

INDEX

A

Abridged life table, 119, 198; for 2003, 124–125; for total population, 2003, 249
Absorbing state, 101
Accuracy, 160, 249
Adobe Illustrator, 154
Adobe Systems, 154
Advisory Committee on Immunization Practices, 38, 39, 177
Agency for Health Research and Quality, 44
ALOS. *See* Average length of stay (ALOS)
American Cancer Society, 44
Analytical horizon, 42
Anderson, J. P., 112
Anderson, R. N., 119
Appropriate technology utilization, 11, 249
Arnesen, E., 172
Asch, D. A., 11
Attaran, A., 11
Attribute, 110, 249
Australia, 17, 62
Avastin, 28
Average length of stay (ALOS), 57–58

B

Bailey, M. J., 66
Barendregt, J. J., 74
Baron, J., 11
Baseline value, 139, 166, 249
Behavior Risk Factor Surveillance System, 171
Berenson, A., 28
Bias, 160, 249
Bobadilla, J. L., 15
Bonneau, L., 74
Brazil, 143, 144
Bridges, C. B., 178, 189
Burden-of-death analysis, 34–35

C

Canada, 17
Canadian Task Force, 180
Care, standard of, 29
CCS codes. *See* Clinical Classifications for Health Policy Research (CCS)

CEA Registry, 27
Centers for Disease Control and Prevention (CDC), 183, 186, 187, 190; Wonder System, 186, 187
Chan, M. S., 17, 32, 150
Charge, 61, 249
Chicago, Illinois, 175
Chile, 17
China, 61–62
CHOICE. *See* Choosing Interventions that are Cost-Effective (CHOICE; World Health Organization)
Choosing Interventions that are Cost-Effective (CHOICE; World Health Organization), 15
Chrischilles, E. A., 162
Clinical Classifications for Health Policy Research (CCS), 59–60, 63, 186
Clinical practice guideline, 44, 249
Clissold, S. P., 174
Combined Health Information Database, 182
Community-derived preferences, 108, 249
Comparator, 29, 43
Competing alternative, 4–5, 249
Consumer Price Index for Urban Consumers, 64
Coons, S. J., 114
Cost-benefit analysis, 30, 32–33
Cost-effectiveness: calculating incremental, 132–134; overview of, 1–3; usefulness of, 3–4
Cost-effectiveness analysis, 30–31, 251; and competing alternative, 4–5; components of, 6; and costs, 7–8; elements of, 4–8; health interventions and, 4; and health states, 5–7; managing error in, 161–168; nonreference case, 31–32; and policy, 14–16; purpose of, 9–12; and quality-adjusted life year, 7
Cost-effectiveness analysis, principles of: and capturing costs, 22–23; and capturing quality, 23–26; perspective in, 19–22
Cost-effectiveness ratio, 8–9; defining comparator in, 29; interpreting, 27–30; and interpreting incremental changes in cost and effectiveness, 30
Cost-effectiveness table, 153
Cost-minimization analysis, 34
Costs: adjusting, 60–61; and adjusting for inflation, 64; and assessing “relevancy” of cost data, 70–71; associated with pain and suffering, 69; capturing, 22–23; and converting charges, 63–64; discounting future, 66; as element of cost-effectiveness analysis, 7–8;

Costs (*continued*)

and getting cost data, 57–58; and hospital charges, 61; hypothetical and discounted, of 1,000 elderly persons over ten years, 68; identifying, 52–55; importance of, 9–11; measuring changes in, 71–72; and micro-costing and gross costing, 55–57; opportunity, 10, 51–52; and partial flowchart of flu, 53; and payments associated with premature death, 73–74; for treatment of influenza, 56; and using diagnostics codes, 59–60; working with, 50–74

Cost-to-charge ratios, 62, 162–163, 249

Cost-utility analysis, 30–31, 249

Cox, N. J., 71

CPI-U. *See* Consumer Price Index for Urban

Consumers

Cross-sectional studies, 169–172, 249

Crude rate, 156, 249

D

DALYs. *See* Disability-adjusted life years (DALYs)

