

Health Trends in the Elderly Population: Getting Better and Getting Worse

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Health trends in the fastest growing sector of the population, the oldest old, have received much attention during the past decade because of the rising costs of medical and long-term care. Many studies have suggested a compression of morbidity in this sector, implying that the future care needs of elderly people will not follow the demographic prognoses. Most of these studies have used health indicators based on disability, a concept that is contextually embedded. We have taken a closer look at health-trend surveys with a focus on the health indicator used. Our findings reveal that although disability measures often show improvement, there is a simultaneous increase in chronic disease and functional impairments—health components that require care resources. That is, an expansion of other health problems may accompany a compression of disability. Therefore, a concept of general morbidity is not sufficient when discussing health trends and the need for care services in the elderly population. Because different indicators do not show the same trends over time, we suggest a more refined discussion that distinguishes between different health components. In addition, different components have different implications for the amount and kind of care resources needed. If the

current positive trends in disability continue, future need for social services and long-term care may not parallel demographic projections. Trends in disease and functional limitations seem to have taken a different direction, suggesting a parallel or increased need for resources in medical care, rehabilitation, and compensatory interventions such as assistive technology.

Key Words: Compression of morbidity, Activities of daily living, Health indicators, Disability

The 20th century was incredibly successful in regard to aging. Although change first appeared in infant mortality, mortality also decreased in elderly age groups due to improvements in living conditions, better control of infectious diseases, and medical advancements. In the second half of the century, cardiovascular disease replaced infectious diseases as the major killer, but survival here also has increased dramatically. Even elderly people who were once considered to have a very high mortality risk now seem to be surviving longer (Crimmins & Saito, 2000; Rosén & Haglund, 2005). When the Swedish pension system began in 1913, retirement age was 67 years. This was not an expensive proposition, as the expected life span at that time was 58 years for women and 56 for men. Women born in Sweden today can expect to live more than 82 years, men 78 years (Statistics Sweden, 2006).

Although Sweden leads the world in regard to an aging population, other nations are following, albeit at different rates of growth. Even in developing countries people are living longer, resulting in a rapid

We are grateful for financial support from the Swedish Council for Working Life and Social Research (Grants 2003-0539 and 2002-0919) and from the Swedish Research Council (Grant 2000-0893/28).

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increase in the oldest sector of their populations (Kinsella & Phillips, 2005; Lloyd-Sherlock, 2000). The prevalence of health problems increases sharply with age with associated costs for medical care, social services, and long-term care. Therefore, health trends in the oldest sector of the population are of particular interest when estimating need for future care resources. As the average expected life span increases, an important issue is whether the years added to life are characterized by good health and independence or by health problems and the need for care.

Bearing in mind the complex interplay of mortality and morbidity, we pose the following question: How should researchers best measure the health of the elderly population to reflect need for care? Different population surveys utilize different kinds of measures, all of which are related to health and are therefore often loosely referred to as health indicators. When used in surveys of the oldest sectors of the population, indicators need to span the entire spectrum of health. Representative samples will include healthy and independent people as well as people who are bedridden and dependent on extensive social and medical services. Thus it is difficult to construct health indicators that avoid floor and ceiling effects. Disease, one of the most common measures of ill health, usually reflects a need for medical care, but without clinical information about severity, disease may say little about the need for the most expensive service, long-term care. For example, people who report that they have heart failure or Parkinson's disease could be fully independent or institutionalized. Consequently, most surveys use measures of function or disability (i.e., measures that reflect the cumulative consequences of disease and other living conditions). There is no consensus about how to define these concepts or which are the best health or function indicators for population surveys. Researchers also have much to learn concerning the validity and reliability of different health indicators in regard to the need for care services. Studies of health trends in elderly populations have shown conflicting results, but much of the confusion may well stem from the use of different health and function indicators (Freedman et al., 2004; Gudex & Lafortune, 2000).

