

# Department of International Health and Development



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Department of International Health and Development  
Tulane University School of Public Health and Tropical Medicine  
1440 Canal Street, Suite 2200  
New Orleans, LA 70112  
ph. 504-988-3655 | fax 504-988-3653  
[www.sph.tulane.edu/~inhl](http://www.sph.tulane.edu/~inhl)

### **Mental and Physical Health Consequences of Repatriation for Vietnamese Returnees: A Natural Experiment Approach**

Hongyun Fu, Ph.D. and Mark J. VanLandingham, Ph.D.

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Department of International Health and Development  
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Tulane University

**ABSTRACT**

While there is much speculation about the potential health, economic, and social consequences of repatriation, systematic comparisons of standard outcome measures involving population-based samples of returnees and non-returnees are virtually non-existent. We address this significant gap in the empirical literature by employing standard measures of mental and physical health outcomes for comparable samples of working-age returnees now living in HCMC; never-leavers living in the same urban wards; and emigrants from Vietnam who successfully settled in a major U.S. metropolitan area (total n=736; data were collected between 2003 and 2005). Our key outcome measures include eight health subscales from the SF-36 (physical functioning; role limitations due to physical health problems; bodily pain; general health perceptions; vitality, energy, and fatigue; social functioning; role limitations due to emotional problems; general mental health); depression; affect balance; blood pressure; BMI and waist-hip ratio; and two behavioral indicators of stress (alcohol and cigarette consumption). We identify a wide range of health disadvantages for the returnees with respect to our comparison groups of never-leavers and immigrants.

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## **Mental and Physical Health Consequences of Repatriation for Vietnamese Returnees**

After the fall of Ho Chi Minh City (HCMC) and the collapse of the South Vietnamese government in 1975, hundreds of thousands fled the newly re-unified Vietnam and reached countries of temporary asylum. Substantial numbers were eventually accepted for settlement in several countries of final destination, principally in the United States. Beginning with a major change in policy instituted by these destination countries in June of 1989, many others were repatriated back to Vietnam. The United Nations High Commission for Refugees (UNHCR) monitored this major repatriation effort up until around 2000. But these monitoring activities did not include the use of comprehensive and internationally-recognized measures of health status; did not involve systematic comparisons with appropriate reference groups; and did not include controls for “selection” effects, i.e., *a priori* factors that make those who attempted to emigrate distinct from those who did not attempt to do so. Moreover, there has been no follow-up since 2000 to determine the longer-term impacts of repatriation on the wellbeing of returnees to Vietnam.

This study exploits that 1989 change in resettlement policy as a “natural experiment.” Those who left Vietnam but reached the transition camps after June 1989 (and were mostly repatriated) share many characteristics with those who left but reached the camps before 1989 (and were mostly settled abroad); both of these two groups attempted to emigrate from Vietnam. These returnees and immigrants live in vastly different social and economic settings (Vietnam and the U.S., respectively); however, returnees and never-leavers share a similar environment (the same wards in HCMC).

Thus, this 1989 change in resettlement policy provides substantial leverage on both selection and contextual factors that generally confound comparisons between returnees and other groups.

## **BACKGROUND**

### *A. Levels, trends, and impacts of repatriation*

National and international conflicts and crises have resulted in the displacement of tens of millions of people worldwide. Repatriation is one of a wide range of responses to such displacements. Recent large scale efforts include not only the repatriation of large numbers of Southeast Asian refugees during the mid-1990s (UNHCR 2000), but also the return of over three million refugees to Afghanistan (UNHCR 2004), a million refugees/internally displaced persons back to Bosnia and Herzegovina, and half a million people back to southern Sudan (UNHCR 2004). Around 300,000 refugees and 4 million internally-displaced people have returned to their homes in Angola since the signing of the Luena Peace Accord in April 2002. And over 250,000 refugees had returned to Sierra Leone by the end of 2004 (UNHCR 2004). Globally, it is estimated 734,000 refugees have been repatriated back to their countries of origins in 2006 alone. An estimated 11.6 million refugees have been repatriated over the past 10 years, with 1.1 million in 2005 and 3 million in 2004 (UNHCR 2005; 2007).

Repatriation is often regarded as an end point of a refugee's trajectory of long exile and suffering. But in fact, refugees' return home after years of displacement is better thought of as the beginning of a long process of reintegration which entails re-establishing ties with home communities and restoring normal and productive lives

(Ballard 2002). UNHCR, UNDP and numerous NGOs have developed programs to facilitate the reintegration of returnees into local communities, by offering resettlement funds to help them restart their lives, temporary salary subsidies, loans to reconstruct houses and business start-ups, and training to gain new employment (Nickerson 1995; UNHCR 1996; Ballard 2002).

While the possible health and psychological needs of returnees back in their country of origin merit an occasional mention in lengthy reports focusing on returnees (UNHCR 1997), such speculation has not been followed-up with systematic and scientific documentation. This is unfortunate, because the stresses and hardships associated with repatriation may indeed have significant health consequences. While any temporary health services provided as part of the re-entry experience will end with the phase-out of services by UNHCR and other agencies, the issue of how the returnees fare in the medium and long-term after repatriation has been largely left unexplored.

#### *B. Vietnamese migration and return stemming from the war in Indochina*

Large scale relocations were rare in modern Vietnam until the 1954 partition which resulted in the exodus of around one million refugees from the northern part of the country (Jones 1982; Jones and Fraser 1982; Duiker 1984). Around two decades later, the upheaval near the end of the Southeast Asian wars of the 1960s and 1970s displaced countless Vietnamese families from their homes (Banister 1993; Zhang et al. 2001), many permanently. Many of these displaced Vietnamese were ultimately settled in the U.S. and in other receiving countries during this period (Montero 1979; Kelly 1977; 1986; Davis 2000).

This exodus from Vietnam is often characterized as occurring in three waves (Stone and McGowan 1980; Kelly 1986; Gold 1992; Campi 2005). The initial wave started just before the collapse of the South Vietnamese government in 1975 and included many former South Vietnamese military and civilian officials and their families, who escaped with the help of the U.S. The second wave, which occurred mostly between 1978 and the late 1980s, was a massive exodus of clandestine emigrants by both land and sea, resulting from discontent with the new regime and post-war political and societal upheaval. This wave included many rural farmers or fisherman as well as many ethnic Chinese. Many suffered terribly during their escape; many others perished (Fox et al. 1995). In part to stem this dangerous exodus of “boat people” from Vietnam, the United Nations convened the First Geneva Conference on Indochinese Refugees in July 1979 (Stein 1979), resulting in the Orderly Departure Program (ODP). The underlying principle of the ODP was that countries of first asylum would continue to accept refugees with the understanding that all or nearly all would be accepted for resettlement in the West.

This agreement collapsed in May 1988, when the countries of ultimate destination implemented much more selective criteria (UNHCR 1989; Helton 1993). This new policy, the Comprehensive Plan of Action (CPA), was established in June 1989, and recommended that "mechanisms should be developed to determine the claims of new arrivals to refugee status on a regional basis" (UNHCR 1989; Bronee 1992). This was a dramatic change in policy, before which, nearly all refugees were accepted for resettlement in the West; after which, only about quarter of newly arriving refugees were accepted for resettlement (Robinson 1998). A fairly small number, about 20,000 from

1978 through 1994, have been accepted for resettlement under the goal of family reunification with relatives already in the United States (Zhou and Bankston 1998). For those arriving in the transition countries after June 1989, only those able to prove a *bona fide* risk of persecution in Vietnam were accepted for resettlement; most (about  $\frac{3}{4}$ ) were repatriated to Vietnam (Helton 1993; UNHCR 1995). Over 110,000 rejected asylum seekers had been repatriated back to Vietnam by the end of 1997 (Ballard 2002). Those who made it, on the other hand, make up the bulk of the over 1.2 million Vietnamese Americans living in the United States by 2000: around 923,000 of these are foreign-born Vietnamese immigrants (Reeves and Bennett 2004).

