Migration Experience and Health Status in Indonesia
Life History Analysis using IFLS Data

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Abstract. In the last few decades, both temporary and permanent geographic mobility of Indonesian population has increased. Such a situation has not only demographic, but also social and economic implications. Health variation is one such major consequence. This study attempts to examine the link between migration experience and health status among adult, early old age and elderly people in Indonesia. Using the 1993 and 1997 Indonesian Family Life Survey (IFLS) data, a longitudinal socioeconomic and demographic survey containing extensive histories on one's life course including migration history and current health status, offers a possibility to perform a statistical analysis on the possible relationship between those two variables. Two health measures-- perceived general health status (GHS) and assessed activity of daily living (ADL)—were utilized in the analysis.

The results show that Indonesian migration experience is negatively associated with the health indicators. Statistically, this relationship is robust to the general health status/GHS but weak to ability status/ADL. This effect is strong among those who have frequently migrated (more than 3 or 4 times and beyond) with longer distance (i.e. inter-province or inter-country), across different environments (urban-rural or rural-urban), started to migrate earlier (before age 17) or later (after age 45), and last migration occurred recently (last 3-6 years). In the same time, this negative association could be reduced by health promoting factors such as no smoking behavior and an ideal body mass index (BMI) as well as by having higher educational attainment. As found in elsewhere, population in younger age (adult and early old age) is more likely to have better health status than their counterparts who are elderly. In addition, being currently married, working and residing in Java-Bali region have affected on increasing the health status of population.

Keywords: Migration, health status, adult and elderly, and Indonesia Family Life Survey (IFLS)

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1. Introduction

In recent years, there has been a marked increase in our understanding of the links between life experiences and health status especially health and well being in later life (e.g. Blane *et al*., 2004; Grundy and Holt, 2000). Some cross sectional studies have also revealed that individual's characteristics and their socioeconomic circumstances directly or indirectly influence their health behavior, including health status. Migration is closely linked to many events. Changes in the life course trajectories of education, work, and marital status, for example, may lead to a migration (residential move) when the individual require change in the daily activity space. In other words, individual's actions over life course, which includes migration, may determine the mean and capability they have accumulated, such as the health status. Therefore, it is sensible to see the link between migration and health status.

In studies of migration, a commonly stated of migration is that the expectation of being better off, especially in their economic perspective. It is no wonder, therefore, to believe that the migrants may expect improvements in their personal development and physical health as well as economic development. On the other hand, the migration process is sometimes stressful and even hazardous. For this reason, one's health status may also deteriorate after migrated. In short, migration and health are indeed interlinked in many ways, both triggering and conditioning components. Moreover, the adoption of a health perspective in the migration research can represent a substantial improvement over migration study's traditional approaches that are often based on distinction among the various types of population movement (Evans, 1987). This is because a health perspective treats population movement as a dynamic process by which individuals are related to specific locations by reasons of their participation in human networks.

In Indonesia and in many other developing countries, while research does exist on migration and health as separate phenomena, little has been done on the way that migration and health are interlinked. In the meantime, the availability of numerous data sets on population-related features in Indonesia has increased, particularly in the last two decades. The Indonesia Family Life Survey (IFLS) is one such example. The survey has been

conducted with a nationally representative sample and a set of broad themes. From such a survey offers the opportunity to examine migration and health. For that reason, the present study attempts to contribute to a better understanding the link between migration and health status in a life course framework, and in the context of a developing setting such as Indonesia.

The paper is organized as follows. The first section is the introduction and then next section briefly describes health developments and migration in Indonesia. Major theories on interactions between migration and health are presented in section three. Potential variables from the data sources and the methodology used are elaborated on section four. This section also describes the analysis of the data. The empirical results from the data are elaborated on section five. A discussion of the results and policy recommendations are presented in the concluding section of the paper.

2. Health Development and Migration in Indonesia: An overview

During the last three decades, Indonesia witnessed considerable demographic change with wide regional diversity. With 206 million people (ICBS, 2000) or about 3.5 percent of the global population, Indonesia is the fourth most populous country in the world after China, India, and the United States of America. Demographic transition is well underway in this country. The fertility rate (TFR) declined rapidly from 5.6 children per woman in the period 1967-1970 to 2.6 in the period 1997-2000. Similarly, the infant mortality rate (IMR) declined from 145 deaths per thousand live births in the period 1968-1971 to 46 by the period 1997-2000. Consequently, life expectancy (i.e. a summary measure of the overall health of population) improved substantially from 46 years in 1971 to 64.3 years in 1995.

Compared to the health development of neighbouring countries in Asia however, Indonesian health development is still quite low. For example, the Indonesian infant mortality and under-5 mortality rates, though lower than in previous years, still remained very high as shown in Table 1. In 2001, IMR in Indonesia was 33 per 1,000 live births, while in other Asian countries; the range was between 3 (for Singapore) and 30 (for Vietnam). One of the reasons for this is the prioritization of infrastructure and economic development over health in the nationsal development programs of Indonesia. Table 1

demonstrates that health expenditure in Indonesia (both percentage and nominal values) still remained very low, especially in terms of public/government health expenditure. During the period 1986 and 1998, for instance, the budget for the health sector declined from 0.70% in 1986 to 0.67% in 1988. The total government health expenditure per capita in 1998 was US$3 (Country Health Profile, WHO website).

----- *Table 1, about here* ----

As a matter of fact, the government of Indonesia has been very committed to the international program *Health for All* (HFA). It was a cosignatory at the UN conference in Alma Ata in 1979 and it launched a program called "*Healthy Indonesia 2010,*"[1] accordingly (Lieberman and Marzoeki 1999; Kurniawan 2002). Program implementation includes prioritizing Primary Health Care (PHC), expanding community activities and implementing large scale national health programs (e.g. the Nutrition Intervention Program that deals with major nutritional problems). More than a quarter million *posyandu* (*pos pelayanan terpadu*, integrated health post), monthly village gatherings to promote child and maternal health and nutrition, have been supported by health centres and hospitals. One concomitant outcome is the decline in infant mortality rates. However, other indicators such as maternal mortality and child nutritional status did not reflect any significant contribution of the HFA program.

Using the level of IMR[2] and the classification of mortality transition as discussed in Bourgeois-Pichat (1952) and D'Souza (1984),[3] Indonesia is already in the stage of intermediate rock (with IMR equal to 46 in 2000) in which infectious and parasitic

[1] The health policy was first launched as "Healthy Indonesia 2000". However, due to the economic crisis that hit Indonesia in 1997, many programs had been cancelled and postponed. In March 1999, the policy was changed into "Health Awareness Development Movement" as a national development strategy aimed at achieving Healthy Indonesia 2010 (Indonesian citizens will enjoy better health status in 2010).

[2] For developing countries such as Indonesia, where the data on adult mortality are difficult to be obtained, the infant mortality rate has been widely used as one of the indicators of mortality or epidemiological transition, as part of health transition.

[3] Bourgeois-Pichat (1952) distinguished two classes of infant mortality based on the causes of deaths, namely endogenous and exogenous. Later, this concept was translated by D'Souza (1984) into three broad classes. These are: 1. Infectious origin (*Soft Rock*) with IMR>100, 2. Non-infectious origin (*Hard Rock*), with IMR<30, and 3. Combination of infectious and non-infectious origin (*Intermediate Rock*), with IMR between 30 and 100.

diseases have not been eradicated but degenerative diseases, man-made diseases, and mental health disorders have emerged. This conclusion is supported by the findings from other studies (e.g. Djaja, Soemantri and Siregar, 1993; Suwandono *et* al., 1999). It reveals that Indonesia still has a double burden of diseases. The first is the "unfinished agenda" of communicable diseases among the young and the second is the "emerging agenda" of non-communicable diseases among the elderly as a result of the health transition. These characteristics of Indonesia's epidemiological transition however are not similar to that in the industrialized countries. As the transition progresses, death and disability among infants and children from communicable diseases tend to decline in importance relative to problems resulting from non-communicable conditions among the elderly. Although currently the cause of mortality in Indonesia does not mirror that in industrialized countries, it may do so at some not too distant point in the future (Suwandono *et* al., 1999). Some primary drivers of this phenomenon may be related to socioeconomic development, changing physical environments and the ecosystem itself.

