

## Original Research

# Repetition of Attempted Suicide Among Immigrants in Europe

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**Key Words:** suicide attempt, suicide attempt repetition, immigration, Europe, culture

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**Objectives:** To compare frequencies of suicide attempt repetition in immigrants and local European populations, and the timing of repetition in these groups.

**Method:** Data from 7 European countries, comprising 10 574 local and 3032 immigrant subjects, were taken from the World Health Organization European Multicentre Study on Suicidal Behaviour and the ensuing Monitoring Suicidal Behaviour in Europe (commonly referred to as MONSUE) project. The relation between immigrant status and repetition of suicide attempt within 12-months following first registered attempt was analyzed with binary logistic regression, controlling for sex, age, and method of attempt. Timing of repetition was controlled for sex, age, and the recommended type of aftercare.

**Results:** Lower odds of repeating a suicide attempt were found in Eastern European (OR 0.50; 95% CI 0.41 to 0.61,  $P < 0.001$ ) and non-European immigrants (OR 0.68; 95% CI 0.51 to 0.90,  $P < 0.05$ ), compared with the locals. Similar patterns were identified in the sex-specific analysis. Eastern European immigrants tended to repeat their attempt much later than locals (OR 0.58; 95% CI 0.35 to 0.93,  $P < 0.05$ ). In general, 32% of all repetition occurred within 30 days. Repetition tended to decrease with age and was more likely in females using harder methods in their index attempt (OR 1.29; 95% CI 1.08 to 1.54,  $P < 0.01$ ). Large variations in the general repetition frequency were identified between the collecting centres, thus influencing the results.

**Conclusions:** The lower repetition frequencies in non-Western immigrants, compared with locals, in Europe stands in contrast to their markedly higher tendency to attempt suicide in general, possibly pointing to situational stress factors related to their suicidal crisis that are less persistent over time. Our findings also raise the possibility that suicide attempters and repeaters constitute only partially overlapping populations.



## Répétition de tentatives de suicide chez les immigrants en Europe

**Objectifs :** Comparer les fréquences de tentatives de suicide répétées chez les immigrants et les populations locales d'Europe, et les temps de répétition dans ces groupes.

**Méthode :** Les données de 7 pays européens, comprenant 10 574 sujets locaux et 3032 sujets immigrants, ont été tirées de l'étude multicentrique de l'OMS-EUROPE sur le comportement suicidaire et du projet de surveillance du comportement suicidaire en Europe

(appelé MONSUE) qui en a découlé. La relation entre le statut d'immigrant et la répétition de tentatives de suicide dans les 12 mois suivant la première tentative enregistrée a été analysée à l'aide de la régression logistique binaire, après correction selon le sexe, l'âge, et la méthode de la tentative. Les temps de répétition ont été corrigés selon le sexe, l'âge, et le type de suivi recommandé.

**Résultats :** Des probabilités moindres de répéter une tentative de suicide ont été observées chez les Européens de l'Est (RC 0,50,  $P < 0,001$ ) et les immigrants non-européens (RC 0,68,  $P < 0,05$ ), comparativement aux populations locales. Des modèles semblables ont été identifiés dans l'analyse spécifique au sexe. Les immigrants d'Europe de l'Est tendaient à répéter leur tentative beaucoup plus tard que les populations locales (RC 0,58,  $P < 0,05$ ). En général, 32 % de toutes les répétitions survenait dans les 30 jours. La répétition tendait à diminuer avec l'âge et était plus probable chez les femmes utilisant des méthodes plus dures à leur première tentative (RC 1,26,  $P < 0,01$ ). De grandes variations dans la fréquence de répétition générale ont été identifiées entre les centres de collecte, influençant ainsi les résultats.