*C. Theoretical and empirical perspectives on migration and repatriation, and the respective health consequences of each*

Migration - along with subsequent adaptation or repatriation – entails numerous challenges, each of which can affect both mental and physical health. Many of these challenges will be particularly stressful for refugees, who often leave under the threat of war and persecution (Lin et al., 1979). Before migration even occurs, such persecution (real or imagined), worry, fear, and disaffection may negatively affect health status. Soon-to-be refugees often experience social upheaval and increasing chaos in their country of origin before departure (Rumbaut 1991). They often face dispossession, economic ruin, and violence, which can lead to mental health symptoms such as nightmares, persistent fears of death, and violent memories.

During the move, threats to health and life itself are myriad, e.g., bandits and pirates, unscrupulous opportunists, and exposure to injury and disease. During flight, not only must they survive displacement from their homes and communities (Papadopoulos

2001), but also inadequate medical/psychological care, new languages, a lack of legal status, and an almost absolute dependence upon individuals they do not know, all of which may tax their health (Nezer 2000). Each of the temporary weigh-stations will contain hazards, not the least of which is the insecurity of not knowing when or how their journey will end. Finally, once the move is complete, even for those who are returning to the familiar environment of their homeland, economic difficulties, prejudice and discrimination, and disaffection all pose continuing threats to well-being.

More positively, some refugees benefit from better health care and housing during at least part of their journey, benefits that may have long-lasting benefits. Also, there is a vast literature that strongly suggests that it is generally the most robust who take on the challenges (and opportunities) of migration in the first place; this is often referred to as the “healthy migrant syndrome.” If true, then the returnees may be well-suited to meet these challenges upon their return.

Empirical research on the actual effects of reintegration upon refugee returnees back in their country of origin is extremely limited in scope (Maynard 1999; Rogge 1994). Farewell (2001) used open-ended interviews to examine the experience of Eritrea refugee youth returning to their homeland after prolonged exile in Sudan. Families, elders, community solidarity, and combatants were identified as important sources of psychological support. Sabin (2006) examined the prevalence of mental illness health and factors associated with poor mental health among Guatemalan Mayan refugees who had been repatriated to Guatemala after spending 12-18 years in refugee camps in Mexico. Psychiatric morbidity was common among the repatriated Mayans. Being female, having relatives or friends who had been mutilated, experiencing sexual assault,

and experiencing a serious wound were associated with higher levels of mental illness (anxiety, PTSD and depression) among the returnees. This study also compared the prevalence rate of mental illness among these returnees with a similar survey conducted one year earlier among Guatemalan refugees who were continuing to live in refugee camps in Mexico. The authors report a lower prevalence of depression but higher levels of PTSD and anxiety among the refugees still living in the camps compared to those who had been repatriated. Factors that distinguish who was repatriated from who remained in the camps are not considered, nor are other more general sources of compositional differences between these two groups.

A large literature examines the adaptation and adjustment of Vietnamese refugees who resettled in the major receiving countries (see VanLandingham and Fu 2007 for a review). Another major literature focuses on the experience of refugees in refugee transit camps (Kunz 1975; Rahe, *et al.*, 1978; Mayadas, 1982; Knudsen 1983; Chan and Loveridge 1987; McKelvey 1997). This latter literature suggests a wide range of mental health stressors, including boredom, uncertainty, helplessness, and isolation. Much less is known about how repatriates fare back in Vietnam. One survey conducted by United Nations High Commissioner on Refugees (NHCR) concluded that the refugee repatriates represent a vulnerable social group in contemporary Vietnam (Ballard 2002). While significant efforts have been made by international organizations and the Vietnamese government to assist the repatriates upon their return (Ballard 2002; Betts 2006), only limited success has been achieved regarding the reintegration of the Vietnamese refugee returnees into Vietnamese society (Nickerson 1995; Duong and Morgan 2001). According to a 1998 survey of Vietnamese exiles repatriated during the 1990s conducted

by the Ministry of Labor, Invalids and Social Affairs (MOLISA) of Vietnam and the European Community International Program for the Reintegration of Vietnamese Returnees (ECIP), technical and vocational education programs contributed only nominally to the economic reintegration of returnees (Duong and Morgan 2001). Physical and mental health indicators may well show equally poor outcomes; these dimensions of refugee well-being have been virtually ignored.

## **CONCEPTUAL FRAMEWORK**

Our conceptualization of how repatriation might affect the health status of Vietnamese returnees is outlined in the figure. Predisposing factors - age, sex, socioeconomic status, personality, etc. - in the upper left box will help determine who attempts to leave in the first place. Of course, many of these same factors directly influence health outcomes as well, as illustrated by the top arrow in the figure. Unmeasured propensities for risk-taking, for example, will influence decisions to leave under dangerous circumstances, such as those in effect during the post-1975 Vietnamese context. These same factors will also work through a wide array of other factors that are unrelated to migration but strongly related to health, e.g., cigarette, alcohol, and seat belt use. Such measured and unmeasured propensities associated with decisions to migrate potentially confound or mask the impacts of the migration experience *per se* upon the health of returnees and immigrants.

Our principal relationship of interest here involves how repatriation influences health outcomes. We hypothesize that such influences will work through features of the migration and return experiences, such as disappointment, discrimination, and subsidies

upon their return to Vietnam; as well as long-lasting influences of their extended stays in the transition camps (see the middle circle in the figure). Our central hypothesis is that the involuntary departure and repatriation experience will have measurable medium and long-term impacts on the health of returnees to Vietnam. Most of these longer-term impacts will be negative, resulting from the cumulative toll of functioning upon their returning to Vietnam

*(Insert Figure 1 here)*

## **METHODS**

### ***A. Research design***

Our major population of interest is Vietnamese returnees living in HCMC. Two comparison groups - Vietnamese Americans and Vietnamese who never left Vietnam - along with the major change in immigration policy described above provide useful leverage for helping to ascertain the effects of migration and repatriation *per se* – as opposed to selection – on health outcomes. Before June 1989 essentially all Vietnamese who made it to a country of first asylum were successfully settled in the West (mostly in the United States) – those who eventually settled in New Orleans constitutes our Vietnamese immigrant group. For those arriving in the transition countries after June 1989, the vast majority was repatriated to Vietnam – those repatriated constitute the returnee group. Those who never attempted to emigrate constitute the never-migrant group.

To make our three samples as similar as possible, our returnees and never-migrants were selected from the same urban wards in HCMC. We specifically chose those urban wards known to have large numbers of returnees. Our Vietnamese immigrants, most of whom lived in HCMC before leaving Vietnam, were sampled in New Orleans, Louisiana. This community is one of the largest urban concentrations of Vietnamese-Americans in the U.S.

Comparing the *returnees* with the *never-migrants* on our outcome measures provides an estimate of the combined effects of repatriation and selection (the unobserved characteristics that place one at risk of migration) on health outcomes net of migration and contextual effects (since neither group migrated to the U.S.). Comparing the *returnees* to the *immigrants* provides an estimate of the combined effects of context (life in Vietnam versus the U.S.) and repatriation on health outcomes net of selection effects (since both groups are subject to the same set of selection effects). On the outcomes where *returnees* differ from both *never-migrants* and *immigrants*, we attribute these differences to the sole effects of repatriation *per se*, since this is the essential attribute that only the returnees possess.

