

Suggested Answers to Selected Case Study Questions

Chapter 1

Case Study No. 1:

Racial Differences in the Incidence of Cardiac Arrest and Subsequent Survival

- A.1. Differences in risk factors. Blacks have more hypertension, left ventricular hypertrophy, and end-stage renal disease that are risk factors for cardiovascular disease. There also may be differences in access to treatment for these risk factors. Social or cultural factors or lack of knowledge may prevent blacks from avoiding these risk factors. Lack of knowledge about recognizing the signs and symptoms of cardiac disease also may prevent blacks from seeking needed help for the treatment of risk factors.
- A.2. Factors influencing survival, or prognostic factors, include age, initial cardiac rhythm, whether or not the cardiac arrest was witnessed, whether or not cardiopulmonary resuscitation was initiated by a bystander, response time, socioeconomic status, and location of victim.
- A.3. The city department of public health could work with a local Red Cross, hospital, fire department, or American Heart Association to teach members of the community first aid and cardiopulmonary resuscitation techniques and how to use the emergency response system.
-

Case Study No. 3: Rural Populations and Public Health Services

- A.1. From the most recent census obtain additional information on population characteristics: number of persons <5, 5–18, and 65 years of age and over; percentage of population in poverty; percentage covered by Medicaid. Obtain information on the number of primary care providers in the county, health status indicators such as birth rate, cause-specific death rates, immunization rates, and infectious disease patterns.
- A.2. Arrange for community town halls meetings on the matter. Contact local development associations to determine whether any new economic initiatives are being planned.
-

**Case Study No. 5:
Why Aren't 100% of Children Immunized Against Common Childhood Illnesses?**

- A.1. Inaccurate record keeping on the part of the office staff could have failed to flag the charts of children who were "due" for a vaccination. Interruptions in the access of the independent practice association to vaccine supplies. Problems with vaccination production by commercial suppliers due to increased regulation of vaccination formulation processes. Children may not necessarily see the same physician at each encounter. Lack of continuity with provider has been identified as a barrier to immunization.
- A.2. Lack of knowledge about the appropriate administration of vaccinations during an episode of acute childhood illness; reluctance to allow children without insurance for immunization into their practice; lack of evening and weekend hours for working parents.
-

Chapter 2

**Case Study No. 2: Inappropriate Emergency Department Visits
by Members of a Health Maintenance Organization (HMO)**

- A.1. To determine agreement beyond chance, the kappa statistic should be computed:

$$P_o = (257-1411)/1745 = .96$$

$$P_e = \{[(277 \times 314)/1745] + [(1468 \times 1431)/1745]\}/1745 = .72$$

$$k = (P_o - P_e)/(1 - P_e) = (.96 - .72)/(1 - .72) = .86$$

- A.2. The kappa of .86 indicates that there was excellent agreement between the two physicians. Therefore, use of criteria to determine what is an appropriate emergency room visit promotes the achievement of reliability.
-

Case Study No. 3: A Breast Cancer Screening Program

- A.1. First, compute the number of women with breast cancer:

$$250,000 \times 0.3\% = 750 \text{ women}$$

Next, find the number of true positives:

$$750 \times 95/100 = 742$$

- A.2. Continuing with the information from Q.1, obtain the number of women without breast cancer:

$$250,000 - 750 = 249,250$$

Determine the number of false positives:

$$249,250 \times (1-99/100) = 2,492$$

The data from Q.1 and Q.2 result in the following 2x2 table:

Mammography result	Breast cancer		
	Yes	No	
Positive	742	2,492	
Negative	8	246,758	
Total	750	249,250	250,000

A.3. Yes. The specificity and sensitivity are both high. Thus, you have a high probability of accurately classifying a woman who is positive from mammography screening to truly have breast cancer. You also have a high probability of determining that if a woman tests negative, she does not have the disease; only eight women are false negatives.

Chapter 3

Case Study No. 1: In-Hospital Mortality from Hip Fractures in the Elderly

A.1. Age-specific mortality rates:

$$\begin{aligned} \text{Rate}_{65-69 \text{ years of age}} \text{ per } 100 &= 68/2542 \times 100 = 2.68 \text{ per } 100 \\ \text{Rate}_{70-74 \text{ years of age}} \text{ per } 100 &= 140/3842 \times 100 = 3.64 \text{ per } 100 \\ \text{Rate}_{75-79 \text{ years of age}} \text{ per } 100 &= 216/5374 \times 100 = 4.02 \text{ per } 100 \\ \text{Rate}_{80-84 \text{ years of age}} \text{ per } 100 &= 297/6541 \times 100 = 4.54 \text{ per } 100 \\ \text{Rate}_{>85 \text{ years of age}} \text{ per } 100 &= 618/9071 \times 100 = 6.81 \text{ per } 100 \end{aligned}$$

Race-gender specific mortality rates:

$$\begin{aligned} \text{Rate}_{\text{white males}} \text{ per } 100 &= 392/4970 \times 100 = 7.87 \text{ per } 100 \\ \text{Rate}_{\text{white females}} \text{ per } 100 &= 847/20,675 \times 100 = 4.10 \text{ per } 100 \\ \text{Rate}_{\text{black males}} \text{ per } 100 &= 38/506 \times 100 = 7.51 \text{ per } 100 \\ \text{Rate}_{\text{black females}} \text{ per } 100 &= 62/1209 \times 100 = 5.13 \text{ per } 100 \end{aligned}$$

The mortality rate increases with advancing age. White males are at highest risk for death followed by black males, black females, and white females.

- A.2. The higher death among males may be due to a higher proportion of the injuries associated with more serious injuries incurred in motor vehicle accidents, assaults, and falls from heights.
- A.3. Since there is a smaller number of deaths in the cells resulting from the cross-tabulation of age group, gender, and race, this was done in order to have stable rates in the population subgroups examined.
- A.4. Death certificates.
- A.5. Deaths may not have been recorded on the hospital discharge abstract as there may not be a legal requirement for doing so, since death certificates are viewed as the standard mechanism for reporting this event. This would underestimate the inpatient mortality rate. Persons with a hip fracture may be readmitted for management of the hip fracture. This also could underestimate the rate because these persons would artificially increase the denominator. If procedure codes are not used concurrently with diagnosis code, persons with hip fracture may be missed. If in-hospital death occurred in the unidentified case, the rate could also be underestimated; otherwise the rate would be overestimated.
-

Case Study No. 2: Medicaid Prenatal Care: Fee-for-Service Versus Managed Care

A.1.

Payer	Low birth weight	Normal weight	Total
Managed care	276	5,846	6,122
Fee-for-service	821	12,632	13,453

Odds ratio = $276/5846 \div 821/12,632 = 0.73$.

Among Medicaid women, the likelihood of a low birth weight baby is less in the managed care group than in the fee-for-service group.

Case Study No. 3: Gender Differential Trends in Prevention, Diagnosis, Classification, and Treatment of Coronary Heart Disease (CHD)

- A.1. Age-specific mortality rates by gender.
 - A.2. Males, 65–74 years of age, for both questions.
 - A.3. In general, mortality rates among men showed a steeper decline than among women.
 - A.4. There may be a greater public awareness of risk factors among men and a higher rate of preventive health behaviors aimed at reducing these factors. Some studies show that there may differences in seeking and obtaining care, with women experiencing more delays in the recognition and treatment of CHD.
 - A.5. CHD in women may be underdiagnosed due to delays in symptom recognition by patient.
 - A.6. Initiate an educational campaign to educate women members about the fact that heart disease is a leading cause of morbidity and mortality among women. Include in the educational campaign information about actions members can take to help reduce their risks that both prevention (e.g., reducing the amount of dietary fat intake), secondary health intervention (cholesterol screening, blood pressure screening), and tertiary intervention (encourage cardiac rehabilitation).
-

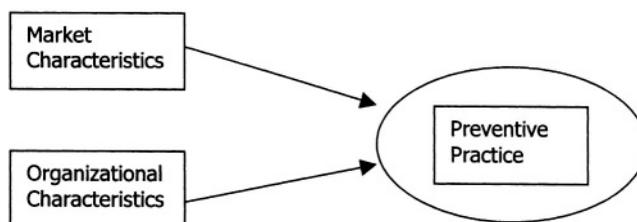
Case Study No. 5: Risk Factors for Coronary Artery Disease (CAD)

- A.1. $RR = 12.6 \text{ per } 100 \text{ population} / 7.7 \text{ per } 100 \text{ population} = 1.64$
 - A.2. A RR of 1.64 means that smokers are 1.64 times more likely to develop CAD than nonsmokers.
 - A.3. $PAR \% = [P_e (RR - 1)] / [1 + P_e (RR - 1)] \times 100\%$
 $= [0.42(1.64 - 1)] / [1 + 0.42(1.64 - 1)] \times 100\%$
 - A.4. In this case, the RR helps define causation and provide an estimate of the degree to which a risk factor plays a role for an individual. The RR indicates that smoking elevates one's chances of developing CAD and, therefore, health promotion services should include methods for assisting an individual in quitting smoking.
-

Chapter 4

Case Study No. 1: Applying the Scientific Method to Develop a Strategy for Assessing HMO Performance in Preventive Practice

A.1.



- A.2. Market characteristics are not associated with preventive practice for elderly persons in HMOs in an urban area. Note that you should specify the independent variable before the dependent variable. The population in which the hypothesis is to be tested should also be specified (HMOs in an urban area in this case).
- A.3. Multiple linear regression analysis or structural equation modeling (LISREL). Since most of the independent and the dependent variables are interval level of measurement, the linear regression technique is the most powerful. Also, there is only one dependent (or outcome) variable: prevention score. Before applying this statistical test to your data, you should evaluate the distribution of your independent and dependent variables to make sure they meet the normality assumption of these statistical tests.
- A.4. Determine which of the factors are statistically significantly associated with prevention score. Determine that confounding has been accounted for either by design or statistical control.
-

Case Study No. 5: Developing a Conceptual Framework for Community-Based Violence Prevention

- A.3. The 1995 National Alcohol Survey for information at the individual level (e.g., violent behaviors, individual and household-level variables). The US Census for 1990 for information on community level education, unemployment, and income.
- A.4. Multilevel analysis.
-

Chapter 5

Case Study No. 1: Strategic Planning for a County Health Department

- A.1. Yes. Although the situation is one full of change, there is no evidence of a crisis situation. Strategic planning could help the Health Department effectively address these changes and chart its future direction.
- A.2. No. The executive director is new; he lacks a sense of the organization's history, and he received mixed messages when members of the Health Department's board shared their vision of where the department should go in the future. Staff of the organization have never had the opportunity to reflect formally on the organization's mission. There is a policy and procedures manual that was compiled some time ago. It describes the mandates of health departments if they are to receive state monies as local public health agencies. The role the department has taken on as a provider of mental health services (a role not essential for health departments) was not addressed in the dated publication (which rarely had been removed from the shelf in recent years anyway). Developing consensus on a mission for the Health Department is a step appropriate for inclusion in the strategic planning process.
- A.3. The types of data appropriate for review by the Health Department include the following: financial data pertinent to funding of the department's programs and service-specific income and expense data; statistical reports that present data relevant to trends in the utilization of services and to the characteristics of those served; county- and statewide morbidity data for reportable diseases and vital statistics (contained in reports prepared by the Illinois Department of Public Health); census data for the county and other data describing the demographic and socioeconomic characteristics of county residents; reports by state agencies (such as the Department of Mental Health and Developmental Disabilities) that provide an inventory of services available for treatment of acute and

chronic illnesses and other dysfunctions and present data pertinent to the assessment of unmet health needs (for a range of medical treatment, habilitative, and supportive services); and data pertinent to the availability of health personnel (such as child psychologists, certified addiction counselors, and therapists of various kinds).

Because some board members expressed the opinion that the Health Department should do more to monitor and improve the environment, it also is appropriate that data be compiled to assess the status of the county's environment against standards for land, air, and water quality. Sources of data may include results from periodic testing of soil, water, and air by the Health Department, governmental reports, and studies of "watchdog" and consumer advocacy organizations. Morbidity and mortality data for the county also could be reviewed to determine whether the county has a higher incidence of diseases that appear to have a link to environmental pollutants.

- A.4. The data identified above could be utilized to gain awareness of the health status of the county's population relative to a meaningful comparison group (such as the population of the state) and to assess possible causes for discrepancies from the norm. The data can facilitate an understanding of the variables (such as age, economic and occupational status, and environmental conditions) that influence health needs and demands.
- A.5. Members of the county board, the executive director, and staff (all or some) certainly should be involved in the process. Representatives of local businesses, other service agencies, and the community at large also may be invited to participate in the process. There is no standard answer to this question, but it is important to have a basis for justifying selection of planning participants. A process that is open and democratic probably has a better chance of success than one that appears closed and autocratic.
- A.6. The case does not suggest evidence that the Health Department has personnel knowledgeable about strategic planning. The executive director and board president should evaluate the capabilities that can be applied to a strategic planning process. If the commitment to undertake the process is sufficient, the executive director and the Board can agree to seek expert help and contract with consultants who can assist in the process. Other potential problems could be avoided if adequate attention is given to planning the planning, to selecting a process tailored to the needs of the organization, and to establishing other conditions that are associated with effective strategic thinking and action.
-

Case No. 2: Strategic Planning for Inpatient Rehabilitation Services

- A.1. A comprehensive study could include assessment of the following factors:
- The need for comprehensive rehabilitation among the population in communities traditionally served by the hospital (with consideration given to sociodemographic variables such as age and income levels) as well as epidemiological variables (causes of morbidity and mortality, incidence of work injuries and illnesses that could increase the need for work rehabilitation programs).
 - The diagnoses of patients currently utilizing the hospital (to assess whether the hospital was already providing acute care services to substantial numbers of patients who were likely candidates for rehabilitation and to determine the impact of more aggressive need identification on occupancy).
 - Financial implications of operating a larger, exempt unit.
 - The perceived need among the hospital's physicians for expansion of inpatient rehabilitation services and the physicians' willingness to refer patients to the hospital's rehabilitation service rather than identifying other resources in the community for meeting the needs of patients.
 - Competitors in the rehabilitation business (their levels of success, the programs offered and those not available).

