

Stockholm Research Reports in Demography | no 2020:15



How the war in Syria changed the demography of Sweden and Norway

– a demographic butterfly effect

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ISSN 2002-617X | Department of Sociology



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Abstract

In an increasingly interconnected world, the demographic effects of wars are not confined only to war zones and neighbouring areas; wars and conflicts may also change populations far away. Without the war in Syria and the mass exodus of Syrian refugees, the population trends in distant countries like Sweden and Norway over the last few years would have been different. We create hypothetical scenarios of the population developments in Sweden and Norway without a war in Syria from 2011 onwards, where excess immigration due to the war and associated excess births are removed. The results indicate that population growth in 2016 would have been roughly 36 per cent lower in Sweden and 26 per cent lower in Norway without the Syrian war. The number of births in 2017 would have been 3 per cent lower in Sweden and above 1 per cent lower in Norway. One in ten municipalities would have had a population decline in 2016 instead of a population increase, and the largest immigrant group in Sweden by January 2019 would still be of Finnish origin.

Keywords: *Syria, migration, war, conflict, refugees, demography*

Stockholm Research Reports in Demography 2020:15

ISSN 2002-617X

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Introduction

The warfare in Syria has had dramatic and devastating consequences in numerous areas. Compared with this, Nordic societies have been largely unaffected by the warfare. But even in a corner of Europe far away from the Middle East, the Syrian war has put its mark on societies through the Syrian refugees who have arrived since the war broke out in 2011. This article aims at examining how conflicts have global implications by estimating how refugee flows caused by the war in Syria have affected the demography of Sweden and Norway.

The literature on demography of conflict has to a large degree been concerned with the effect of wars on mortality, and methods for estimating excess deaths due to wars in countries such as Cambodia, Congo, Iraq, Rwanda, Vietnam and former Yugoslavia (Hirschman, Preston & Loi, 1995; Heuveline, 1998; Brunborg, Lyngstad & Urdal, 2003; Brunborg & Tabeau, 2005; Brunborg & Urdal, 2005; Neupert & Prum, 2005; Tabeau & Bijak, 2005; Verpoorten, 2005; Burnham et al., 2006; Coghlan et al., 2006; Daponte, 2007, 2008; Hagopian et al., 2013; Kapend, Hinde & Bijak, 2013; Kapend, 2014). Several studies have also been concerned with armed conflicts' consequences on births/fertility (Khlat, Deeb & Courbage, 1997; Lindstrom & Berhanu, 1999; Abbasi et al., 2002; Agadjanian & Prata, 2002; Hill, National Research Council & Committee on Population, 2004; Woldemicael, 2010; Rutayisire, Broekhuis & Hooimeijer, 2013; Van Bavel & Reher, 2013; Cetorelli, 2014; Castro Torres & Urdinola, 2019; Kraehnert et al., 2019) and emigration (Cohen, 1988; Lubkemann, 2005; Engel & Ibáñez, 2007; Ibanez, 2009), sometimes in order to create scenarios without deaths due to war, for comparison (Mielke & Pitkänen, 1989; Heuveline, 1998; Lohlé-Tart & Lambert, 2008; Kapend, Hinde & Bijak, 2013). Consistently, the focus has been on the demographic consequences on countries experiencing warfare.

Another body of research has focused on the general determinants of international migration (Massey et al., 1993; Karemera, Oguledo & Davis, 2000; Hatton, 2005; Hatton & Williamson, 2005; Kim & Cohen, 2010; Mayda, 2010; de Haas, 2011; Ortega & Peri, 2013). These have mainly been concerned with determinants such as differences in economic conditions, as well as migration policies, networks of migrants in destination, geographical distance, colonial ties and common language, although some also show how war and conflict explain parts of the immigration into Western countries (Hatton & Williamson, 2003; Conte & Migali, 2019; Weber, 2019). Furthermore, substantial research have aimed at showing the effects of migration on the receiving societies, also in demographical aspects (see for instance

Sobotka (2008) for fertility, Page et al. (2007) and Preston & Elo (2014) for life expectancy, Murphy (2016) for population size and structure, as well as Tønnessen (2017) for a general overview).

This article adds to both these research traditions, by bringing distant effects into the literature on demography of conflict, as well as bringing tools from the demography of conflict into the literature on conflict as a determinant of migration and migration's effects in destination. We do this by creating hypothetical scenarios of the population trends in Sweden and Norway without the Syrian war and calculate how these hypothetical trends differ from the observed developments. The no-war-scenarios take into account that there would still be some immigration of Syrians in a situation without war, and they also consider that Syrian immigrants contribute to population growth through fertility after arrival.