In terms of population mobility or migration, Indonesian people have traditionally been in constant movement over time. Migration within and across the region has been both voluntary and involuntary. Some communities are well-known to be highly mobile ethnic groups, such as Minangkabau and Batak in Sumatra, Bugis and Makassarese in Sulawesi, Banjarese in Kalimantan, and Madurese in Java. Through transmigration policy which spanned nearly a century (1905-1999),[4] many Indonesian families who resided in densely settled regions (in particular Java and Bali) were resettled to regions with lower population density (i.e. islands of Sumatra, Kalimantan, Sulawesi, and Papua). Above and beyond this, because of Indonesia's geographic position between two continents (the Asian mainland and Australia) and two oceans (the Indian and Pacific), this archipelago has had numerous visitors over the centuries. Some remained and/or integrated with the local community while others continued on their way.

[4] Transmigration is the first type of inter-provincial and permanent migration in Indonesia. It began a long time ago in the colonial period in 1905 with the name of *Emigratie* and focused on resettlement for cultivation purposes. After independence in 1945, the government of Indonesia adopted the program that focused on resettling people from over populated regions to balance regional development and strengthen national defense and security (Tirtosudarmo, 2000).

According to the 1971 population census, around 5 percent of the total population lived in different provinces other than their places of birth. This figure increased to 10 percent based on the 1995 intercensal survey (ICBS, 1997b). Between the 1960s and mid-1980s, Java was the most favoured destination among other islands in Indonesia. This situation however shifted after the mid-1980s; the net out-migration from Java to other islands, between the periods 1970-1980 and 1980-1990, markedly declined from 137 percent to only 16 percent (Hugo, 1997). It has been argued that, particularly after the mid-1980s, the change reflected the increasing role of pull factors in Java and the decreasing role of the transmigration policy as a major push factor behind out-migration from Java (Tirtosudarmo, 2000). This trend may also be explained by socioeconomic and political changes, globalization processes, transportation and communication improvements, and the proliferation of migration networks.

Based on the concept of mobility transition[5] as discussed in Zelinsky (1971) and Skeldon (1990), Indonesia has entered the fourth phase of mobility transition (i.e. the late transitional society). This is characterized by massive rural to urban migration, with the largest cities as the targets. Short-circuited migration is centred on the intermediate cities. Mega-cities appear and the rural population starts to decline. National figures show that the rural population of Indonesia has declined in absolute terms. From 1971 to 2000, the percentage of the population living in urban areas rose from 17 percent to nearly 42 percent (see Table 2). The levels of population mobility vary strikingly at the regional level. Some regions are already in the relatively late stages of mobility transition, while others are still in the early stages. For example, Jakarta has emerged as one of the world's mega-cities and has showed characteristics of an early advanced society (*fifth phase*), which is indicated by a decrease in rural to urban movement and by urbanization reaching 50% or more. Table 2 shows that by the year 2000, five provinces in Indonesia had entered the fifth phase, with urbanization rates of 50 percent and over. These are Jakarta (100 percent), West Java (50 percent), Yogyakarta (58 percent), Bali (50 percent), and East

[5] The mobility transition reflects the condition of population mobility which is determined by some indicators, such as urbanization and circulation. It consists of seven phases: (1) pre-transitional, (2) early transitional, (3) intermediate transitional, (4) late transitional, (5) early advanced, (6) late advanced and (7) future super-advanced. For details see Skeldon (1990).

Kalimantan (50 percent). This stage is also indicated by rising commuting, especially among the male population.

At the same time, the urban labour market has continuously grown, especially in some big cities such as Jakarta (the capital city of Indonesia), Bandung and Surabaya and its adjacent peripheral areas where new industrial facilities are concentrated. Attractive job opportunities outside agriculture, coupled with widening rural-urban differentials in income, have prompted rural dwellers to start moving to urban areas in search of gainful employment.

----- *Table 2, about here* ----

In summary, migration in general and urbanization in particular, directly or indirectly, play a role on epidemiological and health transitions. Rapid urbanization and urban housing problems such as bad sanitation will quickly boost infectious diseases. Migrants may also encounter health risk in the process of migration. They may confront difficulties in dealing with health problems, such as the health care culture in the new environment (Shuval, 2001), which can, sooner or later reduce security in daily life as well as socioeconomic status (Sundquist, 2001). Thus, migrants may change the demographic and health characteristics of both the origin and destination locations, and even act as agents of disease transmission.

Moreover, there is a trend of health problems being related to changes in lifestyle, which are associated with changing food habits (such as consuming fast foods), reduced physical activity, and smoking behaviour. Problems associated with "over nutrition" and obesity is currently found among Indonesian population, particularly in the urban areas (Kurniawan, 2002). Regarding smoking, it was estimated that about 23% of the Indonesian population aged 15 and over were regular smokers in 1995. In short, health and migration are undoubtedly linked. It is the purpose of this paper to provide a better understanding of these connections.

3. Theoretical Framework

Evidences regarding the effect of migration on health are mixed. Migration can have negative and positive health consequences and it may even have no effect on the health

status of most people (flat relationship). These relationships have usually been investigated by acknowledging the type of migration (i.e. international, internal and residential) their interaction with each other as well as with other population parameters, such as the age/sex structure, sexual activity, fertility, mortality, and family structure (Evans, 1987).

Following a study in Findley (1988), there are at least four models of migration-health relation, namely: neutral, negative, positive, and dynamic relationships. The *neutral* relation may happen especially among migrants who are in good health and whose pre-migration lifestyles and networks are interrupted least as in the case of short distant moves. Selye (1956, in Findley 1988:10) states that the short residential movement will not involve a major change in social and economic environment, hence it has least effect of migration on subsequent health status (e.g. result in any stress).

The relation can also be *negative* once migration involves major changes. Among migrants, this negative relationship is likely for stressful moves, such as long distance moves and moving to greatly different environments or severe climates (Morgan and Kannisto, 1973; Velex 1982). Moves which are associated with downward economic mobility are also expected to increase the chance of health decline for the at-risk group population, such as infant and elderly with poor health.

A *positive* relation will more likely take place among migrants who are young age and have some or full support and resources during the process of migration. On the other hand, migrants (in particular elderly) who lack support and resources may be exposed to greater stress from migration. Hence, the later case would have *a negative* migration-health relation. In other words, the relation between migration and health can be an *interactive effect,* in which the covariates play a role in determining the relationship. This interactive relationship is determined by some explanatory variables, such as age, living arrangement, help in the home, and maintenance of social contacts. Age, in this case, is likely to be a key covariate.

The fourth model is *dynamic patterns* in the migration-health relationship. The most plausible pattern is a downward blip shortly after migration takes place, with a return to pre-migration health status six months or a year after migration when the migrant have had a chance to get re-established (McKinlay, 1975). Thus, an anticipated severe health

decline for the elderly may be a temporary after-effect of migration, and a later observation of health status would fail to show any difference in prior and post-migration health status despite intervening differences.

In relation to the health status and migration discussed above, it is also widely known that health is multidimensional. Health can be reflected in different ways and linked to many factors that include physical, mental, and social well-being, genotype and phenotype, as well as race, gender and place of residence. Using self-reported health status data from NHANES and IFLS,[6] a study from Thomas and Frankenberg (2002) demonstrates that health status indeed contains information about the respondent's own characteristics such as education, standard of living, interaction with the health system and beliefs or perceptions about good health.

In other words, migration experience as a variable of interest in this study is not a single factor in determining health status. A study on elderly health status from Kobrin and Hendershot (1977), for example, reveals that elderly married men living with their spouses usually have better health and lower mortality than men living alone. In this case, family and friends play a central role in assisting the elderly or those whose activities are limited. . Therefore, it is worthy to consider other factors that are related to the act of migration itself such as individual characteristics and socioeconomic circumstances. The theoretical framework discussed here is applied in this study, which will be further elaborated on in the next section on data and method.

4. Data and Method

4.1. Data sources

The present study utilizes the 1993 and 1997 Indonesia Family Life Survey (IFLS) data. The IFLS is an ongoing longitudinal survey of individual, households, families and communities in Indonesia. The IFLS dataset contain a wealth of information collected, including multiple indicators of socio-economic well being; health status; fertility;

[6] NHANES stands for National Health and Nutrition Examination Survey that has been conducted in the United States since 1950s and is now running on a continuing basis. IFLS stands for Indonesia Family Life Survey that has been conducted in Indonesia since 1993 on a panel basis every three years.

education, migration and labor outcomes; and family and social supports, income and generation transfers and living arrangement.

