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Period effects in the risk of labour market marginalization among refugees in Sweden: a register-based cohort study

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Background: Changes in Swedish national insurance policies over time and/or migration-related health inequalities may influence the risk for labour market marginalization (LMM) in refugees as compared to the Swedish-born host population. This study aimed to investigate potential period effects in the association between refugee status and the risk of LMM and explore any differences by country of birth, age and duration of residence. **Methods:** Using national registers, three cohorts including all Swedish residents during 1999, 2004 and 2009 were followed for 4 years (cohort 2000, 2005 and 2010). Cox regression models were used to examine associations between refugee status and LMM defined as long-term unemployment (>180 days annually) and disability pension. The analyses were adjusted for socio-demographic factors, morbidities and labour market-related factors. Stratified analyses were run for age, country of birth and duration of residence. **Results:** Across the cohorts, hazard ratios (HRs) were higher for long-term unemployment [2000: HR = 1.98; 95% confidence interval (CI): 1.96–2.01; 2005: HR = 2.30; 95% CI: 2.27–2.33; 2010: HR = 2.78; 95% CI: 2.75–2.81] for refugees compared to Swedish-born but not for disability pension. HRs for long-term unemployment were highest among refugees aged 25–34 and 35–44 years, from Somalia, Afghanistan and Iraq and refugees with a shorter duration of residence. **Conclusions:** The risk of long-term unemployment appears to have increased for refugees over time. Particularly some refugee subgroups experienced more difficulties. These findings highlight ongoing disparities for refugees and implicate on a broader scale that changes in policies such as stricter regulations in the insurance or healthcare system might adversely affect them.

Introduction

Labour market marginalization (LMM) has been recognized as a serious public health challenge and economic problem and describes the difficulty to obtain and keep a job.[1] It is commonly conceptualized by long-term unemployment.[2,3] However, medical-based measures such as disability pension also need to be considered, as these take morbidities into account.[4]

Refugees experience an elevated risk for LMM than the Swedish host population.[4–6] Reasons for this are multifactorial and need to be regarded from a broader societal context. Refugees are known to be a heterogeneous group not only in terms of their ethnicity but also regarding their past migration experience;[7] and since the 1980s, the annual number of refugees migrating to Sweden increased to more than 100 000 in 2012.[8] Educational level, language barriers and cultural aspects might influence how refugees are established in the labour market or have knowledge about the insurance and healthcare system in the host country. For example, refugees from African countries usually have a lower educational level than refugees from Iran; refugees from Somalia rather seek help from their social network than from the healthcare system.[5,9,10] Furthermore, pre- and post-migration difficulties such as traumatic experiences and discrimination in the host country or a low income upon arrival might influence the risk of LMM and place refugees at elevated risk for somatic or common mental disorders.[6,11–16] These factors represent a downward spiral as pre-existing untreated mental or somatic disorders might hamper work ability, thereby further increasing the risk of LMM. In turn, LMM might have adverse effects on refugees' mental and physical health and further exacerbate symptoms.[4,17–23]

Further factors contributing to the risk of LMM include the aspect of ethnicity.[5,7,24,25] Refugees from Asia and Africa in particular appear to be at higher risk of long-term unemployment, while European refugees (from former Yugoslavia) experience a higher risk for sickness absence or disability pension as compared to Swedish-born.[5] A reason for this could be the time of immigration (e.g. during a financial crisis) and the hardship they experienced which could lead to different initial challenges in accessing the labour market.[5] Furthermore, older age at arrival as well as a shorter duration of residence were associated with a higher risk for disability pension as compared to the Swedish-born host population.[24,25]

While research has focused on identifying vulnerable groups, potential period effects in the risk of LMM (e.g. temporal changes) should also be considered. Throughout the years, the population structure of refugees has changed, with refugees from different countries migrating to Sweden as a result of a conflict, war or crisis.[5] Furthermore, during the last 20 years, several changes in regulations

of the social insurance and healthcare system occurred in Sweden, among others in 2003 and 2008.[26] According to the 2003 reform, temporary disability pension can now be granted to individuals younger than 30 who had not completed compulsory school yet. In 2008, another large reform included stricter criteria for individuals above 30 years, thus making it more difficult to receive permanent disability pension.[26,27] Also, economic crises occurred, among others the Great Recession in 2008, which led to different austerity measures in many European countries.[28]

These changes might suggest increasing challenges for labour market integration for refugees. To the best of our knowledge, no previous study has investigated such potential period effects on the risk of LMM in refugees. The aim of this study was to investigate potential period effects in the risk of LMM in refugees compared to Swedish-born and explore any differences by country of birth, age and duration of residence.

