소한의 기대되는 결과

기본적으로 커리큘럼은 학생들에게 다음과 같은 사항을 준비할 수 있게 해야 한다.

1. 다음과 같은 지역사회 대상의 인구집단기반 보건사업의 구성요소를 기술할 수 있다.

- a. 목표 집단의 확인.
- b. 목표 집단의 건강수요 확인.
- c. 건강수요에 대해서 우선순위 매기기
- d. 건강 수요에 대응하기 위하여 입법, 독성 산업 폐기물 청소, 작업장 손상 예방, 금연 정책, 건강한 학교 급식들과 같은 지역사회기반 활동의 적절한 보건사업 개발
- e. 보건사업의 효과 평가.
- f. 평가에 근거한 향후 보건사업의 수정

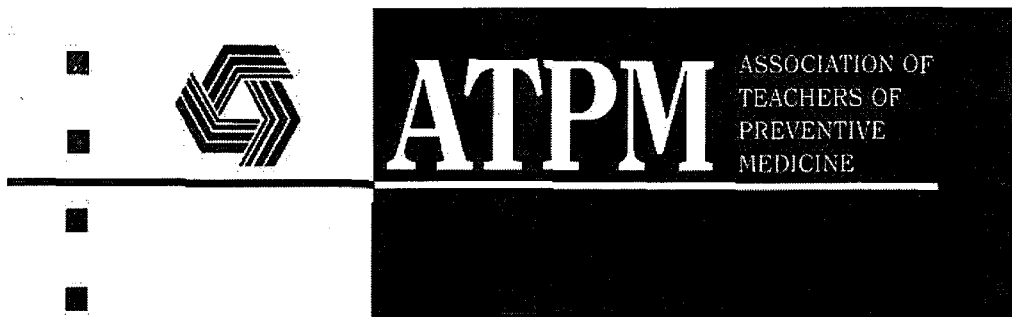
2. 개인과 집단의 특성(예를 들어 언어, 종교적 신념, 수입, 교육, 문화, 인종, 민족성, 생활양식)이 질병의 발생과 공급에 어떻게 영향을 미치는지와 보건 서비스의 이용에 어떻게 영향을 미치는지를 기술할 수 있다.

3. 지역사회내 위험에 노출된 집단의 잠재적으로 불리한 건강 결과와 이들에게 필요한 적절한 임상예방서비스를 나열하고 설명할 수 있다. 여기에는 취약계층(노인, 장애인, 노숙자, 이민자 등), 시설수용자(교도소, 요양원 등), 직업적으로 위험에 노출된 계층(농부, 광부, 보건의료제공자 등)을 포함한다.

4. 공공기관에 대한 의사의 책임을 기술할 수 있다.(예: FDA의 약물 부작용에 대한 보고, 주나 지방 보건국에 신고대상질병의 보고, 법적 권력에 대한 아동 학대의 보고 등)

5. 세계 보건의 중요한 문제점들(예를 들어 지역 역학, 인구 통제, 전염병의 전파 위험, 환경문제, 건강의 불균형적 분배, 의료서비스, 전세계적 갈등으로 인한 부작용)을 기술할 수 있다.

6. 질병 예방과 건강 증진을 위한(예를 들어 Healthy People 2010의 개발을 통한) 보건 정책을 중재하고 개발시키는데 있어 정부의 역할을 기술할 수 있다.



