Chapter 3
Categories of Morbidity Data

Introduction

The classification of objects in the world, whether natural or manmade, is a prerequisite for both the rational explanation of any phenomena and the development of science. Medical science, especially the contemporary Western version, is highly dependent on classification systems or disease nosology, and a number of classifications systems are utilized to categorize health conditions. From a practical standpoint, epidemiologists, medical practitioners, and healthcare administrators must be able to place health conditions into appropriate categories for a variety of reasons, and the relevant system depends on the intended purposes. For example, the system used to classify physical illness differs from that used to classify mental illness.

Most existing classification systems were established to facilitate the diagnostic process. Subsequently, these classification systems have come to be used for administrative, planning, and fiscal management purposes. Administrators need to organize the delivery of care around the categories of health problems that must be addressed. Planners must be able to anticipate the types of services that will be needed in the future. Financial managers must be able to specify the diagnoses affecting patients in order to determine the cost of care and the charges to be levied for the services provided.

In addressing the issue of "the categories" a distinction should be made between morbidity associated with an individual (clinical morbidity) and morbidity associated with a group (epidemiological morbidity). This distinction reflects the unresolved issue of whether researchers should consider morbidity at the individual level or at an aggregate level. This and subsequent discussions will focus on morbidity as an attribute of a population independent for the most part of the morbidity of individuals.

R.K. Thomas, *In Sickness and In Health*, Applied Demography Series 6,
DOI 10.1007/978-1-4939-3423-2_3

Despite the presumed objectivity of medical science, the development of a workable disease classification system has been challenging. The use of modern diagnostic techniques and sophisticated biomedical testing equipment has complicated the classification of disease as ever finer distinctions can be made between various syndromes. Part of the problem stems from controversy over exactly how "disease" should be defined. The reality is that disease syndromes are not necessarily clear-cut and mutually exclusive, diagnostic tests are far from precise, and conventional standards for defining diseases tend to shift in accordance with new research findings, new treatment modalities, and even nonclinical developments. These problems—and the concomitant criticisms—are exacerbated when attempts are made at classifying disabilities or mental disorders. The systems that have been developed, therefore, although widely used, are not without their critics. Although less than perfect, these existing classification systems provide the framework within which medical science operates.

The Classification of Physical Illnesses

Most disease classification systems focus on physical illness rather than mental illness (although there is some overlap between the two types of systems). The section below describes commonly employed disease classification systems for physical illnesses (including injuries and disabilities) with mental illness classification discussed in a later section.

International Classification of Diseases

The most widely recognized and utilized disease classification system is the *International Classification of Diseases*. The International Classification of Diseases (ICD) system, whose major disease categories are shown in Exhibit 3.1, is the official classificatory scheme developed by the World Health Organization within the United Nations. The version currently utilized in the US is ICD-9-CM, with CM standing for "clinical modification" (Centers for Disease Control and Prevention 2015). The US version reflects modifications necessary in keeping with current medical practice in American hospitals. (An updated version of the ICD system—version 10—has been developed and is slowly being introduced.)

The ICD system is designed for the classification of morbidity and mortality information and for the indexing of diseases and procedures that occur within a clinical setting. The present classification system includes two components: diagnoses and procedures. Two different sets of codes are assigned to the respective components; the codes are detailed enough that very fine distinctions can be made between various syndromes and procedures.

Originally, the ICD system was designed to facilitate worldwide communication concerning diseases, to provide a basis for statistical record-keeping and

epidemiological studies, and to facilitate research into the quality of healthcare. However, additional functions have evolved in which the system is used to facilitate payment for health services, evaluate utilization patterns, and study the appropriateness of healthcare costs.

The disease classification component (found in volumes 1 and 2) utilizes 17 disease and injury categories, along with two "supplementary" classifications. Within each of these major categories, specific conditions are listed in detail. A three-digit number is assigned to the various major subdivisions within each of the 17 categories. These three-digit numbers are extended another digit to indicate the subcategory within the larger category (in order to add clinical detail or isolate terms for clinical accuracy). A fifth digit is sometimes added to further specify any factors associated with that particular diagnosis. For example, Hodgkin's disease, a form of malignant neoplasm or cancer, is coded as 201. A particular type of Hodgkin's disease, Hodgkin's sarcoma, is coded 201.2. If the Hodgkin's sarcoma affects the lymph nodes of the neck, it is coded 201.21.