A number of different theories have arisen to describe the dynamics of health changes in the oldest sectors of the population and the interplay of mortality and morbidity patterns with demographic change (Myers, Lamb, & Agree, 2003). The expansion of morbidity theory (Gruenberg, 1977) reflects the medical paradox (i.e., as expected life span increases, the added years will entail an increase in morbid conditions). Fries's (1980, 2003) theory of compression of morbidity maintains that if declines in morbidity are greater than increases in life expectancy, the overall morbidity in the population will decrease. A third theory, that of dynamic equilibrium (Manton, 1982), maintains that longer

survival is associated with an increase in total morbidity, but that medical interventions and improved lifestyle will slow the progression of chronic disease, thus decreasing the time spent with severe disability.

The idea of compressed morbidity among the oldest sector of the population has received wide publicity because of its optimistic implications for future resource need. It suggests that, although the population is aging, future elderly cohorts may not need as many care resources as do current cohorts. That is, as the number of old people in the population increases, the need for care resources may not increase proportionately (Batljan & Lagergren, 2004). In this discussion, however, it is important to remember that even the most optimistic prognoses foresee an absolute increase in resource need.

A recent study of health trends among very old Swedes (Parker, Ahacic, & Thorslund, 2005) showed a significant worsening between 1992 and 2002 according to several health indicators, including objective measures of physical and lung function. This prompted us to look more closely at the international literature in the field and, in particular, at the indicators used. In addition to health indicators, surveys face numerous other methodological challenges when used to study health trends among very old people. The use of different methods of coping with these challenges makes it difficult to compare studies between, and even within, countries. For example, the use of proxy interviews varies based on whether a study uses proxies at all and, if so, in which cases. Other differences include how missing data is handled, how age is standardized, sampling, and varying selection effects of nonresponse. Researchers who have reexamined data sets have found that relatively small changes in methodology can influence results (Freedman et al., 2004; Wolf, Hunt, & Knickman, 2005). Many studies exclude institutionalized individuals, a fact that is particularly lamentable in trend studies as the threshold between the community and institution changes over time in response to changes in policy and resource allocation. Comparability is also complicated by the fact that few studies look at exactly the same time period.

This study builds on the work of several studies and reviews based on population data. There are several published reviews of American studies (Crimmins, 2004; Freedman, Martin, & Schoeni, 2002; Spillman, 2004; Wolf et al., 2005) and international studies (Jacobzone, 2000; Robine & Michel, 2004; Wen, 2004). Two international networks of scholars in this field, Réseau Espérance de Vie en Santé (the International Network on Health Expectancy and the Disability Process; 2006) and TRENDS (2006), were also valuable in our work. The particular focus here is on the health indicators used to measure morbidity. Despite seemingly conflicting results, one can see some general trends when distinguishing between different kinds of indicators. We discuss how different indicators reflect different

components of health and how indicators are influenced to different degrees by factors that may change over time. With about 9 million inhabitants, Sweden is one of the world's smaller countries, but it has one of the largest proportions of very old people, and it has high-quality population data available. Because one can consider Sweden to be a forerunner in regard to modernization and population aging, we include examples from Swedish health-trend studies based on two nationally representative surveys: the Swedish Panel Study of the Living Conditions of the Oldest Old (SWEOLD; Parker et al., 2005) and the Swedish Survey of Living Conditions (ULF; Larsson & Thorslund, 2006; Persson et al., 2001).

Commonly Used Health Indicators

Global Self-Rated Health

This item asks respondents to rate their own general health on a 3- to 5-point scale. Self-rated health reflects the total picture of health as perceived by the individual. As such, it probably reflects dimensions of health that are most meaningful to each individual (Idler, Hudson, & Leventhal, 1999). Self-rated health has become a widely used health indicator due to its ease of administration, its reliability, and its strength as a predictor of mortality (Idler & Benyamini, 1997; Lundberg & Manderbacka, 1996). Most studies show an age effect on self-rated health: Adjusted for functioning, self-rated health tends to improve with age (Jylhä, Guralnik, Balfour, & Fried, 2001), and the global self-ratings of older adults have weaker correlations to mortality risk (Strawbridge & Wallhagen, 1999).