Methods

Design and study population

In this nationwide prospective cohort study, we compared refugees with Swedish-born in three time period cohorts (2000, 2005 and 2010). Each cohort included all individuals aged 19–60 years resident in Sweden on 31 December 1999 ($n = 4\,173\,223$), 2004 ($n = 4\,063\,799$) and 2009 ($n = 4\,076\,428$). Individuals still awaiting a decision on their residency application were not included in this study. Furthermore, we excluded non-refugee immigrants (7.1% in the 2000 cohort; 8.0% in the 2005 cohort; 10.5% in the 2010 cohort) and individuals with an uncertain reason for residence (3.6% in the 2000 and 2010 cohort; 3.7% in the 2005 cohort). Individuals were followed for 4 years (i.e. from 1 January 2000, 2005 and 2010 to 31 December 2003, 2008 and 2013) with regard to long-term unemployment (as defined by >180 annual days of full-time unemployment) and disability pension. Individuals with disability pension at baseline were excluded in the respective cohort (individuals who were excluded in one of the later cohorts could still be included in an earlier cohort).

Databases

We obtained longitudinal data for each individual through register linkages. We used the Longitudinal Integration Database for Labour Market Studies (LISA) to identify the individual cohorts and obtain data related to age, sex, country of birth, educational level, family situation, area of living, number of annual net days with sickness absence, disability pension, number of annual days with long-term unemployment and year of immigration. The Longitudinal database for integration studies (STATIV) was used to retrieve data on the reason for immigration and duration of residence. The National Patient Register was used to obtain data in regard to the date and diagnosis of psychiatric and somatic inpatient healthcare and the Cause of Death Register for the date and cause of death, both held by the National Board of Health and Welfare. Finally, we used the Micro Data for Analysis of the Social Insurance database (MIDAS) to define the first date of being granted disability pension during follow-up.

Exposure measures

The exposure of interest was refugee status as identified by the Geneva Convention from 1951 or if the person had received residence permit due to 'Humanitarian grounds/particularly distressing circumstances' or being 'In need of protection' at the Swedish Migration Agency.[11] Specific countries (Eritrea, Ethiopia, Somalia, Afghanistan, Iran, Iraq, Syria, Chile and Former Yugoslavia) from which the highest number of refugees migrated to Sweden were considered for the country of birth variable. Furthermore, we assessed duration of residence to further examine period effects in these groups (0–4 years, 5–10 years, ≥10 years).

Outcome measures

LMM was operationalized in this paper by two outcome measures: long-term unemployment, defined as >180 annual unemployment days during follow-up, and granting of disability pension (Yes, No) anytime during the follow-up.

Swedish social insurance system

In Sweden, all residents aged between 20 and 64 years who are registered in the Public Employment Service (PES) and are actively looking for a job are eligible to receive unemployment benefits independent of their work experience. Receiving a benefit and the amount thereof is dependent on different factors, such as past work duration, past income and for how long the respective person has had a membership with an unemployment fund.[24,29] Refugees are able to access the labour market after receiving a residence permit and having registered as a job seeker at the PES.[8,24] While successful labour market contacts depend on different factors (e.g. educational level, gender, circumstances of migration), integration into the labour market has been reasonably stable since the 1990s with a small increase in integration up to and including 2016.[8]

Permanent disability pension is granted to individuals aged between 30 and 64 years who are unable to work due to morbidity. Disability pension can be granted part- or full-time. Individuals younger than 30 years may receive temporary disability pension due to a reduced work capacity or if they did not complete their compulsory or upper secondary school yet.[24,29]

Covariates

Socio-demographic and labour market-related factors were measured at baseline (i.e. 31 December 1999, 2004 and 2009 for the cohorts 2000, 2005 and 2010):

- *Socio-demographic factors*: age, sex, educational level, family situation, area of living
- *Labour market marginalization factors*: any history of unemployment, sickness absence, labour market attachment
- *Health factors*: inpatient healthcare (in the 3 years preceding the start of the cohort) due to mental (International Classification of Diseases version 10, ICD 10 diagnoses F01-34, F38-42, F43.1-43.9, F44-48, F50-99) or somatic diagnoses (ICD 10 diagnoses A00-B99, C00-D48, E00-E90, G00-G99, H00-H95, I00-I99, J00-J99, K00-K93, L00-L99, M00-M99, N00-T99); due to the lack of outpatient care data in the 2000 cohort only inpatient healthcare data were used.

The categories of the respective covariates can be found in table 1. Missing values for a covariate were categorized separately.

Statistical analyses

We used chi-square tests to examine the association between the variables. Log-minus-log Kaplan-Meier survival curves were plotted to test the proportional hazards assumption. We used Cox regression models to investigate the association between refugee status and LMM using Swedish-born as the reference population. Hazard ratios (HRs) with 95% confidence intervals (CIs) are shown for the crude and adjusted estimates. The regression analyses were adjusted for all other covariates in a stepwise process, adding socio-demographic factors first (age, sex, education, family status and type of living area) followed by previous somatic or psychiatric inpatient care and labour-market related covariates in a second step (labour market attachment, sickness absence >90 days and unemployment at baseline; the latter was not adjusted for in models examining long-term

Table 1 Descriptive statistics of three cohorts of refugees and Swedish-born aged 19–60 years (Cohort 2000: 2000–03; Cohort 2005: 2005–08; Cohort 2010: 2010–13)