Our results indicate that the war in Syria had a large effect on population growth in these two Nordic countries, particularly in 2016 when many of the refugees arriving in 2015 were granted permission to stay. At the country-level, without the Syrian war, population growth in 2016 would have been roughly 36 per cent lower in Sweden and 26 per cent lower in Norway. Also, the Finnish-born would still have been the largest immigrant group in Sweden. Moreover, Syrian migration altered the population trajectories in many municipalities threatened by depopulation. Roughly one in ten municipalities in both countries that otherwise would have experienced population decline in 2016, instead saw population growth. As such, the demographic effects of the Syrian war on Norway and Sweden were not limited to urban settings but were felt throughout the countries.

The war in Syria and its refugees

In 2011, political unrest and civil uprising erupted in Tunisia and quickly spread to several other North African and Middle Eastern countries. To date, this movement, which became known as the Arab Spring, has toppled three governments, led to at least six major governance changes, and ignited two interstate wars. Although initially these developments were met with great optimism in the international community, positive sentiments quickly faded as these conflicts escalated into global geo-political crises.

The Syrian civil war, in particular, is one resulting crisis that has had a profound international impact. Between 2011 and 2019, the war in Syria developed from a brutal internal conflict to an international proxy war between global powers. Between 1989 and 2017, the conflict was the largest in terms of fatalities in state-based conflict and second in total number of fatalities after the crisis in Rwanda (Pettersson and Eck, 2018) leading the conflict to be declared “the biggest humanitarian and refugee crisis of our time” by Filippo Grandi, the United Nations High Commissioner for Refugees (UNHCR, 2016). Approximately six million Syrian refugees have fled the country and another six million remain internally displaced. Although neighboring countries, such as Turkey, Jordan, Lebanon and Iraq, received an overwhelming majority of the Syrian refugees, a sizeable share made it to Europe. As of 2017, UNHCR found that 15 percent of externally displaced Syrians ended up in the European Union, with 560,000 arriving in Germany – or approximately 50 percent of those that came to the EU (Williams & Carlson, 2020).

In Sweden and Norway, the Syrian population increased substantially between 2011 and 2018. In 2011, the Syrian-born population accounted for only 1.5 percent and less than .5 percent of the foreign-born populations in Sweden and Norway, respectively. In Sweden, there were only a few hundred asylum applications annually from Syria until 2012 (Swedish Migration Agency, 2020), after which the number asylum seekers increased dramatically for the following few years. In 2015, the number of asylum applications from people fleeing Syria surpassed 50,000, causing the government to introduce border controls to reduce the number of asylum seekers from entering (Aradhya & Mussino, 2020). In Norway, on the other hand, this process was somewhat delayed. Immigration from Syria remained at relatively low levels until 2015 when there was a one-year spike in the number of asylum seekers (Tønnessen, Drahus, & Dzamarija, 2020). Despite the relatively short window in which Syrian refugee immigration developed in both countries, it had a profound demographic impact. By 2018, the share of the foreign-born population who originated from Syria was approximately 9 percent in Sweden and 3.5 percent in Norway, making Syrians the largest foreign-born population in the former and the fifth largest in the latter.

Method and data

The demographic effect of a war for a refugee-receiving country is not the same as the net migration from the war-torn country after the outbreak of the war, for at least two reasons: First, there would likely have been some immigration from this country without a war, and second, immigrants also contribute to the population growth in destination by giving births. Our approach takes both these factors into account.

In this paper, the demographic effect of the Syrian war is calculated by creating no-war counterfactual scenarios where net migration of Syrians to Sweden and Norway is assumed to follow an extrapolation of the 2003-2010 trends. By subtracting these counterfactual immigration flows from the observed numbers, we identify the *excess immigrants* that arrived as a result of the war. These are additional immigrants compared to what we would expect to find if the pre-war immigration trends of Syrians were to continue, and can be defined (in line with the definition of ‘excess deaths’ in Daponte 2008, p.53) as ‘migration above and beyond what one would have expected in the population had the demographic conditions and/or trends present just prior to the war continued.’ Similarly, *excess births* are estimated as the difference between all children born to Syrian-born women in Sweden or Norway and the estimated corresponding number of births in a no-war scenario. This method is further elaborated below.