**AN OUTBREAK OF A NEUROLOGIC SYNDROME
AMONG FACTORY WORKERS IN TAIWAN
Centers for Disease Control 1991 EIS Course**

Case Study	1 - 8
Instructors' Manual: Questions and Answers Only	9 - 16

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**AN OUTBREAK OF A NEUROLOGIC SYNDROME AMONG FACTORY WORKERS IN
TAIWAN**

Objectives

After completing this case study, the participant should be able to:

1. List the sequential steps taken when investigating an outbreak.
 2. Explain the rationale for implementing control measures prior to confirmation of an etiologic agent.
 3. Discuss possible obstacles to the application of control measures and possible means to overcome such obstacles.
 4. Discuss strategies for rapidly informing the public about public health threats.
-

PART I

In early October 1986, a physician at the National Taiwan University Hospital was contacted concerning a possible outbreak of a neurologic illness among workers employed at a printing factory in Chang Hwa City, located 150 miles from Taipei, Republic of China. Seven of the plant's 40 workers had reportedly become ill between September 28 and 30 with one or more of the following signs and symptoms: ptosis, diplopia, difficulty swallowing, slurred speech, proximal muscle weakness, and dyspnea.

QUESTION 1: What additional information would you like to obtain during this telephone conversation?

QUESTION 2: What is the differential diagnosis?

PART II

Based on the cranial nerve findings of the patients and an initial environmental inspection of the work site which was unrevealing, the physician suspected that the neurologic symptoms were not due to an occupational exposure. Rapid repetitive stimulation electromyography tests performed on two of the patients revealed an incremental response consistent with a diagnosis of botulism intoxication.

On October 14, the investigating physician contacted the Bureau of Disease Control to report this outbreak of neurologic symptoms compatible with acute botulism intoxication. A team from the Department of Health departed immediately to investigate this outbreak.

QUESTION 3a: List the usual sequence of steps in an outbreak investigation.

QUESTION 3b: How might this sequence be altered when botulism is suspected?

CDC-EIS, 1991: Neurologic Syndrome

The physician who had initially evaluated the seven cases provided the following summary information:

TABLE 1
Characteristics of 7 Cases of Botulism
Chang-Hwa City, September 28-30, 1986

<u>Case</u>	<u>Onset</u>	<u>Ptosis</u>	<u>Diplopia</u>	<u>Dysphagia</u>	<u>Dysphonia</u>	<u>Weakness</u>	<u>Dyspnea</u>	<u>Hospitalized?</u>
1	9/28	Y	Y	Y	Y	Y	Y	Y(died)
2	9/28	Y	Y	Y	Y	Y	Y	Y
3	9/29	Y	Y	Y	N	N	N	N
4	9/29	Y	N	Y	Y	Y	N	N
5	9/29	Y	Y	Y	Y	N	N	Y
6	9/29	Y	Y	Y	Y	Y	Y	Y
7	9/30	Y	Y	N	N	Y	N	N

QUESTION 4: Using the available data, formulate a case definition to be used in this outbreak.

When the team visited the factory, they learned that one of the seven patients was the cook who ran the factory cafeteria and had no direct occupational exposure to the factory. She was the most seriously ill of the seven and was unable to be interviewed since she was on a respirator. On the basis of this discovery and a clinical picture compatible with botulism, investigators thought that the most likely source was an improperly preserved food. The investigators developed a questionnaire which focused on meals eaten in the cafeteria on the 26th and 27th of September. These dates were chosen since all cases became ill between the 28th and 30th of September and the incubation period for botulism is between 12 and 36 hours. The data are summarized in Table 2 on the following page.

CDC-EIS, 1991: Neurologic Syndrome

TABLE 2
Breakfast Location on 26 or 27 September Among Ill and Non-ill Factory Workers

	Ill	Not Ill	Total	Percent Ill
Breakfast in cafeteria	7	7	14	50.0%
Breakfast not in cafeteria	0	25	25	0.0%
Total	7	32	39	

QUESTION 5a: Based on the data in Table 2, what calculations might you perform to quantify and evaluate a possible association? Perform those calculations.

QUESTION 5b: Interpret your results.

Nine food items were served at the breakfasts on September 26 and 27. These items included several commercially preserved canned foods and home-made preserved ginger. When the persons who had eaten breakfast on one of the two days were questioned about specific foods consumed, none of the food items was found to be significantly associated with subsequent illness. Some of the preserved ginger served at the two breakfasts was still available for testing. Although no left-overs or partially empty cans of the eight other items remained from the implicated breakfasts, unopened cans of most of these items were found in the cafeteria's kitchen.