	Cohort 2000		Cohort 2005		Cohort 2010	
	Refugees (n = 145 512) n (%)	Swedish-born (n = 4 023 750) n (%)	Refugees (n = 162 960) n (%)	Swedish-born (n = 3 896 450) n (%)	Refugees (n = 216 210) n (%)	Swedish-born (n = 3 851 484) n (%)
Sex[a]						
Men	85 865 (59.0)	2 078 616 (51.7)	95 632 (58.7)	2 030 849 (52.1)	126 719 (58.6)	2 004 361 (52.0)
Women	59 647 (41.0)	1 945 134 (48.3)	67 328 (41.3)	1 865 601 (47.9)	89 491 (41.4)	1 847 123 (48.0)
Age (M, s.d.)[a]						
	36.19 (9.41)	39.04 (11.79)	36.74 (10.33)	39.40 (11.94)	37.55 (11.09)	39.02 (12.03)
Age[a]						
19–24	19 247 (13.2)	548 900 (13.6)	27 190 (16.7)	531 980 (13.7)	34 322 (15.9)	606 104 (15.7)
25–34	43 320 (29.8)	1 047 773 (26.0)	38 844 (23.8)	945 643 (24.3)	56 279 (26.0)	864 413 (22.4)
35–44	55 257 (38.0)	960 754 (23.9)	57 053 (35.0)	990 656 (25.4)	58 074 (26.9)	997 623 (25.9)
45–54	22 779 (15.7)	984 949 (24.5)	33 291 (20.4)	878 159 (22.5)	53 680 (24.8)	888 629 (23.1)
55–60	4909 (3.4)	481 374 (12.0)	6582 (4.0)	550 012 (14.1)	13 855 (6.4)	494 715 (12.8)
Level of education (years)[a]						
Low (0–9)	40 627 (27.9)	759 696 (18.9)	38 296 (23.5)	514 679 (13.2)	52 295 (24.2)	411 061 (10.7)
Medium (10–12)	58 489 (40.2)	2 064 387 (51.3)	71 446 (43.8)	2 014 160 (51.7)	88 719 (41.0)	1 985 254 (51.5)
High (>12)	35 395 (24.3)	1 191 284 (29.6)	45 584 (28.0)	1 361 063 (34.9)	66 251 (30.6)	1 449 574 (37.6)
Missing information	11 001 (7.6)	8383 (0.2)	7634 (4.7)	6548 (0.2)	8945 (4.1)	5595 (0.1)
Type of living area[a,b]						
Big cities	73 675 (50.6)	1 391 657 (34.6)	79 975 (49.1)	1 375 262 (35.3)	104 214 (48.2)	1 400 579 (36.4)
Medium-sized cities	49 567 (34.1)	1 442 039 (35.8)	58 057 (35.6)	1 407 082 (36.1)	78 600 (36.4)	1 386 923 (36.0)
Small cities/villages	22 270 (15.3)	1 190 054 (29.6)	24 928 (15.3)	1 114 106 (28.6)	33 396 (15.4)	1 063 982 (27.6)
Duration of residence[a]						
0–4 years	22 689 (15.6)	0 (0)	25 842 (15.9)	0 (0)	47 033 (21.8)	0 (0)
5–10 years	90 465 (62.2)	0 (0)	49 099 (30.1)	0 (0)	30 074 (13.9)	0 (0)
≥10 years	32 356 (22.2)	0 (0)	87 279 (53.6)	0 (0)	137 754 (63.7)	0 (0)
Family situation[a,c]						
Married living with partner without children	10 163 (7.0)	526 527 (13.1)	11 373 (2.4)	470 619 (12.1)	16 790 (7.8)	390 051 (10.1)
Married living with partner with children	71 499 (49.1)	1 565 770 (38.9)	77 091 (47.3)	1 507 916 (38.7)	97 612 (45.1)	1 519 400 (39.4)
Single living without children	46 399 (31.9)	1 542 397 (38.3)	53 865 (33.1)	1 525 750 (39.2)	76 430 (35.4)	1 512 811 (39.3)
Single living with children	12 699 (8.7)	256 651 (6.4)	13 784 (8.5)	257 450 (6.6)	18 381 (8.5)	258 112 (6.7)
Children (less than 20 years old) living at home	4749 (3.3)	132 397 (3.3)	6842 (4.2)	134 710 (3.5)	6995 (3.2)	171 108 (4.4)
Country of birth[a]						
Eritrea	2076 (1.4)	0 (0)	2095 (1.3)	0 (0)	4300 (2.0)	0 (0)
Ethiopia	4264 (2.9)	0 (0)	3903 (2.4)	0 (0)	4258 (2.0)	0 (0)
Somalia	5458 (3.8)	0 (0)	6379 (3.9)	0 (0)	12 540 (5.8)	0 (0)
Afghanistan	1140 (0.8)	0 (0)	2666 (1.6)	0 (0)	4788 (2.2)	0 (0)
Iran	22 749 (15.6)	0 (0)	21 800 (13.4)	0 (0)	23 631 (10.9)	0 (0)
Iraq	18 497 (12.7)	0 (0)	25 728 (15.8)	0 (0)	45 501 (21.0)	0 (0)
Syria	4421 (3.0)	0 (0)	4969 (3.0)	0 (0)	5750 (2.7)	0 (0)
Chile	7689 (5.3)	0 (0)	6764 (4.2)	0 (0)	7047 (3.3)	0 (0)
Former Yugoslavia	47 430 (32.6)	0 (0)	54 862 (33.7)	0 (0)	62 512 (28.9)	0 (0)
Previous history of any psychiatric inpatient care[a]						
Yes	2255 (1.5)	42 942 (1.1)	3579 (2.2)	59 126 (1.5)	5119 (2.4)	73 928 (1.9)
Previous history of any somatic inpatient care[a]						
Yes	25 988 (17.9)	627 359 (15.6)	38 873 (23.9)	873 618 (22.4)	51 546 (23.8)	871 976 (22.6)
Outcome, incidence of						
Long-term unemployment	32 806 (22.5)	270 109 (6.7)	32 175 (19.7)	232 092 (6.0)	51 129 (23.6)	212 071 (5.5)
Disability pension	9767 (6.7)	170 586 (4.2)	10 248 (6.3)	124 907 (3.2)	3900 (1.8)	31 009 (0.8)
Labour market attachment[a]						
Employed	60 350 (41.5)	3 312 778 (82.3)	90 819 (55.7)	3 300 456 (84.7)	119 378 (55.2)	3 238 140 (84.1)
Not gainfully employed, but with control information	23 618 (16.2)	416 556 (10.4)	22 687 (13.9)	345 316 (8.9)	30 490 (14.1)	356 240 (9.2)
Not gainfully employed, without control information	61 544 (42.3)	294 416 (7.3)	49 454 (30.3)	250 678 (6.4)	66 342 (30.7)	257 104 (6.7)
Sickness absence >90 days[a]						
Yes	4229 (2.9)	143 770 (3.6)	9164 (5.6)	178 444 (4.6)	5765 (2.7)	77 211 (2.0)
Long-term unemployment[a]						
Yes	17 519 (12.0)	126 639 (3.1)	13 516 (8.3)	110 651 (2.8)	22 336 (10.3)	93 490 (2.4)

