Chapter IV

HEALTH STATUS NOMENCLATURE AND MEASUREMENT NORMS

Measurements of health status have always formed prime elements of public accounting around the globe and research on the health status of populations and population sub groups has a long history. Health status refers to the level of health of the individual, group, or population as subjectively assessed by the individual or as evaluated by more objective measures. Conventionally, measurement of health status of any population did have two major objectives: (i) evaluation of the effectiveness of the health delivery system or programmes funded by governmental agencies and (ii) evaluation of the services provided to the patients by medical practitioners. However, a comprehensive evaluation of the health status of a population or any particular group in the population is warranted for other pertinent purposes as well. For instance, economic performance of the workforce depends, among other things, on the health status of individuals constituting the workforce. Health status of individuals, then, has an inevitable impact on the socioeconomic status of the individuals and their families. This, indeed, is a reverse course contrary to the generally perceived link running from socioeconomic status of the family to its health status.

Socioeconomic status of the family would mean the ranking of the family in the milieu to which the family belongs, in respect of defined variables viz; physical assets, economic status, education, occupation, social position, social and political participation etc. All these, in turn, have a macro level impact generating ripple effects in the economy. Here, assessment of health status becomes a broader issue and, therefore, must take into consideration both the measures of the average level of the community health and measures of the distribution of health among individuals.

Measurement of anything, essentially, requires the fulfillment of two fundamental conditions: (i) an unambiguous definition of what is to be measured and, (ii) a stable scale for accurate measurement. Adhering to the comprehensive definition of health offered by the World Health Organization, the health status of an individual, for the present purpose, can be defined as the current state of one’s health. It includes the status of his wellness, fitness and any underlying diseases or injuries. The old ways of measuring health included
the use of mortality rates and life expectancy as indicators of the health of a population aggregate or that of a community. Because death is a clearly defined event, it has continued to be the most reliable single indicator of the health status of a population.

4.1. Mortality as an Indicator of Health Status

Premature death is undesirable, so one aspect of health is the avoidance of mortality (Kaplan, 2006, p.43). There can be little doubt that living long is a much shared aspiration. Even though it is clearly not the only thing we seek, a long life is inter alia fairly universally valued – and valued very strongly. This is not only because living as a state of being is itself valued, but also because it is a necessary requirement for carrying out plans and projects that we have reason to value (Sen, 1995). Rising longevity in developing countries has opened a new incentive for the current generation to save – an incentive that can have dramatic effects on national saving rates (Bloom et al., 2004). It can substantially boost investment and economic growth. A worker in good health in a low mortality country will be about 70 percent more productive than a worker suffering from ill health in a high mortality environment (Bloom & Canning, 2005). The significance of mortality information lies, therefore, in a combination of considerations, including (i) the intrinsic importance we attach and have reason to attach – to living (ii) the fact that many other capabilities that we value are contingent on our being alive, and (iii) the further fact that data on age-specific mortality can, to some extent, serve as a proxy for associated failures and achievements to which we may attach importance (Sen, 1995).

Mortality rate, also known as death rate, has become the most widely used indicator of health status all over the world because of its plus points. The great virtues of mortality rate are that it is determined objectively, and is reasonably comparable inter-temporally and inter-spatially. The big changes in mortality that are continuing to occur across the world do not involve extending lives to unimaginable lengths, but relate to the saving of premature mortality – of infants, children and young or middle aged adults (Sen, 1995). Generally, countries with higher levels of socioeconomic development and lower levels of poverty also tend to have lower mortality levels. The influence of economic conditions on mortality has been recognized at least since biblical times (Preston, 2007). But this perceived relationship between economic conditions and mortality could not stand the test of time. The United Nations Population Division has expressed the opinion that the cross-sectional relationship between mortality and level of economic development has become
progressively weaker over time (UN, 1963). It is widely believed that mortality has become increasingly dissociated from economic level because of a diffusion of medical and health technologies, facilities and personnel that occurred, in large part, independently of economic level, yet this position has its critics who have gained sympathetic audience (Preston, 2007). The trends in mortality rates translate directly into changes in life expectancy at different ages (Jack, 1999).

