Suicide among immigrants in Norway: A registry-based analysis, 1995-2009

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Abstract

The risk factors and burden of disease in terms of mental health problems among the immigrant population is poorly understood. This study examines risk factors and patterns of suicide among the Norwegian immigrant population, whether these differ between different groupings of countries of origin, and if immigrants' family size in Norway has an effect on suicide risk. We use two linked datasets of several sources of registry data, giving us a representative picture of suicide among Norway's immigrant population with ability to control for some important confounding factors. The results reported are based on the analyses of the first dataset. We find that the suicide rates of the immigrant population are lower than of that ethnic Norwegians. This difference is more pronounced for men than women. Immigrants originating from other Nordic countries have a higher suicide rate than ethnic Norwegians. Preliminary analyses suggest that both for immigrants and ethnic Norwegians being married is associated with a reduced suicide risk, while being divorced or widowed is associated with a higher suicide risk.

Introduction

Like other western European countries Norway has seen an increase in immigration in the recent decades, and this development will continue in the coming decades (Statistics Norway, 2014). This increases the need to know what risk factors and burden of disease these new countrymen and women might have. So far knowledge about immigrants' health is limited, especially in the case of mental illness and suicide. There has been some research done on the mental health of immigrants through the Oslo Health Survey (HUBRO) in 2000-2002[1], but less has been done on the adult immigrant population in recent years. Most importantly, no Norwegian study has yet to deal exclusively with immigrants and suicide.

In this study we seek to study the prevalence of suicide among immigrants in Norway and if these differ between different regions of origin, and whether immigrants' family size in Norway has an effect on suicide risk. These analyses will be conducted using two datasets. The first is based on all people who died due to external causes in Norway in the time period 1995-2009; while the second include all people registered living in Norway in the same time period. Both datasets include a linkage of several sources of Norwegian registry data.

Immigrants in Norway

Immigrants make up 14.9 percent of the Norwegian population, where 83.4 percent of these are first-generation (born outside Norway to foreign-born parents) and 17.6 percent are second-generation (born in Norway to foreign-born parents). The countries with the largest number of first-generation immigrants are Poland, Sweden and Lithuania, and the largest numbers of second-generation immigrants have parents from Pakistan, Somalia and Iraq (Statistics Norway, 2014b). The gender distribution is equal, but while men represent a larger proportion of labor migrants and refugees, women mainly migrate for marriage, education and family reunions.[2]

There has been a tendency of previous national and international studies to portray immigration populations as one large homogenous group, not taking into consideration differences in ethnicity, religion, reason for migrating, pre-migration experiences, social networks, level of integration, customs and socio-economic status (Abebe et al, 2014). In fact, immigrants in Norway come from 221 countries and self-autonomous regions, and they

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[1] Norwegian Institute of Public Health. *The Oslo Health Study (HUBRO)*. http://www.fhi.no/artikler/?id=54464. Accessed 16.12.14

[2] Self-composed table with Statistics Norway data on immigration: https://www.ssb.no/statistikkbanken/selecttable/hovedtabellHjem.asp?KortNavnWeb=innvgrunn&CMSSubjectArea=befolkning

migrate for various reasons like labor, family reunification, marriage, refuge and education (Statistics Norway, 2014b). This analysis seeks to group the sample in a way that best showcases the heterogeneity and complexity of immigrant populations, without sacrificing power or ethical concerns.

Previous research on immigrant mental health in Norway

Most of the recent population-based studies on the mental health of immigrants in Norway draw on the Oslo Health Study (HUBRO), a health survey in Oslo conducted in 2000-2002. HUBRO did not include information on suicide behavior. The study had some limitations, including a low response rate (45.9 percent), cultural validity and difficulties assessing causal relationships because of the cross-sectional study design. One study based on HUBRO-data found that migrants from low and middle-income countries (LMICs) had higher risk of experiencing psychological distress and powerlessness than both ethnic Norwegians and immigrants from high-income countries (HIC), while there was no significant difference in distress between Norwegians and immigrants from HICs (Dalgard et al, 2006). Another study concluded that among immigrants from non-Western countries, social integration was associated with better mental health for men, but not for women, possibly because of social integration being more challenging as it often leads to clashes in social norms and resistance from male family members (Dalgard & Thapa, 2005). A recent register based study also showed that immigrant's use of primary health care services for mental health problems varied greatly on the basis of country of origin and gender (Straiton et al, 2014).