**Conclusions :** Les fréquences de répétition plus faibles chez les immigrants non occidentaux, comparés aux populations locales, en Europe contrastent avec leur tendance sensiblement plus élevée à tenter de se suicider en général, ce qui indique possiblement des facteurs de stress situationnel liés à leur crise suicidaire qui sont moins persistants avec le temps. Nos résultats soulèvent aussi la possibilité que ceux qui tentent de se suicider et qui répètent la tentative constituent seulement partiellement des populations qui se chevauchent.

Studies on suicidal behaviour among immigrants in Europe show high rates of both suicide and attempted suicide<sup>1</sup> in some groups, compared with nonimmigrants,<sup>2-6</sup> as well as worryingly high rates of suicide among women from non-European countries.<sup>7-10</sup> However, only a few of the studies on immigrants' suicidal behaviour have focused on repetition of suicide attempts.

In the general population, a history of previous suicide attempt(s) normally increases the likelihood of further attempts,<sup>11</sup> with 7% to 35% of the patients engaging in a further episode within the next 12 months.<sup>12,13</sup> The risk of suicide after attempted suicide seems to vary between ages and sex,<sup>14</sup> and countries,<sup>15,16</sup> and depending on the follow-up period. Within 5 to 35 years of follow-up, studies show that about 10% of people who have attempted suicide will die by suicide.<sup>17,18</sup>

The risk of repetition is found to be highest immediately after discharge from hospital, with 1 in 3 patients repeating their attempt within 30 days.<sup>19</sup> Also, one-half of all repeated events occur in the first 3 months after the initial attempt, and almost two-thirds (64%) within the first 6 months.<sup>20</sup>

Higher rates of repetition have been found among people who presented with self-cutting,<sup>20-22</sup> while among those who used more lethal methods, such as hanging, drowning, and poisoning by chemical substances, the repetition rates were lower.<sup>20</sup> Conversely, other studies have found that the use of more violent methods in previous suicide attempts increased the risk of repetition.<sup>19,23,24</sup>

The risk factors found to be associated with repetition of suicidal behaviour are of varying nature, including demographic (for example, female sex, younger age, and being single), socioeconomic (for example, unemployment and low level of education and [or] skills), and psychological (for example, hopelessness, hostility, and impulsivity)

#### Clinical Implications

- Non-Western immigrants in Europe show a unique pattern of high risk for attempting suicide and low risk of repetition.
- Higher suicide attempt risk in immigrants may relate more to situational stress (that is, acculturation) and less to psychological features enhancing repetition.
- There may be a sex-specific relation between method of attempt and risk of repetition that demands further investigation.

#### Limitations

- The lower risk for repetition of suicide attempts may be limited to the short term in immigrants.
- The general frequencies for repetition of suicide attempts within 12 months were different in the varying European centres for unknown reasons.

factors, substance misuse, previous suicide attempts, and psychiatric symptoms and history.<sup>19,25-27</sup> The risk factors for repetition are mostly similar to those of other suicidal behaviour and, in clinical assessment, they tend to have poor discriminative predictive value.<sup>28</sup>

As to the repetition of suicide attempts in immigrants, one study conducted in Europe found that they seem to be significantly less likely to repeat than the nonimmigrants, although there were large differences between the areas under study.<sup>29</sup> A review by Bhui et al<sup>7</sup> and another study by Cooper et al<sup>30</sup> similarly reported lower rates of repeated self-harm in South Asian and Caribbean immigrant groups in the United Kingdom. In these populations, previous history of self-harm was less common<sup>31,32</sup> when presenting with a self-harm episode. Conversely, an earlier UK study<sup>33</sup> showed that immigrants were more likely to repeat a suicide attempt, compared with a Caucasian group, unless they had

received psychiatric treatment or social care following the self-harm episode.<sup>7</sup>

Owing to the scarcity of studies on repetition of suicidal behaviour in immigrant populations in Europe, our study aims to further investigate suicide attempt repetition patterns of immigrants from diverse cultural backgrounds, compared with the European local populations, using cross-national data. Specifically, the study aims at

- 1) comparing immigrants and locals in their tendency to repeat suicide attempts;
- 2) investigating whether there are differences in the timing of the repetition within a 12-month period after the index attempt between immigrants and local groups; and
- 3) investigating covariates of suicide attempt repetition.