The IFLS-1 covers a sample of 33,079 individuals living in 7,224 households spread across 13 provinces, which encompass about 83% of the Indonesian population. Over 94% of the IFLS-1 households were successfully re-interviewed in the IFLS-2. About 3% of the base respondents had died at the time of follow up survey conducted. Though all individual were interviewed in IFLS-2, a sampling scheme was applied in IFLS-1 to randomly select several members (aged 15 years and older) within a household to provide detailed information on certain subjects. For example, information on migration history and health status was collected from 39% of the total sample (i.e. 12,990 out of 33,079 respondents). After merging the dataset of migration and health, information on about 12,985 individuals was available for the present analysis.

Table 3 shows the main characteristics of respondents by age groups that are taken into account in the analysis. The average age of the sample is 41.8 years with the greater composition (59%) consists of individuals in the age group 17 to 44. Around 31% of the respondents were in the age group 45 to 64, and the remaining was in the age group 65 and older. Overall, there were more females (55%) than males (45%) in the samples. Yet, the elderly samples consisted more males (54%). Those who were currently married represented 85% of the samples, which was higher among the age group 17 to 44 (91%) and was lowest among the elderly people (62%). Great majority of samples (97%) were living with their spouses, families or relatives, including among elderly population (88%). It demonstrates the fact that Indonesian family's support system is very strong.

As expected, the proportion of not working population was found higher among elderly people than their counterparts who were still in the working age group (i.e. aged 17-44 and 45-64). On the whole, about 64% of samples reported as active worker or searching a job at the base line survey while remaining 36% were not working. In terms of educational attainment, Indonesian younger cohort were more educated that the older cohort. About 89% of the samples age group 17 to 44 was graduated from primary school and higher, while it was about 65% and 46% among samples age group 45 to 64 and age group 65 and older, respectively. It is somehow related with the educational development

in Indonesia. The national program on obligatory primary education, which was designed to provide an education for every child aged seven and older, was just officially implemented in 1984.

Based on the urban residential at three different points in time (i.e. born, childhood and current residences), Table 3 shows that majority of samples resided in the rural circumstances. As Indonesian urbanization level has more advanced over the times, as discussed earlier in the previous section, it is no wonder that younger cohort population had greater proportion of residing at urban areas than the older cohort. For example, about 30% of the samples aged 17-44 was born in the urban setting areas, in comparison with 24% and 21% among the samples aged 45-64 and aged 65 and older, respectively. The same phenomenon was found in terms of childhood and current residences. Regarding residential change (migration), more than half of population (53%) had ever migrated at least once during their life time, which include the crossing border of inter-village, inter-district, and inter-province. Yet, the residential change's proportion is smaller among elderly (47%). With regard to regional dimension, more than half of total samples (63%) resided in Java and Bali region. Comparable to the level of urbanization in Java-Bali region, about half of them lived in urban areas and the remaining lived in rural areas.

----- *Table 3, about here* ----

4.2. Statistical Model

The aims of this study are to examine the adult and elderly health status by considering their migration experiences, and to look at changes in the relationship between migration and health in the periods of 1993 and 1997. In addition, the analysis takes into account individual's socioeconomic and demographic characteristics, which may be associated with health status. In order to see these relationships, we utilize both descriptive and statistical analysis. For statistical analysis, three different regression equations as follows are proposed:

$$\textit{Health 1993} = f(\text{Migration and characteristics up to 1993}) \quad (1)$$

$$\textit{Health 1997} = f(\text{Migration and characteristics up to 1997, Health93}) \quad (2)$$

Health transition 93/97 = *f*(Life course up to 97, Health 93) (3)

Based on the characteristic of dependent variable (i.e. health status outcomes), which is an ordinal measure (inherently *ordered*) and associated with higher and lower ranks, the ordered probit model is employed for Equations (1), (2) and (3). The model has form as follows:

$$y_i^* = x_i'\beta + \varepsilon_i \qquad \text{for } i = 1,\ldots, N$$

β = the coefficient of predictor variables

$$y_i = \begin{cases} 1 & if \quad y_i^* < \alpha_1 \\ 2 & if \quad \alpha_1 \le y_i^* < \alpha_2 \\ : & \\ J & if \quad \alpha_{J-1} \le y_i^* \end{cases}$$

where y_i is the rank of outcomes.

The probability of observed outcomes is then defined as below:

$$\Pr[y_i = j] = F(\alpha_j - x_i'\beta) - F(\alpha_{j-1} - x_i'\beta)$$

for all j , where $\alpha_0 = -\infty$ and $\alpha_J = +\infty$

The fit of the models were assessed from the deviation, i.e. the likelihood ratio/degree of freedom, and it should be≈1. We use STATA version 8.0 for statistical analyses.

4.2.1. Dependent variable

As a dependent variable in this study, ***health status*** includes the both perceived and assessed self-reported health statuses. These are *general health status* (GHS) and *activity* of *daily living* (ADL) index, respectively. The GHS was generated from the question: "In general, how is your health at this time?" It consists of four response categories: "very healthy", "somewhat healthy", "somewhat unhealthy" and "unhealthy". In this analysis, those who answered that their health status was "somewhat unhealthy" or "unhealthy" were reckoned to have a poor health status (unhealthy). The GHS measure is then ranked

into three point-scales corresponding to the categories of: (1) Unhealthy/poor, (2) Somewhat healthy/fair, and (3) Very healthy/good.

Applying a similar method as described comprehensively in Katz *et al*. (1963), the ADL index here was constructed by using nine questions that asked if the respondent could do (was capable of) certain daily activities. The respondents answered with three possibilities: "easily", "with difficulty", and "unable to do". The index permits classifying individuals according to adequacy of performance, which include three functions: (1) *mobility* (i.e. to walk 5 kilometers; to bow, squat, and kneel; to stand up from sitting in a chair or from sitting on the floor), (2) *personal care* (i.e. to dress and to go to the bathroom without help); and (3) *home occupation* (i.e. to carry a heavy load; to sweep; and to draw a pail of water). Each category of activities is scored on a 0-4 scale, with 0 signifying an individual who is unable to do all activities and 4 indicating easy to do everything. The ADL index summarizes over-all performance as a series of ranks as follows:

1 = Unable to do anything (mobility, personal care and home occupation)

2 = Have difficulty in doing all activities

3 = Not easy in doing two type of activities

4 = Not Easy in doing one type activities

5 = Easy in doing all activities (no disability)

The availability of information on health status at two points in times (i.e. base line survey 1993 and follow up 1997), allows us to asses further the *transition* in health. This transition variable is classified into five categories: (1) much worse, (2) worse, (3) stable, (4) better, and (5) much better.

4.2.2. Independent Variables

The independent variables were grouped into four categories: socioeconomic and background personal traits, regional dimension, health exposure, and migration experience. Table 4 summarizes operational definitions of all variables analyzed in this study. Several alternate coding and classification of these predictors variables were tread before adding at the group classified below.

Individual socioeconomic and background characteristics include age, sex, marital status, working status and educational attainment. Age at the survey time (i.e. 1993 for IFLS-1) was considered as continuous variable. Moreover, in order to see the effect of migration on health status at different age group, separate models were applied for three age groups: 17-44 (adult), 45-64 (later working age) and 65 years and beyond (elderly). For gender, female forms the reference. Marital status comprised three groups: never married, currently married, and ever married (including separate, divorce and widow/widower). Working status was defined as working and not working (as reference), which included unemployed, retired, student and housewives. Educational attainment at the time of survey was divided into four categories: no education, primary education, secondary education (i.e. junior and senior high school), and tertiary (higher) education.

Regional variable is based on the current residence (i.e. at the survey time). Considering the level of regional development in Indonesia, this variable is defined into three main regions, namely: urban areas in Java and Bali; urban areas in other regions; and the remaining is rural residence.

Health promotion factors and exposure risk are measured by two variables, body mass index (BMI) and smoking behavior. The index of BMI was constructed by dividing weight (kilograms) over height squared (meter^2). It comprises of under weight (BMI<18.5), normal weight (18.5<=BMI<25.0) and over weight (BMI>=25.0). The smoking behavior was determined by three "Yes" and "No" questions that asked if the respondent had habit of smoking a pipe, smoking self-rolled cigarettes, or smoking cigarettes/cigars. Those with one or more such habits were classified as smokers; either active smokers or ever smokers (had given up at the time of survey).