4.2. The Standard Measure of Life Expectancy

The life expectancy rate is a standard measure used to compare the health status of various populations. The highly significant correlation between life expectancy and the subsequent economic growth has been highlighted by economists with ample evidence from empirical studies (see, for example Barro, 1997). The value of life expectancy statistics is that they provide a way of controlling for the confounding effects of age when comparing populations (Abramson, 1989). Life expectancy at birth for an area in each time period is an estimate of the average number of years a newborn would survive if he or she experienced the particular area’s age-specific mortality rates for that time period throughout his or her life. The figure reflects mortality among those living in the area in each time period, rather than mortality among those born in each area. It is not, therefore, the number of years a baby born in the area in each time period could eventually expect to live, both because the death rates of the area are likely to change in the future and because many of those born in the area will live elsewhere for at least some part of their lives. Life expectancy may be an underestimate of how long on average a person born today can expect to live, because mortality rates are declining all the time and the force of mortality at any future age will be less than it is for a person of that age now. Overall levels of life expectancy are strongly influenced by levels of child mortality. This universal fact manifests evidently the implications of changes in the structure of the causes of death. For the past few decades, epidemiologists have described changes in the structure of causes of death in population within the framework of the epidemiological transition (Omran, 1971; Frenk et al., 1989). This transition specifies that, as mortality declines, it does so more rapidly at younger than older ages, and as a result, the causes of death more common among children, principally pneumonia, diarrhoeal diseases, malaria, measles and prenatal complications, will rapidly decline in relative importance as causes of death. Conversely, the causes of death more common at older ages, namely cancer, major vascular diseases and chronic lung and digestive diseases, will increase in relative importance.
The success of programmes to reduce child mortality over the past two or three decades has led to increasing focus on premature mortality among adults (Murray & Lopez, 1997). But of course immortality is not an option, and the issue is the difference between living long or short, and in particular the difference that is made by the possibility of dying prematurely, at a comparatively young age (Sen, 1995). Premature adult mortality is commonly measured by the risk of death before age 60 among those who reach age 15. Increasingly, the global public health community has been focusing efforts on reducing major causes of young adult mortality, namely HIV/AIDS, tuberculosis and injuries, with the realization that vascular disease rates are surprisingly high at these ages and substantially preventable (Murray & Lopez, 1997).

Life spans slowly but steadily increased in the second half of the 19th century and then jumped markedly in the 20th century, initially in Europe and then in the rest of the world (Bloom et al., 2004). Despite the general connection between real income per head and life expectancy, which is reflected in many inter-country comparisons, there are significant gaps in that relationship (Sen, 1995). Factors exogenous to a country’s current level of income probably account for 75 – 90% of the growth in life expectancy for the world as a whole between 1930s and 1960s; income growth per se account for only 10 – 25% (Preston, 2007).

It is quite striking that the population of Sri Lanka, China and the Indian state of Kerala enjoy much higher longevities than do people of South Africa, Brazil and Gabon, despite the GNP per head of the latter economies being many times those of the former. The former economies exhibit success of economic organization of a kind that is not seen in the latter countries. These contrasts are of considerable policy relevance and bring out the importance of the ‘support led’ (rather than the ‘growth led’) process (Sen, 1995). The increase in life expectancy are the result of the reduction in mortality rates due to improvements in medical care, better lifestyles and improved living conditions. It is perhaps more surprising that the US black population in general has lower chances of reaching a mature age than do the immensely poorer people – women as well as men – of Kerala or China. In terms of chances of survival to a ripe old age, an aspect of race based deprivation is identified here that is missed completely in analysis based only on income data (ibid).
The difference between life expectancy in a particular group and the concurrent state of life expectancy is a meaningful quantification of the possible health deficiencies in that group relative to the overall health status of the state. But the estimation of life expectancy for any group in the population cannot be possible within a short span of time. Non-availability of the longitudinal data pertaining to the group in question is the major factor that works against the feasibility of such an exercise. Moreover, mortality statistics, generally, do not contain any information regarding the causes of death. The best known measure of health status is the cause of death based on the death certificate. This provides invaluable information on patterns of death and trends over time. Unfortunately, complete cause-specific death registration data are available routinely for only a minority of the world countries (Beaglehole & Bonita, 2004, p.18). The lack of routine cause-specific mortality statistics in the developing world makes the adult health situation less clear.

