# Home and Away: Mortality among Finnish-born migrants in Sweden compared to native Swedes and Finns residing in Finland

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## Abstract

*Background:* Most first-generation migrants have lower mortality compared to the native population. Finnish born migrants in Sweden are an exception experiencing higher mortality; this may be because they bring health damaging risk factors with them. The purpose of this study was to assess to compare the mortality of Finnish migrants in Sweden to both the native population of Sweden and the Finnish-born population residing in Finland.

*Methods:* We used Swedish and Finnish register data, applying propensity score matching techniques to account for differences in sociodemographic characteristics between the migrants, Swedes and Finns. The index population were Finnish migrants aged 40—60, residing in Sweden in 1995 followed for mortality in 1996—2008. We compared patterns of all-cause, alcohol-related, smoking-related and cardiovascular disease mortality across the groups.

*Results:* Male Finnish-born migrants in Sweden had lower all-cause mortality compared to Finnish men but higher mortality compared to the Swedish men. The same patterns were observed for alcohol-related, smoking-related and cardiovascular disease mortality. Among women, all three groups had similar levels of all-cause mortality. However, female Finnish migrants had higher alcohol-related mortality compared to Swedish women, on par with Finnish women. Conversely, the migrants had similar levels of smoking-related mortality to Swedish women, lower than Finnish women.

*Conclusions:* Finnish-born migrants residing in Sweden have mortality patterns that are in between the mortality patterns in the native populations in their country of origin and destination. Both the country of origin and destination need to be considered in order to understand migrant health.

## **Introduction**

First generation migrants tend to experience lower mortality rates compared to the majority population in the country of destination<sup>1, 2</sup>. The size of the mortality advantage vary by across countries and migrant group<sup>3</sup>, and a minority of studies have documented higher mortality among first generation migrants<sup>4</sup>. The mortality advantage of migrants tend to decrease with duration of residence in the country of destination<sup>5, 6</sup>. Migrants moving to Sweden from other Nordic countries, specifically Denmark and Finland, experience higher mortality rates compared to the native population <sup>7</sup>. Among Nordic migrants, the Finns are the largest group. The mortality disadvantage of Finnish-born migrants largely stems from causes of death associated with behavioral risk factors such as cardiovascular disease and alcohol-related causes of death, and is only present among men<sup>6, 7</sup>. Similar patterns have emerged in earlier studies comparing the national populations of Finland and Sweden; Finnish men have a shorter life expectancy than Swedish men, while Finnish women have a similar life expectancy to that of Swedish women<sup>8-10</sup>. Furthermore, a recent study by Östergren et al. <sup>10</sup> found that about half of the difference in life expectancy between Finnish and Swedish men were attributable to alcohol-related mortality, and that smoking-related mortality also made a substantial contribution.

The health of migrant groups may be shaped by both pre-migration and post migration factors, for example through self-selection by health behaviors. Silventoinen et al. <sup>11</sup> examined migrant-discordant Finnish twin pairs and found higher levels of smoking and alcohol-consumption among the twin migrating to Sweden compared to the twin that remained in Finland. However, the behavioral patterns of Finnish migrants may converge to that of native Swedes after migration<sup>12, 13</sup>. Other studies also based on the Finnish Twin Cohort<sup>14</sup> have observed health behaviors post migration and have found a tendencies towards lower alcohol consumption<sup>15</sup>, less heavy smoking and more quit attempts<sup>16</sup>, and higher levels of physical activity<sup>17</sup> among the twin residing in Sweden. Differences among women are generally smaller and less conclusive compared to those observed among men<sup>15-17</sup>. Overall, these findings indicate that the health behaviors of migrants are shaped by pre-migration factors in Finland, which also influences the propensity to migrate, as well as post-migration factors in Sweden, leading to the gradual adoption of health behaviors that are more similar to the native Swedish population.

