

# Mental disorders, suicide attempt and suicide: differences in the association in refugees compared with Swedish-born individuals

Emma Björkenstam, Magnus Helgesson, Ridwanul Amin and Ellenor Mittendorfer-Rutz

## Background

Mental disorders are associated with an elevated risk for suicide attempt and suicide. Whether the strength of the associations also holds for refugees is unclear.

## Aims

To examine the relationship between specific mental disorders and suicide attempt and suicide in refugees and Swedish-born individuals.

## Method

This longitudinal cohort study included 5 083 447 individuals aged 16–64 years, residing in Sweden in 2004, where 196 757 were refugees. Mental disorders were defined as having a diagnosis in psychiatric care during 2000–2004. Estimates of risk of suicide attempt and suicide were calculated as hazard ratios with 95% confidence intervals. Adjustments were made for important confounding factors, including history of attempt. The reference group comprised Swedish-born individuals without mental disorders.

## Results

Rates for suicide attempt in individuals with a mental disorder were lower in refugees compared with Swedish-born individuals (480 v. 850 per 100 000 person-years, respectively). This pattern

was true for most specific disorders: compared with the reference group, among refugees, multivariable-adjusted hazard ratios for suicide attempt ranged from 3.0 (anxiety) to 7.4 (substance misuse), and among Swedish-born individuals, from 4.9 (stress-related disorder) to 9.3 (substance misuse). For schizophrenia, bipolar disorder and personality disorder, estimates for suicide attempt were comparable between refugees and Swedish-born individuals. Similar patterns were seen for suicide.

## Conclusions

For most mental disorders, refugees were less likely to be admitted to hospital for suicide attempt or die by suicide compared with Swedish-born individuals. Further research on risk and protective factors for suicide attempt and suicide among refugees with mental disorders is warranted.

## Declaration of interest

None.

## Keywords

Suicide; epidemiology; migration; cohort; transcultural psychiatry.

## Copyright and usage

© The Authors 2019.

During the past few years, there has been a substantial increase in migration globally.<sup>1</sup> In 2017, there were 258 million migrants worldwide, including 25.9 million refugees and asylum seekers.<sup>1</sup> Sweden is one of the largest European recipients of refugees, with more than 160 000 individuals seeking asylum in 2015 alone.<sup>2</sup> Studies have shown that refugees have an increased risk of poor mental health outcomes, including depression, anxiety and post-traumatic stress disorder (PTSD).<sup>3,4</sup> Given the high levels of exposure to traumatic life events both before, during and after the migration process,<sup>5</sup> it has further been hypothesised that refugees also have an elevated risk of suicide attempt and suicide. However, we could only identify one study that examined this association.<sup>6</sup> This study reported lower rates of suicide<sup>6</sup> in refugees when compared with Danish-born individuals. Studies on migrants not discriminating between refugees and non-refugee populations, on the other hand, have shown lower rates of suicide and higher rates of suicide attempt.<sup>7,8</sup> Mental disorders represent one of the most important risk factors for suicide and suicide attempt.<sup>9</sup> Studies have reported geographical and cultural differences with respect to the prevalence of mental disorders in suicide victims. In China, for example, a much lower proportion of people who die by suicide seem to have psychiatric disorders.<sup>10</sup> Still, to what extent mental disorders affect suicide and suicide attempt in refugees remains unknown.

The current register-based study aimed to examine the association between specific mental disorders and suicide attempt and suicide in refugees, and to investigate if the risk differs when compared with Swedish-born individuals.

## Method

### Study population

The study population was defined as all individuals aged 16–64 years, residing in Sweden on 31 December 2004 ( $n = 5\,750\,669$ ). Only those with complete information on their reason for settlement in Sweden were included ( $n = 5\,525\,815$ ). Further, as we compared refugees with Swedish-born individuals, non-refugee immigrants ( $n = 442\,368$ ) were excluded. Thus, the final study population included 5 083 447 individuals, where 196 757 were refugees.

We used the unique (de-identified) Swedish personal identity number<sup>11</sup> to link information from several population-based registers. The Longitudinal Integration Database for Health Insurance and Labor Market Studies (<https://www.scb.se/LISA/>) contains data from the labour market and educational and social sectors. The Longitudinal Database for Integration Studies (STATIV) register holds migration-related information, including reasons for settlement (e.g. refugee status). The National Patient Register (NPR) (<https://www.socialstyrelsen.se/patientregistret>) includes information on in-patient care since 1987, and for specialised out-patient care since 2001. Diagnoses in NPR are coded according to the ICD-10.<sup>12</sup> The Cause of Death Register (<https://www.socialstyrelsen.se/statistik-och-data/register/alla-register/dodsorsaksregistret/>) comprises information on all deaths of Swedish residents since 1952.

## Measures

### Mental disorders

Mental disorders were defined as having a main diagnosis during psychiatric in-patient or specialised out-patient care, as recorded in the NPR during 2000–2004. More specifically, the following disorders were studied (ICD-10 codes): substance misuse disorders (F10–19), schizophrenia/non-affective psychotic disorders (F20–29), bipolar disorder (F30–31), depressive disorders (F32–34), anxiety disorders (F40–42), stress-related mental disorders (F43), PTSD (F43.1) studied separately, behavioural disorders (F50–59, F90–99) and personality disorders (F60–69).

