

The Oslo Immigrant Health Profile

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Preface

Immigrant groups differ significantly between and within themselves regarding risk factors and diseases. Differences between and within immigrant groups are as interesting as differences between immigrants and the indigenous Norwegian population. This is a main finding in the Oslo Immigrant Health Profile, reminding us that studies of unspecific categories of immigrants such as 'non-western' or 'Asian' are of little value when we aim to guide health care providers and public health policies.

The Oslo Immigrant Health Profile presents results from the Oslo Health Study (2000-2001) and the Oslo Immigrant Health Study (2002) on immigrant groups originating from Vietnam, Sri Lanka, Pakistan, Iran and Turkey. An impressive number of scientific publications and doctoral theses have been published from these health studies (<http://www.fhi.no/artikler?id=69820>) since the data were collected 6-8 years ago.

This report provides the first overview of the information on health in the five immigrant groups that were invited to participate in the health studies. Earlier reports have mostly described immigrants from countries outside Europe and North America as one group, yielding information which was clearly too aggregate to be helpful.

Statistics Norway recently presented data on self reported health among immigrants and their descendants. Although the information is older, the Oslo Immigrant Health Profile provides analyses of data from clinical examinations, anthropometric measurements such as height and weight, and analyses of blood samples, in addition to self reported information on smoking, physical activity and other factors influencing health. The objective measurements of risk factors add a new important dimension to the understanding of health in the five immigrant groups. Many of the results are published for the first time in this report.

The demography of the immigrant populations in Norway is very dynamic, and 6-8 years is a long time in this perspective. However, there is no system in place for collecting the kind of data presented in this report in a regular and updated way. Thus, the value of the report lies also in reminding us of the need for more systematic, regular and updated information on risk factors and disease in the total population in Norway, including immigrant groups.

Camilla Stoltenberg
Deputy Director General

Executive Summary

There is growing evidence that the burden of disease is not shared equally and differs considerably across ethnic groups. This report provides an overview of the health status of 5 of the largest immigrant groups in Norway in comparison to the ethnic Norwegian host population. The immigrant groups are from Turkey, Iran, Pakistan, Sri Lanka and Vietnam. It does not cover all the possible and likely health problems but attempts to cover the most salient issues that are relevant for public health.

The data are based on two population based cross-sectional studies carried out in Oslo, Norway. The first is the Oslo Health Study (HUBRO), conducted in 2000 – 2001 by the National Health Screening Service (now the Norwegian Institute of Public Health, NIPH) in collaboration with Oslo Municipality and the University of Oslo. The second study, the Oslo Immigrant Health Study (Innvandrer-HUBRO), was conducted in 2002 by the NIPH and the University of Oslo. Data were collected by means of questionnaires and clinical screening. Data must be interpreted in light of the limitations of this study, elaborated in the method section of the report.

The main findings indicate that there were differences in health between the immigrant groups, thereby illustrating that immigrants are not a homogenous group. Thus it is not only the differences between immigrants and the host Norwegian population that is of interest to public health but equally so the differences between these immigrant groups. Regardless of risk factors, morbidity patterns or disease prevalence, a common conclusion that can be drawn is that the health of immigrant groups differs significantly from that of ethnic Norwegians and each other. The main findings are highlighted below:

Socio-Demographic characteristics

- Among immigrant groups, men were generally older than the women from same country. Further, the age of immigrants reflects migration history from low and middle income countries to Norway; Pakistanis were the oldest and Sri Lankans youngest.
- Among immigrants men had higher education than women, and this was especially the case among immigrants from Turkey and Pakistan. Iranians, Norwegians and Sri Lankans had higher education than those from Vietnam, Pakistan and Turkey.
- More men had full time employment than women, and Norwegian men had the highest proportion of full time employment. At the other end of the scale were Pakistani women with the lowest proportion of full time employees.
- Generally a greater proportion of men lived alone, greater numbers among Iranian and Norwegians and fewest among Sri Lankans and Pakistanis. Over 90 percent of the immigrants in our study lived in Oslo East.

Self-Reported Health

- Norwegians reported good health more frequently compared to the immigrant groups. Women from Pakistan and Turkey reported good health least frequently. In all ethnic groups those with the highest education reported good health more frequently than others. This is illustrated by men from Sri Lanka and Turkey with higher education reporting better health than Norwegians with lower education. A similar pattern was observed among Sri Lankan women compared to Norwegian women.
- Women reported more musculoskeletal disorders than men. However, men had higher proportions of myocardial infarction and stroke. Self-reported diabetes was highest among

Pakistani and Sri Lankans. In general, immigrant groups reported more chronic diseases and conditions compared to Norwegians.

Risk Factors

- Vietnamese men had the lowest consumption of fruit and vegetables, while Turkish women had the highest consumption. Norwegians were at neither end of the spectrum. Men consumed more soft drinks than women, the highest seen in Turkish men. The consumption of full-fat milk was higher in men than women, the highest consumption was observed among Pakistanis and the lowest in Norwegians.
- Immigrants were more inactive, compared to Norwegians. Among the immigrant groups, women were more inactive than men. In Norwegians, men were slightly more inactive than women.
- Smoking habits varied enormously across the immigrant groups. Generally, men smoked more than women, except among Norwegians where women smoked the most. Most smokers were observed among Turkish and Iranian men (53 and 42 percent), while fewest smokers were observed among Sri Lankan women (0 percent), Vietnamese and Pakistani women (4 percent), and Sri Lankan men (19 percent).
- Norwegians had the highest alcohol consumption. Over 90 percent of the women from Turkey, Sri Lanka and Pakistan consumed no alcohol, or less than once a month. Pakistani men's consumption was low and similar to that of Pakistani women, whereas the consumption was higher in men from Sri Lanka, Vietnam, Iran and Turkey. However, all the immigrant men reported a much lower consumption of alcohol compared to Norwegian men.
- General obesity is a challenge among Turkish and Pakistani women, as around 50 percent were obese (Body Mass Index ≥ 30). This was far higher than any of the other ethnic/gender groups. On the other side of the spectrum we found Vietnamese men and women with almost no obesity (3-4 percent). Among all immigrant groups general obesity was more frequent in women than in men, but the opposite was seen in Norwegians.
- Abdominal obesity (Waist Hip Ratio >1 for men and >0.9 for women) was most frequently seen in women from Sri Lanka and Pakistan, which fits with their higher prevalence of diabetes.
- Greater proportions of those with High Blood Pressure were observed among Norwegians and lowest among those from Iran. The favourable HDL (high density lipid) Cholesterol levels were highest in Norwegians but lowest in Pakistanis and Sri Lankans. In addition, triglyceride levels were highest among immigrants from Pakistan and Sri Lanka and lowest among Norwegians.

Mental Health

- Women reported more mental distress than men. Those from Turkey and Iran reported the most mental distress, especially women as more than 40 percent reported to be distressed. The lowest scores were found among Norwegians, especially men. Among the immigrant groups, Sri Lankans had the lowest score, with women in the same range as Norwegian women. In all ethnic groups, except immigrants from Pakistan and Sri Lanka, mental distress decreased with increasing education.

Use of Health Services

- Immigrants made a greater number of visits to the general practitioner (GP) and specialists compared to Norwegians. Turkish and Iranians visited the psychiatrist/psychologist most frequently. Emergency services were used most frequently by those from Turkey and least by the Norwegians.

Immigrants from low and middle income countries living in western urban environments are often trapped between their own traditional lifestyles and practices and those of the host country. This can increase their risk for chronic diseases and they could be pushed down the morbidity and mortality spiral.

Our findings raise concerns, and therefore measures need to be put in place to prevent an increased risk of cardiovascular disease. Besides identifying and quantifying determinants, the analytical challenges that explain how these determinants act in concert and how they act over time, need to be addressed.

The main objective of this report, however, is to provide the evidence and information for policy makers and health practitioners. This evidence could contribute further to design, develop and evaluate strategies that are culturally sensitive for preventing and controlling disease in this segment of the population.

Based on these findings we can conclude that there are some areas in particular that demand immediate and special attention both with regard to further analysis as well as preventive strategies. The figures (spiders) in the conclusion of this report illustrate the ethnic specific variations and indicate specific areas for potential strategies.

Positive Trends among Immigrants

Our findings show positive trends for some risk factors among immigrants.

- In all immigrants the low consumption of alcohol in comparison with Norwegians indicates the risk due to this factor will be considerably lowered.
- With the exception of one group the extremely low prevalence of smoking in women will play a great role in reducing the risk for both overall cardiovascular risk and cancer.
- In most immigrants the prevalence of high blood pressure was low compared to Norwegians and this will contribute to a favourable cardiovascular risk profile.
- In some of the immigrant groups their traditional food habits promote a higher consumption of fruit and vegetables and this could contribute to reducing the risk for several chronic diseases.

General Challenges for all Immigrants

- Concerning physical activity, strategies and interventions planned or being implemented need to ensure that they also reach immigrant groups in order to address the high levels of inactivity.
- Strategies and interventions planned or being implemented to prevent and address musculoskeletal disorders need to pay attention in particular to immigrant women.
- Explanations for greater proportions with poorer self-reported health must be further investigated.
- Increased use of health services might indicate that immigrants both require more medical attention but also that the attention they receive might not be satisfactory and hence increase the frequency. Therefore health care providers require to further analyse the situation to gain a better understanding of the causes and devise strategies to cope.

Group Specific Challenges

Turkish

- Preventive strategies that address smoking are a priority, especially for men.
- As proportion with overweight/obesity is high, interventions that will reduce and control obesity need to be further adapted to address this issue.
- As the proportion with mental distress is high, attention needs to be paid both to gain a better understanding of the problem and to developing strategies to address the need.

Iranian

- Preventive strategies that address smoking are a priority.
- As the proportion with mental distress is high attention needs to be paid both to gain a better understanding of the problem and to developing strategies to address the need.

Pakistani

- Dietary habits indicate the need for nutrition counselling and other interventions that will increase the consumption of fruit and vegetables and decrease the consumption of soft drinks and full-fat milk.
- The high triglyceride and low HDL levels also indicate the potential for improving the dietary habits in addition to other strategies that can contribute to improving the lipid profile.
- As the proportion with overweight/obesity is high, interventions that will reduce and control obesity need to be further adapted to address this issue.
- The high levels of self-reported diabetes indicate the need for prevention, control and treatment of this chronic disease.

Sri Lankan

- The high triglyceride and low HDL levels indicate the potential for improving the dietary habits in addition to other strategies that can contribute to improving the lipid profile.
- As the proportion with central obesity is high, interventions that will reduce and control obesity need to be further adapted to address this issue.
- The high levels of self-reported diabetes indicate the need for prevention, control and treatment of this chronic disease.

Vietnamese

- Preventive strategies that address smoking are a priority for the men.

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Section 1: Background

Introduction

Migration to Norway from neighbouring Scandinavian countries and to a lesser extent Western Europe is not a new phenomenon. However, during the past 4 decades, Norway's fairly homogenous population has become increasingly multi-ethnic with an increase from 1.5 percent of the population in 1970 to 9.8 percent in 2008. Two thirds were from low and middle income countries. (http://www.ssb.no/english/subjects/00/00/10/innvanding_en).

The immigration to Norway from low and middle income countries coincides with Norway's new-found wealth following the discovery of oil. The quest for economic prosperity brought the first group of migrants from Pakistan to Norway in 1967. Migrants from Pakistan and later Turkey arrived to meet an increasing need for industrial labour in the 1970s [1]. Initially, these groups were predominant.

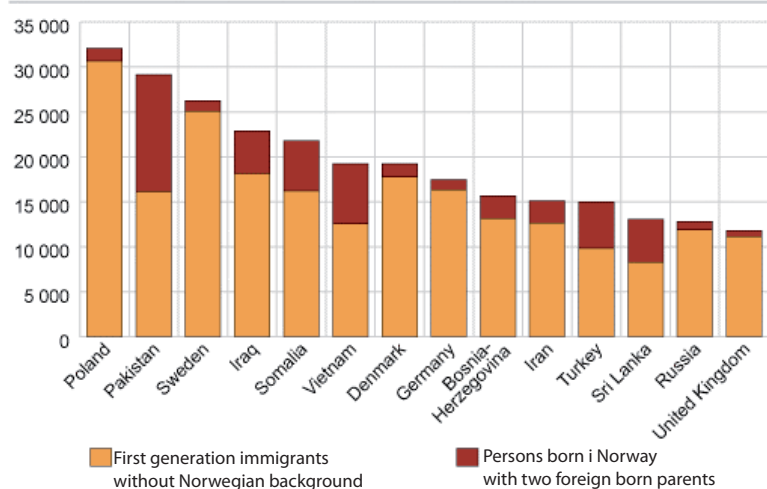
However in the seventies, the development of the Norwegian Immigration Policy led to dramatic changes. Stricter regulations regarding immigration in 1975 were followed by a permanent 'immigration ban' in 1981 [2]. After the 'immigration ban' (1981),

the composition of migrants from low and middle income countries changed from economic aspirants to asylum seekers and refugees. Thus an influx from Sri Lanka, Iran, Iraq, Somalia, Yugoslavia and Albania reflects world events in recent years leading to the movement of these groups to Norway [1]. Immigration accounts for more than half of the national population growth and 87 percent of the growth in Oslo in the 1990s[3].

The Immigrant Population in Norway: Demographics, Living Conditions and Health

In order to assign ethnic origins, some definitions need to be considered: Statistics Norway defines first generation immigrants as persons born abroad with both parents of foreign origin. If one were to consider all the groups with migratory origins, including those with one foreign parent, foreign born children adopted by Norwegian born parents or those with Norwegian parents but born abroad, then they would amount to 628,658 persons, constituting 13.5 percent of the population (http://www.ssb.no/english/subjects/00/00/10/innvanding_en).

The largest immigrant groups in Norway. 1.1.2008. Absolute numbers



Source: Statistics Norway 2008

Figure 1.1 Largest Immigrant Groups in Norway

Until the nineties, the largest group of immigrants in Norway originated from Sweden. Today, however, the single largest group of immigrants from low and middle income countries is from Pakistan when both first generation and second generation immigrants are included. The largest groups are illustrated in figure 1 above [4]. Immigrants from low and middle income countries are young compared to the host population with 47 percent being in the 25-44 years age group. Of those born in Norway with two foreign born parents, 72 percent are below the age of 10 years and 90 percent below the age of 20 years. This age distribution mirrors the fairly recent migration history, though there is a huge variation in the length of stay among groups - with one third having lived in Norway for over 15 years and 33 percent for less than 5 years. The immigrant population is not evenly distributed in Norway, with nearly half (43 percent) being concentrated in the south-eastern parts of Norway. The highest single concentration (25 percent) of immigrants is in Oslo [5].

Ethnic minorities in western countries are generally worse off than the majority/host populations. The US census showed that one third of the American black men lived in areas with the lowest income category compared to less than one percent of white men [6]. This is echoed across the Atlantic with just a quarter of white people having less than half the average income compared to four fifths of Pakistanis in Britain [7, 8]. Also in Norway, despite its egalitarian society and socio-democratic governing principles, the living conditions survey among non-western immigrants illustrated that immigrants from low and middle income countries with their lower incomes, employment, educational levels and housing standards occupy the lowest strata of Norwegian society [10].

Considering that migrants from low and middle income countries have been exposed to the western urban environment for at least a couple of decades in Norway, significant changes in lifestyle might be expected. A western urban environment might entail unfavourable lifestyle changes leading to an increase in bodyweight that later on impacts health. In addition, the once young *healthy migrant* has begun to age, and with aging the propensity of Type 2 Diabetes Mellitus and cardiovascular diseases increases. Besides the aging immigrant, gaining knowledge of the health of second generation immigrants born and brought up in Norway is also of great public health significance for intervention and in the life course perspective.

Routine monitoring of health as well as population based surveys in Norway have not included information on different ethnic groups. Until recently, these have as

a rule excluded immigrants - either due to the design of the study or due to language difficulties or other cultural barriers associated with participation of immigrants in such studies. Immigrant health has therefore focused on selected specific health problems. Regardless of the differences of the subject matter and methodologies of these studies, a common conclusion that can be drawn is that the health of immigrants differs significantly from that of ethnic Norwegians. The sum total of these effects, both negative and positive, results in differences between the health of immigrants/ethnic minorities and the host Norwegian population [2, 11-17].

Growing interest in the health of immigrants/ethnic minorities has led to documenting evidence, advocacy and development of policies. In 1996-1997 the first White Paper on Immigrants and Multicultural Norway was presented (St. Melding nr 17) by the Ministry of Local Government and described the general situation for Immigrants in Norway. However it was only in 2003 that the White Paper to the Norwegian Parliament: Prescription for a Healthier Norway [18], presented by the Ministry of Health, raised the issues of health inequalities and chronic diseases; echoing the very same sentiments that are raised in the WHO policy document: Diet, Nutrition and the Prevention of Chronic Disease [19]. Recently, evidence of growing social inequalities in the Norwegian context has led to recognition of the problem by the Ministry of Health and its recent report to the Parliament no 20; National Strategy to Reduce Social Inequalities in health in 2006-2007 outlines both the challenges and provides insight into how these challenges could be tackled [20]. The National Institute of Public Health's recent report on Social inequalities in Health (2007) provides the overall factual evidence that forms the basis for developing the National Strategy [21].

While these White Papers and reports provide information on the health situation of immigrants, the data and information on immigrants are often aggregated and specific information inadequate. However immigrants are an extremely heterogeneous group; hence besides their health differences with the host population, there are differences between groups [22]. Given that immigrants are now part of the demographics, they warrant special attention as besides their obvious cultural and traditional differences, there are physical, racial and genetic variations that affect the causes of disease.

Objective of the Study

The main objective of this Oslo Immigrant Health profile is to provide an overview of the salient health problems of adults from 5 of the largest immigrant groups in Oslo and to compare their health status and problems with the host Norwegian population.

Materials and Methods

Oslo, the capital of Norway, is a multicultural city with a total population of 529,846 where 22.3 percent are immigrants. 70 percent of these immigrants are from low and middle income countries [23]. The highest proportions of immigrants from low and middle income countries are located in the districts Stovner, Grorud, Gamle Oslo, Søndre Nordstrand (all in the eastern part of the city)[4].

Background

This profile is based on two cross-sectional population surveys conducted in Oslo as part of the Oslo Health Study (HUBRO). Both studies used the same protocol. The first is the main Oslo Health Study (HUBRO) conducted in 2000 – 2001 by the National Health Screening Service (now the Norwegian Institute of Public Health, NIPH) in collaboration with the Oslo Municipality and the University of Oslo (UiO). The second survey, the Oslo Immigrant Health Study (Innvandrer-HUBRO) conducted in 2002 by the NIPH and the University of Oslo, included five of the largest immigrant groups in Oslo.

The main objectives of the Oslo Health Study and the Oslo Immigrant Health Study included identifying health needs and priorities of Oslo residents, estimating prevalence of chronic diseases, investigating the aetiology of major health problems and identifying differences in health and associated risk factors for disease.