Furthermore, the very reliability of life expectancy and mortality statistics as health indicators is doubtful, especially, in an era of global transformation in human health that has led to people living longer. It is obvious that “most people now live longer, on average, than the wealthiest people a century ago” (Beaglehole & Bonita, 2004, p.15), and despite this tremendous achievement, there remains an alarming burden of diseases worldwide. Life expectancy and mortality rates, then, do not correctly express the state of health of population in its entirety and in its evolution. For instance, “death rates have registered a perceptible decline in our country. Yet, debilitating illness still haunts the working population” (Yasodha, 1994, p.64). Life prolonging treatments help postponement of the occurrence of death and have the effect of reducing mortality rate in the community if the individuals can well afford such treatments. But the expenses associated with life prolonging treatments deplete the lifetime savings and makes an inroad into the current consumption of non-medical commodities. The importance of mortality and life expectancy as measures of health status has declined, over the years, as chronic diseases cause affliction without death and, “consequently, other measures of morbidity and disability were sought out” (Anderson, 1978, p.459).

4.3. Measures of Morbidity and Disability

In 1931, the French medical missionary Dr. Albert Schweitzer wrote, “Pain is a more terrible lord of mankind than even death itself” (Murray & Lopez, 1996). Death statistics describe only a part of the health status of a population, and often only the end point of an
illness process. In view of the wide range of effects that various health conditions can engender, the approach of using only mortality was judged inadequate. Injury and disease can cause many disabling conditions that have substantial effects on the quality of life (Mont, 2007). Accurate measures of morbidity and disability, therefore, are needed to assess the health status of population or of any particular group in the population. There can be no question whatsoever that good information on morbidity would be extremely useful (Sen, 1995). Morbidity refers to the state of being afflicted with an ailment. Ailment, which includes illness or injury, is any deviation from the state of normal physical and/or mental well being. Illness in the individual can be understood as disturbance in one or more subsystems. For example, biological system on the basis of clinical evidence (medically defined illness) or in the perspective subsystem on the basis of subjective evidence (perceived need). There are several indicators of morbidity that might be used to assess levels of ill-health (for example, disease incidence, prevalence, duration, severeness, hospitalization rates) often without any standardization.

Though the nature and degree of correlation between morbidity and mortality have not yet been established, two important hypotheses have been formulated to express the association (or rather dissociation) between the two variables. The hypothesis of “compression of morbidity” argues that the decline in mortality is not necessarily associated with an increase in morbidity. It is argued (Fries, 1980) that if the onset of chronic illness is postponed and if this postponement is greater than increases in life expectancy, then the lifetime burden of illness could be reduced. The consequence of this trend would be a reduction in the cumulative lifetime morbidity. The counter hypothesis of “expansion of morbidity” (Gruenberg, 1977; Kramer, 1980) suggests that the decline in mortality is translated into an increase in morbidity. It is argued that health policies focus on preventing death without preventing morbidity.

One of the defining differences between mortality and morbidity measures of health status is the ease with which the first can be measured against the difficulties that surround measurement of the second. Death is a binary variable, but morbidity is a continuous and multidimensional variable, with both objective and subjective components that make quantification difficult. Morbidity, conventionally, is described in terms of the incidence and prevalence of certain diseases or disabilities.
In a population, the number of people with a given disease may change over time. In general we can let the number of people with the diseases at time \( t \) be denoted by \( n(t) \). This number is known as the prevalence of the disease (Jack, 1999). Prevalence rate is measured as the number of persons reporting ailments during the reference time per 1000 persons. The prevalence of disease can change either because new individuals become infected (in which case \( n(t) \) increases), or because infected individuals are cured or die (in which case, \( n(t) \) falls). The rate of infection of new individuals is known as the incidence of the disease (ibid). Incidence rate is measured as the number of new occurrences of an illness during a specified period per 1000 persons. Prevalence, in contrast, includes all the cases – either at a point in time (point prevalence) or over a period in time (period prevalence) (Tones & Green, 2004). Morbidity measures fall into two categories: (i) Observed or objective rates, based on clinical evidences or medical examinations, and (ii) Self perceived or subjective rates, based on reports by individuals.