Data extraction tools, 181, 186–187, 249

Data Ferret, 186

Data, finding: data extraction tools for, 186–187; and data sets useful for finding frequently needed cost-effectiveness parameters, 185; and data sources for which data extractions tools are available, 186; and expert opinions, 189; and finding right electronic data, 183–184; and grading published data, 180; and major sources of international data, 181; and major U.S. health data sets available to public, 181–183; in medical literature, 183; and organizing data, 189–190; overview, 179; and piggybacked studies, 188–189; and printed tabulations of electronic data, 187; and unpublished data, 188; and using electronic data sets, 180–183; and which source to turn to, 184–186

DATA program (TreeAge Software), 99–101

Data, working with, 155–178; and basics of statistical inference, 166–168; and calculating weighted means, 168; and evaluating study limitations, 168–172; and example of triangular distribution, 169; and frequency distributions, 163; and generalizability, 176–178; and graphic representation of 100 cholesterol values, 164; and hypothetical example of two populations with equal numbers of subjects and identical age-specific mortality rates, but different population distributions by age, 156–159; and hypothetical probability distribution, 163; and managing error in cost-effective analysis, 162–170; and meta-analysis, 175–176; and normal curve, 167; overview, 155; and placebo-controlled studies, 170; and primary cost-effectiveness studies, 175–177; and probability distribution, 163, 165;

and prospective studies, 170–171; and randomized controlled trials, 173–174; and retrospective studies, 173; and review of rates, 156–159; and triangular distribution, 168; and understanding error, 160–161; and weighted means, 168

Dawber, T. R., 173

de Andrade, H. R., 177

Decision analysis model, 79–82, 250; basic components of, 80; and calculating cost of each strategy, 82–83; and decision analysis tree, 80; and event pathway for vaccination *versus* supportive care, 81; idea behind, 84; types of, 86

Decision tree model, 80, 81, 83, 86, 101. *See also* Decision analysis model

DeKay, M. L., 11

Delphi method, 191

Diagnosis codes, 59–60; and common codes used to group diseases, 59

Diagnosis-Related Groups (DRGs), 59–60, 62, 63, 186; Medpar cost by, 62

Dimension, 110, 250

Direct costs, 23, 250

Disability-adjusted life years (DALYs), 31, 32, 34, 35, 108, 136; using, 116

Discount rate, 152, 154

Discounting, 66, 250; how to use, 67–68

Doll, R., 173

Domain, 110, 250

Dominant strategy, 250

Dominated strategy, 153, 154, 250

Double-blinded, 174, 250

DRGs. *See* Diagnosis-Related Groups

Drug Topics Red Book, 52

Drummond, M. F., 22, 30, 40–42, 110, 117, 118

Dunet, D. O., 17, 40–42, 188

E

Economic analysis: and burden-of-death analysis, 34–35; and cost-benefit analysis, 32–33; and cost-effectiveness and cost-utility analysis, 30–31; and cost-minimization analysis, 34; types of, 30–35; and when to use nonreference case cost-effectiveness analysis, 31–32

Education, as health expenditure, 10

Effect size, 167

Effectiveness, 11–12, 250; *versus* efficacy, 11–12

Efficacy, effectiveness *versus*, 11–12

Electronic data sets: and finding right electronic data, 183–184; understanding error in, 188; using, 180–183; using printed tabulations of, 187