## Methods

### Data

The data on suicide attempts were derived from the World Health Organization European Multicentre Study on Suicidal Behaviour (previously Parasuicide), initiated in 1988 and described in detail elsewhere,<sup>24,34</sup> and the ensuing Monitoring Suicidal Behaviour in Europe (commonly referred to as MONSUE) project. The centres participating in the study collected information from their catchment areas on all patients who had received any medical treatment following an attempted suicide. Each patient included in the register received a unique, individual code (not personally identifiable) that was used for recording all suicide attempt episodes by the same subject within the study period.

The study has been conducted according to the ethical principles defined in the World Medical Association Declaration of Helsinki and the Ethical committee in Stockholm, Sweden. Each country participating in the collection of the data approved the collection of the data on suicide attempters.

The entire material available for our study included a total of 65 533 suicide attempts made between 1989 and 2010. Our analysis included data from 8 collecting centres in 7 European countries, in which there were more than 30 registered immigrant suicide attempters and with available information on repeated attempts within 12 months. The centres were as follows: Bern (Switzerland) in 1989 and 1993–1997; Ghent (Belgium) in 1996–1999; Holon (Israel) in 1990–1996 and 2005; Leiden (the Netherlands) in 1989–1991; Stockholm (Sweden) in 1989–2004 and 2007–2009; Tallinn (Estonia) in 1995–1999 and 2008–2009; Umeå (Sweden) in 1989–1994, and Würzburg (Germany) in 1989–2003 and 2008. To observe all repetitions within 12 months from the index attempts, the observation period for repeated attempts for each time period above extended for 1 additional year.

The sample for the analysis assessing the effect of immigration on the repetition of suicide attempt within

12 months comprised 10 574 local and 3032 immigrant subjects. The analysis assessing the effect of immigration on the timing of the repetition within that period included 935 local and 214 immigrant subjects.

### *Variables in the Analysis of Repetition of Suicide Attempts*

The dependent variable, repetition of a registered suicide attempt within 12 months, dichotomized the data into repeaters and nonrepeaters. The main independent (classification) variable was immigration status; sex, age, and the method of suicide attempt were used as covariates.

The questionnaire included direct questions on both the respondents' country of birth and their citizenship. The collecting centres used one or both of these variables. Thus subjects who were either born in another country or had a different citizenship than that of the country in which they had made their suicide attempt were counted as immigrants. It should be mentioned that the term may not strictly apply to subjects with other citizenship (as they could be born in the host country). Information on immigration status was unavailable or missing for 5.3% of subjects, thus they were not included in our study.

Immigrants were divided by their general region of origin into 3 major categories: Western European (and other Western) immigrants ( $n = 584$ ; 11 countries of origin), Eastern European immigrants ( $n = 1801$ ; 18 countries of origin), and non-European immigrants ( $n = 664$ ; 64 countries of origin). These groups were compared with a (European) local group, comprising local-born citizens at the above-described European centres ( $n = 10 574$ ).

For sex and age (rational scale), only a few subjects were missing, 0.6% and 1.3%, respectively.

The variable describing the method used in the suicide attempt was divided into 2 categories, hard and soft, based on the International Classification of Disease, Revision 10,<sup>35</sup> coding. Methods X60–X69, self-poisoning with medication, illegal drugs, or other substances, are designated as soft, while methods X70–X84, including hanging, jumping, cutting by sharp objects, are hard. This classification was based on the results of previous studies.<sup>23</sup> The missing data for all methods amounted to 11.2%.

### *Variables in the Analysis of the Timing of the Repetition of Suicide Attempts*

In the second analysis, the dependent variable was based on the number of days elapsed between the index attempt and the repeated attempt. A new variable was constructed, dividing the subjects' data into rapid (up to 30 days) and other (31 to 365 days) repetitions. Among all subjects, 0.6% were missing this information.