Migration experience is measured from two variables. First, we incorporate characteristics of lifetime migration. Second, we include characteristics of the last migration. Several variables are considered in characterizing the lifetime migration, these are (1) frequency, (2) age at first migration, and (3) direction. Migration frequency is measured as: never migrated, circular migrated and permanent migrated (for one, two, three, or four times and beyond). Age at first migration is divided into three groups, these are before working age (younger than 17 years), working age group (17-44 years), and late

working age and beyond (45+). The direction of migration was defined by comparing the place of birth and the current place of residence. It is indicated by one of four categories: urban to urban, urban to rural, rural to urban, and rural to rural. Meanwhile, the most recent (last) migration is characterized by a regional boundary (for measuring the distance) and its period (for measuring the duration). The type of regional boundary crossing was grouped into four categories: inter village; inter sub-district (*kecamatan*)*;* inter district (*kabupaten*); and inter province or country. The time period of last migration was defined into: recently (last four years, 1990-1993) and long time ago (last 5 years or beyond). Those who never migrated constituted the reference category.

----- *Table 4, about here* ----

5. Results and Findings

Over the life course, an individual may likely have several migration (spatial changes) and illnesses (health changes). Using IFLS data, we are able to obtain the information on individual's migration history but regrettably not for health history. Using health information provided at base line (1993) and its follow-up (1997) surveys, current health status and its transition can be measured. During these two points in time, respondent's health status had remained stable, improved, got worse or even died.

5.1. Migration Experience

In the IFLS data, residential change corresponds to permanent inter region migration, in which village is the smallest geographical unit of analysis. Figure 1 illustrates the distribution of migration experience among adult and elderly population in Indonesia. At baseline data, 53% of respondents had experienced at least one migration of inter-village. This proportion, however, declines to 41%, 27%, or even 12% once its regional boundary was changed into a greater unit of analysis (i.e. sub-district, district or province, respectively). Overall, male respondents had migrated more frequent than female respondent had. About 36% of male respondents had experienced migration two times or more and about 20% had migrated simply once during their life. These figures are around 27% and 24%, respectively, among female respondents. A similar situation is found at the

follow-up survey. About 531 respondents (4.1%) had moved to new residents (migrated) within the period 1993-1997, and some of base samples were reported dead (3.5%) and could not be traced (i.e. dropped from interview 10.8%).

--- Figure 1, about here –-

Regarding the age patterns of migration, Table 5 demonstrates that migration in Indonesia has a strong relationship with age. In general, older generation has migrated less frequent than the younger generation has. More than 55% adult respondents aged 17-44 had experienced migration at least once. This number was 46% for aged group 45-64 and 42% among elderly generations (65 and older). Additionally, the younger cohorts tend to migrate earlier than those older cohorts. The mean age at first migration, for example, was 19 years old among Indonesian younger cohort, while it was 23 and 28 years among early old and elderly population, respectively. Many reasons can be used here for the explanation. Among others are the development of transportation and communication in this country as well as the increase of migration networks (Muhidin, 2002). A study from Gooszen (1999) also demonstrates that chain migration (i.e. migration by a person who follows the track of former migrants) due to transmigration program conducted during the colonial period (i.e. before 1945) appeared among recent Indonesian migrants.

--- Table 5, about here ---

5.2. Health Status

Using general health status (GHS) and disability index (ADL) at two points in time (i.e. baseline 1993 and follow-up 1997), Figure 2 shows that the vast majority of respondents were having good and fair health condition (87%) as well as no disability (81%). Regarding gender difference, there is slightly appeared in GHS but it became visible in ADL. In 1993, around 88% and 87% males and females respondents, respectively, reported their health status (GHS) as good and fair. Meanwhile, male respondents have more proportion with no disability (87%) than female respondents have (77%). Four years later (at the follow-up survey), the composition had significantly changed especially

among female population. The good and fair health status was 71% (male) and 74% (female), and no disability was 65% (male) and 51% (female).

--- Figure 2, about here ---

Further illustrations on the transition of health status by sex and age group are shown in Figures 3a and 3b. Within a four-year period (1993 to 1997), most respondents self-reported to have same health status as their reported in 1993, while others had stated an improvement or deterioration, and even died. The age variable plays a significant role in the transition of both health indicators. Those who are younger (i.e. working age group, 17-44 years) tend to have stable and better health status. On the other hand, the elderly people are getting more fragile or even dead (as they are getting older). As mentioned above, sex difference is more evident in the transition of ability (ADL). Female and especially elderly were associated with inferior ability in doing daily activities. The social norm in Indonesian society, which commonly identifying female to be less strong than male (in physical activities), may contribute to this situation. In addition, the family's support system in Indonesian community is still very strong. It implies that children and the wider kindred may often fix responsibilities to older people. Nevertheless, not all older members are so lucky as to have these benefits.

--- Figures 3a and 3b, about here ---

5.3. Multivariate Analysis: Determinants of Health Status

This section describes the effects of some predictor variables on four outcomes of health status variables: the general health status (GHS), the activity daily living (ADL) index, the transition of health status, and mortality. Because the major concern in this analysis is the relation between migration and health status, in most the following discussion, we present only the regression coefficients of the migration terms. However, the influence of the background variables will be discussed briefly first. Detailed results for multivariate analyses are included in Appendix Tables.

Effect of background and regional characters tics

In the pool model (i.e. all age group included), the results demonstrate that general health status and ability is likely to be better among those who are in the younger age group, males, living in Java-Bali region, currently married, highly educated, and actively working. Interestingly, non married (single) respondents are also likely to have better health status in the period 1993, but not in the period 1997 or . It is due to the fact that those non married are highly contributed by the younger population, which are less likely to have inferior health status. Positive impacts on health status from the variable of residing in Java and Bali maybe highly related to the advance and relatively easier access to the health care system in those regions.

Overall, the same directions and magnitudes are found in the models by age groups. For the elderly age group (65 years and beyond), however, few values have changed its directions. For example, males are less likely to have better health status but they are more likely to have better ability. Being currently married or divorced/separated and widowed are less likely to have better health status.

Effect of health risk and exposure

In terms of the effect of health exposure, it is found that the impact of smoking behaviour on the health status and ability is essentially significant. Once smokers were divided into current smokers and former smokers, the impact of smoking was more significant among those who used to smoke. This is due to the fact that the profile of the active current smoker is dominated by younger people, while the older generation mainly comprise the group of former smokers. Regarding nutritional status (proxy by BMI), people who have normal BMI are more likely to have better health than those who do not have normal weight, in particular if they are under weight.

Effect of migration on health

The statistical analysis presented in Table 6 resulted from ***Model 1***, which was tested for responding to the health indicators (GHS and ADL) in 1993 and migration experience prior to 1993. Table 6a expresses the results for GHS93, while Table 6b portrays the

results for ADL93. The results show that the majority of the migration experiences have a negative impact to the health status, though it is bit unclear among the elderly population. One of many explanations is a memory recall problem that often be found among Indonesian elderly in remembering his/her migration history. While the impact on general health status (GHS) is significantly appeared, the impact on ability status (ADL) is somewhat not significant. It implies that the ability status here may not be sufficient enough to be explained by the migration experience.

The regression analyses reveal that those negative impacts are smaller for those who occasionally migrated (less frequent), migration occurred long time ago, and in very short distance (i.e. within or inter village). It may be due to the fact that those residential movements do not change considerably the social and economic environment of migrants. In other words, the greater change in social and economic environment between the origin and destination, the greater the effect of migration on subsequent health status. As discussed earlier, the aspect of migration that linked to changes in health status is stress related to the difficultly of becoming inserted into new residential, social, and economic networks.

---- *Tables 6A and 6B about here* ----

Table 7A and 7B expose the results from *Model 2*, which is using the health indicators GHS and ADL in 1997, respectively, as the dependent variable. Similar to the health status in 1993, the regression results here show that the migration experience has negative impacts on the health status in 1997. Nonetheless, these impacts are somewhat not statistically significant. Many reasons may be used to explain these results. Among others is the fact that *Model 2* here includes the 1993 health status in its dependent variables. Logically, the current health status of someone (says in 1997) is highly determined by his/her previous health status (says in 1993). Hence, the 1993 health status may wash out the significant effect of migration experience in *Model 2*. Another explanation may relate to the number of observation, which declines about 15% from 12,985 in IFLS-1993 to 10,988 in IFLS-1997.

