The migration of doctors and nurses from South Pacific Island Nations

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Abstract

Little is known of the structure of the international migration of skilled health professionals. Accelerated migration of doctors and nurses from the Pacific island states of Fiji, Samoa and Tonga to the Pacific periphery is part of the globalization of health care. The findings from a recent survey of 251 doctors and nurses from the three island countries are reported here. Key determinants of both present migration status and future migration intentions were analyzed using econometric methods. Nurses' and doctors' propensities to migrate are influenced by both income and non-income factors, including ownership of businesses and houses. Migrants also tend to have more close relatives overseas, to have trained there, and so experienced superior working conditions. Migration propensities vary between countries, and between nurses and doctors within countries. Tongan nurses have a higher propensity to migrate, mainly because of greater relative earnings differentials, but are also more likely to return home. The role of kinship ties, relative income differentials and working conditions is evident in other developing country contexts. Remittances and return migration, alongside business investment, bring some benefits to compensate for the skill drain. National development policies should focus on encouraging return migration, alongside retention and recruitment, but are unlikely to prevent out migration.

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Introduction

This paper seeks to examine the rationale for the migration of skilled health professionals (SHPs) from a group of three Pacific island countries (PICs)—Fiji, Samoa and Tonga—in each of which there has been a considerable international skill drain from the health sector. Despite its growing significance, hitherto there have been few studies of the migration of SHPs, especially from developing states, and none that examine the structure of migration at both source and destination. The role of human resources is central to development, especially in small states, and the limited

availability of skilled human resources can be a constraint to development. In the health arena the significance of human resources is doubled; SHPs directly improve the quality of life for others, who are then able to contribute more to the wider society. Conversely the lack of availability of skilled health workers has harmful ramifications for the rest of society. This paper examines one particular facet of that availability: the role of international migration in the changing distribution of SHPs.

In most island states there is a continued need to ensure that training and education are relevant to the particular situation of small states, in terms of local constraints and requirements. This has been better achieved in the Caribbean than in the South Pacific because of a lack of resources in the latter group of countries to make appropriate curriculum changes (Commonwealth Secretariat, 1997, p. 130; cf. Walt

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et al, 2002). Hence training within the Pacific region has rarely produced adequate numbers of SHPs. The lack of adequate numbers of appropriately skilled health workers, has been exacerbated, particularly in the smallest states, where there is migration (and thus attrition) of the labour force.

Migration of SHPs into, within and from the PICs is widely considered to be a growing problem. It affects core national strategies for health sector development, creating problems for health care and for human resource planning and development. Training of SHPs is particularly costly because of the long duration, the high costs of teaching materials and techniques (and the need for post-graduate education and training programs) and the limited resources of PICs. Consequently the loss of SHPs is unusually costly. Replacements may also be costly (and may be lacking in appropriate skills, languages and cultural sensitivity), thus creating potential problems in satisfying basic needs, achieving sustainable health strategies and developing healthy islands.

Hitherto no comprehensive study has been undertaken of the migration of SHPs within the context of regional (even global) labour markets. Consequently there is inadequate information on the rationale and impacts of the migration of SHPs, or the particular forms of migrant selectivity. The evidence that is available points to some worsening of the situation, in terms of attrition and migration rates, during the last decade, accompanying the widespread down-sizing (or stabilizing) of public service numbers. The situation in the PICs was already a source of concern a decade ago: 'The region faces a crisis in terms of its health work force, not only in terms of direct care providers but at all levels of the system. It is not surprising that one of the most frequently mentioned topics is the shortage of doctors…The physician shortage is only the tip of the iceberg…Inefficiency in health systems is a major problem and there is a crucial need for trained administrative personnel' (Lewis, 1990, p. 84). It is in this deteriorating context that the present study is situated.

In the Pacific and elsewhere little empirical information exists about the international migration of SHPs. This paper reports the findings of a survey conducted in 2001–2002 among SHPs in three PICs and two destination countries—Australia and New Zealand. SHPs were interviewed in both origins and destinations. Using data from the survey a statistical analysis was undertaken of the determinants of migration (and return migration) among the sampled doctors and nurses. Hence this is a unique study of the determinants of both migration and return migration. It is also unique in terms of the method applied, since it surveys three categories of SHPs: current migrants, return migrants and non-migrants (stayers). The consolidated data set is then analyzed using econometric methods. The method and conclusions are potentially applicable both to island states elsewhere, notably in the Caribbean where there are structural parallels (Connell, 1991; Connell & Conway, 2000), and to other countries where the populations are much larger and the migrants much more widely dispersed (e.g. Philippines or South Africa), though comparable surveys in those countries would be extremely difficult. In this respect the South Pacific could be conceived as a 'laboratory' for analyzing the determinants of migration among SHPs in general.

The paper is structured as follows: the following sections discuss: the background to migration of SHPs in the South Pacific; the survey; the specification of the three models of migration; the descriptive statistics and econometric results; relative deprivation in terms of comparative income levels; and, conclusions.

Migration in Pacific Island nations

Since the 1960s there has been a very substantial rise in the extent and significance of migration within and from the PICs. The most substantial emigration streams in the region have come from the central Polynesian states (including Tonga and Samoa). However there has long been a significant migration stream of Indo-Fijians from Fiji to several metropolitan destinations. In terms of the migration of SHPs this is the most important stream in the region (Connell, 2002). Fiji is the largest state in the region, with about 825,000 people, while Tonga (with about 100,000 people) and Samoa (with about 170,000 people) have more or less static populations, because of high rates of emigration. All three island states experience low or even negative rates of economic growth. Limited land areas, few natural resources, isolation and fragmentation, and weak infrastructures all pose problems for administration and development.

Whilst the scale of international migration is affected by the vicissitudes of the international economy, migration is primarily affected by uneven development: inequalities, both real and perceived, in socio-economic opportunities. These include income levels and the desire for access to education and health services. Tertiary education is usually undertaken outside the home country, particularly for the smaller states, a factor contributing to emigration (e.g. Workman et al, 1981). Traditionally metropolitan countries have been the main destinations for tertiary studies, but the growth of facilities within the Pacific, especially associated with the University of the South Pacific (USP) in Fiji, and the availability of scholarships elsewhere, have both diversified the range of migration options and encouraged new tertiary movements within the Pacific.

Skilled workers, and SHPs in particular, are a high proportion of immigrants from PICs into metropolitan states. This is attributable to increased demand for skilled migrants in these metropolitan destinations, and the continued (and increasing) scarcity of health workers there, because of relatively low wages and poor working conditions (Nowak & Preston, 2001). Each of the principal destinations for SHPs—the United States, Canada, Australia and New Zealand—has the acquisition of permanent skilled migrants as one objective of their immigration policies. Indeed they have become competitors in trying to attract highly skilled migrants (Cobb-Clark & Connolly, 1997). New Zealand has actively recruited in the PICs, especially Fiji, for SHPs. Ironically many of those migrants become underemployed, contributing to 'brain loss' or 'brain-waste', because their qualifications, despite contributing to gaining them entry, are unrecognized in the destination countries.

Overall, the available evidence on international migration in the Pacific islands demonstrates that in the short-run a number of distinct benefits accrue to individual migrants and their families and to the sending societies (Connell & Brown, 1995). The extent to which this general conclusion also applies to skilled migrants, and especially SHPs, remains to be demonstrated, but is particularly appropriate in a context where there is a widespread perception that any financial gains are outweighed by the costs of the skill drain.