### ***B. Data and sample***

Our data were collected between 2003 and 2005. These data consist of three population-based sub-samples totaling 736 working age adults (23-53 years old). The total sample consists of 141 migration returnees to Vietnam (and living in HCMC), 128 Vietnamese immigrants residing in New Orleans; and 467 never-migrants residing in the same urban wards in HCMC as do the returnees.

Returnees and never-migrants were selected using multi-stage cluster sampling. HCMC has 19 urban districts containing 259 urban wards. Three of these urban districts known to contain large numbers of returnees were selected for study. In each of the three selected districts, 1 ward was randomly selected. In the selected ward, 3 neighborhoods were randomly selected. For each neighborhood, four clusters (*To Dan Pho*) were randomly selected, and 12 households were randomly selected from each cluster. A complete listing of all adults in these households was compiled. To be eligible for interview, potential respondents had to have lived in HCMC for at least 20 years and be between 25-49 years of age. If there was more than one eligible respondent within the household, a procedure to randomly select a respondent was implemented. There were two refusals among the never-leavers. A random sample of all returnees in the age group of interest and known to be living in these same urban wards constitutes the returnee sample. We had no refusals among the returnees.

For the immigrant sample, eligible individuals were required to be between the same ages of 25-49 during the time of the initial survey (summer of 2005);<sup>1</sup> to have been born in Vietnam; to have arrived in the U.S. between 1980 and 1990; and to have been between the ages of 15-30 when they arrived. These fairly strict criteria were in place because the original study from which these data come focused on the immigrants as the principal study group. They also help insure that the immigrants arrived in the transition camps prior to the change in immigration policy in June 1989. We employed a recently-updated population register of Vietnamese-American households in the greater New Orleans area to draw our original sample during the summer of 2005. This register is

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<sup>1</sup> The data collection was completed before Hurricane Katrina flooded this Vietnamese enclave at the end of August 2005.

maintained by the main NGO and Catholic Church serving the area; it includes both Catholic and non-Catholic Vietnamese families. Upon arrival at the household thought to have an eligible respondent (the original registers had a list of residents, with their ages), the interviewer followed a procedure to first list and then randomly select an eligible respondent. The entire set of questions and measurements took about 45 – 90 minutes to complete. The respondents were given a small honorarium for their time and trouble. Data collection was completed in August 2005. Within the eligible households contacted by our NGO collaborators, 128 completed the interviews and 46 refused, yielding a response rate of 74%.

### ***C. Measurement***

Data collected include social, demographic and economic status indicators, lifestyle-related factors (e.g., smoking and drinking), measures of access to care, occupational injury, and various dimensions of health status. Our health status outcome measures include standard and well-regarded self-rated measurements as well as physical measures, e.g., blood pressure, height, weight, hip and waist circumference, and lung capacity.

Several of our principal health outcomes are based upon the SF-36 health assessment instrument (Ware and Sherbourne 1992). The SF-36 has been widely used and is highly regarded as a reliable general health assessment tool, especially for generally healthy populations (McDowell and Newell 1996). SF-36 subscales are computed in such a way that higher scores indicate better health outcomes (Range 0-100). Any difference of ten points or higher on a SF-36 subscale is considered clinically

significant (Ware et al. 1993). We collaborated closely with the developers of the instrument to construct, pretest, and implement the first Vietnamese version of the SF-36 as part of this study.

Second, we employ the Vietnamese Depression Scale (VDS), developed by Kinzie *et al.* (1982) specifically for the Vietnamese. VDS employs six culturally-specific items associated with depression among the Vietnamese, as well as six questions each about physical and psychological symptoms (Buchwald et al. 1993). Previous studies have consistently documented a high level of sensitivity and specificity among Vietnamese residents, refugees and immigrants (Buchwald et al. 1993, McKelvey et al. 1993; Buchwald et al. 1995).

Third, we use the Affect Balance Scale (ABS), developed by Norman M. Bradburn (1969). The ABS is a 10-item rating scale containing five statements reflecting positive feelings and five statements reflecting negative feelings, and is administered to determine overall psychological well-being at a given point in time. One of the 5 positive items – feel on top of the world - is excluded from the survey as this item did not seem to make sense to Vietnamese respondents during our survey pilot-test. The final scale used in this study includes 9 items.

Blood pressure readings were taken as part of the interview using a mercury sphygmomanometer. We employ a widely-used measure that incorporates both systolic and diastolic measures, “biologic effect blood pressure” (Svensson and Lundstrom 1984).

## **RESULTS**

Descriptive characteristics for each of our three study groups are presented in Table 1. Some differences across the groups are apparent. At the time of interview, returnees were on average about the same age as our never-leavers, but both Vietnam-based samples were a bit younger on average (about 3 years) than our immigrant sample. There are more males among our returnees and immigrants, but more females among our never-leavers.<sup>2</sup> Educational attainment of our returnees is on average lower than that for our never-leavers and immigrants. And our returnees are more likely to fall into the “unskilled, service and agricultural” occupational category than are our never-leavers or immigrants, and less likely to fall into the “professional” category. The distribution of marital status is similar across three samples. Differences in background characteristics will be controlled for in our multivariate analyses.

The vast majority (93%) of returnees left Vietnam between 1989 and 1991 (results not shown), close to the date of the policy change. They all had experience in refugee camps in a third country/region including Hong Kong, Indonesia, Malaysia, Thailand, China, etc. Their length of stay in these camps ranged from less than one year to nine years (the average was just under six months). They were repatriated back to Vietnam between 1991 and 1997, with most (60%) returning during 1996 and 1997.

Members of our immigrant sample left Vietnam between 1975 and 1990 (results not shown). The vast majority of them (84%) reported that they first went to a third transition country/region before coming to the United States, including Guam, Hong Kong, Thailand, Indonesia, Malaysia, Philippine, Singapore, etc. The duration of their

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<sup>2</sup> Many more men than women left Vietnam after the war; see Goodkind (1997) for a discussion of some of the implications.

refugee camp experience ranged from less than a year to seven years (the average was just under nine months).

*Insert Table 1 here*

Bivariate differences in health outcomes by migration status are presented in Table 2. Four of our eight SF-36 health scales show statistically significant differences between our returnees and our two comparison groups of Vietnamese. *General health* reveals significant disadvantages in physical health among the returnees, relative to both comparison groups. Returnees also show a disadvantage on *role limitations due to emotional problems*, relative to immigrants. And returnees fare worse on *social functioning* relative to never-leavers. However, returnees show better results on the outcome *vitality, energy and fatigue* relative to immigrants.

Based on our other instruments, returnees again fare worse on *positive affect* and *blood pressure* level than both comparison groups. And the Vietnamese depression scale reveals a significant disadvantage among returnees relative to immigrants. Returnees and never-leavers do not differ much on *BMI* and *waist hip ratio*, outcomes that show clear disadvantages for Vietnamese living in American. These bivariate comparisons show no significant differences between returnees and the other two comparison groups on the SF-36 based measures of *physical functioning, role limitation due to physical problems, bodily pain, or mental health*; there is also no difference on the measure *negative affect*. No significant differences among the groups are found on our two behavioral outcomes, i.e., *binge drinking* and *heavy smoking*.