a: Measured at baseline.

b: Area of residence: big cities: Stockholm, Gothenburg and Malmö; medium-sized cities: cities with >90 000 inhabitant within 30 km distance from the centre of the city; small cities/villages.

c: Family status: 'married' also indicates cohabitant people or people living with a partner; 'single' also indicates people who are separated, divorced or widowed.

unemployment). Censoring was defined as the first event of either emigration, death or end of follow-up.

Stratified analyses were run for age groups in 10-year intervals and for country of birth. For the latter, refugees from other countries of birth other than the ones pre-selected were excluded from these stratified analyses. In addition, we ran regression models with duration of residence as exposure instead of refugee status using the same stepwise approach.

To avoid overlapping across the three cohorts, we conducted stratified analyses by age using narrower intervals (5 years). This is also considered in analyses using duration of residence regarding refugees who have been living in Sweden for less than 5 years. All analyses were performed using SPSS 27.

Ethics

We obtained ethical approval from the Regional Ethical Review Board from Karolinska Institutet in Stockholm, Sweden (review number 2007/762-31).

Results

Table 1 shows an overview of the different cohorts. An increase in the total number of refugees across the three cohorts was observed. The majority of refugees had been living in Sweden for more than 5 years. Across all three cohorts, a higher percentage of refugees came from Former Yugoslavia, followed by Iran in the 2000 cohort and Iraq in the 2005 and 2010 cohort (table 1).

In all three cohorts, refugees were more likely to be male and younger as compared to Swedish-born. Also, refugees had fewer years of educational level and were more likely to live with their partner and children. Almost half of the refugees were living in big cities across all cohorts as compared to roughly a third of Swedish-born. A higher prevalence of previous inpatient care due to a psychiatric or a somatic disease could be observed in refugees as compared to Swedish-born (table 1).

With regard to LMM factors at baseline, a higher proportion of refugees experienced long-term unemployment as compared to Swedish-born in all cohorts. Furthermore, sickness absence >90 days measured at baseline was highest for the 2005 cohort for refugees as for Swedish-born (table 1).

Long-term unemployment

Refugees had higher HRs for long-term unemployment across the three cohorts as compared to Swedish-born (table 2). While refugees had hazards that were 3.67 (2000 cohort; 95% CI: 3.63–3.71), 3.54 (2005 cohort; 95% CI: 3.49–3.58) and 4.72 (2010 cohort; 95% CI: 4.67–4.76) times higher as compared to Swedish-born in the crude model, the HR decreased to 1.98 (95% CI: 1.96–2.01), 2.30 (95% CI: 2.27–2.33) and 2.78 (95% CI: 2.75–2.81), respectively, in the fully adjusted model. The decrease in HR was most pronounced after adjustment of labour-market related factors and previous somatic or psychiatric inpatient care (table 2).