---- *Tables 7A and 7B about here* ----

Effect of migration on health transition 1993-1997

In the beginning, *Model 3* was applied to investigate the link between migration and health transition during the period 1993-1997. However, the same unclear statistical results were produced, as appeared in *Model 2*. Hence, the descriptive analysis is applied for further explanation and elaboration. We use the characteristics of health status and migration experience at two points in time: base line (in 1993) and follow-up (1997). Three health status transitions are resulted. These are: 1. Health/ability did not change, 2. Health/ability improved, and 3. Health/ability deteriorated. All these groups are linked up with their migration experience prior to 1993 (i.e. Mig93) and during the period 1993-1997 (i.e. Mig97).

Tables 8A and 8B show that the *first group* (health/ability did not change) is dominated by younger age people, particularly if migration experience was taken into account. It is due to the fact that the younger persons have much lower incidence rate for health or ability change (especially decline in health or chronic condition) compares their counterparts of elderly have. Regarding the health change, as the time elapsed, the proportion of health deteriorated (*third group*) is higher than the proportion of health improved (*second group*). Since there is a higher probability of onset health and ability changes (declines) at older age, it is no wonder therefore if the big proportion is found among the elderly than in the non-elderly population. As explained detailed in the theoretical framework, the non-elderly people have either upward health transition or mixed. In the meantime, for elderly people, we found that they mostly have declined their health status. In other words, migration is triggered a deterioration in their health, or member of risk group; these are older and poorer health condition and ability.

---- *Tables 8A and 8B about here* ----

6. Conclusion

The analysis results in this paper confirm the links between migration experience and health status among Indonesian adult and elderly. Across a variety of general health status

(GHS) and ability status (ADL), it is found that migration experience tend to be negatively associated with health status. The relationship is robust to the general health status (GHS), while it is bit unclear to the ability status (ADL). Nonetheless, this conclusion was portrayed in a relatively short time period (i.e. 4 years, 1993 to 1997). Indeed, it is understood that the longer the period considered, the more diverse the conclusions that can be observed.

This negative relationship, however, has been reduced by having characteristics that promote health, such as not smoking and having good nutrition, normal BMI. The role of other social and economic aspects in improving the well-being of individual is also examined in this study. At least four regularities are found from this analysis. These are: (1) Age patterns are robust, reasonably regular and consistent with expectation. The younger generation is more likely to be healthier and have more experienced in migration. (2) Gender patterns favor males, female fare worse both in terms of general health status (GHS) and in terms of ability (ADL). (3) The absolute levels of health status among Indonesian urban resident (especially in Java Bali region) are somewhat higher than those who resided in rural setting areas and or in the outside of Java-Bali region. (4) Education and active work promote the health status. Our analysis, however, do not succeed in clarifying exactly which of several alternative mechanism account for the unexpected but observed age disparities. Thus, further analyses will be necessary done in order to answer these questions as population mobility or migration within and across this country would likely become an increasingly important issue in the 21st century.

Most importantly, this analysis offers important policy recommendations based on the finding that the health status is not exclusively determined by migrants' situation but also by their individual and familial circumstances. In other words, the promotion of health development should be continued to include all communities, regardless of their status as migrants or non-migrants families.

References

Bobadilla, J.L., Frenk, J., Lozano, R., Frejka, and Steren, C. 1993. The epidemiological transition and health priorities. In: D.T. Jamison, W.H. Mosley, A.R. Measham, and J.L. Bobadila (eds.). Disease control priorities in developing countries. New York: Oxford Medical Publications.

Bourgeois-Pichat, J. 1952. An analysis of infant mortality. *Population Bulletin of the United Nations*, no. 2, pp.1-14.

Blane, D., Higgs, P., Hyde, M., and Wiggins, R.D. 2004. Life course influences on quality of life in early old age. Social Science and Medicine, 58 (11): 2171-2180.

Central Bureau of Statistics of Indonesia. 1983. *Penduduk Indonesia: hasil sensus penduduk 1980* [Indonesian population, results of the 1980 population census], CBS, Jakarta.

CBS of Indonesia. 1997. *Penduduk Indonesia: hasil survey penduduk antar sensus* (SUPAS) 1995 [Indonesian population, results of the 1995 intercencal population survey], CBS, Jakarta.

CBS of Indonesia. 2000. *Penduduk Indonesia: hasil sensus penduduk 2000* [Indonesian population: results of the 2000 population census], Series RBL1.2. CBS, Jakarta.

CBS of Indonesia, NFPCB, MOH, and MI. 1998. Indonesia Demographic and Health Survey (IDHS) 1997. CBS and Macro Inc., Calverton, Maryland.

Christensen, P. 2004. The health-promoting family: a conceptual framework for future research, *Social Science and Medicine*, vol. 59, no.2, pp. 377-387.

Djaja, S., Soemantri, S., and Siregar, K.N. 1996. Pola penyakit sebab kematian di Jawa-Bali, Survai Kesehatan Rumah Tangga (SKRT) 1995 [Patterns of cause of death diseases in Java-Bali, the 1995 Household Health Survey]. Jakarta: Ministry of Health.

D'Souza, S. 1984. Measures of preventable deaths in developing countries: some methodological issues and approaches, Paper presented in *Seminar on Social and Biological Correlates in Mortality*, Tokyo, November 24-27.

Evans, J. 1987. Introduction: Migration and Health. International Migration Review, 21 (3): v-xiv, Special Issue: Migration and Health.

Findley, S. E. (1988). The directionality and Age Selectivity of the Health-Migration Relation: Evidence from Sequences of Disability and Mobility in the United States. International Migration Review, 22 (3): 4-29.

Grundy, E., and Holt, G. 2000. Adult life experiences and health in early old age in Great Britain. Social Science and Medicine, 51: 1061-1074.

Hugo, G. 1997. Changing patterns and process of population mobility. In: G.W. Jones and T.H. Hull (eds.). Indonesia assessment: population and human resources. Singapore: ISEAS.

Kurniawan, A. 2002. Policies in alleviating micronutrient deficiencies: Indonesia's experience. Asia Pacific Journal of Clinic Nutrition, 11(3): S360-S370.

Lee, E. 1966. A Theory of Migration. Demography, 6:47-57.

Lieberman, S.S. and Marzoeki, P. 1999. Health strategy in a post-crisis, decentralizing Indonesia. Monograph to the World Bank Office, Jakarta.

Muhidin, S. 2002. The Population of Indonesia. Regional Demographic Scenarios Using a Multiregional Method and Multiple Data Sources. Amsterdam: Rozenberg Publishers.

Shuval, J. 2001. Migration, Health and Stress, in William C. Cockerham (eds). The Blackwell companion to medical sociology, Oxford, UK. Malden, Mass., USA. Blackwell, pp.126-143.

Skeldon, R. 1990. Population Mobility in Developing Countries: a Reinterpretation. London, New York: Belhaven Press.

Stark, O. 1991. The Migration of Labour. Cambridge: Basil Blackwell.

Sundquist, J. 2001. Migration, Equality and Access to Healthcare Service. Journal of Epidemiology and Community Health, 55:691.

Suwandono, A., Soemantri, S., Siregar, K. N., and Djaja, S. 1999. Pola morbiditas dan perubahan pola mortalitas di Indonesia. Berdasarkan Survai Kesehatan Rumah Tangga [Morbidity pattern and the changes of mortality pattern in Indonesia. Based on the National Household Health Survey]. National Household Health Survey Series No. 17. Jakarta: Department of Research and Development, Ministry of Health.

Thomas, D., and Frankenberg, E. 2002. The measurement and interpretation of health in social surveys. In: C.J.L. Murray, J.A. Solomon, C.D. Mathers and A.D. Lopez (Eds.). *Summary measures of population health: Concepts, ethics, measurement and application,*

p:387-420. Geneva: World Health Organization.

Tirtosudarmo, R. 2000. Population mobility and ethnic conflict: the aftermath of economic crisis in Indonesia. Paper presented at the Workshop on the socioeconomic situation during the economic crisis in Indonesia. Singapore, 30 May – 1 June 2000.

Zelinsky, W. 1971. The hypothesis of the mobility transition. Geographical Review, 61: 219-249.

Zelinsky, W. 1979. The demographic transition: Changing patterns of migration. In: IUUSP. Population science in the service of mankind. Liège: Ordina.

