Disability-Free Life Expectancy in the Costa Rica: gender differences

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Background

Traditionally, a decline in mortality was considered to reflect a decline in morbidity in the population. Nowadays, in low mortality countries where improvements in life expectancy are mainly caused by mortality reductions from chronic diseases at older ages, serious doubts exist as to whether longer life means better health for the surviving population (Nusselder, 2003). The elderly population is growing at a faster rate than the overall population and people are living longer. Therefore, there is an increasing interest in investigating whether the years added to life expectancy for these elderly are lived in adequate health conditions (Robine et al, 2003; Cai & Lubitz, 2007).

It would be extremely useful to have an indicator that combined mortality and the population's health status. Estimates of healthy life expectancy have been used to meet the demand for information on the amount of years lived with health. The notion of healthy life expectancy is similar to that of total life expectancy, but refers to the mean number of years that someone of a given age can expect to live with health, given that the morbidity and mortality rates prevail for that specific age. Thus, total life expectancy consists of the amount of years lived (from birth or a given age onward) in different states of health, until death, where the years lived with health provide the healthy life expectancy (Jagger, 1999).

Just as there are various definitions for health, there are different ways of measuring healthy life expectancy, such self-perceived health, the consequence of diseases, functional disability, and the notion of physical, mental, or social well-being (Robine, Romieu and Cambois, 1999). Therefore, the way health is operationalized depends on the researcher's objectives and the available data. Different ways of measuring health status can also lead to different results for healthy life expectancy. In practice, healthy life expectancy is often estimated as disability-free life expectancy (Bone, 1992), i.e., free of difficulty in performing given activities. The indicator disability-free life expectancy provides information not only on the prevalence of functional disability, but also on the potential duration of disability and the time demanded for personal care for part of the population (Agree, 1999; Laditka and Hayward, 2003).

The importance of studying functional status lies in the fact that this indicator correlates with the feeling of individual well-being, predicts health and consumption of social services, and has a positive or negative impact on the family. The most demography studies of population health and health expectancy in older population operationalize health status using indicators of functioning ability (Crimminis, Hayward and Saito, 1994).

There is still a scarcity of Latin American studies in this area, which can be partially attributed to the lack of information, such as that pertaining to functional disability (Camargos, Machado and Rodrigues, 2008). Recently the Costa Rica Study on Longevity and Healthy Aging (CRELES) is an ongoing longitudinal study of a nationally representative sample of 2,822 adults born in 1945 or before (ages 60 and over at the first interview) and residing in Costa Rica in the year 2000, with over-sampling of the oldest adults. The first wave of interviews was conducted from 2004 to 2006 and the second wave from 2006 to 2008. In both waves provide information about the functional disability and it is possible work with the incidence and mortality.

The objective of this study was to measure and compare disability-free life expectancy in the Costa Rica elderly, by sex and age, for 2006/2008. In this case, estimating the number and proportion of years of life with disability, in addition to the years of life free of these conditions, as well as their proportions.

Materials and Methods

The probability of functional disability and deaths was estimated based on data from the CRELES. All the data and measurements in CRELES were collected at the participants' homes, usually in two visits. In the first visit, participants provided written informed consent and answered a 90-minute long questionnaire (including some mobility tests and two blood-pressure measures). The informed consent was approved by the University of Costa Rica's Institutional Review Board (Reference: vi-763-cec-23-04).

Disability was used as an indicator of health status and the resulting indicator was called “disability-free life expectancy” or “health expectancy”. The indicator was measured on the basis of five activities of daily living (ADL). Disability was defined in the present study as inability or difficulty in performing given activities (feeding, walking, transferring, toileting and bathing). Sampling weights were used in order to account for varying individual selection probabilities. All statistical analyses were done using the STATA statistical package.

The multistate life table was used to calculate the disability-free life expectancy. The method provides estimates of years an average individual of a particular age can expect to spend in good and poor health. The multistate life table can also provide estimates of the expected number of transitions over one's lifetime or within a specified period of time (Laditka and Hayward, 2003). Moreover, this method allows the explicit assessment of how disability and mortality process contribute to the structure of population health, or the changing prevalence of health problems associated with age (Crimminis, Hayward and Saito, 1994).