The independent variable was immigration status (as described above), and the covariates were sex, age, and the recommended type of care after the first registered suicide attempt. The type of recommended aftercare after the index

attempt was classified into 3 categories: no recommended aftercare; psychiatric or psychotherapeutic inpatient aftercare; and other care. Data on recommended care were missing in 11.3% of the subjects.

The immigrants divided by their general region of origin, as described above, included 55 Western European (and other Western), 108 Eastern European, and 53 non-European immigrants. These subjects were compared with 935 (European) local subjects. Data on immigration status in this analysis were missing in 3.8% of the subjects.

### **Statistical Analysis**

The relation between immigrant status and the repetition of suicide attempt within 12 months was analyzed with binary logistic regression for men and women, separately and together, controlling for sex, age, and the type of method of the attempt (hard or soft). Presented, in addition to the crude (unadjusted) effects, are model I, with the immigrant group, sex and age, and model II, adding also the method of the attempt. The analysis was performed for immigrants as a whole, as well as divided into groups according to their principal region of origin. The effects are given as odds ratios along with 95% confidence intervals.

In addition to the regression analysis of repetitions, previous (self-reported) suicide attempts were investigated to further corroborate (or not) the propensity of immigrants to repeat suicide attempts. The relative frequencies of self-reported previous suicide attempts were thus compared between the immigrant groups and locals using a Student *t* test of proportions.

Another series of binary logistic regressions was performed assessing the differences in the timing of the repetition within a 12-month period after the index attempt between immigrant and local groups, controlling for sex, age, and the recommended type of aftercare.

For all analyses, IBM SPSS Statistics 20.0 (Armonk, NY, 2011) was used.

### **Results**

The average age of the suicide attempters in the material analyzed was 36.3 years (SD 16.7); 40.5% of the subjects were men and 59.5% women. Among the attempters, 71.4% used a soft method in their index attempt, while 28.6% used a hard method. Among the patients, 9.4% repeated their attempt within the same catchment area within 12 months; 90.6% did not.

Clearly, more locals (41.2%) and Western European immigrants (45.7%) reported previous suicide attempts, compared with Eastern European (31.3%) and non-European (34.6%) immigrants. However, data on previous attempt were missing in large amounts (and unequally from immigrants and others) in 3 of the centres: Ghent, Holon, and Tallinn (see further complementary analysis of respondents' self-reported previous suicide attempts).

### **Regression Analyses**

The logistic regression analysis assessing the relation between immigrant status and the repetition of suicide attempt was performed both for immigrants as a whole (not shown in tables) and divided according to their principal regions of origin, for men and women, together and separately (tables 1 to 4).

Comparing all immigrants to all locals, the unadjusted effect of immigration amounted to a significant decrease in repetitive attempts (OR 0.72; 95% CI 0.62 to 0.83,  $P < 0.001$ ). Controlling for sex and age (model I) and then also for the method used in the index attempt (model II) only accentuated the difference between locals and immigrants, who ended up with almost 40% smaller odds than the locals for repeating their suicide attempt within the following 12 months (OR 0.61; 95% CI 0.53 to 0.71,  $P < 0.001$ ).

The same pattern of lower odds for repeating suicide attempts was observed among both male and female subjects (OR 0.70; 95% CI 0.55 to 0.88,  $P < 0.01$  and OR 0.57; 95% CI 0.47 to 0.70,  $P < 0.001$ , respectively).

The effect of immigration is further specified when the immigrants are divided into regional groups (Table 1). Immigrants from Eastern Europe were found to have one-half the odds for repeating their attempt when compared with the locals (OR 0.50; 95% CI 0.41 to 0.61,  $P < 0.001$ ), with the control conditions taken into account. A significant effect also emerged for non-European immigrants clearly less likely than the locals to repeat their suicide attempts (OR 0.68; 95% CI 0.51 to 0.90,  $P < 0.05$ ).