### Suicide attempt and suicide

The study population was prospectively followed up from 1 January 2005 until 31 December 2013, with respect to suicide attempt and suicide. Suicide attempt was defined as having received at least one diagnosis (ICD-10 codes X60–84 or Y10–34) in in-patient care, obtained from the NPR, during follow-up. Suicide was defined by the presence of ICD-10 codes X60–84 (suicide) or Y10–34 (undetermined intent) as the underlying cause of death in the Cause of Death Register. Inclusion of undetermined intent in the measure of suicide and suicide attempt reduces underreporting and spatial and secular trends in detecting and classifying cases of suicide attempt and suicide when intent was indeterminable.<sup>13</sup>

### Refugee status

In this study, a refugee was defined as an individual receiving a residence permit in Sweden as a refugee (according to the Geneva Convention of Refugees<sup>14</sup>), or an individual who has been granted a residence permit because they are ‘in need of protection’ or on ‘humanitarian grounds’.

### Potential confounders

A range of potential confounders, measured in 2004, were considered. Age and gender were included in the analyses. We controlled for education, family situation and type of residential area (please see Table 1 for information on categorisation of the confounders). History of suicide attempt was defined as at least one admission to hospital for suicide attempt between 1987 and 2005. Adjustments were made for somatic multimorbidities, defined as in-patient or specialised out-patient care in 2000–2004 with a main diagnosis for diseases of the musculoskeletal system and connective tissue (ICD-10 codes M00–99), neoplasms (ICD-10 codes C00–97, D10–48), diseases of the circulatory system (ICD-10 codes I00–99) and other somatic disorders (rest of the ICD-10 codes with exception of F00–99). Individuals could be included in more than one group. Long-term sickness absence (>90 net days per year), disability pension and long-term unemployment (>180 days per year) were used as indicators of labour market marginalisation (LMM).

## Statistical analyses

Statistical analyses were conducted with SAS version 9.4 for Windows (SAS Institute Inc., Cary, NC) Crude and multivariate analyses were performed with Cox regression models of time to suicide attempt and suicide, respectively. We assessed person-years at risk by totalling the years that the individuals were living in Sweden during the follow-up period. The entry date was defined as 1 January 2005, and the exit date as the date of in-patient care for suicide attempt (outcome suicide attempt), date of suicide or any other cause, date of emigration or the end of follow-up (31 December 2013), which ever came first. In the main

analysis, three regression models were analysed: model 1, adjusted for age and gender; model 2, with further adjustments for education, family situation, type of residential area and LMM; and model 3, with the addition of history of suicide attempt and somatic multimorbidity. The reference group comprised Swedish-born individuals with no mental disorder. Additionally, as shown in the Supplementary Material available at <https://doi.org/10.1192/bjp.2019.215>, we reran the Cox regression analyses stratified by refugees and Swedish-born individuals (i.e. with two separate reference groups).

## Sensitivity analyses

We conducted a sensitivity analysis, in which individuals who were granted residence permits because they were ‘in need of protection’ and on ‘humanitarian grounds’ were excluded from the refugee category. Additionally, we conducted separate analyses in which we excluded cases coded as undetermined intent.

## Ethical approval

Ethical approval for this study was obtained from the Regional Ethical Review Board, Karolinska Institutet, Stockholm (review number 2016/1533-32). The ethical review board approved the study and waived the requirement that informed consent of research subjects should be obtained. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

## Results

Cohort characteristics of the study population, stratified by mental disorder in refugees and Swedish-born individuals, are presented in Table 1. A total of 4% of Swedish-born individuals were treated at least once in 2000–2004 with a mental disorder as a main diagnosis, of which the most common diagnoses were substance misuse (30%) and depressive disorders (26%) (Supplementary Table 1). In refugees, 6% were treated for mental disorders, where the most common types were stress-related disorders (31%), followed by depressive disorders (30%).

In general, among those with no mental disorder, the age- and gender-adjusted hazard ratio for suicide attempt was slightly higher for refugees compared with Swedish-born individuals (Table 2). However, this was not observed in the multivariable-adjusted models (models 2 and 3). For all diagnostic groups, the risk for suicide attempt was lower for refugees in individuals with mental disorders, with the exception of bipolar disorder (multivariable-adjusted hazard ratio for refugees 6.28, 95% CI 4.05–9.75; multivariable-adjusted hazard ratio for Swedish-born individuals 5.82, 95% CI 5.36–6.33), schizophrenia/non-affective psychotic disorders (multivariable-adjusted hazard ratio for refugees 4.19, 95% CI 3.39–5.19; multivariable-adjusted hazard ratio for Swedish-born individuals 4.81, 95% CI 4.51–5.13) and personality disorders (multivariable-adjusted hazard ratio for refugees 6.34, 95% CI 4.74–8.48; multivariable-adjusted hazard ratio for Swedish-born individuals 6.60; 95% CI 6.18–7.05). When sociodemographic and LMM factors were added to the initial model, all hazard ratios decreased markedly (Table 2, model 2), partly because of education and family situation (data not shown). When additional adjustments were made for history of suicide attempt and somatic multimorbidity (Table 2, model 3), the risk estimates decreased further. The highest estimates for suicide attempt in individuals with a mental disorder were observed in substance misuse (multivariable-adjusted