A British study (respondents aged 75 and older) found worsening self-rated health during the 1980s (Spiers, Jagger, & Clarke, 1996), whereas a study in the United States found improvement among participants aged 65 and older between 1993 and 2001 (Zack, Moriarty, Stroup, Ford, & Mokdad, 2004). An Austrian study found improvement in self-rated health between 1978 and 1998 for respondents aged 60 to 84 but not for older groups (Doblhammer & Kytir, 2001). A Dutch study found clear worsening of self-rated health in participants aged 65 to 84 from 1956 to 1993 (Deeg, Kriegsman, & Van Zonneveld, 1994).

Results from the ULF for respondents aged 75 to 84 (Larsson & Thorslund, 2006) showed general improvement in self-rated health during 1980/1981 to 1990/1991. Thereafter, development was unstable, with no clear sign of improvement. SWEOLD found significant worsening of self-rated health between 1992 and 2002, in particular for men aged 80 to 84 (Thorslund, Lennartsson, Parker, & Lundberg, 2004).

Specific Self-Reported Health Items

Many surveys include items that ask about specific health problems, either diseases or symptoms. When

posed in survey interviews, questions about diseases often necessitate that the respondent be diagnosed, be informed of the diagnosis, remember the diagnosis, and report it during the interview. Few studies have validated self-reported disease; however, one study of elderly disabled women found good agreement between self-report and medical records (Simpson et al., 2004). Questions about symptoms necessitate only that the respondent remember and report the symptom. Symptoms are more subjective than disease and may reflect a myriad of underlying causes.

A study of trends in high-risk biomarkers found a worsening of blood pressure and body mass index among Americans during the 1990s (Crimmins et al., 2005). The same study found an improvement in cholesterol levels, explained most probably by greater use of medications. American studies generally show significant trends of increased disease prevalence, both in self-reported data (Crimmins & Saito, 2000; Freedman & Martin, 2000) as well as medical records (Cutler, 2003; McClellan & Yan, 2000). Researchers have documented similar trends in France (Robine, Mormiche, & Sermet, 1998), Canada (Roos, Havens, & Black, 1993), and Australia (Wen, 2004).

In SWEOLD, we found that several symptoms and diseases had increased between 1992 and 2002 among very old people (e.g., fatigue, pain, leg ulcers, and hypertension; Parker et al., 2005). The ULF study of adults aged 65 to 84 found increases in prevalence of long-standing disease (Rosén & Haglund, 2005) and reported pain (Persson et al., 2001) during the past two decades.

Functional Impairment

Many surveys include instruments or items that refer to specific functions (e.g., walking, rising from a chair, lifting a heavy object, or seeing and hearing).

Based on self-reported visual ability, a large study of American adults (aged 18 and older) found no evidence of improvements between 1986 and 1995 (Lee, Gomez-Marin, Lam, Zheng, & Jane, 2004). A study of Americans aged 70 and older found an increase in blindness during a similar period (Crimmins & Saito, 2000). Another American study of individuals aged 70 and older found no change in rates of vision or hearing impairments between 1984 and 1995 (Desai, Pratt, Lentzner, & Robinson, 2001). SWEOLD found increased hearing problems between 1992 and 2002 (Parker et al., 2005). The ULF (Persson et al., 2001) found mixed results, with improvements for some groups but increased rates of hearing limitations among formerly blue-collar men. The same study found improvements in vision between 1980 and 1999.

Reviews of the literature on physical functional limitations (e.g., lifting, reaching, grasping) show

somewhat mixed results. One American study found fewer functional limitations among women but no change among men (Crimmins & Saito, 2000). Another found a decline in prevalence of lower body limitations but no change for upper body limitations (Freedman & Martin, 2000), and a third found that the proportion of older adults with physical limitations but not disability increased between 1992 and 1996 (Waidmann & Liu, 2000). A British study of adults of all ages found that the prevalence of several functional limitations increased between 1985 and 1997 (Grundey, Ahlburg, Ali, Breeze, & Sloggett, 1999).