Both male and female immigrants from Eastern Europe had lower odds for repeating their attempt, especially the women (OR 0.42; 95% CI 0.31 to 0.56,  $P < 0.001$ ). Also, lower odds were found for non-European immigrant females, with almost 40% smaller odds for repetition (OR 0.61; 95% CI 0.42 to 0.89,  $P < 0.05$ ). This effect was not identified as statistically significant for the men of the same group, compared with the local men (tables 2 and 3).

In all these analyses, no significant (or even large) differences were found between the Western immigrants and the local populations in the propensity of repeating a suicide attempt.

Among the covariates, only age was found to have a consistent significant effect on the odds for repetition in most analyses (with one exception—crude effects; Table 3), with clearly diminishing chances for repetition with increasing age.

The analysis by sex also revealed that females using harder methods had significantly higher odds for repetition (OR 1.29; 95% CI 1.08 to 1.54,  $P < 0.01$ ) than those employing softer methods. Male subjects showed an opposite pattern, with higher tendency to repeat among those who used soft methods. However, this last effect (in men) was only marginally significant when adjusted for other factors (Table 2).

A complementary analysis of respondents' self-reported previous suicide attempts seemed to replicate the findings of

Variable	Crude effects OR (95% CI)	Model I <sup>a</sup> n = 13 344 OR (95% CI)	Model II <sup>b</sup> n = 11 942 OR (95% CI)
Immigrant group, compared with locals			
Western European	1.15 (0.88 to 1.51)	1.07 (0.81 to 1.40)	0.93 (0.71 to 1.23)
Eastern European	0.59 <sup>c</sup> (0.48 to 0.72)	0.56 <sup>c</sup> (0.46 to 0.69)	0.50 <sup>c</sup> (0.41 to 0.61)
Non-European	0.85 (0.64 to 1.13)	0.76 (0.57 to 1.01)	0.68 <sup>d</sup> (0.51 to 0.90)
Sex: female, compared with male	1.10 (0.98 to 1.24)	1.06 (0.94 to 1.19)	1.10 (0.98 to 1.25)
Age, years	0.99 <sup>e</sup> (0.99 to 0.99)	0.99 <sup>e</sup> (0.99 to 0.99)	0.99 <sup>c</sup> (0.98 to 0.99)
Method: hard, compared with soft	1.01 (0.89 to 1.14)		1.07 (0.93 to 1.22)
–2 log likelihood		8441.323	7876.185
Nagelkerke R <sup>2</sup>		0.007	0.012
Variables included in models: <sup>a</sup> Immigrant status, sex, and age; <sup>b</sup> Immigrant status, sex, age, and method of attempt <sup>c</sup> P < 0.001; <sup>d</sup> P < 0.05; <sup>e</sup> P < 0.01			

Variable	Crude effects OR (95% CI)	Model I <sup>a</sup> n = 5408 OR (95% CI)	Model II <sup>b</sup> n = 4959 OR (95% CI)
Immigrant group, compared with locals			
Western European	1.12 (0.71 to 1.78)	1.05 <sup>c</sup> (0.66 to 1.67)	0.97 (0.61 to 1.54)
Eastern European	0.68 <sup>c</sup> (0.52 to 0.90)	0.65 <sup>c</sup> (0.49 to 0.86)	0.62 <sup>c</sup> (0.47 to 0.83)
Non-European	0.97 (0.63 to 1.51)	0.88 <sup>c</sup> (0.56 to 1.37)	0.82 (0.52 to 1.28)
Age, years	0.99 <sup>d</sup> (0.98 to 1.00)	0.99 <sup>d</sup> (0.98 to 0.99)	0.99 <sup>c</sup> (0.98 to 0.99)
Method: hard, compared with soft	0.81 <sup>d</sup> (0.67 to 0.98)		0.84 (0.68 to 1.02)
–2 log likelihood		3305.315	3131.926
Nagelkerke R <sup>2</sup>		0.006	0.009
Variables included in models: <sup>a</sup> Immigrant status, sex, and age; <sup>b</sup> Immigrant status, sex, age, and method of the attempt <sup>c</sup> P < 0.01; <sup>d</sup> P < 0.05			