**Table 1** Cohort characteristics stratified by mental disorder, in Swedish-born individuals and refugees aged 16–64 years, residing in Sweden in 2004

Cohort characteristics	Swedish-born individuals			Refugees		
	All	No mental disorder	Any mental disorder	All	No mental disorder	Any mental disorder
All, <i>n</i> (row percent)	4 886 690 (100)	4 681 005 (96)	205 685 (4)	196 757 (100)	184 609 (94)	12 148 (6)
Sociodemographic factors <sup>a</sup>						
Gender						
Women	2 390 151 (49)	2 282 756 (49)	107 395 (52)	83 440 (42)	77 826 (42)	5 614 (46)
Men	2 496 539 (51)	2 398 249 (51)	98 290 (48)	113 317 (58)	106 783 (58)	6 534 (53)
Age, years						
16–24	847 767 (17)	806 744 (17)	41 023 (20)	41 936 (21)	39 954 (22)	1 982 (16)
25–34	970 090 (20)	930 878 (20)	39 212 (19)	39 885 (20)	37 431 (20)	2 454 (20)
35–44	1 049 955 (21)	1 006 014 (21)	43 941 (21)	61 710 (31)	57 512 (31)	4 198 (35)
45–54	983 745 (20)	940 970 (20)	42 775 (21)	40 012 (20)	37 216 (20)	2 796 (23)
55–64	1 035 133 (21)	996 399 (21)	38 734 (19)	13 214 (7)	12 496 (7)	718 (6)
Education, years						
Compulsory school (<9)	1 037 422 (21)	974 243 (21)	63 179 (31)	56 806 (29)	52 821 (29)	3 985 (33)
High school (10–12)	2 323 820 (48)	2 227 076 (48)	96 744 (47)	78 534 (40)	73 885 (40)	4 649 (38)
College or university (>12)	1 495 063 (31)	1 453 918 (31)	41 145 (20)	49 510 (25)	47 049 (25)	2 461 (20)
Missing	30 385 (1)	25 768 (1)	4 617 (2)	11 907 (6)	10 854 (6)	1 053 (9)
Family situation						
Married/living with partner without children living at home	746 964 (15)	728 743 (16)	18 221 (9)	14 925 (8)	14 104 (8)	821 (7)
Married/living with partner with children living at home	1 604 391 (33)	1 570 730 (34)	33 661 (16)	84 862 (43)	80 650 (44)	4 212 (35)
Single/divorced/separated/widowed without children living at home	1 806 348 (37)	1 689 489 (36)	116 859 (57)	60 380 (31)	55 563 (30)	4 817 (40)
Single/divorced/separated/widowed with children living at home	292 521 (6)	274 166 (6)	18 355 (9)	16 076 (8)	14 591 (8)	1 485 (12)
Individuals (≤20 years old) living at home	436 461 (9)	417 872 (9)	18 589 (9)	20 508 (10)	19 695 (11)	813 (7)
Type of residential area						
Big city area	1 670 362 (34)	1 599 801 (34)	70 561 (34)	95 582 (49)	90 115 (49)	5 467 (45)
Medium city	1 766 133 (36)	1 687 065 (36)	79 068 (38)	70 579 (36)	65 693 (36)	4 886 (40)
Small town	1 450 195 (30)	1 394 139 (30)	56 056 (27)	30 596 (16)	28 801 (16)	1 795 (15)
Health-related factors <sup>b</sup>						
History of suicide attempt	22 450 (0)	6 673 (0)	15 777 (8)	1 184 (1)	479 (0)	705 (6)
Somatic multimorbidity						
Cancer	273 386 (6)	260 056 (6)	13 330 (6)	7 995 (4)	7 354 (4)	641 (5)
Cardiovascular disease	229 669 (5)	214 349 (5)	15 320 (7)	8 742 (4)	7 890 (4)	852 (7)
Musculoskeletal disorders	505 098 (10)	474 197 (10)	30 901 (15)	21 908 (11)	19 906 (11)	2 002 (16)
Other somatic disorders	2 426 266 (50)	2 282 575 (49)	143 691 (70)	107 654 (55)	98 952 (54)	8 702 (72)
Labour market marginalisation factors <sup>a</sup>						
No unemployment	4 301 096 (88)	4 131 160 (88)	169 936 (83)	146 502 (74)	137 397 (74)	9 105 (75)
Unemployed, 1–180 days	460 319 (9)	431 976 (9)	28 343 (14)	36 320 (18)	34 033 (18)	2 287 (16)
Unemployed, >180 days	125 275 (3)	117 869 (3)	7 406 (4)	13 935 (7)	13 179 (7)	756 (6)
No sickness absence	4 294 761 (88)	4 145 175 (89)	149 586 (73)	172 699 (88)	163 160 (88)	9 539 (79)
Sickness absence 1–90 net days	344 859 (7)	324 091 (7)	20 768 (10)	12 667 (6)	11 844 (6)	823 (7)
Sickness absence >90 net days	247 070 (5)	211 739 (5)	35 331 (17)	11 391 (6)	9 605 (5)	1 786 (15)
No disability pension	4 461 247 (91)	4 324 795 (92)	136 452 (66)	181 510 (92)	172 352 (93)	9 158 (75)
Disability pension	425 443 (9)	356 210 (8)	69 233 (34)	15 247 (8)	12 257 (7)	2 990 (25)
Outcome						
Suicide attempt (rate per 100 000 person-years)	38 280 (89.2)	23 958 (58.1)	14 322 (850.3)	1 605 (94.2)	1 110 (69.3)	495 (480.0)
Suicide (rate per 100 000 person-years)	8916 (20.7)	6 011 (14.2)	2 905 (165.3)	226 (13.2)	142 (8.8)	84 (79.5)

Data displayed as absolute numbers and column percentages.  
a. In 2004.  
b. In 2000–2004.

hazard ratio for refugees 7.40, 95% CI 6.35–8.63; multivariable-adjusted hazard ratio for Swedish-born individuals 9.26; 95% CI 8.95–9.57).

