Migration and Later Life Health

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Abstract

Using a uniquely detailed decade-long panel data from a migrant sending setting of the South Asia, this study investigates long term consequences of migration on health - self-reported health and physical functionality. We developed a theoretical framework to explain how migration experience is likely to influence later life health. To test the influence of migration experience on later life health we used multiple data sets featuring detail migration histories and health measures from Chitwan Valley Family Study (CVFS) Nepal. Results of our multi-level multivariate analysis suggest that the number of years of migration experience adversely influence –self-rated health as well as physical functionality. These intriguing results provide important feedback to the policy makers from migrant sending settings grappling with rapid population aging and old age security with eroding historical family norms, values and old age care system.

Introduction

World population is more mobile today than at any point in human history. The population mobility does not only constitute the visitors making short trips for leisure and vacation but also migrants who live for extended period of time outside of their home country. In 2013, 232 million people (3.2 percent of world population) were international migrants (UN Press Release 2013). South Asians were among the largest group of international migrants (36 million in 2013) living outside their home country. In addition, domestic migrants constitute a significant proportion of the world's population. In 2010, 11 percent of the total population moved internally (UNDESA 2010). This mobility is particularly associated with moves from poor agricultural settings to rapidly growing urban areas or industrialized countries.

This unprecedented demographic phenomena has received much attention both in academia and policy arena, resulting into large number of studies, including some very prominent ones (the Mexican Migration Project, the Latin American Migration Project, the Nang Rong Project in Thailand, and other), around the world. These studies have made tremendous advancement in our understanding of (1) predictors of migratory behavior often described in *push-pull* framework, (2) economic consequences to sending communities through cash remittance and loss of labor, (3) immediate and short term health consequences such as transmission of sexually transmitted diseases and HIV/Aids, (4) social consequences for left behind women and children (women's role and autonomy and children's achievement), and lately on what is called *"social remittance"* (change in migrant's values, belief, and skills).

However, except few exceptions (McDonald, and Kennedy, 2004; Zhao, 1999; Lassetter and Callister, 2008; Lu, 2010*)*, little attention has been given to the long term

consequences of individuals' migration experience on their later life health. Moreover, the existing studies on migration and health face the difficulties of choosing the proper comparison group thus posing a potential selection bias (Lu, 2010). Lu reports that previous studies compared migrants and the population of destination thus posing a selectivity bias. This paper takes step towards bridging this gap in the literature using the relevant data. We argue that individual migration experience is likely to have important consequence on later life health potentially through three mechanisms - economic, geophysical, and sociological.

We take special advantage of a natural social laboratory setting, study design and measurement - Chitwan Valley Family Study (CVFS) to investigate the influence of long term influence of migration experience on health. CVFS, a 18-year panel study of communities, households and individuals features migration histories collected retrospectively using a Life History Calendar and prospectively in household registration system provides uniquely detail measures of migration experiences. Moreover, Chitwan Valley, a dense tropical forest with no human settlement opened for settlement in 1950s is not only a melting point for highly diverse Nepali population but also now turned into major migrant sending setting. The individual migration histories supplemented with measures of self-rated health and physical functionality along with repeated panel measures of household economy and consumption, and community change collected using a Neighborhood History Calendar (NHC) provides unique resources and opportunity to investigate and advance our understanding of long term consequences of a demographic phenomenon of the century.

The findings of this study will be of greatest interest to a wide range of audience. First, the findings about long term consequence of migration would be of utmost

importance to the individuals from poor agricultural migrant sending settings lured by the glorifying stories of the economic prospects in the urbanized areas or industrialized countries. Second, the findings from the study will be equally important to policy makers grappling with the skyrocketing medical expenses, rapid population aging and old age security with eroding historical family norms, values and old age care system. Finally, it is our hope that to address the data limitation we faced with, particularly lack of pre-migration measures of health the findings of this study will be of great interest to scholars and will entice new studies with panel measurement of health and advance the area of science.

Theoretical Framework

Migration probably one of the most studied subjects in social demography, resulting into large number of studies, including some very prominent ones (the Mexican Migration Project, the Latin American Migration Project, the Nang Rong Project in Thailand, Migration between Africa and Europe (MAFE) project and others), around the world. Because migratory behaviors have important influence on and are influenced by many other life experiences migration is studied both as substantively and from methodological perspective across many disciplines − sociology, demography, economics, environment, and political science.