Fiji has much the largest, most complex and developed health care system in the region. Its health care system has been most affected by emigration, especially in the last 15 years, when ethnic tensions and military coups prompted a series of resignations and departures, notably after the 1987 and 2000 coups. These prompted a political, economic and social crisis and very substantial emigration, mainly of Indo-Fijians who made up about half the population, with a loss of 100 doctors in 1 year alone (Mitchell, 1988, p. 77). There was not merely a substantial loss of doctors and other medical workers but those who went may well have been the more competent and dedicated staff.

Samoa (formerly Western Samoa) has a health system that has been substantially affected by the large-scale emigration of SHPs. 'Whilst there have been significant numbers of Samoan doctors trained since independence, losses of doctors to other countries in the region and to rim countries continues to be a major problem' (World Bank, 1994, p. 315), hence in 1991 most Samoan doctors practicing in the public system were either of retirement age (15 out of 34) or new graduates (8 of the 34 being aged less than 35) and accounted for only 60% of all public sector doctors, with most of the remainder being United Nations Volunteer doctors. It was argued at the start of the 1990s that 'Many new graduates have not been satisfied with salaries offered and have acquired more remunerative positions elsewhere. According to one 1992 estimate, some 50% of medical graduates migrated over the period 1958–1991 with 80% of this loss occurring since 1980' (cited in World Bank, 1994, p. 322). Similar problems of retention were evident for other SHPs, and were attributed 'to salary levels offered by the government relative to alternative employment opportunities in the region and rim countries' (World Bank, 1994, 323–324). By contrast the number of nurses was then regarded as adequate, though there was a shortage by 1998 when there were only 140 nurses working at the National Hospital (compared with the required staff number of 168). This situation has persisted.

The Kingdom of Tonga is a Polynesian state with a population of just under 100,000 but, in parallel with Samoa, almost as many ethnic Tongans live overseas. Because of the distribution of Tonga's population over some forty populated islands Tonga's health system is more complex and decentralized than in most countries. However since about 70% of the country's population now live on the main island of Tongatapu the central Vaiola hospital plays a crucial role in health delivery. As in Samoa, medical officers are trained overseas, whilst the training of Health Officers and nurses takes place locally. There has been very substantial emigration of SHPs 'who have sought and taken positions overseas where better terms and conditions of service are offered' (World Bank, 1994, p. 226), yet, despite this migration, almost all posts are occupied by Tongans. By the mid-1990s there was concern that difficulties would arise in the health sector if training numbers were not maintained, or the extent of emigration increased, since a significant number of doctors were due to retire within a decade.

In each of the three states the human resource situation in the health sector changed relatively little through the 1990s. Fiji experienced a worsening of doctor–patient and nurse–patient ratios, whereas in Tonga and Samoa there had been relatively little change, but some slight improvement in ratios, albeit from a low base. The present study was thus undertaken at a time when there was no significant worsening of the migration rate, but in circumstances of widespread concern over the impact of emigration on health care. In each of the states the migration of doctors was considered to be more significant than that of nurses, in terms of the proportions who had migrated, their impact on the health care system and the cost of replacement.

The survey

The global rise in the migration of skilled workers has been perceived as a response to the accelerated globalization of the service sector. Such professional

services as health care are very much part of the new internationalization of labour (e.g. Gish & Godfrey, 1979; Buchan & O'May, 1999; Hardill & MacDonald, 2000; Raghuram & Kofman, 2002). In the South Pacific as elsewhere, the migration of SHPs is no new phenomenon. At least as early as 1989 a medical degree from the Fiji School of Medicine was regarded by some as a 'passport to prosperity'. However there have been few studies of any facet of this migration, and those that do exist have been entirely qualitative (Naidu, 1997; Rotem & Bailey, 1999).

Analyses of migration of SHPs in other parts of the world, such as that on doctors moving from Australia and New Zealand to the United States (Miller, Laugesen, Lee, & Mick, 1998), from Canada to the United States (McKendry et al, 1996) or moving within the United States (Baer, Gesler, & Konrad, 2000), of nurses moving from the Philippines (Joyce & Hunt, 1982; Ishi, 1987; Ball, 1996) and of the internal mobility of female doctors within Mexico (Harrison, 1998) are of marginal relevance to the situation in the PICs, being in either developed countries and/or in contexts with very different stock situations. A growing number of studies have addressed issues of skilled labour migration in other developing regions, but have usually focused on other professional skills (Findlay & Stewart, 2002). Only one other study in the Pacific region has examined skilled migration, but of an undifferentiated group of Samoan professionals (Liki, 2001). In short there are remarkably few studies in the Pacific or elsewhere of the migration of SHPs.

Although there has also been some return migration of skilled workers from overseas, this has never been effectively studied in the health sector, and there has been virtually no examination of return migration in the PICs (cf. Maron, 2001), primarily because of the erroneous assumption that it is rare (Liki, 2001). It is therefore critically important to examine why migration has occurred, and hence what prospects

and policies exist for attracting more return migration of SHPs.

The two most favored destinations for movers from the three island states were Australia (Sydney) and New Zealand (Auckland), hence the study of movers was conducted in those two cities. The studies focused on household structure, training, the rationale for migration, careers (labour market experience) and the potential for future stability or further migration (including return migration). Samples were developed in conjunction with the migrant communities, academic researchers and medical organizations, and included both those who had remained employed in the health sector and those who had left (although the difficulties in tracing the latter group meant that there were very few of them). In the destinations snowball sampling was undertaken since there was no basis for alternative approaches. The precise population sizes of the Fijian, Tongan and Samoan migrant communities in New Zealand and Australia are unknown, because of census and definitional problems. However there is some evidence that the sample represented a considerable proportion of the migrant SHPs from the three island states in the metropolitan countries.

Parallel surveys were undertaken within the three countries of origin, Tonga, Samoa and Fiji, of local nurses and doctors, that focused on similar themes alongside attitudes to the health profession and the propensity to migrate. These were entirely undertaken in the capital cities, because of logistical and economic considerations, and hence exclude other centers (where pressures on SHPs, and the propensity to migrate, may be somewhat greater, and demand for adequate health care less likely to be satisfied). Stratified random sampling was used.

The core study included 251 respondents. The composition of the sample is shown in Table 1. Some 77 respondents were current migrants, in metropolitan states (approximately half each in Australia and New

Table 1
Composition of sample by country of birth and migration category

	Current migrants (n = 77)		Return migrants (n = 64)		Non-migrants (n = 110)		Total sample (n = 251)		Doctors and nurses (n = 251)
	Doctors	Nurses	Doctors	Nurses	Doctors	Nurses	Doctors	Nurses	
Fijians (n = 107)	10	17	8	10	11	51	29	78	107
Samoans (n = 57)	3	4	8	12	3	27	14	43	57
Tongans (n = 87)	11	32	15	11	0	18	26	61	87
Total (n = 251)	24	53	31	33	14	96	69	182	251

Zealand), 64 had returned from overseas and were again employed in the health sector and 110 had never moved. The largest number was from Fiji. More than two-thirds of the respondents were nurses, a reflection of the structure of the health care system. Two-thirds of the doctors were males and 95% of the nurses were females, hence the majority of the sample were women. The surveys were undertaken by experienced research assistants who had, as far as possible, some links with the relevant communities and had experience in the health sector.