Mobility is one of the most commonly studied functions because of its importance in independent living. One American study showed no change in mobility between 1984 and 1999 (Spillman, 2004). During the same time period, a Finnish study found improvement in most age groups between 65 and 79 for walking outside and using stairs (Sulander, Rahkonen, & Uutela, 2003). Swedish studies differ in regard to mobility. Among adults aged 77 and older, SWEOLD showed increases in mobility limitations between 1992 and 2002 (Parker et al., 2005), whereas the ULF showed improvement during the same period for respondents aged 65 to 84 (Persson et al., 2001).

Disability

One of the most commonly used indicators of health trends in the elderly population is disability. It is particularly useful because of its close correlation with need for social services. Most often researchers measure it with some form of primary activities of daily living (ADLs; e.g., ability to dress, use the toilet, eat, bathe) and secondary instrumental ADLs (IADLs; e.g., ability to clean house, prepare food, shop for groceries). Experts often refer to limitations with ADLs as severe disability and limitations with IADLs as moderate disability, somewhat misleading terminology as it assumes an underlying continuity.

Scientists designed the original ADL instrument for use by personnel in long-term care (Katz, 1983). However, researchers now widely use ADL and IADL instruments to measure health in both clinical studies as well as community-based surveys of elderly people. There are several variations of ADLs that are more or less standardized, but attempts to harmonize ADLs among studies are often difficult due to differences in wording and activities included (Robine & Jagger, 2003). For example, some instruments ask if the respondent experiences difficulty in performing the activity, whereas others ask if the respondent needs help (i.e., is dependent). Different wordings or scales lead to differences in prevalence rates (Freedman et al., 2004; Jette, 1994; Picavet & van den Bos, 1996). However, a study in five European countries found that despite some differ-

ences in methodology, predictors of IADL limitations were comparable across countries (Nikula et al., 2003).

Most of the large American surveys have used some form of ADL disability as a major outcome (Freedman et al., 2004; Freedman, Martin et al., 2002; Manton, Stallard, & Corder, 1998). Most of these studies showed improvement or no change in ADL limitations during the 1990s, although the trend was not consistent across studies. One American study (Crimmins & Saito, 2000) found increases in ADL disability, and another (Schoeni, Freedman, & Wallace, 2001) found improvement in IADL limitations but not in ADL limitations. A review of eight Organisation for Economic Co-operation and Development countries (Jacobzone, 2000; Jacobzone, Cambois, & Robine, 2000/2001) showed a predominance of improvement in disability, with some exceptions. There seemed to be gender differences in trends in some countries, with men showing reduced ADL disability while women showed either fewer reductions or increases in disability.

There seems to be more consistency in regard to IADL disability: Many studies have shown improvement, and we found no study that showed an increase in IADL limitations. Spillman (2004) showed that most of the improvement in disability measures was IADL driven. In Sweden, SWEOLD showed no significant change in ADL or IADL disability between 1992 and 2002 (Parker et al., 2005).

Tests of Function

Several surveys have incorporated simple tests of function in their batteries. Tests provide more objective measures that are less susceptible to individual interpretations or expectations. They are also less affected by environmental factors. The major disadvantage is that researchers can only use tests in direct interviews. Participants interviewed by proxy—often the most impaired individuals—cannot be tested.

SWEOLD measured physical function with a short battery of simple tests of balance, strength, and range of motion. It also included a crude measure of lung function, the Peak Expiratory Flow test. Results from both these tests showed significant worsening in functioning between 1992 and 2002 for adults aged 77 and older (Parker et al., 2005; Thorslund et al., 2004). A simple test of vision showed no significant change over the period. Similar tests have been conducted in several North American studies; however, we were not able to find any published results concerning changes over time in these objective tests of function.

In population studies, researchers usually capture cognition with simple tests of concentration, memory, and orientation (Folstein, Folstein, & McHugh, 1975). As with tests of physical function, investigators

can only perform cognitive tests in direct interviews, thus excluding the most demented individuals in a population. There is a lack of evidence concerning changes in incidence of dementia over time. Some increases in prevalence rates, especially in less developed nations, are due to increased survival among individuals with dementia (von Strauss, Viitanen, De Ronchi, Winblad, & Fratiglioni, 1999; Wimo, Winblad, Agüero-Torres, & von Strauss, 2003). Studies done on a North American database found conflicting results: One study found improved cognition (Freedman, Aykan, & Martin, 2001, 2002), whereas another study of the same data found no improvement after adjusting for learning effects and some study design features (Rodgers, Ofstedal, & Herzog, 2003).