The supplementary classifications are a concession to the fact that many nonmedical factors are involved in the onset of disease, responses to disease, and utilization of services. These additional codes attempt to identify causes of disease or injury states that are external to the biophysical system. Exhibit 3.1 presents the major categories of diseases and injuries recognized within the ICD classification system. Exhibit 3.2 provides an example of the classification of a particular condition.

Exhibit 3.1: Major Categories of Diseases and Injuries

International Classification of Diseases Version 9	
1	Infectious and parasitic diseases
2	Neoplasms
3	Endocrine, nutritional, and metabolic diseases and immunity disorders
4	Diseases of the blood and blood-forming organs
5	Mental diseases
6	Diseases of the nervous system and sense organs
7	Diseases of the circulatory system
8	Diseases of the respiratory system
9	Diseases of the digestive system
10	Diseases of the genitourinary system
11	Complications of pregnancy, childbirth, and the puerperium
12	Diseases of the skin and subcutaneous tissue
13	Diseases of the musculoskeletal system and connective tissues
14	Congenital anomalies
15	Certain conditions originating in the perinatal period
16	Symptoms, signs, and ill-defined conditions
17	Injury and poisoning
V	Classification of factors influencing health status and contact with health service
E	Classification of external causes of injury and poisoning

Diagnostic Related Groups

Efforts aimed at slowing healthcare expenditures were initiated during the 1980s by the federal government in response to the financial demands placed on the Medicare program, the Medicaid program, and other federally supported healthcare initiatives. The most significant step in this regard was the introduction of "prospective payment" as the basis for reimbursement for health services rendered under the Medicare program. Reimbursement is determined by the Diagnostic Related Group (DRG) that is assigned to the hospital episode. Under this arrangement, hospitals, physicians, and certain other providers of health services are informed at the beginning of the financial accounting period of the amount that the federal government will pay for a particular category of patient as determined by their classification into one of 753 DRGs (Advance Healthcare 2015). This is in stark contrast to the "retrospective payment" approach originally built into the Medicare program, which was essentially a cost- plus arrangement with no incentives for cost containment. The prospective payment system (PPS) limits the amount of reimbursement for service to each category of patient based on rates predetermined by the Centers for Medicare and Medicaid Services (CMS), the federal agency that administers the Medicare program.

Exhibit 3.2: Example of Disease Classification Using ICD-9-CM

Condition	Code
Ischemic heart disease	410–414
Coronary atherosclerosis	414.0
Aneurysm of heart	414.1
Aneurysm of heart wall	414.10
Aneurysm of coronary vessels	414.11
Other aneurysm	414.12
Other specified forms of chronic ischemic heart disease	414.8
Chronic ischemic heart disease, not elsewhere specified	414.9

Introduced by the federal government during the 1980s, DRGs represented an attempt to standardize the classification of hospital patients whose care was being financed by the Medicare program. DRGs represent a mixture of diagnoses and procedures. The primary diagnosis is modified by such factors as coexisting conditions, presence of complications, patient's age, and usual length of hospital stay in order to create the 753 diagnostic categories currently in use. Exhibit 3.3 presents a sampling of DRGs along with their codes.

Exhibit 3.3: Example Diagnostic Related Groups

DRG code	DRG description
071	Nonspecific cerebrovascular disorders with complications
072	Nonspecific cerebrovascular disorders without complications
073	Cranial and peripheral nerve disorders with major complications
074	Cranial and peripheral nerve disorders without major complications
075	Viral meningitis with complications
076	Viral meningitis without complications
077	Hypertensive encephalopathy with major complications
078	Hypertensive encephalopathy with complications
079	Hypertensive encephalopathy without complications
080	Nontraumatic stupor and coma
082	Traumatic stupor and coma
088	Concussion with major complications
089	Concussion with complications
090	Concussion without complications
091	Other disorders of nervous system with major complications
092	Other disorders of nervous system with complications
093	Other disorders of nervous system without complications
095	Bacterial and tuberculous infections of the nervous system with complications
096	Bacterial and tuberculous infections of the nervous system without complications

DRGs can be grouped into 25 major diagnostic categories (MDCs) in order to simplify the system. These MDCs are based primarily on the different body systems. MDCs may be used when a broader view of disease categories is desirable. Exhibit 3.4 lists the MDCs currently in use.