Table 1. Infant and Under-5 Mortality Rates for Selected Asian Countries in 2001

Country	**Infant Mortality Rate**	**Under-5 Mortality Rate**	**Health Expenditure**	
			% of GNP (Public / Private)	US$ (per capita)
Brunei Darussalam	6.0	6.0	2.5 & 0.6	638
Indonesia	33.0	45.0	0.6 & 1.8	77
Malaysia	8.0	8.0	2.1 & 1.8	345
Philippines	29.0	38.0	1.5 & 1.8	169
Singapore	3.0	4.0	1.3 & 2.6	993
Thailand	24.0	28.0	2.1 & 1.6	254
Viet Nam	30.0	39.0	1.5 & 3.7	134

Source: Human Development Report 2002, UNDP

Table 2. Percentage of Urban Population in Indonesia by Province: 1980-2000

Province	Year			
	1980	**1990**	**1995**	**2000**
Sumatra				
Aceh	8.94	15.81	20.54	23.60
North Sumatera	25.45	35.48	41.09	42.40
West Sumatera	12.71	20.22	25.06	29.00
Riau	27.12	31.67	34.36	43.70
Jambi	12.65	21.41	27.16	28.30
South Sumatera	27.37	29.34	30.31	34.40
Bengkulu	9.43	20.37	25.71	29.40
Lampung	12.47	12.44	15.71	21.00
Java				
Jakarta	93.36	99.62	**100.0**	**100.0**
West Java	21.02	34.51	42.69	**50.30**
Central Java	18.74	26.98	31.90	40.40
Yogyakarta	22.08	44.42	**58.05**	**57.70**
East Java	19.60	27.43	32.06	40.90
Bali and Nusa Tenggara				
Bali	14.71	26.43	34.31	**49.80**
West Nusa Tenggara	14.07	17.12	18.85	34.80
East Nusa Tenggara	7.51	11.39	13.88	15.90
Kalimantan				
West Kalimantan	16.77	19.96	21.66	25.10
Central Kalimantan	10.30	17.56	22.47	27.50
South Kalimantan	21.35	27.06	29.96	36.30
East Kalimantan	39.84	48.78	**50.22**	**57.60**
Sulawesi				
North Sulawesi	16.76	22.78	26.28	37.00
Central Sulawesi	8.95	16.43	21.87	19.70
South Sulawesi	18.08	24.53	28.27	29.40
Southeast Sulawesi	9.34	17.02	22.38	25.50
Maluku & Papua				
Maluku	10.84	18.97	24.57	25.90
Papua (Irian Jaya)	20.22	23.97	25.76	22.20
Indonesia	22.27	30.90	35.91	42.00

Sources: The 1980, 1990 and 2000 population censuses and the 1995 intercensal population survey.

Table 3. Percentage distribution of samples at baseline survey (IFLS1993)

No.	*Characteristics*	*Age at baseline survey*			
		17-44	***45-64***	***65+***	***All****
	Sample (N)	7,703	4,020	1,088	12,985
	(% row)	(59.3)	(31.0)	(8.4)	(100.0)
	Median age	32.3	53.3	70.6	41.8
1.	**Sex**				
	Male	42.3	47.1	53.6	44.8
	Female	57.7	52.9	46.4	55.2
2.	**Marital status**				
	Never married	6.2	0.8	0.6	5.2
	Currently married	91.2	82.9	62.0	85.1
	Ever married	2.7	16.3	37.4	9.8
3.	**Living arrangement**				
	Alone	2.0	3.5	11.8	3.3
	With family/relative	98.0	96.5	88.2	96.7
4.	**Working status**				
	Not working	35.3	31.8	50.5	36.0
	Working/search a job	64.7	68.2	49.5	64.0
5.	**Educational attainment**				
	No education	11.0	34.8	54.1	21.8
	Primary	53.1	45.9	38.1	49.3
	Secondary	30.8	16.3	7.1	24.8
	Tertiary	5.2	3.0	0.7	4.1
6.	**Urban residence**				
	Birth's residence (age 0)	30.1	23.5	21.3	27.4
	Childhood (age 12)	31.5	25.7	22.6	29.0
	Current age (survey time)	48.7	44.4	41.4	46.7
7.	**Change residence**				
	At least once migrated	55.3	52.7	47.7	53.4
8.	**Current residence**				
	Java-Bali (urban)	33.8	31.6	30.8	32.8
	Java-Bali (rural)	28.0	33.5	37.9	30.5

Note: *Total respondents included respondents aged 17 and younger (i.e. N=174; 1.3%). Yet, this sample was excluded in the statistical analysis.

Table 4. Operational definitions of variables considered for the analysis of migration and health in Indonesia

Variables	***Operational Definition***
Dependent variable	
Health status 93 & 97	General Health Status (GHS) 1=Poor health; 2 = Fair health, and 3= Good health Disability status (ADL Index) 1=Disable, 2, 3, 4= with some disable, 5=No disable
Health transition (93-97)	1= Much worse, 2=worse, 3=stable, 4=better, 5=much better
Independent variables	
Basic characteristics	
1. Age	Individual's age in 1993, at the time of survey IFLS-1 conducted, including adult (17-44), early old age (45-64), and elderly (65+)
2. Sex	Male = 1 and Female = 0 (as reference)
3. Marital status	Never married, currently married, and ever married (as reference)
4. Working status	Currently working and not working (as reference)
5. Educational attainment	No education (as reference), basic school, junior high school, senior high school, and college/university degree.
6. Current region	Urban areas in Java-Bali, urban areas in other regions, and rural areas (as reference.
Health exposure	
1. Body Mass Index (BMI)	Under weight (BMI<18.5), Over weight (>=25.0), and Normal weight (18.5 <=BMI<25.0) as a reference
2. Smoking behavior	Has smoking behavior (former and current/active) and not having smoking behavior (reference).
Migration experience	
1. Migration status	Never migrated (0, as reference), circular migrated, once migrated (1 time), twice (2 times), thrice (3 times) and four times or more (4+).
2. Lifetime migration	Comparing place of birth and current residence: Urban-Urban, Urban-Rural, Rural-Urban, and Rural-Rural, (non migrant as reference)
3. Age at first migration	Pre working age (<17 years), working age (17-44), and old age (45+)
4. Last migration	
- Time/period	Recently (last three years) and long time ago (3-6 years, 7-9 years and 10 years or beyond).
- Distant	Inter village, inter sub-district, inter district and inter-province or beyond (no migrated as reference).

Table 5. Distribution of samples by migration experience at baseline survey

Characteristics	***Age at base line survey (1993)***			***Total****
	17-44 (n=7,703)	**45-64** (n=4,020)	**65+** (n=1,088)	(n=12,811)
Migration experience				
0 (never migrated)	44.7	47.3	52.3	46.2
1 time	23.6	20.8	21.1	22.6
2 times	16.0	16.0	12.6	15.7
3 times and more	15.6	15.9	14.0	15.6
Age 1st migration (mean)	(19.3 year)	(23.1 year)	(28.4 year)	(21.1 year)
< 15 years	18.2	16.5	10.2	17.4
15 – 24 years	64.0	46.6	36.2	56.5
25 years +	16.6	34.5	47.2	24.2

Notes: * Total population excluded the samples aged below 17 years.

Table 6.A. Regression analysis: Effects of migration on general health status at base line survey (1993)

Migration Experience	*General Health Status (GHS) 1993*			
	All Sample	*Age group*		
		17-44	**45-64**	**65+**
1. Migration status				
Circular migrated	0.047	-0.009	0.069	0.265 *
Once migrated	-0.013	-0.038	-0.003	0.052
2 times migrated	-0.102 **	-0.153 **	-0.048	-0.016
3 times migrated	-0.085	-0.152 *	-0.044	0.274
4 times+ migrated	-0.165 ***	-0.179 **	-0.198 *	-0.034
2. Stream of lifetime mig.				
Urban-Urban	0.057	0.001	0.163 *	0.164
Urban-Rural	-0.283 ***	-0.321 ***	-0.384 *	0.216
Rural-Urban	-0.001	-0.007	0.023	0.015
Rural-Rural	-0.150 ***	-0.162 ***	-0.156 **	-0.116
3. Age at first migration				
< 17 years old	-0.113 ***	-0.134 **	-0.083	-0.062
17-44 years	-0.059 *	-0.079 *	-0.059	0.025
45+ years	-0.155 *		-0.079	-0.082
4. Duration since last mig.				
< 3 years ago	-0.156 ***	-0.163 ***	-0.035	0.186
4-6 years ago	-0.099 *	-0.081	-0.154	-0.046
7-9 years ago	-0.113 *	-0.067	-0.234 *	-0.577 *
10+ years ago	-0.042	-0.077	-0.047	0.001
5. Distant of last migration				
Inter-village	-0.017	0.002	-0.061	-0.025
Inter-sub district	-0.055	-0.127 **	0.020	0.134
Inter-district	-0.070 *	-0.063	-0.075	-0.126
Inter-province/country	-0.195 ***	-0.216 ***	-0.189 **	-0.094

Notes: Significant levels *** ($p<0.001$), ** ($p<0.01$) and * ($p<0.05$).