Previous studies have shown that the mortality disadvantage of Finnish migrants can partly be attributed to socioeconomic conditions<sup>18</sup>. Although recent Finnish migrants have a higher average education than the general Finnish population<sup>19</sup>, the bulk of Finnish migration happened in the 1960s and 1970s and manly consisted of blue collar workers from the Finnish country side moving to Sweden to work in industries<sup>20</sup>. Compared to the native Swedish population, Finnish migrants are more likely to have less favorable socioeconomic conditions, which are independent risk factors for mortality<sup>21</sup>.

The mortality patterns among Finnish migrants in Sweden may then be dependent on both behavioral patterns established before migration and their social and economic conditions post migration. It is therefore meaningful to compare the Finnish migrants to both the Swedish and Finnish populations. A study by Westman et al. <sup>22</sup>, based on survey data, compared the self-rated health of Finns residing in Sweden to both Swedes and Finns residing in Finland. They found that Finns had higher odds of reporting poor self-rated health regardless of their country of residence. Finnish men residing in Sweden had a tendency to report better health than those in Finland, while the opposite pattern was observed among Finnish women. These patterns remained after adjusting for sociodemographic conditions<sup>22</sup>. Direct comparisons between migrants and the population in the country of origin are, however, often difficult due to limited access to comparable individual level data on sociodemographic conditions and mortality in both the country of origin and the country of destination.

In this study, we make use of population register data in both Sweden and Finland to compare mortality among Finnish-born migrants residing in Sweden to both the Swedish-born population and to the Finnish-born population residing in Finland. Sweden and Finland have a similar tradition of keeping administrative registers on, among other things, demographic characteristics, socioeconomic conditions and mortality. The similarities in data content enable us to compare mortality patterns across the three groups while adjusting for sociodemographic conditions.

# <u>Data</u>

Data on demographic characteristics (including country of birth), socioeconomic position, and cause of death were obtained from national total population registers in Sweden, and from an 11 % random sample of the population registers in Finland. We identified all Finnish-born individuals residing in Sweden in 1995, which was the earliest year that comparable socioeconomic data were available for both countries. We used the same categories as Westman et al. <sup>22</sup> and constructed three cohorts: Finnish-born individuals residing in Sweden (hence *Finnish migrants*), Swedish-born individuals residing in Sweden (*Swedes*) and Finnish-born individuals residing in Finland (*Finns*).

We collected data on sex and age, in five-year groups, for the cohort members as well as data on baseline sociodemographic characteristics. Education was categorized into three levels based on highest achieved level of education; compulsory (ISCED 0—2), upper secondary (ISCED 3—4), and tertiary (ISCED 5—6). Income was defined as quintiles of disposable household income, measured after taxes and transfers and equivalized across household compositions using the Oxford method <sup>23</sup>. Civil status was divided into married and not married and we also collected data on whether or not there was a child living in the household. We restricted the cohorts to members that were between 40—60 years old at baseline, an age span during which most individuals are active on the labor market. Mortality follow-up covered the years 1996—2007 (the last available year), when they were between 41—72 years old. If an individual left either of the cohorts during the follow-up without dying, they were right censored. The final populations comprised 1.4 million individuals followed over 28.3 million person years, experiencing 140 133 deaths (Table 1).

Table 1. Descriptives.

	Cohort	n	Person years	Deaths
Men	Finnish migrants	46 138	499 275	5 073
	Finns	149 979	1 713 239	15 011
	Swedes	1 034 761	12 007 386	67 097
Women	Finnish migrants	57 988	660 946	2 932
	Finns	149 054	1 749 526	6 718
	Swedes	999 212	11 725 131	43 302

We calculated all-cause mortality, alcohol-related mortality, smoking-related mortality and mortality from cardiovascular diseases using data from the cause of death registers in Finland and Sweden. Alcohol-related mortality was defined by identifying the following causes using the ICD-10 standard: F10.0—9, G31.2, G40.5, G72.1, I42.6, K29.2, K70.0—4, K85.2, K86.0, X45, as either the underlying or a contributing cause. Smoking-related mortality were indicated by C30—C39, J40—J47, either as the underlying or a contributing cause. Mortality by cardiovascular diseases were indicated by I01-I41, I42.10—I42.16, I42.7—I42.9 or I50—I99 being the underlying cause of death. The estimates for cause-specific mortality partly overlap, and do not cover all deaths. We additionally decomposed all deaths by ICD-10 chapter based on the underlying cause (Table S1, Supplementary materials). Note that some of the chapters were combined due to small number of deaths.

