Active Life Expectancy, Gender, and Education among Elderly Indonesians

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ABSTRACT

The expected growth in the size of Indonesia's elderly population heightens the importance of understanding potential changes in this population's burden of disease. Growing numbers of elderly living with chronic health problems potentially strain family support systems as well as health care institutions' abilities to meet their health care needs. In this paper, we lay the initial groundwork for anticipating Indonesia's future burden of disease by developing a demographic model of population health. We develop this model within the analytic framework of a Markov-based multistate life table model to calculate an important indicator of the burden of disease, the expected years of active life of elderly Indonesians. Active life expectancy refers to the years of expected life free from major functional problems. We gain additional insights into future changes in disease burden by examining educational differences in active life. We pay special attention to gender's association with active life.

EXTENDED ABSTRACT

Introduction

After rapid declines in fertility and mortality, Southeast Asian nations are anticipating massive population aging in the decades ahead. Indonesia's experience illustrates this pattern. Indonesia's success in fertility control and mortality reduction is expected to have substantial implications for the growth of its elderly population. By 2050, Indonesia's elderly population is projected to be among the largest in the world (United Nations 2001), at 69.5 million people, and is expected to comprise 22.3 percent of Indonesia's total population.

The expected growth in the size of Indonesia's elderly population brings into sharp relief the importance of understanding the potential changes in the population's burden of disease. Growing numbers of elderly living with chronic health problems potentially strain family support systems as well as health care institutions' abilities to meet the elderly population's health care needs. Obviously much of the future burden of disease will be a reflection of the growing number of elderly persons. Another factor, however, is the expected years of unhealthy life. Mortality declines that are not accompanied by declines in chronic health problems will precipitate an expansion of morbidity (Crimmins, Hayward and Saito 1994). Morbidity and mortality trends, themselves, are strongly tied to trends in a population's education – a key indicator of a population's social capacity for low morbidity and mortality (Easterlin 1997; Hayward, Crimmins and Zhang In Press). Social capacity includes institutional and structural factors in a society as well individual health capital.

In this paper, we lay the initial groundwork for anticipating Indonesia's future burden of disease by developing a demographic model of Indonesia's population health. We develop this model within the analytic framework of a Markov-based multistate life table model. The multistate model is used to calculate an important indicator of the burden of disease, the expected years of active life of elderly Indonesians. In our study, active life expectancy refers to the years of expected life that a person can expect to spend free of major functional problems. We gain additional insights into future changes in disease burden by examining educational differences in active life. This exercise is informative of future trends in the sense that, as Indonesia's population achieves the educational attainment of the best educated in our study, overall trends in the burden of disease should begin to look like those of the most highly educated group (Hayward et al. In Press). In addition, we pay special attention to gender's association with active life.

Research on the Health Effects of Education and Gender in Indonesia

It is difficult to have well articulated hypotheses about how gender and education affect the morbidity and mortality experiences of elderly Indonesians due to the sparse nature of prior research. We are cautious about assuming that the these factors will be associated with morbidity and mortality in the same way that other research has documented for developed nations (Cambois, Robine and Hayward 2001; Crimmins, Hayward and Saito 1996; Crimmins and Saito 2001; Freedman and Martin 1999; Freedman, Martin and Schoeni 2002; Hayward et al. In Press; Robine and Romieu 1998; Robine, Romieu and Michel 2002). For example, in a study of economic well being of elderly Indonesians, Rudkin (1993) found that women were more disadvantaged in terms of work-income, remittances from children, and access to resources.

Low socioeconomic well being could lead to less access to health resources for elderly women compared to men, reducing women's traditional health advantages.

Education's effect on health for women is also more difficult to anticipate than that for men. In part, this ambiguity reflects the low proportion of elderly women having any formal education in Indonesia (only 33.5 percent). It also reflects the fact that some elderly women received informal education at home.

How well education reflects the social capacity for health in Indonesia compared to other countries is also not clear. Indonesia lags behind countries such as Thailand and Sri Lanka in terms of percent GDP spent on health yet elderly Indonesians report fewer ADL difficulties (Lamb and Myers 1999). Clearly, it is difficult to make strong inferences from a single study. Moreover, the study itself has limitations that argue for further research. One notable limitation is that the study is based on a sample from one province, Central Java, which ethnically and demographically is not representative.

Data and Methods

In this study, we examine the transition of functional status for elderly Indonesians using two waves of the Indonesian Family Life Survey (IFLS), 1993 and 1997. Although this survey was not created to study aging, it contains a sizable elderly sample and asked questions about health status, household economy, health care utilization, and health behaviors. Another advantage of this survey compared to others used in studies of elderly Indonesians is that it is representative of 83 percent of the Indonesian population. The sample of 55+ years is 2,775.

To measure health, we use three types of measures: Nagi, ADL, and IADLs. The Nagi measures assess a person's limitation of activities around and outside the home such as:

- To carry a heavy load (like a pail of water) for 20 meters
- To draw a pail of water from a well
- To bow, squat, kneel
- To walk for 5 kilometers

ADL and IADL measures assess functional imitation inside the home such as:

- To sweep the house floor or yard
- To dress without help
- To stand up from sitting position in a chair without help
- To go to the bathroom without help
- To stand up from sitting on the floor without help

Analysis Plan

We calculate two types of life table models to better understand the burden of disease among elderly Indonesians. First, we calculate population-based life tables that identify the expected years of active and inactive life for persons of a given age. Population-based tables are calculated separately by sex to evaluate differences in men's and women's burden of disease. We also calculate life tables for each educational group within sex. This allows us to evaluate

how educational achievement is associated with active life expectancy and how this varies for men and women.

The second set of life tables consists of status-based models. These models allow us to explicitly identify the implications of having a major health problem at a given age on active life expectancy. These tables are particularly useful in simulating the implications of postponing health problems for the burden of disease – a pattern that is likely to occur with increasing social capacity for health in Indonesia.

We adopt a two-state model to calculate active life expectancy. State 1, active, is defined as having no limitation in activities around and outside the home (Nagi measures) and no ADL/IADL limitations. "Inactive" is defined as having any Nagi and any ADL/IADL limitations. The model is bi-directional – people can decline and improve in health, and mortality is allowed to be state dependent.

At the current stage of our research, we have prepared the dataset and are estimating the models described above.

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