- The unit's current ability to achieve established clinical outcomes and to satisfy other quality standards and expectations of consumers and stakeholders.
- A.2. No. It made a decision to involve consultants to expedite the process. This was probably a responsible decision, considering that the management team lacked adequate time and expertise to address the problem itself. There is no absolute formula for success in strategic planning. However, the management team worked with consultants to design a process with a high probability of success. The consultants did the research and analytical work usually associated with a situational analysis. However, the management group maintained involvement in the process and carefully reviewed the work of the consultants to ensure that there would be adequate confidence in conclusions and ownership of recommendations. The hospital's management team became more educated and informed of the issues as the process proceeded; this facilitated good judgment and decision making on their part. The management team also gave full consideration to what needed to be done to begin implementation of some of the recommendations of the consultants.
- A.3. There's no right or wrong answer to this question. Certainly, other approaches might have worked as well or better. The hospital wanted to get a certificate-of-need (CON) permit, which was necessary to achieve formal recognition of the unit and to gain authorization of capital expenditures that the hospital had budgeted to improve the physical environment of the unit. It obtained the permit, but not without difficulty because it initially failed to give attention to the politics associated with the CON regulatory process. The hospital wanted the rehabilitation unit to gain exemption and to achieve a more favorable "bottom line." Both objectives also were attained. Therefore, unless the management team had other objectives that were not accomplished, the process worked.
-

Chapter 6

Case Study No. 1: Evaluation of an Influenza Vaccination Program

- A.1. A case-control study could be designed for all those who received the vaccination (as the cases) and a control group from the community of those who did not get the vaccination.
- A.2. A variety of factors would need to be assessed, including but not limited to age, gender, date of vaccination, type of vaccination, onset of flu symptoms, and coexistence of other illnesses.
- A.3. Incidence rates should be compared. A logistic regression could be performed using measures to control for differences between the groups to calculate the odds of still getting the flu after vaccination.
- A.4. Anticipating that incidence of flu among those who were vaccinated is lower than among those who were not, this information could be made part of a mass media campaign to educate the elderly and solicit participation in subsequent years.
-

Case Study No. 2: Impact of a Smoking Prevention Program

- A.1. An assessment of prevalence of tobacco use in the community and in the school-based population is an initial step. Calculating prevalence rates and relative risk for cancer given population information might be possible.
- A.2. A survey might be done to assess knowledge and awareness. It could establish a baseline for the evaluation of the intervention to prevent tobacco use.

- A.3. A longitudinal study could be done to monitor children over time. If an intervention is implemented at a number of schools and not at others, the results across schools could be compared to assess effectiveness over time using a quasi-experimental design.
-

Case Study No. 3: Evaluation of Exposure to Tuberculosis (TB)

- A.1. Screening of the staff of the hospital would have to be done immediately. Current patients also should be screened. In addition, other patients who had been discharged also should be notified to undergo testing. Timing of how far back discharged patients might have to be tested will depend on identification of positive cases and potential exposure of patients.
- A.2. For staff who may be carriers, the units that they worked in, patient population demographic information, people who they may have come in contact with who also might be exposed.
- A.3. A historical prospective comparison of staff screening for TB could be done.
-

Case Study No. 4: Evaluating a Community-Based Hypertension Control Program

- A.1. Changes in the prevalence of hypertension, prevalence of controlled hypertension, and cardiovascular mortality rates are appropriate criteria.
- A.2. This is quasi-experimental because of the inability to randomize persons in the community into an intervention or control group.
- A.3. Factors other than the intervention could contribute to the outcome experienced by the population overtime.
- A.4. The program was effective. The prevalence of controlled hypertension was significantly increased in only the intervention counties. In addition, the percentage of the population with hypertension declined in the intervention counties, but not significantly in the control counties.
- A.5. An audit of the process could have been done and accounted for in the follow-up survey. That is, attention could have focused on delineating the types of interventions for high blood pressure control to which those surveyed were exposed. It also would be relevant to assess how long survey respondents had lived in the county (to assess the duration of exposure to the various intervention approaches).
-

Chapter 7

Case Study No. 1: Managing a Hospital-Specific Cesarean Section Rate

- A.1. Select appropriate team members and review the current processes.
- A.2. First, the number of newborn deliveries must be identified (the denominator). This may be done using International Classification of Diseases (ICD) codes for procedures, diagnoses, or other internal coding schemes for identifying the newborn (such as an admission code). Then, the numerator must be defined. Either codes from the ICD or using diagnosis-related groups can be used.

- A.3. A flowchart could be used to understand the current process. Run charts (line graphs) and control charts would be constructed once data are available. Use a cause–effect diagram to help identify the source(s) of the problem(s).
- A.4. The rate measures used are only crude rate measures and not risk adjusted. Typically, cesarean section data reviewed by hospitals for quality improvement initiatives are derived from billing claims (not from birth certificate data) that are derived from coded medical records. Therefore, the data are influenced by the experience and knowledge of hospital coders and the timeliness of data submission to the state agency that collects and reports the hospital utilization data.
- A.5. Feedback to physicians on individual cesarean section rates, practice guideline for management of active labor, patient education for candidates for vaginal birth after cesarean section, and implemented policy for preapproval of scheduled cesarean or scheduled inductions of labor.
-

Case Study No. 2: Measuring and Improving Patient Satisfaction

- A.1. The first two hospitals have the same percentage of patients rating their satisfaction a “1” and a “2,” yet there is a big difference in the overall percentile ranking of the two hospitals. Only a small percentage of patients respond with a rating of poor or very poor. The real difference is in the percentage of patients providing a score of “5.” Therefore, the opportunity may not be getting the low scores up to the top, but rather putting efforts toward bringing the scores of “4” to scores of “5.”
- A.2. According to the PDCA cycle, to fix a problem, a process must be studied. Once data are evaluated, team members must decide on a plan for improvement. To study patient satisfaction, further analyses should be conducted to determine which areas are in need of improvement. The data could be stratified by service line, unit, or patient population. Examine the data according to the various dimensions measured by the experience to pinpoint trouble areas, such as provider interactions, facility conditions, meals, pain management, and so forth. Correlate findings with those of other quality-related programs such as case management, utilization management, or risk management. A control chart can be constructed to examine whether the findings have been consistent (stable) over time. A comparison chart can be used to examine how closely the data match that of other organizations. Once areas for improvement are identified, a team could be formed to further analyze issues. Deming (1986) believes it is important to involve those closest to the process, thus consider for team membership a patient representative and a sample of key individuals who interact with patients.
- A.3. Check sheets, histograms, and Pareto diagrams may be used to display levels of patient satisfaction according to various dimensions of care. Once the team has narrowed down the area(s) in need of improvement, a cause-and-effect diagram can be constructed to help identify causes of dissatisfaction. If the causes point to a process in need of fixing, the team can work to construct a flow diagram to identify areas where value can be added and/or inefficiencies corrected. If the satisfaction measurement will be continued over time, a trend chart and/or control chart might be useful to examine the stability of the process. In addition, a comparison chart would offer ease in identifying how the facility compares with others.
- A.4. Create a cause-and-effect diagram—“Patient Units Are Noisy”—and list all the sources of noise and why these noises happen. Using a check sheet, collect data on noise levels through observation. Break data into categories of type of noise. Involve the team in a brainstorming session on how to create a warm atmosphere. If there is no budget for remodeling, challenge them to generate no-cost or low-cost options.

- A.5. Implement on a small scale, such as one patient unit, and measure the effect of the change. If successful, implement on a larger scale.
-

Case Study No. 3: Investigation of a Medical Error

- A.1. The team should include persons who interacted with the patient and/or were responsible for various aspects of surgical preparation. The risk manager, in-house attorney, and senior leaders may be involved. Refrain from any punitive action and encourage honest interaction. Set ground rules for discussion, such as those used for brainstorming.
- A.2. Review all medical record documents, unit logs, and preadmission documentation. Keep these documents available for reference during team discussions. Construct a cause-and-effect diagram titled "Reasons for Wrong-Site Surgery." Ask the team members to openly offer thoughts on causes, in particular those related to the process, as opposed to blaming individuals. Construct a flow diagram to map out the patient's course, beginning with early preparation for admission and surgery. Look for pitfalls in the process.
- A.3. A new flow diagram should be constructed, this time representing the improved process. The new process should be implemented in a pilot phase and evaluated by the team as to its effectiveness. To ensure that the process is being maintained, follow-up checks should be conducted to assure quality control.
-

Chapter 8

Case Study No. 1: Decreasing Hepatitis B Virus Infection in Health Care Workers

- A.1. The policy regarding incentive encouragement is the most effective. The prevalence ratio of vaccinated to those not vaccinated is 1.6. The 95% confidence interval of 1.4–2.0 does not contain 1.0. This means that the ratio is statistically significantly elevated.
- A.2. Tracking system used to monitor coverage is the least effective. The prevalence ratio is the lowest. In addition, the 95% confidence interval contains 1.0. This means that the tracking system is not statistically associated with an increased vaccination rate.
- A.3. Persons who are immunized may not have responded to the survey. Persons may not accurately recall their immunization status.
- A.4. Employee health personnel staffing levels may be inadequate to mount large-scale education programs, send reminder letters, or to track immunization schedules.
-

Case Study No. 2: Outbreak of Hepatitis B Virus (HBV) Infection among Hemodialysis Patients

- A.1. The shared multiple-dose vial.
- A.2. Since HBV survives well in the environment, blood-contaminated surfaces that are not routinely cleaned and disinfected are a reservoir for transmission of HBV. Staff also can transfer HBV to patients from contaminated surfaces by their hands or through use of contaminated equipment and supplies.

- A.3. Strict adherence to universal precautions should be practiced. Serum specimens from all susceptible patients should be tested monthly for hepatitis B surface antigen (HBsAg). HBsAg-positive patients should be isolated by room, machine, instruments, medications, supplies, and staff. No instruments, medications, or supplies should be shared. Multidose medication vials should be avoided, but if necessary, medications must be prepared in a clean centralized area separate from areas used for patient care, laboratory work, or refuse disposal. Areas for clean and contaminated items should be clearly established. Blood specimens should be handled with gloved hands and stored in a designated area away from central supply and medication preparation areas. Hepatitis B vaccination for susceptible patients should be encouraged.
-

**Case Study No. 3: Methicillin-resistant *Staphylococcus aureus* (MRSA):
A Prevalent Nosocomial Pathogen in US Hospitals**

- A.3. Handwashing, gloving, masking and eye protection, gowning, appropriate device handling, and appropriate handling of laundry should be implemented. Wash hands after touching blood, body fluids, secretions, excretions, and contaminated items, whether or not gloves are worn. Wash hands after tasks and procedures on same patient and between patient contacts. Wear gloves when touching blood, body fluids, secretions, excretions, and contaminated items. Wear mask and eye protection during patient care activities and procedures that are likely to result in sprays or splashes of blood, body fluids, excretions, or secretions. Wear a gown to protect skin and prevent soiling of clothes during patient care activities and procedures likely to result in sprays or splashes of blood or body fluids. Handle, transport, and process used patient care equipment or devices soiled with blood, body fluids, excretions, or secretions in a manner that prevents skin and mucous membrane contact, contamination of clothing, and transfer of microorganisms to other environments and patients. Handle, transport, and process linens soiled with blood, body fluids, excretions, or secretions in a manner that prevents mucous membrane and skin contact, contamination of clothing, and transfer of microorganisms to other environments and patients.
-

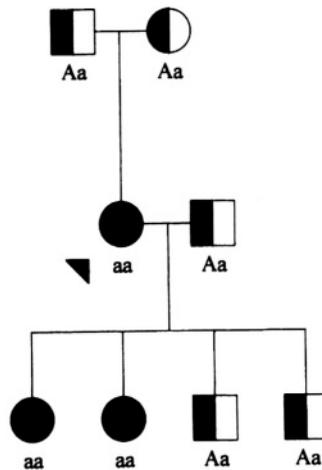
Chapter 9

Case Study No. 2: Analysis of Genetic Disorders in a Tribal Setting

- A.1. The patterns of a disorder's appearance in different families can be used to determine, through segregation analysis, the mechanism of inheritance of the disorder, that is, whether or not there is Mendelian transmission, and if so, whether the disorder is autosomal dominant, autosomal recessive, or X-linked. This will aid in determining which relatives should be screened using what method of screening.
- A.2. The population is relatively homogeneous and genetic traits are less likely to be influenced by intermarriage with outsiders.
- A.3. By identifying which tribes have the highest incidence of Schwartz–Jampel syndrome, screening and follow-up health care resources can be targeted to that tribe.
-

Case Study No. 3: Cost-Effectiveness of Screening for Hereditary Hemochromatosis

A.1.