## Methods

The study by Westman et al. <sup>22</sup> used pooled survey data from Finland and Sweden. Pooling the data was, however, not a viable option in this study. In order to access register data for research purposes, it is necessary to obtain ethical permits and establish user agreements with the responsible government agencies<sup>24</sup>. These agreements limit the use and sharing of register data, especially regarding data on health, which are considered sensitive. Therefore, we could not share individual level data or data on health across national borders. We used propensity score weighting to overcome this obstacle.

Propensity score techniques were originally developed to use observational data to mimic experimental designs<sup>25, 26</sup>. We do not attempt to estimate causal effects. Instead we apply this technique to adjust the mortality estimates for differences in the distribution of sociodemographic conditions across the groups using two separate data sets. Propensity score weighting consists of two steps; estimating a set of probabilities using a treatment model and weighting the treatment groups using those probabilities.

In the first step, we estimated propensity scores using a treatment-model, where the different treatment groups were defined by country of birth and country of residence in 1995. We used aggregated data on the distribution of education, income, civil status and having children in the household in each group. Since these data sets were aggregated and did not contain any information on health, they could be shared between the countries. We fitted a logit model using the treatment group as the dependent variable and sociodemographic factors as independent variables. Finnish migrants were defined as the reference group. Propensity scores (the probabilities of belonging to a specific treatment group given the observed values of the sociodemographic factors) were obtained in post-estimation. The propensity scores were then applied as weights to the Finns and Swedes. Once applied, the distributions of the sociodemographic conditions among the native populations in Sweden and Finland are similar to those of the Finnish migrants. Table S2 (Supplementary materials) provides the observed and weighted distributions in the three groups.

In the second step, we appended the propensity score weights to data on mortality in Sweden and Finland respectively. The propensity scores were used to weight number of person years and number of deaths by age and sex, both for all-cause and for cause-specific mortality. We then used the weighted numbers to calculate age-standardized mortality rates and incidence rate ratios. All calculations were made in Stata 14.

## **Results**

Table 2 presents age-standardized mortality rates among the Finnish migrants, the Finns and the Swedes. Among men, the Finnish migrants had the highest observed mortality rate followed by the Finns and the Swedes, who had the lowest. When comparing the weighted estimates, that are adjusted for differences in sociodemographic conditions between the groups, a different pattern emerged. The migrants experienced lower all-cause mortality than the Finns but higher mortality than the Swedes, although the latter difference is reduced from 41.2 to 28.0 deaths per 10 000 person years. Similar patterns emerged for alcohol-related and smoking-related mortality as well as mortality from cardiovascular diseases; Finnish migrants had a mortality advantage compared to the Finns and a mortality disadvantage compared to the Swedes.

Among women, the patterns are consistent. No substantial differences in all-cause mortality were observed between the Finns and Swedes. All-cause mortality among the Finnish migrants was somewhat higher but the differences were small, around 2 deaths per 10 000 person years. Alcohol-related mortality was similar among female migrants and native Finns, but lower among the Swedes. Finnish migrants and native Swedes experienced similar levels of smoking-related mortality, which was higher than the native Finns. The pattern observed for cardiovascular diseases was similar to that among men; the Finnish migrants had a mortality advantage compared to the native Finns and a disadvantage compared to native Swedes.