Combined Study Population: HUBRO and the Oslo Immigrant Health Study

The combined study population includes Oslo residents born in Pakistan, Turkey, Iran, Sri Lanka and Vietnam (in the period 1940-71), and those born in Norway (in the years 1940, 1941, 1955, 1960 and 1970).

In total 14,857 individuals were included; as they met the age criteria, belonged to one of these 6 ethnic groups and the criteria of inclusion. However the numbers in the tables could be lower due to missing data on certain variables. We briefly describe the two studies here:

HUBRO

Oslo residents born in 1924, 1925, 1940, 1941, 1955, 1960 and 1970 were invited to participate in the HUBRO study and subsequently two written reminders were sent. Detailed description of HUBRO can be obtained from <http://fhi.no/artikler/?id=54464>.

A total of 18 770 individuals (46 percent) participated in the survey (criteria of inclusion: written consent, attended at the screening station and/or submitted at least one questionnaire) after reminders. The proportion participating differs with age, gender, ethnicity and other socio-demographic characteristics and this is further described by Sjøgaard et al [24].

The Oslo Immigrant Health Study

Data collection was similar in two studies. Oslo residents born in Pakistan, Iran, Vietnam, Sri Lanka and Turkey (born between 1942 and 1971), excluding the 7 birth cohorts previously invited to HUBRO, were invited to participate in the Oslo Immigrant Health Study. Non-responders received one written reminder 3-8 months after the original invitation. (In addition, persons born between 1971- 1982 were invited, but they are not included in this report). For more information see <http://www.fhi.no/dav/906123CAA9.pdf>.

A total of 3019 individuals (39.7 percent) participated in the survey (same criteria of inclusion as HUBRO). Participation rates according to country of birth are as follows: Turkey 32.7percent, Sri Lanka 50.9percent, Iran 38.8percent, Pakistan 31.7percent and Vietnam 39.5percent respectively. The non responder pattern among these groups was similar to that observed in the preceding Oslo Health Study (for details see <http://www.fhi.no/dav/906123CAA9.pdf>).

Data Collection

All invited persons were asked to complete the main questionnaire at home and bring it to the screening station where it was reviewed by a trained nurse. The questionnaire included questions on self-reported health and chronic diseases, dietary and smoking habits, physical activity, medication use, mental health and use of health services. At the screening station, body weight (kg) and height (cm) were measured with an electronic height and weight scale with the participants wearing light clothing without shoes. Body mass index (BMI) was computed as weight/height^2 (kg/m²). Waist and hip circumference (cm) were measured with a steel measuring tape to compute the waist-hip-ratio (WHR). Systolic and diastolic blood pressures (mmHg) were measured with a Dinamap 845XT instrument (Criticon, Tampa, Florida, USA). Three different readings were taken with one-minute intervals, and the

mean of the two last measurements was included in this analysis. A non-fasting venous blood sample was obtained and analyzed for serum total cholesterol, HDL-cholesterol, and triglycerides (Hitachi 917 autoanalyzer, Roche diagnostics, Switzerland), at Department of Clinical Chemistry, Ullevål University Hospital, Oslo, Norway. Further details of data collection can be found in annex 1.

Statistical methods

We adjusted for the age effect between groups using one-way ANOVA. The effect of age adjustment was minor. We used basic standard methods, like proportions and mean values, and chi-square test for differences between groups for the tables in the annex. Data were analysed using the SPSS package 14.0 (SPSS INC., Chicago, Illinois, USA) and STATA. P values less than 0.05 were considered statistically significant.

Ethics and approvals

The study protocols were approved by the Norwegian Data Inspectorate and cleared by the Regional Committee for Medical Research Ethics. Both studies have been conducted in full accordance with the ethical principles as per the World Medical Association Declaration of Helsinki. All the participants of the Oslo Health Study and the Oslo Immigrant Health Study have given their written consent.

Limitations of the Study

The main limitations of this study are: the low participation rate with varying response rate by ethnic group, the lack of information on non-responders, lack of validated instruments and the lack of outcome data in order to evaluate the prediction of risk. These are briefly discussed below

Conducting population-based studies among ethnic minorities is challenging, and accessing these communities may be especially difficult. Low attendance rates among marginalised groups are also reported by others [25, 26]. The relative low participation rate of our study might have introduced selection bias. It is however unlikely that the ethnic differences can be explained by selection bias alone.

Our information on non-responders is limited to gender, age and ethnic group and can give some, but not sufficient insight regarding the between groups differences. A comprehensive study of the effects of non-attendance in HUBRO 2000-2001 concluded that prevalence estimates might be robust even in light of considerable non-attendance [24]. Further analy-

ses that in particular addressed immigrant groups supported this conclusion (<http://www.fhi.no/dav/C1E43891DD.pdf>).

In the Oslo Immigrant Health Study the attendance was highest among Sri Lankans and lowest among Pakistanis. Iranians and Sri Lankans had higher education compared to Pakistanis and Turkish. This concurs with official data on immigrants from Statistics Norway. (<http://www.ssb.no/emner/04/01/utinnv/>), and it is therefore unlikely that the difference in education per se reflects selection bias. Factors such as acculturation, integration, language skills and understanding the significance of health surveys, might vary according to socio-cultural differences among ethnic groups and could account for some of the differences in response rates.

The use of standard indicators of socio-economic position for the Norwegian population may not be appropriate for immigrant groups. Similarly the inability to control for other factors due to the unavailability of adequate data is also a limitation as this might have contributed further to explaining the reported differences.

Until such time when the predictive ability of risk factors for cardiovascular disease (CVD) has been evaluated in immigrant populations using morbidity and mortality outcome data, we are unfortunately unable to draw firm conclusions about the accuracy of predictions of future CVD risk.

Section 2: Main findings

2.1 Socio – Demographic Characteristics

Age

In all groups men were older than women, ranging from 0.2 years in Iranian to 2.1 years in Pakistanis. Furthermore, the age of immigrants reflects the migration history from low and middle income countries to Norway; Pakistanis were the oldest and Sri Lankans youngest.

(Additional information is found in Annex 2, table 2.11A &B)

Self-Reported Education

Men reported more years of education than women in all groups. Whereas this difference was very large in immigrants from Turkey and Pakistan, it was marginal in Norwegians. As can be seen in figure 2.1.1, the proportion with more than 12 years of education was highest in Iranians and Norwegians and lowest among immigrants from Turkey.

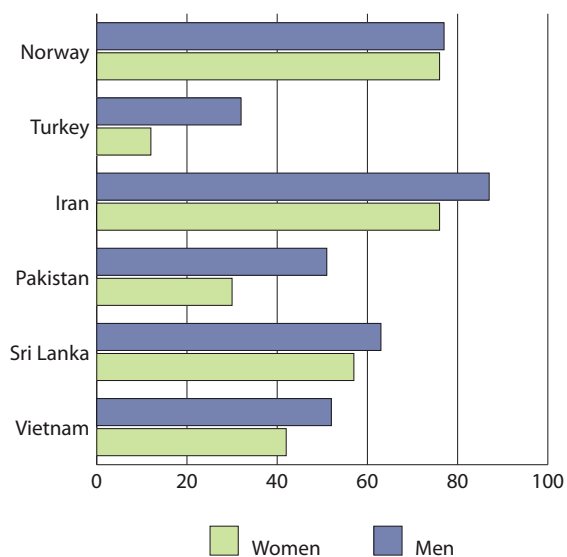


Figure 2.1.1: Age Adjusted Proportions (%) with Higher Education (>12 years)

(Additional information is found in Annex 2, table 2.12)

Self-Reported Employment Status

Regardless of ethnic group more men were in fulltime employment, whereas more women had part time employment.

Not employed is a category that includes; not in salaried employment, students, housewives, retired persons and is not exclusive to those unemployed. Figure 2.1.2 shows that in all ethnic groups more women than men were not employed. Among women 16 percent of Norwegian women were not employed compared to 71 percent of women from Pakistan. The large proportion of not employed women from Pakistan could be attributed to the fact that the large majority within this group are most probably housewives.

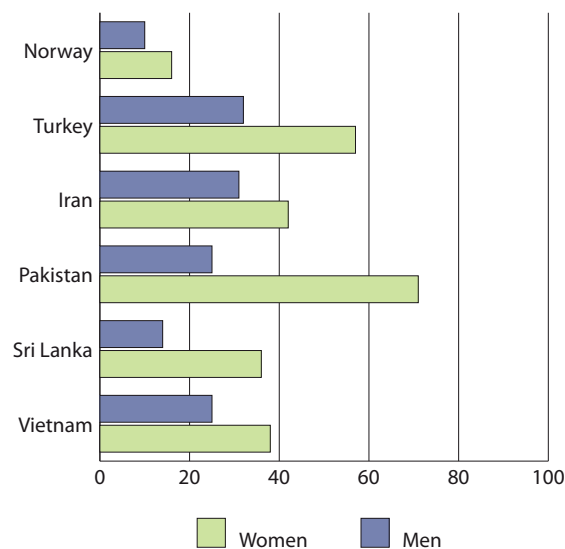


Figure 2.1.2: Age Adjusted Proportions (%) of those Not Employed

(Additional information is found in Annex 2, table 2.13)

Self-Reported Marital Status and Proportion Living Alone

In general more men than women were unmarried, and more Norwegians than immigrants were unmarried. Whereas over 90 percent of South Asians (Pakistani/Sri Lankan) were married less than half of the Norwegians were so (46 percent men and 44 percent women).

The proportion of men living alone was greater than among women in all ethnic groups except for Sri Lankans (Fig 2.1.3). The greatest proportions of those living alone were among Norwegian and Iranian men whereas the lowest were among Pakistanis.

Area of Residence in Oslo

Oslo was until 2004 divided into 25 districts. These are categorised according to geographic location into 4 geographic regions. The geographic regions in our study comprise; Inner West, Outer West, Inner East, Outer East. Whereas around 40% of the Norwegians were living in Oslo West, few immigrants did so (Fig 2.1.4).

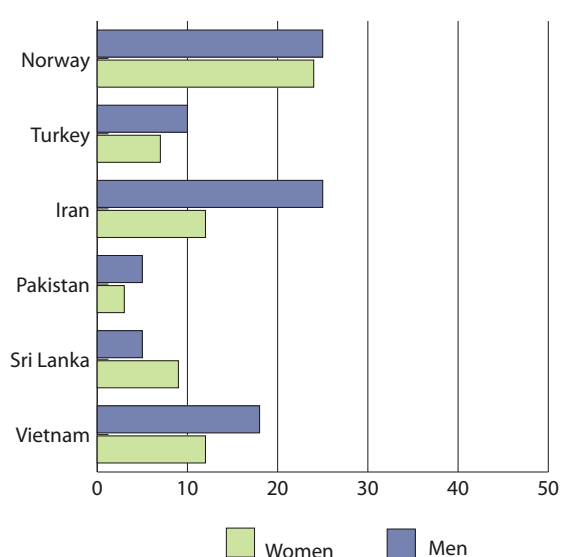
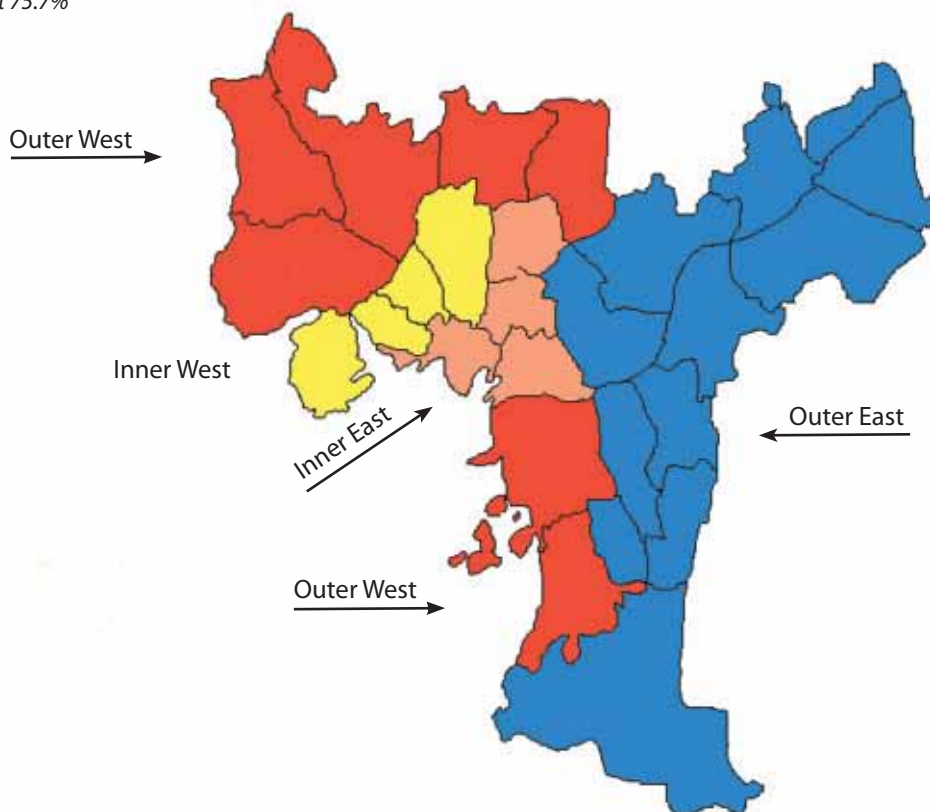


Figure 2.1.3: Age Adjusted Proportions (%) Living Alone

(Additional information is found in Annex 2, table 2.14 A & B)

Proportion (%) of the immigrants in our study living in different parts of Oslo

- Outer West 3.3%
- Inner West 3.3%
- Inner East 17.7%
- Outer East 75.7%



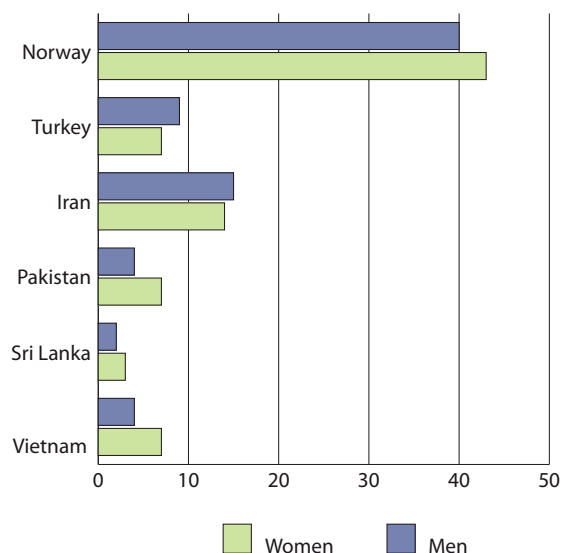


Figure 2.1.4: Age Adjusted Proportions (%) of those Living in Oslo West

(Additional information is found in Annex 2, table 2.15)

Self-Reported Social Security Benefits

The respondents were asked to report whether they were currently receiving social benefits classified into 7 of the most common types of benefits; Sickness, Disability pension, Rehabilitation, Unemployment, Social Assistance and Social parent allowance. In addition, some of them are only achievable for those in the work force. These data must be interpreted cautiously as the number of respondents to these questions were lower than the number of respondents for the rest of the study. Immigrant groups received more benefits than Norwegians in all categories. Of all groups those from Turkey had the greatest proportion receiving disability pension. Among those receiving unemployment benefits the greatest proportion were from Sri Lanka.

(Additional information is found in Annex 2, table 2.16)

HIGHLIGHTS Chapter 2.1: Socio-Demographic characteristics

- **Age of immigrants:** reflects migration history: Men are older than women, Pakistanis are the oldest and Sri Lankans youngest.
- **Education :** Among immigrants men had more years of education than women, and this gender difference was especially evident among those from Turkey and Pakistan. Iranians, Norwegians, and Sri Lankans had greater proportions with higher education than those from Vietnam, Pakistan and Turkey.

- **Employment:** More men had full time employment, Norwegian men had highest proportion of full time employment Pakistani women had the lowest.
- **Living Alone:** Greater proportions of men were living alone. These numbers were higher among Iranians and Norwegians and the lowest among Sri Lankans and Pakistanis.
- **Area of residence:** Over 90 percent of immigrants in our study live in Oslo East, whereas Norwegians were more evenly distributed between East and West.

2.2 Self-Reported Health

Self-Perception of Health

The very first question of the main questionnaire provides subjects with the opportunity to describe their own health in four categories; poor, not very good, good and very good. While this standard means of assessing overall health within populations has been used globally it may not be comparable across ethnic groups. This may be attributed to the different perceptions of health that are rooted in culture and language. This in turn implies that we need to be cautious about the interpretation of self-rated health ratings when comparing different ethnic groups. In our study we have chosen to further categorize four into two categories and to present those reporting very good or good health as one group as used in previous Norwegian Studies[22].

Self-Reported Health and the Effect of Age

As observed in figures 2.2.1-2.2.2 as age increased good health decreased. This was seen in both men and women and in all ethnic groups, and the difference between the ethnic groups mostly seemed to be constant across age (Fig 2.2.1- 2.2.2). Thus, the highest proportions of good/very good self-reported health were observed in the youngest age group (30-35 years) where around 90 percent of the Norwegians reported good/very good health compared to 48 percent of the Turkish women and 61 percent of the Turkish men. Turkish women in the three oldest age groups had the lowest proportion (10 percent) reporting good/very good health.