The no-war scenarios, excess net migration and excess births

The no-war scenarios are calculated for Sweden and Norway separately. First, we extrapolate the trends in net migration of Syrians to Sweden and Norway from 2003 to 2010. Already before the war, Sweden had a considerably higher immigration of Syrians than what Norway experienced. In both countries, annual net migration from Syria increased in the period 2003-2010, from 541 to 1,159 for Sweden and from 44 to 59 in Norway.

By linear extrapolation, we create hypothetical no-war scenarios for net migration from 2011 onwards (below we discuss this assumption). In these scenarios, Sweden would have a no-war net migration of 1,865 Syrians in 2018, whereas the corresponding number for Norway would be 76.

By subtracting the net migration in these no-war scenarios ($NM_{NW,t}$) from the actual net migration ($NM_{A,t}$) of Syrian-born to Sweden and Norway from 2011, we estimate excess net migration of Syrians ($NM_{E,t}$) due to the war, for year t :

$$NM_{E,t} = NM_{A,t} - NM_{NW,t} \quad (1)$$

Using the no-war scenarios on net migration of Syrians, we also calculate no-war estimates on the number (stock) of Syrian immigrants living in Sweden and Norway ($S_{NW,t}$). On January 1st 2011 there were almost 21,000 Syrian-born living in Sweden and 1,500 in Norway. Adding annual no-war net migration to these figures gives us no-war estimates of the stock of Syrians in Sweden and Norway. Note that this does not take into account mortality among Syrian immigrants, a simplification which is discussed later in this section. Thus, for year t , the estimated no-war populations of Syrians in Sweden or Norway is calculated as the actual stock of Syrians per 01.01.2011 ($S_{A,2011}$) plus the cumulated no-war net migration from 2011 onwards:

$$S_{NW,t} = S_{A,2011} + \sum_{s=2011}^t NM_{NW,s} \quad (2)$$

To calculate the estimates of excess births, we start with the no-war estimates on the stock of Syrians ($S_{NW,t}$). The no-war stock estimates are divided by the actual stock of Syrians ($S_{A,t}$), to show the share of the non-war stock compared to the actual stock. This is done for every year from 2011. Next, we apply these shares to the annual number of actual births to Syrian-born women in Sweden and Norway ($B_{A,t}$), to get annual no-war estimates on the number of births to the no-war stocks of Syrians. The remaining births are considered ‘excess births’ due to the Syrian war. This implies that we assume that the no-war Syrian immigrants would have generated the same number of births per person as all actual Syrian immigrants did – an assumption that is also discussed below. Thus, the excess births ($B_{E,t}$) due to the Syrian war are calculated as:

$$B_{E,t} = B_{A,t} - \left(B_{A,t} * \frac{S_{NW,t}}{S_{A,t}} \right) \quad (3)$$

The sum of the excess net immigration of Syrians and the excess births constitutes the excess population growth due to the war in Syria, $PG_{E,t}$:

$$PG_{E,t} = NM_{E,t} + B_{E,t} \quad (4)$$

where $PG_{E,t}$ is the excess population growth in a certain year (in absolute numbers), $NM_{E,t}$ is the excess net migration the same year, and $B_{E,t}$ are the excess number of births to Syrian women.

Hence, the no-war population growth ($PG_{NW,t}$) in Sweden or Norway is estimated as

$$PG_{NW,t} = PG_{A,t} - PG_{E,t} \quad (5)$$

where $PG_{A,t}$ is the actual total population growth in these countries whereas $PG_{E,t}$ is the excess population growth due to the Syrian war.

Input data and results from these calculations are also shown in Table 1.

The no-war population of Sweden and Norway in year t ($POP_{NW,t}$) is calculated as the actual population in 2011 plus the sum of the annual no-war population growth ($PG_{NW,t}$).

$$POP_{NW,t} = POP_{A,2011} + \sum_{s=2011}^t PG_{NW,s} \quad (6)$$

Further, data also allow us to calculate demographic effects of the Syrian war at the municipality level. This no-war scenario is calculated by assuming that, for each year, each municipality's share of no-war Syrians would be the same as the municipality's share of all Syrians in Sweden and Norway, respectively. Hence, for every year we find each municipality's actual share of all Syrians in the country, and apply this share to the number of excess Syrians each year on the national level, in order to estimate non-war population growth in each municipality in the relevant year, as follows:

$$PG_{NWM,t} = PG_{AM,t} - PG_{E,t} * \frac{S_{AM,t}}{S_{A,t}} \quad (7)$$

where $PG_{NWM,t}$ is the no-war population change in the municipality (in absolute numbers), $PG_{AM,t}$ is the actual population change in the municipality, $PG_{E,t}$ is the excess population growth (at the national level) calculated in Eq. (4), $S_{AM,t}$ is the actual stock of Syrian-born immigrants in the municipality and $S_{A,t}$ is the actual stock of Syrian-born immigrants nationally.¹

¹ 28 Norwegian municipalities had 0 Syrian immigrants in 2015-2018, and so their no-war estimate of Syrians is also 0.