Figure 1 is a forest plot displaying incidence rate ratios by cohort, using the Finnish migrants as the reference group. The estimates presented are weighted for sociodemographic conditions. Overall, migrants had mortality patterns that were somewhere in between the two native populations. In some cases, migrants had a similar level of mortality as one or two of the native populations but the highest, or lowest, mortality were consistently observed in one of the native populations. Similar patterns were observed in all chapters of ICD-10, with the exception of Chapter V: Mental and behavioral disorders, in which migrants had the highest mortality. The absolute number of deaths from causes in this chapter is, however, small (Table S1).

**Table 2**: Observed and weighted age-standardized mortality rates and 95% confidence intervals for all-cause mortality, alcohol-related mortality, smoking-related mortality and mortality from cardiovascular disease in Finland, Sweden and, among Finnish migrants residing in Sweden, men and women 1996—2007.

			O	bserved	W	eighted <sup>1</sup>
		Cohort	ASMR	95% CI	ASMR	95% CI
Men	All-cause	Finnish migrants	97.1	94.4—99.9	97.1	94.4—99.9
		Finns	91.7	90.2—93.2	104.1	100.7—107.6
		Swedes	55.9	55.4—56.3	69.9	67.6—72.3
	Alcohol-related	Finnish migrants	24.2	22.8—25.6	24.2	22.8—25.6
		Finns	24.9	24.2-25.7	29.7	27.9—31.6
		Swedes	7.1	6.9—7.2	10.7	9.8—11.7
	Smoking-related	Finnish migrants	11.2	10.4—12.2	11.2	10.4—12.2
		Finns	11.4	10.9—12.0	13.4	12.1—14.7
		Swedes	6.1	6.0—6.3	7.9	7.1—8.7
	CVD	Finnish migrants	24.3	23.0—25.7	24.3	23.0—25.7
		Finns	32.1	31.2—33.0	36.8	34.7—38.9
		Swedes	13.0	12.7—13.2	16.4	15.3—17.6
Women	All-cause	Finnish migrants	42.8	41.2—44.4	42.8	41.2—44.4
		Finns	39.5	38.6—40.5	40.2	38.3—42.2
		Swedes	36.6	36.3—36.9	41.1	39.6—42.7
	Alcohol-related	Finnish migrants	4.8	4.3—5.4	4.8	4.3—5.4
		Finns	5.0	4.4—5.4	5.2	4.5—5.9
		Swedes	1.9	1.8—2.0	2.4	2.0—2.8
	Smoking-related	Finnish migrants	6.6	6.0—7.2	6.6	6.0—7.2
		Finns	3.7	3.4—4.0	3.8	3.3—4.5
		Swedes	6.1	6.0—6.3	7.1	6.5—7.8
	CVD	Finnish migrants	5.5	5.0—6.1	6.6	6.0—7.2
		Finns	8.4	8.0—8.8	8.6	7.7—9.6
		Swedes	3.8	3.7—4.0	4.6	4.1—5.2

<sup>1</sup> Finns and Swedes are weighted by propensity scores based on income, education, civil status and having a child in the household using the distributions of the Finnish migrants as the reference. The estimates for the Finnish migrants are not weighted.

										Women								Men	
				CVD		Smoking-related		Alcohol-related		All-cause		CVD		Smoking-related		Alcohol-related		All-cause	
		JWERES	Curodoc	Finns	Swedes	Finns	Swedes	Finns	Swedes	Finns	Swedes	Finns	Swedes	Finns	Swedes	Finns	Swedes	Finns	
	.5 —						•								<b> </b>				
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Migrants (ref.)	1				•			•	•	•				•		ł		+	-
	 2			•								+							
		0.03 [0.7 1, 0.27]	0 02 (0 71 0 07)	1.56 (1.35, 1.80)	1.08 (0.95, 1.23)	0.59 (0.49, 0.70)	$0.50\ (0.41, 0.61)$	1.09 (0.92, 1.29)	0.95 (0.89, 1.00)	0.95 ( $0.91$ , $1.01$ )	0.68 (0.62, 0.74)	1.51 (1.40, 1.64)	0.70 (0.62, 0.79)	1.19 (1.05, 1.34)	0.44 ( $0.40$ , $0.49$ )	1.23 (1.13, 1.34)	0.72 (0.69, 0.76)	1.07 (1.03, 1.12)	IRR (95% CI)