Contemporary social scientists have developed and extensively employed several theoretical and conceptual frameworks (*push-pull, new economics, labor loss hypothesis*) both to identify the determinants of migration process and explain the consequences for both sending and receiving countries, communities, households and individuals. These frameworks and models have been highly successful in advancing our understanding of

1) predictors of migratory behaviors, (2) economic consequences to sending communities through cash remittance and loss of labor, (3) short term health consequences such as transmission of sexually transmitted diseases and HIV/Aids, (4) social consequences for left behind women and children (women's role and autonomy and children's achievement), and lately on what is called "*social remittance*" (change in migrant's values, belief, and skills). Despite appealing theoretical and practical reasons, however the research literature on long term consequences of migration, particularly on health is skimpy.

To fill the gap in the literature we develop a theoretical framework for our investigation of long term consequences of migration on health. Our theoretical framework heavily draws on the extensive literature on predictors of migratory behavior and short term economic and social consequences. Below we describe potential mechanisms through which individuals' early life migration experiences likely to influence later life health.

Healthy migrant hypothesis

First, the ***Healthy migrant hypothesis*** suggests that migrants are healthier than their counterparts in the sending communities or those in the receiving communities (Lassetter and Callister, 2008; Lu 2010). Moreover, because early life health status is strong predictor of later life outcomes (Hayward and Gorman, 2004; Elo and Preston, 1992) and individuals usually migrate at young ages, the health status of migrants at the time of the move should be positively associated with later life health. If this is the case, individuals who experienced migration in the early stage of life should remain healthier than their counterparts who never migrated.

Economic prosperity hypothesis

Second, the ***Economic prosperity hypothesis*** suggests that the wage difference between the origin and destination substantially increased migrant's earning potential and actual earnings (Zhao 1999; Todaro 1980; Stark and Taylor 1989; Stark, Taylor and Yitzhaki 1986). This increased earning will then result into higher living standards including more nutritious food and better medical care, helping the migrant to remain healthy at their older ages.

Undoubtedly both the *Healthy migrant hypothesis* and the *Economic prosperity hypothesis* seem plausible and predict a positive relationship between migration experience and later health outcomes. However, we argue that both these hypotheses over stated the benefit and overlooked the potential hardship the migrants may go thorough and the long term consequences of those hardships on later health. Indeed, we argue that the consequences of the hardship are so strong that the positive effects of early life health status and economic prosperity may be overshadowed by the hardship effect and likely to result into a net negative effect on later life health. We argue that the migration may negatively influence later life health through two potential mechanisms – structural and social and psychological.

Structural hypothesis

Structural adaptation argument suggests that migrants usually go through a difficult process of geophysical and environmental adoption. Migration leads to a change in geographical location that usually is different from the one that migrants are used to.

This may expose the migrants to a series of physical and environmental conditions including topography, temperature and working conditions that are difficult to adopt. For example, the early migrants to Chitwan from the hills and mountains probably were never exposed to temperature above 25^0c but when they migrated to Chitwan they were exposed to the heat of Chitwan that goes well above 40^0c in summer days. The adverse climatic conditions with no experience and the lack of resources to cope with resulted into not only higher mortality but also severe long term health problems. Similar is the case for more recent migrants from Chitwan to Persian Gulf Countries. Thus, we expect that compared to migrants who have short migration experience the migrants who have longer migration experience are more likely to rate their health poor and also have more functional limitations at their older ages.

Social psychological hypothesis

Stressful experiences can increase the likelihood of onset of physical and mental disorders and decrease resiliency or delay recovery (Barnett et al. 1997; Bigbee 1990; Collins et al. 1998; Ge et al. 1994; Lantz et al. 2005; Segerstrom and Miller 2004; Selye 1936, 1955). The separation from family, changes in physical location and exposure to new social and environmental conditions are all conceptualized as stressful experiences. Stressful life events are known to worsen health outcomes, especially in domains closely related to stress such as substance use and mental health. Stressful life events increase substance use in the short term and substance dependence in the long term; stressful life events also increase PTSD, depression, GAD, IED, and panic disorder in the long term.9-14 The literature repeatedly identifies separation from family and exposure to new environment as the life events most likely to produce significant personal stress. Thus, we expect that compared to migrants or who have short

migration experience migrants who have longer migration experience are more likely to rate their health poor and also have more functional limitations at their older ages.