Discussion of the assumptions made

As shown above, the method used to create no-war scenarios in this paper builds on only a few assumptions. In the following, we discuss these assumptions, and in the discussion chapter we elaborate on the assumptions that are *not* made; for instance about the war's effects on immigration policies, on immigration from other countries, on the network effect, or on other demographic determinants in Sweden and Norway.

Perhaps the most crucial assumption in our approach, is the linear extrapolation of the 2003-2010 *net migration trends*. We could have used other types of extrapolations, such as exponential, or kept the net migration constant into the future (based on the level in 2011 or some average of the years before the outbreak of the war). It could also have been possible to compare our no-war scenario of net migration with the net migration from similar countries that did not experience a war, an approach recommended and often used in works on demography of conflict (Heuveline, 1998; Coghlan et al., 2006; Daponte, 2007). To explore the plausibility of our assumption on linear extrapolation, we have compared our no-war scenario of Syrian net migration in Sweden and Norway with the actual net migration from ten countries neighbouring Syria, where some countries did and some did not experience an Arab spring and/or regime change. The results from this exercise, appendix A, indicate that our no-war net migration assumptions lie within the range of net migration trends from similar countries. For Sweden, our no-war net migration scenario may be overestimated, implying that our estimates on excess net migration may be too low and thus our estimated effects of the war on the Swedish population can be interpreted as a lower-bound.

For *births*, we assume that they are proportionally distributed between the no-war Syrians and those who arrived due to the war. This may not be the case, for several reasons. Births are not evenly distributed by sex and age – they are mostly confined to women age 20-39. If we compare women age 20-39's share of all the Syrian-born immigrants in Sweden and Norway in 2011 (before the war) and in 2018, the share of women age 20-39 was clearly lower in 2017, as the refugee flows were male dominated.² This factor suggests that the crude number of births per person would be lower among the excess immigrants. On the other hand, however, previous research has shown that immigrants' fertility is often highest right after arrival (Andersson, 2004). Since the excess-immigrants are relatively newly arrived, their

² In January 2011, 22% of the Syrian-born in Sweden and 24% of the Syrian-born immigrants in Norway were women age 20-39. At the start of 2018, the corresponding figure was 16% in both Sweden and Norway.

fertility may be higher than that of ‘no-war’ Syrians. This pulls in the other direction, indicating that our estimates of excess births may be too low, and that the actual effect of the Syrian war may be higher than we estimate.

Finally, we assume no *deaths* in the no-war population of Syrian-born immigrants. For long run estimates of the demographic effects of the Syrian war, this would have posed a problem. However, the Syrian-born population in Sweden and Norway is still relatively young, with very few persons in mortality-intensive ages. In both 2010 and 2017, 99 per cent of Syrian-born individuals in Sweden and Norway were below 80 years. Estimating deaths would require an estimated no-war population broken down by sex and age, and for such a young population this would add much complexity to the method without really changing the results.³ Since deaths would (slightly) reduce the size of the no-war population, assuming no mortality in this group also means that our estimates on the effect of the Syrian war may be slightly downward biased.

In these calculations, we have used *net migration* and not (gross) immigrations. Using net migration has some advantages: It is a simple way to handle emigration, since emigrations are already deducted in the net migration figures. In addition, data on net migration may be more readily available in many contexts compared with data on the separate flows. Further, net migration shows the contribution from migration to population change, which is what we need in order to estimate the growth in the no-war population. Treating immigrations and emigration separately could perhaps open up for more sophisticated models, however in the case of Syrian immigrants in Sweden and Norway the emigration rate is low; annually, less than one per cent of the Syrian-born individuals emigrate.