Specification of migration models

Current migration status

The complexity of international migration is considerable. Economic variables, and especially the relationship between income levels and cost of living, are of key relevance in influencing migration decisions. According to human capital theory, people tend to migrate if predicted earnings (estimated relative to age, education and years of work experience) and real incomes set against costs of living are greater in the destination country (Harris & Todaro, 1970; Borjas & Bratsberg, 1996). Social variables can also be of considerable significance, with family and kinship ties central to decision making (Liki, 2001; Lee, 2003). Migration now has a substantial history in the PIC region, overseas social networks (the 'transnational corporation of kin') are extensive, access to education for family members is important and social status is of some concern in much of the region (Marcus, 1981; Liki, 2001). All of this is tied into the conditions and location of training facilities, hence Taylor simply concluded for PICs that 'Migration is more likely if an individual had recognizable qualifications in the destination country, lived there for some period, and particularly if married to a national of that country—all are often a consequence of overseas professional training' (Taylor, 1990, p. 92). It can be expected that Samoans and Tongans, most of whom have trained overseas, will be more likely to migrate than Fijians. The balance between such variables and many others is likely to vary significantly between places and social categories.

Existing studies of the PICs emphasize that migration is primarily related to quality of life issues that involve the particular employment context (poor working conditions, inadequate facilities, limited opportunities for research or career development), income (particular professional salary structures, costs of living) and a variety of social factors (educational opportunities for children, location of kin, morale), though not necessarily in that order (Macpherson, 1999). None of these factors is surprising; they parallel similar conclusions elsewhere,

but they do not necessarily provide a sophisticated understanding of migration.

Individuals have also joined the health workforce for other reasons, from family pressure to altruism, and have similarly migrated for other reasons, including frustration with working conditions in hospitals, to join kin, or, in the case of Fiji, for political reasons (Connell, 2001). Existing location of kin in major migrant destinations has also been a critical influence on migration. Working conditions in Pacific hospitals are often poor, there is limited access to modern technology and ongoing training, long hours and considerable discrepancies between wages and salaries in PICs and metropolitan states (Connell, 2001), hence there has been a recent and substantial history of migration from each of the three states. However island nations are far from identical, and doctors and nurses within a country do not necessarily face the same incentives to migrate.

The decision of an individual to migrate may therefore be modeled as a process where he or she is influenced by a combination of individual characteristics, perceived material and other work-related conditions, family and kinship considerations, as well as other country-specific factors including relative socio-economic conditions among SHPs, the political climate and cultural differences. In this section, three migration models are specified and, in the following section, are tested using appropriate econometric methods.

The simplest form of a migration model can be represented by the equation:

$$M_i = \beta_0 + \beta_1 I_i + \beta_2 W_i + \beta_3 S_i + \beta_4 C_i + \varepsilon, \qquad (1)$$

where M_i is the probability of the ith individual being a migrant; I_i the variables describing the individual's personal characteristics; W_i the variables describing the individual's material conditions; S_i the variables describing the individual's family or kinship situation; C_i the variables capturing other unobserved country-level conditions; β_0 (the constant term), $\beta_1, \beta_2, \beta_3$ and β_4 are the parameters to be estimated and ε is the error term. In the first model we consider two possible states for the dependent variable (M_i), *migrant* and *non-migrant*, where the migrant category includes both current and return migrants. Accordingly, we use a binomial logit model to estimate the main characteristics affecting the probability of the respondent being a *migrant*. The dependent variable *MIGRATOR* is equal to 1 when the individual is a migrant (current or returned) and equal to 0 if a non-migrant (stayer).

As the literature on brain-drain often points out, out-migration can be highly beneficial if the migrants subsequently return to their country of origin with accumulated work experience, and possibly additional qualifications and other capital assets from the host country. The extent of return migration to PICs is usually small (Connell, 1984; Hayes, 1985; Macpherson,

1985; Ahlburg & Levin, 1990; Ahlburg, 1994; cf. Liki, 2001), so that the potential for the transfer of overseas acquired human capital is rather limited. However, studies of migrants' remittances and return migration among Tongan and Samoan migrants have found strong evidence of sizeable capital transfers from migrants intending to return to their country of birth (Brown, 1997; Ahlburg & Brown, 1998). In the second model we therefore consider three possible states for the dependent variable (M_i), *current migrant, return migrant* and *non-migrant*, with a view to identifying factors that most affect the probability of a migrant returning to his/her country of birth. Accordingly, we use a multinomial logit model where the dependent variable *MIGSTAT* (migration status) is equal to 0 for a current migrant, 1 for a return migrant, and 2 for a non-migrant. In this model we estimate the main characteristics affecting the probability of the ith being a return migrant or a non-migrant versus a current migrant.

In both models, and following the previous discussion of relevant migration literature, the dependent variable is hypothesized to be a function of the following independent variables available from the survey data:

Individual characteristics
Age of individual in years (continuous variable *AGE*).
Occupation of individual (dummy variable *NURSE*, equal to 1 if a nurse and 0 if a doctor).
(Gender is not included as a separate variable in view of problems of multicolinearity with *NURSE* given that 95% of nurses were women. Similarly, country of training cannot be included as a variable since all Samoan and Tongan doctors are overseas trained).
Income earnings potential given as major reason for becoming a SHP (dummy variable *MEDINC*, equal to 1 if yes, 0 if no).
Income indicated as a major reason for current migrant status (dummy variable *INCMOT*, equal to 1 if yes, 0 if no).
Material conditions
Ownership of house (dummy variable equal to 1 if yes, 0 if no).
Ownership of a business (dummy variable equal to 1 if yes, 0 if no).
(As income is also a function of the individual's current migrant status, declared income at time of survey cannot be included in this model as an independent variable. The attitudinal variables *MEDINC* and *INCMOT* should however capture the extent to which perceptions about income differentials are significant predictors of the individual's actual migration decision.)
Family situation
Living separately from spouse (dummy variable *APART* equal to 1 if yes, 0 if no)

One or more parent(s) living abroad (dummy variable *OSPAR* equal to 1 if yes, 0 if no).
Unobserved country-level differences
Country of birth (set of dummy variables: *FIJI-BORN* equal to 1 if born in Fiji, 0 otherwise; *SAMBORN* equal to 1 if born in Samoa, 0 otherwise; the omitted category is Tongan born).

These variables capture any other, country-specific unobserved differences. For instance, the average earnings differentials of SHPs relative to other occupations within each country are not captured by any of the other variables and, if relevant, will be picked up by these variables. Similarly any country-specific socio-political conditions—"push-factors"—both in- and outside the workplace, and cultural differences, affecting migration and return migration propensities, will also be captured by these variables.

Future migration intentions

The preceding models of determinants of migration status are based on actual or revealed behaviour in terms of the individual's status as a current migrant, return migrant or non-migrant at the time of the survey. The survey also asked those who had never migrated if they intended to do so in the near future. While attitudinal measures have well-known problems, attitudinal responses contain useful information. Migrants who express an intention to return home are more likely to do so than those who do not (Ahlburg & Brown, 1998). However intentions to return have an effect on behaviour, such as remitting, that are of importance to the home country (Ahlburg & Brown, 1998; Brown, 1997; Galor & Stark, 1990; Macpherson, 1994; Merkle & Zimmermann, 1992). Although intentions may be imperfectly related to actual behaviour, they contain sufficient information to warrant investigation of those expressing an intention to return home.

That is, we posit the following model:

$$I_i = \beta_0 + \beta_1 I_i + \beta_2 W_i + \beta_3 S_i + \beta_4 C_i + \varepsilon, \qquad (2)$$

where the dependent variable (I_i) is the probability of the ith individual intending to migrate, and the independent variables are the same as in the previous migration models (see Eq. (1)) with one exception. As the sample is now restricted to those who have never migrated, but is divided between those who intend to migrate and those who do not, it is reasonable to include current income level as an independent variable. The continuous variable *INCOME* (monthly income in Australian dollars) and *INC2* (being *INCOME*^{2} to express income as a quadratic relationship) are added to the model as additional independent variables.