Exhibit 3.4: Major Diagnostic Categories for Diagnostic Related Groups

MDC code	MDC description
1	Nervous system
2	Eye
3	Ear, nose, mouth, and throat
4	Respiratory system
5	Circulatory system
6	Digestive system
7	Hepatobiliary system and pancreas
8	Musculoskeletal system and connective tissue

(continued)

Exhibit 3.4 (continued)

MDC code	MDC description
9	Skin, subcutaneous tissue, and breast
10	Endocrine, nutritional, and metabolic system
11	Kidney and urinary tract
12	Male reproductive system
13	Female reproductive system
14	Pregnancy, childbirth, and puerperium
15	Newborn and other neonates
16	Blood and blood-forming organs and immunological disorders
17	Myeloproliferative disorders
18	Infectious and parasitic disorders
19	Mental disease and disorders
20	Alcohol/drug use of induced mental disorders
21	Injuries, poison, and toxic effect of drugs
22	Burns
23	Factors influencing health status
24	Multiple significant trauma
25	Human immunodeficiency virus infection

Reportable or Notifiable Disease Classification

"Reportable" conditions, or notifiable diseases, represent another system of disease classification. Within the US, each state has the authority to define conditions of public health importance, also known as State Reportable Conditions, with the list of such conditions varying from state to state. "Notifiable" conditions are those that are recognized as reportable across all states and territories (Centers for Disease Control and Prevention 2014). The Centers for Disease Control and Prevention (CDC) and the Council of State and Territorial Epidemiologists (CSTE) designate certain conditions as nationally notifiable (also called National Notifiable Conditions or NNCs).

A condition might be on the national list but not be reportable in a particular state. In addition, conditions may be on a state's list of State Reportable Conditions that are not on the national list. Each state carries the authority to determine which conditions reporting entities (laboratories, hospitals, healthcare providers, etc.) are required to report. This discussion focuses on notifiable diseases since this list is standard for all public health authorities.

The CDC requests that states notify them when an instance of a disease or condition occurs that meets the national case definition. Potential (suspect) cases of notifiable diseases are reported to local, regional, or state public health authorities. These reports might be based on a positive laboratory test, clinical symptoms, or epidemiologic criteria. A public health investigation is sometimes conducted to determine the need for appropriate public health interventions. When a suspect case is determined to meet the national case definition, de-identified data are sent to the CDC. This can include information reported to public health authorities by

laboratories and healthcare providers, along with other information collected during public health investigations.

Notifiable diseases have been singled out primarily because of their communicable nature and for which regular, frequent, and timely information on individual cases is considered necessary for the prevention and control of the disease. Public health officials are particularly interested in conditions that have the potential to spread to epidemic proportions. It should be noted that virtually all notifiable diseases are acute conditions, at a time when chronic conditions represent the dominant health threat. For this reason, notifiable morbid conditions have become less useful over time as indicators of health status.

The list of nationally notifiable diseases is revised periodically and currently there are 52 infectious diseases so designated at the national level. A disease may be added to the list as a new pathogen emerges, or a disease may be deleted as its incidence declines. Public health officials at state health departments and the CDC continue to collaborate in determining which diseases should be nationally notifiable. The CSTE, with input from the CDC, makes recommendations annually for additions and deletions to the list of nationally notifiable diseases. Reporting is currently mandated (i.e., by state legislation or regulation) only at the state level and the reporting of data on notifiable diseases to the CDC is voluntary. All states generally report the internationally quarantinable diseases (e.g., cholera, plague, and yellow fever) in compliance with the World Health Organization's International Health Regulations.

Data on notifiable diseases are available from the CDC in all 50 states, the District of Columbia, and 122 selected cities. The data are available on a monthly basis in *Morbidity and Mortality Weekly Report*, a CDC publication, and at http://www2.cdc.gov:81/mmwr/mmwr.htm. Additional information on notifiable diseases can be found at http://www.cdc.gov. Exhibit 3.5 presents the current (2013) list of notifiable diseases.

Exhibit 3.5: Infectious Diseases Designated as Notifiable at the National Level: 2013

Anthrax
Arboviral diseases
Babesiois
Botulism
Brucellosis
Chancroid
Chlamydia trachomatis infection
Cholera
Coccidioidomycosis
Cryptosporidiosis
Cyclosporiasis
Dengue virus infection
Diphtheria
Ehrlichiosis/Anaplasmosis
Giardiasis

(continued)

Exhibit 3.5 (continued)