Key

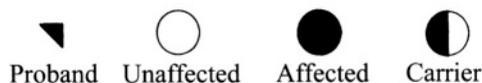


Figure 9.3. Pedigree illustrating an autosomal recessive method of inheritance.

A.2. Determine the (1) specificity and sensitivity of the all four testing methods, (2) prevalence of children that are homozygous, (3) prevalence of siblings that are homozygous, and (4) incidence of cirrhosis in those with hereditary hemochromatosis.

Case Study No. 4: Which Diseases to Screen for in Outpatient Settings?

A.1. Gene location and mechanism of inheritance should be established. Information on the incidence and prevalence of disease and the consequences of the diseases should be considered. Information on the variation of incidence in population subgroups served by the outpatient clinic (to target screenings and interventions) also should be known. There must be clear evidence that asymptomatic people can be identified using the screening test. There must be high specificity and sensitivity of the screening method. Effective therapy for the condition, if identified, must be available.

Chapter 10

Case Study No. 1: Solvent/Detergent-Treated Plasma (SDP)

A.1. The likelihood of viral transmission from fresh frozen plasma (FFP) is very low, with rates of transmission estimated at 1:676,000 for HIV, 1:63,000 for HBV, and 1:103,000 for HCV. Risk increases with multiple transfusions (Schreiber *et al.*, 1996).

- A.2. No. Bacterial contamination is theoretically possible, and the infectious risk of nonlipid-envelope viruses (e.g., parvovirus B19 and hepatitis A) is not eliminated.
 - A.3. Donor-retested plasma is a third option that uses plasma from a single donor after a specified period of quarantine time.
 - A.4. AuBuchon and Birkmeyer (1994) estimated a cost-effectiveness ratio for SDP at slightly less than \$300,000 per quality-adjusted life year, using a model that understated the actual acquisition cost of SDP by 50%.
-

Case Study No. 2: Transmyocardial Laser Revascularization (TMLR)

- A.1. TMLR patients are those that are not candidates for CABG or PTCA procedures, because they may have diffuse atherosclerosis, distal stenosis, or small arteries, or are unresponsive to pharmacological management.
 - A.2. Chelation therapy, enhanced external counterpulsation, heart transplantation, neural stimulation, and urokinase injection.
 - A.3. Safety, as measured by morbidity and mortality of TMLR to an appropriate alternative treatment, and efficacy, which could be determined as an improvement in symptoms as measured by a validated angina scale (e.g., New York Heart Association Angina Classification System).
-

Case Study No. 3: Intensity-Modulated Radiation Therapy (IMRT)

- A.1. Remain competitive in marketplace, enhance institutional reputation, improve oncology staff recruitment, increase patient referrals, or augment research opportunities.
 - A.2. No. Randomized controlled trials have definitely proven advantages on these effects for IMRT versus standard treatment.
 - A.3. Capital equipment committee.
-

Case Study No. 4: Intravenous Immunoglobulins (IVIG)

- A.1. (1) Cost—annual pharmacy budget for this item is often substantial; (2) availability—short national supply of IVIG often results in limited inventory locally; and (3) reimbursement difficulties—third-party payers often will not cover off-label uses.
 - A.2. (1) Evaluate the biomedical literature to identify all the possible uses of IVIG; (2) characterize these uses based on the strength of published evidence as acceptable, unacceptable, or promising but unproven; (3) examine existing health system use and compare to guidelines developed in 2; (4) educate clinicians on appropriate use; and (5) develop monitoring and feedback mechanisms to control IVIG use.
-

Chapter 11

Case Study No. 1: The Health Consequences of a Record Heat Wave

- A.1. Case-control study.
 - A.2. The strongest risk factor from Table 11.9 is “did not leave home at least once a week.” The crude odds ratio (OR) is 6.7. The 95% confidence limits of 3.0 and 15.0 (since 1 is not contained) indicate that the OR represents a statistically significant relationship between the exposure and outcome (death from heat wave). The strength of the OR suggests that it is not likely to be a chance occurrence.
 - A.4. Living controls but proxy respondents for the cases were interviewed.
 - A.5. Form a seasonal group to prospectively monitor climactic conditions (heat and humidity). Utilize health aides from the Department on Aging to go to neighborhoods, particularly those with high density elderly and poverty and high rise buildings, to monitor conditions of elderly.
-

Case Study No. 2: Neighbors versus Their Neighborhood

- A.1. Name of the compounds being used, their amount and frequency, and the specific areas being covered. Information on the known acute toxicity or other health hazards (e.g., effects on pregnant women) can be obtained from the Environmental Protection Agency (EPA).
 - A.2. Cross-sectional study design of exposure (yes vs. no) compared to presence of recent symptoms of pesticide exposure, and use of protective measures or safe-handling practices (yes vs. no) and presence of recent symptoms of pesticide exposure.
 - A.3. Convene a community meeting to discuss what is known about health effects of pesticides and risk of human exposure through air, water, food, or bystander exposure. Information brochures for health care providers and for the public on safe and proper handling of pesticides (including reading the label). Public service announcements by the local EPA, television, and radio.
-

Case Study No. 3: Community Health Risk from an Industrial Plant

- A.1. Better plant design and facilities for storing chemicals. Training of workers in emergency procedures.
 - A.2. Surveys, epidemiological studies. Longitudinal studies comparing exposed and nonexposed persons to ascertain incidence and mortality of disease.
 - A.3. Emergency planning. Community awareness of plan. Land-use planning in locating industrial plants. Adequate information about industrial chemicals used in the area for health care providers. Properly trained and equipped emergency response personnel. Cooperation of industry, labor, government, and medical personnel in planning for environmental emergencies. Local department of public health could take the lead in these efforts.
-

Case Study No. 4: Environmental Equity

- A.1. Recommend blood lead screening for children according to CDC protocol. Send chips of peeling paint or dust wipes of residence to an environmental laboratory for analysis in areas at high risk for poverty. Be familiar with state-mandated resources for residential lead identification and removal programs.
 - A.2. Paint deterioration in older, poorly maintained housing and lead dust from the environment from proximity near industry with lead by-products.
 - A.3. Population size, density, and time trends; proximity to water supply; geologic stability; the nature of existing proximate pollution sources; community attitudes about the presence of the additional waste facilities.
-

Case Study No. 5: Global Environmental Health

- A.1. Know where the main sources of radiation are in the community and what forms of radiation they emit and the different adverse effects caused by different forms of radiation.
 - A.2. Appropriate design and operation of sources producing ionizing radiation. Education of members of the public as to what action they should take in response to nuclear disasters. Prevent unnecessary exposure through certifications and regulations.
 - A.3. Links among health officials at national and international levels. Disease surveillance networks. Multinational cooperative agreements among governments.
-

Chapter 12**Case Study No. 1: Chicago Violence Prevention Strategic Plan**

- A.1. Consider using geographic information software to identify community areas at highest risk for violence or if different violence patterns emerge in different communities (e.g., drug crimes).
 - A.2. Substance abuse, mental health problems, family stress, family isolation, weapons possession, and lack of access to mental health or community support services.
 - A.3. Examples of policies would include the creation of an Office of Violence Prevention within the Chicago Department of Public Health. Specific program initiatives would need to span housing, mental health, family planning, and social services. Increased public health nurse and clinic professionals training aimed at interventions to families with young children aimed at preventing and identifying stressful situations (family and community), providing counseling, and anticipatory guidance and referral to other agencies as needed.
 - A.4. The Chicago Department of Public Health suggests that through quality assurance programs and information systems, managed care plans can promote the standardized use of protocols for screening for substance abuse and to monitor the providers in their compliance with these protocols. In addition, managed care plans can determine the prevalence of certain diagnoses or conditions (risk factors) related to violence within the contracted populations they serve through the examination of encounter data and to develop prevention programs accordingly.
-

Case Study No. 2: Increase Quality and Years of Healthy Life

- A.1 Chronic disabling diseases (such as arthritis), physical inactivity, obesity, and smoking.
- A.2. High mortality rates early in life such as that resulting from high infant mortality, homicide in youth, and AIDS in young African Americans.
- A.3. Policies supporting primary and secondary prevention in the elderly focused on quality of life and longevity issues. According to the World Health Organization (1999), examples include:
- Promoting the benefits of healthy lifestyles, especially promoting physical activity.
 - Legislation on sales and advertising of alcohol and tobacco.
 - Ensuring access to health care and rehabilitation services for older people.
 - Adapting physical environments to existing disabilities.
- Other policies are needed that provide additional social systems for the elderly needing resources such as caretakers, meal services, daycare facilities for the disabled, legal services, recreation, and funding for wellness home and community health services.
-

Case Study No. 4: Measles—United States, 1999

- A.1 Endemic measles can be reestablished in the United States if vaccination coverage declines. High coverage and strong surveillance are essential to maintaining the current status of measles in the United States.
- A.2. Eradication, control, or elimination of a disease in our global society is dependent on international planning and cooperation through the WHO, including the sharing of resources (goods and services) when necessary as well as technology to developing countries. International certificates of vaccinations for diseases when epidemic in a country may be required or policy as a condition of entry into that country. The United States recommends that children 12–15 months and older visiting countries where measles is an endemic disease be vaccinated before entry into that country (CDC, 1996). An example of a disease requiring a certificate of vaccination for entry into some countries is yellow fever. The political, economic, social, and cultural implications of mandating vaccinations when applied to global control of vaccine-preventable diseases are complex.
-

Chapter 13

Case Study No. 1: What Is the Most Cost-Effective Treatment for Tuberculosis?

- A.1. Out of a cohort of 100 patients, directly observed treatment (DOT) will cure 15.5 more patients after initial therapy (94.5 per 100–79.0 per 100).
- A.2. The cost per cure is negative for DOT protocol irrespective of how costs are determined. The ratio is –49,961 per cured patient considering only direct health care costs and –52,697 per cured patient when all costs are considered.
- A.3. All cost estimates were taken from specific cases convenient to the researchers such as specific facility charges for treatment, facility cost-charge ratios, test charges, and so on.
- A.5. The minister of health should adopt the DOT strategy both to reduce health care costs and to improve patient outcomes.
-

Case Study No. 2: Health and Economic Benefits of Weight Loss

A.1.

Gender and age group	27.5 kg/m ²	32.5 kg/m ²	37.5 kg/m ²
Men age 35–44			
Health costs avoided	\$2300	\$3500	\$4900
Discounted PV of cost	\$2389	\$2371	\$3073
Benefit/cost ratio	0.96	1.28	1.59
Women age 35–44 years			
Health costs avoided	\$2200	\$3300	\$4600
Discounted PV of cost	\$2651	\$2902	\$3243
Benefit/cost ratio	0.86	1.14	1.42

A.2. The benefit-to-cost ratio increases with higher weight to height for both males and females.

A.3. Because causal linkages between weight and incidence rate of a specific disease are not clear, reductions in weight may not reduce incidence in disease.

A.4. There appears to be a positive relationship (dose–response) between obesity and cost of adverse medical problems. Greater initial weight appears to increase the likelihood of all/most diseases.

A.5. Weight loss programs have a benefit to cost ratio that increases with the initial weight to height ratio. Consequently, targeting weight loss programs to those with at least a current status of 37.5 kg/m² would be suggested. Enrolling individuals in a weight loss program with an initial status of 27.5 kg/m² or less is not recommended. These programs should not differentiate by gender because benefit to cost ratios do not seem to differ by gender.

Case Study No. 3: Inactivated Poliovirus Vaccine (IPV) versus Oral Polio Vaccine (OPV) as Routine Childhood Immunizations

A.1.

Category	Cost	Cost avoided	Net cost
OPV	\$286.7 M	\$0 M	\$286.7 M
IPV	\$320.6 M	\$11.4 M	\$309.2 M
IPV/OPV	\$303.7 M	\$5.7 M	\$298.0 M

A.2. OPV is base

IPV \$22.5 M (309.2–286.7)

IPV/OPV \$11.3 M (298.0–286.7)

A.3. OPV is base

IPV \$22.5 M/9.5 cases avoided = \$2.37 M per polio case avoided.

IPV/OPV \$11.3/4.75 cases avoided = \$2.38 M per polio case avoided.

A.4. Either IPV-related option appears costly per polio case avoided. OPV should be maintained as the desired immunization policy. However, the driving factor in this decision is the cost per dose difference between the two types of vaccine. If policy moves totally to IPV would that have an effect on the cost per dose (due to increased volume, etc.)? This is important because if the cost of IPV vaccine falls by 10 or 20%, the cost per case avoided falls dramatically. For example, a 10% vaccine cost reduction lowers IPV unit vaccine cost to \$7.58 and lowers net cost of this strategy to \$296.3 M

(from \$309.2 M). The difference between IPV and OPV then falls to \$9.5 M or about \$1.0 M per case avoided.

**Case Study No. 4: Cost-Effectiveness of Magnetic Resonance Imaging (MRI)
for Internal Derangement of the Knee**

A.1.