Immigrants and risk factors of suicide

A migrant's mental health problems is often not due to one, single predictive factor, but usually results from a combination of aspects on a societal (both of origin and settlement), ethnic and individual level (Oppedal et al, 2005).

Migrants are often seen as a younger and healthier select group of people, compared to the rest of the population in their country of origin, hence the "healthy migrant" hypothesis (Lu & Qin, 2014). However, it is likely that this hypothesis only holds for certain types of immigrants, like those migrating for labor, and less for refugees and asylum seeker. In terms of mental health, refugees and asylum seekers seem to have a large burden of post-traumatic stress syndrome and other psychiatric disorders (Jakobsen et al, 2014). Migration is a stressful life event of itself, filled with change and demands, and might increase the impact of traumatic events related to war or conflict and lead to an increased risk of suicide (Ferrada-

Noli, 2001). Migrants often have a higher suicide rate than in the country they originate from (Westman et al, 2006). For most migrants, being integrated into society will over time reduce the stress of migration. However, lack of acculturation might lead to a heightened risk of mental distress, and this is found to not vary significantly in terms of cultural diversity or country of origin, but rather relates to the conditions in the receiving community (Haasen et al, 2008).

Low socio-economic status (SES) has shown to be a predictor of poor mental health and suicide in many European studies (Qin et al, 2003). On average, immigrants in Norway have lower income than ethnic Norwegians, but this vary widely with countries of origin, length of stay and reason for migrating (Statistics Norway, 2014c). Cultural and religious background and associated lifestyle and risk-taking behavior can also influence the risk of suicide, for example through high alcohol intake, as seen in many Eastern-European countries (Pridemore & Chamlin, 2006).

Immigrants, social support and family size

Another factor that may influence suicide risk is the presence of social support and a social network. The importance of social networks is exemplified in a sample of Iraqi refugees in the UK, where low "affective social support" was a stronger predictor of depression and other mental health problems than traumatic events were (Gorst-Unsworth & Goldenberg, 1998). However, among young migrant women, especially from Asia, family networks might also cause conflict and culture clash. The transformation of families from their culture of origin to a Western culture might be complex and difficult, especially in terms of gender roles. The women might feel trapped between the cultural gender expectations from their families and the expectation from the new community to behave like everyone else, feeling barred from becoming independent (Van Berger et al, 2009). Numerous studies report higher suicide rates among young female migrants from areas with higher gender inequality and rigid gender roles, e.g. South Asia (Spallek et al, 2014). But family clashes might just be one of many predicting factors (Bhugra et al, 2014).

Aims of study

The aim of this study is to examine risk factors and patterns of suicide among immigrants in Norway using registry data. To our knowledge, this is the first Norwegian study focusing on

this topic. The main research questions are (1) Are immigrants at higher risk of suicide than the rest of the Norwegian population? (2) How does this risk vary between different groupings, for example by regions of origin, reason for migrating, human development index score (HDI) or income group of country of origin? (3) Does family size (indicated by close relatives registered) in Norway function as a supportive network and a protective factor against suicide?

Methods

Data

The analyses are based on two datasets both covering the time period 1995-2009. Both datasets link information from the following national registries: 1) Norwegian Population Registry, 2) the Cause-of-Death Registry, 3) Statistics Norway's Educational Registration System, and 4) the Database on Social Welfare. By means of a unique personal identification numbers assigned to each Norwegian resident at birth and all immigrants living in Norway for more than 6 months, it is possible to construct individual record linkages between different data sources. It is also possible to link children and parents. Using registry data has the benefit of including all those registered as living in Norway, including immigrants with a personal ID number. Many national health surveys have had very low percentage of immigrants, and language and attrition issues. The sample will be large, making it possible to study rare events like suicide.

Data set 1:

Includes all who died by external causes in Norway during the observation period (1995-2009). It contains the following variables: *Outcome variables*: Suicide (X60-X84, Y870) and external causes of death (groups R,V, W, X and Y) according to ICD-10. *Control variables*: Gender, age, marital status (unmarried, married, divorced and widowed), region of origin (Eastern-Europe, Western-Europe, North America and Oceania, the Nordic countries, Asia and Africa), category of immigrant (e.g. first- vs second generation immigrants), educational attainment and income.

