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REDEFINING THE ROLE OF PUBLIC HEALTH IN DISABILITY*

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■ **Abstract** The stated mission of current public health activities is to prevent mortality, morbidity, and disability. Though this mission is a noble challenge, attention is now being drawn to that group of the public who are not prevented from living with a disability. This chapter seeks to redefine the functions of public health in the field of disability. It describes the changing demographics of disability and provides a framework for addressing the complex issues associated with defining disability. Finally, we outline a strategy for stronger and clearer public health presence to improve the health and well-being of people with disabilities.

INTRODUCTION

Public health is traditionally associated with clear outcomes—mortality and morbidity—and rigorous epidemiological procedures. Disability provides a challenge to this clarity. This review describes the thicket of issues embedded in the disability experience, the changing demographics and dynamics of disability, the measurement of disability, and the public health functions as applied to disability.

DISABILITY EXPERIENCE

Disability may result from an event at or prior to birth; it may occur as a result of acute onset of disease or injury, or, most likely, it is the result of chronic conditions that over time affect physical or cognitive function in mid to later life. Thus, for some people disability represents a lifelong experience, whereas for others it is a late-life concern. Moreover, the severity of disability may vary considerably from one person to the next. Therefore, defining disability represents a significant challenge for public health.

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Because there is no gold standard definition of disability and no clear threshold that defines when a person becomes "disabled," establishing an acceptable definition of disability becomes an important first step. If we can standardize some operational definitions of disability, it may then become possible to address the public health functions of assessment, policy development, and assurance. Several perspectives are common frames for a definition of disability in our culture. They differ in the degree to which "disability" is defined by characteristics within the individual or is a product of the interaction between the individuals and their environment.

1. Disability is most often assumed to emerge *a priori* from a specific disease or impairment. This equation of diagnosis or physical manifestation with disability is found in the general public as well as in the public health community. Therefore, someone who has the diagnosis of cerebral palsy (diagnosis) or blindness (physical manifestation) is by virtue of the diagnosis or impairment equated with being disabled. The presence of the condition also assumes a diminished health state. This perception of disability is often termed the medical model.
2. Disability is also commonly viewed as a limitation in completing basic life activities, say the inability to walk a quarter of a mile or bathing oneself. Functional abilities have been grouped into well-known categories of Activities of Daily Living (ADLs), which characterize ability to perform basic self-care activities (bathing, dressing, toileting, continence, and feeding) (19), and more demanding tasks necessary for independent function in the community, Instrumental Activities of Daily Living (IADLs) (including housework, shopping, meal preparation, using the telephone, and financial management) (21). These measures were first used to describe physical capacity, prognosis, present and projected health services needs, and for programmatic evaluation (18) and then used as outcome measures attached to the causes of disability (13). The activity-limitation perspective can be a generic one unrelated to any specific medical condition. However, to the extent that these limitations are suggested to be the direct result of a medical condition, such as arthritis or spinal cord injury, this perspective can also be called medical in orientation.
3. By contrast, disability also has a tradition of being defined by limitations in social roles, such as going to school or working. Social role limitation or restriction in participation in society is also a more general approach to definition. This perspective, however, has also often been attached to a medical condition as causative, thereby placing it in a medical framework.
4. A more contemporary notion of disability asserts the critical nature of the environment in defining disability. That is, disability may be defined by the lack of fit between the person and the environment in which he/she functions. This change of emphasis from an internal, medical orientation to a more external environmental perspective has been termed the social model of disability (3).

The ambiguity of these concepts of disability is reflected in the complex array of organizations, legislation, and funding structures designed to respond to

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people with disabilities. Some public organizations deal with specific health conditions (e.g., spinal cord injury) or broader concepts of disability (for example, intellectual impairment). Some federal programs are designed to provide financial assistance to people who cannot work [Supplemental Security Income (SSI)] and people who can no longer work [Social Security Disability Income (SSDI)]. And yet other programs are designed to return people with disabilities to work (Rehabilitation Services Administration). The legislation authorizing federal programs provides rather narrow eligibility criteria to define disability because large sums of money are potentially involved. By contrast, other legislation, most notably the Americans with Disabilities Act (1990), is based on an exceptionally broad, inclusive definition of disability—a definition that is still being debated in the legal system. This uncertainty and confusion about what constitutes disability is illustrated by recognizing that federal legislation provides over 50 definitions of disability (12). Public health, because of its perspective on the health of people with disabilities, casts a wide net to include broad populations within the definition of disabled.