Elmore, J. G., 158

“Epidemics and Economics,” 74

Erickson, P., 117, 202

- Error: and bias, 160; in electronic data, 188; managing, in cost-effective analysis, 162–168; in medical literature, 178; and misclassification bias, 188; nonrandom, 160, 162; random, 160; type I, 167; type II, 167; understanding, 160–162
- EuroQol, 35, 112, 113, 131, 203; 5D health domains, 109
- EuroQol 5D Health Domains, 204
- EuroQol Group, 35, 108
- Event pathway, 45
- Evidence, levels of, 180, 252
- Excel (Microsoft), 154
- Expected value, 84
- Expert opinion, 189
- External validity, 73, 250
- ## F
- Fahs, M. C., 17
- False-positive test results, 2, 250
- Farmer, P., 4
- Federal Electronic Research and Review Extraction Tool (FERRET), 186
- Filmore, I. D., 130
- Filmore procedure, 130, 131, 139; incremental effectiveness of Reinkenshein procedure relative to, over range of risk ratios, 140; *versus* Reinkenshein model rolled back, 135; *versus* Reinkenshein model rolled back to reveal gains in quality-adjusted Life expectancy associated with each strategy, 132; *versus* Reinkenshein model with costs added, 133; *versus* Reinkenshein model with discounting added to HRQL values, 134
- Fisher, M. J., 170
- Fixed costs, 71, 250
- Forde, O. H., 171
- Framingham, Massachusetts, 173
- Franks, P., 29, 105, 114, 116
- Frequency distributions, 163–167; of hypothetical cholesterol values obtained from 100 subjects, 163–164; and random error, 163–167
- Friction costs, 73
- Fryback, D. G., 29, 105
- Fukuda, K., 71
- ## G
- Gaussian distribution, 166. *See also* Normal distribution
- Generizability, 178–180
- Germany, 146, 186
- Gittelsohn, A., 9
- Gold, M. R., 10–11, 13, 14, 17, 22, 26, 27, 29–34, 39–42, 55, 58, 66, 70, 73, 74, 105, 107–109, 112, 114, 116, 117, 136, 137, 148, 150, 152–154, 188
- Gotzsche, P. C., 175
- Governmental perspective, 21, 250
- Griffin, M. R., 151
- Gross costing, 55–57, 250
- Gross costs, 55, 250
- Guillain-Barré syndrome, 71
- Gyrd-Hansen, D., 33
- ## H
- Haddix, A. C., 17, 40–42, 188
- HALYs. *See* Health-adjusted life years (HALYs)
- Harvard University, 34
- Health Care Finance Administration, 185
- Health interventions, 4, 250; example of effect of on health states of patients admitted to ER for acute asthma, 5; *versus* medical interventions, 14; prioritizing, 15–16
- Health maintenance organization (HMO), 177–178
- Health outcome, 250
- Health People 2010, 188
- Health states, 5–6, 110, 250; and diabetes Markov model depicting three, 111
- Health status, 6–7, 250
- Health Utility Index, 109
- Health-adjusted life years (HALYs), 31
- Healthcare Cost and Utilization Project, 60, 64
- Healthcare Cost and Utilization Project-3 (HCUP-3), 181, 184, 185
- Health-related quality-of-life (HRQL) score, 23–26, 31, 32, 34, 35, 69, 121, 137, 250; deriving, 108–109; deriving, using EuroQol, 113; difference in, among subjects who received Filmore or Reinkenshein procedure, 131; effect of age on, 115; effect of disease stage on, 115; effect of intervention on, 115; generated from large health surveys, 114–115; generating, for acute conditions, 113–114; graphic representation of, 24; hypothetical differences in, over ten years for diabetic women and women in perfect health, 25; and preference scores, 106–107; and trade-off between status quo health state and gamble, 107; use of, in diverse populations, 116; who should valueate, 107–108; working with, 104–116
- Healthy volunteer effect, 173, 251
- Healthy-years equivalent (HYE), 31, 32
- Heel, R. C., 174
- Herd immunity, 91
- Hill, A. B., 173
- Hirth, R. A., 33
- HIV, 65
- Hoyert, D. L., 121
- HRQL score. *See* Health-related quality-of-life (HRQL) score

HYE. *See* Healthy-years equivalent (HYE)

Hypothetical cohort, 251

Hypothetical data, 88, 157

I

IBM, 71

ICD. *See* International Classification for Disease (ICD)