*Insert Table 2 here*

The associations among demographic, socio-economic background factors and our mental health outcomes are presented in Table 3. As found in other studies of health outcomes, our results indicate health advantages for the young, for men, for the married, for the better-educated, and for those who are occupationally more-privileged. Younger in age is significantly related to better outcomes on SF-36 *physical functioning* (marginally significant), *general health, vitality energy and fatigue*, lower *blood pressure* level, lower likelihood of having *high waist-hip-ratio* and lower likelihood of *heavy smoking* (marginally significant). Being male is related to better outcomes on SF-36 *physical functioning, role limitation due to physical problem, bodily pain, general health, vitality, energy and fatigue, role limitation due to emotional problem, general mental health, depression, negative affect* and *blood pressure*. Males on average have higher *BMI*, but they have lower rates of high waist-hip-ratio. Higher education is associated with better outcomes on SF-36 *physical functioning, general health, vitality, energy, fatigue* and *positive affect*. Those with higher education also have lower *blood pressure*; lower *BMI*, lower rate of *having high waist-hip-ratio*, and less likelihood of *heavy drinking*. Higher occupational status is related to better outcomes for SF-36 *physical functioning, vitality, energy and fatigue, bodily pain, general health, mental health, depression* (marginally significant) and *positive affect*. The formerly married (including separated, divorced and widowed) fare worse on SF-36 *physical functioning, bodily pain, vitality, energy, fatigue, general mental health, depression* and *negative affect*. On the other hand, the formerly married and the never-married have on average lower *BMI*, and lower rates of *high waist-hip-ratio* than the currently married.

*Insert Table 3 here*

Controlling for the above confounding factors, our multivariate linear regression analyses (see Table 4) reveal significant disadvantages among the returnees on the SF-36 sub-scale *general health, as well as depression, positive affect, and blood pressure*, relative to both never-leavers and immigrants. Returnees also fare worse on the SF-36 sub-scale *social functioning* and *negative affect* (marginally significant), relative to the never-leavers (but not relative to immigrants). In addition, returnees fare worse on *role limitations due to physical problems* (marginally significant) and *role limitations due to emotional problems* relative to immigrants (but not relative to never-leavers). More positively, returnees fare better on *vitality, energy and fatigue*; have lower *BMI* and a lower likelihood of having *high waist-hip-ratio*, as compared to immigrants.

*Insert Table 4 here*

Our final set of models are limited to the returnee sample to explore what factors might be related to health outcomes among those repatriated to Vietnam. Bivariate associations (Table 5) are presented first to illustrate the basic connections between factors related to return and health. Return-related factors of interest include: length of stay in the transition camps; length of time back in Vietnam since returning; number of communities lived in since returning; and self-reports of community reaction to their return as returnees. Results showed that longer stays in transition camps are related to worse outcomes on *depression* and *negative affect* (marginally significant). Having lived in more (rather than fewer) communities in Vietnam since returning is related to worse outcomes on *role limitations due to physical health* and *bodily pain* (marginally significant). And perceived negative community reaction is related to worse outcome on *negative affect* (marginally significant).

*Insert Table 5 here*

Simultaneously controlling for differences in age, sex, and social economic status in our multivariate linear regression models (Table 6) shows that longer camp stays are related to worse outcomes on *depression*. Perceived negative community reaction is associated with worse outcomes on *negative affect* and higher *waist hip ratio* (marginally significant). Multivariate logistic regression models for high WHR, binge drinking among men, and heavy smoking among men (tables not shown) showed few significant relationships. In summary, most of the anticipated associations between factors related to return and health outcomes are not validated, perhaps due in part to the small sample of returnees.<sup>3</sup>

*Insert Table 6 here*

## CONCLUSIONS

Our study of how returnees fare back in Vietnam, compared to those who successfully emigrated and to those who never left, shows a pattern of substantial health disadvantages for the returnees. Moreover, this pattern of disadvantage does not appear attributable to differences in background characteristics among our three comparison groups, nor are they attributable to selection, i.e., pre-existing factors that distinguished

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<sup>3</sup> Regarding the demographic, social and economic factors, as expected, older age is associated with worse outcome on *vitality, energy and fatigue, depression* and *positive affect* (marginally significant) and higher *blood pressure* and higher *BMI* and *waist hip ratio*. Males fare better than females on 7 of the 8 SF-36 health dimensions (i.e. *physical functioning, role limitation due to physical problem bodily pain, general health, vitality, energy and fatigue, social functioning and role limitations due to emotional problems, depression* and *negative affect*). However, males also tend to have higher *blood pressure* and higher *waist hip ratio*. Furthermore, compared to those who perform agricultural, unskilled, service types of jobs, those having higher occupational status (i.e. having professional career) fare better on *vitality, energy and fatigue, mental health, depression* (marginally significant) and *positive affect*. In addition, those who are currently married/living together have lower *blood pressure*, as compared to the formerly married (including divorced, widowed and separated).

returnees from the other two groups before the returnees departed. From a methodological perspective, this is a significant result since other studies that have sought to document possible disadvantages among returnees have been severely hampered by a wide range of potentially confounding influences among the groups being compared, especially differences related to pre-departure “selection” factors. While our approach to this methodological challenge is far from perfect, the fact that returnees suffer such a wide range of health disadvantages relative to two similar comparison groups who did not experience repatriation provides very strong evidence that these differences are real and not artifactual. Our use of standard and widely-accepted measures of health status, rather than more commonly used *ad hoc* measures, also increases confidence that these disadvantages are genuine.

Specifically, we find disadvantages for returnees on *social functioning* and *negative affect* in comparison to never-leavers (but not immigrants). Since these comparisons involve two very similar groups of individuals living in the same place, these differences may be due in large part to unique hardships related to the returnees’ departure and repatriation. But selection cannot be ruled out in such a two-way comparison, since the returnees decided to leave Vietnam while the never-leavers did not. Such pre-departure differences between these groups could be very important. In the context of post 1975 Vietnam, those who suffered the most from the conflicts or those were the most dissatisfied with the new emerging political reality presumably would be more likely to take the perilous risks associated with a clandestine escape.

Returnees also show significant disadvantages on *role limitations due to physical problems* and *role limitations due to emotional problems* relative to immigrants – those

who similarly choose to leave but, largely by chance, ended up settled in the U.S. But these outcomes for the returnees are not significantly different from those of the never-leavers. Thus, these differences may be due either to the negative consequences of repatriation or to some negative consequences of living in Vietnam (relative to America).

But returnees also show disadvantages on the outcomes of the SF-36 *general health, depression, positive affect* and *blood pressure* relative to *both* comparison groups. So while much of the health disadvantage found among returnees from the two comparisons above may well be due to repatriation, we are confident that the disadvantages in general health, depression, positive affect, and blood pressure *are* due to repatriation, since this is the only factor that the returnees have that the comparison groups do not.<sup>4</sup> Life for returnees back in Vietnam is characterized by heightened stress (as indicated by higher blood pressure), poorer affect and mood (as indicated by worse scores on positive affect and standard depression measures), and worse physical well-being (as indicated by lower scores on a standard measure of general health) than comparable groups, and these health problems are directly attributable to their status as returnees.