Gonorrhea
Haemophilus influenzae, invasive disease
Hansen disease (leprosy)
Hantavirus pulmonary syndrome
Hemolytic uremic syndrome, post-diarrheal
Hepatitis, viral
Human immunodeficiency virus (HIV) infection
Influenza-associated pediatric mortality
Legionellosis
Listeriosis
Lyme disease
Malaria
Measles
Meningococcal disease
Mumps
Novel influenza A virus infections
Pertussis
Plague
Poliomyelitis, paralytic
Poliovirus infection, nonparalytic
Psittacosis
Q fever
Rabies
Rubella
Salmonellosis
Severe acute respiratory syndrome (SARS-CoV)
Shiga toxin-producing (STEC)
Shigellosis
Smallpox
Spotted fever rickettsiosis
Streptococcal toxic-shock syndrome
Streptococcus pneumoniae, invasive disease
Syphilis
Tetanus
Toxic-shock syndrome (other than streptococcal)
Trichinellosis
Tuberculosis
Tularemia
Typhoid fever
Vancomycin infection
Varicella
Vibriosis
Viral hemorrhagic fevers
Yellow fever

Source: Centers for Disease Control and Prevention

Occupational Injury and Illness Classification

Another example of morbidity for which a classification system is required is injuries. There are different injury classification systems with applications in various settings. The Occupational Injury and Illness Classification System (OIICS) manual developed by the Bureau of Labor Statistics within the US Department of Labor outlines the classification system for coding the case characteristics of injuries, illnesses, and fatalities employed in the Survey of Occupational Injuries and Illnesses (SOII) and the Census of Fatal Occupational Injuries (CFOI) programs. This manual contains the rules of selection, code descriptions, code titles, and indices for data collection based on the nature of the injury or illness, the part of body affected, the primary (and secondary) source of injury or illness, and the event or exposure that led to the injury or illness. The OIICS was originally developed and released in 1992. Clarifications and corrections were incorporated into the manual in 2007. Exhibit 3.6 lists the different divisions addressed by the OIICS.

The Nature of Injury or Illness code structure is the most relevant for understanding disability patterns and is arranged so that traumatic injuries and disorders are listed first (in Division 1) while diseases are listed in Divisions 2–6. Exhibit 3.6 lists the divisions into which injuries and illnesses are arranged. Exhibit 3.7 presents a section of the coding system that has been extracted from the manual.

Exhibit 3.6: Divisions Used for Classifying Occupational Injuries and Illnesses

Division	Title
1	Traumatic injuries and disorders
2	Systemic diseases and disorders
3	Infectious and parasitic diseases
4	Neoplasms, tumors, and cancers
5	Symptoms, signs, and ill-defined conditions
6	Other diseases, conditions, and disorders
7	Exposures to disease—no illness incurred
8	Multiple diseases, conditions, and disorders
9999	Nonclassifiable

Exhibit 3.7: Coding System for Traumatic Injuries and Disorders (Division 1)

Code	Title
10	Traumatic injuries and disorders, unspecified
11	Traumatic injuries to bones, nerves, spinal cord
110	Traumatic injuries to bones, nerves, spinal cord, unspecified

(continued)

Exhibit 3.7 (continued)

Code	Title
111	Fractures
112	Traumatic injuries to spinal cord
1120	Traumatic injuries to spinal cord, unspecified
1121	Paralysis, paraplegia, quadriplegia
1129	Traumatic injuries to spinal cord, n.e.c.
113	Traumatic injuries to nerves, except the spinal cord
1130	Traumatic injuries to nerves, except the spinal cord, unspecified
1131	Pinched nerve
1139	Traumatic injuries to nerves, except the spinal cord, n.e.c.
118	Multiple traumatic injuries to bones, nerves, spinal cord
119	Traumatic injuries to bones, nerves, spinal cord, n.e.c.
12	Traumatic injuries to muscles, tendons, ligaments, joints, etc.
120	Traumatic injuries to muscles, tendons, ligaments, joints, etc., unspecified
121	Dislocations
1210	Dislocations, unspecified
1211	Herniated disks
1212	Dislocation of joints
1218	Multiple types of dislocations
1219	Dislocations, n.e.c.
122	Cartilage fractures and tears
1220	Cartilage fractures and tears, unspecified
1221	Meniscus tears
1229	Cartilage fractures and tears, n.e.c.
123	Sprains, strains, tears 1230 Sprains, strains, tears, unspecified
1231	Major tears to muscles, tendons, ligaments
1232	Sprains
1233	Strains
1238	Multiple sprains, strains, tears

Note: *n.e.c.* not elsewhere classified

Disability Classification

"Disability" is a condition that is hard to define and it does not lend itself to easy classification. A number of different classification systems have been developed and each has its own particular purpose. Care should taken when comparing the estimates from various sources because of differences in the criteria used to define disability. In the US, development of classification systems has been spurred by the needs of social insurance programs such as workmen's compensation, veterans' benefits, and Social Security.