ICD-9 system, 60

Incidence, prevalence *versus*, 158

Incidence rate, 172, 251

Incremental value, 251

India, 61–62

Indirect costs, 23, 251

Infante, A., 17

Influence analysis, 143. *See also* Tornado analysis

Intangible costs, 23, 69, 251

International Classification for Disease (ICD), 59–60, 63, 186

International health data, 183

Intervention, dominant *versus* dominated, 30

Interventions, 43; defining, under study, 38–40

J

Jamison, D. T., 15

Jeckel, J. F., 158

Jia, H., 116

Johnson, J. A., 114

K

Kannel, W. E., 173

Kaplan, R. M., 112

Katz, D. L., 158

Keech, M., 113

Kendal, A. P., 40

Khan, K., 151

Kolata, G., 51

Kung, H. C., 121

L

Lasky, T., 1

Lawrence, L., 184

League table, 15–16, 251; hypothetical, for village in Malawi, 15–16; hypothetical, for village in Malawi with \$58,000 health budget, 16

Leisure time, 26, 251

Life expectancy, calculating, 87–103; and age-specific mortality rates, survivors, and number of deaths in cohort of 15 year olds, 97; basic Markov model used to, 129; complete decision analysis tree for, using DATA, 101; and deaths, mean age of death due to influenza, and life expectancy for persons

aged 15–65, 90; at given age, 123; by hand years gained, 88–92; and number of deaths due to influenza virus infection by age group, 89; at selected ages by race and sex. United States, 2003, 201; and total deaths and deaths due to influenza and total survivors in cohort of one million 15 year olds, 93; and total person-years lived among cohort of 15 year olds, including and excluding deaths due to influenza, 96; and total person-years lived by cohort of 15 year olds, 95; and total years of life lost due to influenza in United States, 91; using Markov models, 92–103; and using Markov models for subjects receiving Filmore and Teinkenshein procedures, 92–103

Life table method, 119–120; and abridged life table, 124–125; and abridged quality-adjusted life table for total population, 2003, 202; and quality-adjusted life table, 126–127

Longitudinal studies, 173, 175, 251

Lopez, A. D., 32, 34, 117

Lost productivity costs, 26, 251

Lubetkin, E., 116

Lyell, L. P., 173

M

Malawi, 15, 16

Mandelblatt, J., 17

Marginal value, 251

Margolis, K. L., 151

Markov model, 251; basic concept of, 98; to calculate life expectancy, 129; to calculate QALE, 129–132; calculating life years lost using, 92–103; designed to calculate life expectancy of subjects receiving Filmore and Reinkenshein procedures, 130; for diabetes, depicting three health states, 111; in practice, 99–103; principles of, 98–99; and progression of cohort of ten women with breast cancer over six-year period, 100

Mauskopf, J., 15

McCoy, K. I., 29, 105

Measham, A. R., 15

Medical Expenditure Panel Survey (MEPS), 35, 47, 52, 63, 74, 114, 115, 181, 185, 202, 251

Medical interventions, health interventions *versus*, 14

Medical Provider Analysis and Review (Medpar), 62; costs by DRG, 62

Medical study designs, review of, 170

Medicare, 17

Medpar. *See* Medical Provider Analysis and Review (Medpar)