Table 6.B. Regression analysis: Effects of migration on ability status at base line survey (1993)

Migration Experience	*ADL Index 1993*			
	All	*Age group*		
	Sample	**17-44**	**45-64**	**65+**
1. Migration status				
Circular migrated	-0.050	-0.091	-0.058	0.072
Once migrated	0.006	0.032	-0.054	0.079
2 times migrated	-0.027	-0.032	-0.064	0.035
3 times migrated	-0.118 *	-0.194 *	-0.125	0.237
4 times+ migrated	-0.113 *	-0.209 **	-0.038	-0.077
2. Stream of lifetime mig.				
Urban-Urban	0.020	-0.001	0.033	0.077
Urban-Rural	-0.018	-0.083	0.034	0.228
Rural-Urban	0.017	0.013	0.038	-0.022
Rural-Rural	-0.044	-0.023	-0.108	0.049
3. Age at first migration				
< 17 years old	-0.047	-0.071	0.003	-0.069
17-44 years	-0.003	0.017	-0.057	0.046
45+ years	-0.110		-0.151	0.002
4. Duration since last mig.				
< 3 years ago	-0.131 *	-0.086	-0.037	0.245
4-6 years ago	-0.100	-0.080	-0.040	0.329
7-9 years ago	0.088	0.232 **	-0.146	-0.394
10+ years ago	0.014	-0.014	-0.033	0.041
5. Distant of last migration				
Inter-village	0.000	0.043	-0.053	0.056
Inter-sub district	-0.049	-0.067	-0.047	-0.004
Inter-district	0.019	0.011	0.019	0.039
Inter-province/country	-0.037	-0.041	-0.102	0.083

Notes: Significant levels *** ($p<0.001$), ** ($p<0.01$) and * ($p<0.05$).

Table 7.A. Regression analysis: Effects of migration on general health status at follow-up survey (1997)

Migration Experience	*General Health Status (GHS) 1997*			
	All Sample	*Age group*		
		17-44	**45-64**	**65+**
1. Migration status				
Circular migrated	0.017	-0.013	0.071	-0.025
Once migrated	0.041	0.027	0.049	0.146
2 times migrated	0.013	-0.013	0.028	0.176
3 times migrated	-0.072	-0.122	0.006	0.026
4 times+ migrated	-0.050	-0.089	0.057	-0.193
2. Stream of lifetime mig.				
Urban-Urban				
Urban-Rural	0.050	0.039	0.073	0.122
Rural-Urban	-0.025	-0.041	-0.025	0.262
Rural-Rural	-0.016	-0.114 *	0.168 *	0.110
3. Age at first migration				
< 17 years old	-0.053	-0.057	-0.041	-0.023
17-44 years	0.026	0.016	0.038	0.063
45+ years	-0.007		0.005	0.257
4. Duration since last mig.				
< 3 years ago				
4-6 years ago	-0.073	-0.093	-0.037	0.166
7-9 years ago	-0.045	-0.064	0.115	-0.039
10+ years ago	0.034	0.048	0.011	0.114
5. Distant of last migration				
Inter-village	0.060	0.052	0.045	0.218
Inter-sub district	0.014	-0.011	0.083	-0.093
Inter-district	0.010	-0.016	0.013	0.298
Inter-province/country	-0.087 *	-0.076	-0.113	-0.019

Notes: Significant levels *** (p<0.001), ** (p<0.01) and * (p<0.05).

Table 7.B. Regression analysis: Effects of migration on ability status at follow-up survey (1997)

Migration Experience	*ADL Index 1997*			
	All Sample	*Age group*		
		17-44	**45-64**	**65+**
1. Migration status				
Circular migrated	-0.093 *	-0.108 *	-0.064	-0.197
Once migrated	-0.026	-0.018	-0.026	-0.081
2 times migrated	-0.022	-0.009	-0.046	-0.079
3 times migrated	-0.030	0.018	-0.123	-0.167
4 times+ migrated	-0.048	-0.119	-0.032	0.097
2. Stream of lifetime mig.				
Urban-Urban	-0.056	-0.017	-0.115	-0.055
Urban-Rural	-0.100	-0.128	-0.072	-0.033
Rural-Urban	0.087	0.103	0.071	-0.036
Rural-Rural	-0.006	0.005	-0.032	0.011
3. Age at first migration				
< 17 years old	-0.048	-0.013	-0.081	-0.147
17-44 years	0.019	0.029	-0.013	-0.018
45+ years	0.037		0.024	0.192
4. Duration since last mig.				
< 3 years ago	0.000	0.000	0.000	0.000
4-6 years ago	0.001	0.023	0.149	0.393
7-9 years ago	-0.029	-0.007	-0.009	0.188
10+ years ago	0.009	0.023	-0.034	-0.040
5. Distant of last migration				
Inter-village	-0.004	0.038	-0.046	-0.077
Inter-sub district	-0.015	-0.008	-0.028	-0.111
Inter-district	-0.002	0.000	-0.017	0.005
Inter-province/country	0.042	0.039	0.011	0.169

*Note*s: Significant levels *** ($p<0.001$), ** ($p<0.01$) and * ($p<0.05$).

Table 8A. Interaction between migration and transition of health status (GHS)

General Health Status (GHS)	***Age at baseline survey (1993)***			***Total***
	17-44	***45-64***	***65+***	
1. Health no changed				
No migration **(1.a)**	**1931**	**1104**	**246**	**3281**
	(29.13)	(31.58)	(32.97)	(30.18)
Any Migration				
Mig93=0, Mig97=1	60	19	5	84
Mig93=1, Mig97=0	2304	1148	216	3668
Mig93=1, Mig97=1	54	22	5	81
Total (1.b)	**2418**	**1189**	**226**	**3883**
	(36.47)	(34.01)	(30.29)	(35.26)
2. Health improved				
No migration **(2.a)**	**376**	**195**	**57**	**628**
	(5.67)	(5.58)	(7.64)	(5.78)
Any Migration				
Mig93=0,Mig97=1	11	0	0	11
Mig93=1,Mig97=0	429	221	45	695
Mig93=1,Mig97=1	9	2	1	12
Total (2.b)	**449**	**223**	**46**	**718**
	(6.77)	(6.38)	(6.17)	(6.60)
3. Health deteriorated				
No migration **(3.a)**	**716**	**397**	**98**	**1211**
	(10.80)	(11.36)	(13.14)	(11.14)
Any migration				
Mig93=0,Mig97=1	21	2	2	25
Mig93=1,Mig97=0	696	381	69	1146
Mig93=1,Mig97=1	22	5	2	29
Total (3.b)	**739**	**388**	**73**	**1200**
	(11.15)	(11.10)	(9.79)	(11.04)
Total (1+2+3)	**6629**	**3496**	**746**	**10871**
	(100.0)	(100.0)	(100.0)	(100.0)

Notes: The health status transition here is not including died in 1997.
Value in parentheses ( ) is percentage in column
Mig93=1 means there is any migration prior to 1993
Mig97=1 means there is any migration between 1993 and 1997

Table 8B. Interaction between migration and transition of ability status (ADL)