4.3.1. Observed Measures of Morbidity

Observed measures of morbidity can be classified into four categories: (1) physical and vital signs, (2) physiologic and pathophysiologic indicators, (3) functional tests, and (4) clinical evidence. Physical and vital signs refers to evidence of diseases that can be detected by physical examination. Vital signs include blood pressure and body temperature. A whole spectrum of laboratory examinations (of blood, urine, feces, and other body fluids) and diagnostic imaging techniques such as radiography are included in the category of physiologic and pathophysiologic indicators. Functional tests assess a person’s ability to perform some function such as running, blowing up a balloon, lifting weights, or performing intellectual tasks. Clinical evidence comes from physician’s evaluation and diagnosis, reported either by the physician or the patient (Sullivan, 1981).

There is a preference for objective indicators among health professionals because ill health is given a physical manifestation, which is tangible and measurable (Ware et al., 1981). However, objective measures cannot be taken for granted as they are not without problems. While physicians are presumably better at making accurate physical diagnosis than surveyors with less training, observer error and variance in skill can be substantial problems in morbidity surveys based on physician’s examinations (Cochrane et al., 1951). Another difficulty with the objective approach is its cost and logistical problems.
4.3.2. Self Perceived Measures of Morbidity

Perceived health reflects an individual’s awareness of symptoms, diagnosis, and performance decrements that are associated with mortality risk (Kaplan et al., 1996). Self perceived measures of morbidity can broadly be grouped into two different but related categories: (1) symptoms, and (2) functional disability. Most morbidity surveys collect information about symptoms by asking questions about the occurrence symptoms of illness in a defined time period. Surveys of functional disability ask people about their ability to carry out specific functions or about restrictions of their activity.

People’s perception of illness varies with what they are used to and also with their medical knowledge. In places where medical care is widespread and good, people often have higher perception of morbidity, even though they may be in much better general health (Sen, 1995). This, in fact, is a drawback of the measures of morbidity based on people’s perception. Also, the approach is being criticized on various other counts. First, measures of morbidity are based on symptoms, which “are not always disease specific and are often on a continuum” (Ho, 1982, p.11). Second, the subjective reporting of morbidity is influenced by cultural and individual differences and appears to be accurate only for diseases that interrupt normal activity or cause “pain” or “disability” (ibid, p.16). Third, “morbidity rates are subject to considerable variation in quality” depending upon the accuracy of data collection (Hunt et al., 1986, p.40).

Because all measures of self perceived morbidity have two distinct sets of determinants – that is, underlying disease and perception of illness – they sometimes produce information that is counter intuitive. For instance, the Indian National Sample Survey, 1974 reported overall self perceived morbidity incidence rates for acute conditions that occurred in the two weeks before the survey. The state that had the lowest mortality rates, Kerala had the highest reported morbidity. There are three possible interpretations of this finding: (a) the pattern of disease in Kerala is strikingly different, characterized by higher rates of non fatal conditions than in other states in India; (b) the pattern of disease in Kerala is same as in other states, but the burden of disease is greater, and the low mortality rates are due to extremely effective therapeutic health services; or (c) as health has improved in Kerala, illness perception and reporting behaviour have changed so that the Keralites report more illness despite a lower disease burden (Murray, 1992).
In spite of the disparagement, self reported health based on individual’s perception continues to be the most significant measure of health status at regional, national and global levels. Numerous studies show that self reported health status (SRHS) is an increasingly common and comprehensive measure of health in empirical research (see for example, Ettner, 1996; Deaton & Paxson, 1998; Kennedy et al. 1998; Smith, 1999). Further, studies suggest that it predicts morbidity and subsequent mortality (Okun et al., 1984) and allows examination of how health status varies over the life course (Case & Deaton, 2003). A strong link between SRHS and more objective health outcomes, such as mortality and prevalence of disease, has been revealed in an extensive body of literature (Idler & Kasl, 1995; Kaplan & Camacho, 1983; Mossey & Shapiro, 1982). However, in order to portray a clear and complete picture of the health status of any group in the population, especially when the focus is to get foolproof information on the health status of working-age adult population, measures of disability should also be taken into account.