THE CHANGING POPULATION OF PEOPLE WITH DISABILITIES

The problems, of course, with estimating the number of people with disabilities and the potential changes that might occur in this population are embedded in the varying definitions of the concept. Differing definitions of disability, in all probability, yield differing population estimates; that is, there is less precision and less convergence in the data than one would like. Public health, like the Americans with Disabilities Act, is likely to embrace the most inclusive definition of disability, and it is likely to address issues beyond person-level concerns. Given these problems of case definition, the estimated prevalence of disability ranges from about 15% to 20% of the population, and most large population-based studies cluster around that range (6, 7, 20, 26).

The broad evidence suggests that the total population of people experiencing disabilities has increased fairly rapidly in recent decades and that these increases are likely to continue, but the dynamics of these changes differ among children, adults, and older adults (20). Although the prevalence of disability increases with age, it is not age alone that predicts disability. Rather, disability is predicted by a variety of socioeconomic factors, including education, income, and race. Poverty is a predictor of disability because people who are poor may not have access to prenatal health care or health care in general, and they may be more exposed to unintended injury or violence. The lack of prenatal care may result in low-birth-weight babies who may experience developmental disabilities, such as cerebral palsy. Likewise, people who do not use seat belts may be more likely to experience injury from traffic accidents.

Given these underlying influences of age, education, poverty, and race, it may be useful to examine disability from the public health concerns that are associated with the onset of disability: birth defects, developmental disabilities, injury,

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and chronic disease (23). Birth defects are the leading cause of infant mortality, and birth defects, such as Down's syndrome and Fetal Alcohol Syndrome (FAS), result in substantial disability. Developmental disabilities is a broad term used to characterize conditions that affect children and adolescents, including cognitive, hearing, or vision impairments, and cerebral palsy; these impairments often lead to substantial limitations over the lifetime. Severe injuries are often associated with disability, across the lifespan. Spinal cord injury and traumatic brain injury affecting young people create life-long disability, and in old age, falls may result in broken hips, an injury that often precipitates disability. Chronic diseases with limitations on activity affect perhaps as much as 10% of the population, primarily among the elderly. For many people, chronic conditions, especially in combination, lead to limitations on activity (35). One would assume that with better health and public health interventions, disability would be on the decline. However, that does not appear to be the case. In fact, public health interventions and medical technologies appear to be creating what Oeffinger et al. (31) term "an epidemic of survival." Specific examples are dramatic; prior to World War II, for example, life expectancy for a person with a spinal cord injury was about 14 months (27). Similarly, first-year survival for people with Down's syndrome increased from less than 50% in the period 1942–1952 to 91% in a 1980–1996 cohort (15). In some cases, increasing numbers may be a result of better case identification; that is, people may have had attention deficit disorder but it may not have been identified or it may have been attributed to another condition.

Reports for the 1970s and 1980s indicated increases in the prevalence of activity limitations among older people (24, 32). In the late 1990s investigators reported that age-standardized prevalence of disability had declined by as much as 14.5% from 1982–1994, but the absolute numbers continued to increase because of the surge in the number of older people (25). More recent research, however, suggests that the prevalence continues to decline so that the absolute numbers are decreasing as well. Although the precise reasons for these declines remain uncertain, some investigators have reasoned that increasing educational levels among older age groups may be contributing to these decreases (25). That is, people with higher levels of education are more likely to seek medical care, comply with medical advice, and generally practice healthier lifestyles. The effects of some conditions, especially the epidemic of obesity in the United States, may lead to chronic diseases that, in turn, will lead to an acceleration of disability rates in the coming decades (28).

THE PUBLIC HEALTH ROLE IN DISABILITY

Public health began as an effort to reduce mortality: to know why people were dying and how many people were dying. Cause of death became the principal information collected and tracked. Almost 100 years after the List of Causes of Death (later to become *ICD*) was introduced in 1855, a formal decision was made in 1948 to expand public health data and focus to include why people get sick, thus adding morbidity to the base information collected. The *International Classification of*

Diseases (*ICD*) (37), while changing during the century, evolved into the primary data collection scheme, and public health activities framed and were framed by these data. As the twentieth century ended, public health and medical achievements produced a population whose lifespan had increased 30 years since the beginning of the century (5). Those achievements also produced a new phenomenon—a large segment of the population living with disabilities. As with mortality and morbidity, the human situation generated the interest. Public health must again respond by doing first what it does best—count. Even though there are various operational definitions of disability, there are at least 50 million Americans who report limitations in their activities (26).