Conflicting Evidence

Table 1 presents the trends for the indicators mentioned previously as a summary of health-trend studies of the elderly population over the past two decades. Although it does not reflect an exhaustive review of the literature, this table comprises results from several other studies and reviews (Crimmins, 2004; Cutler, 2001; Freedman, Martin et al., 2002; Jacobzone et al., 2000–2001; Robine & Michel, 2004; Spillman, 2004; Wen, 2004; Wolf et al., 2005).

Results of trend studies using self-rated health and measures of self-rated function have shown mixed results: Some have shown improvement, and others have shown worsening. Results concerning specific diseases and symptoms have leaned overwhelmingly toward increased prevalence.

Results for ADL limitations (severe disability) have been mixed, although there is much evidence for improvement or no change. Results for IADL limitations (moderate disability) have leaned heavily toward improvement. We found no study showing increased prevalence of IADL limitations.

SWEOLD seems to be the only study that has analyzed tests of physical function over time. Tests of physical capacity and lung function showed significant worsening between 1992 and 2002 for participants aged 77 and older. The test of vision showed no significant change. More work must be done to determine trends in dementia incidence. Several studies have shown increases or no change in prevalence.

Discussion

From this overview of international studies, it is clear that research results diverge, and even conflict, in regard to health trends among elderly populations. Investigators can expect to see different trends in different countries due to different demographic and mortality patterns. For example, a comparative study of 10 European countries found more pronounced declines in disability in the south compared

Table 1. Health Trends in Elderly Populations According to Various Health Indicators

Indicator	Trend
Self-rated health	Mixed results
Specific health items: diseases and symptoms (self-ratings, tests, medical journals)	Increased prevalence
Self-rated physical function	Mixed results
Self-rated activities of daily living	Mixed, mostly improvement
Self-rated instrumental activities of daily living	Improvement or no change
Tests of functional ability	Increased prevalence or no change

to the north (Äijänseppä et al., 2005). Even within countries, variations exist due to methodological differences between studies (e.g., in regard to non-response; inclusion or exclusion of institutionalized and cognitively impaired individuals; and, in particular, the health indicator used). Nor can researchers expect the same trends over different time periods, as development is not likely to follow a continual linear curve.

The nature and direction of health trends is highly contingent upon the indicator used (Gudex & Lafortune, 2000). As pointed out by Crimmins (1996), indicators reflect different health dimensions, and there are logical reasons why trends in different components of health show disparity. Looking at results for different kinds of indicators reveals a general pattern beyond differences in methodology: There are clear increases in health problems as measured by specific items such as diseases and symptoms, and as measured by medical records and tests of physical function. Measures of disability (e.g., ADLs), however, show improvement or little change. In other words, investigators can witness an expansion of health problems with a compression of disability.

Explaining Change in Prevalence Rates

It is unlikely that fundamental, evolutionary changes in the human body can be detected over two or three decades. Therefore, when searching for factors that can explain changing prevalence rates, researchers must look at factors that can and do change over time.

One can explain some change in prevalence over time as a result of changes in reporting, particularly for symptoms and diseases. Most population surveys are based on self-reports from respondents or proxies. Many factors other than the pathological condition of the respondent can influence these reports. These factors can change over time, thereby explaining some of the temporal change in prevalence

rates. Higher levels of educational attainment in more recent cohorts of elderly people can lead to increased knowledge and understanding of one's own health, influencing awareness and reporting propensity. Education and higher standards of living may have also raised expectations and aspirations among later cohorts of elderly people. People may expect more of their health and demand more from medical services. This may be particularly true in Sweden, where more recent cohorts have spent more years of their lifetimes in the welfare state with a medical care system that was developed in the 1950s and 1960s.