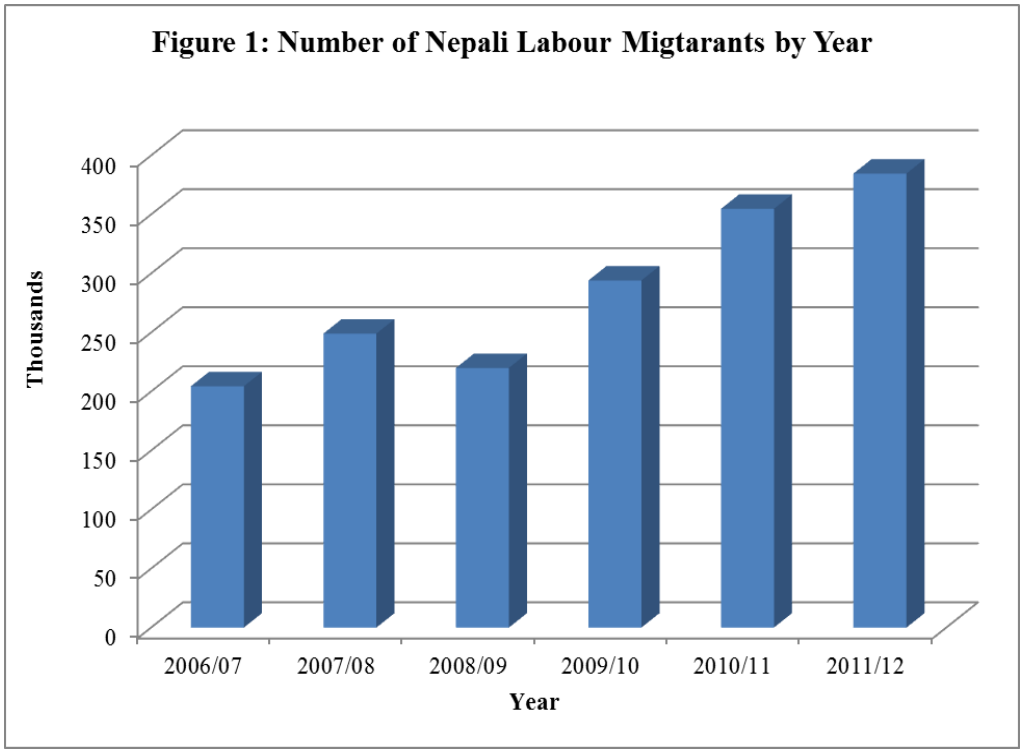
Nepal and Its Historical Background of Migration

Nepal has a long history of migration through trade routes between the Himalayan regions and the Indian plains. Population of Nepal is confluence of streams of Indo-Aryan origin migrants from the South (India) and Mongolian ancestry Tibeto-burmise origin migrants from the North (Tibet). While there was a continuous internal mobility at low level throughout the history, internal migration started taking it tools in the 1950s when the country rapidly growing population in the hills was experiencing frequent and widespread food shortage with devastating natural calamities of flood and landslides all over the country (Kandel 1996). The government of Nepal adopted a strategy of population redistribution (Joshi 1995) by opening settlement in the Terai including Chitwan, our study area, was then completely covered by dense tropical forest. As the cultivation of steeper slopes is getting less and less productive and infrastructure structures and economic opportunities in new settlement and urban areas are flourishing, the migration from mountains and hill areas to terai/urban area (rural to urban migration) is quite common.

The international labor migration, on the other hand, was formally began in 1815 AD with the recruitment of Nepali youth in The British Brigade of Gurkha—units of the British Army that were composed of Nepalese soldiers (Rathaur 2001; Gurung 1983). However, it was not until the government of Nepal promulgated the Foreign Employment Act of 1989 that international labor migration to destinations other than India became a viable option. The 1989 Foreign Employment Act licensed non-governmental institutions

to export Nepalese workers abroad and legitimized certain labor contracting organizations. This ignited large streams of international migration which had previously been restricted to India (Kollmair et al. 2006; Thieme and Wyss 2005).

Recent data for 2009/2012 from the Department of Foreign Employment Promotion shows that Nepalis migrate to over 100 countries globally to work. The number of international migrants increased steadily and dramatically from 2006/2007 to 2011/2012, with more than 350 thousand Nepalis migrating internationally annually at the end of this period. Figure 1 below presents the staggering increase in number of international migrant departures over the last decade.