Public health has been relatively slow to respond to the health needs of this population for at least four reasons:

1. The traditional public health emphasis on reducing mortality, morbidity, and disability has led to a mindset that equates disability with a failure of the public health system—specifically, to prevent conditions associated with disability;
2. the logical consequence of the first dynamic is that public health has been hard pressed to frame a public health role toward people with disabilities, except to assume that medical costs associated with disability are a proxy for health expenditures and emphasis;
3. even if motivated to act, there has been no standard classification and coding scheme that can capture data and assess the multidimensional nature of disability, paralleling *ICD*'s classification for mortality and morbidity; and
4. without assessment, policy development and assurance are fragmented or nonexistent.

This review addresses these issues, highlighting the need to include people with disabilities as a developing target for public health assessment, policy development, and assurance of service.

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Morbidity and Disability

The major reason why people with disabilities have not been a target of public health is that historically the public health perspective has focused on preventing disabling conditions. The primary prevention of birth defects (e.g., neural tube defects), developmental disabilities (e.g., cerebral palsy and fetal alcohol syndrome), injuries (e.g., spinal cord and acquired brain injuries), and chronic diseases (e.g., cancer and HIV) receive major attention through research at the National Institutes of Health (NIH) and the Centers for Disease Control and Prevention (CDC). These efforts are absolutely crucial public health activities.

These activities do not, however, address health issues faced by people who develop or acquire a disabling condition, whatever its etiology, even though people with disabilities are clearly at risk for additional health and related problems. While much public health science has addressed the epidemiology of the diagnoses

associated with disabilities, there has been scant epidemiologic attention to related health issues, research on the natural course of secondary conditions, or efficacy studies that would improve the health and prevent secondary conditions among people with disabilities. Moreover, there are few mechanisms for translating research into public health practice for this population or for conducting prevention research in the public health settings. This situation reasonably suggests that these concerns should be a focus of public health activity.

Conceptual confusion has added to the dilemma. Chamie (9) has outlined the conceptual differences between morbidity and disability, concluding with the assertion that disability does not equal illness, and that morbidity is but one factor in explaining and may be a risk factor for the occurrence of disability. From this perspective, disability and health are not mutually exclusive terms; that is, disability does not necessarily equate to poor health. Even in data that suggest that people with disabilities report poor health more often than those without disabilities (4), environmental factors are hypothesized as intervening variables contributing to reduced health status. As disability status is separated from health status, operationalizing the related-but-independent concepts will be cleaner.

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Expenditures

It is easy to see how the health of people with disabilities could be omitted from a public health agenda, given the appropriate concern for primary prevention and confusion of the constructs of morbidity and disability. In fact, it could be argued that people with disabilities use substantial medical expenditures, which could be viewed as outside the public health arena altogether. Data from the 1996 Medical Expenditures Panel Survey (MEPS) indicate that of the $260 billion spent on medical care, people with disabilities account for 47% of those costs (15). It would be comfortable to suggest that these costs cover the societal responsibility for people with disabilities. Not included in that perspective, however, is the notion that public health interventions could well prevent secondary medical conditions that contribute to the substantial MEPS figures. The potential savings that could accrue from health promotion and clinical preventive services for this population is projected to be substantial.

Unifying Framework for Disability and Health

Beginning in the 1960s, several conceptual frameworks were developed to describe the process associated with "disability" (1). The three major conceptual models were provided by Nagi (29), the National Center for Medical Rehabilitation Research (NCMRR) (30) at the National Institutes of Health, and the World Health Organization (WHO) (36). The Institute of Medicine expanded the Nagi model in a report entitled *Enabling America* (17). The conceptual approaches are quite similar, emerging from the social model of disability (1). The social model, as noted previously, emphasizes the role of the environment and the interaction between the person and environment in the disability process. This perspective has been revolutionary in that it requires attention be given to the ways in which a person's

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environment hinders or helps functioning in the world. This view is in contrast to the traditional medical perspective that assumes any difficulty associated with a disabling condition was attributed to the individual's limitations. This view has substantially affected each of the models evolving over the past 30 years. Although each of the frameworks include four core dimensions of the interactive process: (*a*) physiologic systems, (*b*) personal functions, (*c*) societal participation, and (*d*) environmental factors, only the World Health Organization model includes a classification and coding system. Hence, the WHO model best meets the requirements for public health utility.