the main analysis, indicating that immigrants also reported fewer previous attempts than did the locals ( $t = 3.57$ ,  $df = 2638$ ;  $P < 0.001$ ). Nevertheless, when excluding centres with large amounts of missing data on previous suicide attempts (Ghent, Holon, and Tallinn), the analysis showed significantly less previous suicide attempts only for the non-European immigrants ( $t = 3.14$ ,  $df = 445$ ;  $P < 0.01$ ).

Considering our study's second aim, to investigate possible differences in the timing of the repetitions of suicide attempts within the 12-month period, 32% of the repetitions were rapid (within 30 days); 68% were not. No differences were found comparing immigrants as a whole with the locals in the timing to repetition. Nevertheless, when divided into groups by region of origin (Table 4), it was found that Eastern European immigrants were significantly less likely to repeat their suicide attempt rapidly than the locals while controlling for other variables (OR = 0.58; 95% CI 0.35 to 0.93,  $P < 0.05$ ).

Also, female attempters were about 30% less likely to repeat an attempt within 30 days of the index attempt. The age of the attempter and the type of recommended aftercare had no effect on how fast the attempt was repeated.

## Discussion

### *Repetition of Suicide Attempt: Immigrant and Local Populations*

The results of our study show that immigrants had a clearly lower propensity to repeat a suicide attempt within 12 months, compared with locals, in Europe. This was found for both male and female immigrants from Eastern Europe and for Non-European female immigrants. These results are in line with other European local reports.<sup>7,29,30</sup>

A possible counterargument regarding the immigrants' lower rate of repetition would be that of their generally greater mobility, which could be thought to prevent their repetitive attempts from being registered. However, the finding that

**Table 3 Immigration and repetition of suicide attempt—immigrants by region of origin, females**

Variable	Crude effects OR (95% CI)	Model I <sup>a</sup> OR (95% CI) <i>n</i> = 7936	Model II <sup>b</sup> OR (95% CI) <i>n</i> = 6983
Immigrant group, compared with locals			
Western European	1.15 (0.83 to 1.60)	1.07 (0.77 to 1.49)	0.93 (0.66 to 1.31)
Eastern European	0.50 <sup>c</sup> (0.37 to 0.68)	0.48 <sup>c</sup> (0.36 to 0.65)	0.42 <sup>c</sup> (0.31 to 0.56)
Non-European	0.77 (0.53 to 1.12)	0.69 (0.48 to 1.01)	0.61 <sup>d</sup> (0.42 to 0.89)
Age, years	0.99 (0.99 to 1.00)	0.99 <sup>d</sup> (0.99 to 1.00)	0.99 <sup>e</sup> (0.98 to 0.99)
Method: hard, compared with soft	1.29 <sup>e</sup> (1.08 to 1.53)		1.29 <sup>e</sup> (1.08 to 1.54)
–2 log likelihood		5132.674	4731.005
Nagelkerke <i>R</i> <sup>2</sup>		0.009	0.017
Variables included in models:			
<sup>a</sup> Immigrant status, sex, and age;			
<sup>b</sup> Immigrant status, sex, age, and method of the attempt			
<sup>c</sup> <i>P</i> < 0.001; <sup>d</sup> <i>P</i> < 0.05; <sup>e</sup> <i>P</i> < 0.01			