Despite their widespread use each of the classification systems suffers from limitations of one kind or another. From a research perspective, the use of self-reported disability measures raises questions concerning the standardization of the participants' answers. Disability measures have also been problematic as public policy-making tools. The nation's social security insurance programs rely on the narrowly defined criteria of the disease model to determine disability. They do not adequately address psychological difficulties nor do they provide insight into certain social contributions to disability. Systems measuring limitations in major activities, on the other hand, may indicate the presence of some social contributions to disability but do not provide sufficient information to inform health interventions. These limitations have been recognized, but there has been limited success in developing a system that provides a sufficiently broad understanding of disability. Examples of disability classification systems are presented below.

International Classification of Impairments, Disabilities, and Handicaps

The WHO system categorizes a wide range of disabilities resulting from disease. The form and organization of the system are similar to WHO's *International Classification of Diseases* (ICD-9) especially in many of its subcategories; the overall structure, however, is informed by a theory of "planes of experience" in the development of illness and disability. This gives rise to four main categories: disease/disorder, impairment, disability, and handicap. The WHO manual describes these planes of experience as follows:

1. Something abnormal occurs within the individual; this may be present at birth or acquired later. A chain of causal circumstances, the "etiology," gives rise to changes in the structure or functioning of the body, the "pathology." These features are reflective of the medical model of disease.
2. Someone becomes aware of such an occurrence, and the pathological state is *exteriorized*. Most often the individual himself becomes aware of disease manifestations, usually referred to as "clinical disease." In behavioral terms, the individual has become or been made aware that he is unhealthy.
3. The performance or behavior of the individual may be altered as a result of this awareness, either consequentially or cognitively. Common activities may become restricted, and in this way the experience is *objectified*. Also relevant are psychological responses to the presence of disease. These experiences represent "disabilities," which reflect the consequences of impairments in terms of functional performance and activity by the individual.
4. Either the awareness itself, or the altered behavior or performance to which this gives rise, may place the individual at a disadvantage relative to others, thus *socializing* the experience. This plane reflects the response of society to the individual's experience, or to the extent to which the condition is a "handicap."

Unfortunately, this well-thought-out classification system for disabilities does not lend itself to a quantification of disabilities useful for our purposes. It is not commonly used as a framework for examining disability patterns in the US despite its many positive attributes.

International Classification of Functioning, Disability, and Health

The International Classification of Functioning, Disability, and Health (ICF) was developed by the World Health Organization and released in 2001. The ICF attempts to bridge many of these definitions by considering disability as an umbrella term for impairments, activity limitations, and participation restrictions. Rather than a dichotomous concept, disability is a gradient on which every person functions at different levels due to personal and environmental factors. While the ICF provides a common language for discussion of the concepts associated with disability, operationalizing this framework for survey questionnaires remains a challenge. Surveys must contain questions about a finite set of activities and set thresholds for levels of functioning over time. Exhibit 3.8 presents categories of disability utilized by the ICF.

Parts of this system have been adapted for use with federal surveys. In its supplemental questionnaires on adult and child functional limitations, the Survey of Income and Program Participation (SIPP) contains questions about whether respondents had difficulty performing a specific set of functional and participatory activities. For many activities, if a respondent reported difficulty, a follow-up question was asked to determine the severity of the limitation. Using these responses and others to questions about specific conditions and symptoms, this report presents disability as severe and nonsevere. These two measures combine to provide an overall estimate of disability prevalence.

Exhibit 3.8: Definition of Disability in the Communicative, Mental, and Physical Domains

The International Classification of Functioning, Disability and Health (ICF) categorizes types of disabilities into communicative, physical, and mental domains according to the criteria described below. While the characteristics of individuals with disabilities in a domain may be heterogeneous, the domains may group individuals with some common experiences. Because people can have more than one type of disability, they too may be identified as having disabilities in multiple domains. Disability among children less than 15 years old are not categorized into one of the three domains. Furthermore, it is possible for adults to have a disability for which the domain is not identified
People who have disability in the *communicative domain* reported one or more of the following:
1.Was blind or had difficulty seeing

(continued)

Exhibit 3.8 (continued)

2.Was deaf or had difficulty hearing
3.Had difficulty having their speech understood
People who have disability in the *physical domain* reported one or more of the following:
1.Used a wheelchair, cane, crutches, or walker
2.Had difficulty walking a quarter of a mile, climbing a flight of stairs, lifting something as heavy as a 10-lb bag of groceries, grasping objects, or getting in or out of bed
3.Listed arthritis or rheumatism, back or spine problem, broken bone or fracture, cancer, cerebral palsy, diabetes, epilepsy, head or spinal cord injury, heart trouble or atherosclerosis, hernia or rupture, high blood pressure, kidney problems, lung or respiratory problem, missing limbs, paralysis, stiffness or deformity of limbs, stomach/digestive problems, stroke, thyroid problem, or tumor/cyst/growth as a condition contributing to a reported activity limitation
People who have disability in the *mental domain* reported one or more of the following:
1.Had a learning disability, an intellectual disability, developmental disability or Alzheimer's disease, senility, or dementia
2.Had some other mental or emotional condition that seriously interfered with everyday activities