Category	Arthroscopies averted (%)	Strategy 1 no MRI \$ per person	Strategy 2 MRI \$ per person	Incremental costs of MRI \$ per person	Cost per arthroscopy averted
Base: Social costs	10%	\$975	\$1108	\$151	\$1514
Worst case	5%	\$964	\$1156	\$192	\$3850
Best case	16%	\$949	\$1050	\$101	\$632
Base: Direct costs	10%	\$660	\$822	\$162	\$1624
Worst case	5%	\$666	\$855	\$189	\$3773
Best case	16%	\$651	\$782	\$130	\$813

A.2. See above.

A.3. See above.

A.4. Probably would not adopt the MRI screening policy from either the social or private point of view. Because there are not that many arthroscopies avoided using the MRI diagnostic process, the potential savings from avoiding surgery does not compensate for the costs of the MRI test being performed on these patients. Additional information that might mitigate this conclusion include the potential for reduction in the cost of the MRI diagnostic procedure due to increased volume and more information about potential indirect costs or quality of life associated with arthroscopy. It is possible that this analysis underestimated the indirect costs of avoided surgery by only using value of lost work time. Quality of life for those not having to have surgery might increase benefits somewhat, but probably not sufficiently to justify surgery, however.

Chapter 14

Case Study No. 2: Reporting Intimate Partner Violence

A.1. An assaultive partner may be less likely to repeat the assaultive behavior if he or she knows that he or she will face legal consequences, including imprisonment. However, if the police response does not address the situation effectively, it is possible that partner violence will be encouraged because the assaultive partner will come to believe that there are no consequences for his or her actions. Public health departments may be more likely over time to approach the issue of partner violence from a prevention perspective, unlike the police, who have a law enforcement orientation. Compared to both the public health department and the police, the reporting of such events to a registry would potentially permit the development of a more comprehensive database that could be used to develop more targeted and effective prevention and intervention programs.

A.2. The mandated reporting of the violence limits the autonomy and privacy of the victim and, depending on the circumstances, may increase the risk of harm following the report. Public health departments have significant experience in maintaining confidentiality of records, such as reports of

infectious disease and contact tracing procedures. Most registries also operate under strict guidelines relating to confidentiality. Many reports filed with the police are available for public inspection, thereby compromising an individual's privacy and potentially increasing his or her risk of future harm.

Case Study No. 4: The Epidemiology of Do-Not-Resuscitate (DNR) Orders

- A.1. Individuals who are older are more likely to be sicker, thereby justifying a DNR. Individuals who are suffering from dementia may not have expressed their wishes to their physicians or family prior to the onset of their dementia and are unable to do so, so that the providers and/or family must try to determine what the patient would have wanted and/or what would be best for the patient under the circumstances.
- A.2. Conflicts of interest may exist in the specification of DNR physician orders. For example, (1) the family does not have the resources or the energy to care for the relative so asks that a DNR order be placed in the chart, although it may not be the wish of the patient, or (2) the hospital believes that older individuals have already lived their lives and that an extension of life and consumption of the requisite resources is unwarranted, given the scarcity of resources and perhaps the patients' inability to pay for care. Women may face denial of procedures more frequently than men. Alternatively, the seriousness of their health condition is not recognized as early as it should be due to provider lack of knowledge of women's health and/or unwillingness to address seriously women's complaints, so that women are hospitalized/undergo procedures at more advanced stages of illness.
- A.3. Briefly, utilitarianism seeks to achieve the maximum good. In this situation, it might be theorized that DNR orders are warranted based on the patients' medical status, that there is a limited amount that can be done, that resources are limited, and that it serves the greater good to limit access to limited resources by those who would consume a great deal of them and offer little economically in exchange, e.g., through employment. A principlistic examination would focus on respect for persons, beneficence, nonmaleficence, and justice in the context of the factual situation and would likely conclude that the entry of a DNR order is a matter to be decided by the patient. Feminist ethics would be concerned not only with the patient, but also with the effect of the DNR order on the patient's relations with caregivers, family, friends, and so forth, and the implications of any changes in those relations as a result of the order.
-

Appendix

Websites for Health Care Managers Thinking Epidemiologically

The editor recommends that all health care managers visit each of these websites in this section to familiarize themselves with the type and amount of information that are available for health planning and evaluation. The websites were selected because of easy access to online data for this purpose. Since these websites also are now likely to be frequented by consumers of health care, health care managers must be prepared to respond to consumer requests for information and services as may be prompted through searches from the worldwide web.

Commercial

General search engine (originated at Stanford).
<http://www.yahoo.com>

ask Dr. Weil

Dr. Weil's integrative medicine and self-healing-oriented site
<http://www.drweil.com>

drkoop.com

"The Best Prescription is Knowledge." Health news, family health, health resources, health and wellness, community, conditions, and concerns.
<http://www.drkoop.com>

Elements: Visionary Health Insurance and Wellness Program

Featuring personalized health improvement profiles and direct links to traditional and complementary providers.
<http://www.elementswellness.com>

HealthNetwork.com/WebMD

Builds on cable/video programming. Original programming live, breaking news, exercise and nutrition guides, expert medical advice and in-depth information; interactive.
<http://ahn.com>

Center for Studying Health System Change—HSC Data Files

1996–1997 HSC household and physician surveys.

<http://www.hschange.com>

Health Central

Health news, health profiles and information, tips, disease and condition library, Dr. Dean Edell.

<http://www.healthcentral.com>

HealthPartners Consumer Choice System

Information to select a provider, clinic, or care network; compare care networks or hospitals on quality and satisfaction.

<http://www.consumer-choice.com>

HealthGrades.com

Health care report cards on hospitals, physicians, health plans, nursing homes; choosing a hospital, physician, health plan, nursing home, chiropractor, dentist, acupuncturist, naturopathic physician, assisted living residence.

<http://www.healthgrades.com>

Health Pages: The Voice of the Health Care Consumer

Physician directory where patients grade and comment on their doctors, compare insurance plans, and explore health care options.

<http://thehealthpages.com>

Intelihealth

Johns Hopkins Health Information. Health issues, drug search, medical dictionary, diseases and conditions, health assessments.

<http://www.intelihealth.com>

iVillage.com: The Women's Network

The leading women's health network.

<http://www.ivillage.com>

Mylifepath

Blue Shield of California provides health information and links to providers and products.

<http://www.mylifepath.com>

Onhealth

Health information: draws from major medical journals. Diseases and conditions, women, family, baby, alternative, lifestyle, food and fitness, library, community, shopping, and news.

<http://www.onhealth.com>

Press, Ganey Services

Provider information including research and best practices, published articles and accreditation news.

<http://www.pressganey.com>

RealAge

A personalized age assessment and health risk reduction plan

<http://www.RealAge.com>

Web Medicine

Consumer health information linked to provider/payer e-commerce resources.

<http://www.webmed.com>

US Government

Federal Government

The Agency for Healthcare Research and Quality (AHRQ)

The Medical Expenditure Panel Survey (MEPS)

A nationally representative survey of health care use, expenditures, sources of payment, and insurance coverage for the US civilian noninstitutionalized population, as well as a national survey of nursing homes and their residents.

Healthcare Cost and Utilization Project (HCUP)

Comprises a family of administrative longitudinal databases—including state-specific hospital discharge databases and a national sample of discharges from community hospitals—and powerful, user-friendly software that can be used with both HCUP data and with other administrative databases.

<http://www.ahcpr.gov/data>

Administration on Aging

Provides information on health, social, and economic needs of the elderly including legislation and implementation of US government entitlement programs for the elderly.

<http://www.aoa.dhhs.gov>

Bureau of Labor Statistics

This is the principal data source agency for the US federal Government in the fields of economics and labor statistics.

<http://stats.bls.gov>

Center for the Evaluation of Risks to Human Reproduction

Provides the latest information about potentially hazardous effects of chemical on human reproduction and development.

<http://cerhr.niehs.nih.gov>

Center for Information Technology (CIT)

To provide, coordinate, and manage information technology and to advance computational science.

<http://www.cit.nih.gov/home.asp>

Centers for Disease Control and Prevention

To promote health and quality of life by preventing and controlling disease, injury, and disability. Includes 11 center, institute, and offices. Information on travelers' health, health topics A-Z, publications, software and products, data and statistics, training and employment.

<http://www.cdc.gov>

- **National Center for HIV, STD, and TB Prevention**

To prevent HIV infection and reduce the incidence of HIV-related illness and death, in collaboration with community, state, national, and international partners.

<http://www.cdc.gov/nchstp/od/nchstp.html>

- **National Center for Chronic Disease Prevention and Health**

Plans and coordinates a program to prevent premature mortality from chronic illness.

<http://www.cdc.gov/nccdphp/index.htm>

- **CDC WONDER**

Easy-to-use system that provides a single point of access to a wide variety of CDC

reports, guidelines, and numeric public health data.
<http://wonder.cdc.gov/>

Comprehensive Epidemiologic Data Resource Program (CEDR), US Department of Energy

Epidemiologic data sets on radiation health effects available for downloading
<http://cedr.lbl.gov>

Department of Health and Human Services

Medical and social science research; preventing outbreak of infectious disease; assuring food and drug safety; Medicare; financial assistance for low-income families; child support enforcement; improving maternal and infant health; Head Start; preventing child abuse and domestic violence; substance abuse treatment and prevention; services for older Americans; comprehensive health services delivery for American Indians and Alaska Natives.
<http://www.os.dhhs.gov>

Department of Veterans Affairs

Searchable database of active VA-funded research programs; Health Services Research and Development Service.
<http://www.va.gov/va.htm>

Environmental Protection Agency

To protect human health and to safeguard the natural environment. Programs: reinvention activities, general interest, media, industry partnerships, state, local and tribal projects, geographic, research.
<http://www.epa.gov>

FedStats

Statistics from over 100 agencies in US Federal Government for the public.
<http://www.fedstats.gov>

Health Care Financing Administration

Information on Medicare and Medicaid; research initiatives and publications of Office of Research and Demonstrations.
<http://www.hcfa.gov>

Healthfinder

Information for patients regarding quality of health plans, primary care providers, long-term care facilities, hospitals, and treatments.
<http://www.healthfinder.gov>

Medicare

The official US government site for general Medicare information.
<http://www.medicare.gov>

National Center for Health Statistics (NCHS)

NVSS Births: 1998 data; births, marriages, divorces, and deaths: 1999. National Nursing Home Survey. National Health Interview Survey on Disability. NHIS Data Release. Collection systems: NHANES, NHCS, NHIS, NIS, NSFG, SLAITS, Vital Statistics. Initiatives: Aging, Classification of Diseases, Healthy People. FASTATS A to Z. FEDSTATS, AIDS/HIV information, aging, elderly care, alcohol and drug information (PREVLIN), cancer information, cardiovascular disease, CDC, child health, consumer information, diseases, electronic

records, environment, Federal Depository Library, food and nutrition, funding and grants, health information, health insurance, health promotion, heart disease and stroke, Hispanic health, immunizations, Indian health, injuries, international data, medication, prescriptions, oral health, state governments, statistics, women's health, web searching tools.
<http://www.cdc.gov/nchs>

- Most recent data sets and updates from the NCHS are stored at this FTP directory
<ftp://ftp.cdc.gov/pub/>

National Guideline Clearinghouse (NGC)

Evidence-based clinical practice guidelines and related abstract, summary, and comparison materials widely available to health care professionals. Operated by US Department of Health and Human Services, AHRQ, in partnership with the AMA and the AAHP.
<http://www.guideline.gov/index.asp>

National Health Care Indicators and Expenditures Indicators

Contains data and analysis of recent trends in health care spending, employment and prices.
<http://www.hcfa.gov/stats/stats.htm>

National Institute on Alcohol Abuse and Alcoholism

NIAA publications and databases, news and events, grants information.
<http://www.niaaa.nih.gov>

National Institute on Drug Abuse

Events calendar, grants and contracts, publications and brochures, such as NIDA Notes.
<http://www.nida.nih.gov>

National Institutes of Health

Conducts and supports research and fosters communication of biomedical information. Composed of 25 separate institutes and centers.
<http://www.nih.gov/about/nihnew.html>

- **National Cancer Institute (NCI)**
<http://www.nci.nih.gov>
A color atlas of geographic patterns of cancer death rates is available through the NCI.
<http://www.nci.nih.gov/atlas>
- **National Center for Complementary and Alternative Medicine**
<http://nccam.nih.gov>
- **National Center for Research Resources (NCRR)**
<http://www.ncrr.nih.gov>
- **National Eye Institute (NEI)**
<http://www.nei.nih.gov>
- **National Heart, Lung, and Blood Institute (NHLBI)**
<http://www.nhlbi.nih.gov/index.htm>
- **National Human Genome Research Institute (NHGRI)**
<http://www.nhgri.nih.gov>
- **National Institute on Aging (NIA)**
<http://www.nih.gov/nia>
- **National Institute on Alcohol abuse and Alcoholism (NIAAA)**
<http://www.niaaa.nih.gov>

- **National Institute of Allergy and Infectious Diseases (NIAID)**
<http://www.niaid.nih.gov>
- **National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)**
<http://www.nih.gov/niams>
- **National Institute of Child Health and Human Development (NICHD)**
<http://www.nichd.nih.gov>
- **National Institute on Deafness and Other communication Disorders (NIDCD)**
<http://www.nih.gov/nidcd>
- **National Institute of Dental and Craniofacial Research (NIDCR)**
<http://www.nidr.nih.gov>
- **National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)**
<http://www.niddk.nih.gov>
- **National Institute on Drug Abuse (NIDA)**
<http://www.nida.nih.gov/NIDAHome1.html>
- **National Institute of Environmental Health Sciences (NIEHS)**
<http://www.niehs.nih.gov>
- **National Institute of General Medical Sciences (NIGMS)**
<http://www.nigms.nih.gov>
- **National Institute of Mental Health (NIMH)**
<http://www.nimh.nih.gov>
- **National Institute of Neurological Disorders, and Stroke (NINDS)**
<http://www.ninds.nih.gov>
- **National Institute of Nursing Research**
<http://www.nih.gov/ninr>
- **National Library of Medicine (NLM)**
<http://www.nlm.nih.gov>

National Library of Medicine

MEDLINE, MEDLINE*plus*, databases, publications, training, grants, research programs, computational molecular biology, medical informatics, announcements, exhibits, jobs, contracts
<http://www.nlm.nih.gov>

Naval Health Research Center, Health Sciences and Epidemiology

Conducts research and development to improve the clinical and medical information systems available to operational commanders, medical planners, environmental health and preventive medicine staff, and field medical providers engaged in the prevention, control, and treatment of illnesses and injuries in deployed military forces.