Activity of Daily Living (ADL)	***Age at baseline survey (1993)***			***Total***
	17-44	***45-64***	***65+***	
1. Ability no changed				
No migration **(1.a)**	**2262**	**901**	**178**	**3341**
	(34.13)	(25.77)	(23.86)	(30.74)
Any Migration				
Mig93=0, Mig97=1	75	17	3	95
Mig93=1, Mig97=0	2559	1026	157	3742
Mig93=1, Mig97=1	63	15	2	80
Total (1.b)	**2697**	**1058**	**162**	**3917**
	(40.69)	(30.26)	(21.72)	(36.04)
2. Ability improved				
No migration (**2.a**)	**211**	**160**	**39**	**410**
	(3.18)	(4.58)	(5.23)	(3.77)
Any Migration				
Mig93=0, Mig97=1	5	0	0	5
Mig93=1, Mig97=0	260	146	30	436
Mig93=1, Mig97=1	5	5	1	11
Total (2.b)	**270**	**151**	**31**	**452**
	(4.07)	(4.32)	(4.16)	(4.16)
3. Ability deteriorated				
No migration (**3.a**)	**549**	**635**	**184**	**1368**
	(8.28)	(18.16)	(24.66)	(12.59)
Any migration				
Mig93=0, Mig97=1	12	4	4	20
Mig93=1, Mig97=0	609	578	143	1330
Mig93=1, Mig97=1	17	9	5	31
Total (3.b)	**638**	**591**	**152**	**1381**
	(9.63)	(16.91)	(20.38)	(12.71)
Total (1+2+3)	**6627**	**3496**	**746**	**10869**
	(100.0)	(100.0)	(100.0)	(100.0)

Notes: *Notes*: The health status transition here is not including died in 1997.
Value in parentheses ( ) is percentage in column.
Mig93=1 means there is any migration prior to 1993
Mig97=1 means there is any migration between 1993 and 1997

Figure 1. Distribution of migration experience at baseline and follow up (IFLS 1993 and 1997)

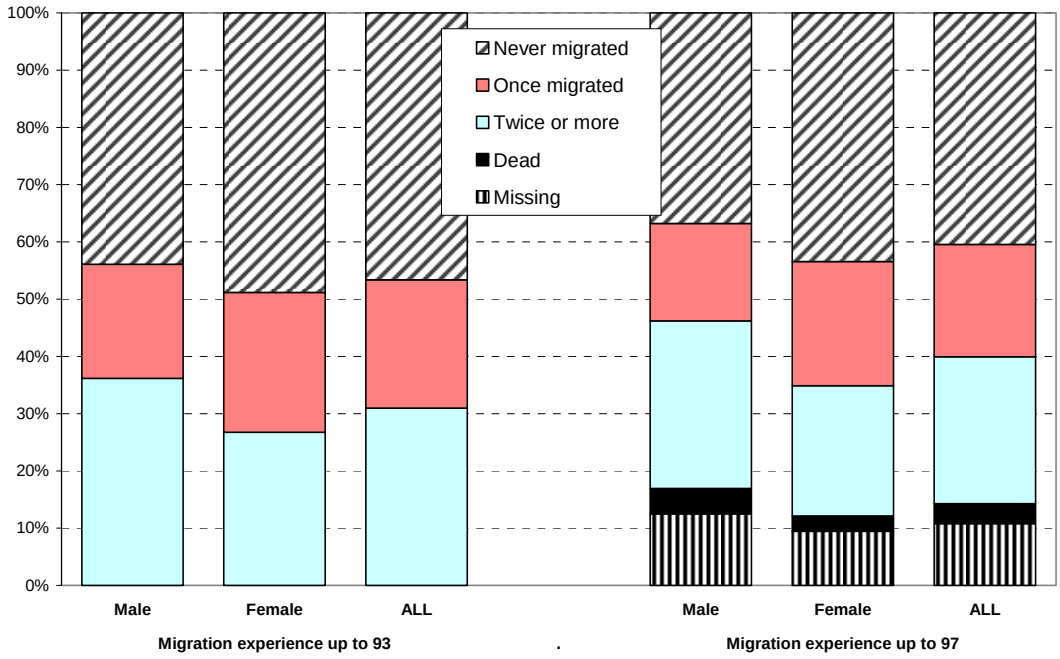

Figure 2. Distribution of health and disability status at baseline and follow up (IFLS 1993 and 1997)

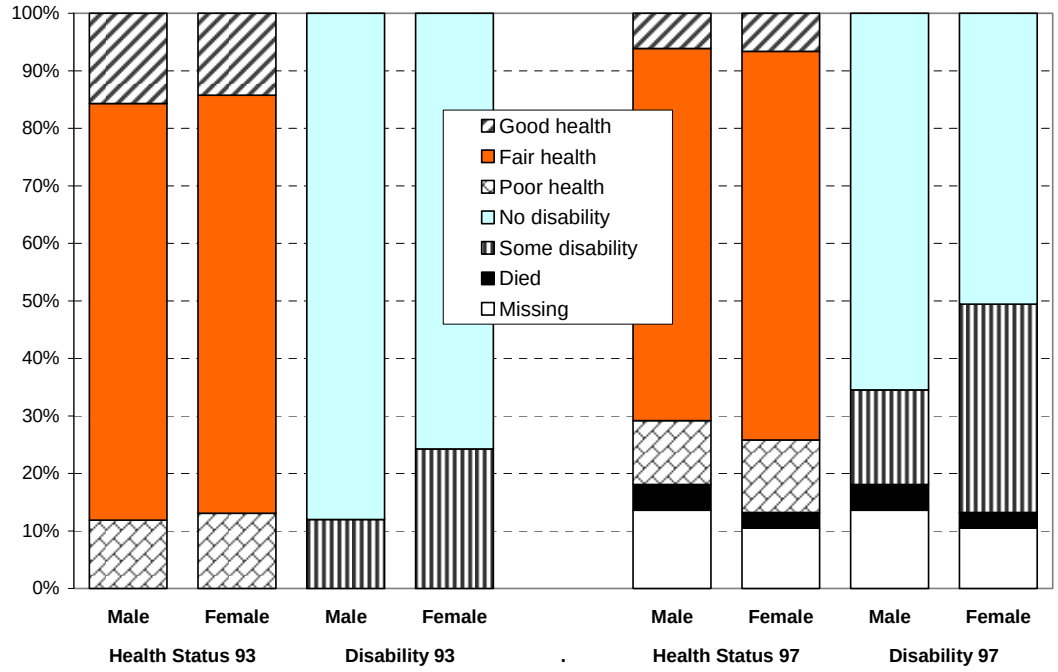

Figure 3A. Transition of General Health Status (GHS) by Sex and Age Group: Period 1993-1997 (IFLS Data)

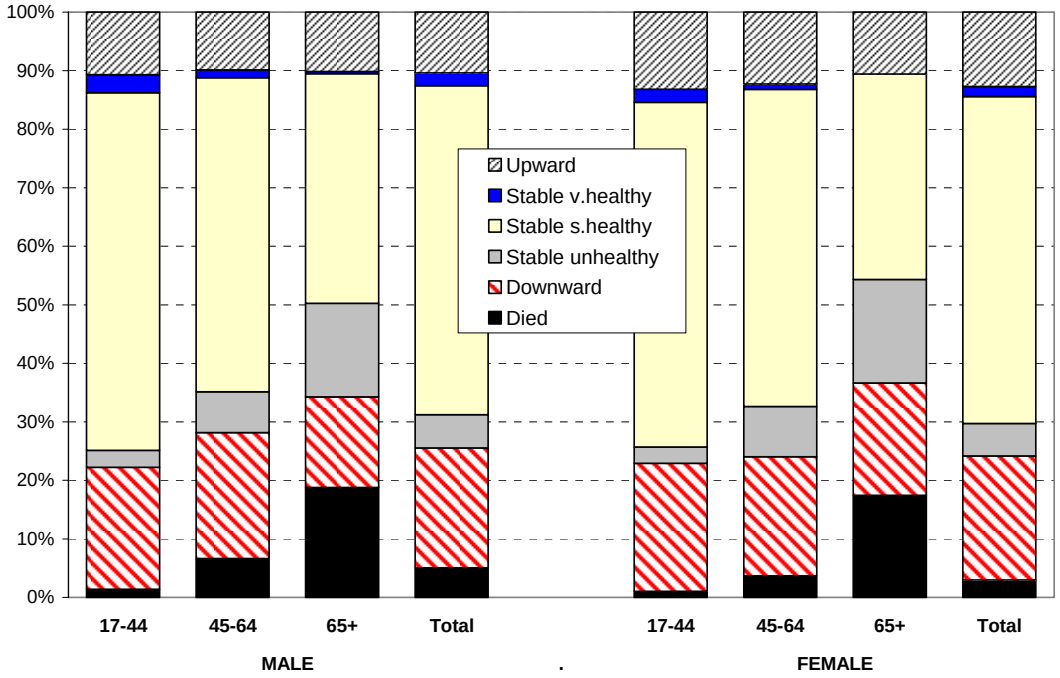

Figure 3B. Transition of Activity Daily Living (ADL) Index by Sex and Age Group Period 1993-1997 (IFLS Data)