Workers' Compensation Disability Classifications

Established by the US Department of Labor, the federal Workers' Compensation program in cooperation with the various states and employers provides compensation as appropriate to workers injured or stricken ill on the job or as a result of a job. An injured worker's healthcare provider determines the extent of the disability. Cash benefits are directly related to the following disability classifications:

Temporary Total Disability: The injured worker's wage-earning capacity is lost totally, but only on a temporary basis.

Temporary Partial Disability: The wage-earning capacity is lost only partially, and on a temporary basis.

Permanent Total Disability: The employee's wage-earning capacity is permanently and totally lost. There is no limit on the number of weeks payable. In certain instances, an employee may continue to engage in business or employment, if his/her wages, combined with the weekly benefit, do not exceed the maximums set by law.

Permanent Partial Disability: Part of the employee's wage-earning capacity has been permanently lost on the job. If the work-related accident or date of disablement occurred before March 13, 2007, benefits are payable as long as the partial disability exists and results in wage loss. If there is no wage loss or reduced earnings as a result of the partial disability, only medical benefits are payable.

In addition, there is a special category (Schedule Loss) of Permanent Partial Disability, and involves loss of eyesight or hearing, or loss of a part of the body or its use. Compensation is limited to a certain number of weeks, according to a schedule set by law.

Disfigurement: Serious and permanent disfigurement to the face, head, or neck may entitle the worker to compensation up to a maximum of $20000, depending upon the date of the accident.

Census Bureau/ACS Disability Classification

The Census Bureau currently collects data on disability through the American Community Survey (ACS). The questions in the current ACS questionnaires cover six disability types:

- Hearing difficulty: Deaf or having serious difficulty hearing
- Vision difficulty: Blind or having serious difficulty seeing, even when wearing glasses
- Cognitive difficulty: Having difficulty remembering, concentrating, or making decisions because of a physical, mental, or emotional problem
- Ambulatory difficulty: Having serious difficulty walking or climbing stairs
- Self-care difficulty: Having difficulty bathing or dressing
- Independent living difficulty: Because of a physical, mental, or emotional problem, having difficulty doing errands alone such as visiting a doctor's office or shopping

Respondents who report any one of the six disability types are considered to have a disability. The Census Bureau pools together 12-months of data collection to produce annual estimates for geographies with populations of 65000 or more. With a 36-month period of data collection, a three-year estimate is produced. In 2013, the first 5-year estimates (pooling 60 months of data collection) on the disability status of individuals were produced for all geographies including census tracts and block groups.

ACS reports present the number of residents with a (i.e., any) disability and breaks these down into the age groups of under 18 years, 18–64 years, and 65 years and older. More detailed statistics are presented on disability related to the labor force. The disability status of those in the labor force and employed, those in the labor force and unemployed, and those not in the force is broken down into the six categories listed above. Data are also presented on the disabled in relation to their poverty status.

Childhood Disability Classification

In order to address the needs of school-age children affected by disabilities, the Individuals with Disabilities in Education Act (IDEA) was passed in 2004. The IDEA's disability terms and definitions guide how States define disability and determine who is eligible for free appropriate public education under the special

education law. In order to fully meet the definition (and eligibility for special education and related services) as a "child with a disability," a child's educational performance must be adversely affected due to the disability. The following conditions are considered disabilities according to IDEA criteria:

- Autism
- Deaf-blindness
- Deafness
- Developmental delay
- Emotional disturbance
- Hearing impairment
- Intellectual disability
- Multiple disabilities
- Orthopedic impairment
- Other health impairment
- Specific learning disability
- Speech or language impairment
- Traumatic brain injury
- Visual impairment including blindness

The federal government has established a database for accessing state-level data about school-aged children with disabilities (ages 3–21) served under the Individuals with Disabilities Education Act. These data can be accessed through the www.data.gov website.