4.3.3. Measures of Disability

The World Health Organization defines a disability as “any restriction or lack (resulting from impairment) of ability to perform an activity in the manner or within the range considered normal for a human being” (WHO, 1980, p. 28). Thus, for practical purpose, disability days can be defined as those days in which persons restrict their activities “because of any injury or illness that resulted from either an acute or chronic condition” (Treveno & Moss, 1984, p. 12). In this context, three types of disability days can be identified: restricted activity days, bed days, and work loss days. Restricted activity days are days in which normal activity is restricted because of illness or injury. Bed days are defined as days in which all or most of the time is spent in bed (Kozak & McCurthy, 1987). Work loss days are simply days lost among gainfully employed adults due to illness or injury.

By contrast, the WHO defines handicap as “a disadvantage for a given individual resulting from impairment or a disability that limits or prevents the fulfillment of a role that is normal (depending on age, sex, and social and cultural factors) for that individual” (WHO, 1980). Handicap need not be an eventual outcome of a weakening health state as it depends on factors other than health but a disability is intended to depend on health factors only. Developing a measure of disability is exceedingly difficult: one reason for this is that, unlike mortality, there are many dimensions to disability such as physical
disabilities, pain, discomfort, emotional distress and loss of dignity. Moreover, each state, depending on its severity, must be given a disability weight in order to make the dimension a sensible one. The disability weight is a measure of the impact of a health condition and its calculation is based on the preferences of a panel of judges for each health state relative to full health and to death (Murray & Acharya, 1997). However, from an economist’s point of view, there is no point in gathering information about all aspects of the disability conditions of individuals constituting the population. This is because only the work related disability alone will have bearing on the employment prospects and earning capacity of individuals.

Work related disability is defined as “the inability to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment that can be expected to result in death or that has lasted, or is expected to last, for a continuous period of not less than 12 months” (Wunderlich et al., 2002, p. 4). The concept of morbidity can, in fact, be expressed in terms of episodes of illness and then in terms of ability to work. But all states of impairments do not affect the working ability of individuals and, therefore, need not be taken into account while evaluating the economic consequences of debilitating health status of any group in the population. “An individual’s physical and mental impairment(s) must be of such severity that he or she not only is unable to do the previous work but cannot, given the person’s age, education, and work experience, engage in any other kind of substantial gainful work that exists in the national economy, regardless of whether such work exists in the local area, or whether a specific job vacancy exists, or whether the person would be hired if he or she applied for work” (ibid). There is no doubt that data on morbidity, disability, and functional impairment are more useful indicators of health status than data on mortality rates alone since the former reflect the quality of life of a population throughout the life course. However, a more meaningful and all-inclusive evaluation requires a methodical assessment of the summary measures of the health of a population in any setting.

4.4. Summary Measures of Population Health

Summary measures of population health (SMPH) combine information on mortality and non-fatal health outcomes to represent the health of a population as a single numerical index (Field & Gold, 1998). A number of summary measures combining mortality and non-fatal health outcomes have been developed: (i) quality adjusted life year (QALY); (ii)
disability adjusted life year (DALY); (iii) healthy life years (HeaLY); (iv) disability free life expectancy (DFLE); and (v) disability adjusted life expectancy (DALE).

4.4.1. Quality Adjusted Life Year (QALY)

The term ‘quality adjusted life year’ (QALY) was first used in 1976 by Zeckhauser and Shepard to indicate a health outcome measurement that combines duration and quality of life (Zeckhauser & Sheppard, 1976). But the underlying concept had been formally shaped in the early 1970s in the development of a ‘health status index’ (Fanshel & Bush 1970; Torrance, 1970; Torrance et al., 1972), while an earlier study of the treatment of chronic renal disease (Klarman et al., 1968) had used a subjective adjustment for quality of life (Sassi, 2006).

The quality adjusted life year (QALY) is a way of assigning a numerical value to a health state. It is based on the premise that, if a year of good quality life expectancy is given the value one, then a year of poor-quality or unhealthy life must be worth less than one. Therefore QALY combines the length and quality of life into a single index (Bowling, 1977). The number of QALYs for a health profile is found by multiplying the health related quality of life weight (HRQoL) of the health state, with the duration of the health state. For example, a person who gets some disability at the age of 30, lives with the condition for 20 years, and suffers a premature death at the age of 50. If the life expectancy is 70 years, and the health related quality of life associated with the condition is 0.5, the lifetime QALYs of this person are $1.0 \times 30$ (QALYs before onset of disease) + $0.5 \times 20$ (QALYs during disease) = 40. The QALY loss would be $1.0 \times 70$ (QALYs in case of full health for full life expectancy) – 40 = 30.