Nepal once the melting point of stream of Indo-Aryan ancestry origin migrants from the South and Mongolian origin Tibeto-Burmese from the North now turned into one of the major migrant sending country. Because of the historical and more recent

migration experience Nepal provides an ideal setting to study the influence of migration of later life health.

Study Setting: The Chitwan Valley

Chitwan valley lies in the south central part of Nepal. Before the 1950s, Chitwan was covered with dense tropical forest and world famous flora and fauna including one horned rhino, Bengal tiger, and many species of highly poisonous snakes. Because of the deadly disease malaria, Chitwan by then was known as Death Valley. In 1955, the government opened this valley for settlement and distributed land parcels to people from other parts of the country. Up until the 1970s, the valley was very much isolated from the rest of the country. However, since the late 1970s, the valley has undergone rapid changes both in terms of physical and socioeconomic conditions (Shivakoti et al., 1997).

The valley has become connected to the rest of the country by all-weather roads and also turned into a business hub of the country. Furthermore, there has also been a massive expansion of schools, health services, markets, bus services, cooperatives, and employment centers in Chitwan (Axinn & Yabiku 2001). This transformation, from an isolated valley to a busy business center and fast-growing valley, has tremendous impact on the communities and individuals daily social life. The population of the valley grew by more than five folds and once the sparsely populated valley turn into a highly populated area.

Furthermore, the massive expansion of services such as schools, health services, bus services, market, employment centers, and communication facilities, resulted in more young people going to school, working outside the family, and interacting with mass media. The fast growing young age population resulted into surplus labor force with

exposure to schooling and international media that the slow growing country's economic could hardly keep economically engaged in Nepal. As a result, the valley experienced an unprecedented international labor out-migration, turning once a migrant receiving valley into a migrant sending valley.

Data and Methods

This study uses multiple data sets from the Chitwan Valley Family Study (CVFS), a multilevel, mixed method, panel study of communities, households and individuals.

The CVFS selected a systematic probability sample of 151 neighborhoods in Western Chitwan and defined a neighborhood as a geographic cluster of five to fifteen households. Once a neighborhood was selected, all individuals aged 15-59 residing in the sampled neighborhood were interviewed. If any of the respondents had a spouse living elsewhere, that spouse was interviewed as well. A total of 4,446 individuals were interviewed with a 97% response rate. This study provides rich retrospective measurement of the occurrence and timing of individual life events, including migration histories collected using a LHC and linked measures of the characteristics of those events using a structured questionnaire. The LHC method provides more accurate retrospective measurement of life events than alternative measurement techniques (Belli 1998; Freedman et al. 1988). Moreover, the LHC used in the CVFS was specifically designed to use local events to help respondents recall the timing of personal events and to allow respondents to report their recall of marital events in a manner most consistent with local practices (Axinn et al. 1999). In addition, the CVFS also collected detailed histories community change since 1954 in 1996 and later updated it in 2005, using Neighborhood History Calendar method (Axinn, Barber and Ghimire 1997).

After the individual survey, the CVFS launched a Monthly Demographic Household Registry to track the individuals and their households over time and collect survey data on migration, marriage, childbearing, and mortality in their households. Beginning in February of 1997, interviewers visited each household monthly to update demographic events such as births, deaths, marriages, divorces, contraceptive use, pregnancies, and changes in living arrangements. All residents of these 1,580 households have been followed over time, including households and individuals from those households who have moved out of the study area. This means that the prospective panel data are maintained for all those who were interviewed in the original study, regardless of their migration behavior.

In 2006 the CVFS collected detailed information about health and wellbeing from all elderly residents in 151 of the sample neighborhoods. We define elderly as aged 45 and older, which is lower than typically used in Western studies of aging and care giving. However, as in many other poor agricultural settings many individuals are already experiencing many of the physical and mental signs of aging by the age of 45 we take age 45 as an appropriate age to start with. Work in Chitwan is generally very physically demanding and most people in their 40s have been participating in hard, physical labor for over 30 years. As a result, many people suffer debilitating physical impairments from relatively minor ailments. Using a younger age boundary to define our sample of interest is further supported by the fact that life expectancy in Nepal is only 62 years.

The 2006 elderly health and wellbeing being survey resulted into 1,373 individuals who were interviewed in 1996 individual survey, followed up in household registry and interviewed in 2006 elderly health and wellbeing survey.

Measures

We focused on the self-reported health and physical functionality as our outcome measures. Our measures of self-reported health and physical functionality come from responses to individual interview in the 2006 elderly health and wellbeing survey.