Key limitations of our study include fairly small samples of working-age adult returnees and immigrants. This problem is lessened by the fact our sample is quite homogeneous, e.g., there is a fairly narrow age range due to our interest in working age adults. Nevertheless, with a larger sample, we may well have demonstrated additional

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<sup>4</sup> We find no significant differences among returnees, immigrants, and never-leavers on the outcomes SF-36 *physical functioning, bodily pain, mental health, heavy drinking* or *heavy smoking*. These outcomes seem unaffected by emigration/repatriation, migration, or selection. Advantages among returnees relative to immigrants (but not to the never-leavers) on *vitality, energy and fatigue, BMI* and *waist-hip-ratio* seem due to the negative consequences of living in the U.S., e.g., a more sedentary life style and higher fat intake in the U.S. There are no health advantages for returnees relative to never-leavers on our health outcomes.

differences in the health profiles of returnees compared to immigrants and never-leavers. A second limitation stems from the fact that we are employing a natural experiment involving three groups rather than a controlled experiment involving two. It is possible that some of the health disadvantages we report for the returnees relative to both immigrants and never-leavers may have separate explanations, with neither related to repatriation. For example, general health may be worse for returnees than for immigrants because of poorer quality medical care in Vietnam; and may be worse for returnees than for never-leavers because of selection. While such thought exercises help illustrate the obvious limits of natural experiments, they also generally run counter to what we know about migration (e.g., that individuals who migrate tend to be more healthy – not less-than those who do not).

The policy implications of the findings are that the problems returnees face after repatriation do not end with resettlement. Working-age returnees in Vietnam suffer poorer health than comparable individuals even when assessed at a point several years after their return, and these health disadvantages are attributable to their migration and repatriation experiences. Much longer-term monitoring than what is typically achieved by placement agencies is needed to properly identify individuals with continuing health needs so that they are referred for treatment and care.

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**Figure 1: Conceptual framework of repatriation and health outcomes**

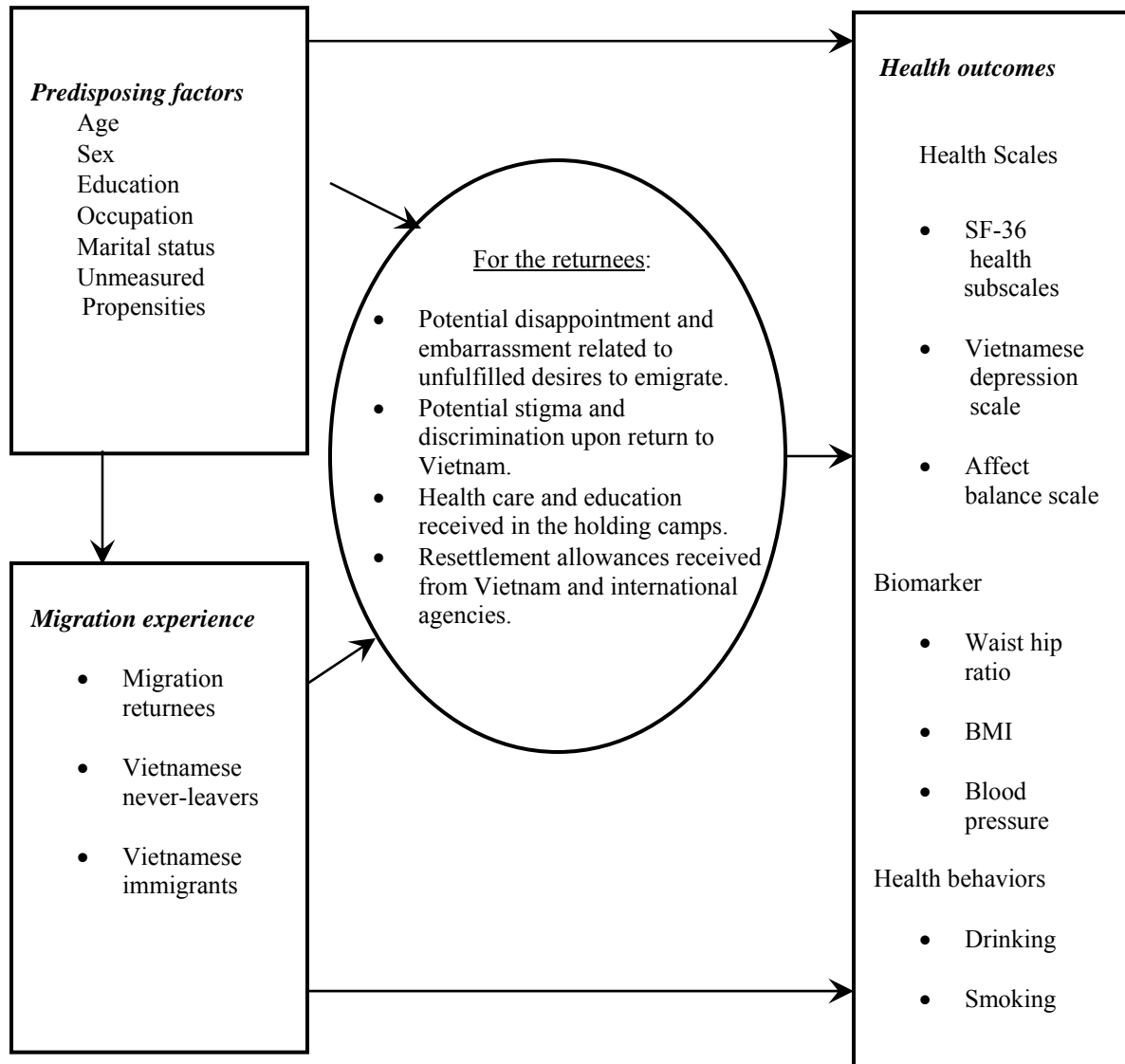


Table 1. Demographic characteristics of study participants (N=736).

Socio-demographic indicators	Returnees (n=142)	Never leavers (n=467)	Immigrants (n=127)
<b>Age</b>			
Mean age	38.61	38.06***	42.01
Median age	38.50	39.00***	42.00
Range (23-53)			
<b>Sex</b>			
Male	60%	43%***	66%
Female	40%	57%	34%
<b>Marital Status</b>			
Never married	22%	24%	14%
Currently Married & living with spouse	70%	65%	77%
Separated, divorced, widowed	9%	11%	9%
<b>Education</b>			
0-6 years	63%	35%***	32%
7-9 years	20%	26%	13%
10 years or above	17%	39%	54%
<b>Occupation</b>			
Unskilled, service and agricultural	19%	8%***	19%
Clerical, factory, skilled, sales	11%	12%	29%
Professional	5%	12%	14%
Entrepreneur	37%	45%	21%
Unemployed, other	28%	24%	17%

Note: ^Significant at  $P < 0.1$ ; \*Significant at  $p < 0.05$ ; \*\* Significant at  $p < 0.01$  \*\*\* significant at  $p < 0.001$ . The combined dataset has 738 respondents. But 2 cases (1 with age coded as 84 and 1 with age missing) were excluded from the analysis. The final analyses include a sample of 736 respondents.