<http://www.nhrc.navy.mil>

Occupational Safety and Health Administration (OSHA)

Sets standards for workplace health and safety.

<http://www.osha.gov>

Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute

Most authoritative source of information on cancer incidence and survival in the United States. Information on more than 2.5 million cancer cases included. SEER data, publications, and resources are available free of charge.

<http://www-seer.ims.nci.nih.gov>

United States Census Bureau

Preeminent collector and provider of timely, relevant, and quality data about the people and economy of the United States.

<http://www.census.gov>

United States Public Health Service

<http://www.os.dhhs.gov/phs>

- **Administration for Children and Families (ACF)**
<http://www.acf.gov>
- **Administration of Aging (AOA)**
<http://www.aoa.gov>
- **Agency for Healthcare Research and Quality (AHRQ)**
<http://www.ahrq.gov>
- **Agency for Toxic Substances and Disease Registry (ATSDR)**
<http://www.atsdr.cdc.gov>
- **Centers for Disease Control and Prevention (CDC)**
<http://www.cdc.gov>
- **Food and Drug Administration (FDA)**
<http://www.fda.gov>
- **Health Care Financing Administration (HCFA)**
(Medicare and Medicaid)
<http://hcfa.hhs.gov>
- **Health Resources and Services Administration (HRSA)**
<http://www.hrsa.gov>
- **Indian Health Service (IHS)**
<http://www.ihs.gov>
- **National Institutes of Health (NIH)**
<http://www.nih.gov>
- **Program Support Center (PSC)**
<http://www.psc.gov>
- **Substance Abuse and Mental Health Services Administration (SAMHSA)**
<http://www.samhsa.gov>

United States Department of Commerce

Promotes job creation, economic growth, sustainable development, and improved living standards for all Americans. Makes possible daily weather reports; facilitates technology that is used in the workplace and home; supports the development, gathering, and transmission of information essential to competitive business; conducts the constitutionally mandated decennial census.

<http://204.193.246.62>

State Government**Council of State Governments**

<http://www.csg.org>

NASIRE

<http://www.nasire.org>

The leading forum for addressing opportunities, implications, and challenges of improving the business of government through the application of information technology.

Robert Wood Johnson Foundation for State Health Policy Home Page

<http://www2.umdncj.edu/shpp/homepage>

University of Indiana Virtual Law Library

<http://www.law.indiana.edu>

Washburn Law School State Government and Legislative Info Site

<http://www.washlaw.edu>

*All Known State Websites Pertaining to Health Care***Alaska Department of Health and Social Services**

<http://health.hss.state.ak.us>

Arizona Department of Health Services

<http://www.hs.state.az.us>

California Health and Human Services

<http://www.chhs.ca.gov>

Connecticut Department of Social Services

<http://www.dss.state.ct.us>

Colorado Department of Health and Human Services

http://www.state.co.us/gov_dir/agencies.html

Florida Agency for Health Care Administration (AHCA)

<http://www.fdhc.state.fl.us>

Georgia Statewide Academic and Medical System

<http://www2.state.ga.us/Departments/DOAS/GIST>

Idaho Department of Health and Welfare

http://www2.state.id.us/dhw/hwgd_www/home.html

Illinois Department of Public Health

<http://www.idph.state.il.us>

Kansas Department of Human Resources

<http://www.kdhe.state.ks.us>

Kentucky's NASIRE State Search: Health, Human Services and Welfare

The Cabinet for Health Services

<http://cfc-chs.chr.state.ky.us>

Maine Bureau of Health

<http://janus.state.me.us/dhs/boh/index.htm>

Massachusetts Department of Public Health

<http://www.state.ma.us/dph/dphhome.htm>

Michigan Department of Community Health

<http://www.mdch.state.mi.us>

Minnesota Department of Health

<http://www.health.state.mn.us>

Mississippi Division of Medicaid

<http://www.dom.state.ms.us>

New Jersey Department of Health and Senior Services

<http://www.state.nj.us/health/index.html>

New York State Department of Health

<http://www.health.state.ny.us>

North Carolina Department of Human Resources

<http://www.dhhs.state.nc.us>

North Dakota Health Department

<http://www.ehs.health.state.nd.us/ndhd>

North Dakota Department of Human Services

<http://lnotes.state.nd.us/dhs/dhsweb.nsf>

Oregon Department of Human Services

<http://www.hr.state.or.us>

Pennsylvania Department of Health

<http://www.health.state.pa.us>

Rhode Island Department of Health

<http://www.health.state.ri.us>

South Carolina State Department of Health and Environmental Control

<http://www.state.sc.us/dhec>

South Dakota Department of Health

<http://www.state.sd.us/doh>

Tennessee Department of Health

<http://www.state.tn.us/health>

Texas Department of Health

<http://www.tdh.texas.gov>

Utah Department of Health

<http://hlunix.ex.state.ut.us>

Virginia Department of Health

<http://www.vdh.state.va.us>

Washington State Department of Health

<http://www.doh.wa.gov>

Wisconsin Department of Health and Family Services

<http://www.dhfs.state.wi.us>

Private Organizations**American Cancer Society**

Information for the lay public and health care professionals on current trends in cancer prevention, diagnosis, and treatment. Statistical trends and online journal available.

<http://www.cancer.org>

American College of Epidemiology

The professional organization dedicated to continued education and advocacy for epidemiologists in their efforts to promote the public health.

www.acepidemiology.org

Citizens for the Right to Know

A California consumer advocacy group offers tips for choosing a health plan.

<http://www.rtk.org>

Cochrane Library

The Cochrane Database of Systematic Reviews (CDSR): a collection of databases containing systematic, up-to-date review of the effects of health care.

<http://www.library.mcgill.ca/cdroms/colib.htm>

Electronic Hallway

University of Washington. Teaching cases and exercises; role plays; teaching workshops, editorial assistance, peer-reviewed case journal.

<http://www.hallway.org>

Epidemiology and Public Health (Public health, biosciences, medicine)

Government agencies and international organizations; university sites; professional societies and organizations; cancer, cardiovascular, diabetes, infectious disease, and AIDS; hospital epidemiology and infection control; genetic and molecular, social behavioral, environmental, nutrition, reproductive health and population studies; biostatistics and mathematical modeling; data sources, publications, meetings/courses, computing resources, news and discussion groups, FAQ.

<http://chanane.ucsf.edu/epidem/epidem.html>

Federation of American Scientists, ProMED Initiative

Global monitoring of emerging diseases: AHEAD/ILIAD and ProMED mail reporting network.

<http://www.fas.org/promed>

Hardin Library for the Health Sciences

Information/references, education services, educational multimedia facility and electronic classroom, IHIO, National Laboratory for the Study of Rural Telemedicine, Healthnet, MD consult, journals, indexes/databases, HealthWeb, lists for health subjects, OASIS, health information resource for health providers and patients.

<http://www.arcade.uiowa.edu/hardin>

Joint Commission on Accreditation of Healthcare Organizations

Information for providers, consumers and employers on the safety and quality of care provided to the public through the provision of health care accreditation and related services that support performance improvement in health care organizations.

<http://www.jcaho.org>

Massachusetts Health Quality Partnership

Results from the 1998 project and information on the objective and methodology of the project.

<http://www.mhqp.org>

Mayo Clinic Health Oasis

Reliable information for a healthier life; news; centers for diseases.

<http://www.mayohealth.org>

Metro Chicago Information Center

An independent, nonprofit research organization committed to increasing the quality, quantity, and accessibility of information about human conditions and the quality of life in the Chicago Metropolitan area.

<http://www.mcic.org>

National Academy of Science

Private, nonprofit society engaged in scientific and engineering research.

<http://www.nas.edu>

National Committee for Quality Assurance (NCQA)

Information for consumers and health care organizations regarding NCQA accreditation, links to other health care websites. Source of information on quality indicators for managed care plans. Maintains the Health Plan Employer Data and Information Set (HEDIS® 1999) for benchmarking health plan quality.

<http://www.ncqa.org>

Osteoporosis Society of Canada

A Canadian charity serving persons who have or are at risk for osteoporosis through education, empowerment, and community support. Provides an on-line assessment of calcium intake.

<http://www.osteoporosis.ca>

Picker Institute Homepage

Patient survey information and links to other websites with patient/consumer focus.

<http://www.picker.org>

Quality Measurement Advisory Service

Assists state and local healthcare coalitions, purchasing groups, and health information organization to measure health care quality.

<http://www/qmas.org/default.htm>

International**National Health Service (NHS)**

Describes current initiatives of the medical care system for Great Britain.

<http://www.nhs50.nhs.uk>

Pan American Health Organization

An international agency specializing in health.

<http://www.paho.org>

United Nations Population Information Network (POPIN)

Electronic information on world population trends including migration and development.

<http://www.undp.org/popin>

University of Bergen

Compilation of resources of family physicians that link a rich variety of sites across the world.

<http://www.uib.no/isf>

The World Bank Group

A group of five closely associated institutions: the International Bank for Reconstruction and Development, International Development Association, International Finance Corporation, Multinational Investment Guarantee Agency, and the International Centre for Settlement of

Investment Disputes. Initiatives are aimed at reducing poverty and promoting social justice and equity. Economic and social indicators on countries are available.

<http://www.worldbank.org>

World Health Organization (WHO) Report on Infectious Diseases: Removing Obstacles to Healthy Development

A review of the report's key messages; presentation and index of graphs and figures; presentation and index of WHO initiatives; a test-only version; contact points for further information.

<http://www.who.int/infectious-disease-report>

The World Medical Association, Inc.

Provides a forum for its member associations to communicate freely, to cooperate actively, to achieve consensus on high standards of medical ethics and professional competence, and to promote the professional freedom of physicians worldwide.

<http://www.wma.net>

Slide Presentations

HIV/AIDS Surveillance—General Epidemiology

Describes trends in HIV/AIDS over time, variation by geographic area, and population subgroups through downloadable .pdf or .ppt formats.

<http://www.cdc.gov/graphics.htm>

ICD-10-Procedure Coding System (ICD-10-PCS)

On-line slide presentation to describe differences between ICD-9-CM procedure coding and ICD-10 procedure coding.

<http://www.hcfa.gov/stats/icd10/icd10pcs.pdf>

Supercourse: Epidemiology, the Internet and Global Health

Compilation of lecture materials, including slide presentations on various contemporary and classical epidemiology topics. On-line viewing available. Maintained by faculty from the University of Pittsburgh.

<http://www.pitt.edu/~superl/main/index.htm>

Glossary

- Adjusted rates** A summary rate that is produced by arithmetically weighting the specific rates in a study population by the proportion of persons in a reference population for each specific rate category. This removes the effect of population characteristics influential on an outcome to permit comparison of groups of individuals or populations with respect to incidence or mortality rates.
- Alpha level** An arbitrary value that indicates the threshold probability for rejecting a true null hypothesis. Also known as the “level of significance.”
- Alternative hypothesis (H_A)** Makes a statement about the values of population parameters and is phrased to contradict the null hypothesis.
- Attributable risk** The proportion of excess risk of disease or health problem that is associated with exposure to a risk factor.
- Beta level** Probability of accepting a false null hypothesis.
- Bias** Any difference between an observed value and the true parameter.
- Case-control study** Individuals are selected on the basis of the presence or absence of an outcome. Evidence of a factor suspected as causative of the outcome is sought by comparing its prevalence among those who have the outcome factor (cases) to those who do not (controls).
- Case-fatality rate** Number of persons dying of a condition divided by the number diagnosed with the condition within one year or less.
- Carrier** An infected person or other vertebrate who harbors a transmissible agent without discernible clinical disease and who serves as a potential source of infection.
- Causation** A process of identifying an outcome resulting from exposure(s) using a study design, that employs a comparison group.
- Causative factor** A variable that is linked to producing an effect, either by itself or in combination with some other factor. It must precede the effect in a time interval consistent with the anticipated effect.
- Censored observation** Cases in which the outcome of interest (e.g., death) has not been observed. Term used in survival or failure-time analysis.
- Clinical outcomes** The health status changes or effects individual patients experience resulting from the delivery of health care; are measured in terms of the patient’s perspective as morbidity, mortality, functional abilities, and satisfaction with care.
- Coefficient of variation** Relates the variability of a set of scores to the average size of the set of scores (as a percent). Coefficient of variation = standard deviation \div mean \times 100%.
- Cohort** Group of individuals who share a common experience or event and who pass through time together. Cohorts could be defined by birth year, death year, or exposure to a common source (e.g., atomic bomb survivors).