MEDPAR Inpatient Hospital National Data for Fiscal Year 2004, 203

MEDSTAT MarketScan Databases (Medstat), 189

- Meltzer, M. I., 71
 MEPS. *See* Medical Expenditure Panel Survey (MEPS)
 Meta-analysis, 146, 251
 Micro costs, 55, 251
 Micro-costing, 55–57, 251; when to use, 72–73
 Microsoft Corporation, 154
 Misclassification bias, 188, 251
 Mitchell, E. F., 151
 Models, 75–79
 Monte Carlo simulation, 143–147, 154, 165, 166, 252; and chance of incurring any given value of normally distributed variable, 144; and diabetes model in which values of each variable are normally distributed, 144; picking distributions in, 145–146
 Monto, A. S., 40
 Morbidity costs, 23, 252
 Mortality costs, 23
 Mortality data, 88
 Mortality rate, 97, 252
 Mortality Statistics (health data set), 182
 Mosley, W. H., 15
 Muennig, P., 10, 17, 32, 33, 35, 64, 92, 114, 116, 117, 136, 150, 151
 Muller, C., 17
 Multiattribute health status classification systems, 110, 252
 Multiway sensitivity analysis, 252
 Murray, C.L.J., 32, 34, 117
- N**
 National Ambulatory Medical Care Survey (NAMCS), 70, 181, 185
 National Center for Health Statistics (NCHS), 88, 90, 94, 160, 161, 186, 187; life expectancy and quality-adjusted life expectancy tables from, 200–202
 National Health and Nutrition Examination Survey (NHANES; National Center for Health Statistics), 162, 182, 185, 186
 National Health Interview Survey (NHIS; National Center for Health Statistics), 162, 182, 185, 187
 National Home and Hospice Care Survey (NHHCS), 182
 National Hospital Ambulatory Medical Care Survey (NHAMCS), 182
 National Hospital Discharge Survey (NHDS), 181, 184
 National Nursing Home Survey (NNHS), 182
 Nelson, C., 70
 Net present value, 61, 252
 Neumann, P. J., 17
 Neuzil, K. M., 151
 New York, 51
 New York City, 73, 177
 Nichol, K. L., 151
 Nonhealth data sets, 180
 Nonrandom error, 160, 162, 252
 Nonreference case analyses, 31–32
 Normal distribution, 165, 252
- O**
 O'Brien, B. O., 22, 30, 40–42, 110, 117, 118
 Odds ratio, 173, 252
 Olsen, M., 66
 Olsen, O., 175
 Olson, B. H., 18
 One-way sensitivity analysis, 139–142, 252, 253; answering secondary questions using, 141–142; examining how cost of providing influenza vaccine influences intervention, 141; and incremental effectiveness of Reinkenshein procedure relative to Filmore procedure over range of risk ratios, 140; to validate a model, 141
 Opportunity cost, 10, 252
 Oregon, 18
 Oregon Health Services Commission, 18
 Oregon Office for Health Policy, 18
 Organization for Economic Cooperation and Development, 88
 Oseltamivir, 40
 Outcomes, 4, 252
 Owings, M. F., 184
 Oxford Center for Evidence-based Medicine, 180
- P**
 Pallin, D., 17, 32, 150
 Panel on Cost-Effectiveness in Health and Medicine, 13, 22, 26, 41, 67, 74, 107, 133, 152
 Pereria, M. S., 40
 Person years, 120, 122
 Piggyback study, 149, 252; using data from, 188–189
 Placebo-controlled studies, 170
 “Plan Auge” (Chile), 17
 Policy, cost-effectiveness and, 14–16
 Population, 43, 157; defining, 38
 Preference score, 105, 252
 Preference-weighted generic instruments, 108, 253; using, 109–110
 Premature death, savings associated with, 73–74
 Prevalence, 252
 Prevalence ratio, 158, 252
 Prevalence, *versus* incidence, 158
 Prevalent cases, 158
 Prices, 52
 Primary cost-effectiveness analysis, 188, 252