Data and results

Descriptive statistics

This section uses the dataset from the survey to test the above models explaining migration status—propensities to migrate and to return home—and the migration intentions of non-migrants, for nurses and doctors in the three sampled countries. The names and sample means of the variables used in the analysis are given in Table 2.

The mean values for the same variables for each of the three migration status categories are given in Tables 3a and b. As expected, nurses and doctors who are current migrants have mean incomes substantially greater than those living in their country of birth, although it is also noteworthy that the mean income of return migrants is more than that of stayers (non-migrants). Nurses working in Australia or New Zealand enjoy a mean income of A$1100 per month in comparison with A$318 per month for return migrants and A$221 per month for non-migrants. Return migrant nurses are also rather older than non-migrants (44 years compared with 37 years). While this could also account for the earnings

differential, this is more likely to be an outcome of the additional skills and qualifications gained overseas. With doctors this is not the case.

Although return migrant doctors earn, on average, about one-third more than non-migrants (mean income of A$867 per month in comparison with A$627 per month) they are also younger than non-migrant doctors (38 years in comparison with 43 years). In large part this is an outcome of the bonding system practiced in all three states, which stipulates that doctors trained overseas through national scholarships must return to practice for periods upwards of 3 years.

Income incentives are likely to be an important motivation for migration. Of those who are currently working overseas, a much higher percentage also indicated that income was a major reason for joining the medical profession (MEDINC). Approximately 47% of nurses and 42% of doctors currently working overseas joined the profession for reasons of income, in comparison with 25% and 29% among non-migrant nurses and doctors respectively (Tables 3a and b). In other words, someone who claims to have become a nurse or doctor because of the earnings potential of the profession is more likely to migrate overseas.

Table 2
Definitions and descriptive statistics of regression variables

Variable name	Variable definition	Sample means (Std. dev.)		
		Nurses	Doctors	Combined sample
INCOME	Monthly income in Australian dollars (A$)	471.57 (533.23)	1108.58 (1215.12)	640.90 (822.10)
AGE	Age in years	40.5714 (10.382)	41.9565 (12.562)	40.9522 (11.016)
HOUSE	Ownership of house (yes = 1, no = 0)	0.7033 (0.458)	0.6087 (0.492)	0.6773 (0.468)
BUSINESS	Ownership of business (yes = 1, no = 0)	0.1319 (0.339)	0.2754 (0.450)	0.1713 (0.378)
APART	Married and spouse living in another country (yes = 1, no = 0)	0.0824 (0.276)	0.0580 (0.235)	0.0757 (0.265)
OSPAR	At least one parent or in-law living overseas (yes = 1, no = 0)	0.1374 (0.345)	0.1014 (0.304)	0.1275 (0.334)
MEDINC	Income being a major reason for entering medical profession (yes = 1, no = 0)	0.3352 (0.473)	0.2609 (0.442)	0.3147 (0.465)
INCMOT	Migration status motivated by income (yes = 1, no = 0)	0.3132 (0.465)	0.3333 (0.475)	0.3187 (0.470)
INTENT	Intention to (re-)migrate overseas (yes = 1, no = 0	0.4056 (0.492)	0.4328 (0.499)	0.4130 (0.493)
FIJIBORN	Country of birth is Fiji (yes = 1, no = 0	0.4286 (0.496)	0.4203 (0.497)	0.4263 (0.496)
SAMBORN	Country of birth is Samoa (yes = 1, no = 0)	0.2308 (0.422)	0.2029 (0.405)	0.2231 (0.417)
TONGBORN	Country of birth is Tonga (yes = 1, no = 0)	0.3352 (0.473)	0.3768 (0.488)	0.3466 (0.477)

Table 3
Variable means by migration category

Variable name	Current migrants ($n = 53$)	Return migrants ($n = 33$)	Non-migrants ($n = 96$)
(a) *Nurses*			
INCOME (A$pm)	1100.55	318.17	221.32
AGE (years)	42.00	43.79	38.68
HOUSE	62.26%	69.70%	75.00%
BUSINESS	7.55%	18.18%	14.58%
APART	15.09%	3.03%	6.25%
OSPAR	37.74%	3.03%	4.17%
MEDINC	47.17%	36.36%	25.00%
INCMOT	66.04%	27.27%	13.54%
INTENT	37.74%	40.63%	42.11%
	Current migrants ($n = 24$)	Return migrants ($n = 31$)	Non-migrants ($n = 14$)
(b) *Doctors*			
INCOME (A$pm)	1898.11	867.46	627.37
AGE (years)	45.75	38.55	43.00
HOUSE	75.00%	61.29%	35.71%
BUSINESS	37.50%	19.35%	28.57%
APART	4.17%	9.68%	0.00%
OSPAR	25.00%	3.23%	0.00%
MEDINC	41.67%	12.90%	28.57%
INCMOT	45.83%	19.35%	42.86%
INTENT	50.00%	50.00%[a]	15.38%

[a] One missing observation ($n = 30$).

A separate question was asked about the respondents' motivations for migrating, returning home, or not migrating, including relative income earning opportunities, expressed by the variable INCMOT. Some important differences can be observed among the different categories. Almost two-thirds (66%) of current migrant nurses and 46% of current migrant doctors indicated income was a major reason for moving. However, this does not appear to be a major factor in the decision to return home. Among return migrants only 27% of nurses and 19% of doctors indicated that income was a major reason for their decision to return. With non-migrant nurses, income is even less important as a reason for remaining at home; only 13% of non-migrant nurses considered income an important factor in their decision. However, among non-migrant doctors it is important; 43% of doctors who chose not to migrate indicated that income was an important reason for their decision. This is about the same proportion of current migrant doctors who indicated that income was a major reason for migrating.

These findings are important as they support the view that out-migration decisions are motivated by the higher income earnings opportunities in the wealthier, OECD destination countries. It is not altogether surprising that, of those who return or who choose not to migrate, income is not a major factor in that decision. The finding that non-migrant doctors appear to be motivated by

income to stay is somewhat surprising and worthy of further investigation, especially when it is noted that non-migrant doctors earn, on average about one-third (A$627) of what current migrants earn (A$1898) and about 75% of what return migrants earn (A$867). It is conceivable that non-migrant doctors who earn significantly higher incomes than the mean level also indicated that income is an important factor in their decision to stay. They could also be older and belong to a more altruistically motivated cohort. The multivariate regression analysis should identify such relationships.

As far as future migration intentions are concerned (INTENT) a similar percentage of nurses in each category intend to migrate in future; some 38% of current migrants plan to remain abroad or move to another country, and 41% of return migrants and 42% of non-migrants are also intending to migrate in the future. With doctors, a much lower percentage of non-migrants (15%) intend to migrate in the future in comparison with current migrants or return migrants (50%). Overall therefore, even of those who are presently stayers, a high proportion is anticipating out-migration in the future.