The Classification of Mental Illness

The classification of morbidity related to mental problems is conceptualized somewhat differently from physical illness, and this is reflected in a classification system specific to mental disorders. Mental illness involves disorders of mood, behavior, or thought processes. This sets this category of health problems apart from physical disorders; differences in etiology, symptomatology, progression, diagnostic procedures, and treatment modalities are clearly distinguished. The fact that mental disorders are generally not subject to clinical diagnostic procedures has important implications for the classification system that has evolved.

The definitive reference on the classification of mental disorder is the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association 2013). Now in its fifth edition, it is commonly referred to as DSM-V. Its 16 major categories of mental illness and over 300 identified mental conditions are exhaustive. The DSM classification system is derived in part from the ICD system discussed earlier. It is essentially structured in the same manner, with a five-digit code being utilized. The fourth digit indicates the variety of the particular disorder under discussion, and the fifth digit refers to any special considerations related to the case. The nature of the fifth-digit modifier varies depending on the disorder under consid-

eration. (Exhibits 3.9 and 3.10 indicate the major classifications within DSM-V and present a representative sampling of the coding of mental disorders.) Unlike the other classification systems discussed, the DSM system contains rather detailed descriptions of the disorders categorized therein.

Exhibit 3.9: Diagnostic Categories Utilized in the Diagnostic and Statistical Manual of Mental Disorders (Fourth Edition) (DSM-V)

Category	Example
Neurodevelopmental disorders	Mental retardation
Schizophrenia spectrum and other psychotic disorders	Schizophrenia
Bipolar and related disorders	Manic-depressive disorder
Depressive disorders	Depression
Anxiety disorders	Generalized anxiety disorder
Obsessive-compulsive and related disorders	Obsessive-compulsive disorder
Trauma- and stressor-related disorders	Posttraumatic stress disorder
Dissociative disorders	Amnesia
Somatic symptom disorders	Hypochondriasis
Feeding and eating disorders	Bulimia
Elimination disorders	Urinary tract symptoms
Sleep-wake disorders	Insomnia
Sexual dysfunctions	Male erectile disorder
Gender dysphoria	Gender identity disorder
Disruptive, impulse control, and conduct disorders	Kleptomania
Substance use and addictive disorders	Drug use disorder
Neurocognitive disorders	Dementia
Personality disorders	Sociopathy
Paraphilic disorders	Pedophilia
Other disorders	

It may be worthwhile to present another conceptualization of the categories of mental disorder that is more straightforward (oversimplified, some might say), but is both more useful for general discussions of mental illness and more in keeping with popular conceptualizations of mental disorders. The significance of the various categories for the contemporary healthcare delivery system will be noted as each is discussed.

This system begins by distinguishing between *organic* and *nonorganic mental disorders*. Only a small fraction (approximately 5 %) of mental disorders fall into the organic category, and many would classify these as physical illnesses because of the presence of brain damage, neurological dysfunction, or chemical imbalance. The small proportion of cases is noteworthy, since they require almost total care and the significance of this category is expected to increase as victims of Alzheimer's disease become more numerous. Brain-damaged patients generally do not benefit from active medical intervention and are typically cared for in custodial-type institutions.

Exhibit 3.10: Representative Examples of DSM-V Codes for Mental Disorders

Panic disorders
300.21—panic disorder with agoraphobia 300.22—agoraphobia without history of panic disorder 300.01—panic disorder without agoraphobia
Generalized anxiety
300—anxiety disorder NOS 300.02—generalized anxiety disorder
Phobias
300.23—social phobia 300.29—specific phobia
Obsessive-compulsive disorder
300.3—obsessive-compulsive disorder

The remainder of disorders are nonorganic, or *functional*. They are termed functional disorders because their common characteristic is interference with social role performance and interpersonal relationships. Unlike the organic disorders, functional disorders typically do not have an identifiable underlying biological basis, and in fact their etiology is generally not known. These conditions are manifested primarily by disorders of mood, thought processes, and behavior.

Functional disorders are commonly divided into three major categories: neuroses, psychoses, and personality disorders. *Neuroses* include the relatively mild disorders that are generally associated with low intensity care (e.g., psychological counseling) and include such conditions as anxiety, compulsiveness, and various "nervous" conditions. These are conditions that typically affect only one dimension of a person's being; the remaining aspects of personality are essentially normal. These disorders are virtually always cared for on an outpatient basis and have limited significance for the formal healthcare system.