In 1980, WHO commissioned the *International Classification of Impairments, Disabilities, and Handicaps* (*ICIDH*) (36). This document provided a framework for classifying three planes of experience associated with an *ICD* category. Impairment was used to describe the body systems and functions affected (e.g., neurological, respiratory, urologic), disability was used to describe limitations in a person's abilities (e.g., mobility, personal care, communication, behavior), and handicap was used to describe the disadvantages experienced by people in their environment (e.g., in terms of employment, economic sufficiency, independence). The strength of the *ICIDH* was its delineation of various aspects of the disabling process. However, because disability advocates, especially in the United States, opposed the medical approach taken in the document, the usage of terms such as handicap and the primary focus on the person without a balanced emphasis on environmental barriers, the document proved unacceptable in the United States as a workable conceptual frame, and therefore, as a classification system (21).

In 1993 WHO began revising the *ICIDH*. The process included disability groups from around the world, including Disabled Peoples International, along with professional groups such as the American Psychological Association and the American Occupational Therapy Association and public health representatives from CDC, the NIH, the Agency for Healthcare Research and Quality, the Social Security Administration, the Health Resources Services Administration, and the Department of Education. The new document *International Classification of Functioning, Disability and Health—ICF* (38) maintains the body function/structure and impairment duality, maintains the personal activity limitations, changes handicap or role difficulty to the more specified societal participation component, and adds a contextual/environmental component. It acknowledges that the environment is always interacting with people to assist or hinder participation in life activities and often may be more instrumental in an individual's lack of participation than are the limitations associated with their physical, mental, or emotional condition. The *ICF* includes the body function/structure as one component, combines the personal and societal activities into the second component, and places the environment as the third major conceptual component. Its classification system allows personal activity limitations and societal participation to be separated, and thus four components—body functions/structure, activities and participation, and environment—can be classified. Finally, the classification system has been fully developed for each component so that codes can be assigned for assessment or other public health purposes. The coding system is developed to four-digit codes

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using the traditional tree-branch-leaf taxonomic approach. Thus, this framework allows us to map the multidimensional character of disability. And, therefore, the *ICF* employs four components to describe functioning and disability:

1. *Body functions* are the physiological functions of body systems (including psychological functions).
   Body structures are anatomical parts of the body such as organs, limbs, and their components
   Impairments are problems in body function or structures such as a significant deviation or loss (38, p. 12).
2. *Activity* is the execution of a task or action by an individual.
   Activity limitations are difficulties an individual may have in executing activities.
3. *Participation* is involvement in a life situation.
   Participation restrictions are problems an individual may experience in involvement in a life situation (38, p. 14).
4. *Environmental factors* make up the physical, social, and attitudinal contexts in which people live and conduct their lives (38, p. 16).

The distinct components allow the term disability to be used generically to describe the overall process rather than any one particular aspect. Using this approach, it is relatively easy to understand and explain the different operational definitions used in proposed analyses. If chronic conditions (*ICD* codes) are the focus, for example, associated impairment codes can be identified. If public health interest is addressing personal activity limitations, they may be coded. Role limitations are operationalized as societal participation restrictions. Environmental barriers, for example, professional attitudes, architectural barriers, or governmental regulations, can be coded appropriately, and statistical analyses can clarify relationships among the components. The importance of this multidimensional model cannot be overemphasized.

Current Assessment Directions

The Future of Public Health (16) asserted the core functions of public health to be assessment, policy development, and assurance. In the report, assessment was described as the routine and systematic monitoring of the health of the community. The assessment function is the foundation from which policy is developed and services are assured. People with disabilities, as we have seen, are a considerable segment of the community. Given the conceptual obstacles and lack of attention confronting the assessment of people with disabilities, it is important to note that substantial work is being undertaken to forge a public health science related to disability. Greater coordination among efforts is needed, and government agencies and university researchers are cooperating in the current undertaking.

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DEMOGRAPHIC-LIKE VARIABLE Although we have demographic variables such as age, ethnicity, race, and sex to describe basic characteristics of the population, we do not have a similar variable to identify disability status in the population. Whereas each of the components of disability can be coded using the WHO *ICF* classification and coding system, finding a relatively simple and straightforward approach to identifying people with disabilities has not been a priority. This is the highest public health priority in the area of assessment. If public health is to characterize people with disabilities alongside people without disabilities, a robust but small set of identification questions that can be included in any survey, census, or questionnaire must be developed. This set will be used as a demographic variable, with age, race/ethnicity, and sex in data collection and subsequent analyses.