Other differences of note include the proportion of respondents with one or more parent (or in-law) living overseas (OSPAR). A larger proportion of current migrant nurses (38%), than return migrants (3%) and or non-migrants (4%), have a parent abroad. Similarly

Table 4
Logit estimates: characteristics of migrants vs. non-migrants

Variable	Combined sample ($n = 251$)		Nurses only ($n = 182$)	
	Coefficient (asymptotic *t*-value)	Marginal effect (asymptotic *t*-value)	Coefficient (asymptotic *t*-value)	Marginal effect (asymptotic *t*-value)
Constant	1.5415 (2.119)**	0.3622 (2.157)	−1.1020 (−1.333)	−0.2753 (−1.331)
AGE	0.0283 (1.799)*	0.0067 (1.813)	0.0586 (2.967)***	0.0146 (2.970)
HOUSE	−0.6993 (−1.830)	−0.1643 (−1.841)	−1.4039 (−2.845)***	−0.3507 (−2.850)
BUSINESS	−0.1401 (−0.338)*	−0.0329 (−0.338)	−0.1412 (−0.276)	−0.0353 (−0.276)
APART	0.4235 (0.647)	0.0995 (0.647)	0.0308 (0.037)	0.0077 (0.037)
OSPAR	1.8141 (2.851)***	0.4262 (2.914)	1.8767 (2.554)***	0.4689 (2.560)
MEDINC	0.3356 (0.844)	0.0789 (0.846)	0.6567 (1.238)	0.1641 (1.239)
INCMOT	1.1944 (3.354)***	0.2806 (3.381)	1.8081 (4.233)***	0.4517 (4.243)
FIJIBORN	−1.8404 (−3.833)	−0.4324 (−3.905)	−2.2065 (−3.543)***	−0.5512 (−3.551)
SAMBORN	−1.8341 (−4.559)***	−0.4309 (−4.676)	−1.7634 (−3.528)***	−0.4405 (−3.538)
NURSE	−1.7376 (−4.512)***	−0.4082 (−4.577)		
Log L. (LRS)	−126.2680 (91.585)***		−88.1624 (75.431)***	
Pseudo-R^2	0.4623		0.5048	
% predicted	76.89%		76.90%	

Dependent Variable = MIGRATOR.
*Significant at the 10% level.
**Significant at the 5% level.
***Significant at the 1% level.

with doctors, some 25% of current migrants in comparison with 3% of return migrants and 0% of non-migrants have a parent abroad. These findings suggest that a parent or in-law abroad could be a major reason for migration. The direction of causality could also be the other way around, if the parent moved overseas to be re-united with the migrant nurse or doctor. This needs to be investigated further. For the purpose of the regression analysis in the following sections the variable OSPAR is treated as an independent variable. It is also evident that a relatively larger proportion (15%) of married, migrant nurses live in a different country to their spouse, in comparison with return migrants (6%) and non-migrants (3%). This suggests that out-migration of a married nurse need not be a significant hindrance to migration, but it could also be a reason for returning home.

These descriptive statistics suggest a number of interesting differences among the categories of respon-dent, and point to a combination of income and non-income related factors being relevant to the migration decision. However, such univariate comparisons could be misleading. To correctly assess the relative importance of each variable on the individual's migration decision appropriate multivariate statistical techniques are necessary.

Binomial logit model: migrants vs. non-migrants

Eq. (1) was estimated by binomial logit regression and the results are given in Table 4. Two versions of the model are reported. The first column is for the combined sample of nurses and doctors where there is a control dummy variable for occupation (NURSE = 1 for nurses, 0 for doctors). The second column is for nurses only, in view of the high statistical significance of the variable NURSE in the first model.[1]

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[1] At the 1% level. The *p*-value is equal to 0.0000.

The results show that the regression model predicts a respondent's status correctly in 77% of all cases. The pseudo-R^2 has a value of 0.46, suggesting a good overall fit. The model also shows that the signs of the variables are as expected, and most are statistically significant. The older the respondent the more likely he/she is to be a migrant. The marginal effects show that the probability of being a migrant increases by only 0.1 of a percentage point for each additional year of age. Owning a house or business reduces the probability of being a migrant. For nurses only, owning a house is statistically significant (albeit only at the 10% level) and reduces the likelihood of the nurse being a migrant by 35%. For the combined sample, owning a business is significant and the sign of the coefficient is negative, but the marginal effect is weak: it reduces the probability of being a migrant by only 3%. Having a parent living overseas also increases the probability of being a migrant (significant at the 1% level) by 43%.

Contrary to the suggestions from the discussion of the descriptive data, being motivated to become a SHP because of income earning possibilities (MEDINC) is not statistically significant. On the other hand, the variable indicating whether or not the respondent's current residential status was income motivated (INCMOT) is of high statistical significance (at the 1% level): respondents who indicated that their present migration status was motivated by income are 28% more likely to be a migrant. In the nurses-only model the marginal effect of this variable is 45%, suggesting a much stronger relationship for nurses than for doctors. In other words, although being motivated by income earning opportunities to become a SHP does not seem to be relevant to the individual's subsequent migration decision, income considerations do appear to influence the migration decision.

In the combined sample, ownership of a business (BUSINESS) is shown as having a negative effect on the propensity to migrate, but the marginal effect is rather weak; it decreases the probability of being a migrant by 3%. On the other hand, in the nurses-only model, ownership of a house (HOUSE) has a strong, negative effect on the respondents' propensity to migrate; it reduces the probability by 35%.

It is also evident that certain country specific variables are highly significant at the 1% level. Fijians and Samoans are less likely to be migrants, relative to Tongans. Both Samoans and Fijians are 43% less likely to be a migrant than their Tongan counterparts with identical other characteristics. Similarly, nurses are less likely to be migrants than doctors. Being a doctor increases the likelihood of being a migrant by 41% relative to a nurse. However, this finding could simply reflect the fact that most Pacific Island doctors, and all those from Samoa and Tonga, are overseas trained.

Another possible explanation for the unobserved country differences could be found in terms of relative rather than the absolute income levels. It is conceivable that Tongans earn less than their Fijian and Samoan counterparts, in relation to other income earners within their respective countries. It is also possible that doctors' relative earnings overseas are disproportionately greater in comparison with nurses. These explanations are explored further below.

Multinomial model: current migrants, return migrants and non-migrants

The results of this model in terms of the marginal effects on each of the three possible states are reported in Table 5, again for the combined sample and nurses-only sub-sample. (For the full results of the model, see Table A1 of Appendix A.).

The marginal effects show the relative importance of each variable in determining each of the three possible states. The overall models are statistically significant at the 1% level and, in the combined model, 69% of the cases are predicted accurately and 74% in the nurses-only model. Age is positively related to being a return migrant and negatively related to being a non-migrant. In other words, the older the person the more likely he/she is to be a return migrant, and the less likely to have never migrated. As current migrants will be a mixture of new and old migrants, the relationship to age is less clear-cut and is therefore not statistically significant.

Owning a business is not statistically significant for any category, but house ownership is positively related to being a non-migrant, indicating that those who own a house in their country of birth are 16% more likely never to have migrated. Having a parent overseas increases the probability of being a migrant (significant at the 1% level) by 62%, and reduces the probability of being a return migrant by 30%, or of being a non-migrant by 32%.

Income as an important reason for entering the profession was a significant characteristic (at 1% level) of those who are current migrants, increasing their probability of being a current migrant by 25%. It is negatively related to being a non-migrant, and reduces the probability of being a non-migrant. Those who are motivated by income are 43% more likely to be current migrants, and 30% less likely to be non-migrants. There is possibly a negative relationship between this variable and being a return migrant but it is not statistically significant. In other words, being motivated by income is a significant reason for leaving home, but not a significant reason for returning. Given the low relative income levels in the source countries, this conclusion is not surprising.