Psychoses are often thought of as more serious forms of neuroses, although many contend that there is a qualitative difference between the two. Psychotic conditions are often extreme in their manifestations and tend to disorder completely the lives of the individuals so affected. This category includes schizophrenia, depression, and extreme paranoia—conditions that often require institutionalization in mental hospitals since they are usually too severe and disruptive to be treated in a general hospital setting. These are the conditions that often entail psychotropic drug therapy, electroconvulsive shock treatment, and at times psychosurgery

The final category, *personality disorders*, represents something of a residual category. It includes a variety of conditions that do not fit neatly into the other categories. Included are such disorders as antisocial behavior, sexual deviance, and alcohol and drug abuse. The contents of this category exhibit the most variety, since this is the "bucket" in which newly diagnosed or redefined conditions often end up. Other

examples included in this category are homosexuality, eating disorders, and child abuse, all conditions that at some time in the recent past would not have been considered medical conditions. Although these disparate conditions are hard to categorize, they could be said to share the characteristics of unpredictability, unclear etiology, and unresponsiveness to any type of therapy other than behavior-modification techniques. Personality disorders are of growing significance for the healthcare delivery system in that certain of them are receiving inordinate attention at this point in time; examples of these include substance abuse and eating disorders.

While this system is useful for understanding the nature of mental disorder within a population, limited data are collected using these categories. As a practical matter, the technical classification system represented by DSM guidelines is more commonly used in psychiatric epidemiology.

Cause of Death Classification

Some mention should be made of the manner in which death is classified. A cause of death is assigned to each deceased individual and registered through the standard death certificate that is used throughout the US. To the extent that cause of death can be considered as something of a proxy for morbidity, basic information on the assignment of cause of death may be informative. Historically, there was a fairly close correlation between common maladies and common causes of death. The immediate cause of death was typically the primary cause of death, with few complicating factors involved. That connection can still be made today to a certain extent, in that the leading causes of death (heart disease and cancer) reflect common maladies within the population.

Contemporary population scientists place less emphasis on mortality analysis than they did in the past. In the US, the mortality rate has dropped to the point that death is a relatively rare event. As a component of population change, mortality has become less important than fertility and both have become less important than migration. Further, the correspondence between mortality and morbidity has become diminished. Because of the preponderance of chronic disease within the US population, death certificates are less and less likely to capture the underlying disease. Chronic diseases typically do not kill people, but those affected typically die from some complication (of diabetes, AIDS or cancer, for example). This is not to say that mortality analysis cannot provide insights into morbidity patterns, but that the situation is much more complicated than in the past, and analysts require a better understanding of disease processes (and the vagaries of death certificates) today.

The *causes of death* affecting a population are a major factor in determining the level of mortality. Populations in different times and places are subject to different causes of death. Knowing the number of people who died is one thing, but knowing what they died from provides valuable insights into the overall health status of the population and the types of health conditions that afflict that population. Information on cause of death in the US is compiled from certificates filed with health authori-

ties on the occasion of any death. Since virtually every death is accompanied by a death certificate, the information on cause of death is fairly complete. However, given today's morbidity patterns, it is increasingly difficult to specify the ultimate cause of death. With a preponderance of chronic diseases, it is often the case that death can and should be attributed to a factor other than the proximate cause of death. For example, patients with AIDS do not typically die as a direct result of AIDS but due to system failure caused by AIDS. Similarly, individuals affected by diabetes are often said to die from "complications of diabetes." While the immediate cause of death may be kidney failure, it is useful to know that diabetes was the underlying cause. Similarly, obesity, while not an immediate cause of death, is increasingly being listed as a contributing factor. While the death certificate provides space for the recording of contributing conditions, the complexity of chronic disease may make it difficult to determine the exact cause of death.

While death certificates represent a significant source of data for mortality analysis, there are issues that require caution in their use. There is not universal agreement as to the determination of which factor is the immediate cause of death. There are, in fact, differences that exist from community to community with regard to the classification of contributing and proximate factors. There may also be a tendency, hopefully not widespread, to misrepresent the cause of death for various reasons. There may be reluctance, for example, to specify AIDS or some other sexually transmitted disease as a cause of death. Similarly, there may be reticence with regard to specifying alcohol- or drug-related conditions as the cause of death. The slippage with regard to accurate classification of cause of death is also exacerbated due to the trend toward employment of coroners who are not physicians. In fact, in some jurisdictions, the coroner may be an elected office. For these reasons, it is important to use mortality data with caution and certainly to consider the full variety of contributors to mortality.

In the US, the International Classification of Disease classification system is used to assign cause of death. The tenth version of the ICD system is slowly being adapted but most US healthcare organizations are still using the nineth version (ICD-9). Exhibits 3.1 and 3.2 above provide information on the ICD classification system used for both applying a diagnosis to a live patient as well as assigning a cause of death to a deceased individual.

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Additional Resources

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