Awareness of problems such as depression or hypertension among elderly people has increased in the medical profession, leading to more frequent diagnosing. Physicians may also be more likely today than they were in previous years to tell their patients about the diagnoses. In general, it has also become more socially acceptable to talk about certain problems, such as depression and incontinence; respondents may therefore be more willing to report these problems now than their counterparts would have been years ago.

Nonetheless, there also seems to be substantial evidence for increases in disease prevalence among older sectors of the population. The objective tests of physical and lung function in SWEOLD (Parker et al., 2005), as well as medical records data (Cutler, 2003; McClellan & Yan, 2000), confirm this tendency.

How can investigators explain the increased prevalence of health problems, both reported disease and symptoms as well as tested functional ability? Most population studies, understandably, look at prevalence at a particular time. As the mortality rate decreases, more people—even those with diseases—survive with their problems. In particular, survival among even very old people with stroke and cardiac infarct has improved (Rosén & Haglund, 2005). Many of these people survive, but they often have chronic health problems. Incidence studies are able to disentangle survival effects on prevalence rates. Unfortunately, studies of disease incidence are often clinically-based, and few population surveys are able to detect incidence of functional impairment or disability.

Changing gender roles could account for some of the improvement in moderate disability. Most measures of IADLs include shopping and preparing food—two activities that women have traditionally dominated. As recent cohorts of men have aged, more men may have more competence in these areas, something that could explain men's improvements. It is less likely that changes in gender roles affect primary ADLs (e.g., eating, toileting).

Changing social policy and access to care services can also affect disability trends. Reported use of help in carrying out activities is driven, in part, by supply (Wolf et al., 2005). Expected access to care services also influences reporting. In Sweden, for

example, the threshold for receiving help in the household with IADLs has risen over the past decade (Lagergren, 2005a; Sundström, Johansson, & Hassing, 2002). Knowing how difficult it is to receive help may influence how likely elderly people are to report needing help.

Despite the widely divergent results, the general tendency seems to be that older sectors of the population report more diseases and health problems at the same time that they seem to be coping better with many of the activities necessary for independent living (Crimmins, 2004; Parker et al., 2005; Spillman, 2004). Decreases in disability levels do not seem to be the result of less disease or fewer symptoms. Cutler (2003) found reduced disability among people with serious disease, not fewer people with disease. He went on to show that increased use of intensive surgical interventions was only partly responsible for this finding.

Disability has been defined as the gap between an individual's capacity and environmental demand (Verbrugge & Jette, 1994). Disability, therefore, is constructed through a combination of personal and contextual factors (Schneidert, Hurst, Miller, & Üstün, 2003). Contextual factors include housing standards; assistive technology; accessible buildings and public transportation; microwave ovens and ready-made dinners; as well as social changes, such as changes in social policy and shifting gender roles. All of these factors can facilitate activities and participation despite limitations of function. As these factors change over time, the relationships between disease, function, and disability change. When the contextual changes are advantageous, people can do more despite health problems. Therefore, disability measures in health-trend research reflect both changes in capacity and changes in the environment. Although trends in disability are definitely of interest, if researchers cannot identify and separate the elements of capacity and environment, these variables provide little information to guide future resource distribution or interventions.

Many studies combine primary and secondary ADLs, despite numerous findings that these concepts follow different trends (Schoeni et al., 2001; Spillman, 2004). The fact that most studies have found that IADL disability seems to be improving could well reflect the many environmental changes that can facilitate these activities: improved accessibility, wheeled walkers with baskets, ready-made meals, and microwave ovens. There are fewer technological interventions available to facilitate primary ADLs such as maintaining personal hygiene, dressing, and eating.