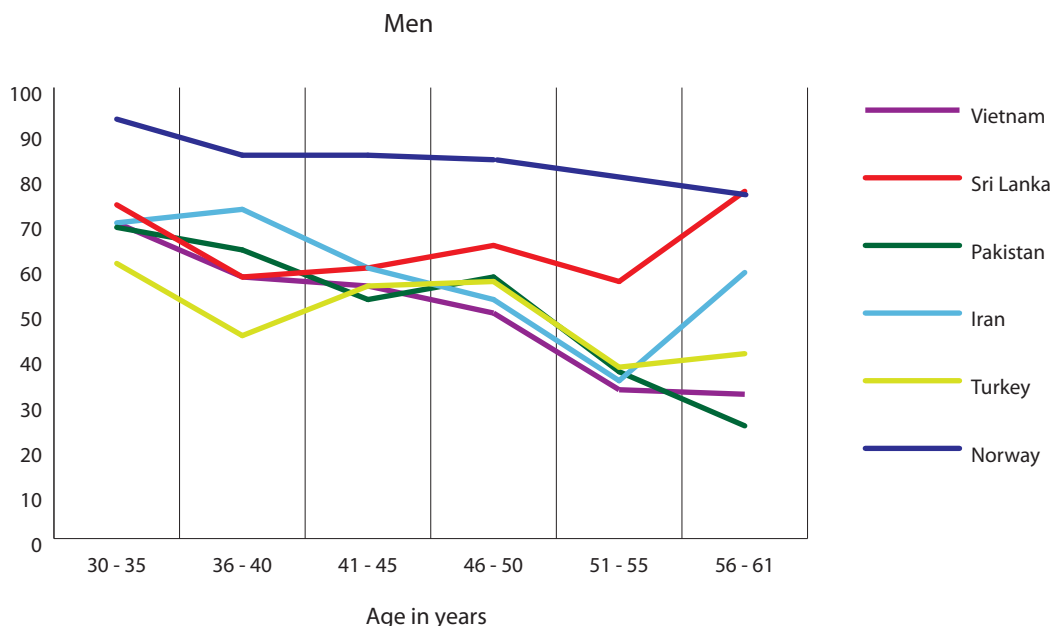


Figure 2.2.1: Proportions (%) of MEN with Good/Very Good Self-Reported Health by Age group

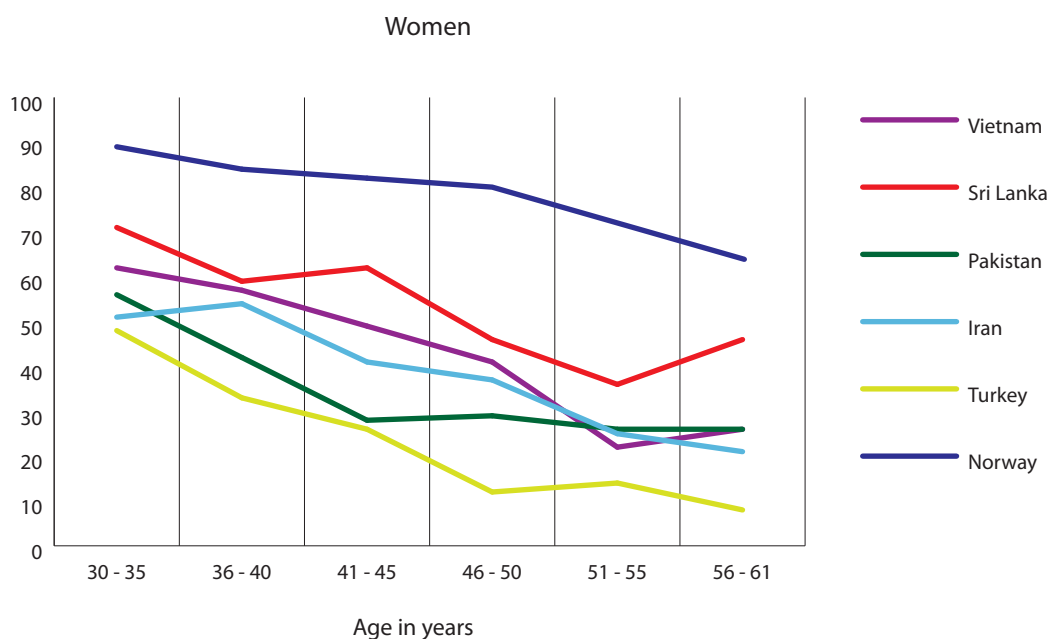


Figure 2.2.2: Proportions (%) of WOMEN with Good/Very Good Self-Reported Health by Age group

Self-Reported Health; Gender and Ethnicity

The different age distribution among the immigrant groups did not alter the results; in fig 2.2.3 even after adjusting for age the greatest proportion of those with good/very good health were from Norway both for men and women. Among the immigrant groups those with the lowest proportion (28 percent) of good/very good health were Turkish women whereas those with the highest proportion (66 percent) were Sri Lankan men. However the gender differences were consistent

in all groups regardless of ethnicity, the differences between men and women being the lowest among Norwegians and Vietnamese.

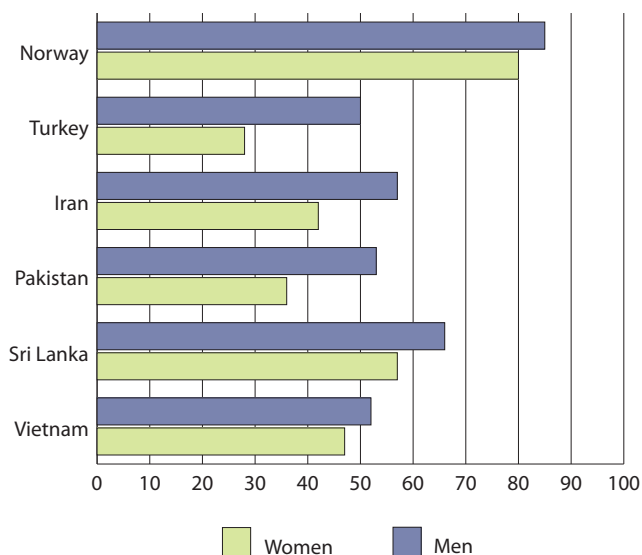


Figure 2.2.3: Age Adjusted Proportions (%) of Adults with Good/Very Good Self-reported Health

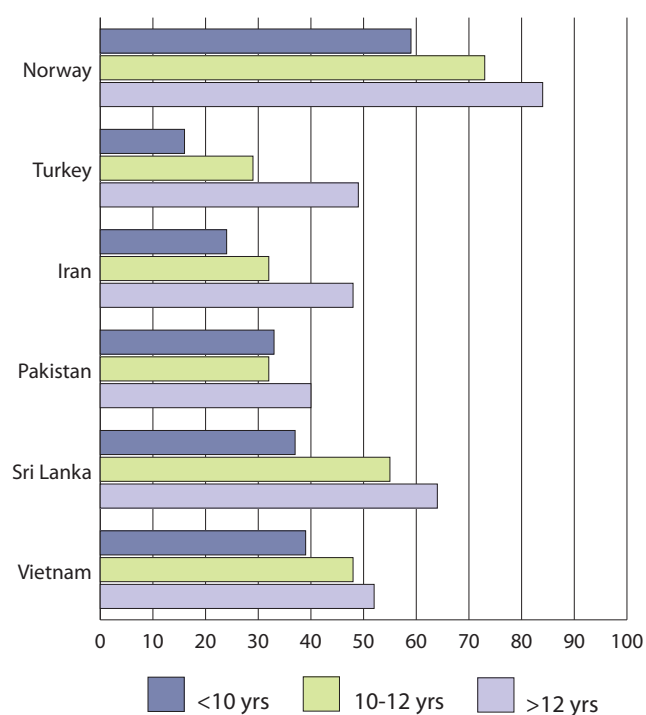


Figure 2.2.5: Age Adjusted Proportions (%) of WOMEN with Good/Very Good Self-Reported Health by Years of Education

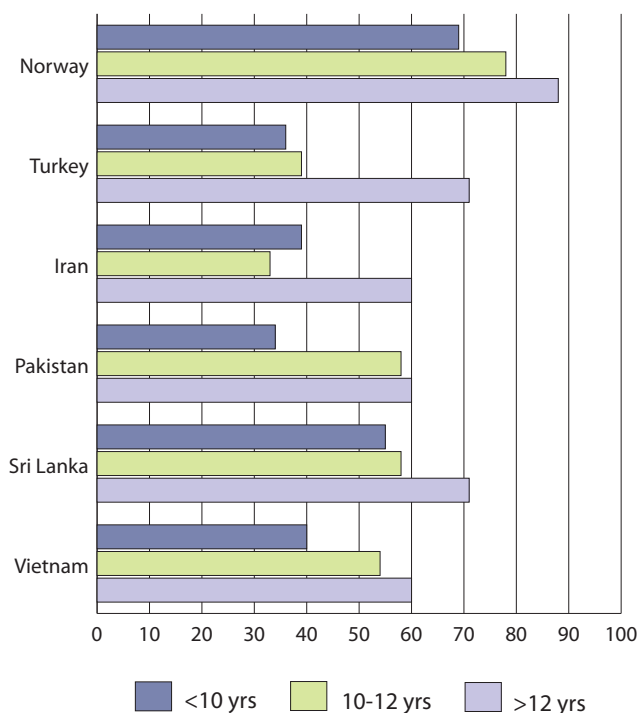


Figure 2.2.4: Age Adjusted Proportions (%) of MEN with Good/Very Good Self-Reported Health by Years of Education

Self-Reported Health and Education

Almost all groups had an educational gradient in self-reported health. Those reporting more than 12 years of education had the highest proportion with good/very good health. This was especially evident in Turkish and Iranian men, and also women. Sri Lankan and Turkish men with more than 12 years of education reported as good health as Norwegians with less than 10 years of

education. A similar pattern was observed among Sri Lankan and Norwegian women. Except for Iranian men (and Pakistani women) those reporting less than 10 years of education had the least proportion with good/very good health (Fig 2.2.4-2.2.5).

Self-Reported Chronic Diseases and Conditions

Self-reported diabetes prevalence was highest among those from Pakistan and Sri Lanka and lowest among those from Norway and Iran (Fig 2.2.6). Given the age of the sample it is not surprising that self-reported prevalence of myocardial infarction and stroke was low (See Annex 2, Table 2.18). In both conditions this proportion was lower among women compared to men. However, Iranian women had higher proportion with stroke than any group of men. The greatest proportion with myocardial infarction were found in Pakistani men.

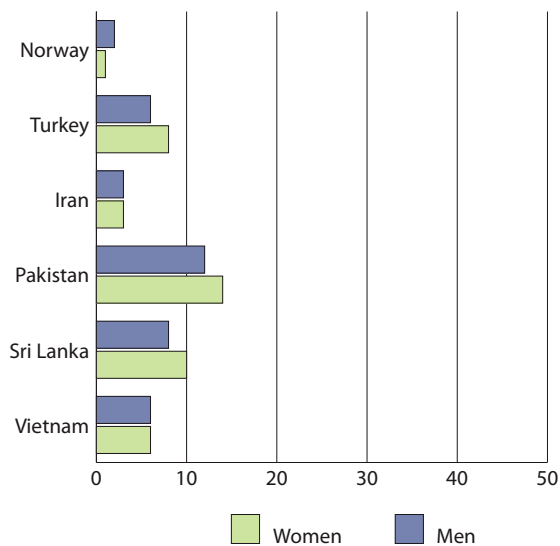


Figure 2.2.6: Age Adjusted Proportions (%) with Self-Reported Diabetes

A greater proportion of women reported musculoskeletal disorders than men regardless of ethnicity (Fig 2.2.7). Much fewer Norwegians reported musculoskeletal disorders than immigrants. For mental health, see section 2.4.

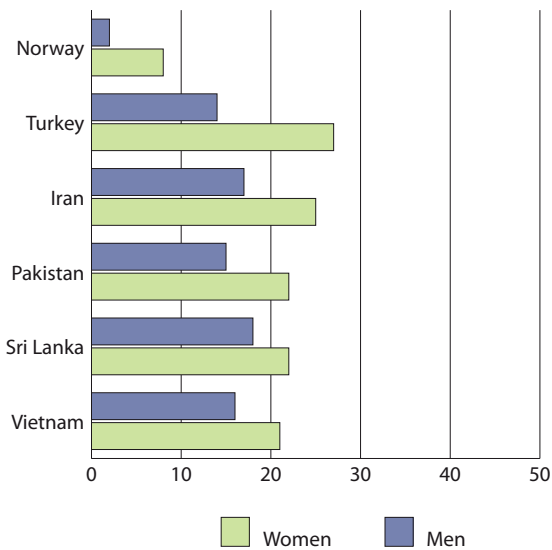


Figure 2.2.7: Age Adjusted Proportions (%) with Self-Reported Musculoskeletal Disorders

Additional information is found in Annex 2, table 2.18

HIGHLIGHTS Chapter 2.2: Self-Reported Health

- **Self-reported health:** Norwegians most frequently reported good/very good health, whereas women from Pakistan and Turkey least frequently did so. Gender differences were least among the Norwegians and Vietnamese.
- **Self-reported health and education:** In all ethnic groups those with more than 12 years of education most frequently reported good/very good health.
- **Self-reported chronic diseases and conditions:** Women had higher proportions of self-reported musculoskeletal disorders. Men had higher proportions of myocardial infarction. Self-reported diabetes was highest among those from Pakistan and Sri Lanka. In general, immigrant groups reported higher proportions with chronic diseases and conditions compared to Norwegians.



Foto: www.colourbox.com

2.3 Risk Factors

Fruit and Vegetables

In all ethnic groups women reported a higher intake of fruit and vegetables than men, the gender differences being the least among the Sri Lankans and greatest among Vietnamese (Fig 2.3.1).

The highest consumption was reported among women from Turkey and lowest among men from Vietnam. Interestingly Norwegians were not at either extreme of the spectrum but in the middle between these two groups. Additional adjustments for education did not change the ranking of consumption among the groups.

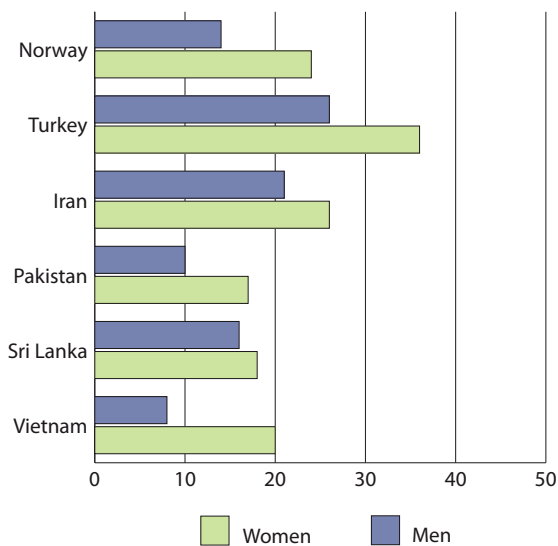


Figure 2.3.1: Age Adjusted Proportions (%) of those with High* Consumption of Fruits and Vegetables

*High Consumption= High category of the fruit and vegetable index (compiled from three variables: fruit, raw vegetables/salad and fruit juice) reflects a daily to several times a day, frequency of consumption of at least two of three original variables

(Additional information is found in Annex 2, table 2.19)

Cola/Soft Drinks and Full-Fat Milk

Cola/soft drinks represent a high consumption of sugar. These soft drinks are also part and parcel of an urbanized western society whereas full-fat milk is a source of high fat and representative of traditional diets in the low and middle income countries. Together they are a double minus in the diet for many immigrants and best termed double jeopardy.

After adjusting for age, the daily consumption of cola/soft drinks was higher among men than women in all groups (Fig 2.3.2). The highest proportion of daily consumers of cola/soft drinks was found among those from Turkey followed by the Norwegians and the lowest in Vietnamese and Sri Lankans.

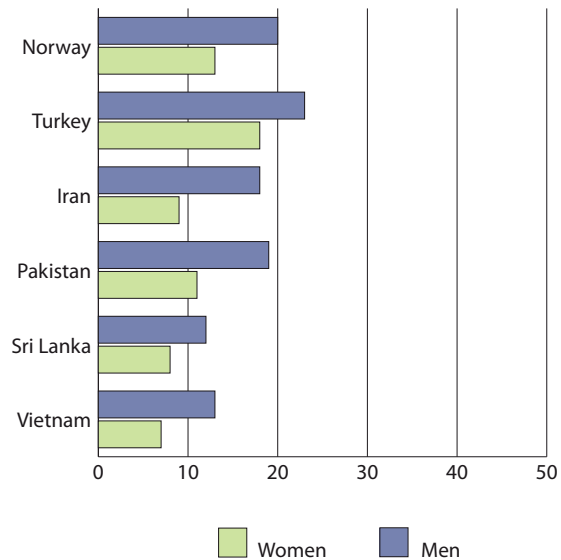


Figure 2.3.2: Age Adjusted Proportions (%) of Daily consumption of Cola/Soft Drinks

(Additional information is found in Annex 2, table 2.20)

Figure 2.3.3 shows that in most groups a greater proportion of men than women had a daily consumption of full-fat milk. The highest consumption of full-fat milk was observed among Pakistanis and the lowest in Norwegians.

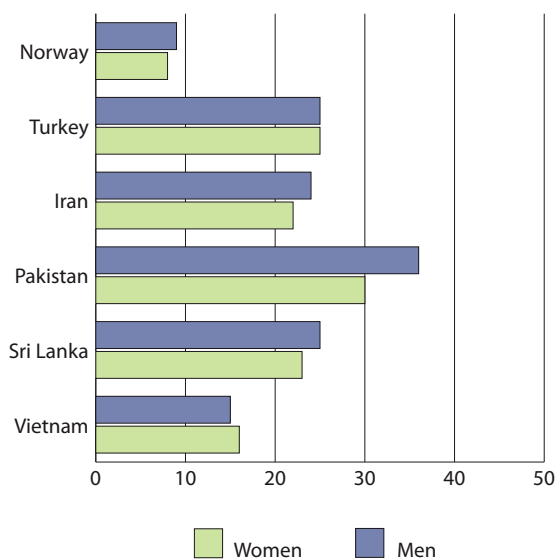


Figure 2.3.3: Age Adjusted Proportions (%) of Daily Consumption of Full-Fat Milk

Physical Inactivity

Around one in two of all immigrant groups reported that they were inactive compared to one in five of Norwegians. Among the immigrant groups, men tended to be less sedentary than women. In Norwegians the opposite was the case – Norwegian men were slightly more sedentary than Norwegian women (Fig 2.3.4).

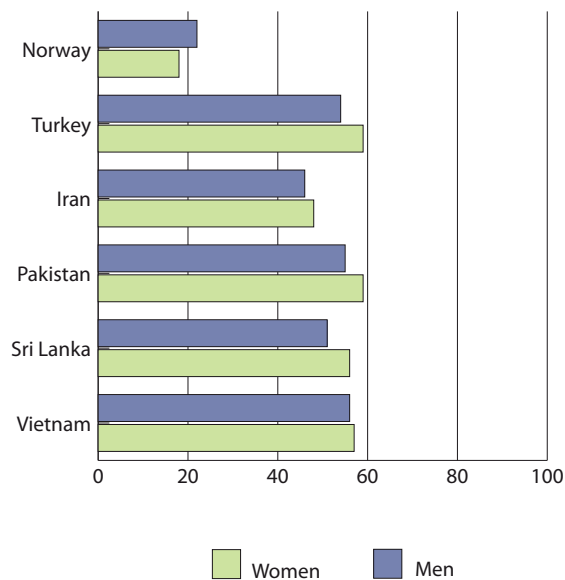


Figure 2.3.4: Age Adjusted Proportions (%) with Physical Inactivity

Men from Turkey, Pakistan and Vietnam with the least education had the greatest proportions reporting inactivity. Among women the pattern was more consistent with the highest proportions of physical inactivity in those with least education (Fig 2.3.5-2.3.6).