Country specific characteristics are statistically significant and important for migration status. Being Fijian

Table 5
Multinomial logit marginal effects estimates: characteristics of current migrants, return migrants and non-migrants

Variable	Combined sample ($n = 251$)			Nurses only ($n = 182$)		
	Current migrant	Return migrant	Non migrant	Current migrant	Return migrant	Non migrant
Constant	0.1272	0.2634	−0.1362	−0.1421	0.3221	0.4642
	(−0.762)	(1.697)	(−0.740)	(−0.797)	(−1.972)**	(2.264)**
AGE	0.0028	0.0042	−0.0071	0.0043	0.0095	−0.0138
	(0.823)	(1.327)*	(−1.802)*	(1.132)	(2.587)***	(−2.820)***
HOUSE	−0.1032	−0.0617	0.1649	−0.2453	−0.1109	0.3562
	(−1.156)	(−0.754)	(1.718)*	(−2.424)***	(−1.203)	(2.876)***
BUSINESS	0.1044	−0.1066	0.0022	−0.0363	0.0210	0.0153
	(1.122)	(−1.148)	(0.021)	(−0.308)	(0.209)	(0.120)
APART	−0.0037	0.0746	−0.0710	0.0060	−0.0318	0.0258
	(−0.026)	(0.512)	(−0.427)	(0.044)	(−0.158)	(0.117)
OSPAR	0.6232	−0.2973	−0.3259	0.5396	−0.2160	−0.3236
	(4.822)***	(−1.807)*	(−1.914)**	(3.945)***	(−1.074)	(−1.510)
MEDINC	0.2527	−0.1162	−0.1365	0.2532	−0.0243	−0.2289
	(2.809)***	(−1.372)	(−1.345)	(2.292)**	(−0.243)	(−1.715)*
INCMOT	0.4275	−0.1219	−0.3055	0.4402	0.0184	−0.4587
	(5.501)**	(−1.518)	(−3.375)***	(4.636)***	(0.207)	(−4.000)***
FIJIBORN	−0.1490	−0.2920	0.4409	−0.2246	−0.1972	0.4218
	(−1.811)*	(−3.387)***	(4.397)***	(−2.327)**	(−1.941)**	(3.293)***
SAMBORN	−0.6874	0.1015	0.5858	−0.8153	0.0618	0.7534
	(−5.178)***	(1.058)	(4.608)***	(−4.786)***	(0.554)	(4.343)***
NURSE	−0.1180	−0.3027	0.4207			
	(−1.477)	(−4.021)***	(4.380)***			
Log L. (LRS)	−186.150			−118.350		
	(166.089)***			(129.584)***		
%predicted	69.32			73.63		

Dependent Variable = MIGSTAT; asymptotic *t*-values in parentheses.
*Significant at the 10% level.
**Significant at the 5% level.
***Significant at the 1% level.

decreases the respondent's likelihood of being a current migrant by 14%, and being Samoan, by 69%, relative to being Tongan. Fijians are 44% more likely to be non-migrants and Samoans are 59% more likely to be non-migrants than Tongans. Fijians, however, are 29% less likely to return home (significant at the 1% level) and Samoans are possibly slightly more likely to return than Tongans, but this is not statistically significant. In other words, while Tongans appear to have a higher propensity to out-migrate they also appear to have a higher propensity to return home. This is a potentially important difference that is taken up later where the relative earnings differentials in the three source countries are compared.

The behavior of nurses and doctors is also significantly different. Nurses are more likely to be non-migrants, but they are also less likely to return. This suggests that a separate analysis of nurses is warranted. The nurses-only sub-sample (Table 5) is quite similar to that of the whole sample, but some relationships are somewhat stronger. For instance, owning a house is statistically significant for current migrant nurses and

non-migrants. House ownership is negatively related to being a current migrant, and those who own a house are also more likely never to have migrated. It does not have a statistically significant impact on the probability of being a return migrant. The most likely reason for the greater likelihood of nurses being non-migrants, but also of being less likely to return, is that almost all the nurses in the sample were female (95%) and almost all of these were married (96%), hence decisions on migration were more likely to have involved reasons connected to their husbands and families, rather than being linked directly to the health sector. However, living in a different country to one's spouse (APART) is not significant for any category of nurse. Having a parent overseas (OSPAR) increases the probability of a nurse being a migrant (significant at the 1% level) by 54%, but does not have a statistically significant impact on the probability of being a return migrant or non-migrant.

Income as an important reason for entering the nursing profession (MEDINC) was a significant characteristic (at the 5% level) of those who are current migrants, increasing their probability of being a current

migrant by 25%. It is negatively related to being a non-migrant, and reduces the probability of this by 23%. Those who indicated that their current residential status was motivated by income (INCMOT) are 44% more likely to be a current migrant, and 45% less likely to be non-migrants. There is again no clear relationship between this variable and being a return migrant. In other words, being motivated by income is a significant reason for a nurse to emigrate, but not necessarily a significant reason for returning.

Country specific characteristics are statistically significant and important for migration status. Being Fijian decreases the nurse's likelihood of being a current migrant by 22%, and being Samoan, by 81%, relative to being Tongan. Fijians are 42% more likely to be non-migrants and Samoans are 75% more likely to be non-migrants than Tongans. Fijian nurses, however, are 20% less likely to return home (significant at the 5% level) and Samoan nurses are possibly slightly more likely to return than Tongans, but this is not statistically significant.

Binomial logit model: intention to migrate

Two logit models of non-migrants' intentions to migrate in the future were estimated; one with the combined sample of doctors and nurses and one for the nurses only sub-sample (Table 6). As the doctors-only sub-sample is very small ($n = 14$) it was not possible to estimate a separate regression model for doctors.

The results show that the regression model correctly predicts non-migrants' intentions to migrate in 81% of cases, for the combined sample, and in 83% of cases for the nurses-only sample. Although both versions of the model are statistically significant at the 1% level, in neither case are many of the variables individually significant. The most interesting finding is that income level is a significant variable in the combined model but not in the nurses-only model. The results for the combined model show that as income rises, the probability of a respondent intending to migrate decreases. This relationship is not linear; as income rises the probability of intent will decrease at a decreasing rate (INC2 is significant and positive). For the nurses-only model the signs of the coefficients are the same but the INCOME variables are not statistically significant. This has two possible explanations: doctors have higher incomes than nurses and, as the descriptive statistics showed, a much smaller proportion of them are intending to migrate. By including them in the sample, the negative relationship between income and INTENT is thus strengthened. However, the variable NURSE should control for any differences between doctors and nurses.

One of the most interesting results in this model is that the variable NURSE is not significant, indicating that non-migrant doctors are no more (or less) inclined to be intending to migrate than nurses. This is confirmed by the close similarity of the results for the combined and nurses-only samples. Alternative model specifications with interaction terms to allow for different income relationships for nurses and doctors did not indicate statistically significant differences. It can therefore be concluded that for both nurses and doctors there is a similar, negative relationship between income and intention to migrate.

The marginal effects indicate that as income increases by A$1000, the propensity to migrate decreases by approximately 2.5%. In other words, a nurse at the current mean level of income for non-migrant nurses (A$220) has a 45% chance of intending to migrate, assuming all other characteristics are set at their mean levels. To reduce this propensity to zero, holding all other variables constant, income would need to be increased to A$400 per month. This is considerably less than the A$1100 earned by current migrants and not much more than that being earned by return migrants (A$318).

Ownership of a business in the home country is significant in both the combined and nurses-only models. The sign of the coefficient is negative, and the marginal effect shows that owning a business reduces respondents' intention to migrate by 42%. Owning a house also reduces the respondent's likelihood of intending to migrate, but this variable is not statistically significant. Similarly having a parent or parent-in-law overseas increases the probability of migration. Both motivational variables, those of residential status being income-motivated (INCMOT) and income earning opportunities being a main reason for becoming a SHP (MEDINC), appear to reduce the probability of migration but they too are not statistically significant.