Figure 1: Incidence rate ratios for all-cause mortality, alcohol-related mortality, smoking-related mortality and mortality from cardiovascular disease in Finland, Sweden and, among Finnish migrants residing in Sweden, men and women 1996—2007. Weighted for sociodemographic conditions

### Discussion

#### Summary of the main findings

We compared mortality patterns between Finnish migrants residing in Sweden to those observed among native Swedes and Finns residing in Finland, adjusting for differences in sociodemographic conditions between the groups using propensity score weighting. The results indicated that the mortality pattern among the migrants were somewhere in between those observed in the country of origin and the country of destination.

#### Interpretation of the results

The mortality advantage often observed among migrants has commonly been discussed in relation to selection processes in which obstacles within the migration process ensure that only healthy and resourceful individuals are able to successfully complete migration<sup>1, 27</sup>. Considering that Finnish migrants to Sweden have higher mortality than Swedes and that Sweden and Finland are neighboring countries and since the establishment of the common Nordic labor market in 1954, Finnish and Swedish citizens can freely move across the border <sup>28</sup>. It is therefore unlikely that such obstacles are important determinants for mortality differentials between Finnish migrants in Sweden and native Swedes.

The free mobility also means that there are no restrictions for return migration. Individuals that left Sweden during the follow-up were right censored. Return migration from Sweden to Finland is common and usually takes place shortly after the initial emigration<sup>19</sup>, and the individuals that return are likely to have a more difficult time adapting to the Swedish society compared to those who stay. Selection by return migration may then result in the remaining Finnish migrants being more similar to the Swedish population. Selective return migration can then be considered to be a part of the processes that generate differences in mortality between migrant groups and native population, and, given the open border between the two countries, may have contributed to the observed patterns. It is difficult to estimate the extent to which re-migration affects the results. To do so would require data on the mortality of migrants after they have returned.

It is important to note that while we estimate mortality from behavioral risk factors, we do not directly observe behavior. Still, evidence from surveys and twin studies suggest that Finnish migrants are less likely than Finns residing in Finland to report smoking, low physical activity, a poor diet and risky alcohol consumption <sup>15-17, 29</sup>. These findings, together with those presented by Silventoinen et al. <sup>11</sup>, indicating higher levels of smoking and alcohol consumption before migration among twins that migrate compared to twins that remain, suggests that residing in Sweden may lead to the gradual adaption of health behaviors. Adapting to the health behaviors of the host country may imply either an increase or a decrease in mortality risk depending on the relationship between behavioral patterns in the country of origin and destination. In most cases, adapting to Swedish behavioral patterns results in lower mortality risks among Finnish-born migrants. However, Swedish women tend to smoke more than Finnish women<sup>30</sup>. We observed higher smoking-related mortality compared to the Finns, on par with the level observed among the Swedes. Juárez et al. <sup>6</sup> and Hammar et al. <sup>31</sup> have found that the all-cause mortality among Finnish-born men tends to decrease over time in Sweden. In light of these findings, our results suggest that among both men and women, the gradual adoption of behavioral patterns of the Swedish population contributes to the mortality patterns of Finnish-born migrants in Sweden.

### Methodological considerations

Propensity score techniques were originally developed to mimic experimental designs and estimate causal effects in observational data <sup>25, 26</sup>. It is important to note that we did not use the propensity score to estimate causal effects. We calculated the propensity score to adjust for differences in the distribution of a specific set of sociodemographic conditions in a setting where it was not possible to merge data. The treatment model was defined in line with this purpose, rather than to obtain the maximum explanatory power in terms of assignment of treatment. Further, the sociodemographic conditions were observed in the post-treatment period making it difficult to assess if they are predictors or outcomes of migration. In order to properly estimate the causal effect of migration on mortality, detailed information on pre-migration characteristics is needed. This approach is not feasible using register data since the bulk of Finnish migration to Sweden occurred several decades before the establishment of several of the

registers. However, using propensity score weighting in this way enables more sophisticated analysis than is typically possible in comparative research where data may not be merged.