Our analysis at the municipality level assumes that the no-war populations of Syrians would have been distributed similarly as the observed Syrian population each year. This may not be the case, at least not for Norway; all municipalities in Norway were encouraged to accept refugees when the large number of Syrians arrived in the fall of 2015, even those with no existing Syrian-born population (Tønnessen & Andersen, 2019). Newly-arrived Syrians are now to a much higher degree living in rural areas than immigrants in general and also compared with the Syrians who lived in Norway before 2011 (Tønnessen et al, 2020). Thus, it is reasonable to suggest that the no-war population would be living in somewhat less rural

³ In a no-war Syrian population of 30,000, if 1% is 80 years or more and has a mortality of 0.2 (which is relatively high), this corresponds to 60 deaths per year, or 0,2 % of the no-war Syrian population.

areas in Norway than what our method assumes. This suggests that we have a somewhat too low estimate on the number of Norwegian municipalities where population decline was turned into population increase due to the Syrian war. In Sweden, refugees can decide where to live however, many of the new cohorts of Syrian-born were placed by the Migration Board. This is why Syrian born living in Sweden in 2017 are more equally distributed in the territory compared to the prewar period (Aradhya & Mussino, 2020).

Despite the uncertainty associated with our assumptions, using a method with relatively few assumptions has several advantages. First, a parsimonious method is more transparent and easier to explain. Second, the simplicity of the model matches the uncertainty in this field; using an elaborate model might create a false impression of accuracy in a world where all migration flows, and in particular refugee flows, are affected by so many unpredictable factors. Even with the best specified model with respect to demographic change, there will always be political and other stochastic factors affecting the flows that are impossible to take into account, as further elaborated in the discussion chapter.

Similarity to other methods in conflict demography

The method outlined above has, to our knowledge, not been used in previous studies. As mentioned in the introduction, the methods in conflict demography has largely been concerned with mortality and excess deaths in the country of war, and migration flows have usually been estimated in more discretionary ways or taken from other sources, often as part of an approach to estimate war mortality/deaths. In an overview of different approaches used to estimate civilian casualties associated with the armed conflict in Iraq, Daponte (2007) lists different methods which also could have been applied to our setting: (a) *Tallies of deaths*, adding up the number of deaths that occur in incidents of violence as recorded by various sources, (b) *sample (household) surveys to estimate change in mortality rates from a pre-war period*, extrapolating the survey results to the general population, and (c) *demographic analyses*, i.e. making a no-war population projection from some starting point before the war, and compare with real census data (usually collected after the war).⁴ The difference is interpreted as the effect of the war.

⁴ Several projections approaches have been used: either only mortality is kept at a 'normal' level while fertility and migration is allowed to be affected by war, this would give estimates of excess deaths (done by Heuveline (1998) and Neupert and Prum (2005) for Cambodia); or all components are kept at 'normal' levels, this would give estimates of the total demographic cost of the war (see for instance Mielke and Pitkänen (1989) and Kapend (2014)).

Since we are, instead, interested in estimating excess net migration due to a war in another country, the parallels to these three approaches could be to ask either (a) all or (b) a sample of post-war immigrants from Syria whether they came due to the war, and apply this share to all post-war immigrants from Syria. For both (a) and (b), we would have to also ask about children born to these immigrants in Sweden and Norway, to be able to estimate the total effects on population size. The approach we use in this paper, is a parallel to (c). However, since our model is tailored to focus on migration flows and their effects far away from the war and we want to keep the model simple to match the great uncertainty in factors we cannot include (see the discussion chapter), our model is more parsimonious than the standard analyses often used to estimate the demographic effects in a country affected by war. For instance, we do not run full population projections, as we do not assume changes in the general (Swedish and Norwegian) population's mortality and fertility when only the migration flows are assumed to change.

Data

Unlike most other studies on demography of conflict, the data availability for this study has few limitations. We use data from the Swedish and the Norwegian population register, which is considered of high quality, and which covers every person who has documented immigration to the country. Most of the data used in our analyses are publicly available at the web-based statistical databases of Statistics Sweden⁵ and Statistics Norway^{6,7} However, although the register data in both of these countries is high-quality, they are not entirely comparable. In Sweden, people have to (intend to) stay in the country for at least 12 months to be registered in the population register, whereas the limit in Norway is 6 months (and thus the Norwegian figures include some more short-term migrants). Also, Sweden mainly uses the category 'foreign born', including also people born abroad to Swedish-born parents, whereas Norway uses the category 'immigrants', defined as people born abroad with parents and grandparents also born abroad.⁸ However, in the context of this paper, the differences between the two countries is not a major concern since we conduct our analyses for Sweden and Norway separately.

⁵ <http://www.statistikdatabasen.scb.se/pxweb/en/ssd>

⁶ <https://www.ssb.no/en/statbank>

⁷ The only data we needed to obtain separately, were the births to Syrian-born women (Norway and Sweden) and the number of Syrian-born persons in Swedish municipalities.