Today, QALYs are used in most economic evaluation, and by many regulatory agencies which have made cost effectiveness analysis an integral part of their decision making process (Sassi, 2006). However, the use of QALY as a means of prioritization of health care has been viewed as unjust because it is “essentially ageist – systematically favoring interventions that improve the health status of the young by virtue of their longer life expectancy” (Tones & Green, 2004, p. 47). Moreover, the arbitrary assignment of values indicating quality of life associated with any particular health condition is open to questioning and for this very reason QALYs cannot be relied upon as a measure of health status of any group in the population. Researchers in the field have developed another
related but different measure – the disability adjusted life year (DALY) – to evaluate the health status of population.

4.4.2. Disability Adjusted Life Year (DALY)

Disability adjusted life year (DALY) is concerned with the loss of life due to premature death and disability. A premature death in this context is defined as one that occurs before the age that the person could be expected to reach if they were a member of a standard reference population with a life expectancy equal to the world’s longest-surviving population – that is, Japan (WHO, 1999). This concept was introduced in the World Development Report 1993 (World Bank, 1993) as a means of measuring the global burden of disease and the effectiveness of health interventions.

DALY is a time-based measure accounting for years of life lost due to premature mortality and healthy years of life lost due to disability (Murray & Lopez, 1994). DALYs are calculated as \( \text{DALY}_i = \text{YLL}_i + \text{YLD}_i \); where \( \text{YLL}_i \) is the years of life lost in a population due to premature mortality attributable to health condition \( i \), and \( \text{YLD}_i \) is the healthy years of life lost in a population due to disability attributable to health condition \( i \). For each health condition, the YLD is calculated as \( \text{YLD} = D \times I \times L \); where \( D \) is the disability weight associated with the health condition (taking a value between 0 and 1); \( I \) is the incident number of cases; and \( L \) is the average number of years that the condition lasts (Mathers et al., 1999, p.21). DALYs combine years lost from premature mortality with the loss experienced by living with disability. For example, consider an individual who acquires a chronic illness that leads to his living 12 years with a condition that has a disability weight of 0.5 and then dying 9 years prematurely. His loss in health would be 15 DALYs – that is, the sum of the 9 years of lost life plus the six year loss \( (12 \times 0.5) \) from the disabling condition. The calculation seems rather easy but in actual practice it is quite difficult to obtain DALYs for a particular population.

The difficulty lies in how DALYs encapsulate disability and how disability relates to health. Currently, summary health measures portray disability as a medical condition that rests within the individual. To have a disability is therefore to necessarily have poorer health. In a sense, disability is viewed as an expression of the poor health associated with a particular illness, such as diabetes or heart disease. Also, the notion of health and disability embedded in this measure raises strong concerns. Another related concept, the healthy life
year (HeaLY), has become an equally important composite measure of population health in any setting.

4.4.3. Healthy Life Years (HeaLYs)

The healthy life year is a composite measure that combines the amount of healthy life lost due to morbidity, plus that attributed to premature mortality (Hyder, 1998). The HeaLY can be applied to population groups to determine the impact of a particular disease or disease group, to work out the effects of an intervention or package of interventions, or to compare areas, populations, or socioeconomic groups (Hyder & Morrow, 2000).

The HeaLY approach focuses on the knowledge of pathogenesis and natural history of disease (Last, 2000) as the conceptual framework for assessing morbidity and mortality and for interpreting the effects of various interventions. For the purpose of estimating healthy life lost or gained, disease has been defined as anything an individual experiences that causes, literally, ‘dis-ease’, anything that leads to discomfort, pain, distress, disability or death from whatever cause including injuries and psychiatric disabilities.