Table 3 presents hazard ratios with 95% confidence intervals for suicide by refugee status and type of mental disorder. Swedish-born individuals without a mental disorder constituted the reference group. In the absence of a mental disorder, refugees had a significantly lower risk of suicide compared with the reference group when adjustments were made for age and gender (hazard ratio 0.60, 95% CI 0.51–0.71). In general, the suicide rates and hazard ratios in individuals with a mental disorder was lower in refugees (rate of 79.5 per 100 000 person-years) compared with the

Swedish-born population (rate of 165.3 per 100 000 person-years) (Table 3). This pattern was somewhat different for the different diagnostic groups. For example, the suicide risks for refugees with a mental disorder were comparable with the suicide risk for Swedish-born individuals with a mental disorder for schizophrenia (multivariable-adjusted hazard ratio for refugees 4.88, 95% CI 3.25–7.32; multivariable-adjusted hazard ratio for Swedish-born individuals 4.99, 95% CI 4.42–5.63) and for personality disorder (multivariable-adjusted hazard ratio for refugees 6.57, 95% CI 3.51–12.28; multivariable-adjusted hazard ratio for Swedish-born individuals 5.56, 95% CI 4.74–6.52). The suicide risk for refugees with a mental disorder was lower than that for Swedish-born

**Table 2** Associations between specific mental disorders<sup>a</sup> and subsequent admission to hospital for suicide attempt in Swedish-born individuals and refugees aged 16–64 years, residing in Sweden in 2004

	Suicide attempt, <i>n</i> (rate per 100 000 person-years)		Model 1 <sup>b</sup>		Model 2 <sup>c</sup>		Model 3 <sup>d</sup>	
	Swedish-born individuals	Refugees	Swedish-born individuals	Refugees	Swedish-born individuals	Refugees	Swedish-born individuals	Refugees
No mental disorder	23 958 (58.1)	1110 (69.3)	1 (reference)	1.11 (1.04–1.18)	1 (reference)	0.96 (0.90–1.02)	1 (reference)	0.94 (0.89–1.00)
Any mental disorder	14 322 (850.3)	495 (480.0)	14.02 (13.73–14.31)	7.89 (7.22–8.62)	8.40 (8.21–8.60)	5.02 (4.59–5.50)	6.10 (5.95–6.26)	3.80 (3.47–4.16)
Specific mental disorders (ICD-10 codes)								
Substance misuse disorders (F10–19)	7265 (1546.1)	168 (1257.2)	26.01 (25.33–26.70)	18.93 (16.26–22.03)	14.23 (13.83–14.65)	11.04 (9.48–12.86)	9.26 (8.95–9.57)	7.40 (6.35–8.63)
Schizophrenia/non-affective psychotic disorders (F20–29)	1384 (816.8)	86 (5119.0)	16.21 (15.35–17.11)	11.88 (9.61–14.68)	6.91 (6.51–7.34)	5.75 (4.65–7.12)	4.81 (4.51–5.13)	4.19 (3.39–5.19)
Bipolar disorders (F30–31)	734 (994.7)	20 (1172.1)	20.28 (18.84–21.83)	20.00 (12.90–31.01)	10.34 (9.58–11.15)	11.56 (7.45–17.92)	5.82 (5.36–6.33)	6.28 (4.05–9.75)
Depressive disorders (F32–34)	4513 (1023.0)	172 (559.7)	16.90 (16.37–17.45)	9.59 (8.26–11.14)	9.81 (9.47–10.15)	5.47 (4.71–6.36)	6.11 (5.87–6.36)	3.77 (3.24–4.39)
Anxiety disorders (F40–42)	3172 (950.5)	79 (441.3)	15.10 (14.55–15.67)	7.29 (5.84–9.08)	8.27 (7.95–8.60)	4.30 (3.45–5.37)	5.26 (5.03–5.50)	3.04 (2.43–3.79)
Stress-related disorders (F43)	2132 (976.4)	155 (483.2)	15.77 (15.08–16.48)	8.12 (6.93–9.50)	9.00 (8.60–9.43)	4.78 (4.08–5.60)	4.93 (4.67–5.21)	3.08 (2.62–3.61)
PTSD (F43.1)	173 (1358.6)	63 (447.8)	20.05 (17.26–23.28)	7.96 (6.22–10.19)	9.50 (8.17–11.04)	4.57 (3.57–5.86)	4.14 (3.54–4.84)	2.99 (2.33–3.83)
Personality disorders (F60–69)	1842 (2338.8)	46 (1585.2)	36.79 (35.09–38.58)	26.80 (20.07–35.80)	15.97 (15.16–16.82)	12.92 (9.67–17.27)	6.60 (6.18–7.05)	6.34 (4.74–8.48)

Data are displayed as hazard ratios with 95% confidence intervals. PTSD, post-traumatic stress disorder.

a. Mental disorders diagnosed in specialised healthcare in the period 2000–2004.

b. Model 1: adjusted for age and gender.

c. Model 2: adjusted for age, gender, education, family situation, type of residential area, unemployment, sickness absence and disability pension.

d. Model 3: model 2 with additional adjustments for history of suicide attempt and somatic multimorbidity.