Self-reported health. As in other major international surveys, our measures of self-reported health was measured by asking "Overall, would you say that your (Her/His) health is excellent (coded 1), good (coded 2), fair (coded 3), and poor (coded 4)? During analysis, responses were recoded as: 1=poor; 2=fair; 3=good and 4=excellent and was used as a continuous measure. This measure is widely used in measuring health inequalities in developed as well as developing countries (Idler and Benyamini 1997; Carlson 2001; Lindstrom, Sundquist, and Ostergren 2001; Balabanova and McKee 2002; Unden and Elofsson 2006; Rogers, Hummer and Nam 2000) and is considered as a strong and independent predictor of mortality (Idler and Benyamini 1997; Idler 2003).

Physical functionality. Our measure of physical functionality comes from response to a series of questions in the 2006 elderly health and welling being individual interview. An index was created by using 8 items that measured activities of daily living (ADL). These items were dichotomously measured by asking whether a respondent has difficulty in (1) stooping, kneeling, or crouching; (2) finding a pin dropped on the ground; (3) getting in and out of bed without help; (4) bathing without help; (5) moving 30 kg rice bag from one place to another; (6) difficulty getting water from well; (7) continuously walking for one hour; and (8) doing farm activities such as plowing, hoeing, or planting. The index of physical functionality or activities of daily living was created by summing up the yes (=1) or no (=0) responses to these 8 items. The index ranged from 0

– 8, 0 being no difficulty and 8 being severe difficulty in performing activities of daily living. This measure is also used as a continuous measure in the analysis.

Migration. We used the number of years lived outside the birth place as our measure migration experience. As we described above, our measure of migration experience comes from information combining from 1996-Life History Calendar (respondent's birth to 1996) and Household Registry system (1997-2006). Migration was defined as 'living away from home most of the time in the past six months' since their birth. On an average our respondents reported 30 years of migration experience. However, slightly over 16 percent of them reported no migration outside of their birth place (results not shown).

Other factors associated with migration and later life health

Evidences suggest that a number of respondent's background characteristics and experiences (other than migration), household and community characteristics may have important independent influences on later health (Lu 2010; Elo and Preston, 1992; Hayward and Gorman 2004). Thus, our models of migration and health also control for measures of respondents' backgrounds (birth cohort, ethnicity, gender, marital and childbearing experiences, education, and employment); household wealth (land holding) and community characteristic both during childhood and contemporary context) to help insure the associations we observe are not a product of these other factors.

Age. Population health and mortality is closely associated with age (Elo and Preston, 1992; Hayward and Gorman 2004), and therefore, ignoring age in the analysis of population health and mortality will introduce a major bias (Hummer, Rogers and Eberstein 1998). Obviously, elderly people are more likely to report severity in terms of

both – self reported health and physical functionality – of these health statuses. We group ages into three categories as: age in years between 45-54, 55-64, and 65 years and over. We treated the oldest cohort—ages 65 and over—as the reference group.

Gender. Both morbidity and mortality are related to sex. Patterns of death between the sexes vary due to different biological functions such as childbearing, adapting risky behaviors such as smoking and alcohol use, occupational hazards and so on. Other evidence suggests that women may be protected from a number of infectious and degenerative diseases because of the presence of reproductive physiology, protective hormones, and certain X-linked genes (Gage 1994; Hummer, Rogers and Eberstein 1998). Evidence suggests that although women live longer than men, there is paradox in self-report of health. Women report worse self-rated health than their male counterparts (Case and Paxon, 2005). Therefore, we also control for gender in the analysis.

Marital status. Marital protection argument suggests that marriage protects individuals by focusing on following healthy behaviors, risk reduction, and compliance with medical treatments (Hummer et al. 1998). For instance, compared to unmarried individuals, married individuals eat healthy foods, follow healthy lifestyles, take better care of themselves, and live a more stable, secure, and scheduled lifestyles (Gove 1973; Trovato and Lauris 1989). Moreover, another well-known argument is the social integration (Durkheim 1951/1897). Social integration leads to social support thus influencing individual health status. On the other hand, marital selectivity argument focuses on morbidity and mortality difference in terms of marriage of healthy individuals (Lillard and Panis 1996). Therefore, we control for marital status which is measured as: currently married (coded 1) vs, else (coded 0).