We were unable to identify members of the ethnic minority of Finnish-born Swedish-speakers. Previous studies have shown that these are both more likely to migrate to Sweden and less likely to return to Finland<sup>19</sup>. A recent survey from the Public Health Agency of Sweden indicated that the Swedish-speaking Finns residing in Sweden had higher levels of obesity and binge drinking compared to the native Swedes and somewhat lower levels compared to Finnish-speaking migrants <sup>29</sup>. The Swedish-speaking Finns are more affluent than Finnish-speakers, which contributes to the observed differences. Since we adjust for sociodemographic factors, it is unlikely that the observed patterns are attributable to this group.

## Conclusions

Adjusted for sociodemographic conditions, Finnish-born migrants residing in Sweden have mortality patterns that are in between the mortality patterns in the native populations in their country of origin and destination. Depending on if we chose the country of origin or the country of destination as a reference, Finish migrants in Sweden may be considered to experience either a mortality advantage or a disadvantage.

Causes of death that are subject to behavioral risk factors contribute to the observed patterns. Mortality patterns among migrants may converge to the mortality patterns of the country of destination as the migrants gradually adopt the behavioral patterns of the majority population.

Both pre- and post-migration factors are important for the health of migrants and both the country of origin and destination, and the relationship between them, need to be considered in order to understand migrant health.

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Table S1—a: Age-standardized mortality rates and 95% confidence intervals for all-cause mortality, and mortality by ICD-10 chapter in Finland, Sweden and among Finnish migrants residing in Sweden, men 1996—2007.

	Migrants		Finns				Swedes			
	Observed		Observed		Weighted		Observed		Weighted	
	ASMR	CI	ASMR	CI	ASMR	CI	ASMR	CI	ASMR	CI
All deaths	97.1	94.4—99.9	91.7	90.2—93.2	104.1	100.7—107.7	55.9	55.4—56.3	69.9	67.6—72.3
II: Neoplasms	23.6	22.3-24.9	23.5	22.8-24.3	25.1	23.4-26.9	18.9	18.6—19.1	21.1	19.9—22.4
V: Mental and behavioural	6.2	5.6-7.0	2.0	1.8-2.2	2.5	2.0-3.0	1.9	1.9—2.0	3.1	2.6—3.6
disorders										
VI – VIII: Diseases of the	1.7	1.4-2.1	2.1	1.9-2.4	2.3	1.8-2.9	1.4	1.3-1.5	1.7	1.4-2.2
nervous system and sensory										
organs										
XI: Diseases of the circulatory	33.8	32.2-35.4	33.1	32.2-34.0	38.0	36.0-40.2	18.0	17.8—18.3	22.8	21.5-24.2
system										
X: Diseases of the respiratory	4.0	3.5-4.6	3.5	3.2-3.8	4.3	3.6—5.0	1.9	1.8-2.0	2.7	2.3-3.2
system										
XI: Diseases of the digestive	6.7	6.0-7.4	8.1	7.6—8.5	13.2	12.0—14.4	3.0	2.9-3.1	4.3	3.7-4.9
system										
XX: External causes	13.3	12.3—14.3	16.1	15.5—16.7	18.7	17.3-21.1	7.0	6.8—7.1	9.1	8.3—10.0
Other <sup>1</sup>	7.7	6.9—8.5	3.3	3.0-3.6	4.5	3.9—5.3	3.7	3.6—3.8	5.0	4.4-5.7

<sup>1</sup> I: Certain infectious and parasitic diseases, III: Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism, IV: Endocrine, nutritional and metabolic diseases, XII: Diseases of the skin and subcutaneous tissue, XIII: Diseases of the musculoskeletal system and connective tissue, XIV: Diseases of the genitourinary system, XV: Pregnancy, childbirth and the puerperium,XVI; Certain conditions originating in the perinatal period, XVIII: Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified.