Disability pension

With regard to disability pension, refugees had hazards that were 1.62 (2000 cohort; 95% CI: 1.59–1.66), 2.02 (2005 cohort; 95% CI: 1.98–2.06) and 2.28 (2010 cohort; 95% CI: 2.20–2.36) times higher than for Swedish-born in the crude model. The HR increased to 2.27 (95% CI: 2.22–2.32), 2.56 (95% CI: 2.51–2.62) in the 2000 and 2005 cohort after adjusting for socio-demographic factors but decreased to 2.26 (95% CI: 2.18–2.34) in the 2010 cohort. In the fully adjusted model, the HRs decreased to 1.85 (95% CI: 1.81–1.89), 1.97 (95% CI: 1.93–2.01) and 1.48 (95% CI: 1.43–1.54) (table 2).

Age

The HR for long-term unemployment was highest in refugees aged between 35 and 44 years as compared to same-aged Swedish-born in the 2000 cohort (Supplementary table S1). The association between refugee status and long-term unemployment by age group remained stable across the three cohorts.

For disability pension, the HR was highest in refugees aged between 45 and 54 years than same-aged Swedish-born. Young refugees (aged 19–24) showed lower hazards of disability pension as compared to Swedish-born, which also extended to refugees aged 25–34 years in the 2010 cohort (Supplementary table S1).

A stratified analysis by age in groups of 5-year intervals revealed similar results to the analysis of the 10-year intervals (Supplementary table S2).

Country of birth

The HR for long-term unemployment was highest for refugees from Syria or Iran as compared to Swedish-born in the 2000 cohort (Supplementary table S3). In 2005, the HR was highest for refugees from Iraq as compared to Swedish-born. In the 2010 cohort, HRs remained highest for refugees from Iraq, followed by refugees from African countries (Eritrea, Somalia).

In regard to disability pension, in the 2000 cohort, refugees from Eritrea, Ethiopia and Somalia were less likely to be granted disability pension as compared to Swedish-born, while the HR was higher for

Table 2 Crude and adjusted hazard ratios (HRs) and 95% confidence intervals (CIs) for long-term unemployment (UE) and disability pension (DP), three cohorts with a 4-year follow-up each (population aged between 19 and 60 years)

Cohort	Individuals	*n* (%)	Rate per 100 000	Crude HR (95% CI)	Model 1 HR (95% CI)	Model 2 HR (95% CI)
Long-term unemployment						
2000	Swedish-born	270 109 (6.7)	1813.00	Ref	Ref	Ref
	Refugees	32 806 (22.5)	7136.09	3.67 (3.63–3.71)***	3.80 (3.76–3.85)***	1.98 (1.96–2.01)***
2005	Swedish-born	232 092 (6.0)	1608.08	Ref	Ref	Ref
	Refugees	32 175 (19.7)	6205.16	3.54 (3.49–3.58)***	3.52 (3.48–3.57)***	2.30 (2.27–2.33)***
2010	Swedish-born	212 071 (5.5)	1453.47	Ref	Ref	Ref
	Refugees	51 129 (23.6)	7449.54	4.72 (4.67–4.76)***	4.29 (4.25–4.33)***	2.78 (2.75–2.81)***
Disability pension						
2000	Swedish-born	170 586 (4.2)	1091.72	Ref	Ref	Ref
	Refugees	9767 (6.7)	1768.25	1.62 (1.59–1.66)***	2.27 (2.22–2.32)***	1.85 (1.81–1.89)***
2005	Swedish-born	124 907 (3.2)	824.79	Ref	Ref	Ref
	Refugees	10 248 (6.3)	1671.58	2.02 (1.98–2.06)***	2.56 (2.51–2.62)***	1.97 (1.93–2.01)***
2010	Swedish-born	31 009 (0.8)	204.26	Ref	Ref	Ref
	Refugees	3900 (1.8)	465.39	2.28 (2.20–2.36)***	2.26 (2.18–2.34)***	1.48 (1.43–1.54)***

***: $P < 0.001$ (two-tailed).

Note: Outcome UE: Model 1 adjusted for sex, age, education, family status and type of living area. Model 2 additionally adjusted for previous somatic and psychiatric inpatient care, labour market attachment and sickness absence >90 days.

Outcome DP: Model 1 adjusted for sex, age, education, family status and type of living area. Model 2 additionally adjusted for previous somatic and psychiatric inpatient care, labour market attachment, unemployment at baseline and sickness absence >90 days.

refugees from former Yugoslavia, Iran and Iraq (Supplementary table S3). This was found to be similar in the 2005 cohort. In the 2010 cohort, there was no evidence for a difference in HRs between refugees and Swedish-born for most countries of birth. Similar to the previous two cohorts, the HR for disability pension was lowest in people from Somalia and highest in refugees from former Yugoslavia as compared to Swedish-born (Supplementary table S3).