- Competitor analysis** An assessment of an organization's position in the marketplace relative to other entities (individuals, groups, or organizations) which may compete for the same customers or valued resources or otherwise interfere with an organization's ability to serve its selected markets.
- Competitor** An individual, group, or organization, which competes for the same customers or valued resources or otherwise interferes with the ability of another entity to engage in exchange with a targeted market.
- Confidence interval** Represents a range of values for a point estimate of a parameter (mean, proportion, odds ratio, difference between means) within which the true population parameter is expected to lie within a given level of probability.
- Construct** An underlying, not directly observable concept of which measurement is desired. For example, "severity of illness" and "quality of life" are constructs.
- Construct validity** An instrument exhibits construct validity when it is seen to correlate with other trusted measures of the phenomenon being measured and it is able to discriminate between groups that have known differences.
- Consumer price index (CPI)** A measure of the average change in price over time in a fixed "market basket" of goods and services purchased either by urban wage earners and clerical workers or by all urban consumers.
- Cost-benefit analysis (CBA)** An analytic tool for estimating the net social benefit of a program or intervention as the incremental benefit of the program less the *incremental cost*, with all benefits and costs measured in dollars.
- Cost-effectiveness analysis (CEA)** An analytic tool in which costs and effects of a program and at least one alternative are calculated and presented in a ratio of incremental cost to incremental effect. Effects are health outcomes, such as cases of a disease prevented, years of life gained, or quality-adjusted life years, rather than monetary measures as in cost-benefit analysis.
- Cost-effectiveness ratio** The incremental cost of obtaining a unit of health effect (such as dollars per year, or per quality-adjusted year, of life expectancy) from a given health intervention, when compared with an alternative.
- Crude rate** All events in a population in a calendar year multiplied usually by 1000. The crude death rate represents the probability of dying from all causes and is affected by the age distribution of the population under consideration.
- Customers** In a health care situation, those individuals utilizing services offered by a health care provider; a term frequently favored over the term "patients," as it is suggestive of a scenario in which the consumer has a choice among alternatives for the satisfaction of a health-related need or want.
- DALYs (disability adjusted life years)** A summary measure that is the sum of years of life lost due to premature mortality and the years lived with disability adjusted for severity of the disability.
- Decision analysis** An explicit, quantitative, systematic approach to decision making under conditions of uncertainty in which probabilities of each possible event, along with consequences of those events, are stated explicitly.
- Decision tree** A graphic representation of a decision, incorporating alternative choices, uncertain events (and their *probabilities*), and outcomes.
- Demand** In the context of health care, the amount of service actually utilized or the amount of service considered necessary to meet need as perceived subjectively or as determined "objectively" by application of a formula.
- Demography** The study of human populations in reference to such variables as size, distribution, and composition and to the dynamics of fertility, mortality, and migration.

- Dependent variable** The variable that is the result of some antecedent or independent variable. Sometimes called the response or outcome variable.
- Diagnosis** Identifying a target disorder based on objective laboratory or clinical standards.
- Direct costs** The value of all goods, services, and other resources that are consumed in the provision of an intervention or in dealing with the side effects or other current and future consequences linked to it.
- Direct medical costs** The value of health care resources (e.g., tests, drugs, supplies, health care personnel, and medical facilities) consumed in the provision of an intervention or in dealing with the side effects or other current and future consequences linked to it.
- Disability days** Days in which activity is restricted due to either short-term or long-term health problems or conditions.
- Discounting** The process of converting future dollars and future health outcomes to their present value.
- Discount rate** The interest rate used to compute present value, or the interest rate used in discounting future sums.
- Double-blinded** The administration of an intervention where neither the person receiving the intervention nor the person administering the intervention know the nature of the treatment.
- Economies of scale** The situation where cost of production per unit of output decreases as the total volume of output increases. This may come about because of more efficient use of labor or equipment, or ability to specialize productive processes.
- Effectiveness** The extent to which medical interventions achieve health improvements in real practice settings.
- Effect size** A standardized measure of change in some variable measured using a “before and after” design in a group or a difference in such changes between two groups. It is the mean change divided by the standard deviation of changes across individuals.
- Efficacy** The extent to which medical interventions achieve health improvements under ideal circumstances.
- Effectiveness** The impact of an intervention in practical application, such as a community setting.
- Efficacy** Determines whether a medical technology or other intervention technique works under controlled conditions or a set of guidelines or conditions, ideally through a randomized clinical trial; it is the result of positive outcomes minus negative outcomes.
- Endemic** The usual or constant prevalence of a disease or infection in a human population in a defined geographic area.
- Environmental scanning** An organizational function designed to ensure that the organization is aware of change relative to the forces and character of its environment so that both the threats and opportunities inherent in the environment are recognized.
- Epidemic** The occurrence of cases in excess of expected. Expected values are defined from historical rates in the population or the occurrence of two or more cases of a condition not normally expected in a population.
- Etiology** The sum of the knowledge regarding the cause of a disease.
- Excess risk** The arithmetic difference between two measures of risk.
- External environment** Individuals, groups, or other organizations that exist outside the boundaries of a focal entity as well as the political, economic, social, and technologic forces which impact the entity’s operations.
- False-negative probability** Probability of those with an outcome whose test results are negative for the outcome of interest. Inversely related to sensitivity.

- False-positive probability** Probability of those without an outcome whose test results are for outcome. Inversely related to specificity.
- Functional status** An individual's effective performance of or ability to perform roles, tasks, or activities (e.g., to work, play, maintain the house). Often functional status is divided into physical, emotional, mental, and social domains, although finer distinctions are possible.
- Gap analysis** An analysis that attempts to quantify a deficit by comparing an ideal situation with the current situation or the situation as it would be in the future without some form of intervention.
- Goal** A broad statement indicating general direction toward a desired future state.
- Hazard rate** Number of persons having an adverse outcome before time $t+1$ who were outcome free until time t divided by the number at risk between t and $t+1$ time. Synonym is failure rate.
- Health** A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.
- Health outcomes** Injury and disease morbidity and mortality resulting from the intervention of health care services.
- Health promotion** Activities related to individual lifestyle to prevent disease, disability, and injury, e.g., physical fitness, nutrition counseling, tobacco cessation programs, family planning.
- Health protection** Environmental or regulatory interventions aimed at large groups, e.g., air quality standards, seat belt laws, water fluoridation.
- Health-related quality of life** As a construct, health-related quality of life refers to the impact of the health aspects of an individual's life on that person's quality, of life, or overall well-being. Also used to refer to the value of a health state to an individual.
- Health state** The health of an individual at any particular point in time. A health state may be modified by the impairments, functional states, perceptions, and social opportunities that are influenced by disease, injury, treatment, or health policy.
- Health status measures** Systems used to define and describe health states (e.g., a multi-attribute health status classification system).
- Herd immunity** Populations protected from infection due to the presence of immune persons. The degree of protection achieved depends on age of immunity, season of the year, timing of introduction of susceptibles, and disease reproduction rate.
- Iatrogenic injury** An injury occurring as a result of medical care or health care management.
- Immunity** Resistance of the host associated with the presence of antibodies or cells having a specific action on the invading microorganism or on its toxin.
- Inapparent infection** Presence of infection in a host without the occurrence of recognizable clinical signs and symptoms.
- Incidence** Number of new cases.
- Incidence rate**
$$\frac{\text{No. of new cases}_t}{\text{Population at risk}_t} \times 10^k$$
where t is a time period and k is some factor of 10. A change in the incidence rate means that there is a change in the balance of etiologic factors, some naturally occurring fluctuation, or possibly the application of an effective control program.
- Incremental cost** The cost of one alternative less the cost of another.
- Incremental cost effectiveness (ratio)** The ratio of the difference in costs between two alternatives to the difference in effectiveness between the same two alternatives.

- Indirect costs** A term used in economics to refer to productivity gains or losses related to illness or death; in accounting it is used to describe overhead or fixed costs of production.
- Incubation period** Time between the entry of a microorganism into a host and the first signs and symptoms of disease.
- Independent variable** The variable that is manipulated to cause or influence an outcome. In experimental studies, this is the intervention. Sometimes called the antecedent variable.
- Infection** The entry and establishment of a transmissible agent in host tissue resulting in cellular injury.
- Internal environment** The situation of an organization as characterized by its structure and resources or inputs; the elements associated with an organization's internal environment are generally those under direct control and within defined organizational boundaries.
- Kappa statistic** A measure of agreement (reliability) for categorical variables beyond chance alone. A kappa (k) = 1 indicates perfect agreement. The significance of the k statistic is assessed with a z score.
- Likelihood ratio** Ratio of the probability that persons with the outcome have an observed value of a test to the corresponding probability among people without the outcome. Likelihood ratios are expressed as odds. Likelihood ratios do not vary with prevalence. Good for examining likelihood of outcome at various levels of a test.
- Longitudinal study** Individuals are selected in consideration of varying degrees of exposure to suspect factor but are not known to possess the outcome associated with the factor under study. The purpose of this study is to examine the rate of occurrence of particular outcome with various levels of some causative factor(s). The group selected for study can be a sample from the general population or a select group, e.g., individuals in certain occupations. It also is possible to conduct a prospective study by defining a past date for a specific group (e.g., HMO enrollees) investigation. Follow-up information concerning the outcome is reconstructed, if necessary, through a number of sources including death certificates, hospital records. This latter approach also may be termed historical prospective or retrospective.
- Market** The set of all people who have an actual or potential interest in a product or service.
- Market analysis or audit** An analytic process associated with planning, which is initiated for the purpose of defining and characterizing the market and its needs, wants, or preferences.
- Market area** The place or location that is associated with the actual or potential markets (or customers), which an organization targets or selects for delivery of one or more products or services.
- Marketing** A managerial function encompassing planning, analysis, implementation, and control activities, which are undertaken to bring about the voluntary exchange of valued resources between two or more parties; a set of activities that are designed to facilitate the satisfaction of the resource-dependency needs of an organization.
- Market segment** A subset of a larger market (or set of all people who have an actual or potential interest in a product or service); members of such a subset are homogeneous in regard to defined demographic, geographic, psychographic, or behavioristic variables and adequately distinct from other market segments to justify delineation of specific marketing strategies.
- Marginal rate of return** The percent gain per time period (e.g., per year) from diverting \$1 of consumption to investment. For example, if the marginal rate of return is 6% annually, a dollar invested today will yield \$1.06 one year hence.

- Medicaid** A government health insurance program that is designed to provide care for those families and individuals who are unable to afford necessary medical care.
- Medicare** A federally financed health insurance plans for elderly persons, individuals receiving Social Security disability payments, and most persons with end-stage renal disease. Medicare Part A provides hospital insurance. Medicare Part B can be purchased for a monthly premium to pay for medical expenses.
- Medical technology** Therapeutic or diagnostic devices, medical or surgical procedures, Pharmaceuticals, or combinations thereof.
- Medication error** A preventable event that leads to or causes patient harm of inappropriate medication use. Types of medication errors include drug allergy, too rapid intravenous fluid flow rate, wrong route, and wrong dose.
- Meta-analysis** A systematic method using statistical analyses that combines data from independent studies to obtain a quantitative estimate of the summary effect of an intervention on an outcome.
- Mission statement** A statement that describes an organization's reason for being, its business, the products or services it offers, the market(s) it intends to serve, and features that distinguish the organization from others.
- Morbidity** The condition of being affected by a disease, illness, or symptoms. It may be newly onset case (incidence) or an existing condition (prevalence).
- Mortality rate** Number of deaths in a time period/population at risk times a factor of 10.
- Negative predictive value** Probability that a person with a negative test result does not have the outcome. It is the same thing as the posttest likelihood or posterior probability of no disease.
- Nosocomial infection** An infection in a patient or staff member emerging as a result of exposure to a source within a health care facility.
- Null hypothesis (H_0)** Makes a statement about the value of a population parameter to be statistically evaluated, phrased to negate the possibility of a relationship between the independent and dependent variables.
- Objective** A specific statement that indicates in measurable terms what an organization intends to accomplish and when in order to progress toward fulfillment of a goal objective.
- Odds** Ratio of the occurrence of an attribute that exists in a sample or population relative to it not existing.
- Odds ratio (OR)** The ratio of one odds to another. In a case-control study, the odds ratio compares the odds of exposure among the cases to the odds of exposure among the controls. The odds ratio in longitudinal and cross-sectional studies compares the odds of the outcome among the exposed relative to the odds of the outcome among those not exposed. The odds ratio is a descriptive measure of the strength of the relationship between an exposure factor and an outcome.
- Open systems theory** A theory that recognizes the importance of the interface or optimum fit between an organization and its environment and attempts to explain organizational behavior by viewing the organization as an open system that must interact with other entities in its environment in order to acquire resources and disburse its goods or services.
- P Value** The probability associated with a test statistic. Indicates how extreme the observed parameter is relative to a distribution. A *P* value of less than .05 generally is accepted as meaning that the results of the statistical test are unlikely to be due to chance alone. It also means that for a given test statistic the values observed are less than 5 times out of a 100 as extreme as the one observed.