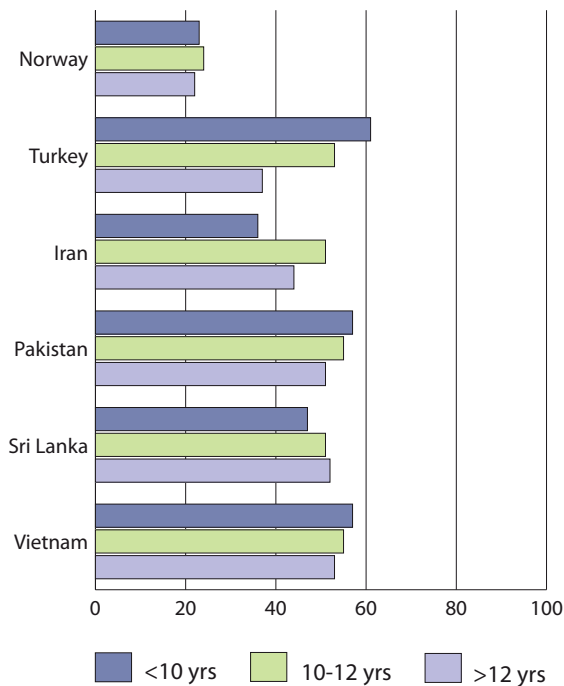
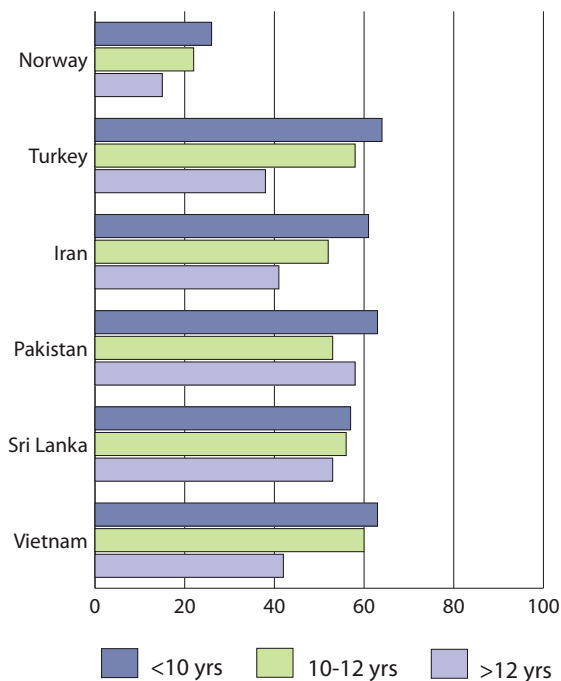


Fig 2.3.5: Age Adjusted Proportions (%) of Physical Inactivity in MEN by years of Education



(Additional information is found in Annex 2, table 2.21)

Fig 2.3.6: Age Adjusted Proportions (%) of Physical Inactivity in WOMEN by years of Education

Smoking Habits

There were large variations in smoking prevalence (Fig. 2.3.7). The gender pattern varied across the groups, with men generally smoking more than women with the exception of Norwegians, where women smoked slightly more. Norwegian women had the highest proportion (30 percent) women smokers of all the ethnic groups. On the other end of the womens smoking scale we found the Sri Lankan with no smokers at all and the Vietnamese and Pakistani women also had very low percentage smokers (4 percent). Sri Lankans, both men and women, had the greatest proportion 'Never smokers'. In men, one in two of those from Turkey were current smokers compared to one in five from Sri Lanka.

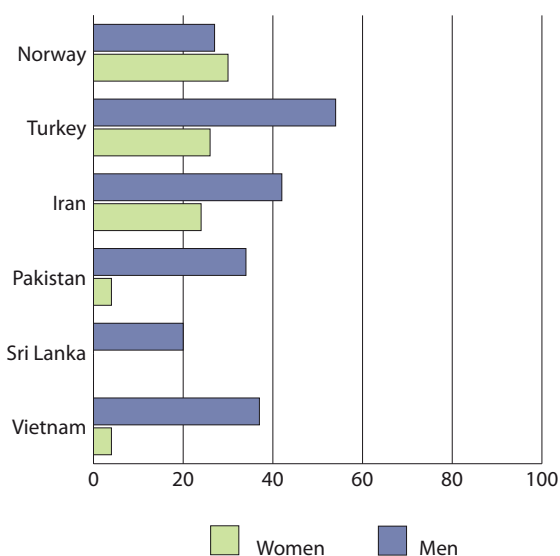


Figure 2.3.7: Age Adjusted Proportions (%) of Current Daily Smokers

An educational gradient was observed in smoking habits among Norwegians both men and women (Fig 2.3.8-2.3.9). A greater proportion of Norwegians with less than 10 years of education smoked. However, while the pattern of less education and more smokers was consistent among Pakistani and Vietnamese men it was the reverse among Iranian and Turkish men and women, with more smokers in the higher educational groups .

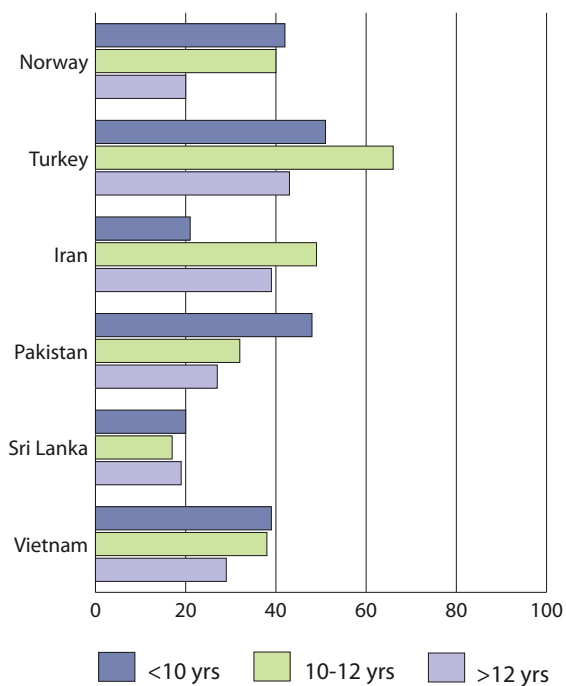


Figure 2.3.8: Age Adjusted Proportions (%) of Current Daily Smokers in MEN by Years of Education

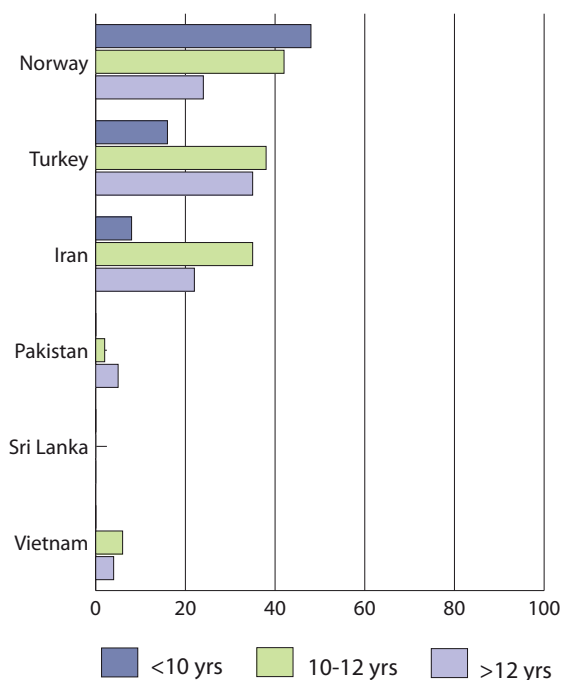


Figure 2.3.9: Age Adjusted Proportions (%) of Current Daily Smokers in WOMEN by Years of Education

(Additional information is found in Annex 2, table 2.22 & 2.23)

Alcohol

In all groups women consumed alcohol less often than men. Immigrant men from all other countries reported a lower consumption of alcohol compared to Norwegian women (Fig 2.3.10). Over 90 percent of the women from Turkey, Sri Lanka and Pakistan consumed no alcohol or less than once a month. Among men the patterns were not as consistent with Pakistani men's consumption being similar to immigrant women, whereas 50-60 % of the other immigrant groups reported low consumption.

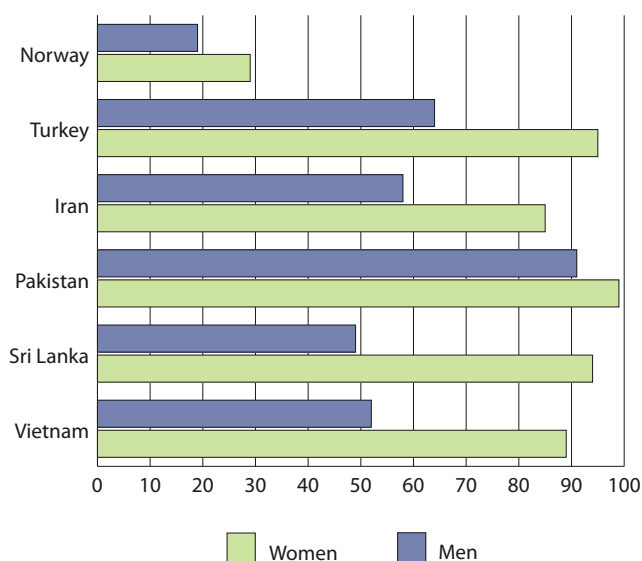


Figure 2.3.10: Age Adjusted Proportions (%) of Low* Alcohol Consumers

* Low= seldom/ never consumed alcohol
(Additional information is found in Annex 2, table 2.24)

Obesity

Generalised obesity was defined as BMI ≥ 30 kg/m², whereas central/abdominal obesity was defined as Waist/Hip -ratio (WHR) ≥ 1.0 in men, and ≥ 0.85 in women.

Generalized obesity (BMI) was higher among women than men for all the immigrant groups but it was the opposite for Norwegians (Fig 2.3.11). Turkish women had the highest mean BMI and proportions of those obese (BMI ≥ 30). Vietnamese men and women had the lowest mean BMI and proportions obese. While Norwegians particularly women were towards the leaner end of the spectrum the Pakistanis were closer to the more obese end of the spectrum.

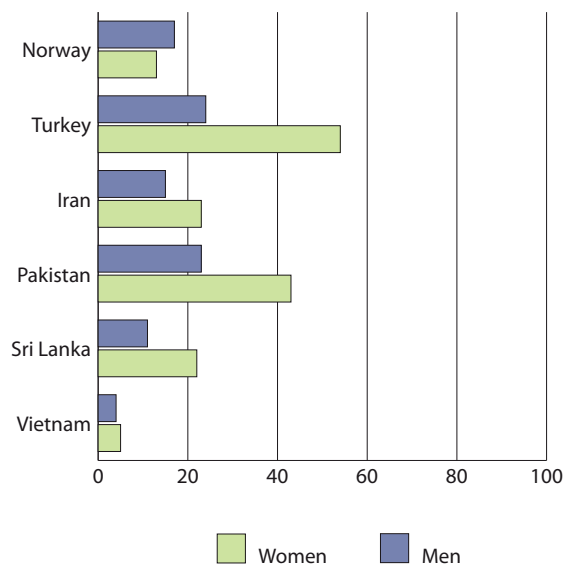


Figure 2.3.11: Age Adjusted Proportions (%) of those with General Obesity (BMI ≥ 30)

Abdominal or central obesity measured here by WHR was more common in women than men including Norwegian women (Fig 2.3.12). The greatest proportions of those with central obesity were women from Sri Lanka and Pakistan, the lowest were men from Vietnam. It is also noteworthy that though some ethnic groups such as the Sri Lankan and Vietnamese women had modest proportions with generalized obesity these proportions were considerably higher with regard to abdominal obesity Vietnamese men and Norwegian women had the lowest proportions of abdominal obesity.



Figure 2.3.12: Age Adjusted Proportions (%) of those with Abdominal Obesity (WHR > 1.00 (men) and 0.9 for (women))

In men and women in all ethnic groups the greatest prevalence of obesity was found in those with lowest education (Fig 2.3.13-2.3.14).

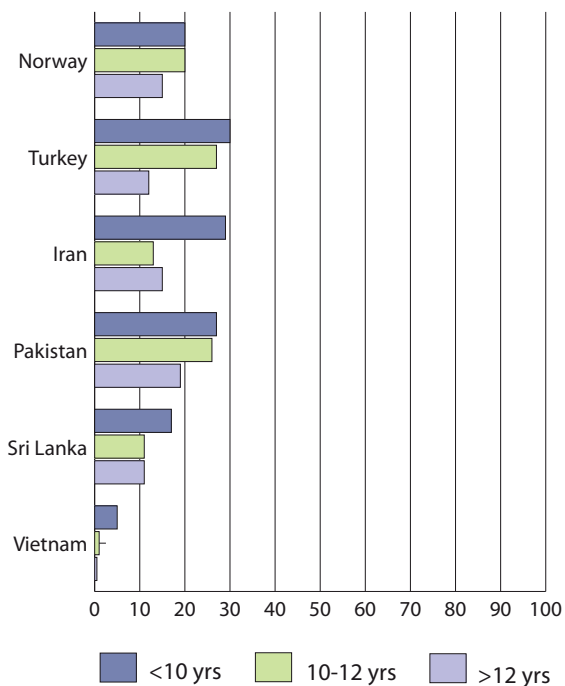


Figure 2.3.13: Age Adjusted Proportions (%) of Obese MEN (BMI>30) by Years of Education

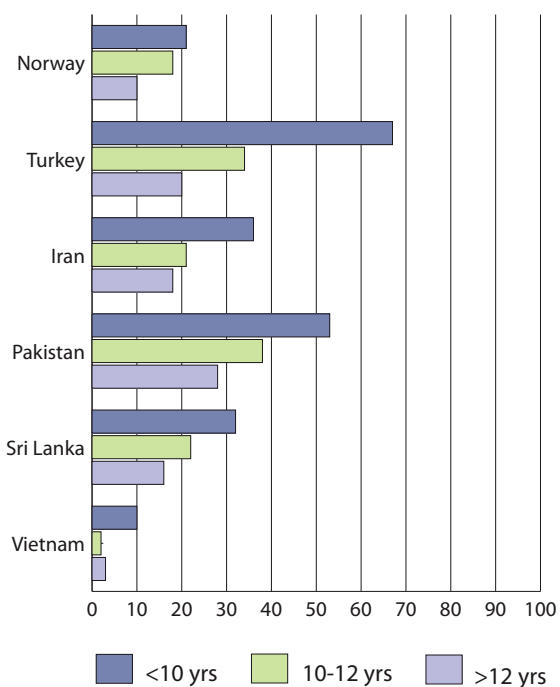


Figure 2.3.14: Age Adjusted Proportions of Obese WOMEN (BMI>30) by Years of Education

In figure 2.3.15 weight gain is calculated as the difference between self-reported weight at age 25 and current weight (at the time of the study). Women gained more weight than men except for Norwegians, Iranians and Vietnamese. The weight gain was twice as high (15 kg) or more in women from Sri Lanka, Pakistan and Turkey compared to Norwegian women and the Vietnamese (8 kg).



Figure 2.3.15: Age adjusted Weight gain* since age 25 in kilos

* mean number of kilos gained

(Additional information is found in Annex 2, table 2.25)

Blood Lipids and Blood Pressure

Ethnic differences in mean total cholesterol were observed both among men and women, with the Norwegian men having the highest mean values. However, Norwegians also had highest HDL cholesterol, followed by the Vietnamese, with the lowest mean HDL observed among Pakistanis and Sri Lankans (See Annex 2, table 2.26). Similarly mean triglyceride levels were highest among immigrants from Pakistan and Sri Lanka and lowest among Norwegians.

Men and women from Norway had the highest mean systolic blood pressure while those from Vietnam and Iran had the lowest values. Norwegians had the highest mean diastolic blood pressure among women and men, with Pakistani women and Sri Lankan men also having the highest diastolic BP (See Annex 2, Table 2.26).

Among men, the greatest proportion with current antihypertensive medication use and current lipid

lowering medication use were Pakistani immigrants. Among women a greater proportion of women from Pakistan and Sri Lanka were on antihypertensive medication and lipid lowering medication compared to ethnic Norwegians.

After adjusting for age (fig 2.3.16) it was observed that men had greater proportions with high BP than women. The greatest proportion with high blood pressure were Norwegian men and lowest women from Iran.

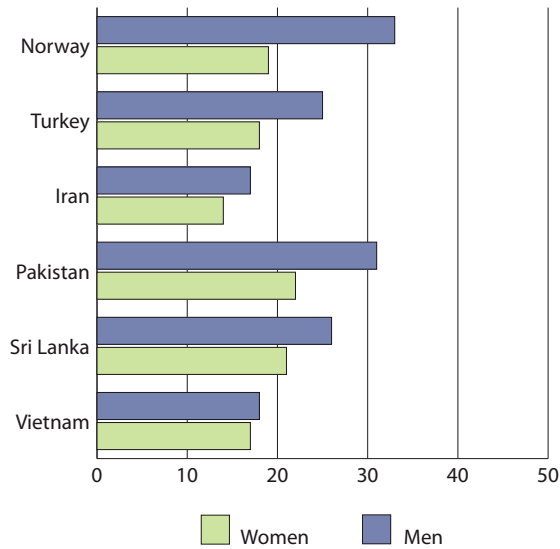


Figure 2.3.16: Age Adjusted Proportions (%) of those with High Blood Pressure*

*High Blood Pressure – Systolic BP > 140 or Diastolic > 90 or on medication for Blood pressure

Whereas a high total cholesterol levels is known to be a risk factor for cardio-vascular disease, high levels of HDL-cholesterol is protective regarding the same diseases. In all groups after adjusting for age (fig 2.3.17) it was observed that men had greater proportions with low HDL than women, which means that men are at higher risk than women. The greatest proportions with low HDL were among men from Sri Lanka, Pakistan and Turkey. Among women from Norway, it was only a few percent with this risk factor of low HDL-cholesterol.

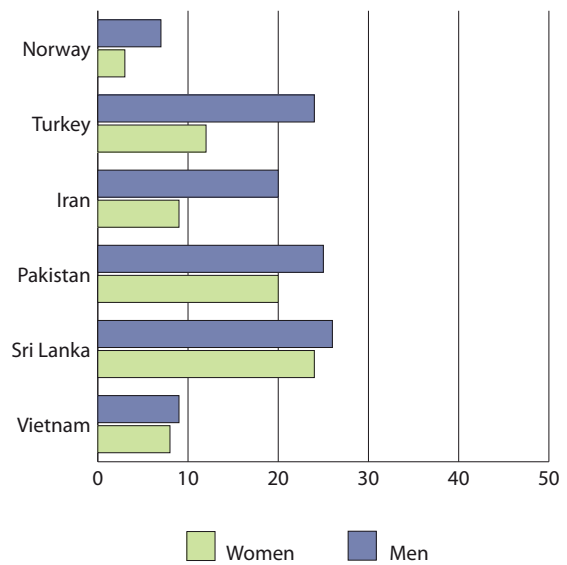


Figure 2.3.17: Age Adjusted Proportions (%) of those with Low HDL*

*Low HDL – HDL Cholesterol < 0.9 mmol in men and < 1.0 mmol in women

Men had a greater proportion of those with high triglycerides compared to women in all groups (fig 2.3.18). The greatest proportions were observed among men from Pakistan, Sri Lanka and Turkey, the lowest among women from Norway, Turkey, Iran and Vietnam.