**Table 3** Associations between specific mental disorders<sup>a</sup> and subsequent suicide in Swedish-born individuals and refugees aged 16–64 years, residing in Sweden in 2004

	Suicide, <i>n</i> (rate per 100 000 person-years)		Model 1 <sup>b</sup>		Model 2 <sup>c</sup>		Model 3 <sup>d</sup>	
	Swedish-born individuals	Refugees	Swedish-born individuals	Refugees	Swedish-born individuals	Refugees	Swedish-born individuals	Refugees
No mental disorder	6011 (14.2)	142 (8.8)	1 (reference)	0.60 (0.51–0.71)	1 (reference)	0.59 (0.50–0.69)	1 (reference)	0.58 (0.49–0.68)
Any mental disorder	2905 (165.3)	84 (79.5)	11.90 (11.38–12.44)	5.55 (4.48–6.89)	7.13 (6.78–7.49)	3.96 (3.18–4.91)	5.79 (5.49–6.11)	3.36 (2.70–4.17)
Specific mental disorders (ICD-10 codes)								
Substance misuse disorders (F10–19)	1476 (291.6)	27 (190.5)	18.43 (17.40–19.51)	11.67 (8.00–17.04)	10.23 (9.61–10.89)	7.40 (5.06–10.81)	7.81 (7.28–8.38)	5.74 (3.93–8.40)
Schizophrenia/non-affective psychotic disorders (F20–29)	400 (226.7)	24 (179.6)	14.99 (13.54–16.58)	11.33 (7.59–16.92)	6.40 (5.72–7.16)	6.26 (4.19–9.37)	4.99 (4.42–5.63)	4.88 (3.25–7.32)
Bipolar disorders (F30–31)	188 (242.3)	<10 (278.6) <sup>e</sup>	17.30 (14.96–20.00)	22.18 (9.23–53.30)	9.09 (7.83–10.56)	13.91 (5.78–33.45)	5.71 (4.84–6.75)	9.06 (3.76–21.83)
Depressive disorders (F32–34)	855 (183.5)	31 (98.1)	14.45 (13.45–15.53)	7.19 (5.05–10.23)	8.63 (8.00–9.32)	4.86 (3.41–6.93)	5.91 (5.40–6.46)	3.79 (2.65–5.40)
Anxiety disorders (F40–42)	520 (148.2)	10 (54.6)	11.64 (10.64–12.73)	4.02 (2.16–7.47)	6.64 (6.04–7.30)	2.87 (1.54–5.34)	4.63 (4.17–5.16)	2.27 (1.22–4.24)
Stress-related disorders (F43)	318 (138.3)	22 (67.0)	11.08 (9.90–12.41)	4.69 (3.08–7.12)	6.81 (6.06–7.64)	3.33 (2.19–5.07)	4.02 (3.51–4.61)	2.42 (1.59–3.69)
PTSD (F43.1)	23 (167.8)	12 (83.5)	15.23 (10.11–22.93)	5.41 (3.07–9.53)	7.97 (5.28–12.02)	3.82 (2.16–6.73)	3.82 (2.50–5.83)	2.83 (1.60–4.99)
Personality disorders (F60–69)	284 (317.6)	10 (316.1)	25.03 (22.22–28.20)	19.67 (10.58–36.57)	11.31 (9.97–12.83)	11.07 (5.94–20.60)	5.56 (4.74–6.52)	6.57 (3.51–12.28)

Data are displayed as hazard ratios with 95% confidence intervals. PTSD, post-traumatic stress disorder.

a. Mental disorders diagnosed in specialised healthcare in the period 2000–2004.

b. Model 1: adjusted for age and gender.

c. Model 2: adjusted for age, gender, education, family situation, type of residential area, unemployment, sickness absence and disability pension.

d. Model 3: model 2 with additional adjustments for history of suicide attempt and somatic multimorbidity.

e. For ethical reasons (the risk of identification of individuals), if the number of suicides is fewer than ten, it is not reported.



individuals with a mental disorder for substance misuse, depressive disorders, anxiety disorders including PTSD, and behavioural disorders (Table 3). The hazard ratios decreased considerably after adjustments were made for sociodemographics and LMM factors (Table 3, model 2). In the fully adjusted model (model 3), where we also included factors related to comorbidity, all hazard ratios decreased further markedly, as a large part of the association was explained by history of suicide attempt.

Within-group analyses of refugees (Supplementary Tables 2 and 3) revealed that, when compared with refugees with no mental disorders, refugees with any as well as specific mental disorders had significantly elevated risk for suicide attempt and suicide.

### Sensitivity analyses

In the sensitivity analysis, where we excluded individuals who were granted a residence permit on 'humanitarian grounds' or because they were 'in need of protection', results were similar to the main analyses. Finally, separate analyses for suicides and deaths coded as undetermined intent were conducted. These analyses generated similar estimates (data not shown).