Education. It is argued that education influences morbidity and mortality through altered health behaviors and indirectly through its effect on income and occupation (Elo and Paterson 1996; Ross 1995). Education provides knowledge, skills, and information as well as increases access to health care, employment and income. Education is measured as the number of years of schooling.

Employment. Employment is another important measure that may influence individual health status. Evidence also suggests that employment has beneficial effect on health and mortality through income effect or social relations with peers, and other benefits (Hummer et al 1998; Ross and Mirowsky 1995). Our measure of employment is the total number of years of non-family work.

Ethnicity. Nepali society consists of many ethnic groups (Bista 1972) that are likely to have significantly different educational experiences and marital relationships. Scholars have often categorized these ethnicities into five major groups for analytical purposes: Brahmin/Chhetri (high caste Hindus), Dalit (low caste Hindus), Newar, Hill Janajati (Hill indigenous), and Terai Janjati (Terai indigenous) (Axinn and Yabiku 2001). We coded individuals as "1" if they are members of a specific category and "0" if not, and treated Brahmin/Chhetri as the reference group.

Household land holding. Household wealth (household socioeconomic status) is closely linked with individual health and mortality. This socioeconomic status may include knowledge, money, community standing, and power (Hummer et al. 1998). Land is the most important production resource in an agricultural setting. Therefore, private ownership of land is considered one of the important determinants of socioeconomic status (De Janvry 1981; Findley 1987; Datta 1998). Moreover, the access to land is one of the important determinants of food security/insecurity in developing countries thus

directly influencing individual health status. Therefore, we control for the access to land, which is measured as the total of bari and khet land cultivated by a farm household during the survey year in the local unit, bigha and kattha (1 hectare = 1.5 bigha = 30 kattha). The average size of land in the household was about 19 kattha.

Childhood community context. Childhood community context has strong influence on individual mortality suggesting that the access to community services such as schools and health services will reduce mortality (Hayward and Gorman 2004; Wickrama and Noh 2010). Information about access to school, health services, employment and bus services during childhood was collected through individual interviews. During these interviews, respondents were asked, "Was there a school within a one-hour walk from your home at any time before you were 12 years old?" A positive response was coded as "1" and "0" if otherwise. Similarly, information on other services was collected by asking similar question. Then, we created individual's access to these community contexts during childhood by summing up the responses resulting in a scale of 0 to 4.

Access to contemporary community services. Access to non-family services such as schools and health services may influence individual's health status. In the CVFS survey, all of these variables were measured as the time to walk (in minutes) to the nearest service (school or health service) from the neighborhood.

Distance to urban center. Proximity to urban center is associated with information and opportunity both for migration and health therefore highly likely to influence migration and health and association between the two. Narayangarh/Bharatpur is the largest urban center of the Chitwan and district e headquarters. Therefore, distance to Narayangarh/Bharatpur from the community measured in kilometers is used as a

control. The average distance to Narayangarh/Bharatpur from the community was 8.62 kilometers.

Analytic Strategy

We use a multi-step analytical strategy to estimate the relationship between migration experience and health status (self-reported health status and physical functionality). First, we calculated the univariate distribution of all the measures used in the analysis. Next, multivariate models were estimated to examine the relationships between migration experience and health status adjusting for the effects of other controls that are known to confound the relationships. Since the outcomes - self-reported health status and physical functionality - are measured as continuous measures, we used the multi-level OLS regression as a multivariate tool to estimate our models of migration and later life health.

Results

Migration and Self-reported Health

Table 1 provides descriptive statistics of all the measures used in the analysis. Overall, the average self-rated health score is 2.13, suggests that on an average our respondents reported as fairly good health. Specifically, about 19% of them reported that their health status was poor and 60% of them reported their health status as fair. Contrarily, about 10 percent of them reported it as good and 11% reported as excellent.

(Table 1 about here)

The results of our multivariate models suggest that the number of years of migration experience is negatively associated with later life self-rated health. The regression coefficient of -.004 (Row 1 in Table 2) suggests that on a 4-point self-rated health scale, one year increase in number of migration experience reduces self-rated health by.004. This means, on average a respondent who lived 10 years away from her birth place is likely to rate his/her health .04 point lower than a respondent who never lived away from his/her birth place. Although technically the magnitude of the effect seems small the consequences of this could be lot severe than it seems because respondents were constrained to rate their health in very narrow scale (1-4) point. Moreover, this effect is robust against wide range of other factors known to influence the relationship.