- Probabilities, 75–79; and course of events during influenza season among those receiving supportive care alone, 76; and course of events during influenza season among those receiving vaccination, 77; and total cost of vaccination and supportive care strategies after incorporating probability of becoming infected with influenza virus, 78
- Probability distributions, 163, 252
- Program in Cost-Effectiveness and Outcomes (PCEO), 99, 121, 183
- Prospective studies, 172–173, 253; design, 174
- Publication, preparing study for: and content and structure of cost-effectiveness articles, 149–150; and cost-effectiveness table, 153; and introduction, 151; and methods, 151–152; overview, 149; and results, 153–154; and technical appendix, 154
- Published data, grading, 181
- PubMed, 180
- Q**
- QALE. *See* Quality-adjusted life expectancy
- QALY. *See* Quality-adjusted life year
- Quality of Well-Being (QWB) scale, 109, 112, 114
- Quality-adjusted life expectancy, 119, 253
- Quality-adjusted life expectancy (QALE), 7, 119, 121–128; and abridged life table for 2003, 124–125; and calculating incremental cost-effectiveness, 132–134; and calculating life expectancy at given age, 123; and difference in HRQL among subjects who received Filmore or Reinkenshein procedure, 131; and Filmore *versus* Reinkenshein model with costs added, 133; and quality-adjusted life table, 126–127; and sum of person years across age groups for cohort of one million 15 year olds, 122; using Markov models to calculate, 129–132
- Quality-adjusted life table, 126–127
- Quality-adjusted life year (QALY), 7, 11, 13, 15, 31, 33, 34, 253; calculating, 117–136; and quality-adjusted life expectancy (QALE), 121–127; and total person-years lived by cohort of one million 15 year olds, 120; using life table method, 119–120; using summation method, 118–119; and year-to-year progress of treated and untreated subjects with Leishmaniasis, 119
- QWB. *See* Quality of Well-Being (QWB) scale
- R**
- R (statistical package), 190
- Random error, 160–165, 253; and basics of statistical inference, 166–168; frequency distributions and, 162–166; and graphical representation of 100 cholesterol values, 164; and hypothetical probability distribution of 1,000 cholesterol test results, 166; and normal curve, 167; and probability distribution of 100 cholesterol values, 164
- Randomized controlled trials, 173–175, 253; design, 173
- Rates, 156–159; and hypothetical example of two populations with equal numbers of subjects and identical age-specific mortality rates, but different population distributions by age, 157; incidence, 172; and prevalence *versus* incidence, 158; relationship between risks, and, 158
- Recursive component, 98, 253
- Reed, G. W., 151
- Reference case analysis, 12–13, 31, 253
- Reinkenshein, L. E., 130
- Reinkenshein procedure, 130, 131, 133, 134, 139; Filmore *versus*, rolled back, 135; Filmore *versus*, rolled back to reveal gains in quality-adjusted life expectancy associated with each strategy, 132; Filmore *versus*, with costs added, 133; Filmore *versus*, with discounting added to HRQL values, 134; incremental effectiveness of, relative to Filmore procedure of range of risk ratios, 140
- Relative risk, 172, 253. *See also* Risk ratios
- Reliability, 160, 253
- Reliable*, 160
- Reproducibility, 160, 253
- Research project: and designing analysis, 43–49; developing, 36–49; and developing research question, 38–43; eight steps to perfect, 36–38; and flowchart indicating clinical course of influenza illness, 45; and flowchart indicating course of influenza among vaccinated subjects, 46; and probability of seeing doctor among subjects who receive vaccination *versus* those who receive supportive care, 47; project map for, 44; and research checklist, 40–42; and vaccination decision node, 48; and vaccination strategy represented with all probabilities filled in, 48
- Research question: anatomy of, 38; and defining interventions under study, 38–40; and defining population, 38; and defining study disease, 40; developing, 38–43
- Retrospective studies, 170–171, 253; design, 171
- Risk ratios, 172, 173, 253
- Risks, 158; relationship between, and rates, 158–159
- Robust analysis, 253
- Robust model, 138
- Rolling back, 102, 253
- Rosen, A. B., 17
- Russell, L. B., 10–11, 14, 17, 22, 26, 27, 29–32, 34, 39–42, 55, 58, 66, 70, 73, 74, 107–109, 112, 116, 136, 137, 148, 150, 152–154, 188