Figure 2.3.18: Age Adjusted Proportions (%) of those with High Triglycerides*

*High Triglycerides - Triglycerides > 5 mmol.

(Additional information is found in Annex 2, table 2.26 & 2.27)

HIGHLIGHTS Chapter 2.3: Risk Factors

Dietary Habits

Fruits and Vegetables

- Vietnamese men were found to have the lowest frequency of consumption and the Turkish women had the highest.
- Norwegians were at neither extreme of the spectrum.

Soft Drinks and Full-fat Milk

- Men consumed more soft drinks than women, the highest seen in Turkish men.
- The consumption of full-fat milk was higher in men than women, the highest consumption was observed among Pakistanis and the lowest in Norwegians.

Physical activity

- Self-reported physical activity was much lower in all immigrant groups compared to the Norwegians.
- One out of two immigrants was inactive, compared to one of five of Norwegians.
- Among the immigrant groups, men tended to be less physical inactive than women.

Smoking Habits

- Men had greater proportions of current smokers than women, except among Norwegians.
- Sri Lankan immigrants had greatest proportions of non-smokers.
- Greatest proportions of smokers were from Turkey.

Alcohol

- More women than men reported no or seldom consumption of alcohol in all ethnic groups.
- In all immigrant groups, women had a very low consumption

- Among men Pakistanis had the lowest consumption.
- Norwegian men and women showed the highest frequency of alcohol consumption.

Obesity

- Among immigrants general obesity was more frequent in women than in men, but the opposite was seen in Norwegians
- Among women, mean BMI was highest in Turkish and lowest in Vietnamese.
- The greatest proportions with central obesity were recorded in Sri Lankan and Pakistani women and lowest in Vietnamese men.

Blood Lipids and Blood Pressure

- High Blood Pressure: Greater proportions among Norwegians and Pakistanis and Lowest in Iranians and Vietnamese.
- HDL cholesterol: Lowest levels were found in those from Sri Lanka and Pakistan and highest levels in those from Vietnam and Norway.
- Triglyceride: Highest levels observed among immigrants from Pakistan and Sri Lanka and lowest among Norwegians.

2.4 Mental Health

A greater proportion of women reported mental distress (derived from the Hopkins Symptom Check List -10) than men in all ethnic groups, although the difference was marginal in Sri Lankans (Fig 2.4.1). The greatest proportions with mental distress were among women from Turkey and Iran (more than 40 percent). The men from Turkey and Iran also reported high scores; with 3 in 10 reporting to be distressed.

The lowest scores were found in Norwegians both men and women, especially in men where less than 1 in 10 reported to be distressed. Among the immigrant groups, the Sri Lankans had the lowest proportion of mental distress, Sri Lankan women being in the same range as the Norwegian women.

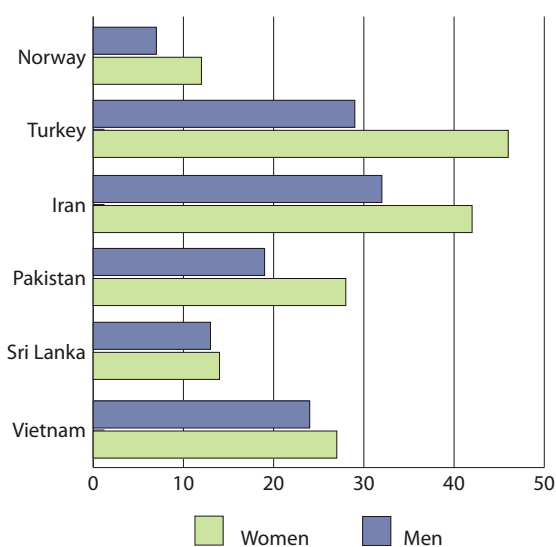


Figure 2.4.1: Age Adjusted Proportions (%) with Mental Distress *

* The Mental Distress variable was derived from the Hopkins Symptom Check List -10. Cut-off point was set at 1.85, the variable dichotomized and subjects scoring above the limit labelled as "distressed".

The greatest proportions of those with mental distress were in the group with less than 10 years of education for both men and women, except for Sri Lankans and Pakistanis (Fig 2.4.2). In Pakistani men there was no association between education and mental distress. The Sri Lankan men with higher education were slightly more distressed than those with lowest education. A similar picture was seen in women from these two immigrant groups; Pakistani and Sri Lankan women with higher education tended to be more distressed than their lower educated counterparts. Norwegian men with more than 12 years of education were least distressed.

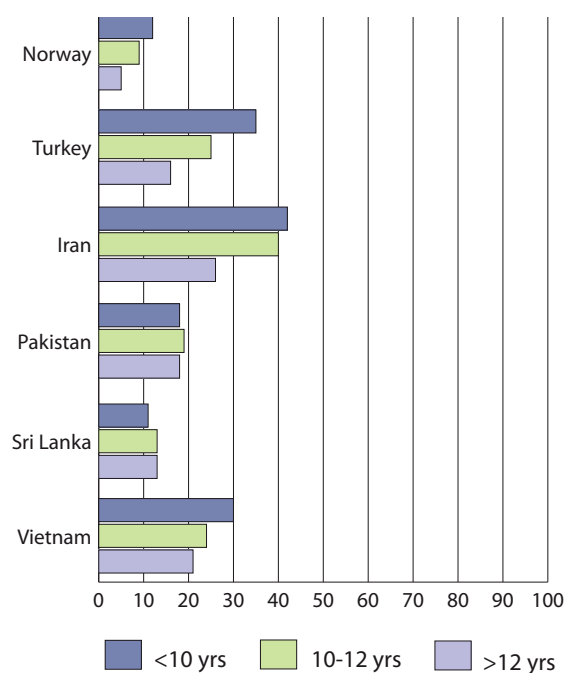


Figure 2.4.2: Age Adjusted Proportions (%) of Mental Distress in MEN by years of Education

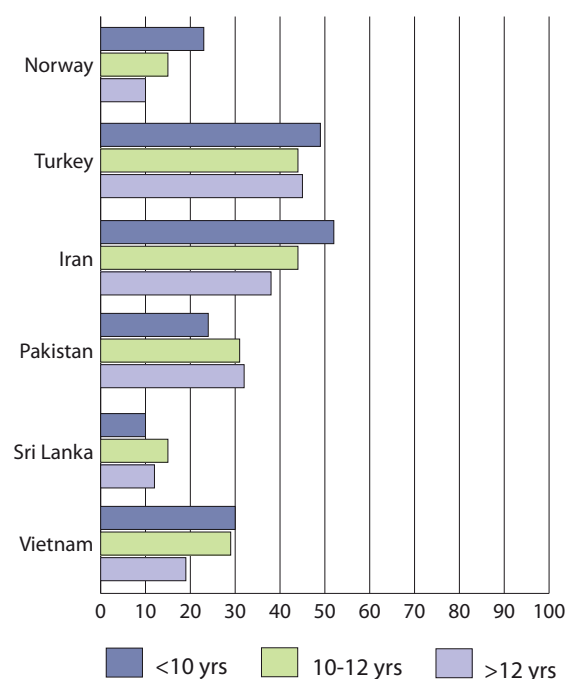


Figure 2.4.3: Age Adjusted Mental Distress in WOMEN by years of Education

(Additional information is found in Annex 2, table 2.28)

HIGHLIGHTS Chapter 2.4: Mental Health

- Women reported more mental distress than men.
- Those from Turkey and Iran, especially the women reported high proportions (more than 40percent) with mental distress. The men from Turkey and Iran also reported high scores.
- The lowest scores were found in Norwegians, especially in men, but also the women.
- Among the immigrant groups, the Sri Lankans had the lowest score, with women being in the same range as the Norwegian women.
- In all ethnic groups except immigrants from Pakistan and Sri Lanka mental distress decreased with increasing education.

2.5 Use of Health Services

The immigrant groups visited general practitioners two to three times more than the Norwegians. Women visited GPs more frequently than men in all groups (See Annex 2, table 2.29). Over half of the women from Turkey and Iran made 4 or more visits to the GPs during the last 12 months compared to one fifth of Norwegian women.

The greatest proportions of those with frequent visits to the GP (4 or more visits last year) were in the group with less than 10 years of education (Fig 2.5.1. and 2.5.2.). One in two men from Iran and Pakistan were in this category. This pattern was consistent across ethnic group, except for men from Sri Lanka and women from Vietnam and Pakistan. With few exceptions it was the group with more than 12 years education that had the lowest proportion of frequent visits to the GP.

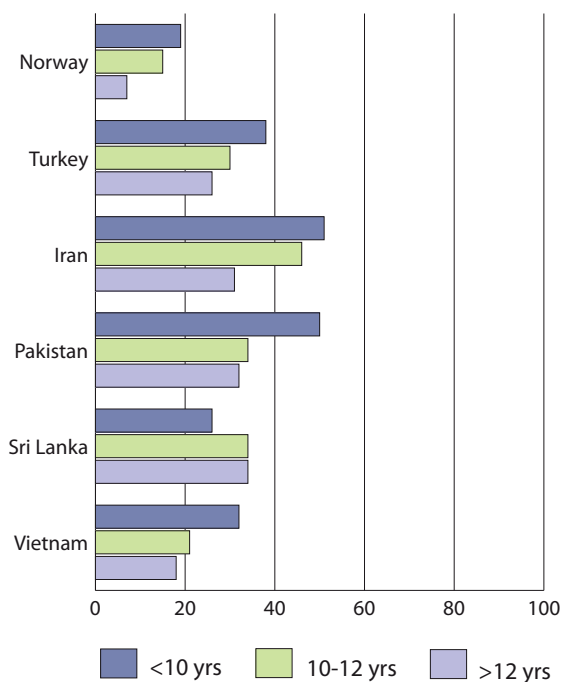


Figure 2.5.1: Age Adjusted Proportions (%) of Frequent Visits to the GP* for MEN by Years of Education

*4 or more visits last year

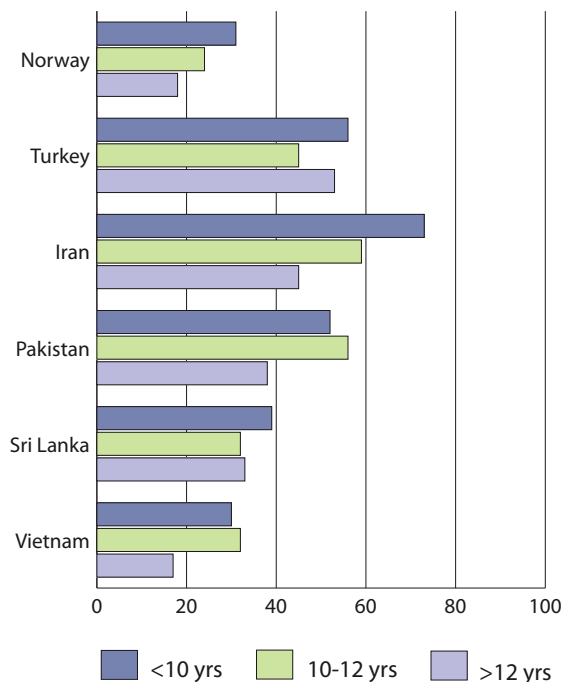


Figure 2.5.2: Age Adjusted Proportions (%) of Frequent Visits to the GP* for WOMEN by Years of Education

*frequent visits - 4 or more visits last year

More women than men reported frequent (at least four times during the past 12 months) visits to the physiotherapist in all groups except for immigrants from Sri Lanka where there was no gender difference (Fig 2.5.3). Around a fourth of Iranian women visited the physiotherapists frequently in contrast to less than a tenth of Vietnamese and Norwegian men.

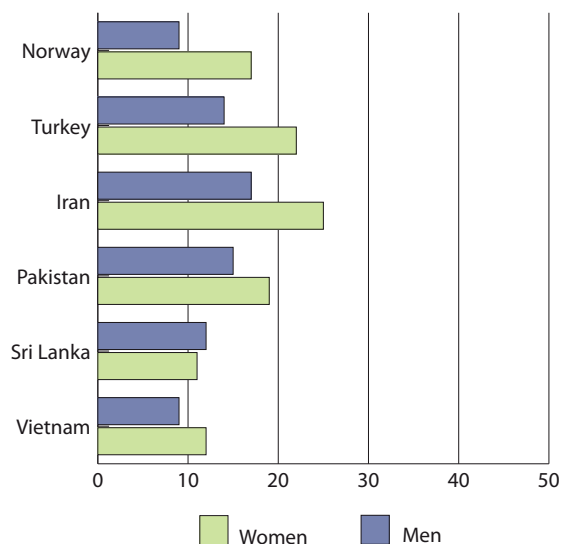


Figure 2.5.3: Age Adjusted Proportions (%) of those with Frequent Visits to Physiotherapist*

* 4 or more times in the last 12 months

All immigrant groups visited the specialist in greater proportions than Norwegians with the exception of Sri Lankan men and Vietnamese women. Among those frequently visiting a psychiatrist or psychologist those from Turkey and Iran had greater proportions than any other group.

The greatest proportions of those with frequent use of emergency services were those from Turkey the lowest being Norwegians and Sri Lankans. The proportion with frequent hospitalization in all groups was low with the exception of women from Turkey and Pakistan. Similarly the proportions availing of the home nursing services were low with the exception of those from Iran.

(Additional information is found in Annex 2, table 2.29)

HIGHLIGHTS Chapter 2.5: Use of Health Services

- The immigrants made greater number of visits to the GP and specialist than the Norwegians.
- The greatest proportion of those with frequent visits to the GP (=at least 4 visits last year) were in the group with less than 10 years of education.
- Turkish and Iranian visited the psychiatrist/psychologist most frequently.
- Emergency services were used most frequently by those from Turkey and least by the Norwegians.

Section 3: Conclusions and Summary of Main Findings

In this section, spider diagrams are presented to summarize the findings from the report. One spider representing one country group highlights the main health challenges of the immigrants compared to the host population.

Favourable health, lifestyle or risk values will be located inside the black, solid circle line for Norway. For example for men from Iran, the prevalence ratio for moderate or high alcohol consumption is 0.5. The prevalence of high (or moderate) alcohol consumption is half as high as the prevalence for Norwegian men. For diabetes, the prevalence ratio for women from Iran is 3.0, or a prevalence three times higher than the prevalence for Norwegian women.

The diagrams show prevalence ratios, based on prevalence for the following health and risk factors.

Health "Not good": Prevalence of self-reported health not very good/ poor (corresponding to the inverse of good/ very good health in figure 2.2.3).

Mental distress: Prevalence above cut-off. Symptoms measured with Hopkins Symptom Check List-10, see figure 2.4.1.

Diabetes: Prevalence of self-reported diabetes, see figure 2.2.6.

Physical inactivity: Prevalence of "reading, watching television or other sedentary activities" in the spare time the last year, see figure 2.3.4.

Current smoker: Prevalence of daily smoking, see figure 2.3.7

Moderate / high alcohol consumption: Prevalence of high (more than 4-7 times / week) / moderate (from once pr month to 2-3 times pr week) consumption of alcohol. See table 2.24 (Annex 2).

Hypertension: Prevalence of high blood pressure, see figure 2.3.16 (Section 2.3) and table 2.26 (Annex 2).

Central Obesity: Prevalence of abdominal obesity, see figure 2.3.12.

Turkish

- Men and women consume less alcohol than Norwegians
 - In men, smoking is higher than in Norwegians, whereas smoking rates in women are similar
 - Physical inactivity is higher compared to Norwegians
 - Proportions with obesity and diabetes are high, interventions that will reduce and control need to be further adapted to address this issue
- In spite of more obesity, the prevalence of hypertension is lower than in Norwegians
 - Proportions with mental distress are much higher than in Norwegians and so are the proportions not reporting good health

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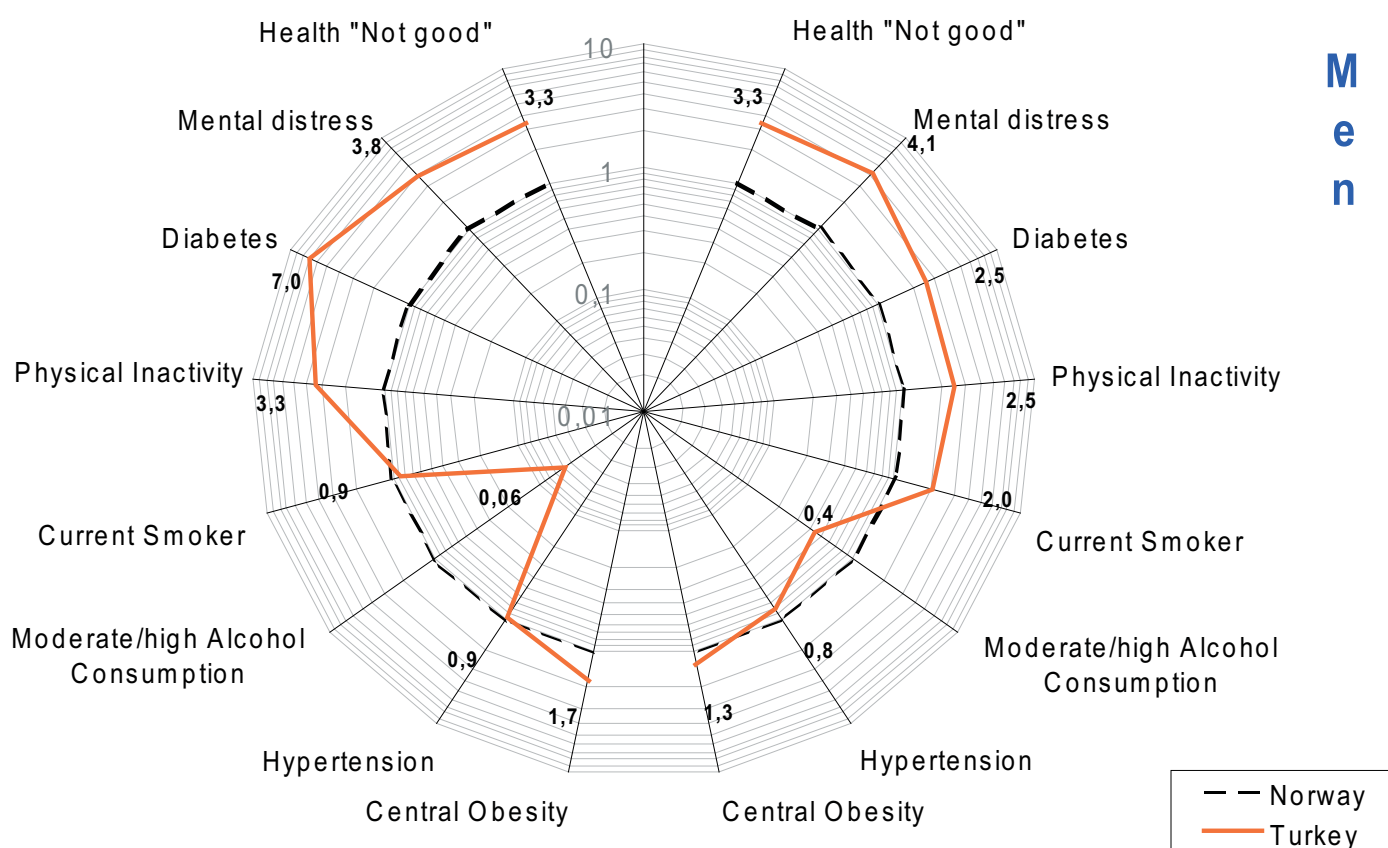