QUESTION 6a: Discuss some of the possible reasons why no specific food from the breakfast could be implicated.

QUESTION 6b: How would you proceed with your investigation to determine the vehicle of transmission?

PART III

Initial testing of the acidity and salinity of the single home-made product, preserved ginger, showed that it was an unlikely vehicle for transmission of botulism. The preserved ginger and remaining cans of items served at the implicated breakfasts were then sent to the laboratory for bacteriologic and biologic testing. Serum specimens were also obtained from some of the surviving patients, though the specimens were gathered 2-3 weeks after onset of illness.

At the end of the third week in October, an unopened jar of preserved peanuts produced by factory X was positive for type A botulinal toxin. Serum specimens for all tested patients were negative. Some public health officials thought a product recall should be initiated at this point.

QUESTION 7: In light of the absence of botulinal toxin in collected serum and the identification of toxin only in an unopened jar of peanuts, is a product recall appropriate? Discuss the arguments for and against a product recall from the point of view of the health department.

PART IV

The Department of Health recommended a product recall to protect the public from the potentially lethal effects of the preserved peanuts while further investigations of the factory and the product were undertaken. Until this time the public and medical community at large had been unaware of the problem. The proposal for a product recall met with resistance for the following reasons:

1. Some opponents felt that there was not sufficient proof to implicate this product as the cause of the outbreak.
2. There were no additional cases reported suggesting that the outbreak was over, therefore, why alarm anyone.
3. It would potentially have adverse economic effects upon the canning industry.

QUESTION 8a: How would you respond to each of the above points offered by opponents of the recall?

QUESTION 8b: In considering a product recall, who should be informed of the product recall and why?

QUESTION 8c: What information would you include in the recall message for each target group?

QUESTION 8d: What methods would you use to reach each target group?

PART V

A product recall was implemented. Information concerning the recall was frequently broadcast by radio and television over several days and people were advised to return any Factory X peanuts to the nearest government health facility.

Two more cases of botulism occurred in Cnang Hwa County in late November. A 68 year-old woman and her 6 year-old grandson developed symptoms of botulism within 24 hours of eating peanuts that had been produced by Factory X on 10 September, the same day as the can implicated in the printing factory outbreak. The woman died at home on November 29, and the grandson was hospitalized with severe respiratory depression on November 30. A serum specimen collected shortly after admission was positive for type A botulinal toxin. The boy was placed on mechanical ventilation and treated with antitoxin provided by the Department of Health. He required prolonged assisted ventilation, but recovered completely.

QUESTION 9: What are the possible reasons for additional cases despite the aggressive recall program?

PART VI

An investigation of the factory revealed that it was not licensed to produce canned foods. The company was a small, family-run business with fewer than 15 full-time employees. It had been processing preserved foods in bulk quantity for more than 20 years, but it had been canning for only about 6 years. The factory owner supervised all food processing and relied only on his memory for ingredients and steps in processing. There were no production records available to compare batches of peanuts produced on September 10 with other batches prepared on other days. There were no sales or distribution records to assist in the recall of the product. The only food processing equipment in the factory was several large cauldrons and a labeling machine. The factory didn't have pressurization equipment required by law for thermal processing of low-acid foods such as peanuts.

Laboratory analysis of samples of product recalled as of 26 November revealed that 9 of 12 jars of peanuts produced on September 10 were positive for toxin, compared to none of 32 jars from batches produced on other days.

QUESTION 10: How can a recurrence of this problem in the canning industry be prevented? Are these proposals practical in this setting?

Reference

Chou JH, Hwang PH, Malison MD. An outbreak of type A foodborne botulism in Taiwan due to commercially preserved peanuts. *Internal J Epidemiol* 1988; 17:899-902.