(Table 2 about here)

Migration Experience and Physical Functionality

As shown in Table 1, in a scale of 0-8 (0=not difficult to 8=very difficult) the 3.55 mean of physical functionality (activities of daily living) index suggests that on an average our respondents are experiencing some functional health problems. While only about 10 percent of the respondents reported no difficulty to function daily activities, about a quarter of them reported difficulty to do 6 or more daily activities.

(Table 3 about here)

Similar to our results in self-rated health, the result from our multivariate model of migration and physical functionality suggests strong positive association between migration and physical functionality. The results confirm to our expectation that the number of years of migration experience significantly and positively predicted physical disability. The regression coefficient of 0.013 (Row 1 Table 3) on a nine point physical functionality scale suggests that one year increase in number of migration experience increases the functional difficulty by 0.013 units. Considering an average migration experience of 30 years this is an enormous effect. Moreover, this effect is independent of other factors know to influence the later life health.

Other factors associated with later life health

To ensure that the associations we observed between migration and later life health are not spurious we included a series of factors that are known to influence later life health and migration in our models. The effects of most of these controls are as expected. Age is an important contributor to physical functionality and the direction of the effect is as expected i.e. younger adults are less likely to report severe physical functionality compared to older adults. However, age was not a significant contributor to self-reported health status. Similarly, females are more likely to report physical disability as well as were less likely to report better self-reported health status than males. While number of years of schooling significantly reduced physical disability, it positively and significantly associated to self-reported health. We also find strong association between individual ethnicity and later life health. Compared to Brahmin and Chhetri, both Hilll and Terai Janajatis are less likely to report physical disability. In terms of household wealth individuals with larger land holdings are likely to report fewer disabilities.

Discussion and Conclusion

Our results suggest that migration experience of individuals is (a) positively associated with physical disability/ functionality, and (b) negatively associated with the self-reported health status, net of all other important individual, household and community level controls known to influence migrant health. These intriguing results provide important insights about migrants and their later-life health status in a setting that is experiencing overwhelming outmigration and rapid aging.

One of the unique strengths of this study is the proper comparison group – both migrants and non-migrants at the place of origin. This paper takes step towards bridging this gap in the literature using the relevant data. According to Lu (2010) one of the major limitations of the existing studies on migration and health face was the difficulty of choosing the proper comparison group thus posing a potential selection bias (Lu, 2010). Moreover, this study also takes advantage of the panel data to study the same individuals overtime.

Moreover, Nepal provides an ideal setting for this study. However, a crucial question is whether the findings of our study are relevant to other settings. While our study involved both internal and international migration experiences and include many destination communities, it is limited to only one origin area in Nepal. We know there are important historical, cultural, sociopolitical, and economic differences among sending countries and among receiving countries, and methodological challenges faced by migration studies vary by both origin and destination country. However, our experience in our origin study site in Nepal offers useful information for research in other parts of the world. This is because the population of Nepal lives in social, cultural, political, and

economic conditions similar to those of many other parts of the world with low levels of education and income. In addition, many aspects of culture and economics in Nepal are very similar to most other parts of South Asia, including India, Pakistan, and Bangladesh—major migrant-sending countries. South Asia is home to a large, young, and fast-growing population with a substantial proportion living in poverty, with many attracted by opportunities and earning prospects in parts of the world that are better off economically.

However, this study is still not free from selection bias. In real sense, some scholars argue that sample of living human being in itself is a biased sample because the sampling frame does not include the dead one. Likewise, some of the healthy migrants could still be outside their origin. Additionally, the *healthy migrant hypothesis* predicts that those who are healthy migrate and thus, there could be a positive relationship between migration experience and later health outcomes. However, due to the lack of baseline health status of migrants, we were not able to control for this measure in the analysis.

Despite these limitations, we believe that the findings of this study will be of greatest interest to a wide range of audience. First, the findings about long term consequence of migration would be of utmost importance to the individuals from poor agricultural migrant sending settings lured by the glorifying stories of the economic prospects in the urbanized areas or industrialized countries. Second, the findings from the study will be equally important to policy makers grappling with the skyrocketing medical expenses, rapid population aging and old age security with eroding historical family norms, values and old age care system. Finally, it is our hope that to address the data limitation we faced with, particularly lack of pre- migration measures of health the

findings of this study will be of great interest to scholars and will entice new studies with panel measurement of health and advance the area of science.