Again, there are some significant differences among respondents from different countries. All other things being equal, in comparison with Tongans, being Samoan or Fijian significantly reduces the probability of the non-migrant intending to migrate.

Relative income differentials within and across countries

One important finding to emerge from the regression analysis was that Tongans have a higher propensity to out-migrate, a higher propensity to return home, and, among non-migrants, a higher stated intention of future migration, in comparison with Fijian and Samoans. It was noted earlier that country of birth variables are likely to be capturing the effects of a number of unobserved variables. This section explores possible interpretations of these results.

Tongan migrants appear to do better than Fijian and Samoan migrants in two respects (Table 7). First,

Table 6
Logit estimates: non-migrants who intend to migrate

Variable	Combined sample ($n = 108$)		Nurses only ($n = 95$)	
	Coefficient (asymptotic t-value)	Marginal effect (asymptotic t-value)	Coefficient (asymptotic t-value)	Marginal effect (asymptotic t-value)
Constant	5.0564 (2.124)**	1.1135 (1.984)	5.6488 (2.263)**	1.2709 (1.900)
INCOME	−0.0114 (−1.973)**	−0.0025 (−1.930)	−0.0082 (−0.438)	−0.0018 (−0.423)
INC2	0.0000 (1.919)**	0.0000 (1.892)	0.0000 (0.011)	0.0000 (0.011)
AGE	0.0066 (0.215)	0.0014 (0.215)	−0.0100 (−0.303)	−0.0023 (−0.302)
HOUSE	−0.2661 (−0.413)	−0.0586 (−0.413)	−0.3875 (−0.545)	−0.0872 (−0.543)
BUSINESS	−1.8932 (−1.991)**	−0.4169 (−1.921)	−1.8251 (−1.925)**	−0.4106 (−1.826)
APART	−1.3320 (−1.054)	−0.2933 (−1.049)	−1.4624 (−1.148)	−0.3290 (−1.138)
OSPAR	2.2523 (1.475)	0.4960 (1.463)	2.9632 (1.639)*	0.6667 (1.625)
MEDINC	−0.8438 (−0.982)	−0.1858 (−0.974)	−1.0235 (−1.020)	−0.2303 (−1.005)
INCMOT	−1.2219 (−1.044)	−0.2691 (−1.081)		
FIJIBORN	−5.1030 (−3.847)***	−1.1238 (−3.631)	−5.9101 (−3.855)***	−1.3297 (−3.833)
SAMBORN	−3.2048 (−2.905)***	−0.7058 (−2.607)	−3.2669 (−2.942)***	−0.7350 (−2.611)
NURSE	0.0715 (0.056)	0.0157 (0.056)		
Log L. (LRS)	−45.997 (52.348)***		−39.149 (51.021)***	
Pseudo-R^2	0.5707		0.6060	
%predict	80.56%		83.16%	

Dependent Variable = INTENT.
* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

the mean monthly income of Tongan current migrants is A$1311 in comparison with A$777 for Fijians and A$1026 for Samoans. Second, Tongan return migrants have a mean monthly income of A$492 compared to A$257 and A$205 for Fijians and Samoans respectively.

Although Tongan non-migrant nurses do not appear to be deprived relative to their Fijian and Samoan counterparts, what would be more relevant to the individual potential migrant is how much is earned relative to other Tongans, either abroad or at home. To measure relative deprivation we have calculated three earnings ratios (Table 8a).

The first ratio is that of current migrant to non-migrant mean annual income, and the second is of mean annual non-migrant income to per capita gross national

product of the nurses' respective country. Comparing both ratios indicates that Tongan nurses are relatively deprived. Tongan migrants earn over six times more than Tongan non-migrants, in comparison with 3 to 4 times more in the case of Fijians and Samoans. The second ratio shows that Tongan non-migrants earn the equivalent of only 81% of Tonga's per capita income whereas Samoans earn the equivalent of 151% of Samoa's per capita income. However Fijian nurses also perform poorly by this measure as they earn the equivalent of only 63% of their country's per capita income. What distinguishes Tongans from the others is that a relatively low earnings ratio (81%) is combined with the substantially greater potential ratio of migrant-to-non-migrant earnings (6.07) suggesting a combination of strong 'push' and 'pull' factors.

Table 7
Mean values of nurses' earnings and labour market experience (by migration status)

	Current migrants			Return migrants			Non-migrants		
	Fiji $n = 17$	Samoa $n = 4$	Tonga $n = 32$	Fiji $n = 10$	Samoa $n = 12$	Tonga $n = 11$	Fiji $n = 51$	Samoa $n = 27$	Tonga $n = 18$
Income (A$pm)	776.83	1026.39	1311.17	256.68	205.01	491.94	210.50	245.37	215.91
Oth. Inc. (A$pm)	47.8	492.53	289.22	292.75	211.07	569.96	262.76	248.18	237.10
Age (years)	38.12	41.0	44.19	47.3	38.83	46.00	39.63	40.55	33.17
Male (%)	0.0	0.0	0.06	0.0	0.0	0.0	0.06	0.11	0.06
LMX[a] (years)	16.7	19.25	17.03	27.3	16.33	23.6	18.5	16.67	10.33
OLMX[b] (years)	1.12	7.25	1.62	2.9	4.52	4.00	Na	Na	Na

[a] Potential labor market experience calculated as years since completion of studies/training.
[b] Potential overseas labour market experience calculated as years since completion of studies in Australia or New Zealand.

Table 8
Relative earnings

	Mean earnings levels (A$ per annum)				Relative earnings ratios		
	GNP/Cap[a]	Migrant	Non-Mig	Return Mig	Mig/Non-Mig Inc.	GNPPC/Non-Mig Inc	Return/Non-Mig Inc.
(a) *Nurses*							
Fijians	4018	9322	2526	3080	3.69	0.63	1.22
Samoans	1945	12317	2944	2460	4.18	1.51	0.84
Tongans	3182	15734	2591	5903	6.07	0.81	2.28

	GNP/Cap[a]	Migrant	Non-Mig		Mig/Non-Mig Inc.	GNPPC/Non-Mig Inc	
(b) *Doctors*							
Fijians	4018	31811	6151		5.17	1.53	
Samoans	1945	10946	12579		0.87	6.47	
Tongans	3182	15143	13536[b]		1.12	4.25	

[a] Average over period 1993–1998 (World Bank, 2002).
[b] Return migrant income as there were no non-migrant Tongan doctors in the sample.

The econometric analysis showed that Tongan migrants also display a higher propensity to return home. The data on mean earnings differentials support this finding. Tongan return migrants earn significantly more than their Fijian and Samoan counterparts, in terms of both absolute earnings levels and their earnings relative to non-migrants. They earn about two-and-half times as much as their Samoan counterparts and almost twice as much as their Fijian counterparts. Tongan return migrants also earn 2.28 times the income of Tongan non-migrants. In comparison, Fijian return migrants earn 1.22 times as much as Fijian non-migrants and Samoan return migrants earn less than non-migrants (84%). These data suggest that Tongan nurses have a relatively stronger financial motive to return home. However, some of these differences could be explained by other variables such as age. For instance the observation that the mean income of Samoan return migrants is less than that of non-migrants could be attributable to Samoan return migrants having relatively

less labor market experience than their Fijian and Tongan counterparts.

For doctors the differences are less clear-cut, but the sub-sample sizes of the disaggregated dataset are very small and could produce unreliable results (Table 8b).

These data suggest that Fijian doctors would have the greatest propensity to migrate given a combination of a relatively high migrant-to-non-migrant earnings ratio (5.17) and a relatively low ratio of non-migrant earnings to per capita income (1.53) in comparison with doctors from the other two countries.