Figure 3.1: Some Risk Factors and Self-Reported Diseases for Turkish related to Norwegians *

* The scale showing values as quotients between Turkey and Norway (reference)

Iranian

- Consumption of alcohol is lower compared to Norwegians
- Smoking is higher in men and lower in women compared to Norwegians
- Physical Inactivity is higher compared to Norwegians
- Proportion with central obesity is lower among men but not among women compared to Norwegians

- Diabetes is higher in women but not in men compared to Norwegians
- Proportions with hypertension are lower compared to Norwegians
- Proportions with mental distress are much higher than in Norwegians and so are the proportions not reporting good health

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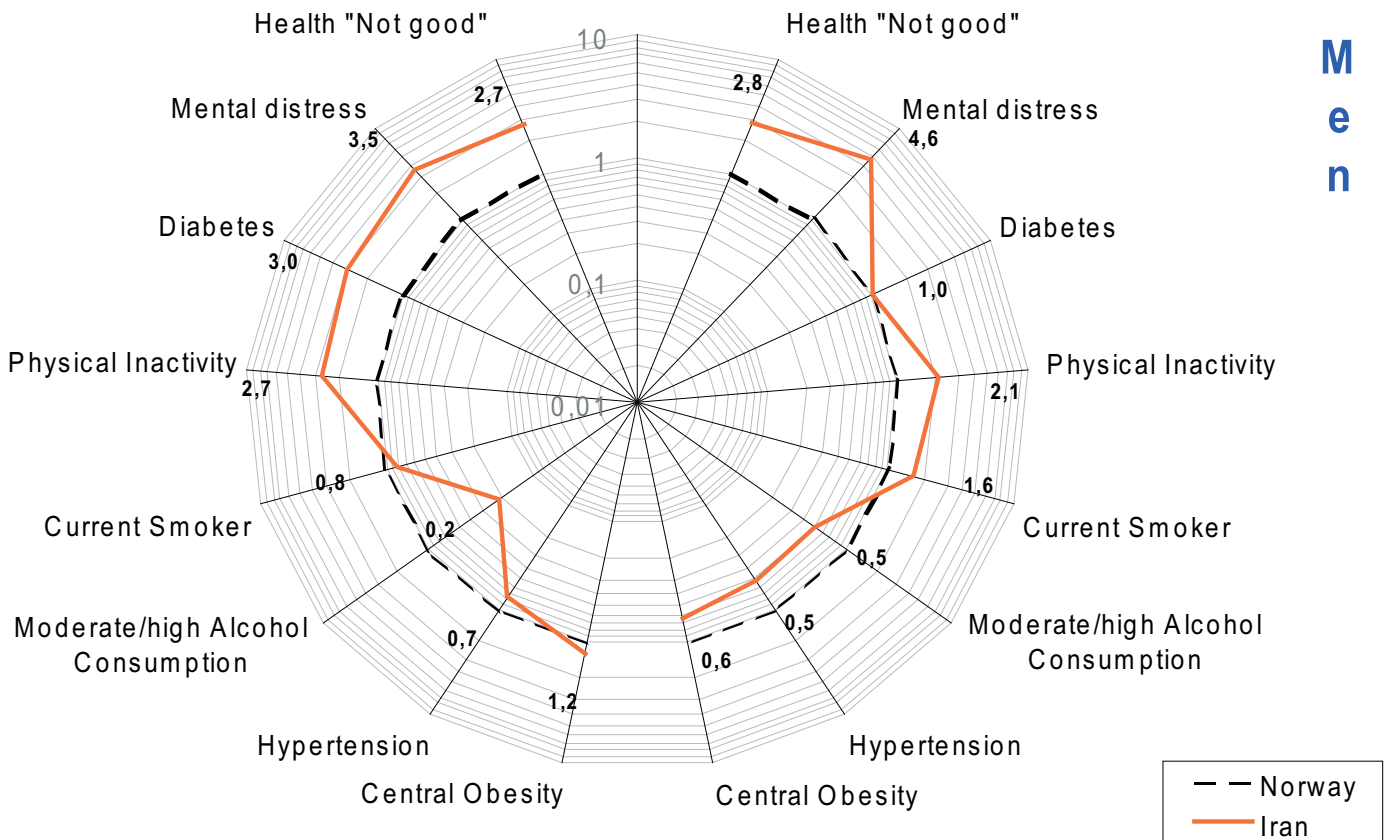


Figure 3.2: Some Risk Factors and Self-Reported Diseases for Iranian related to Norwegians *

* The scale showing values as quotients between Iran and Norway (reference)

Pakistani

- Men and women consume much less alcohol than Norwegians
- Smoking is rare in women, whereas in men smoking is higher than in Norwegians
- Physical inactivity is higher compared to Norwegians

- Proportions with central obesity and diabetes are much higher in both men and women compared to Norwegians
- Proportions with mental distress are higher than in Norwegians and so is the proportions not reporting good health

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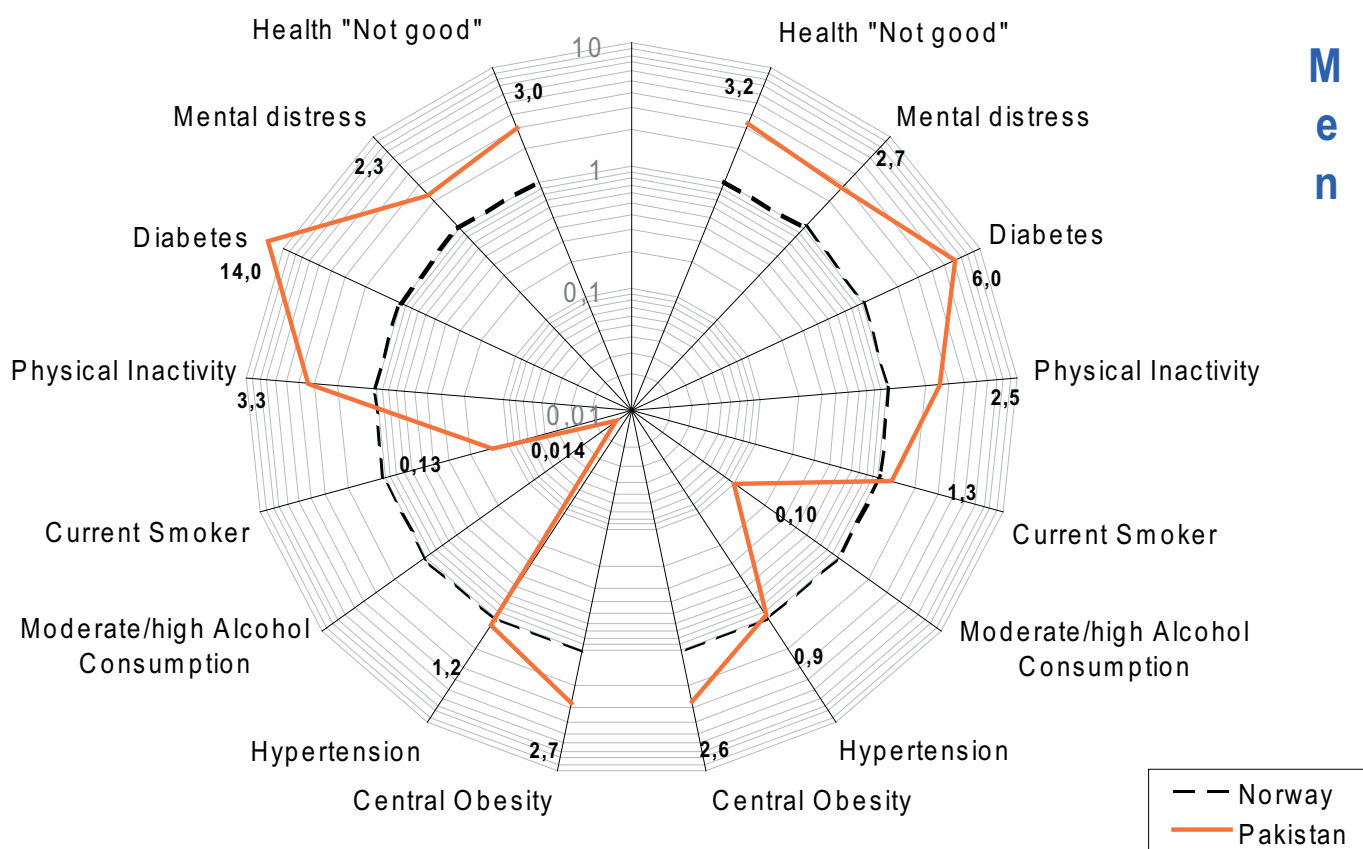


Figure 3.3: Some Risk Factors and Self-Reported Diseases for Pakistani related to Norwegians *

* The scale showing values as quotients between Pakistan and Norway (reference)

Sri Lankan

- Both women and men smoke less and consume less alcohol than Norwegians
- Physical inactivity is higher compared to Norwegians
- Proportions with central obesity and diabetes are higher compared to Norwegian, especially in women

- Proportions not reporting good health is higher compared to Norwegians, whereas especially in women the difference in mental distress is little

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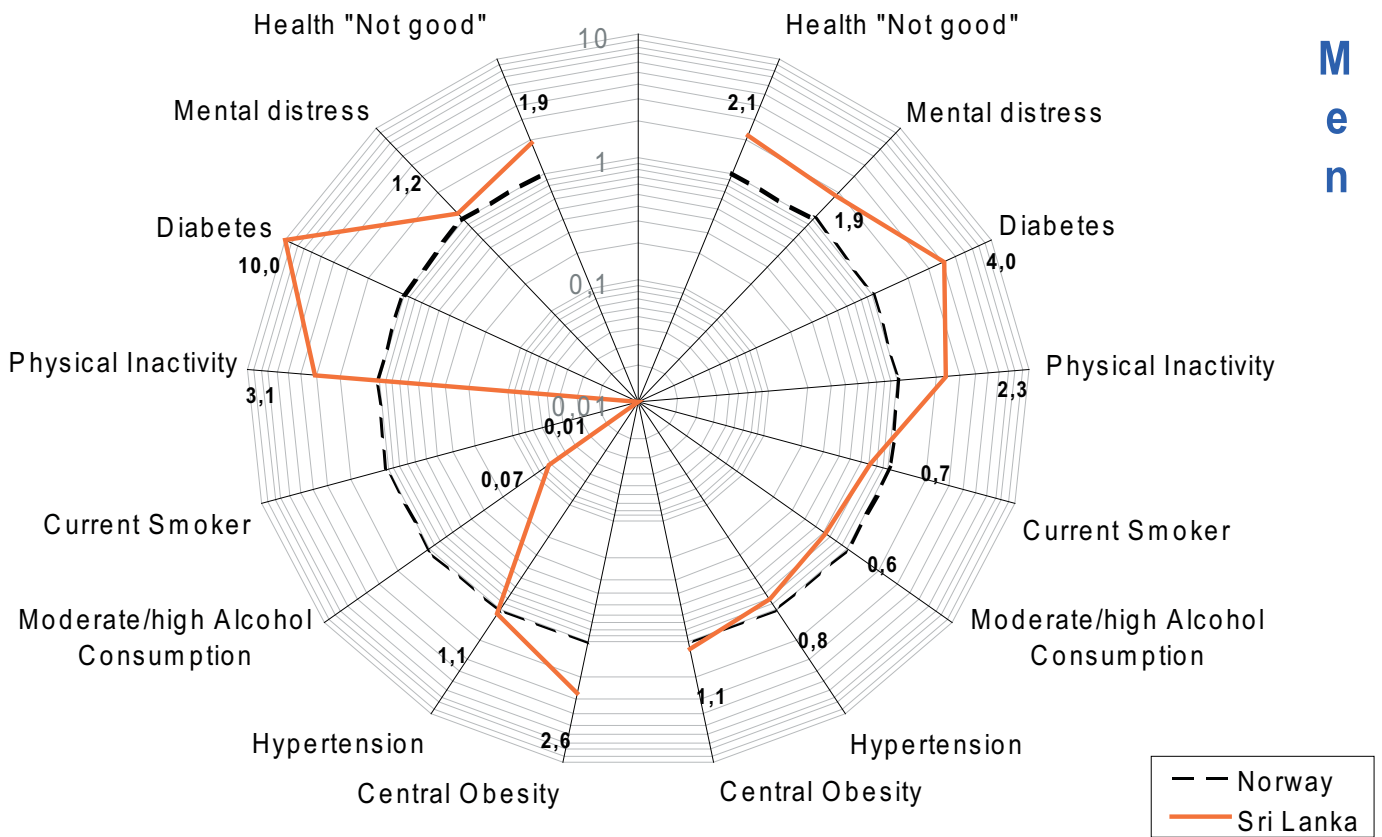


Figure 3.4: Some Risk Factors and Self-Reported Diseases for Sri Lankan related to Norwegians*

* The scale showing values as quotients between Sri Lanka and Norway (reference)

Vietnamese

- The consumption of alcohol is lower, particularly among women, than in Norwegians
- Smoking is low in women but higher in men than among Norwegians
- Physical inactivity is higher compared to Norwegians

- Proportions with central obesity are lower in men, but proportions with diabetes are higher in both genders compared to Norwegians
- Proportions with mental distress are higher than in Norwegians and so are the proportions not reporting good health

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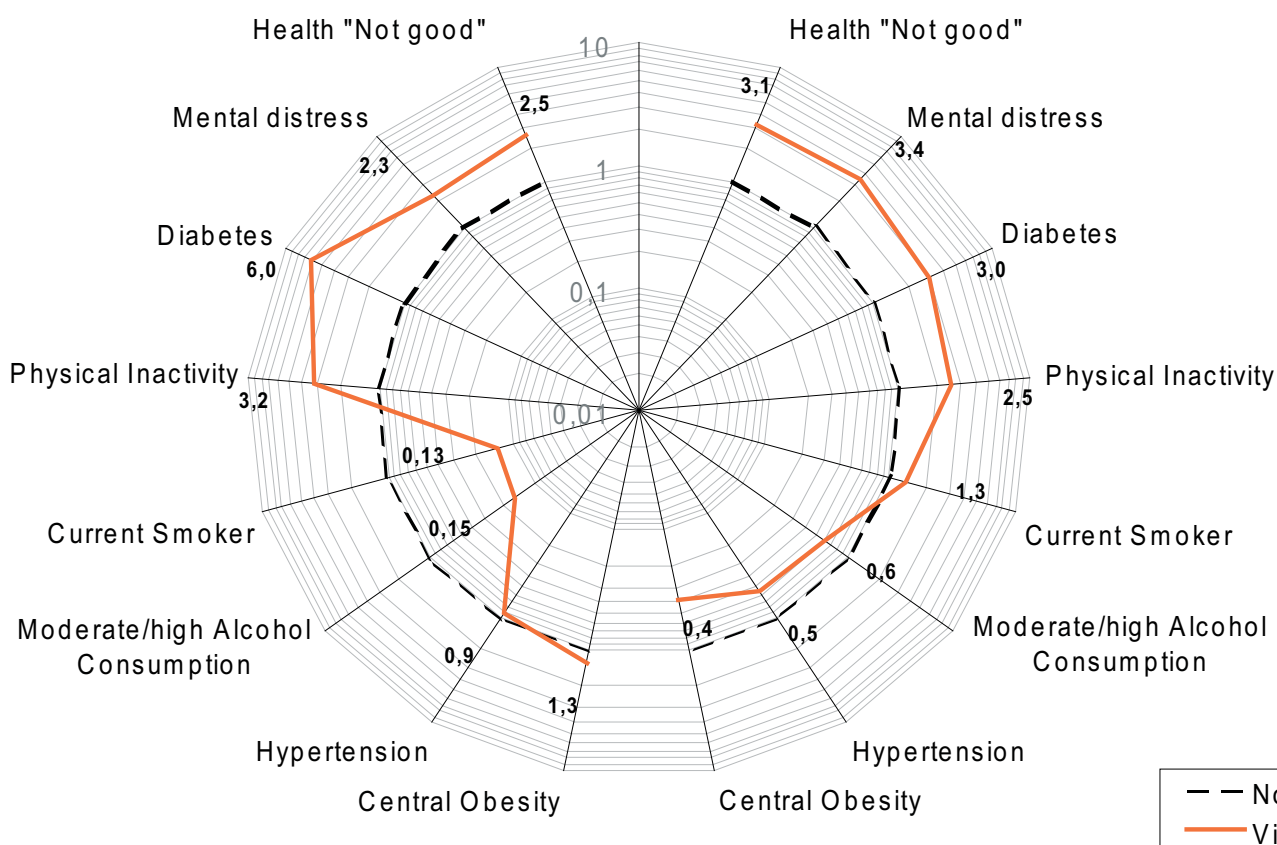


Figure 3.5: Some Risk Factors and Self-Reported Diseases for Vietnamese related to Norwegians *

*The scale showing values as quotients between Vietnam and Norway (reference)