**Table 4 Immigration and rapid repetition of suicide attempt—immigrants by region of origin**

Variable	Crude effects OR (95% CI)	Model I <sup>a</sup> OR (95% CI) <i>n</i> = 1283	Model II <sup>b</sup> OR (95% CI) <i>n</i> = 1141
Immigrant group, compared with locals			
Western European	1.20 (0.71 to 2.03)	1.20 (0.70 to 2.04)	0.96 (0.53 to 1.74)
Eastern European	0.65 (0.41 to 1.02)	0.61 <sup>c</sup> (0.38 to 0.97)	0.58 <sup>c</sup> (0.35 to 0.93)
Non-European	1.51 (0.87 to 2.62)	1.48 (0.85 to 2.58)	1.36 (0.76 to 2.41)
Sex: female, compared with male	0.69 <sup>d</sup> (0.55 to 0.88)	0.68 <sup>d</sup> (0.53 to 0.86)	0.66 <sup>d</sup> (0.51 to 0.86)
Age, years	1.00 (0.99 to 1.00)	0.99 (0.99 to 1.00)	0.99 (0.99 to 1.00)
Recommended care after index attempt, compared with other type of care			
No recommended care	1.22 (0.76 to 1.94)		1.14 (0.66 to 1.86)
Inpatient care	0.85 (0.66 to 1.11)		0.87 (0.65 to 1.86)
–2 log likelihood		1602.375	1407.378
Nagelkerke <i>R</i> <sup>2</sup>		0.017	0.021
Variables included in models:			
<sup>a</sup> Immigrant status, sex, and age;			
<sup>b</sup> Immigrant status, sex, age, and recommended care after attempt			
<sup>c</sup> <i>P</i> < 0.05; <sup>d</sup> <i>P</i> < 0.01			

immigrants themselves also reported significantly fewer previous suicide attempts strengthens the assumption that, indeed, they have a lower tendency to repeat their attempts.

Conversely, Western immigrants (who were found solely in the Western European localities), while probably being closer culturally to the locals, did not differ from these locals, neither in their registered tendency to repeat a suicide attempt nor in their reporting of previous suicide attempts.

The current results are interesting, especially in light of previously reported findings that Russian immigrants (who constitute most of the Eastern European immigrants), specifically male,<sup>2,3,8</sup> as well as non-European female immigrants,<sup>3,5,7,10,36,37</sup> tend to have markedly higher suicide attempt rates than locals.

Thus our study identifies a distinct feature of certain non-Western (Eastern European or non-European) immigrant suicide attempters: although they may have a higher tendency to attempt suicide, they do not seem to repeat their attempt more often than others. These results correspond with most of the (mostly UK) studies indicating less repetitions of suicide attempts among non-European immigrants and minority ethnic groups mentioned in the introduction. No previous studies have been found on Eastern Europeans.

Cooper et al<sup>30,38</sup> have proposed that immigrants' lower repetition frequency may be a result of their generally lower amount of risk factors for suicide attempt. In their studies, immigrants were much less likely to live alone, to

use alcohol in the suicide attempt, or to have a previous psychiatric history or a history of self-harm.<sup>30,38</sup> As a consequence, the researchers reported that clinical staff tended to rate both South Asian men and women as being at lower medical risk and lower risk of future self-harm, compared with Caucasians. Considering the results of our study, it could be hypothesized that immigrants who harm themselves do so impulsively in response to life events, possibly in connection to their experiences as immigrants, rather than in association with a persistent psychiatric illness.<sup>7,37,39</sup>

Correspondingly, the lower tendency of repeated attempts in non-European immigrant groups goes hand in hand with a tendency to be discharged without any further recommendation following a suicide attempt.<sup>40</sup>

Another possible explanation is that immigrants' lower repetition frequency may be explained by their negative experiences with mental health services at the initial presentation, which may affect their willingness for further contact.<sup>38,41</sup> Nevertheless, the fewer self-reported previous attempts among the immigrants speak against this assumption, strengthening the hypothesis that non-Western immigrants truly are a low-risk population for repetition of suicide attempts.