Table 2: Bivariate associations between health outcomes and migration status(N=736)

Health Outcomes	Returnees (n=142)	Never leavers (n=467)	Immigrants (n=127)
1. PF	89.40 ( $\alpha=0.85$ )	89.27 ( $\alpha=0.85$ )	86.94 ( $\alpha=0.92$ )
2. RP*	80.11 ( $\alpha=0.85$ )	79.28 ( $\alpha=0.88$ )	87.60 ( $\alpha=0.87$ )
3. BP	76.94 ( $\alpha=0.94$ )	77.11 ( $\alpha=0.88$ )	77.12 ( $\alpha=0.68$ )
4. GH***	48.40 ( $\alpha=0.82$ )	52.33 ( $\alpha=0.77$ )	66.42 ( $\alpha=0.67$ )
5. VT^	65.88 ( $\alpha=0.73$ )	64.98 ( $\alpha=0.69$ )	61.34 ( $\alpha=0.35$ )
6. SF***	83.98 ( $\alpha=0.79$ )	89.16 ( $\alpha=0.77$ )	82.64 ( $\alpha=0.34$ )
7. RE***	77.00 ( $\alpha=0.81$ )	80.51 ( $\alpha=0.84$ )	91.60 ( $\alpha=0.83$ )
8. MH*	70.59 ( $\alpha=0.70$ )	72.61 ( $\alpha=0.74$ )	69.20 ( $\alpha=0.48$ )
# 9. VDS ^	5.30 ( $\alpha=0.80$ )	4.44 ( $\alpha=0.70$ )	4.07 ( $\alpha=0.91$ )
10. Positive Affect ***	7.12 ( $\alpha=0.65$ )	7.91 ( $\alpha=0.68$ )	8.49 ( $\alpha=0.65$ )
11. Negative affect	7.34 ( $\alpha=0.78$ )	7.11 ( $\alpha=0.77$ )	7.36 ( $\alpha=0.65$ )
# 12. Blood pressure****	102.66	98.04	97.87
13. BMI***	22.11	22.09	23.97
14. Waist-Hip ratio ***	0.84	0.83	0.92
# 15. High waist hip ratio *** (% yes)	35.5%	39.8%	77.0%
#16. Binge drinking (% yes) (N=368, male only)	17.6%	16.4%	15.9%
#17. Heavy smoking (% yes) (N=368, male only)	21.2%	17.9%	22.0%

Notes: ^ significant at the  $p < 0.1$  level. \* significant at the  $p < 0.05$  level. \*\* significant at the  $p < 0.01$  level. \*\*\* significant at the  $p < 0.001$  level.

SF-36 subscales: Larger scores indicate better health outcomes. PF = Physical functioning, RP = Role limitations due to physical health problems, BP = Bodily pain, GH = General health perceptions, VT = Vitality, energy, and fatigue, SF = Social functioning, RE = Role limitations due to emotional problems, MH = General mental health. #VDS - Vietnamese Depression Scale: (Range: 3-28) The higher value indicated being more depressed. N=713 with 25 missing cases on depression scale items; #Blood pressure: N=727 with 11 missing cases. Positive affect and negative affect are two health dimensions from affect balance scale. Higher score in positive affect indicates better health outcome. Higher score in negative affect indicates worse health outcome. Waist hip ratio: N=730, with 6 missing cases (mean = 0.85; range 0.57-1.63). High waist hip ratio: waste hip ratio  $\geq 0.90$  for male, or  $\geq 0.80$  for female (N=730, with 6 missing cases). Binge drinking: drink 5 shots or more every day. Heavy smoking: smoke 5 packs or more cigarettes every week.

Table 3: Bivariate relationships between demographic characteristics and mental health outcomes (N=736).

Variables	Health outcomes							
	PF	RP	BP	GH	VT	SF	RE	MH
<b>Age</b>								
23-39	89.86 <sup>^</sup>	81.11	77.97	55.52*	66.02*	88.02	80.95	71.75
40-53	87.94	80.65	76.20	52.48	63.06	85.89	82.53	71.52
<b>Sex</b>								
Male	92.33***	86.42***	80.45***	59.06***	67.42***	86.65	84.50*	72.74*
Female	85.39	75.27	73.66	48.84	61.60	87.23	78.96	70.51
<b>Education</b>								
0-6 years	87.16*	78.94	75.63	51.41***	62.26**	86.69	80.71	70.66
7-9 years	89.73	80.47	77.02	52.77	64.74	87.87	80.47	71.31
10 years or above	90.24	83.18	78.64	57.46	66.80	86.64	83.64	72.86
<b>Occupation</b>								
Unskilled, service, agricultural and unemployed	87.53*	79.04 <sup>^</sup>	75.45***	52.23***	62.77*	85.24	81.28	69.09***
Clerical; factory; skilled; sales	90.90	84.17	81.95	58.24	65.28	88.65	83.79	71.27
Professional	92.43	88.33	80.83	62.84	69.00	89.33	86.67	76.32
Entrepreneur	88.44	79.30	75.69	51.64	64.67	87.16	80.07	72.82
<b>Marital status</b>								
Never married	91.61*	86.01	80.60**	56.09	65.69 <sup>^</sup>	88.05	81.76	71.39***
Married and living with spouse	88.37	79.33	76.44	53.69	64.77	86.45	82.07	72.61
Separated, divorced, widowed	86.60	80.33	73.91	51.56	60.40	87.83	79.56	65.55

Notes: <sup>^</sup> significant at the  $p < 0.1$  level. \* significant at the  $p < 0.05$  level. \*\* significant at the  $p < 0.01$  level. \*\*\* significant at the  $p < 0.001$  level.

SF-36 subscales: Larger scores indicate better health outcomes. PF = Physical functioning, RP = Role limitations due to physical health problems, BP = Bodily pain, GH = General health perceptions, VT = Vitality, energy, and fatigue, SF = Social functioning, RE = Role limitations due to emotional problems, MH = General mental health. #VDS - Vietnamese Depression Scale: (Range: 3-28) The higher value indicated being more depressed. N=713 with 25 missing cases on depression scale items; #Blood pressure: N=727 with 11 missing cases. Positive affect and negative affect are two health dimensions from affect balance scale. Higher score in positive affect indicates better health outcome. Higher score in negative affect indicates worse health outcome. Waist hip ratio: N=730, with 6 missing cases (mean = 0.85; range 0.57-1.63). Binge drinking: drink 5 shots or more every day. Heavy smoking: smoke 5 packs or more cigarettes every week.

Table 3. Continued: (N=736).

Variables	Health Outcomes							
	VDS	Positive affect	Negative affect	Blood Pressure	BMI	High WHR (% Yes)	#Binge drinking (% Yes)	#Heavy Smoking (% Yes)
<b>Age</b>								
23-39	4.30	7.77	7.23	96.57***	21.96***	35.6%***	18.7%%	15.9%^
40-53	4.78	7.95	7.15	101.22	22.84	54.6%	14.5%%	23.1%
<b>Sex</b>								
Male	3.99***	7.96	6.93***	95.29***	22.78**	40.4%**	N/A	N/A
Female	5.10	7.75	7.47	102.59	22.04	50.0%	N/A	N/A
<b>Education</b>								
0-6 years	4.68	7.43***	7.13	101.22***	22.70^	51.9%***	16.5%	26.6%*
7-9 years	4.51	7.82	7.12	98.92	22.43	47.9%	18.0%	12.4%
10 years or above	4.41	8.33	7.31	96.43	22.09	36.4%	15.7%	17.1%
<b>Occupation</b>								
Unskilled, service, agricultural and unemployed	5.06^	7.42***	7.35	99.90	22.19	44.6%	15.8%	15.8%
Clerical; factory; skilled; sales	4.37	8.08	7.35	97.46	22.75	45.4%	24.2%	24.2%
Professional	3.88	8.39	7.23	96.90	22.15	38.7%	15.7%	19.6%
Entrepreneur	4.31	8.03	6.99	99.06	22.54	47.2%	14.1%	20.7%
<b>Marital status</b>								
Never married	4.47*	7.64	7.44*	98.34	21.58***	37.1*	22.2%	16.7%
Married and living with spouse	4.38	7.94	7.06	99.36	22.77	48.4%	14.1%	21.1%
Separated, divorced, widowed	5.75	7.76	7.61	97.22	21.78	41.3%	22.7%	13.6%

Notes: ^ significant at the  $p < 0.1$  level. \* significant at the  $p < 0.05$  level. \*\* significant at the  $p < 0.01$  level. \*\*\* significant at the  $p < 0.001$  level.