Current initiatives to develop a short set of questions to identify people with disabilities include the 2000 United States Census, the National Health Interview Survey, the Behavioral Risk Factor Surveillance System (BRFSS), and a joint effort by CDC's National Center for Health Statistics and the HRSA's Maternal and Child Health Bureau. The approaches are varied but reflect the clear movement and even progress toward establishing disability as a demographic variable. For example, seven questions, including sensory impairments, five different activity limitations, and work participation were included in Census 2000. In a study comparing the census questions with other approaches, Andresen et al. (2) have suggested that the questions are more complex than questions previously asked. In addition, proxy responses, part of the census methodology overestimated disability prevalence when compared with the individuals themselves. Alternatively, the National Health Interview Survey (NHIS) identifies disability status using eight questions, of which four ask about activity limitations, two focus on work participation, and two ask about use of special equipment. Moreover, two questions are being included in the current BRFSS to identify adults with disabilities—one relating to activity limitation, the other to special equipment. These two questions are also included among the NHIS questions. Finally, five questions with supplemental responses are being used in a national survey to identify children with chronic conditions. One question inquires about activity limitations whereas the remaining questions identify children needing special services or interventions. In addition, the United Nations Disability Statistics Office has been the catalyst for the Washington City Group (named after the first city to begin the meetings), whose first task is to develop a short set of questions to be used to identify disability status globally in surveys and censuses. The meetings began in early 2002, and they expect to have a product sometime in 2004.

This review of current efforts by these organizations indicates the continuing struggle to develop convergence in assessment tools. The results of these activities are leading to the development of a small set of questions that can be used to identify people with disabilities for public health. The most promising approaches to identifying people with disabilities appear to be questions that (*a*) identify persons with activity limitations or (*b*) persons who report using special equipment to ameliorate an activity limitation or participation restriction.

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SUBGROUP IDENTIFICATION Developing an operational definition of disability on the basis of a brief set of questions is only the first step in surveillance. The implementation of these questions will allow us to make estimates about the population of people who experience disability. However, this demographic variable does not adequately capture the diversity or severity of limitations needed for additional public health utility. Therefore, a second level of case definition is needed to clarify the differences in limitations among people. That is, often there are differences among people with disabilities, as well as between people with and without disabilities. In the traditional public health model, disability is defined by the presence of certain diagnoses, and distinctions are made on the basis of diagnostic codes from the *ICD*, such as cerebral palsy, acquired brain injury, or arthritis. However, due to the low incidence of many disability-related diagnoses, *ICD* codes are often not statistically feasible. Using the *ICF* classification system, limitations of personal activities can cross diagnoses, which allows substantially larger groups to be analyzed with similar functional characteristics—for example, distinguishing learning from communication from mobility from personal care limitations. Public health interventions, then, could be effective across diagnoses, addressing outcomes associated with common functional problems.

Regardless of etiology, people with substantial activity limitations are at risk for health and related problems. This function-based approach will need time to become part of the public health model, but it can be extremely important to researchers, policy makers, and service providers. Case definitions of these activity limitations are also critical. For example, speech therapists have developed instruments to measure receptive and expressive language, occupational therapists have developed instruments to assess personal care and domestic activities, and physical therapists have developed instruments to assess mobility. Psychologists have instruments to assess learning limitations/disabilities and behavioral limitations. *ICF* provides the typology for case identifications of activity limitations within the population of people with disabilities.

SECONDARY CONDITIONS AND ENVIRONMENT In addition to creating a demographic variable and identifying subgroups, assessment of secondary conditions must be implemented. Secondary conditions are the medical, physical, emotional, and social problems to which people with primary disabling conditions are more susceptible (22). For example, whether the diagnosis is spina bifida, spinal cord injury, multiple sclerosis, or cerebral palsy, many people with these diagnoses have mobility limitations. Mobility limitations, in turn, often create greater vulnerability to pressure sores or social isolation. The question could be asked, "How much of the $260 billion of medical expenditures could be saved if secondary conditions were reduced or prevented?" Identifying common secondary conditions will allow the development of public health interventions to address them.