Conclusion

The present study has demonstrated that income is a major influence on decisions to join the health profession, for both nurses and doctors in each of the three PICs. It is also a key reason for international migration. Tongans have a significantly higher propensity to

migrate, and the differential between mean incomes of nurses and the national mean per capita income was greatest in Tonga. This 'push' factor could explain why Tongan nurses are more likely to migrate than Fijians or Samoans. Tongan migrant nurses also earn significantly higher mean incomes than comparable Fijians and Samoans, in terms of both absolute levels and in relation to the mean incomes of stayers in their respective source countries. This 'pull' factor could also be an important reason for Tongan nurses having a higher propensity to migrate.

The econometric analysis showed that Tongans also have a higher propensity to return. Again this could be attributable mainly to Tongan nurses enjoying the largest relative income gains from return migration. Return migrants in Tonga enjoy substantially higher incomes than their Samoan and Fijian counterparts, both absolutely and in relation to incomes of stayers. Critically important therefore, as an influence on migration, are relative income inequalities *within* countries, alongside the expected inequalities *between* countries.

The dataset for the sub-sample of doctors was too small for the estimation of separate econometric models. However, the data on mean incomes and relative earnings of doctors suggest that Fijian doctors earn relatively less than their Samoan and Tongan counterparts in terms of both absolute levels and relative to per capita incomes, while Fijian migrant doctors earn substantially more than their counterparts, again in terms of both absolute levels and relative to stayers' incomes.

Migration to overseas jobs also has much to do with dissatisfaction with the terms and conditions of government work, only part of which concerns income. Migrant SHPs were strongly critical of the lack of an evident career structure, promotion opportunities and access to modern technology and training. Many argued that they faced nepotism and favoritism. The one other study of the migration of skilled professionals from the Pacific (Liki, 2001) has shown that similar concerns were widespread in other government sectors. The greater propensity of Samoans and Tongans to migrate is partly a function of the situation where they are more likely to have trained abroad than Fijians. This correlation of overseas training and subsequent immigration has been observed elsewhere (Findlay, Li, Jowett, Brown, & Skeldon, 1994). Similarly the migration of SHPs follows kinship connections. Only in Fiji, where political considerations intervene, both to stimulate migration and discourage return migration, and in Tonga where income differentials are considerable, are there particular inter-country differences.

In the wider context of migration from the PICs, where substantial numbers of islanders now live in New Zealand, Australia and other metropolitan states, migration is also linked to the migration and residence of kin. SHPs are more likely to migrate overseas, and more likely to return, where they have close kin overseas or at home respectively. International migration in the Pacific is embedded in an extended family context, where decisions to migrate and return are linked to household, as much as individual, aspirations and goals (Marcus, 1981; Lee, 2003) and where the provision of remittances is expected to ensue. While this survey collected no data on remittances, an earlier survey of Tongan and Samoan nurses indicates that remittances were sustained at high levels, and thus contributed substantially to the welfare of kin in the home country (Brown & Connell, 2003). In the present context migration is less likely to occur where doctors or nurses own a house or business in their home country. Moreover returning SHPs are particularly likely to establish a business on their return, having accumulated enough savings for this to be possible, a pattern that occurs more widely amongst returnees (Brown & Connell, 1993; Maron, 2001). Some 36 of the 77 migrants in the present survey intended to return 'soon' hence, though intent is quite different from action, this does suggest that the pattern of investment in the home state is likely to continue.

Similar conclusions have been reached in other countries, including Zimbabwe and parts of the Caribbean, and emphasize both the institutional context of skilled migration, kinship connections, relative income levels and poor and deteriorating working conditions (Thomas-Hope, 2002; Walt et al, 2002; Gaidzanwa, 1999). Otherwise there are too few detailed studies of the migration of SHPs in comparable developing countries elsewhere for effective comparisons to be made.

Migration occurs in a context where a number of metropolitan governments have implemented aggressive recruitment campaigns to attract doctors and nurses, a situation evident by the 1960s and increasingly becoming a global phenomenon (Mejia, Pizurki, & Royston, 1979; Hardill & MacDonald, 2000). However the present survey indicates that there are some gains. Many SHPs return, after an average period of 5 years away, with additional skills and with capital that is invested in housing and businesses, providing some individual and national benefits. Attempts to slow that migration in the Pacific region have focused on developing primary health care services, establishing regional and national medical schools and other training facilities, adapting medical curricula to local needs and enabling private practice (and thus greater opportunities for local income generation). Despite such policies, migration has continued, especially where SHPs graduated or went for further training overseas, and in the absence of significantly higher wages and improved working conditions. This trend has been reinforced by growing perceptions of superior salaries and conditions overseas, and through recruitment, in a context where international migration was a familiar and accepted phenomenon.

Table A1
Multinomial logit regression results: characteristics of current migrants, return migrants and non-migrants

Variable	Combined sample ($n = 251$)		Nurses Only ($n = 182$)	
	Return vs. current migrant	Non vs. current migrant	Return vs. current migrant	Non vs. current migrant
Constant	1.403	0.1833	−0.6340	1.5598
	(1.347)	(0.190)	(−0.448)	(1.257)
AGE	0.0040	−0.0625	0.0184	−0.0465
	(0.205)	(−1.334)	(0.658)	(−1.743)**
HOUSE	0.1785	0.7594	0.8382	1.9299
	(0.346)	(1.518)	(1.169)	(2.789)***
BUSINESS	−0.7701	−0.3936	0.2863	0.2214
	(−1.358)	(−0.748)	(0.328)	(0.280)
APART	0.2741	−0.1433	−0.1701	0.0122
	(0.322)	(−0.178)	(−0.137)	(0.013)
OSPAR	−3.4140	−3.100	−3.8426	−3.4585
	(−3.916)***	(−4.354)***	(−3.043)***	(−3.990)***
MEDINC	−1.3691	−0.1267	−1.4682	−1.7548
	(−2.634)***	(−2.474)***	(−1.866)*	(−2.326)**
INCMOT	−2.0560	−2.3083	−2.2896	−3.1550
	(−4.308)***	(−5.134)***	(−3.524)***	(−5.198)***
FIJIBORN	−0.4495	1.5458	0.3519	1.9309
	(−0.915)	(3.185)***	(0.515)	(3.012)***
SAMBORN	2.976	3.9213	4.6569	5.6783
	(3.945)***	(5.060)***	(3.662)***	(4.448)***
NURSE	−0.6049	1.3829		
	(−1.334)	(2.888)***		
Log L.				
(LRS)	−186.150		−118.350	
	(166.089)***		(129.584)***	
%predicted	69.32		73.63	

Dependent Variable = MIGSTAT; asymptotic *t*-values in parentheses.
* Significant at the 10% level.
** Significant at the 5% level.
*** Significant at the 1% level.

While the present study has not addressed these questions directly, it is evident that a skill drain is likely to continue, where there have been structural reforms that reduce public sector employment, wages and salaries remain unequal, working conditions are difficult and hierarchical, international recruitment intensifies and many kin are overseas. Policies that redress these circumstances have proved difficult for most countries, but especially for small and poor PICs. However the present study emphasizes that the skill drain has some potential gains through human capital transfers (with return migration), remittances and the investments of returnees. Hence policy formation concerning SHPs might also focus on encouraging return migration, through providing appropriate investment opportunities (Brown, 1997; Ahlburg & Brown, 1998) and more adequate working conditions and promotion structures. Equally it must continue to address issues of recruitment and retention, to further reduce the impact of the existing skill drain.

Appendix A

Multinomial logit regression results (see Table A1).

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