Rutten, F., 15
 Ryan, P. J., 113

S

Sachs, J., 11
 San Francisco, California, 175
 Saratoga, Illinois, 20
 SARS outbreak (2003), 74
 SAS Transport, 187
 Schaller, D. R., 18
 Schappert, S. M., 70
 Schechter, C., 17
 Scholz, D. A., 162
 Schonfeld, W., 15
 Scott, A. H., 113
 Secker-Walker, R. H., 69–70
 Sell, R., 17, 32, 150
 Sensitivity analysis, 37, 152, 253; conducting, 137–148; and determining plausible range of each variable, 147–148; and Monte Carlo simulation, 143–147; multiway, 138; one-way (univariate), 138–142; and terminal branch of Filmore arm represented, 139; and tornado analysis, 138; two-way (bivariate), 138, 142–143
 Shaffer, P. A., 17, 40–42, 191
 Shannon, I., 117, 202
 Shaw, J. W., 114
 Siegel, J. E., 10–11, 13, 14, 17, 22, 26, 27, 29–32, 34, 39–42, 55, 58, 66, 70, 73, 74, 107–109, 112, 116, 136, 137, 148, 150, 152–154, 188
 Simple decision analysis tree, 253
 Skehel, J. I., 40
 Skewness, 165
 Smith, B. L., 121
 Societal perspective, 21–22, 254
Society, 21
 SPSS, 187, 188; Graph, 154
 Standard deviation, 167, 168, 254
 Standard gamble technique, 106, 254
 Standard life table, 119, 254
 Standard of care, 29, 254
 STATA, 189, 190
 State transition model, 86, 254. *See also* Decision analysis model
 Statistical inference, 166–168
 Statistical power, 167, 254
 Statistics Canada, 184
 Stat/Transfer, 187
 Status quo, 254
 Stoddart, G. L., 22, 30, 40–42, 110, 117, 118
 Strauss, R. S., 162
 SUDAAN, 188

Summation method, 118–119
 Surveillance, Epidemiology, and End Results System (SEER), 182, 185
 Systematic bias, 161, 254

T

Technology utilization, appropriate, 11
 Tengs, T. O., 33
 Teutsch, S. M., 17, 40–42, 188
 Thelle, D. S., 171
 Threshold analysis, 42, 254
 Time costs, 69, 251
 Time preference, 66, 254
 Time trade-off, 107, 254
 Tornado analysis, 138, 143, 254. *See also* Influence analysis
 Torrance, G. W., 22, 30, 40–42, 110, 117, 118
 Transfer payments, 73
 Treanor, J. J., 28
 TreeAge Software, 99
 Triangular distribution, 146, 147, 254
 Tulsa, Oklahoma, 73
 Two-way sensitivity analysis, 142–143, 154, 253, 254; comparing changes in efficacy of influenza vaccine and incidence of influenza-like illness, 142
 Type I error, 167
 Type II error, 167

U

Ubel, P. A., 11
 United Kingdom, 113, 114, 202
 United States health data sets, 181
 Unpublished data, using, 188
 U.S. Bureau of Labor Statistics, 64, 182
 U.S. Bureau of the Census, 185
 U.S. Department of Agriculture, 17
 U.S. Food and Drug Administration, 33
Utility, 108

V

Vaccine efficacy, 46
 van der Mass, P. J., 74
 Variable costs, 71, 254
 Veterans Affairs hospital, 177
 Von Sternberg, T., 151

W

Weighted means, 171
 Weinstein, M. C., 10–11, 13, 14, 17, 22, 26, 27, 29–32, 34, 39–42, 55, 58, 66, 70, 73, 74, 107–109, 112, 116, 136, 137, 148, 150, 152–154, 188

- Wennberg, J., 9
WHO. *See* World Health Organization
Wilkinson, R. G., 10
Wilson, R., 117, 200
Wonder System (National Centers for Disease Control), 186
Wonder System (National Centers for Disease Control and Prevention), 187
World Bank, 34
World Health Organization (WHO), 11, 34, 40, 61, 88, 183
Wuorenma, J., 151
Wynn, A., 18
Wynn, M., 18
- Z**
Zanamivir, 40