Data set 2

Includes all registered living in Norway in the observation period (1995-2009). This dataset will be available by May 2015 after a final approval from the Regional Ethic Committee in

Norway. The dataset will contain the following variables: *Outcome variables*: Suicide (X60-X84, Y870) and external causes of death (groups R,V, W, X and Y) according to ICD-10. *Control variables:* Gender, age, marital status (unmarried, married, divorced and widowed), parity, region of origin (Eastern-Europe, Western-Europe, North America and Oceania, the Nordic countries, Asia and Africa), country of birth, year of immigration, category of immigrant (e.g. first- vs second generation immigrants), the number of close relatives (parents and siblings registered living in Norway), educational attainment, educational activity, labour activity, type of occupation, household income and receiving social welfare benefits.

Preparation for data analysis

The immigrants of different countries of origin will be sorted into different types of groupings, to best reflect the variations and heterogeneity between countries, but without comprising power or ethics by having groups that are too small or detailed.

Groupings include 1) geographical regions, based on Statistics Norway's categories (data set 1) 2) human development index score, by very high, high, medium and low HDI (data set 2) 3) Income group, by low, lower middle, upper middle and high income countries (data set 2) 4) Collectivist or individual culture of country (data set 2)

In addition, data set 2 will be linked to UCDP/PRIO armed conflict dataset 1946-2013 (Gleditsch et al, 2002) to illustrate whether there has been a conflict in the immigrant's country of origin, and if this happened before or after immigrating to Norway.

Statistical analysis

The analysis will be undertaken in STATA 13. First, descriptive analyses will be carried out. Next, survival analysis with Cox hazard regression will be conducted to establish risk factors of suicide, and logistic regression to establish characteristics and associations with the immigrant population. Factors that are associated with both the main explanatory variable (Grouping of country of origin) and response variable (Suicide) will be integrated into a final multivariate regression model, giving us a model of predictors of suicide among the Norwegian immigrant population. Sub-analyses will be conducted separately for men and women.

Results

The results reported below are based on analyses of the first dataset. When the second dataset is made available to us, this part will be updated with new results.

Distribution of suicides in the observation period

387 immigrants committed suicide between 1995 and 2009, 258 men and 129 women (see table 1). In the same time period the share of immigrants in the Norwegian population increased from 5.1 percent to 10.6 percent. This indicates that suicide is less common among immigrants than among ethnic Norwegians, and that this difference has increased over time.

Table 1 Number of suicides by immigrant status 1995-2009

	1995-1999	2000-2004	2005-2009
General population (%)	2 611 (95.7%)	2 496 (95.6%)	2 465 (94.1%)
Immigrants (%)	116 (4.3%)	116 (4.4%)	155 (5.9%)
Total	2 727 (100%)	2 612 (100%)	2 620 (100%)

In a second step we calculated suicide rates by dividing the number of suicides by the midyear population (average) of the five year period and multiplying by 100,000, giving a suicide mortality rate per 100,000 inhabitants (se table 2). The midyear population was obtained from Statistics Norway. Throughout the whole time period the suicide rate of the immigrant population is lower than the suicide rate of the ethnic Norwegians. Since a substantial part of the Norwegian immigrant population (about 50 percent) originates from non-western countries with relatively low suicide rates, this could indicate that immigrants tend to retain the suicide rate of their birth country. It is also important to take into account that immigrants on average are younger than ethnic Norwegians. This may also have an impact on the suicide rate. Thus for the time period 2005-2009 we obtained information about the age distribution of the immigrant population from Statistics Norway and calculated an age-standardized suicide rate. The standardized suicide rate was 7.58. This rate is still substantially lower than the suicide rate of ethnic Norwegians.

Table 2 Five year suicide rates (suicides per 100 000 inhabitants) by immigrant status 1995-2009

	1995-99	2000-04	2005-09
General population	12.54	11.84	11.58
Immigrants	9.54	7.18	6.92

Gender distribution of suicide

With a few exceptions, globally men are more likely to commit suicide than women (WHO, 2014). However, the magnitude of this gender difference differs across regions and countries.

The difference is generally larger in high-income countries than in low and middle-income countries. In a second step we therefore calculated the suicide rates for men and women separately (see table 3). Both for men and women the suicide rates is lower in the immigrant population than among ethnic Norwegians. The difference is somewhat more pronounced for men than women.

We also calculated the gender ratio in the immigrant population and among the ethnic Norwegians. The gender ratio is somewhat larger among the ethnic Norwegians than among the immigrant population. Given that a substantial share of the immigrants originates from low- and middle-income countries, this support previous studies reporting a higher gender ratio in high-income countries than in middle- and low-income countries.