### ***Repetition of Suicide Attempt: Age and Method of Attempt***

Reflecting on both immigrants and nonimmigrants, the likelihood for repetition of a suicide attempt within 12 months decreased with age, a finding that corresponds to several other reports.<sup>20,42,43</sup> Also, the finding that women using harder methods in their index attempt were clearly more likely to repeat their attempt within 12 months than those who used softer methods correspond to the results of Perry et al.<sup>20</sup> They found that acts involving self-cutting (identified as a hard method here) were associated with an elevated risk of repetition for women, in cases where cutting was the sole method employed.

Possible explanations for these findings may be related to the levels of intent in repeaters and nonrepeaters, although studies on the relation between method of attempt and intent have shown contradictory results,<sup>44-47</sup> and some have even concluded that repetition is related neither to the lethality of the method nor to the level of intent of the index attempt.<sup>48</sup>

### ***Repetition Attempt Timing***

The difference found in the timing of the repetition of suicide attempt within a 12-month period for Eastern European immigrants who, when repeating their attempt, did so much less often within 30 days, compared with the local population, may relate to their generally lower tendency to repeat attempts. Specifically, repetition has been shown to occur most rapidly among people who have previously attempted suicide.<sup>49</sup> Eastern Europeans do fit into this pattern, as they had a generally weaker tendency

to repeat their attempts. This, again, stands in an interesting contrast to their generally high rates of suicide attempts.<sup>2</sup>

### ***Methodological Considerations***

Owing to heterogeneity in the material, our study investigated repetition attempts occurring within 12 months after the index attempt. However, because most repetitions occur during this period,<sup>20</sup> we may assume that the differences found between immigrants and local populations are reasonably well established.

Suicide attempt repetitions may be underestimated in some ethnic groups,<sup>2</sup> as some groups may avoid using health services.<sup>1</sup> Nevertheless, the current results include 2 culturally differing groups (non-European and Eastern European immigrants) with probably dissimilar help seeking patterns.<sup>1</sup> Thus the lesser probability of repetition in these immigrant groups most likely reflects reality.

The general frequency of repetition of attempted suicide within 12 months in the collecting centres varied largely. Holon, Tallinn, and Würzburg had a relatively low frequency of repetition, Bern, Ghent, Leiden, and Stockholm had a medium amount, while Umeå had a very high proportion of repetitions. The influence of the relative frequency of repetition attempts at the monitoring centre was thus investigated, identifying significant and large effects for this division (ORs between 2.4 and 3.5;  $P < 0.001$ ) in the main regression analysis; moreover, the significant effects for Eastern European immigrants and all (that is, immigrant, compared with nonimmigrant) males disappeared, while other effects remained.

The reasons for these differences are unclear, but they should be considered. It is possible that the lower repetition frequencies among the Eastern European immigrants is related to the generally lower repetition rates found in the Tallinn centre, where we also find the largest amount of Eastern European immigrants in our sample. Nevertheless, regarding the main focus of this work, the differences in the repetition of suicide attempts by immigrants mostly remained even when the differences between the centres were controlled.

Finally, it should be noted that the immigrants living within the catchment areas involved in our study may not be representative of the immigrants in those countries as a whole. Nevertheless, this was tested before the start of the monitoring period and no major differences were found with the general population in all participating centres.<sup>24</sup> Also, our study used the largest European data available and it could point toward possible areas of future investigation.

### ***Conclusions***

Our study showed that non-Western immigrants consistently tend to repeat their suicide attempts less often than local populations or immigrants from Western countries. This pattern stands in contrast to their markedly higher tendency to attempted suicide in general.<sup>2,8</sup> The reason may be that the suicidal crises of these immigrants are rather related to the

situational stress factors that are less persistent over time, or even that the act of suicide attempt in these groups is less connected to psychological features enhancing repetition. However, the lower risk for further suicidal behaviour in these immigrants should be further explored from a longer-term perspective.

Our current findings imply that, although suicide attempters and repeaters have many features in common, they constitute only partially overlapping populations with at least some divergent characteristics. The recognition of these common features and divergent characteristics may help build a clearer risk profile for the immigrant suicide attempter, specifically, and consequently, better prevention and treatment plans.

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