Duration of residence

For long-term unemployment, refugees with a duration of residence of 10 years or above showed the highest HR as compared to Swedish-born in the 2000 cohort (table 3). In the 2005 and 2010 cohort, the HR was higher for refugees with a duration of residence below 10 years (table 3).

Being granted disability pension was highest for refugees with a duration of residence between 5 and 10 years as compared to Swedish-born across all cohorts and refugee groups (table 3).

Period effects

Across the cohorts, an increase in HRs could be observed for long-term unemployment in refugees as compared to Swedish-born, but not for disability pension. The increase was particularly found in refugees aged between 25 and 34 and 35 and 44 (figure 1).

In regard to the countries of birth, refugees from Somalia, Afghanistan and Iraq experienced particular increases in the hazard of long-term unemployment (Supplementary figure S1). Furthermore, refugees with a shorter duration of residence, (i.e. 0–4 years and 5–10 years) experienced increased hazards of long-term unemployment across the cohorts (table 3).

Discussion

Main findings

The hazard of long-term unemployment among refugees appeared to be elevated in all cohorts and comparatively increased over time, while no change in the granting of disability pension could be observed, thus suggesting a period effect in long-term unemployment. Increases in the risk estimates of long-term unemployment across the cohorts were particularly pronounced for vulnerable subgroups such as middle-aged refugees, refugees from Somalia, Afghanistan and Iraq, and refugees with a shorter duration of residence. The findings of this study suggest increasing challenges for refugees to access the labour market. This is problematic, as increasing LMM could further harm refugees regarding economic difficulties and their mental and physical health.[4] To the best of our knowledge, this is the first paper that examined any potential period effects in the risk of LMM in refugees as compared to Swedish-born. Previous studies have only examined period effects in the association between disability pension and mortality as well as the risk of LMM in suicide attempters, therefore no direct comparisons are possible.[27,30]

The observed period effects could have multifactorial reasons. Changes in the composition of the immigrant subgroups, e.g. increase in the number of refugees in Sweden over time,[31] could have contributed to period effects. A growing number of refugees who recently migrated to Sweden could need more time in getting to know the system and learning the language, thus facing challenges in accessing the labour market.[5] In addition, socioeconomic factors (e.g. education, income) could be different among the refugee groups,

Table 3 Crude and adjusted hazard ratios (HRs) and 95% confidence intervals (CIs) for long-term unemployment (UE) and disability pension (DP) based on duration of residence in Sweden, three cohorts with a 4-year follow-up each (population aged between 19 and 60 years)

Cohort	Individuals based on duration of residence in Sweden	Rate per 100 000	Crude HR (95% CI)	Model 1 HR (95% CI)	Model 2 HR (95% CI)
Long-term unemployment					
2000	Swedish-born	1813.00	Ref	Ref	Ref
	0–4 years	6680.18	3.48 (3.38–3.57)***	3.69 (3.58–3.80)***	1.49 (1.45–1.54)***
	5–10 years	7293.39	3.74 (3.69–3.80)***	3.87 (3.82–3.93)***	2.06 (2.03–2.09)***
	≥10 years	7029.21	3.60 (3.51–3.68)***	3.67 (3.59–3.76)***	2.16 (2.11–2.21)***
2005	Swedish-born	1608.08	Ref	Ref	Ref
	0–4 years	9118.50	5.04 (4.92–5.16)***	4.90 (4.78–5.02)***	2.42 (2.36–2.48)***
	5–10 years	6434.22	3.65 (3.57–3.72)***	3.62 (3.55–3.70)***	2.43 (2.38–2.48)***
	≥10 years	5250.03	3.03 (2.98–3.08)***	3.08 (3.03–3.13)***	2.18 (2.15–2.22)***
2010	Swedish-born	1453.47	Ref	Ref	Ref
	0–4 years	18 975.90	10.52 (10.37–10.66)***	8.94 (8.81–9.08)***	4.44 (4.36–4.51)***
	5–10 years	8817.29	5.48 (5.36–5.60)***	5.03 (4.91–5.14)***	2.96 (2.90–3.03)***
	≥10 years	4407.56	2.91 (2.86–2.95)***	2.84 (2.80–2.88)***	2.11 (2.08–2.14)***
Disability pension					
2000	Swedish-born	1091.72	Ref	Ref	Ref
	0–4 years	1437.80	1.32 (1.25–1.39)***	1.67 (1.57–1.77)***	1.60 (1.50–1.70)***
	5–10 years	1715.38	1.57 (1.53–1.62)***	2.26 (2.20–2.32)***	1.97 (1.91–2.02)***
	≥10 years	2156.07	1.98 (1.91–2.06)***	2.63 (2.53–2.73)***	1.72 (1.65–1.79)***
2005	Swedish-born	824.79	Ref	Ref	Ref
	0–4 years	1124.54	1.36 (1.28–1.44)***	1.72 (1.62–1.83)***	1.93 (1.81–2.05)***
	5–10 years	1890.99	2.28 (2.21–2.36)***	2.81 (2.71–2.91)***	2.16 (2.09–2.24)***
	≥10 years	1708.69	2.06 (2.01–2.12)***	2.63 (2.56–2.71)***	1.88 (1.83–1.93)***
2010	Swedish-born	204.26	Ref	Ref	Ref
	0–4 years	371.37	1.82 (1.69–1.96)***	1.37 (1.25–1.49)***	1.01 (0.93–1.10)
	5–10 years	510.77	2.50 (2.31–2.71)***	2.47 (2.27–2.68)***	1.57 (1.44–1.70)***
	≥10 years	486.74	2.38 (2.29–2.48)***	2.51 (2.41–2.61)***	1.59 (1.53–1.66)***