Implications of Different Health Components

The attention to health indicators is important from a methodological standpoint, but also in regard to policy implications of prevalence rates and trends over time. Different health indicators have different

implications for care resources. This differentiation of health components and their implications is one of the principles of the International Classification of Functioning, Disability and Health (ICF; Üstün, Chatterji, Bickenbach, Kostanjsek, & Schneider, 2003). The ICF model emphasizes the contextual context of function and offers a model that distinguishes between four different components of health and function: body structure, body function, activities, and participation. The ICF model proposes that components are associated with different care needs. Symptoms and disease, at the level of body structure and function, imply the need for medical care. In the case of symptoms, one needs medical care to explore the underlying cause and/or to manage the symptom itself. For diseases, one needs medical interventions to cure or manage the disease process. Limitations in activities (such as difficulty or inability walking, grasping, or lifting) call for rehabilitation and/or compensation in the form of assistive technology, housing adaptations, or social services (i.e., personal assistance and/or home help). Restrictions in participation, such as difficulty or inability carrying out tasks for daily living, may call for further compensatory interventions or changes in the environment. Although useful, the divisions are not always clear cut when it comes to very old sectors of the population. Dementia, for example, results from structural neurological damage but, in lieu of effective medicine, leads to a need for social services or long-term care.

Considering the various implications of different health and function components, it seems essential for trend studies to employ indicators for several components separately and simultaneously if the studies are to contribute to predictions of possible future need. When there are different trends for the different components, this has important implications for the kind and amount of future need for care resources.

In addition, it is important that researchers consider both the need and the demand for services. The concepts of need and demand are complex; they can change over time and vary between different social groups. For example, global measures of self-rated health, which are not included in the ICF model, are influenced by expectations and aspirations. Therefore, self-rated health can vary between cohorts as well as between social groups within cohorts. Experts' understanding of how expectations affect self-rated health is limited (Carr, Gibson, & Robinson, 2001), and for that reason self-rated health may be a poor choice of indicator for health trends. However, expectations steer self-assessments of care needs, which, in turn, influence demand for services and are therefore relevant to the discussion.

Conclusions

The study of health patterns over time will lead to better understanding of contextual factors that may

be correlated to health. Experts may also use health trends in the oldest sectors of the population to make projections of possible future resource need. However, most studies aimed at estimating future need do not specify which kinds of resources will be needed. Studies that use only disability measures give misleading results in regard to the total resource need that can be expected in the future. Elder care includes a wide variety of services, from highly specialized medical care to long-term-care facilities to simple but essential home services. The resources, in terms of cost and competence, vary accordingly. Therefore, if the study of health trends is going to be of any use in planning resource distribution in the future, investigators must examine the different components of health separately. This entails using a variety of measures as indicators.

Nebulous concepts of morbidity have clouded discussion on, and research about, health trends. Studies have shown that during a single time period there are different trends for different components of health in the elderly population and that the correlations between different components also change. This review suggests that the prevalence of symptoms, disease, and functional limitations is expanding at the same time that disability is being compressed, or at least postponed. Researchers must clarify the implications of these different trends. Symptoms and disease imply need and demand for medical services. Functional limitations imply rehabilitative and compensatory measures, whereas disability among elderly people often entails need for social services and/or long-term care.

In Sweden, as in many countries, care resources are divided administratively. County governments are responsible for most medical care, and municipalities are responsible for long-term care and home services. Demographic projections done in Sweden foresee, in the most optimistic scenario, a 25% increase in long-term-care need among the oldest sectors of the population between the years 2000 and 2030 (Lagergren, 2005b). Which resources should be augmented? Our study results suggest that future need for medical care may be greater than expected from simple demographic extrapolations (Thorslund & Parker, 2005). At the same time, need for social services may be less than expected.

In summary, trend studies using disability measures give a skewed picture of overall health development in the elderly population. Furthermore, the implication that future need for care may be lower for future cohorts of elderly people is dangerously deceptive. To adequately study health trends among the very old, surveys need to include multiple health indicators. Researchers need to use and develop indicators that are more objective and less susceptible to reporting effects and environmental change. At the same time, surveys should include indicators with a subjective element in order to understand demand for care, as well as indicators

with a contextual element to understand the changing relationship between disease and disability. The comparison of trends for different kinds of indicators, and the changing relationships between them, may reveal information that is important for policy concerning resource development and distribution, as well as insight into the development of disability in a contextual perspective.

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Received March 2, 2006

Accepted September 22, 2006

Decision Editor: Linda S. Noelker, PhD