## Discussion

### Key results

The present study examined the associations between mental disorder and suicide attempt and suicide, using a large cohort of 4 886 690 Swedish-born individuals and 196 757 refugees in Sweden. Our findings demonstrate that the prevalence of mental disorder was slightly higher in refugees than in Swedish-born individuals. Overall, the rates and risk for suicide attempt in individuals with a mental disorder were lower in refugees compared with the Swedish-born population; a pattern that was also true for most specific disorders. Similar patterns were seen for suicide.

### Mental disorders in refugees and Swedish-born individuals

Our results revealed slightly higher levels of mental disorders in refugees than in Swedish-born individuals, which has been reported by others.<sup>3,4</sup> Previous studies have shown that particularly PTSD and depressive disorders are common among refugees, which was confirmed in our study. The high level of exposure to traumatic life events in refugees has been pointed to as an explanation for the elevated psychiatric morbidity in this group.<sup>4,5</sup> Furthermore, post-migration stress, including acculturation problems and ethnic discrimination, may also contribute to adverse mental health.

### Suicide attempt and suicide in refugees and Swedish-born individuals

Our findings showed that refugees in general had a lower risk of suicide attempt and suicide compared with Swedish-born individuals. To the best of our knowledge, our study is the first to examine these associations (i.e. both suicide attempt and suicide) in a nationwide setting. One study investigating differences in injury mortality in refugees, immigrants and Danish-born individuals reported lower rates of suicide in refugees, when compared with natives.<sup>6</sup> However this study focused solely on suicide death, and the lower risk was seen for males only.<sup>6</sup> Thus, there is a gap in the literature on studies examining these associations, particularly in refugees. There have been studies on immigrants (not discriminating between refugees and non-refugee migrants) and asylum seekers, where both higher and lower rates of suicide attempt and suicide have been reported.<sup>7,8</sup>

There are several possible explanations for the lower suicide rates in refugees. Among others, cultural influences might explain differences in rates of suicide attempt and suicide.<sup>7,15</sup> Here, culture may contribute to determining the way refugees experience and express mental health problems, and reflect upon their needs for mental healthcare.<sup>16</sup> Moreover, culture may also influence a person's attitudes toward suicidal behaviour, such as how one reacts to suicidal thoughts.<sup>16</sup> Most of the refugees included in our study come from Muslim majority countries (data not shown), and studies have shown that cultural and religious factors and stigma attached to suicide attempt and suicide are associated with much lower suicide rates in Islamic nations, and especially in Muslim countries.<sup>17</sup> Further studies on the potential influence of cultural features and religious aspects in the risk of suicide attempt and suicide in refugees are warranted.

### Mental disorders and suicide attempt and suicide in refugees and Swedish-born individuals

Moreover, our study is the first to examine associations between mental disorders and suicide attempt and suicide in refugees. Studies investigating these associations in general populations regardless of migration status have demonstrated that individuals suffering from mental disorders have a considerable higher risk for suicide attempt and suicide<sup>9,18,19</sup> compared with individuals without mental disorders.<sup>19,20</sup> In our study, Swedish-born individuals with a mental disorder had a sixfold elevated risk for both suicide and suicide attempt compared with Swedish-born with no mental disorder, after adjustments for several important confounders.

We can now further show that in the presence of a mental disorder, the risk of suicide attempt and suicide is lower in refugees than in Swedish-born individuals. These findings are interesting as they challenge the idea of lower rates of suicide attempt and suicide in refugees being mainly attributable to a positive health selection of refugees – the healthy migrant effect.<sup>21</sup> Moreover, our findings are counterintuitive as refugees with a mental disorder in specialised healthcare might even be hypothesised to suffer from more severe forms of mental disorders than Swedish-born individuals. This reasoning is based on clinical and scientific knowledge on differences in access to and acceptance of specialised healthcare of refugees compared with the population in the host country in countries of the Organisation for Economic Co-operation and Development (OECD).<sup>22,23</sup> Moreover, healthcare and treatment needs might not be met to the same extent for refugees as for natives.<sup>24</sup> Adequate care in immigrants and refugees might be hampered by language barriers, differences in the clinical manifestation and symptom course of the underlying disease, and consequently in its diagnostics, as well as the lack of competence in transcultural psychiatry and psychology in the healthcare settings of the host country.<sup>25</sup>

### Potential protective factors in refugees

Despite these risk factors and common aetiological features of suicidal behaviour and suicide across groups with different ethnicity, our results suggest that refugees with mental disorders have protective factors regarding the risk of suicide attempt and suicide, which Swedish-born individuals with the same disorders might lack. One such protective factor might be the lower likelihood to act upon suicidal ideas among refugees, which in turn might be affected by the strong stigma associated with suicidal behaviour and suicide prevailing in many countries, from which refugees migrate to Sweden.<sup>16</sup> Such a culturally influenced stigma might prevent suicidal behaviour and suicide by strongly shaping the individual's attitudes toward ending one's own life. Other potential protective factors among refugees might be related to differences in personality

and resilience factors as well as differences regarding social connectedness.<sup>26</sup> In our cohort, refugees with mental disorders were considerably more often cohabiting with partners or children than Swedish-born individuals. We have controlled for family situation in the analyses, but this observation might still be a marker of a stronger social connectedness in refugees with mental disorders. Further studies on protective factors as well as risk factors for suicidal behaviour and suicide among refugees are warranted.