SF-36 subscales: Larger scores indicate better health outcomes. PF = Physical functioning, RP = Role limitations due to physical health problems, BP = Bodily pain, GH = General health perceptions, VT = Vitality, energy, and fatigue, SF = Social functioning, RE = Role limitations due to emotional problems, MH = General mental health. #VDS - Vietnamese Depression Scale: (Range: 3-28) The higher value indicated being more depressed. N=713 with 25 missing cases on depression scale items; #Blood pressure: N=727 with 11 missing cases. Positive affect and negative affect are two health dimensions from affect balance scale. Higher score in positive affect indicates better health outcome. Higher score in negative affect indicates worse health outcome. Waist hip ratio: N=730, with 6 missing cases (mean = 0.85; range 0.57-1.63). Binge drinking (male only, n = 368): drink 5 shots or more every day. Heavy smoking (male only, n = 368): smoke 5 packs or more cigarettes every week.

Table 4: Multivariate regression analysis on migration and health outcomes (N=736).

Mental health outcomes	Never-leavers Beta	Immigrants Beta	Returnees Beta	R <sup>2</sup>
<b>PF: Physical functioning</b>				
Model 1: Never-migrants as reference group		-3.33*	-0.69	0.09
Model 2: Immigrants as reference group	3.33*		2.64	0.09
<b>RP = Role limitations due to physical health problems</b>				
Model 1: Never-migrants as reference group		7.36*	-0.10	0.04
Model 2: Immigrants as reference group	-7.36*		-7.46^	0.04
<b>BP = Bodily pain</b>				
Model 1: Never-migrants as reference group		-1.62	-0.95	0.07
Model 2: Immigrants as reference group	1.62		0.67	0.07
<b>GH = General health</b>				
Model 1: Never-migrants as reference group		13.65***	-4.85**	0.17
Model 2: Immigrants as reference group	-13.65***		-18.50***	0.17
<b>VT: Vitality, energy, and fatigue</b>				
Model 1: Never-migrants as reference group		-3.74*	0.40	0.07
Model 2: Immigrants as reference group	3.74*		4.14*	0.07
<b>SF: Social functioning</b>				
Model 1: Never-migrants as reference group		-6.56***	-4.93**	0.03
Model 2: Immigrants as reference group	6.56***		1.63	0.03
<b>RE: Role limitations due to emotional problems</b>				
Model 1: Never-migrants as reference group		10.53**	-4.23	0.03
Model 2: Immigrants as reference group	-10.53**		-14.77***	0.03
<b>MH: General mental health</b>				
Model 1: Never-migrants as reference group		-3.40*	-1.95	0.05
Model 2: Immigrants as reference group	3.40*		1.45	0.05

Notes: ^ significant at the  $p < 0.1$  level. \* significant at the  $p < 0.05$  level. \*\* significant at the  $p < 0.01$  level. \*\*\* significant at the  $p < 0.001$  level.

SF-36 subscales: Larger scores indicate better health outcomes. PF = Physical functioning, RP = Role limitations due to physical health problems, BP = Bodily pain, GH = General health perceptions, VT = Vitality, energy, and fatigue, SF = Social functioning, RE = Role limitations due to emotional problems, MH = General mental health. #VDS - Vietnamese Depression Scale: (Range: 3-28) The higher value indicated being more depressed. N=713 with 25 missing cases on depression scale items; #Blood pressure: N=727 with 11 missing cases. Positive affect and negative affect are two health dimensions from affect balance scale. Higher score in positive affect indicates better health outcome. Higher score in negative affect indicates worse health outcome. Waist hip ratio: N=730, with 6 missing cases (mean = 0.85; range 0.57-1.63). Binge drinking (male only, n = 368): drink 5 shots or more every day. Heavy smoking (male only, n = 368): smoke 5 packs or more cigarettes every week.

Table 4 Continued (N=736):

Health Outcomes	Never-leavers Beta	Immigrants Beta	Returnees Beta	R <sup>2</sup>
<b>Depression</b>				
Model 1: Never-migrants as reference group		-0.35	0.93*	0.04
Model 2: Immigrants as reference group	0.35		1.28*	0.04
<b>Positive affect</b>				
Model 1: Never-migrants as reference group		0.65***	-0.72***	0.08
Model 2: Immigrants as reference group	-0.65***		-1.37***	0.08
<b>Negative affect</b>				
Model 1: Never-migrants as reference group		0.43*	0.33^	0.04
Model 2: Immigrants as reference group	-0.43*		-0.10	0.04
<b>Blood pressure</b>				
Model 1: Never-migrants as reference group		-3.68**	2.77*	0.15
Model 2: Immigrants as reference group	3.68**		6.46***	0.15
<b>BMI</b>				
Model 1: Never-migrants as reference group		1.44***	-0.12	0.08
Model 2: Immigrants as reference group	-1.44		-1.56***	0.08
	Odds ratio	Odds ratio	Odds ratio	
<b>#High waist hip ratio (yes/no)</b>				
Model 1: Never-migrants as reference group		5.31***	0.90	0.12
Model 2: Immigrants as reference group	0.19***		0.17***	0.12
<b>#Binge drinking (yes/no, male only)</b>				
Model 1: Never-migrants as reference group		1.03	1.24	0.02
Model 2: Immigrants as reference group	0.97		1.21	0.08
<b>#Heavy smoking (yes/no, male only)</b>				
Model 1: Never-migrants as reference group		1.08	1.25	0.02
Model 2: Immigrants as reference group	0.93		1.16	

Notes: ^ significant at the  $p < 0.1$  level. \* significant at the  $p < 0.05$  level. \*\* significant at the  $p < 0.01$  level. \*\*\* significant at the  $p < 0.001$  level.

SF-36 subscales: Larger scores indicate better health outcomes. PF = Physical functioning, RP = Role limitations due to physical health problems, BP = Bodily pain, GH = General health perceptions, VT = Vitality, energy, and fatigue, SF = Social functioning, RE = Role limitations due to emotional problems, MH = General mental health. #VDS - Vietnamese Depression Scale: (Range: 3-28) The higher value indicated being more depressed. N=713 with 25 missing cases on depression scale items; #Blood pressure: N=727 with 11 missing cases. Positive affect and negative affect are two health dimensions from affect balance scale. Higher score in positive affect indicates better health outcome. Higher score in negative affect indicates worse health outcome. High waist hip ratio: waste hip ratio  $\geq 0.90$  for male, or  $\geq 0.80$  for female (N=730, with 6 missing cases). Binge drinking: drink 5 shots or more every day. Heavy smoking: smoke 5 packs or more cigarettes every week.

Table 5: Bivariate associations between emigration and repatriation variables and health outcomes among Vietnamese migration returnees (#N=136).

Independent variables	Health Outcomes							
	PF	RP	BP	GH	VT	SF	RE	MH
Camp stay in years (Correlation coeff.)	0.058	-0.066	-0.055	0.048	-0.006	-0.059	-0.124	0.011
Time in Vietnam since returning (Correlation coeff.)	0.028	0.047	0.018	-0.043	-0.023	0.025	0.073	0.017
Numbers of communities lived since returning (Correlation coeff.)	-0.008	-0.183*	-0.140^	-0.080	-0.056	-0.054	0.107	0.098
Community reaction (mean)								
Fine, no problem	89.77	78.60	77.10	47.53	65.41	83.67	77.18	70.67
Somewhat not accepting	87.80	82.00	76.00	52.20	68.60	82.50	74.67	69.76

Notes: ^ significant at the  $p < 0.1$  level. \* significant at the  $p < 0.05$  level. \*\* significant at the  $p < 0.01$  level. \*\*\* significant at the  $p < 0.001$  level.