References

1. Vassenden, K., *Innvandrere i Norge (Immigrants in Norway)*. 1997, Oslo: Statistics Norway.
2. Vangen, S., *Perinatal Health among immigrants in Norway*, in *Faculty of Medicine*. 2002, University of Oslo: Oslo.
3. Østby, L., *Why Focus on Immigrants (In Norwegian)*, in *Samfunnsspeilet*. 2001.
4. *Population statistics. Immigrant population, 1 January 2006*. 2006 [cited 2006; Available from: <http://www.ssb.no/emner/02/01/10/innvbef/tab-2006-05-11-05.html>].
5. *Table 11 Immigrant Population by country background*. 2005, Statistics Norway.
6. Davey Smith, G., et al., *Mortality differences between black and white men in the USA: contribution of income and other risk factors among men screened for the MRFIT*. MRFIT Research Group. *Multiple Risk Factor Intervention Trial*. *Lancet*, 1998. **351**(9107): p. 934-9.
7. Modood, T., *Ethnic Minorities in Britain: Diversity and Disadvantage*. 1997, London: Policy Studies Institute.
8. Nazroo, J.Y., *The Health of Ethnic Minorities: Findings From a National Survey*. 1997, London: Policy Studies Institute.
9. Blom, S.R.A., *Levekår blant ikke-vestlige innvandrere: Trang økonomi, men færre enn antatt opplever diskriminering (In Norwegian)*, in *Samfunnsspeilet nr 1*. 1997, Statistics Norway.
10. Blom, S. and K. Henriksen, *Levekår blant innvandrere i Norge 2005/2006*. 2008, Statistisk sentralbyrå/ Statistics Norway: Oslo-Kongsvinger
11. Thapa, S.B. and E. Hauff, *Gender differences in factors associated with psychological distress among immigrants from low- and middle-income countries--findings from the Oslo Health Study*. *Soc Psychiatry Psychiatr Epidemiol*, 2005. **40**(1): p. 78-84.
12. Stoltenberg, C., *[Research on immigrants and health. Curiosity or benefit?]*. *Tidsskr Nor Laegeforen*, 1997. **117**(17): p. 2435.
13. Hauff, E. and P. Vaglum, *Establishing social contact in exile: a prospective community cohort study of Vietnamese refugees in Norway*. *Soc Psychiatry Psychiatr Epidemiol*, 1997. **32**(7): p. 408-15.
14. Dalgard, O.S., *[Immigration and health]*. *Tidsskr Nor Laegeforen*, 1993. **113**(17): p. 2073.
15. Brunvand, L. and R. Brunvatne, *[Health problems among immigrant children in Norway]*. *Tidsskr Nor Laegeforen*, 2001. **121**(6): p. 715-8.
16. Jenum, A.K., et al., *Ethnicity and sex are strong determinants of diabetes in an urban Western society: implications for prevention*. *Diabetologia*, 2005. **48**(3): p. 435-9.
17. Blom S. *Innvandrerens helse*. 2005/06. Rapp. 2008/35. Oslo Kongsvinger: Statistics Norway.
18. *Resept for et sunnere Norge. Folkehelsemeldingen (Prescription for a Healthier Norway)*. 2003, Det Kongelige Helsedepartement: Oslo.
19. WHO, *Diet, Nutrition and the Prevention of Chronic Disease*, in *WHO technical Report Series*. 2003, WHO: Geneva, Switzerland.
20. *Nasjonale strategier for å utjevne sosiale helseforskjeller (National Strategy to reduce Social Inequalities in Health)* 2006-2007, Det kongelige helse- og omsorgsdepartement: Oslo.
21. Naess, Ø., M. Rogernud, and B.H. Strand, *Sosial ulikhet i helse; En faktarapport*. 2007, Folkehelseinstituttet: Oslo.
22. Bhopal, R., et al., *Heterogeneity of coronary heart disease risk factors in Indian, Pakistani, Bangladeshi, and European origin populations: cross sectional study*. *British Medical Journal*, 1999. **319**: p. 215-220.
23. *Population statistics. Immigrant population, 1 January 2005*. 2005 [cited 2005; Available from: www.ssb.no].
24. Sogaard, A.J., et al., *The Oslo Health Study: The impact of self-selection in a large, population-based survey*. *Int J Equity Health*, 2004. **3**(1): p. 3.
25. Rankin, J. and R. Bhopal, *Understanding of heart disease and diabetes in a South Asian community: cross-sectional study testing the 'snowball' sample method*. *Public Health*, 2001. **115**(4): p. 253-60.
26. Visser, O., et al., *Results of breast cancer screening in first generation migrants in North-west Netherlands*. *Eur J Cancer Prev*, 2005. **14**(3): p. 251-5.
27. *The Oslo Health Study: Protocol 2002*, Norwegian Institute of Public HealthOslo.
28. Næss, O., et al., *Cohort of Norway (CONOR)*. *Int J Epidemiol* 2008, **37**: p.481-85
29. Lime-Larsen, P., and Nelson, *Data fra SHUS - bakgrunn og anvendelse*. *Norsk Epidemiologi*, 2003. **13**, nr.1.

30. Yusuf, S., et al., *Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study*. The Lancet, 2004. **364**: p. 937-52.
31. Lochen, M.L. and K. Rasmussen, *The Tromso study: physical fitness, self reported physical activity, and their relationship to other coronary risk factors*. J Epidemiol Community Health, 1992. **46**(2): p. 103-7.
32. Aires, N., R. Selmer, and D. Thelle, *The validity of self-reported leisure time physical activity, and its relationship to serum cholesterol, blood pressure and body mass index. A population based study of 332,182 men and women aged 40-42 years*. Eur J Epidemiol, 2003. **18**(6): p. 479-85.
33. Strand, B. H., *Measuring the mental health status of the Norwegian population: a comparison of the instruments SCL-25, SCL-10, SCL-5 and MHI-5 (SF.36)*. Nord J Psychiatry, 2003. **57**(2): p. 113-18.

Annex1: Data Collection and Variables

Efforts to increase attendance among immigrant groups including reminding non-responders

An Information Committee with members from all the collaborators developed an information plan and strategy and worked throughout the study period in an effort to increase attendance. They took several initiatives to inform the citizens of Oslo about the Oslo Health Study and motivate those invited to attend. More details of this can be found at

Special efforts made to reach the immigrant groups in the Immigrant Study were as follows:

- The questionnaires (main), the brochure and the declaration of consent were translated into 5 different languages. The supplementary questionnaire was translated into English only.
- The Norwegian information brochure also contained short information in 5 languages on how to obtain the translated material.
- Field workers at the screening-station spoke the respective 5 languages in order to assist the 5 immigrant groups.
- The project coordinator (immigrant background) worked with various immigrant groups, organisations and media, through lectures, formal and informal meetings with health personnel, political leaders, imams and other key persons. This included visits to the mosques as well as special radio/ TV-programmes for immigrants. Announcements and reports in immigrants' newspapers and *stands* in the streets with information about survey also got the information out to the immigrant groups.

In order to increase participation rates during this round, different strategies were used including telephone calls to non-responders. The reminder invited participants to a mobile screening unit (bus) parked in the neighbourhood of those invited. The bus visited 7 such sites in the city over a period of 12 weeks.

Data Collection and Data Entry Methods

In both studies the data collection was undertaken by staff of the NIPH trained to follow the standard procedure outlined in the study protocols [27]. A postal invitation was mailed two weeks prior to the clinical screening to all eligible participants containing:

- An invitation letter to participate with time and place of appointment.
- A three-page questionnaire (main questionnaire).
- Instructions about how to fill out the questionnaire and a letter of consent, to be handed in personally at the screening station.
- Information brochure containing the aims of the study, content, procedures, etc.
- Map showing the exact location of the screening station.
- The information brochure and the questionnaires (main questionnaire and first supplementary questionnaire) were also made available to HUBRO participants in 11 languages other than Norwegian.
- For the Immigrant Study all enclosures of this postal package were translated into the 5 appropriate languages of the 5 immigrant groups in addition to the official Norwegian version.

The physical examination of both surveys included standardised measurements such as height, weight, waist and hip circumference, blood pressure, heart rate, and non-fasting blood tests. For the Immigrant Study participants a supplementary questionnaire had been tailored to suit their health needs and could be filled in at the screening site with the assistance of field workers that spoke the same language as the respondents.

Four weeks after attending the clinical examination, a letter with results of this examination and blood tests was sent to all participants. Among HUBRO participants those with the highest scores of cardiovascular risk [27] were offered a new clinical examination at Ullevål University Hospital. Among the Immigrant Study participants those with unusually high values of blood sugar (> 25/mmol) or blood pressure (> 125 mmHg diastolic after the second or third measurement) were informed immediately and referred to a referral hospital/clinic. However others with values that exceeded normal limits were asked to contact their General Practitioner for further follow up. In addition those with random blood sugars ≥ 6.1 /mmol were invited to undertake a fasting blood sugar that included total cholesterol, HDL- cholesterol, triglycerides and serum insulin analysis.

Questionnaires

The questionnaires were developed based on previously conducted studies in Norway, existing scientific knowledge and current needs and priorities of researchers. A pilot study of the main questionnaire (common for both HUBRO and the Oslo Immigrant Health Study) was carried out before HUBRO started. The *main questionnaire* covered the following main topics:

Self-reported health and diseases such as diabetes, asthma, coronary heart disease, stroke and mental distress, musculoskeletal pains, family history of disease, risk factors and lifestyles (food habits, physical activity, smoking, alcohol use), environment while growing up, social network and social support, quality of life, education, work and housing, use of health services, use of medicine and reproductive history (women).

The main questionnaire is identical for both HUBRO and the Oslo Immigrant Health Study and includes questions that form part of the larger CONOR (Cohort Norway) data bank encompassing several large population studies from the regions of Norway. Several of the questions, but not all, have been used in National Health Screening Service's previous studies (28-29).

The supplementary questionnaire covered many of the topics of the main questionnaire in greater detail and is the same for all age-groups. However the supplementary questionnaires for HUBRO and the Immigrant Study are not identical though many questions overlap. This has been adapted for the Oslo Immigrant Health Study based on the experiences of HUBRO and additional relevant research. In both studies, participants were asked questions about life events, weight change and winter depression. The questionnaire also had a special section targeted at immigrants – with questions about why and when they moved to Norway, how they cope with the Norwegian language, the health services and their every day life, and whether they had ever experienced any discrimination. The food and drink section included changes in the diet after migration and this part of the questionnaire has been modified to meet the additional requirements of these groups.

The questionnaires along with official English translations can be found at the following website: <http://www.fhi.no/tema/helseundersokelse/oslo/index.html>

Determining Ethnicity

Norwegian population registers identify all residents with a unique 11 digit identification code. This register also contains the country of birth for all residents. This register was used as the basis for the invitation file

and only those with the 6 selected countries of birth were included. Thus only first generation immigrants are included. Concerning the five immigrant groups, a cross check with SSB registers confirmed that only in 0.2 percent of cases the country of birth was not identical to the "country of origin".

Data Sources of Socio-Demographic Variables

Register: Age, Gender, Country of birth, Marital status and Area of residence of all participants, was made available from the population registers 1999- 2002.

Self-reported: Years of Education, Employment Status, Occupation, Proportion living alone, Social Security Benefits were self-reported in the Main Questionnaire. Self-reported years of education was the indicator selected as the measure of socio-economic position as occupation and employment were considered inaccurate predictors in this sample due to insufficient information.

Measurements: Non-fasting serum total cholesterol, serum HDL cholesterol, glucose and serum triglycerides were measured directly by an enzymatic method (Hitachi 917 Auto Analyzer, Roche Diagnostics, Switzerland). Serenorm Lipoprotein was used as internal quality control material for the lipid analyses and Autonom Human Liquid for the glucose. The control material was done at the start and for every 30th sample. All the laboratory investigations were performed by the Department of Clinical Chemistry, Ullevål University Hospital, Oslo, Norway for both studies. Pulse recordings, systolic and diastolic blood pressures were measured by an automatic device (DINAMAP, Criticon, Tampa, USA), which measured the blood pressure in mm Hg automatically by an oscillometric method. Three recordings were made at one-minute intervals. The values of the mean of the second and third systolic blood pressure measurements were used in this report.

Anthropometry: Body weight (in kilograms, one decimal) and height (in cm, one decimal) was measured with electronic Height and Weight Scale with the participants wearing light clothing without shoes. BMI (kg/m²) was calculated based on weight and height. Waist circumference, defined as the midpoint between the iliac crest and lower margin of ribs was measured to the nearest 0.1cm with the subject standing and breathing normally. Hip circumference was measured as the maximum circumference around the buttocks and at the symphysis pubis anteriorly. Both waist and hip were measured with a measuring tape of steel. Waist and hip circumference were used to calculate

the waist-hip ratio using the formula waist (cm)/ hip circumference (cm).

Dietary Habits: In large cross-sectional population based studies questions on diet and dietary habits are often limited. In order to provide both comparisons with previous Norwegian studies many of the questions used here have been used in earlier studies. Therefore all the questions in the main questionnaire are based primarily on the Norwegian diet. Therefore many aspects of the diets of the immigrant group are not captured through these questions. We have selected those indicators that are both risk factors for several diseases and that have been measured through this questionnaire.

The intake of fruit and vegetables has been identified as one of the ten most important contributing risk factors for cardiovascular disease in a study including many ethnic groups [30]. Low intake of fruits and vegetables are also well documented as being associated with the increased risk for cancer.

Questions on dietary habits covered nine food categories, fifteen drink categories and two dietary supplement categories. The food habit questions were re-coded from six to three categories: daily consumption (1–2 and 3 or more times a day), weekly consumption (1–3 and 4–6 times a week) and seldom (seldom/never and 1–3 times a month). A fruit and vegetable index was compiled from three variables: fruit, raw vegetables/salad and fruit juice. The new variable thus obtained was re-coded into three categories ranging from low to high consumption based on the summed score. Thus the high category of the index reflects a daily to several times a day, frequency of consumption of at least two of three original variables. Similarly, the low category reflects seldom/never or 1–3 times a month frequency of consumption of at least two of the three original categories.

Two drinks questions were used; the first about cola & soft drinks and the other about full-fat milk/yoghurt. The six categories included seldom/never, 1-6 glasses per week, 1 glass per day, 2-3 glasses per day, 4 glasses or more per day, these were recoded to 3 categories; seldom/never, 1-6 glasses/ wk, 1- 4 glasses per day.

Physical Activity: Self-reported leisure-time physical activity was assessed by a four graded measure (inactive to very active) based on previously validated questionnaires in Norway and shown to predict mortality risk in both genders [31,32]. However, it is not validated in immigrant populations. Responses included; 1) "reading, watching television or other sedentary activities" inactive/predominantly sedentary);2) walking,

cycling or moving at least 4 times per week; 3) taking part in physical exercise/sport or heavy gardening; 4) hard exercise or participation in competitive sports regularly(very active). The physical inactivity question was recoded to give the following 2 categories; 1) Inactive/sedentary 2) Active includes categories 2, 3, 4

Smoking : Respondents were asked if they smoked daily and their responses were categorized as; 1) yes, now (current smoker), 2) yes, earlier (previous smoker) and 3) never (non smoker).

Alcohol : Respondents were asked about their consumption of alcohol both type, frequency and quantity and of 8 possible responses their responses were categorized into 3 as; 1) High (consumption more than 4-7 times/week), 2) moderate, 3) low (seldom/ never).

Mental Health: An instrument often used in large population based studies is the Hopkins Symptom Check List-10 derived from the more widely used HSCL-25 that was developed from the SCL-90.

Ten questions are used to screen for symptoms of depression and anxiety and related somatic symptoms. Thus the HSCL-10 measures mental distress, but does not provide a psychiatric diagnosis. The HSCL-10 includes responses to : "Have you over the course of the last week felt... "a) sudden panic b)fearful c)faintness, dizziness or weakness d) tense or keyed up e) self-blaming f)difficulties falling asleep or staying asleep g) sadness h)worthless i)everything is a burden j)hopeless about the future

Each question was rated on a scale of 1 (not at all) to 4 (extremely) and the mean (average) score was used as a measure of global psychological distress in subsequent analyses. Thus, an increase in score on the HSCL-10 indicates an intensification of anxiety or depression or both, and a decrease in total scores, or mean score indicates improvement in symptomatology.

A cut-off point was set at 1.85, the variable dichotomized. Subjects scoring 1.85 or above were labelled as "distressed". [33]

Use of Health Services: Use of health services was assessed by questions recording number of visits to various health service providers in the past 12 months. Responses included; 1) No visits 2) 1-3 times/12 months 3) 4 or more times/12months. These questions were recoded to give the following 2 categories; 1) Infrequent 2) Frequent (>_4 visits/12 months).

Annex 2: Additional Data

NOTE: Data presented are crude (unadjusted) unless specified

Table 2.11A: Mean Age of the Sample from the Oslo Health Study and Oslo Immigrant Health Study (Combined Data)

		Norway	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men	N = 7116	4985	291	434	419	685	302
Age(mean)		44.6	42.3	41.8	44.3	40.0	43.6
Women	N = 7741	6042	242	288	361	460	348
Age(mean)		44.3	40.8	41.6	42.2	39.0	43.3

Table 2.11B: Proportions (%) of the sample in 3 age groups

		Norway*	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men							
Age groups	30-40 yrs	39	50	53	41	65	39
	41-50 yrs	30	31	35	30	27	39
	51-61 yrs	31	19	13	29	9	22
Women							
Age groups	30-40 yrs	39	59	50	48	71	42
	41-50 yrs	32	26	35	32	20	37
	51-61 yrs	29	15	15	20	9	21

* For Norwegians 30-40 years includes only 30 and 40 year olds, 41-50 years includes only 45 year olds, 51-60 indicates only 59 and 60 year olds. For immigrant groups all the age cohorts are represented in each of the age groups

Table 2.12: Mean length and proportions (%) with different Levels of Education

		Norway	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men							
Yrs of Education (mean)		14.5	9.8	14.9	11.3	13	11.6
< 10yrs		10	49	5	24	7	31
10 – 12 yrs		13	17	6	24	27	17
> 12 yrs		77	34	89	52	66	52
Women							
Yrs of Education (mean)		14.4	7.3	13.1	8.7	12.4	10.3
< 10yrs		10	64	15	36	10	46
10 – 12 yrs		15	18	3	27	27	11
> 12 yrs		75	18	81	36	63	43

Overall anova $p < 0.001$ for all variables

Table 2.13: Proportions (%) with Different Employment Status

Employment	Norway	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men						
Fulltime	85	61	62	68	78	68
Part time	5	7	8	7	8	7
Not employed [*]	10	14	31	25	14	25
Women						
Fulltime	65	33	43	15	44	50
Part time	19	11	15	14	21	12
Not employed ^a	16	57	42	71	36	38

^{*}indicates those not in salaried employment, includes students, housewives, retired persons etc

Table 2.14A: Proportions (%) with Different Marital Status

	Norway	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men						
Unmarried	41	6	22	2	6	20
Married/Partner	46	76	61	95	92	64
Other	13	18	18	3	2	16
Women						
Unmarried	37	3	5	0	3	19
Married/Partner	44	79	64	89	93	54
Other	19	18	32	10	5	27

Table 2.14B: Proportions (%) Living Alone

	Norway	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men	25	10	26	5	6	18
Women	25	6	11	2	8	12

Table 2.15: Proportions (%) Living in Different Areas of Residence of Oslo

Area Residence	Norway	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men						
Outer West	26	2	7	2	1	3
Inner West	14	6	8	2	1	1
Inner East	16	28	18	19	13	21
Outer East	44	63	67	77	86	75
Women						
Area Residence						
Outer West	29	2	8	4	3	4
Inner West	14	4	7	3	1	3
Inner East	13	21	12	22	11	22
Outer East	44	73	73	71	86	71

Table 2.16: Proportions (%) Receiving Social Security Benefits (self-reported)

	Norway	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men						
Sickness Benefits	4	15	12	13	15	11
Disability pension	7	21	17	18	4	12
Unemployment benefits	2	9	11	6	16	15
Social assistance	1	14	14	4	3	12
Women						
Sickness Benefits	6	20	20	11	20	8
Disability pension	11	26	14	16	4	8
Unemployment benefits	2	17	9	6	19	13
Social assistance	1	21	16	9	8	21

• Chi square test not significant all other differences are significant.