### Specific mental disorders



The aforementioned pattern was somewhat different for the different diagnostic groups. Estimates for suicide attempt and suicide were equally high for refugees and Swedish-born individuals with schizophrenia, bipolar disorder and personality disorder. Previous studies have shown a higher risk for schizophrenia in refugees compared with the population in the host country.<sup>27</sup> In our study, 13% of refugees had been treated for schizophrenia and non-affective psychotic disorders compared with 10% of Swedish-born individuals. These differences in patterns related to these three disorders might be related to the morbidity level (i.e. all three are severe mental disorders) and to the stigma associated with living with such a disorder as a refugee. In both refugees and Swedish-born individuals, substance misuse disorder entailed a particularly high risk for suicide. Especially alcohol misuse has been pointed out as a key risk factor for suicidal behaviour and suicide in the general population,<sup>9,28</sup> and this also seems to hold true for refugees.

### Strengths and limitations

This study has several strengths, including the longitudinal population-based design and use of national registers with high completeness and validity. The large cohort size allowed for detailed analyses of different types of mental disorders and the ability to adjust for important confounders. Nevertheless, there are limitations. Information on mental disorder and suicide attempt relied solely on register data, and thus we have likely captured the most severe cases. This may lead to misclassification of undiagnosed and/or untreated individuals as unexposed, especially in refugees where the prevalence of psychological distress is often very high.<sup>4</sup> Potential differences in healthcare-seeking behaviour in Swedish-born individuals and refugees may also affect our findings (e.g. poor language skills may prevent refugees from seeking healthcare). Furthermore, because of cultural and religious stigma, underreporting of suicide attempt may be especially prevalent in refugees from Islamic or Muslim majority countries. On the other hand, cultural and religious aspects might represent protective factors for suicide attempt and suicide in refugees. Such information was not available for the present study but merits future investigations. Another limitation is that the refugee population also included those granted a residence permit because they were 'in need of protection' and on 'humanitarian grounds'. It has been shown that the comorbidity in the latter group is considered to be higher than in other groups who obtain a residence permit in Sweden. This might have introduced a potential negative health selection in the refugee group in our study. However, in the sensitivity analyses where we included and excluded these individuals, there were no significant differences in the results.

In conclusion, this study is the first to provide evidence that, in individuals with a mental disorder, refugees have a lower risk for both suicide attempt and suicide compared with their Swedish-born counterparts; however, risk estimates differed by type of disorder. Nevertheless, compared with those with no mental disorder, both refugees and Swedish-born persons had an elevated risk for both suicide attempt and suicide. This knowledge should guide healthcare planners and providers who need to be aware that

mental disorders are strong risk factors for suicide attempt and suicide in both refugees and Swedish-born individuals.

**Emma Björkenstam** , PhD, Assistant Professor, Division of Insurance Medicine, Department of Clinical Neuroscience, Karolinska Institutet, Sweden;  
**Magnus Helgesson**, PhD, Senior Postdoctoral Research Fellow, Division of Insurance Medicine, Department of Clinical Neuroscience, Karolinska Institutet, Sweden;  
**Ridwanul Amin** , MSc, Doctoral student, Division of Insurance Medicine, Department of Clinical Neuroscience, Karolinska Institutet, Sweden;  
**Ellenor Mittendorfer-Rutz**, PhD, Professor of Insurance Medicine, Division of Insurance Medicine, Department of Clinical Neuroscience, Karolinska Institutet, Sweden

**Correspondence:** Emma Björkenstam, Division of Insurance Medicine, Department of Clinical Neuroscience, Karolinska Institutet, Berzeliusväg 3, Plan 6, SE-171 77 Stockholm, Sweden. Email: emma.bjorkenstam@ki.se

First received 11 Mar 2019, final revision 9 Aug 2019, accepted 3 Sep 2019

### Supplementary material

Supplementary material is available online at <https://doi.org/10.1192/bjp.2019.215>.