# there are 6 missing cases with information on camps stay. SF-36 subscales: Larger scores indicate better health outcomes. PF = Physical functioning, RP = Role limitations due to physical health problems, BP = Bodily pain, GH = General health perceptions, VT = Vitality, energy, and fatigue, SF = Social functioning, RE = Role limitations due to emotional problems, MH = General mental health. #VDS - Vietnamese Depression Scale: (Range: 3-28) The higher value indicated being more depressed. N=713 with 25 missing cases on depression scale items; #Blood pressure: N=727 with 11 missing cases. Positive affect and negative affect are two health dimensions from affect balance scale. Higher score in positive affect indicates better health outcome. Higher score in negative affect indicates worse health outcome. High waist hip ratio: waste hip ratio  $\geq 0.90$  for male, or  $\geq 0.80$  for female (N=730, with 6 missing cases). Binge drinking: drink 5 shots or more every day. Heavy smoking: smoke 5 packs or more cigarettes every week.

Table 5 Continued: (N=136)

Independent variables	Health Outcomes					
	VDS	Positive affect	Negative affect	Blood pressure	BMI	WHR
Camp stay in years (Correlation coeff.)	0.143 <sup>^</sup>	-0.075	0.150 <sup>^</sup>	0.019	-0.081	-0.013
Years in Vietnam since returning (Correlation coeff.)	0.078	0.103	-0.122	0.015	0.104	0.079
Numbers of communities lived since returning (Correlation coeff.)	0.074	0.023	-0.024	0.107	0.025	0.054
Community reaction (mean)						
Fine, no problem	5.22	7.07	7.16 <sup>^</sup>	103.71	22.10	0.8379
Somewhat not accepting	5.68	7.24	7.92	99.15	21.77	0.8591

Notes: <sup>^</sup> significant at the p < 0.1 level. \* significant at the p < 0.05 level. \*\* significant at the p < 0.01 level. \*\*\* significant at the p < 0.001 level.

SF-36 subscales: Larger scores indicate better health outcomes. PF = Physical functioning, RP = Role limitations due to physical health problems, BP = Bodily pain, GH = General health perceptions, VT = Vitality, energy, and fatigue, SF = Social functioning, RE = Role limitations due to emotional problems, MH = General mental health. #VDS - Vietnamese Depression Scale: (Range: 3-28) The higher value indicated being more depressed. N=713 with 25 missing cases on depression scale items; #Blood pressure: N=727 with 11 missing cases. Positive affect and negative affect are two health dimensions from affect balance scale. Higher score in positive affect indicates better health

Table 6: Multivariate regression models on health outcomes among Vietnamese migration returnees (#N=136).

Predictors	Health Outcomes							
	PF	RP	BP	GH	VT	SF	RE	MH
Age	-0.24	-0.46	-0.31	-0.40	-0.60*	-0.07	0.07	-0.32
Sex (Female as ref)								
Male	8.80***	14.02*	8.41*	11.14**	6.39*	6.64^	12.49^	1.91
Occupation								
Unskilled, service, agricultural and unemployed (ref)								
Skilled, clerical, factory and sales	3.09	-2.54	3.72	1.57	0.21	-9.24	-15.66	1.68
Professional and entrepreneur	-1.28	2.55	1.58	1.57	5.74*	-2.42	1.47	5.90*
Marital status								
Separated, formerly married (ref)								
Never married	-0.35	-8.98	0.04	9.92	-2.71	4.15	3.12	3.68
Currently married & living with spouse	-5.71	-20.53	-5.25	4.07	-4.57	-4.56	-10.41	5.81
Camp stay (by years)	-0.29	-1.21	-0.48	0.52	-0.20	-0.42	-1.99	-0.09
Community reaction								
Fine, no problem (ref.)								
Somewhat not accepting	-1.97	3.66	-1.47	2.99	1.88	-0.86	-1.29	-2.21
Constant	99.39***	110.39***	89.17***	47.77**	87.70***	89.02***	86.00**	75.11***
R <sup>2</sup>	0.14	0.07	0.08	0.14	0.12	0.06	0.07	0.09

Notes: ^ significant at the p < 0.1 level. \* significant at the p < 0.05 level. \*\* significant at the p < 0.01 level. \*\*\* significant at the p < 0.001 level.

# there are 6 missing cases with information on camps stay. SF-36 subscales: Larger scores indicate better health outcomes. PF = Physical functioning, RP = Role limitations due to physical health problems, BP = Bodily pain, GH = General health perceptions, VT = Vitality, energy, and fatigue, SF = Social functioning, RE = Role limitations due to emotional problems, MH = General mental health. #VDS - Vietnamese Depression Scale: (Range: 3-28) The higher value indicated being more depressed. N=713 with 25 missing cases on depression scale items; #Blood pressure: N=727 with 11 missing cases. Positive affect and negative affect are two health dimensions from affect balance scale. Higher score in positive affect indicates better health outcome. Higher score in negative affect indicates worse health outcome. High waist hip ratio: waste hip ratio  $\geq 0.90$  for male, or  $\geq 0.80$  for female (N=730, with 6 missing cases). Binge drinking: drink 5 shots or more every day. Heavy smoking: smoke 5 packs or more cigarettes every week.

Table 6 Continued: (N=136)

Predictors	Health Outcomes					
	VDS	Positive affect	Negative affect	Blood pressure	BMI	WHR
Age	0.18*	-0.05 <sup>^</sup>	0.04	0.64**	0.10 <sup>^</sup>	0.004***
Sex (Female as ref)						
Male	-2.47**	0.44	-1.18**	10.64**	0.70	0.07***
Occupation						
Unskilled, service, agricultural and unemployed (ref)						
Skilled, clerical, factory and sales	-1.66	1.02 <sup>^</sup>	0.10	-2.60	0.45	0.003
Professional and entrepreneur	-1.38 <sup>^</sup>	0.81*	-0.34	0.49	0.79	0.01
Marital status						
Separated, formerly married (ref)						
Never married	2.43	0.52	0.41	-0.66	-0.43	0.01
Currently married & living with spouse	2.14	0.83	0.52	-7.99 <sup>^</sup>	0.28	-0.005
Camp stay (by years)	0.39 <sup>^</sup>	-0.10	0.14	0.71	-0.10	0.001
Community reaction						
Fine, no problem (ref.)						
Somewhat not accepting	0.48	0.04	0.73 <sup>^</sup>	-4.18	-0.14	0.025 <sup>^</sup>
Constant	-3.59	8.04***	5.22***	74.05***	18.11***	0.63***
R <sup>2</sup>	0.14	0.13	0.12	0.22	0.09	0.32

Notes: <sup>^</sup> significant at the p < 0.1 level. \* significant at the p < 0.05 level. \*\* significant at the p < 0.01 level. \*\*\* significant at the p < 0.001 level.

SF-36 subscales: Larger scores indicate better health outcomes. PF = Physical functioning, RP = Role limitations due to physical health problems, BP = Bodily pain, GH = General health perceptions, VT = Vitality, energy, and fatigue, SF = Social functioning, RE = Role limitations due to emotional problems, MH = General mental health. #VDS - Vietnamese Depression Scale: (Range: 3-28) The higher value indicated being more depressed. N=713 with 25 missing cases on depression scale items; #Blood pressure: N=727 with 11 missing cases. Positive affect and negative affect are two health dimensions from affect balance scale. Higher score in positive affect indicates better health outcome. Higher score in negative affect indicates worse health outcome