***: $P < 0.001$ (two-tailed).

Note: Outcome UE: Model 1 adjusted for sex, age, education, family status and type of living area. Model 2 additionally adjusted for previous somatic and psychiatric inpatient care, labour market attachment and sickness absence >90 days.

Outcome DP: Model 1 adjusted for sex, age, education, family status and type of living area. Model 2 additionally adjusted for previous somatic and psychiatric inpatient care, labour market attachment, unemployment at baseline and sickness absence >90 days.

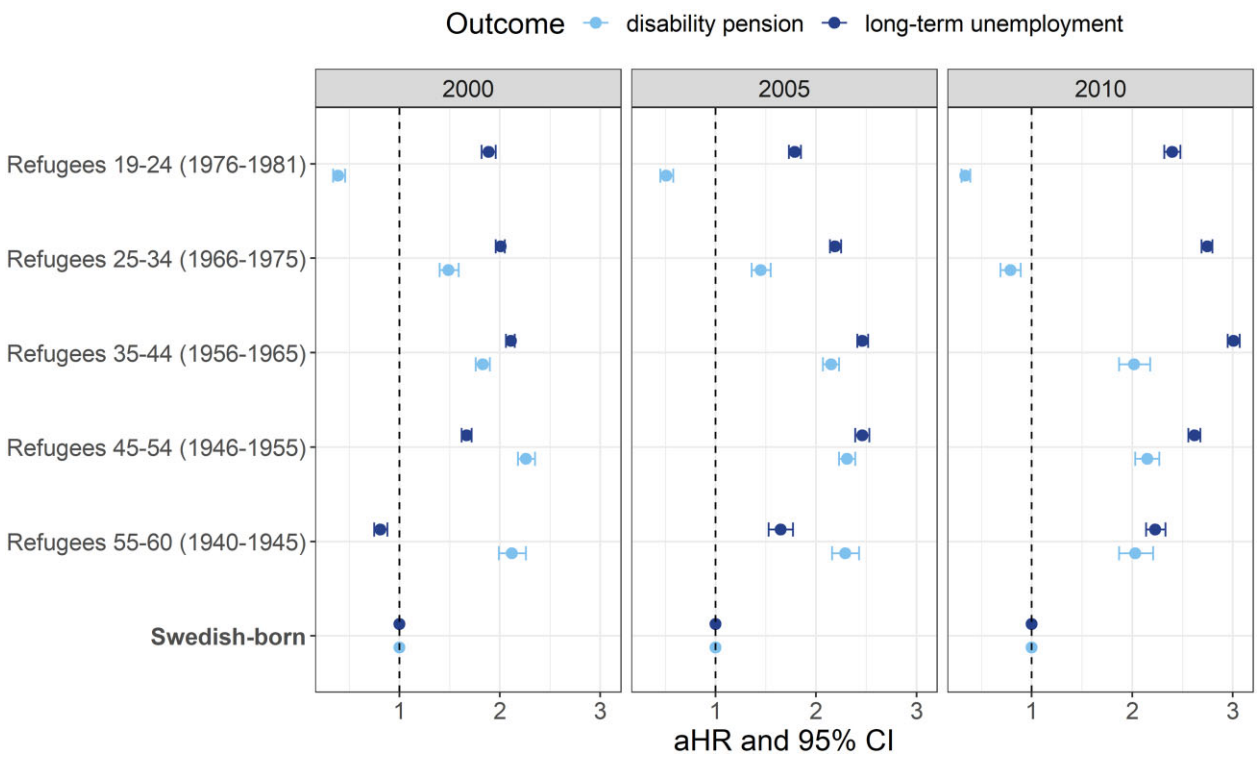

Figure 1 Adjusted hazard ratios (aHRs) and 95% confidence intervals (CIs) for long-term unemployment and disability pension by age group (10-year intervals), three cohorts with a 4-year follow-up each (population aged between 19 and 60 years)

which, in light of the changes of refugee groups migrating to Sweden over time, could lead to period effects.[5] Furthermore, the general change of long-term unemployment rates over time could have affected the risk of long-term unemployment in particularly vulnerable groups such as refugees.[32,33] Specifically, a general increase in the risk of long-term unemployment was found from cohort 2005 to cohort 2010, which could also be reflected by the Economic Recession in 2008.[28,33]