Table S1—b: Age-standardized mortality rates and 95% confidence intervals for all-cause mortality, and mortality by ICD-10 chapter in Finland, Sweden and among Finnish migrants residing in Sweden, men 1996—2007.

	Migrants		Finns				Swedes			
	Observed		Observed		Weighted		Observed		Weighted	
	ASMR	CI								
All deaths	42.8	41.2—44.4	39.5	38.6—40.5	40.2	38.3—42.2	36.6	36.3—36.9	41.1	39.6—42.7
II: Neoplasms	19.5	18.4-20.6	18.2	17.6—18.9	18.4	17.1—19.7	20.3	20.0-20.5	21.5	20.4-22.7
V: Mental and behavioural	1.4	1.1-1.7	0.5	0.4-0.6	0.6	0.4-0.8	0.6	0.5-0.6	0.7	0.5—1.0
disorders										
VI – VIII: Diseases of the	1.1	0.9—1.4	1.6	1.4—1.8	1.6	1.2-2.0	1.2	1.1-1.2	1.3	1.1—1.7
nervous system and sensory										
organs	0.6	9.0 10.4	05		07	79 07	65		7 0	71 05
XI: Diseases of the circulatory system	9.6	8.9—10.4	8.5	8.0—8.9	8.7	7.8—9.7	6.5	6.4—6.7	7.8	7.1—8.5
X: Diseases of the respiratory	1.9	1.6—2.2	1.3	1.2—1.5	1.4	1.1—1.9	1.7	1.6—1.7	2.1	1.8-2.5
system										
XI: Diseases of the digestive	2.2	1.9—2.6	2.0	1.8—1.5	2.8	2.3—3.3	1.4	1.4—1.5	1.8	1.4-2.1
system										
XX: External causes	4.2	3.7—4.7	4.6	4.3-4.9	4.7	4.1—5.4	2.6	2.5-2.7	3.0	2.6—3.5
Other <sup>1</sup>	2.8	2.4-3.2	1.9	1.7—2.2	2.1	1.7—2.6	2.3	2.2-2.4	2.8	2.4—3.3

<sup>1</sup>I: Certain infectious and parasitic diseases, III: Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism, IV: Endocrine, nutritional and metabolic diseases, XII: Diseases of the skin and subcutaneous tissue, XIII: Diseases of the musculoskeletal system and connective tissue, XIV: Diseases of the genitourinary system, XV: Pregnancy, childbirth and the puerperium,XVI; Certain conditions originating in the perinatal period, XVIII: Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified.

					Cohort		
			Finnish	Finns		Swedes	
			Migrants	Observed	Weighted	Observed	Weighted
Men	Education	ISCED 0-2	49	41	48	32	48
	%	ISCED 3-4	39	34	39	42	40
		ISCED 5—6	12	26	14	25	12
	Income	Q1	26	20	25	16	25
	%	Q2	17	19	18	17	17
		Q3	19	20	20	20	20
		Q4	21	20	21	22	21
		Q5	17	20	17	25	17
	Civil Status	Not married	48	32	44	37	48
	%	Married	52	68	56	63	52
	Children	No	60	62	61	44	59
	%	Yes	40	38	39	56	41
Women	Education	ISCED 0-2	37	40	38	26	37
	%	ISCED 3-4	42	35	40	45	42
		ISCED 5-6	21	26	22	29	21
	Income	Q1	23	20	22	18	23
	%	Q2	19	21	19	17	19
		Q3	18	20	18	18	18
		Q4	21	20	21	22	20
		Q5	19	20	19	25	20
	Civil Status	Not married	43	32	40	35	43
	%	Married	57	68	60	65	57
	Children	No	50	64	54	43	49
	%	Yes	50	36	45	57	51

Table S2: Weighted and unweighted population characteristics.