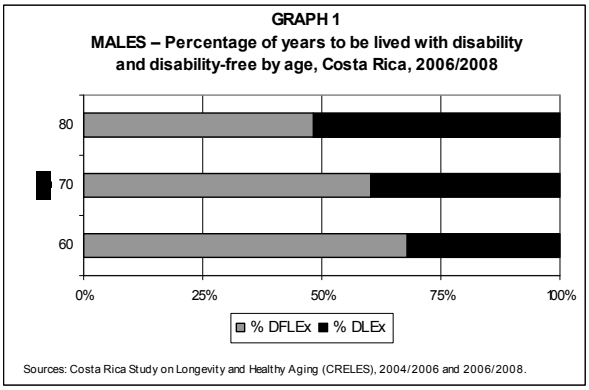
Two life tables were constructed, one for each sex. Status differences between the beginning and the end of intervals are used to determine transitions in health status. Four transitions are measured: (1) active to disabled; (2) disabled to active; (3) active to dead and (4) disabled to dead. The transitions probability was estimated using a multivariate logistic regression. In our study, within each observation interval, events (death or disability transition) are assumed to occur in the middle of the interval and exposure is adjusted to produce central rates. Thus the data impose the assumption that only one transition occur within two-year interval. The number of person-years lived within each age group in the life table was distributed according to the probability of functional disability and deaths in each specific age group.

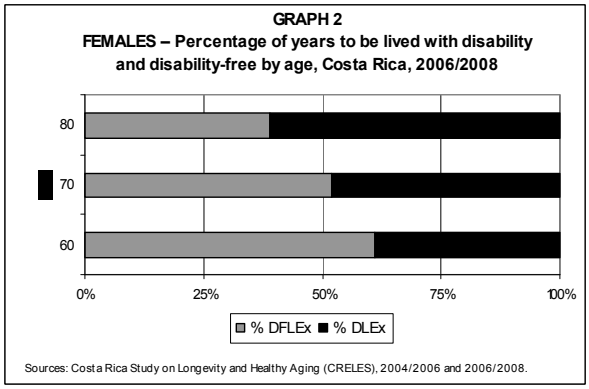
In our analysis the number of persons without functional disability at age x+n is equal to the number of persons without disability at age x, plus the number moves from disability to active, minus the number moves from active to disability, minus those persons who had no disability at the age x who died during the interval. The disability free life expectancy (DFLE) and disability life expectancy (DLE) were computed given the number of person-years lived in each age group with and without functional disability.

Results and Considerations

The preliminaries estimates indicated that, in the Costa Rica, elderly women could, on average, expect to live more years with disability than men. At age 60, as an example, the disability life expectancy was 6.5 and 7.9 among males and females, respectively. The difference between sexes decreased with age. The percentage of life expectancy lived with disability for women was longer than men (Graph 1 and Graph 2). At age 60, men could expect to live 68% of their remaining time in good health (without disability) and these

figures were 60% and 48%, for men at age 70 and 80, respectively. For women they were, respectively, 61%, 52% and 39%.





These preliminaries findings are corroborated by previous studies (Agree, 1999; Zimmer, 2005; Jagger et al., 2007; Camargos, Machado and Rodrigues, 2007; Camargos, Machado and Rodrigues, 2008). It could be argued that higher mortality rates for men, compared with women, at younger ages could lead to a selection in the senior years. Therefore, those men who survive to older ages could be, in fact, the 'strongest ones' (Perls, Kunkel and Puca, 2002) and the composition at each age group of women, compared with men, would be less homogeneous, with a higher percentage of frail elderly women, which would result in a higher percentage of years with functional disability for women.

Finally, to the extent that the current study presents information on the proportion of years of life with and without functional disability, it provides backing for estimating the demand for health care and interventions in the elderly population, pointing to the need to invest in prevention in order to expand disability-free life expectancy.

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