Note: N is lower than all other variables

Table 2.17: Proportions (%) with Good/Very Good Self-Reported Health

		Norway	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men							
All ages	30 +	85	51	58	52	68	53
Age	30 – 35	93	61	74	69	70	70
	36 – 40	85	45	58	64	73	58
	41 – 45	85	56	60	53	60	56
	46 – 50	84	57	53	58	65	50
	51 – 55*	-----	38	35	37	57	33
	56 – 61	76	41	59	25	77	32
Women							
All ages	30 +	79	31	44	38	61	47
	30 – 35	89	48	51	56	71	62
	36 – 40	84	33	54	42	59	57
	41 – 45	82	26	41	28	62	49
	46 – 50	80	12	37	29	46	41
	51 – 55*	-----	14	25	26	36	22
	56 – 61	66	8	21	26	46	26

• Chi square test not significant, all other differences are significant.

Table 2.18: Proportions (%) with Self-Reported Chronic Diseases and Conditions

		Norway	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men	Asthma	8	9	6	11	9	13
	Bronchitis	3	10	4	5	5	5
	Musculoskeletal	2	14	17	15	17	16
	Mental Distress	11	21	29	10	4	9
	Diabetes	2	5	2	12	8	6
	Myocardial Infarction	2	4	2	7	2	5
	Stroke	1.3	0.4	1.2	0.5	1.1	0.7
Women	Asthma	11	12	7	13	10	9
	Bronchitis	4	7	6	3	6	5
	Musculoskeletal	8	26	24	21	20	21
	Mental Distress	20	28	27	10	3	8
	Diabetes	1	7	3	14	10	6
	Myocardial Infarction	0.4	0.9	0.4	0.6	1.4	1.6
	Stroke	0.8	1.9	2.2	1.2	1.9	0.3

• Chi square test not significant, all other differences are significant.

Table 2.19: Frequencies* (%) of consumption of Fruits and Vegetables

		Norway	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men	Low	13	6	12	17	15	15
	Moderate	73	68	67	73	69	76
	High	14	26	21	10	16	8
Women	Low	7	6	5	20	13	9
	Moderate	69	58	69	63	69	71
	High	24	36	26	17	18	20

* See methods for explanation for what low, moderate and high consumption mean.

Table 2.20: Frequencies (%) of Consumption of Cola/Soft drinks and Full-Fat Milk

			Norway	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men	Cola/Soft Drinks	Seldom	42	40	29	35	47	43
		Weekly	39	37	52	47	39	44
		Daily	19	23	19	18	14	14
	Full-Fat Milk	Seldom	69	29	34	32	47	55
		Weekly	22	46	42	31	29	31
		Daily	9	25	23	36	24	15
Women	Cola/Soft Drinks	Seldom	68	34	42	41	51	55
		Weekly	24	42	37	29	27	30
		Daily	8	24	21	30	23	16
	Full-Fat Milk	Seldom	58	45	49	48	61	56
		Weekly	30	36	41	40	29	37
		Daily	13	19	10	11	9	7

Table 2.21: Proportions (%) with Different Degrees of Activity in Leisure Time

		Norway	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men	Sedentary	22	54	46	55	51	56
	Moderately Active	51	36	41	40	36	28
	Active	19	5	9	3	8	13
	Very Active	7	5	4	3	5	3
Women	Sedentary	18	59	48	59	55	57
	Moderately Active	67	33	45	36	38	33
	Active	12	6	7	5	4	10
	Very Active	3	2	0.4	0.7	2	0.7

Table 2.22: Proportions (%) of Smokers and Non Smokers

		Norway	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men	Current Smoker	27	53	42	34	19	36
	Ex Smoker	28	24	25	19	14	34
	Never Smoked	45	23	33	47	66	29
Women	Current Smoker	30	26	24	4	0	4
	Ex Smoker	26	15	14	2	0	4
	Never Smoked	43	59	62	94	100	92

Table 2.23: Age Adjusted Proportions (%) of Current Smokers according to Socio-demographic Factors

		Norway	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men	Years Education						
	<10yrs	42	51	21	48	20	39
	10-12yrs	40	66	49	32	17	38
	>12yrs	20	43	39	27	19	29
	Employment: Yes	25	56	40	29	19	35
	Employment: No	45	51	45	48	21	35
	Residence: Oslo West	22	68	33	44	16	38
Residence: Oslo East	30	52	44	33	20	37	
Women	Years Education						
	<10yrs	48	16	8	0	0	0
	10-12yrs	42	38	35	2	0	6
	>12yrs	24	35	22	5	0	4
	Employment: Yes	29	30	28	6	0	5
	Employment: No	37	25	19	3	0	4
	Residence: Oslo West	23	31	22	4	0	16
Residence: Oslo East	36	26	24	4	0	3	

Table 2.24: Proportions (%) of those Consuming Alcohol

		Norway	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men	High	8	3	2	1	4	4
	Moderate	73	32	39	7	46	44
	Low	19	65	58	91	50	52
Women	High	5	0	1	0	0	0
	Moderate	66	4	14	1	5	11
	Low	29	95	85	99	95	89

Table 2.25: Age Adjusted Generalised and Central Obesity: Mean Values and Proportions (%)

		BMI (mean)	BMI \geq 30 (%)	WHR (mean)	WHR (%) > 1.0 (M) > 0.85(w)
Men	Norway	26.3	14	0.90	7
	Turkey	27.7	21	0.91	10
	Iran	26.5	13	0.90	6
	Pakistan	27.4	22	0.94	20
	Sri Lanka	25.7	9	0.93	11
	Vietnam	24.0	3	0.87	3
Women	Norway	24.8	11	0.78	17
	Turkey	30.5	48	0.82	33
	Iran	26.5	20	0.80	24
	Pakistan	29.3	40	0.85	52
	Sri Lanka	26.8	19	0.85	53
	Vietnam	23.3	4	0.80	23

Table 2.26: Age Adjusted Mean Blood Lipids and Blood Pressure

		Cholesterol	HDL	Triglycerides	Systolic BP	Diastolic BP
Men	Norway	5.58	1.31	1.85	133	78
	Turkey	5.45	1.11	2.51	127	76
	Iran	5.41	1.13	2.34	125	75
	Pakistan	5.43	1.05	2.70	129	77
	Sri Lanka	5.50	1.09	2.60	127	78
	Vietnam	5.48	1.26	2.38	124	75
Women	Norway	5.40	1.64	1.22	124	72
	Turkey	5.24	1.35	1.74	120	69
	Iran	5.10	1.40	1.53	117	68
	Pakistan	5.11	1.25	2.11	122	72
	Sri Lanka	5.15	1.23	1.84	121	70
	Vietnam	5.14	1.47	1.53	118	69

Table 2.27: Age Adjusted Proportions (%) of Medication: Lipid reducing/Antihypertensives

		Norway	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men	BP medication	7	11	8	14	9	8
	Lipid medication	5	11	7	13	7	5
	BP medication	6	8	8	11	11	7
Women	Lipid medication	3	4	6	6	7	1

Table 2.28: Mean Mental Distress (HSCL -10) Scores

		Norway	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men							
Age	30 – 35	1.21	1.44	1.51	1.43	1.29	1.52
	36 – 40	1.25	1.69	1.62	1.37	1.30	1.50
	41 – 45	1.29	1.73	1.67	1.36	1.33	1.54
	46 – 50	1.26	1.88	1.71	1.32	1.34	1.45
	51 – 55*	-----	1.63	1.93	1.53	1.24	1.61
	56 – 61	1.25	1.51	1.92	1.66	1.08	1.69
Women	30 – 35	1.31	1.87	1.74	1.41	1.27	1.56
	36 – 40	1.37	1.81	1.89	1.51	1.30	1.43
	41 – 45	1.35	1.93	1.87	1.64	1.39	1.62
	46 – 50	1.36	1.88	1.89	1.92	1.30	1.72
	51 – 55*	-----	1.92	1.94	1.80	1.92	1.80
	56 – 61	1.40	2.19	2.11	1.57	1.29	1.61

*No Norwegians in this age group.

Table 2.29: Proportions (%) of those using Different Health Services

		Norway	Turkey	Iran	Pakistan	Sri Lanka	Vietnam
Men	Frequent visits to GP	11	30	35	37	32	23
	Frequent visits to Specialist	4	10	9	8	4	9
	Frequent visits to Corporate Doctor	1	1	3	1	1	3
	Frequent visits to Psychiatrist/Psychologist	3	8	8	3	1	4
	Frequent visits to Physiotherapists	9	14	17	15	11	9
	Frequent visits to Emergency services	1	7	3	4	2	4
	Frequent hospitalization	0	2	1	2	0	1
	Home Nurse	0.1	1	2	1	0	1
	Women	Frequent visits to GP	21	51	53	49	33
Frequent visits to Specialist		6	10	12	8	4	7
Frequent visits to Corporate Doctor		6	10	12	8	4	7
Frequent visits to Psychiatrist/Psychologist		6	11	15	4	1	2
Frequent visits to Physiotherapists		17	22	24	18	11	12
Frequent visits to Emergency services		1	6	6	5	1	4
Frequent hospitalization		0	3	2	3	1	2
Home Nurse		0.3	1	2	1	0	1

Note: Frequent – more than 4 times/yr

THE OSLO HEALTH STUDY

Do not write here:

5.3 (Bydel)

(Fylke) (Land)

9.3 (Aktivitet)

9.4 (Yrke)

14.7 (Merke)

1. YOUR OWN HEALTH

1.1 How would you describe your present state of health? (Mark only one answer with a cross)

Poor	Not very good	Good	Very good
1	2	3	4

1.2 Do you have any of these illnesses, or have you suffered from of them in the past?

Yes No Age on last occasion

Asthma yrs

Hay fever yrs

Chronic bronchitis/emphysema..... yrs

Diabetes..... yrs

Osteoporosis..... yrs

Fibromyalgia / chronic pain syndrome..... yrs

Mental disorders for which you sought help yrs

Cardial infarction..... yrs

Angina pectoris (cardiac spasm)..... yrs

Stroke/cerebral haemorrhage ("drip")..... yrs

1.3 Have you ever noticed any sudden change of your pulse or heart beat during the past year? Yes No

1.4 Do you feel pain or discomfort when you: Walk up hills, climb stairs or walk fast on level ground?..... Yes No

1.5 If you do feel such pain, do you usually:

Stop?	Slow down?	Continue at the same pace?
1	2	3

1.6 If you stop, does the pain then disappear after less than 10 minutes?..... Yes No

1.7 Is such pain just as likely to occur when you are standing still or sitting / lying down?..... Yes No

2. MUSCULOSKELETAL DISORDERS

2.1 Have you suffered from pain and/or stiffness in muscles and joints in the course of the last 4 weeks?
(Duration to be stated only if you have been troubled in this way)

	Not troubled	Somewhat troubled	Very troubled	Duration	
				Up to 2 weeks	2 weeks or more
Neck/shoulders.....					
Arms, hands.....					
Upper back.....					
Lower back.....					
Hips, legs, feet.....					
Elsewhere.....					

2.2 Have you ever: Age on last occasion

	Yes	No	
Broken (fractured) your wrist/lower arm?.....			yrs
Fractured your hip (neck of your femur)?.....			yrs

3. OTHER DISORDERS

3.1 Below is a list of various problems. Have you suffered from any of the following during the last week (including today)?
(Put a cross for every problem)

	Not troubled	Slightly troubled	Quite a lot troubled	Much troubled
Suddenly feel panicky for no reason.....				
Suddenly feel frightened or anxious.....				
Feel faint or dizzy.....				
Feel tense or harassed.....				
Easily find fault with yourself.....				
Sleeplessness.....				
Feel depressed, dejected.....				
Feel useless, of little worth.....				
Feel that everything is a burden.....				
Feeling of hopelessness for the future.....				
	1	2	3	4

4. USE OF THE HEALTH SERVICES

4.1 How many times during the last 12 months have you personally used:
(One cross on each line)

	None	1-3 times	4 times or more
General practitioner			
Company doctor.....			
Psychologist or psychiatrist..... (private or at an outpatient clinic)			
Other consultant (specialist) (private or at an outpatient clinic)....			
Emergency service ("doctor-on-call") (private or public).....			
Admission to hospital			
Home nursing service.....			
Physiotherapist.....			
Chiropractor			
Dentist.....			
Alternative therapist.....			

5. WHERE YOU GREW UP / WHERE YOU BELONG

5.1 How long have you lived in Oslo altogether?..... yrs
(Write 0 if less than 6 months)

5.2 How long have you lived altogether in the district /
sub-municipality of Oslo where you are living now? yrs
(Write 0 if less than 6 months)

5.3 Where did you live for most of the time before you reached the age of 16 years?
(Cross off one alternative and specify)

- Same sub-municipality/district of Oslo 1
- Another sub-municipality/
district of Oslo 2 _____
- Another county in Norway 3 Which _____
- Outside Norway..... 4 Country _____

5.4 Have you moved in the course of the last five years?

No	Yes, once	Yes, several times
1	2	3

6. WEIGHT

6.1 Assess your weight when you were 25 years old: whole kg

7. FOOD AND DRINK

7.1 How often do you usually eat the following kinds of foods?

(Mark the appropriate answer with a cross on each line)

	Seldom/ Never	1-3 times. pr. mth	1-3 times. pr. week	4-6 times. pr. week	1-2 times. pr. day	3 times or more pr. day
--	------------------	-----------------------	------------------------	------------------------	-----------------------	----------------------------

Fruit/berrries

Cheese (all kinds)

Potatoes

Cooked vegetables

Raw vegetables/salad ...

Fat fish (e.g. salmon
trout, mackerel, herring) 1 2 3 4 5 6

7.2 What kind of fat do you use most often? (One cross only on each line)

	Dairy- butter	Hard margarine	Soft/light margarine	Oil	Do not use
--	------------------	-------------------	-------------------------	-----	---------------

On bread

For cooking

1	2	3	4	5
---	---	---	---	---

7.3 Do you take the following food supplements? Yes, daily Sometimes No

Cod liver oil, cod liver oil capsules, fish oil capsules?

Vitamin- and/or mineral supplement?

7.4 How much do you usually drink of the following?

(One cross per line).

	Seldom/ Never	1-6 glass pr.wk	1 glass pr.day	2-3 glasses pr. day	4 glasses or more pr. day
Full cream melk, kefir, yoghurt					
Semi-skimmed milk, "cultura", light yoghurt					
Skimmed milk (sour/sweet)					
Fruit juice					
Water					
Carbonated bottled water					
CocaCola, Pepsi Cola or suchlike					
Other "fizzy"drinks/thirst quenchers					
	1	2	3	4	5

7.5 Do you usually drink thirst quenchers / Cola: With sugar 1 Without sugar 2

7.6 How many cups of coffee or tea do you drink daily?

(Write 0 if you do not drink coffee or tea daily)

Number cups coffee Number cups tea:

7.7 What kind of coffee do you usually drink?

Filter-/ instant coffee.....

"Boiled" (coarse ground)/ Cafeteria-made coffee

Other coffee (espresso etc.)

Do not drink coffee.....

7.8 How often have you consumed alcohol in the course of the past year?

(Low alcohol beer and non-alcoholic beer are not included)

4-7 times 2-3 times ca. once 2-3 times About once
pr. wk pr. wk pr. wk pr. mth pr. mth.

1 2 3 4 5

A few times in Have not drunk Have never
the past year alcohol this past year drunk alcohol

6 7 8

To those who have consumed alcohol during the past year:

7.9 When you consumed alcohol, how many glasses or drinks did you usually consume? *Number*

7.10 How often in the course of the past year did you drink as many as at least 5 glasses or drinks in the course of one day? *Number of. times*

7.11 When you drink, do you usually drink: (Put more than one cross if applicable)

Beer Wine Spirits

8. SMOKING

8.1 How much time do you usually spend each day in a smoke-filled room?.....*Number whole hours.*

Yes No

8.2 Did any of the adults in your home smoke when you were growing up?.....

8.3 Are you living, or have you lived in the same house as a daily smoker after reaching the age of 20 yrs? Yes No

Yes, now Yes, earlier Never

8.4 Have you smoked/do you smoke daily?...
If **NEVER**: Go straight to the questions on **EDUCATION AND EMPLOYMENT**)

8.5 If you smoke daily **at present**, do you smoke: Yes No

Cigarettes?

Cigars/cigarillos?

A pipe ?

8.6 If you have smoked daily **before**, how long is
it since you stopped smoking? Number of years

8.7 If you smoke daily **now**, or have smoked before:

How many cigarettes do you or did you usually
smoke daily? Number cigarettes

How old were you when you started to
smoke daily? Age in yrs

How many years altogether have you smoked
daily? Number yrs .

9. EDUCATION AND EMPLOYMENT

9.1 How many years of schooling/education
have you completed altogether?..... Number yrs.

9.2 Are you currently employed?

Yes, full time 1 yes, part time 2 No 3

9.3 Describe the activity going on at the place of work (department)
where you carried out paid work for the longest period of time during the
last 12 months. (E.g. Firm of Accountants, lower secondary school, pediatric
department at a hospital, carpentry workshop, car repair workshop, bank,
commodity trade, etc..)

Activity: _____
If retired, state your activity and occupation before retirement..
Applies also to 9.4.

9.4 What is/was your occupation / title at this place of work?

(E.g. secretary, teacher, industrial worker, child nurse, cabinet maker,
head of department, salesman, driver, etc..)

Occupation: _____

9.5 In your main occupation, are you self-employed, do you work as an employee
or as a family member without an agreed fixed wage?

Self-employed Employee Family member

9.6 Do you think you are in danger of losing your Yes No
present work or income in the course of the next
2 years.....

9.7 Are you receiving any of the following benefits? Yes No

Sick pay (Certified as being ill).....

Old-age pension, early retirement pension
or widow(er)'s pension.....

Rehabilitation/training allowance.....

Disability pension (full or part).....

Daily allowance during unemployment.....

Social assistance / benefit.....

Interim allowance for single parents/supporters..

13. USE OF MEDICINES

Medicines, in this context, means medicines bought at a pharmacy.
Food supplements and vitamins are not included here..

13.1 Do you take?

	Now	Earlier, but not now	Never used
Medicine for high blood pressure.....			
Cholesterol-reducing medicine.....			

13.2 How often in the course of the last 4 weeks have you taken the following medicines?
(One cross per line)

	Daily	Every week but not daily	Less often than every week	Not taken during the last 4 weeks
Painkillers, off prescription.....				
Painkillers, on prescription.....				
Sedatives				
Tranquillisers				
Anti-depressives				
Other medicine on prescription.....				
	1	2	3	4

13.3 For those medicines you have crossed off in items 13.1 and 13.2, and you have taken during the last 4 weeks:

State the name of the medicines and your reason for taking/having taken them (disease, symptom):
(Cross off for how long you have taken the medicine)

Name of medicine: (one name per line):	Reason for taking the medicine	How long have you taken the medicine?	
		Up to 1 yr	One yr. or more

If there is not enough space here, continue on a separate page and enclose it with the form)