Table 1. Descriptive Statistics of Measures (N=1,373)

Measures	Mean/Percent	SD	Min	Max
Outcome Measures				
Self-reported health scale (1=poor through 4=excellent)	2.13	0.39	1	4
Poor	18.79			
Fair	60.31			
Good	09.83			
Excellent	11.07			
Index of physical functionality (0=not difficult to 8=very difficult)	3.55	2.18	0	8
Explanatory Measures				
Migration (number of years lived outside birth place)	29.32	16.44	0	65
Controls				
Age cohort 1 (Ref: 65 and above)	0.11	0.32	0	1
Age cohort 2 (45-54)	0.51	0.50	0	1
Age cohort 2 (55-64)	0.37	0.48	0	1
Gender (female = 1)	0.53	0.50	0	1
Marital Status (currently married=1)	0.88	0.33	0	1
Number of years of schooling	2.76	4.68	0	26
Number of years in non-family work	12.76	12.91	0	50
Ethnicity (Brahmin/Chhetri = 0)				
Dalit	0.10	0.30	0	1
Hill Janajati	0.17	0.37	0	1
Newar	0.07	0.26	0	1
Terai Janajati	0.19	0.39	0	1
Total land owned (kattha)	18.76	26.83	0	200
Community context	1.51	1.42	0	4
School within 15 minutes' walk	8.82	6.45	0	30
Health services within 15 minutes' walk	19.83	17.73	0	90
Distance to Narayangarh	8.62	4.01	.02	17.70

Table 2: Coefficients from Multilevel OLS Regression to Estimate the Relationships between Migration Experience and Self-rated Health (N=1373)

Measures	Self-rated Health
Migration Experience	
Number of years migrated outside birth place	-0.004 *
	(-1.95)
Controls	
Age cohort 1 (Ref: 65 and above)	-
Age cohort 2 (45-54)	0.004
	(0.04)
Age cohort 2 (55-64)	-0.033
	(-0.43)
Gender (female = 1)	-0.139**
	(-2.58)
Marital Status (currently married=1)	-0.064
	(-0.89)
Child/children ever born	0.001
	(0.11)
Number of years of schooling	0.016
	(2.76)**
Number of years in non-family work	0.001
	(0.73)
Ethnicity (Brahmin/Chhetri = 0)	-
Dalit	-0.072
	(-0.83)
Hill Janajati	0.046
	(0.67)
Newar	-0.085
	(-0.89)
Terai Janajati	-0.114
	(-1.19)
Total land owned (kattha)	0.007
	(1.60)
Community level Controls	
Community services (school, health service, employment and bus service) at age 12	0.023
	(1.29)
School within 15 minutes' walk	0.007
	(1.60)+
Health service within 15 minutes' walk	0.007
	(-3.96)***
Distance to Narayangarh	0.017
	(2.36)**
Intercept	2.234 (15.47)***
-2 Res Log Likelihood	3478.8
ICC	0.026

t-statistic *** = p<.001; ** = p<.01; * = p<.05; + = <.10

Table 3: Coefficients from Multilevel OLS Regression to Estimate the Relationships between Migration Experience and Physical Functionality (N=1373)

Measures	Physical Functionality
Migration Experience	
Number of years migrated outside birth place	0.012*
	(2.43)
Controls	
Age cohort 1 (Ref: 65 and above)	-
Age cohort 2 (45-54)	-0.529**
	(-2.58)
Age cohort 2 (55-64)	-0.283
	(-1.48)
Gender (female = 1)	1.072***
	(8.10)
Marital Status (currently married=1)	-0.113
	(-0.63)
Child/children ever born	0.056
	(2.17)*
Number of years of schooling	-0.042
	(-2.94)**
Number of years in non-family work	-0.001
	(-0.22)
Ethnicity (Brahmin/Chhetri = 0)	-
Dalit	0.378
	(1.78)+
Hill Janajati	-0.460
	(-2.67)**
Newar	-0.144
	(-0.61)
Terai Janajati	0.357
	(1.50)
Total land owned (kattha)	-0.005
	(-2.16)*
Community level Controls	
Community services (school, health service, employment and bus service) at age 12	-0.087
	(-1.96)*
School within 15 minutes' walk	0.015
	(1.46)
Health service within 15 minutes' walk	-0.004
	(-0.95)
Distance to Narayangarh	0.002
	(0.11)
Intercept	3.086 (8.68)***
-2 Res Log Likelihood	5909.4
ICC	0.032

t-statistic *** = p<.001; ** = p<.01; * = p<.05; + = <.10

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