### References

- United Nations Department of Economic and Social Affairs (DESA), Population Division. *International Migration Report 2017: Highlights (ST/ESA/SER.A/404)*. DESA, 2017 ([https://www.un.org/en/development/desa/population/migration/publications/migrationreport/docs/MigrationReport2017\\_Highlights.pdf](https://www.un.org/en/development/desa/population/migration/publications/migrationreport/docs/MigrationReport2017_Highlights.pdf)).
- Swedish Migration Agency. *Asylum Applications Statistics*. Swedish Migration Agency, 2019 (<https://www.migrationsverket.se/English/About-the-Migration-Agency/Statistics.html>).
- Bogic M, Njoku A, Priebe S. Long-term mental health of war-refugees: a systematic literature review. *BMC Int Health Hum Rights* 2015; **15**: 29.
- Tinghög P, Malm A, Arwidson C, Sigvardsson E, Lundin A, Saboonchi F. Prevalence of mental ill health, traumas and postmigration stress among refugees from Syria resettled in Sweden after 2011: a population-based survey. *BMJ Open* 2017; **7**: e018899.
- Ferrada-Noli M, Åsberg M, Ormstad K, Lundin T, Sundbom E. Suicidal behavior after severe trauma. Part 1: PTSD diagnoses, psychiatric comorbidity, and assessments of suicidal behavior. *J Trauma Stress* 1998; **11**: 103–12.
- Norredam M, Olsbjerg M, Petersen JH, Laursen B, Krasnik A. Are there differences in injury mortality among refugees and immigrants compared with native-born? *Inj Prev* 2013; **19**: 100–5.
- Bursztein Lipsicas C, Mäkinen IH, Apter A, De Leo D, Kerkhof A, Lönnqvist J, et al. Attempted suicide among immigrants in European countries: an international perspective. *Soc Psychiatry Psychiatr Epidemiol* 2012; **47**: 241–51.
- Di Thiene D, Alexanderson K, Tinghög P, La Torre G, Mittendorfer-Rutz E. Suicide among first-generation and second-generation immigrants in Sweden: association with labour market marginalisation and morbidity. *J Epidemiol Community Health* 2015; **69**: 467–73.
- Hawton K, van Heeringen K. Suicide. *Lancet* 2009; **373**: 1372–81.
- Law S, Liu P. Suicide in China: unique demographic patterns and relationship to depressive disorder. *Curr Psychiatry Rep* 2008; **10**: 80–6.
- Ludvigsson JF, Otterblad-Olausson P, Pettersson BU, Ekblom A. The Swedish personal identity number: possibilities and pitfalls in healthcare and medical research. *Eur J Epidemiol* 2009; **24**: 659–67.
- World Health Organization. *International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10)*. WHO, 1994.
- Linsley KR, Schapira K, Kelly TP. Open verdict v. suicide - importance to research. *Br J Psychiatry* 2001; **178**: 465–8.
- United Nations High Commissioner for Refugees (UNHCR). *Convention and Protocol Relating to the Status of Refugees*. UNHCR, 2010. (<https://cms.emergency.unhcr.org/documents/11982/55726/Convention+relating+to+the+Status+of+Refugees+%28signed+28+July+1951%2C+entered+into+force+22+April+1954%29+189+UNTS+150+and+Protocol+relating+to+the+Status+of+Refugees+%28signed+31+January+1967%2C+entered+into+force+4+October+1967%29+606+UNTS+267/0bf3248a-cfa8-4a60-864d-65cdcfce1d47>).
- Bhui K, McKenzie K, Rasul F. Rates, risk factors & methods of self harm among minority ethnic groups in the UK: a systematic review. *BMC Public Health* 2007; **7**: 336.

- 16 Lawrence RE, Oquendo MA, Stanley B. Religion and suicide risk: a systematic review. *Arch Suicide Res* 2016; **20**: 1–21.
- 17 Lester D. Suicide and Islam. *Arch Suicide Res* 2006; **10**: 77–97.
- 18 Björkenstam E, Björkenstam C, Holm H, Gerdin B, Ekselius L. Excess cause-specific mortality in in-patient-treated individuals with personality disorder: 25-year nationwide population-based study. *Br J Psychiatry* 2015; **207**: 339–45.
- 19 Hawton K, Sutton L, Haw C, Sinclair J, Harriss L. Suicide and attempted suicide in bipolar disorder: a systematic review of risk factors. *J Clin Psychiatry* 2005; **66**: 693–704.
- 20 Nepon J, Belik SL, Bolton J, Sareen J. The relationship between anxiety disorders and suicide attempts: findings from the National Epidemiologic Survey on Alcohol and Related Conditions. *Depress Anxiety* 2010; **27**: 791–8.
- 21 Kennedy S, Kidd M, McDonald J, Biddle N. The healthy immigrant effect: patterns and evidence from four countries. *J Int Migr Integration* 2015; **16**: 317–32.
- 22 Ekblad S, Kastrup MC. Current research in transcultural psychiatry in the Nordic countries. *Transcult Psychiatry* 2013; **50**: 841–57.
- 23 Graetz V, Rechel B, Groot W, Norredam M, Pavlova M. Utilization of health care services by migrants in Europe—a systematic literature review. *Br Med Bull* 2017; **121**: 5–18.
- 24 Kohlenberger J, Buber-Ennser I, Rengs B, Leitner S, Landesmann M. Barriers to health care access and service utilization of refugees in Austria: evidence from a cross-sectional survey. *Health Policy* 2019; **6**: 1–7.
- 25 Bhugra D, Gupta S, Schouler-Ocak M, Graeff-Calliess I, Deakin NA, Qureshi A, et al. EPA guidance mental health care of migrants. *Eur Psychiatry* 2014; **29**: 107–15.
- 26 Shaw RJ, Atkin K, Bécares L, Albor CB, Stafford M, Kiernan KE, et al. Impact of ethnic density on adult mental disorders: narrative review. *Br J Psychiatry* 2012; **201**: 11–9.
- 27 Hollander AC, Dal H, Lewis G, Magnusson C, Kirkbride JB, Dalman C. Refugee migration and risk of schizophrenia and other non-affective psychoses: cohort study of 1.3 million people in Sweden. *BMJ* 2016; **352**: i1030.
- 28 Reutfors J, Brandt L, Ekblom A, Isacsson G, Sparen P, Osby U. Suicide and hospitalization for mental disorders in Sweden: a population-based case-control study. *J Psychiatr Res* 2010; **44**: 741–7.