The measure of loss from death is based on the years of life that would have been expected had the disease not occurred. The HeaLY includes three components: case disability ratio (CDR), extent of disability and duration of disability. The CDR and duration can be determined objectively, but assessment of the extent, which ranges from zero to one (from no disability to that equivalent to death), has a substantial subjective element (Morrow & Bryant, 1995) and the estimation of this subjective element might lead to inaccurate results and misleading conclusions.

4.4.4. Disability-free Life Expectancy (DFLE)

Disability-free life expectancy (DFLE) is a more comprehensive indicator than that of the life expectancy because it introduces the quality of life. It is used to distinguish between years of life free of any activity limitation and years experienced with at least one activity limitation. DFLE represents the expected number of years of remaining disability-free life a member of the life table cohort would experience if cohort age-specific rates of mortality and disability prevailed throughout his/her lifetime (Imai & Sonej, 2007). The index of DFLE as an appropriate measure of health status was introduced by Sullivan (Sullivan, 1971), and is used by researchers around the world. It is computed by subtracting from the life expectancy the probable duration of bed disability and inability to
perform major activities. In addition to the readily available data on life expectancy, the calculation of DFLE requires data on age and sex specific prevalence of disability from a population survey. International comparisons of DFLE and other expectancies have, however, been severely hampered by differences in calculation and definition (Romieu & Robine, 1994). Moreover, the DFLE is concerned only with major activity limitations. Major activity limitations are those caused by a long-term physical or mental condition or a long-term health problem that has lasted or is expected to last six months or more.

4.4.5. Disability Adjusted Life Expectancy

Disability adjusted life expectancy (DALE) was developed by Lopez and Murray in the Global Burden of Disease Study (Murray, 1996, World Bank, 1993) as a summary measure of population health. DALE summarizes the expected number of years to be lived in what might be termed the equivalent of “full health”. To calculate DALE, the years of ill-health are weighted according to severity and subtracted from the expected overall life expectancy to give the equivalent years of healthy life (WHO, 2000). Weights are assigned to different states of health. These states include: no activity limitations, activity limitations in leisure activities or transportation, activity limitations at work and, institutionalization in a health care facility. The DALE years are different from DALYs as used by the World Bank (Murray & Lopez, 1996). Although DALE has a number of advantages over many other macro measures of population health, it is beset with a number of practical difficulties like the need for developing for each country of age-sex specific disability prevalence estimates and construction of latent health factor scores from representative population health surveys and again the estimation of weighted disability prevalence from these latent health factor scores.

4.5. Conclusion

This chapter underlined the significance of measuring health status and examined its measurement norms so as to choose an appropriate indicator, especially, in the Kerala setting. The old ways of measuring health included rate of mortality and life expectancy and these indicators, still, continue to be the most common measures because of their objectivity and comparability. However, life expectancy and mortality, at present, are deemed as rudimentary indices of health status as the health problems that occur through lifespan of an individual are not being looked into by these indices. Accurate measures of
morbidity, in this context, can be relied upon to reflect, truly, the health status of individuals in an advanced community.

Morbidity, conventionally, is described in terms of the incidence and prevalence of certain diseases or disabilities. Morbidity can be measured either objectively or subjectively as reported by the individuals. Self reported health, based on individual’s perceptions, continues to be the most significant measure of health status in spite of its numerous pitfalls. However, a more meaningful and all inclusive measurement is provided by the summary measures of population health as these measures combine both mortality and morbidity in order to obtain a single index reflecting the quality of life. But the absence of a stable and standardized scale make the summary measures less reliable and the conceptual ambiguities make the estimation relatively difficult. This implies that the measurement of health status of any community in a low mortality, high life expectancy population must take recourse to morbidity as reported by the individuals in question. Morbidity can be measured on the number of persons who are ill, periods or spells of illness and, the duration of illness. The measures of morbidity along with information on work related disability can, absolutely, be relied upon, without any standardization, to assess the health status of any community. The elucidation in this chapter as well as in the previous chapter provides the much needed conceptual clarity on health status and its indicators so that the analytical examinations of the data collected from the return emigrants will be more scientific and meaningful. However, an all-inclusive scrutiny of the survey data must be preceded, as a backdrop, by a discussion on the theoretical foundation of migration and an illustration of the changing scenario and the current state of Gulf specific migration from Kerala. An attempt, in this direction, is made in the next chapter.
References