Moreover, changes in the Swedish insurance system could have affected any observed period effects. The introduction of stricter criteria for the granting of disability pension in 2008 might have affected the risk of LMM in refugees as compared to Swedish-born.[26] The HR of granting disability pension for refugees as compared to Swedish-born appeared relatively stable across the different cohorts, though. Still, in regard to the absolute numbers, a drop in the most recent cohort was observed, which is likely reflecting the aforementioned change and shows that considerably less or only severely ill people were granted disability pension regardless of their potential refugee status. These findings have implications on the European level, as austerity measures resulting from economic crises or weaknesses in the healthcare system have generally shown to have a detrimental impact on the physical and mental health of particularly vulnerable people across Europe.[28,34,35] It highlights the precarious conditions refugees are faced with—even in countries with a comparatively more supportive system than several other EU countries—and points to the need of conducting more European-wide research in this regard.

Specific refugee subgroups appeared to be more affected. Refugees who were aged between 35 and 44 years experienced a pronounced relative risk of long-term unemployment across the cohorts as compared to same-aged Swedish-born. While previous studies have examined the risk of LMM in younger refugees,[24,25,36] this is the first study that examined different age groups across different cohorts. In comparison to younger refugees, refugees who migrated to their host country at a later stage in life might experience challenges in accessing the labour market (e.g. needing more time in learning the host country's language).[37] Additionally, refugees from Somalia, Afghanistan and Iraq experienced an elevated risk of long-term unemployment across the three cohorts which is concordant with previous research.[5] Furthermore, the risk of long-term unemployment for all three cohorts was most pronounced in refugees who have been living in Sweden for less than 10 years. Refugees who recently moved to Sweden might still have language difficulties or face challenges due to a low educational level, which might make it hard for them to establish themselves in the labour market in the first years of their stay.[8,37,38]

Strengths and limitations

Strengths of this study include the longitudinal study design, the use of high-quality registers with nearly no loss to follow-up and adjusting for several potential confounders. However, there are also several limitations. The latest cohort was followed until 2013 and therefore might not represent the current situation in Sweden. However, as there were no further major changes including changes in the social insurance regulation since 2009, a change in the observed period effects seems unlikely after 2013. Another limitation represents the use of inpatient care as a proxy for morbidity. Previous studies have shown that access to healthcare was lower for refugees, possibly due to barriers (e.g. language barriers, lacking knowledge about the healthcare system) or cultural aspects (e.g. seeking help from friends or family instead of professionals) thus introducing bias.[9,10] Furthermore, in our examination of period effects, we cannot exclude some overlap across the cohorts. Particularly, stratified analyzed by country of birth might be subject to such overlap as refugees from earlier cohorts are still represented in later cohorts. Still, the analyses of 5-year age intervals and duration of residence managed to get rid of this potential overlap, therefore we can conclude that the presented findings are actually based on findings from different individuals affected during different periods.

Conclusion

Since 2005, refugees appear to be faced with increasing difficulties in accessing the labour market as compared to Swedish-born, specifically in regard to long-term unemployment. Within this group,

middle-aged refugees, refugees from Somalia, Afghanistan and Iraq and refugees who recently migrated to Sweden experienced increasing challenges to establish themselves at the labour market. These findings highlight the elevated challenges refugees are faced with in the labour market and implicate on a broader scale that changes in policies such as stricter regulations in the insurance or healthcare system might adversely affect refugees.

Supplementary data

Supplementary data are available at *EURPUB* online.

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Conflicts of interest: None declared.

Data availability

The project utilized data from the REWHARD consortium, supported by the Swedish Research Council (VR grant number. 2017-00624). These data cannot be made publicly available due to privacy regulations. According to the General Data Protection Regulation, the Swedish law SFS 2018:218, the Swedish Data Protection Act, the Swedish Ethical Review Act and the Public Access to Information and Secrecy Act, these types of sensitive data can only be made available for specific purposes, including research, that meet the criteria for access to these type of sensitive and confidential data as determined by a legal review. Readers may contact Professor Kristina Alexanderson (kristina.alexanderson@ki.se) regarding the data.

Key points

- This is the first paper that examined any potential period effects in the risk of labour market marginalization (LMM) in refugees as compared to the Swedish-born host population.
- In general, refugees experienced a higher risk of LMM in all three time period cohorts as compared to Swedish-born.
- A period effect for long-term unemployment among refugees as compared to Swedish-born could be observed.
- Increases in the risk estimates of long-term unemployment across the three time period cohorts were particularly pronounced for specific subgroups such as middle-aged refugees, refugees from Somalia, Afghanistan and Iraq as well as refugees who recently migrated to Sweden.
- The findings of this study suggest increasing challenges over time and difficulties for refugees to access the labour market and implicate on a broader scale that changes in policies such as stricter regulations in the insurance or healthcare system might adversely affect refugees.

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