- Pathogenicity** The ability of a biological agent to cause disease in a susceptible host.
- PESTs** An acronym for the political, economic, social (demographic), and technological forces that exist in an organization's external environment and determine the nature of the threats and opportunities confronting an organization.
- Population** The universe of all possible observations given a set of rules.
- Position** In the context of marketing, a comparative measurement of the standing of an organization or of each of its products and services relative to competitors and their products or services.
- Positive predictive value** Probability that a person with a positive test result has the outcome. It is used to assess yield of cases for screening efforts and is the same as the posttest likelihood or disease or posterior probability of disease. It is the proportion of individuals in the population with a characteristic at a specified point or period of time. It is the same as the pretest likelihood of disease or the prior probability of disease. The lower the prevalence rate, the lower the predictive value of a positive test.
- Present value** The value to the decision maker now of outcomes occurring in the future.
- Prevalence** Is the number of individuals in a population with the attribute of interest. Prevalence includes both previously diagnosed as well as new cases of a disease. Prevalence is a function of both the incidence and duration of the disease.
- Prevalence rate**
$$\frac{\text{Total number of new and old cases}_t}{\text{Total population}_t} \times 10^k$$
 where t designates a time interval and k is some factor of 10. The cases must come the same population in the same time period.
- Primary data** Information that is collected by the manager or researcher using any study designs, such as randomized controlled trials or observational studies.
- Primary prevention** Measures designed to prevent the onset of a disease or health problem (e.g., immunizations, health education).
- Prognosis** Forecasting the outcome of interest in a cohort or person initially free of the outcome of interest.
- Prognostic factor** A variable that affects the course of a disease or other health problem or outcome.
- Random sample** A subset of observations drawn from populations in such a way that each observation contained in population has an equal chance of being included in the sample.
- Receiver operating characteristic (ROC) analysis** A graph of a pair of true positive and false positive pairs used to evaluate the accuracy of a diagnostic test. The x axis is $1 - \text{specificity}$ or $1 - \text{"true negatives"}$; the y axis is sensitivity or "true positives." A way to determine the optimal cutoff point in consideration of diagnostic error. The optimal curve (test with the least diagnostic error) is one in which the x and y coordinates are maximal at the upper left of the graph.
- Relative risk (RR)** A ratio of the incidence rate among exposed divided by the incidence rate among the nonexposed. If the RR is greater than 1, the exposure factor increases risk of the outcome occurring. If RR is less than 1, exposure is protective for the outcome.
- Research hypothesis** Makes a statement about a presumed relationship between an independent variable(s) and a dependent variable within a population, e.g., fewer medication errors will occur when the nurse-patient ratio is at least 1:10.
- Resource dependency** A facet of open systems theory that holds that the behavior of an organization is influenced by the need to relate to other organizations in the environment

in order to obtain resources essential for organizational survival and for production of outputs (or the goods and services of the organization).

Risk The probability that an event will occur within a defined population during a specified time.

Sample A subset of observations drawn from a population.

Secondary data Data that already exist, having been collected for another purpose; data that may contribute to the understanding of a marketing situation or problem, although it may not be entirely responsive to the information needs of a current situation since the data were previously collected for some other reason.

Secondary prevention Measures that identify or treat persons who have a disease or risk factors, but who are not yet experiencing symptoms of the disease (e.g., Pap smears, blood pressure screening).

Sensitivity The ability of screening test to give a positive finding when the person tested truly has the disease. % Sensitivity =

$$\frac{\text{Persons with disease detected by screening test}}{\text{Total number of persons with the disease}} \times 100\%$$

Sensitivity analysis Mathematical calculations that isolate factors involved in a decision analysis or economic analysis to indicate the degree of influence each factor has on the outcome of the entire analysis. Specifically measures the uncertainty of the probability, distributions.

Sentinel event Any unexpected occurrence in the course of providing health care that results in death, serious physical or psychological injury, loss of function, or other events as defined by an accrediting body (e.g., infant discharge to wrong family, rape, patient suicide).

Situational analysis An assessment of an organization's situation in terms of its market(s), the forces in its external environment, competitors, the internal aspects of the organization associated with its resources and capabilities, and the performance of the organization relative to expectations.

Specific rate Rate pertaining to a segment or subgroup of a population, e.g., sex-specific rate. Represented as per 100,000 population in community assessments.

Specificity The ability of the test to give a negative finding when the person tested is free of the disease under study. % Specificity =

$$\frac{\text{Persons without the disease who are negative to the screening test}}{\text{Total number of persons without the disease}} \times 100\%$$

Stakeholder An entity (individual, group, or organization) that has an interest in or influence on a specified organization.

Sterilization The complete destruction of biological agents on or in an object, usually by means of heat (e.g., autoclave) or chemicals.

Strategic planning A systematic process for setting future direction, developing effective strategies, and ensuring that an organization's structure and systems are compatible with long-term survival and success.

Strategy A set of decision rules developed for the purpose of guiding an organization's behavior under varying circumstances; a pattern or plan for integrating an organization's mission, resources, and activities into a cohesive whole.

Surveillance The systematic collection, tabulation, analysis, and feedback of information about all those at risk for a particular condition regarding the occurrence of the condition. Surveillance also involves the implementation of strategies to reduce risks and prevent

outbreaks. Surveillance may be targeted, i.e., focused on high-risk populations (ICU patients), passive (the review of microbiological reports from a transplant unit), or active (case finding of needlestick injuries).

Survival curve Graphic representation of the cumulative probability of death, survival, or other end-point determined from the follow-up of a defined group of persons at risk for the event.

SWOT analysis An assessment of the strengths and weaknesses of an organization (as represented by the resources under the organization's control and the resulting organizational capabilities) and the opportunities and threats (SWOT) existing in an organization's external environment and determined by the political, economic, socio-demographic, and technological forces in that environment.

Technology assessment The evaluation of the safety, effectiveness, efficiency, and appropriateness of devices, organization of services, medical and surgical procedures, and Pharmaceuticals as promoted for improving a patient's condition or quality of life.

Tertiary prevention Measures or services that are designed to prevent recurrence, death, or further disability in persons with clinical illness (e.g., cardiac rehabilitation, calcium plus vitamin D supplementation in elderly persons).

Time costs The time a patient spends seeking care or participating in or undergoing an intervention.

Time horizon The period of time for which costs and effects are measured in a cost effectiveness analysis.

Type I error An error committed when a true null hypothesis is rejected; occurs when the sample is too large.

Type II error An error committed when a false null hypothesis failed to be rejected; occurs when the sample is too small.

Uncensored observation The event of interest has occurred in the case (e.g., death). Term used in survival or failure-time analysis.

Utility A concept in economics, psychology, and decision analysis referring to the preference for or desirability of a particular outcome. In the context of health-related quality-of-life measurement, utility refers to the preference of the rater (usually a patient or a member of the general public) for a particular health outcome or health state.

Index

An italicized number signifies that the entry is in a figure.

- Absolute risk reduction, 236
- Acceptability, 136–137
- Accessibility, 13, 135
- Adjusted rates, 60; *See also* Standardization of rates
- Affinity diagram, 171
- Age adjustment, 60
- AIDS (acquired immunodeficiency syndrome), 104, 194, 195
 - classification of, 39
 - See also* Human Immunodeficiency Virus
- Airborne disease, 203
 - control measures, 204
- Airborne precautions, 205
- Air pollutants, 265
- Allele, defined, 218
- American College of Epidemiology, ethics guidelines, 340
- Association analysis, 225
- Autoregressive integrated moving average (ARIMA) model, 149
- Availability
 - defined, 13
 - related to health care utilization, 13
- Behavioral Risk Factor Surveillance System, of the Centers for Disease Control and Prevention, 45, 57
- Benchmarking, defined, 164
- Best practices, 162–163
- Biologic markers
 - definition, 272
 - of effect, 272
 - of exposure, 272
 - of susceptibility, 273
- Bloodborne disease
 - exposure control measures and plans, 199, 200
 - hepatitis B (HBV), 197, 198
 - human immunodeficiency virus (HIV), 197, 198
 - prevention and control, 199
 - standard precautions, 202
- Brainstorming, defined, 171
- Carrier, defined, 193
- Case, making for ethical analysis, 332
- Case-control study, 142
 - advantages and disadvantages, 143
 - purpose of, 142
 - selection of control group, 142
 - See also* Study designs
- Case-fatality rate, 58
- Case management, 163
- Casuistry, 331
- Causal analysis
 - multiple outcomes, 149
 - qualitative causal criteria, 90–92
- Causality
 - definition, 90
 - steps in evaluation of, 79
- Causal inquiry, seven steps, 79
- Cause-and-effect diagram
 - defined, 172
 - examples and construction of, 172–173
- Census, 45
- Centers for Disease Control and Prevention, 54
- Classification systems
 - defined, 38
 - diseases, 38
 - functional ability, 40
 - infectious agents, 192
 - injuries, 40
 - Mendelian, 230
 - mental and behavioral disorders, 41
 - organizations, 42
 - procedures, 43
 - quality of life, 41
- Clinical practice guidelines
 - critical success factors, 162
 - key features of, 162
- Clinical trials, ethical guidelines, 340
- Clinical Value Compass, 164–165
- Coefficient of variation, 36
- Coherence, causal criteria, 91
- Cohort, 143

- Cohort study, 143; *see also* Longitudinal studies
- Communicable disease reporting, 194, 197
- Communitarianism, 333, 342
- Community, definition of relevant, 333
- Comparison charts, 179, 180
- Competitive (or competitor) analysis, 111–112
- Conceptualization, 80
- Confidence interval, 67
- Confidentiality and privacy concerns, 344
- Consent, informed, elements of, 345
- Consistency, causal criteria, defined, 91
- Construct validity, 34
- Content validity, 34
- Continuity, defined, 136
- Continuous quality improvement, 158
- Control chart
 - definition and example, 177
 - formulae for, 178
 - steps in preparing, 178
- Control of confounding, 90
- Correlation coefficient, 36
- Cost–benefit analysis, 312
 - defined, 150, 312
 - steps in performance of, 313
- Cost-effectiveness analysis (CEA), 312
 - computation of cost-effectiveness ratio, 321
 - defined, 150, 312
 - epidemiological data, 318
 - steps in performance of, 313, 318
- Cost components, 315
- Cost identification, 314, 315
- Costs and benefits, equity of distribution of, 318
- Council for International Organizations of Medical Sciences, 340
- Cox regression, 148–149
- Criterion validity, 34
- Critical paths. *See* Clinical practice guidelines
- Cross-sectional study, 141
 - limitations, 141
 - See also* Study designs
- Crude rates, 58, 60
- Death certificate, as a source of information about deaths, 55, 56
- Decision criteria, 243
- Decision model, 314
- Declaration of Helsinki, 338
- Deductive inquiry, 77
- Dependent variable, 82
- Descriptive epidemiologic measures, 68
- Diagnostic related groups (DRGs), 181
- Directly observed treatment (DOT), 319
 - and benefits compared to self-administration of treatment (SAT), 320, 321
- Direct rate adjustment, 60–61, 62; *See also* Standardization of rates
- Disability, defined, 40
- Disability-adjusted life expectancy (DALE), 139–140
- Disability-adjusted life years (DALYs), 64, 103
- Disasters, environmental, 267
- Discounting, defined, 317
- Disparities, health, 292
- Ecological fallacy, 89
- Economic decision-making, 309
- Effectiveness, 136
- Efficacy, 139
- Efficiency, defined, 136
- Environment
 - impact on the immune system, 264
 - impact on the nervous system, 265
 - impact on the reproductive system, 263
 - impact on the respiratory system, 266
- Environmentally related (or environmentally provoked) diseases, 274
 - health services for
 - primary prevention, 274
 - secondary prevention, 274
 - tertiary prevention, 276
 - recognition and assessment, 271–272
 - risk assessment, 273
- Environmental equity, 269
- Environmental terrorism, 266
- Epidemic, 196
 - definition, 196
 - role of health care manager, 196
- Epidemiological framework
 - health system characteristics and health status of populations, 18
 - population-based focus for health care delivery, 15
 - questions to answer to address health problems, 21
- Epidemiological measures
 - ratio measures, 64
 - specific rate measures, 58, 59
 - summary rate measures, 58
- Epidemiological model for health care delivery, 4
- Epidemiologic triangle, 262
- Epidemiology
 - applying in health care management practice, 21
 - defined, 3
 - determining distribution of needs (disease), 16–17
 - formulating and evaluating public policy, 20, 290
 - monitoring health system performance, 19–20
 - monitoring, service population size, 15
 - planning and evaluating health services, 134
 - understanding genesis and consequences of health problems, 18
- Ethical evaluations, approaches for resolving, 330
 - casuistry, 331
 - Communitarianism, 333
 - feminist ethics, 334
 - principlism, 330
 - utilitarianism, 335
- Ethic of care, 334

- Ethics
 - defined, 329
 - in epidemiology, 340
 - in medical genetics, 232
- Ethics of genetic disease screening, 230
- Evaluation, in health care
 - defined, 133
 - process, 137–138
 - purposes, 133
 - use of epidemiological principles and methods in, 133