Finally, assessment of environmental factors must be included in public health data collection if the interactive nature of disability is to be captured. While public health has traditionally assumed that the disabling process occurs within the

person alone, it is clear that inaccessible buildings, discriminatory attitudes, and government policies may contribute more to the individual's reduced societal participation than the person's impairments or limitations. Measuring environmental influences is crucial to public health intervention. Projects to measure both environmental factors and levels of social participation have recently been completed and provide the basis for public health interventions (10, 14, 33). These projects include tools to measure environmental barriers (*a*) in surveys, (*b*) in clinical settings, and (*c*) with children.

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ASSESSMENT FOR POLICY AND ASSURANCE

The IOM report, *The Future of Public Health*, asserts the important relationship between assessment and the development of policy by noting public health's use of scientific data for decision making. Assessment informs the development of policy. As we have seen, two major achievements have led to clarity in assessment in the emerging science of public health and disability. First, the development of a rigorous, consistent, and robust conceptual framework, classification system, and coding scheme are offered by the *ICF*; the power of this framework emerges from its capacity to acknowledge the complex, multidimensional characteristics of disability. Second, efforts to create a demographic-like variable composed of a few items to identify disability in large data sets for analytical purposes will provide a major breakthrough in public health and disability science. Both of these assessment functions provide the foundation for the development of public health policy. *The Future of Public Health* also distinguished among the roles of communities, states, and the federal government. At each level, science informs policy. At the community level, communities establish health goals with key policy makers and assure services for all their citizens so that goals can be achieved. At the federal level, two recommendations are relevant: (*a*) "support of knowledge development and dissemination through data gathering, research, and information exchange"; that responsibility is achieved through a variety of assessment protocols noted above; (*b*) "establishment of nationwide health objectives and priorities and stimulation of debate on interstate and national public health issues." The chief vehicle for accomplishing the second responsibility is through the once-a-decade publication of Healthy People.

Healthy People 2010

The clearest immediate use for improved assessment of the health characteristics of people with disabilities is the public health agenda for the United States. Healthy People is the health agenda for the nation, and as such, includes both policy and assurance dimensions. Previous iterations have provided a blueprint for public health activities in policy, research, and intervention. *Healthy People 2010* (11) is the first Healthy People document to include a chapter addressing the health of people with disabilities: "Disability and Secondary Conditions."

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It is one of 28 chapters, and the chapters incorporate 467 objectives. In addition to the disability chapter [#6] that includes 13 objectives, more than 100 additional objectives throughout other chapters include "people with disabilities" as a select population—that is, a targeted subpopulation on which data should be collected for purposes of comparison with the population not reporting disabilities.

Elimination of health disparities is a major overarching goal of *Healthy People 2010*. The first of 13 objectives in "Disability and Secondary Conditions" addresses the inclusion of an operational definition in health-related surveys. The remaining objectives address health and well-being areas not addressed in other chapters of *Healthy People 2010*—such as reducing the number of children and adults in institutions and encouraging family-oriented settings, eliminating disparities in employment rates between people with and without disabilities, and increasing the time during which children with disabilities are included in regular education classes. The objectives also emphasize reducing environmental barriers to societal participation by people with disabilities. The final objective proposes to integrate disability and health programs into each state's public health activities. *Healthy People 2010* provides the opportunity to develop the data needed for all person-centered objectives, as well as to implement clinical and community preventive services for this population.

CONCLUSION

Public health and disability have had no natural historical ties, save that primary prevention activities have attempted to keep disabling conditions from occurring. Emphasis on the primary prevention of conditions associated with disability is important, whether by encouraging women of childbearing age to include folic acid in their diet thereby reducing the incidence of neural tube defects or by promoting the use of seatbelts to prevent injuries. Unfortunately, people who are born with, develop, or in other ways come to live with disabilities have not received public health attention. Public health is now moving into a new era of emphasis—one in which people with disabilities are included as an integral part of the public, a population group that needs attention in order to eliminate disparities. Public health cannot afford to underestimate the needs of this population.

Pope & Tarlov asserted that "disability ranks as the nations' largest public health problem" (34). This public health problem can best be understood by unpacking the complex experience using the public health functions of assessment, policy, and assurance. Assessment is being conducted by state public health agencies and scientists at CDC and in universities. This science base is beginning to inform public policies that are leading to the development of interventions to support the health of people with disabilities. And as programs are developed at the state level, there will be an increased assurance of the inclusion of people with disabilities in public health programs.

The core public health functions of assessment, policy development, and assurance provide the opportunity to make an historically invisible population visible to public health. Without data, no foundation for public health intervention is available. Credible data will allow the creation of physical, attitudinal, and policy environments that can improve the health of people with disabilities with the goal of full participation in society.

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