Table 3 Five year suicide rates (suicides per 100 000 inhabitants) by gender and immigrant status 1995-2009

	1995-99	2000-04	2005-09
Immigrant men	13.3	9.4	9.0
Norwegian men	18.5	17.0	15.8
Immigrant women	5.8	5.0	4.8
Norwegian women	6.4	6.1	6.5
Gender ratio immigrants	2.2	1.8	1.8
Gender ratio Norwegians	2.8	2.7	2.4

Suicide among immigrants from the Nordic countries

A substantial part of the men and women immigrating to Norway come from other Nordic countries (Sweden, Finland and Denmark), and in particular from Sweden. Immigrants from Sweden make up the second largest immigrant group in Norway. Thus we calculated separate suicide rates for Nordic immigrants (see table 4). In line with previous Swedish studies (Westman et al, 2006; Sundaram et al, 2006; Spallek et al, 2014), we find a higher suicide rate among Nordic immigrants than ethnic Norwegians. Still we find this result surprising. The main bulk of Nordic immigrants in Sweden originate from Finland, a country with a relatively high suicide rate compared with the other Nordic countries. Given that most Nordic immigrants in Norway originate from Sweden; a country with very similar suicide rates to Norway, we would have expected little difference between the suicide rates of the Nordic immigrants and the remaining population. Thus this group of immigrants' deserves more attention.

Table 4 *Five-year suicide rates(suicides per 100 000 inhabitants) by immigration status* 1995-2009			
	1995-99	2000-04	2005-09
General population	12.4	11.7	11.3
Immigrants from Nordic countries	17.2	11.8	15.0
Other immigrants	8.9	7.3	6.7

Relationship status and suicide

Several studies indicate that married men and women are less likely to commit suicide than the unmarried (Qin et al, 2003). Thus we also report some very preliminary results where we examine the distribution of suicides by marital status in the immigrant population and among ethnic Norwegians (see table 5). Since our data (dataset 1) do not include the entire population, we are not able to estimate suicide rates for the different marital status groups. However, for illustration purpose and to gain a first impression we use information about the distribution of marital status in the two population groups from Statistics Norway's two national health and living condition surveys conducted in 1998 and 2005 (HLCS) (see distribution in table 5) (Blom & Henriksen, 2008). For both immigrants and the general population being married appears to decrease the risk of suicide, whereas having experienced union disruption (either due death or divorce) appears to increase the risk of suicide. More thorough analyses based on the second dataset which includes the whole population will give us a more certain answer to the role of marital status.

Table 5. Suicide by relationship status and immigration status, 1995-2009						
Relationship status	Unmarried	Married	Widowed	Divorced	Separated	Total
General pop (%)	3 630 (48.2)	1954 (25.9)	453 (6.0)	1136 (15.0)	353 (4.6)	7 525
HLCS General pop %	51.5	37.5	1	9	1	100
Immigrant (%)	114 (30.8)	152 (40.1)	27 (7.3)	62 (16.8)	14 (3.7)	369
HLCS Immigrant pop %	28.5	63	1.5	5	2.5	100

Discussion and conclusion

In this paper we set out to examine risk factors and patterns of suicide among Norwegian immigrants compared with the ethnic Norwegian population. Based on the analyses of the first data set covering all who died from external causes in the time period 1995-2009, we find that the suicide rate of immigrants is substantially lower than the suicide rate of ethnic Norwegians. We find a similar pattern when we examine the suicide rates of men and women separately. However, the difference between immigrants and ethnic Norwegians is more pronounced for men than women. In line with previous studies the magnitude of the suicide gender ratio is smaller for immigrants than the ethnic Norwegians. Immigrants from the Nordic countries appear to be a risk group. We find a substantially higher suicide rate in this immigrant group than among the remaining immigrants and ethnic Norwegians. Finally, very preliminary results suggest that being married (both for immigrants and the ethnic Norwegian population) is protective of suicide while having experienced union disruption appears to increases the risk of suicide.

Based on these first analyses, immigrants in general do not appear to be a high-risk group in relation to suicide in Norway. Since half of all immigrants coming to Norway originate from non-western countries with low suicide rates, this also suggests that the immigrants' suicide risk do not converge with the suicide rates of ethnic Norwegians. However, immigrants originating from the other Nordic countries appear to be a risk group with regard to suicide. Given that the majority of these immigrants come from Sweden, a country with a suicide rate very similar to the Norwegian suicide rate, this is a surprising result. Thus we need to gain more insight into this result. Moreover, this result also demonstrates the need to take the heterogeneity of immigrants into account when studying suicide. The second dataset will prove useful in both respects and in examining in more detail the importance of marital status and the number of close relatives as protective factors for suicide.

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