See also Health system, evaluation criteria
- Evaluation criteria, conceptual frameworks for
 - specifying and measuring impact, 138–140
 - RE-AIM (reach, efficacy, adoption, implementation, and maintenance) model, 139
 - SPO (structure, process, outcome) classification, 139
 - WHO systems level framework and five dimensions of, 139
- Exchange theory as the foundation of marketing, 105
- Exon, defined, 219
- Experimental studies, 144–145
 - quasi-experimental studies, 145
 - time series design, 145
- Exposure
 - in developing infectious disease, 195
- False negative, 34
- False positive, 34
- Feminist ethics, 334
- Fertility rates, 58, 100
- Flow chart, 173, 174
- Functional ability, classifications of, 40–41
- Gap analysis, 113
- Gene-environment interaction, 262
- Genetic epidemiology, studies, 226
 - of BRCA1 and BRCA2, 226
- Genetic epidemiology and health services management, 227
- Genetic health services, 227, 229
 - and information needs and systems, 229, 230
- Genetic linkage, 219
- Genetic mapping, 220
- Genetic screening (testing), 227, 228, 229
 - conditions for appropriateness, 228
 - economic and health impact, 230
 - example of phenylketonuria screening, 228
 - future of, 229
 - levels of
 - family, 228
 - individual, newborns, 228
 - population, 228, 229
 - prenatal, 227, 229
- Genetics, ethical challenges of, 230
- Genetics and epidemiology of
 - genetic techniques and tools, 223
- Genetic and epidemiology of (*cont.*)
 - genetic techniques and tools (*cont.*)
 - association analysis, 225
 - linkage analysis, 224
 - pedigree, 223
 - phenotype identification, 223
 - segregation analysis, 224
 - twin studies, 225
- Genotype, defined, 218
- Global environmental health, 271
- Goal, defined, 115
- Hazard rate, 53
- Health
 - classification of, 38
 - definition of, 14
 - environment and, 261
 - global, 271
 - measures of, 9, 10, 14
 - needs, 6, 8, 16
 - outcomes, 15, 261–262
- Health care quality management
 - defined, 157
 - interrelationship with epidemiology, 157
- Health Plan Employer Data and Information System:
 - see* HEDIS
- Health services
 - for environmentally provoked diseases, 274
 - evaluation, 134
 - prospects of, 150
 - public, 286
- Health status, 168
- Health system
 - defined, 137
 - evaluation criteria, 134
- HEDIS (Health Plan Employer Data and Information System), 166–167
- Helsinki Declaration, 339
- Hepatitis B
 - adverse events from vaccination, 299
 - geographic distribution, 297
 - rates of occurrence, 296, 298
- Herd immunity, 300
- Histogram, 175
- Historical prospective study, 143
- Host susceptibility, 195
- Human Genome Epidemiology Network (HuGE Net), 221
 - web sites for, 222
- Human Genome Project, 219
 - epidemiology and, 221, 222
 - international implications of, 221
- Human Immunodeficiency Virus (HIV)
 - epidemiology of, 198–199
 - transmission of, 197
- Hypothesis
 - defined, 83

- Hypothesis (*cont.*)
 formulation of and template for, 82
 testing, 83
- Immune system
 definition, 264
 impact of the environment on, 264
- Immunity
 defined, 195
 herd, 300
 types, 195
- Incidence
 density rate, 52
 rate, 51
 sources of information, 54
- Incubation period, defined, 193
- Independent segregation of genes, law of, 218
- Independent variable, 82
- Indirect adjustment, 61–62, 63
- Inductive inquiry, 77
- Infant mortality rate, 14, 58, 180, 293
- Infection control, management responsibilities, 196, 197, 198
- Infectious disease control
 special considerations by health care setting
 ambulatory care, 208
 behavioral health, 211
 home care, 209
 hospice, 210
 inpatient acute care, 207
 long-term care/skilled nursing facility, 209
See also Bloodborne disease
- Infectious diseases
 concepts of, 192
 drug-resistant, 203
 emergence of, 192
- Informed consent, defined, 341
 essential categories of, 345
- Institutional Review Board (IRB) defined, 348
- Integrated requirements model (IRM) for primary care
 resource planning, 113
- Internal organizational audit, 112–114
 defined, 112
 understanding of strengths and weaknesses, 112
- International Classification of Diseases* (ICD), 38, 39
- International Covenant on Civil and Political Rights, 339
- International Ethical Guidelines for Biomedical Research Involving Human Subjects*, 341
- International Guidelines for Ethical Review of Epidemiological Studies*, 342
- Intervention effects
 methods for analyzing, 145–149
- Introns, 219
- Kappa statistic, 36, 37
- Law of independent assortment of alleles, 218
- Level of measurement, 31
- Level of significance, 83
- Life expectancy defined, 14–15
- Likelihood ratio, defined, 35, 36
- Likelihood ratio in genetic analysis, 225
- Likert-type ordinal scale, 31, 168
- Linkage analysis, 219, 224
- Lod score, 225
- Logistic regression model, 84–85, 146
- Longitudinal study (prospective or cohort study), 143–144
 advantages and disadvantages of, 144
 purposes of, 143
 types of, 143
- Malcolm Baldrige National Health Care Quality Award, 181–183
- Map, genetic, 221
- Market, defined, 108
- Market analysis, 108–110
- Marketing, 105
- Measurement, logistics of, 38
- Measurement error
 control of, 44
 defined, 43
 sources of, 44
- Measurement of benefits, 316, 320
- Measurement of costs, 314, 319
- Measurement of resources, 316
- Mendelian Classification System, 230
- Mendel's laws, 218
 exceptions to, 218
 independent segregation of genes, 218
 law of independent assortment of alleles, 218
- Meta-analysis
 computing effects, 245
 critiquing, 246
 defined, 92
 summarizing effect, 149
 in technology assessment, 244
- Microbiologic agents, categories of bacteria, fungi, parasites, viruses, 193
- Mission statement, key elements of, 107
- Multilevel analysis, 87
- National Center for Health Statistics, 55
- National Committee for Quality Assurance, 161, 166
- National Death Index, 55
- National Health Interview Survey, 45
- National Health Objectives, 287
- National Immunization Survey, 296
- Needs, health, 16
- Nervous system, impact of the environment on, 263
- Nosocomial infection, 207
- Nuremberg Code, ten basic principles of, 338

- Observational studies, types, 140, *141*
 case-control, 142–143
 case series, 140
 cohort, 143
 cross-sectional, 141
 descriptive, 141
 longitudinal or prospective, 143
- Odds, defined, 66
- Odds ratio, defined, 66
- Office for Human Research Protections, 344
- Operational definition, 81
- ORYNX initiative of Joint Commission on
 Accreditation of Healthcare Organizations,
 166
- Outbreaks, disease
 managing, 195–197
 reasons for occurrence, 195
- Outcome measures, *170*
- Outcomes
 assessment, 139, 246
 clinical, 167
 health, 139
- P value, 242
- Pareto chart, 175, *176*
- Pathogenicity, defined, 193
- Pedigree, 225, 226
- PESTs (political, economic, social technological
 forces), 110
- Phenotype, defined, 223
- Plan, Do, Study, Act (PDSA) cycle, 164, *165*
- Planning, 137
- Population
 characteristics impact on disease patterns, 101
 defined for health services delivery, 4, 134
 factors affecting size, *16*
 sources of data, 5–6
 trends, 6, 7, 8, *17*, 100, *101*
- Population attributable risk (PAR) percent, 67
- Population genetics, defined, 223
- Population pyramids, 101, *102*
- Practice guidelines, clinical, 162
- Present value (PV)
 discount rate, 317
 formulae for benefits and costs, 317
- Prevalence
 defined, *34*
 rate, 53–54
 sources of data, 55
- Prevention
 for environmentally-provoked diseases, 274
 primary prevention, 10, *11*, 274
 secondary prevention, 10, *11*, 274–276
 tertiary prevention, 10, *11*, 276
- Principlism, definition, 330
- Privacy: *see* Confidentiality and privacy concerns
- Problem, identification and specification, 79
- Process measures, 139, 167, *170*; *see also* Evaluation
 criteria
- Program evaluation, 133
 conceptual dimensions, *134*
 design considerations, 140
- Programmatic quality initiatives
 defined, 160
 examples of, 160
- Propositions, definition of, 78
- Prospective study (longitudinal), 143
- Public goods, 310
 and applications of CBA and CEA, 310
 and government provision of, 310
 and health care, 310
- Public health
 definition, 286
 services, 286
- Public policy process, 287, 288
- Quality
 defined, 135
 dimensions of, 159
See also Program evaluation
- Quality assessment, 114–115, 135
- Quality audits, *106*, 114
- Quality control tools, statistical, 173–181
 check sheet, 175
 comparison charts, 170–180
 control chart, 177–179
 histogram, 175
 Pareto chart, 175–176
 run chart, 177
 scatter diagram, 176
- Quality improvement tools, qualitative, 170–173
 affinity diagram, 171
 brainstorming, 171
 cause-and-effect diagram, 172
 flowchart, 173, *174*
- Quality management in health care, 158
 definition, 158
 organizational approaches to, 159
 performance standards, 161
 planning, 160
 programmatic options in, 159–160
- Quality measurement, 166
 clinical outcomes, 167
 data sources, 168
 health status, 168
 levels of, 169–170
 process measures, 167
 sampling, 169
 satisfaction, 167–168
- Quality of life, 41
- Quasi-experimental studies, 145
- Randomization, random sample, defined, 144
- Randomized clinical trial (RCT), 247

- Random sample, 169
- Rate, uses of, 68, 169, 170
- Ratios, uses of, 68, 170
- Receiver operating characteristic (ROC) curves, 35, 244
- Relational ethics, 334
- Relative risk (RR), 66
 - percentage reduction, 236
- Reliability, 36
- Reportable (notifiable), 193, 194
- Reproductive health
 - agents affecting, 264
 - impact of the environment on, 263
- Reservoir, for infectious agents, 193
- Respiratory system, impact of the environment on, 266
- Review of literature, 80, 242
- Risk adjustment, 181
- Risk assessment, process for environmentally provoked diseases, 273
- Risk factor, 64–65
- Risk management, 163
- Risk ratio, 65
- Run chart, 177

- Sampling, 169
- Satisfaction, patient, means of measuring, 168
- Scatter diagram, 176
- Scientific inquiry, 75
 - characteristics of, 76
 - conceptualization, 80
 - logic of, 77
 - and deductive inquiry, 77
 - and inductive inquiry, 77
 - stages in (seven steps), 79
 - model selection, 80
 - review of literature, 80, 81
 - theoretical framework, 80
- Screening
 - for environmentally provoked diseases, 275
 - genetic, 227
 - for phenylketonuria, a model, 228
 - programs 229
- Segregation analysis 225
- Selecting a statistical test, 84
- Sensitivity, defined, 34
- Sensitivity analysis (in CBA and CEA), 317
- Small area analysis, 141
- Specificity, defined, 34
- Specific rate, 58, 58, 59
- Stakeholders
 - defined, 114
 - examples of, 115
- Standard, performance, 161–162
- Standardization of (adjusted) rates, 60
 - direct adjustment, 60
 - indirect adjustment, 63
- Standard precautions, 202
- Statistical tests, selection, 84, 85
- Strategic planning
 - application of epidemiology, 105
 - conceptual framework, theoretical basis, 104–106
 - data resources for, 117, 118–119
 - defined, 104, 106
 - epidemiological basis, 99
 - process steps, 108–115, 116–117
 - SWOT analysis, 117–119
 - theoretical basis, 104–106
 - tools for, 117–119
 - worksheets (sample) for use in strategic planning, 120–121
- Structural equation models (SEM), 85–86, 149
- Structural measures of evaluation, 139
- Study design, selection of, 82, 140
- Study designs, 140, 141, 243
 - descriptive studies, 141
 - in evaluation, 140–150
 - experimental studies, 144
 - observational studies, 140
- Study variables, quantification of, 80
- Summary rate measures, 58
- Surveys
 - advantages and disadvantages, 30
 - types of, 30
- Survival analysis, 147–149
 - Cox regression, 148–149
 - Kaplan–Meier (product limit) survival estimate, 147, 148, 149
 - log-rank test, 148
 - survival curve, 149
- SWOT analysis, 117–119

- Technology assessment
 - criteria for, 240
 - defined, 235
 - framework for prioritizing technologies, 242
 - organizational efforts, 248–251
 - problems in performing, 252
- Technology life cycle, 238
- Terrorism, environmental, 267
 - control measures, 268
- Theoretical framework, 80
- Theory formulation approaches, 77
 - deduction, 77
 - induction, 77
- Time series design, 145
- Total Quality Management (TQM), defined, 158
- Transmission of disease
 - modes (route) of transmission, 193, 195
 - portal of entry, 193
 - portal of exit, 195
 - vehicles of, 194
- Tuberculosis (TB), 203
 - control measures and plans, 204–207

- Tuberculosis (*cont.*)
 - transmission of, 203
- Utilitarianism
 - role of rules, 336
 - theory of, defined, 335
- Utilization management, 162–163
- Utilization of health care services
 - changing patterns, 111
 - determinants or influences of, 12
 - proxy measure of need, 8
- Vaccine preventable diseases, 289, 295
- Validity
 - defined, 33
 - evaluation of, 34
- Variance tracking, defined, 162
- Variation
 - assessment of, 180
 - common cause, 180
 - special cause, 180
- Virulence, 193
- Viruses, 192
- Years of potential life lost (YPLL), 63, 64