⁸ Due to data availability, our figures on net migration to Norway show Syrian citizens and not Syrian-born immigrants.

Table 1 shows the input data (shaded columns) and how they are used to calculate no-war scenarios and assess the effect of the Syrian war on the population growth in Sweden (upper panel) and Norway (lower panel).

Sweden									
	A	B	C	D	E	F	G	H	I
	<i>Actual net migration of Syria-born (NMA)</i>	<i>No-war net migration of Syria-born (NMnw)</i>	<i>Excess net migration (NME)</i>	<i>Actual stock of Syrian-borns (SA)</i>	<i>No-war stock of Syrian-borns (SNw)</i>	<i>Actual births to Syrian women (BA)</i>	<i>No-war births to Syrian women (BNw)</i>	<i>Excess births (BE)</i>	<i>Excess population growth (PGE)</i>
	(Statistics Sweden)	Extrapolation of 2003-10 trends	NMA,t-NMNw,t	(Statistics Sweden)	For 2011: SA,2011 Later: SNw,t-1+ NMnw,t-1	(Statistics Sweden)	BA,t * (SNw,t /SA,t)	BA,t - BNw,t	NME,t+BE,t
2003	541								
2004	509								
2005	624								
2006	1010								
2007	504								
2008	612								
2009	897								
2010	1159								
2011	1653	1247	406	20758	20758	691	691	0	406
2012	5211	1336	3875	22357	22005	663	653	10	3886
2013	14263	1424	12839	27510	23341	914	775	139	12978
2014	25914	1512	24402	41748	24765	1327	787	540	24942
2015	30400	1600	28800	67671	26277	2002	777	1225	30024
2016	51290	1689	49601	98216	27877	3177	902	2275	51877
2017	22028	1777	20251	149418	29566	4289	849	3440	23691
2018	13850	1865	11985	172258	31343	4605	838	3767	15752
<i>Excess population size by 01.01.2019:</i>									163555
Norway									
	A	B	C	D	E	F	G	H	I
	<i>Actual net migration of Syrian citizens (NMA)</i>	<i>No-war net migration of Syrian citizens (NMnw)</i>	<i>Excess net migration (NME)</i>	<i>Actual stock of Syrian immigrants, 1. January (SA)</i>	<i>No-war stock of Syrian immigrants, 1. January (SNw)</i>	<i>Actual births to Syrian women (BA)</i>	<i>No-war births to Syrian women (BNw)</i>	<i>Excess births (BE)</i>	<i>Excess population growth (PGE)</i>
Source	(Statistics Norway)	Extrapolation of 2003-10 trends	NMA,t-NMnw,t	(Statistics Norway)	For 2011: SA,2011 Later: SNw,t-1+ NMnw,t-1	(Statistics Norway)	BA,t * (SNw,t /SA,t)	BA,t - BNw,t	NME,t+BE,t
2003	44								
2004	47								
2005	61								
2006	54								
2007	57								
2008	81								
2009	48								
2010	59								
2011	56	61	-5	1497	1497	69	69	0	-5
2012	360	63	297	1571	1558	65	64	1	297
2013	830	65	765	2009	1621	82	66	16	780
2014	2118	68	2050	3080	1687	107	59	48	2099
2015	3986	70	3916	5450	1754	177	57	120	4036
2016	11184	72	11112	9710	1824	350	66	284	11396
2017	6874	74	6800	20823	1896	689	63	626	7426
2018	3744	76	3668	27392	1970	714	51	663	4331
<i>Excess population size by 01.01.2019:</i>									30361

Table 1: Calculation of no-war scenarios and excess population growth due to the Syrian war, Sweden (upper panel) and Norway (lower panel)

Note: Due to data limitations, figures for Norway are by citizenships for actual net migration, and by country of birth for actual stock of Syrians.

Results

The war in Syria affected the population in Sweden and Norway in several ways. Here, we focus on the population growth and size, the number of births, the ranking of immigrant groups and population growth at the municipality level.

First, the *population growth* increased substantially due to the Syrian war. According to our estimates (Table 1, right column) the excess population growth was particularly high in 2016, when many of the refugees arriving in the fall of 2015 got their permission to stay and thus were recorded as immigrated. Without the Syrian war, population growth in Sweden would have been around 29 % lower in 2015, 36 % lower in 2016 and 19 % lower in 2017. In Norway, the growth would have been approximately 26 % lower in 2016 and 20 % lower in 2017. The effects are depicted in Figure 1.

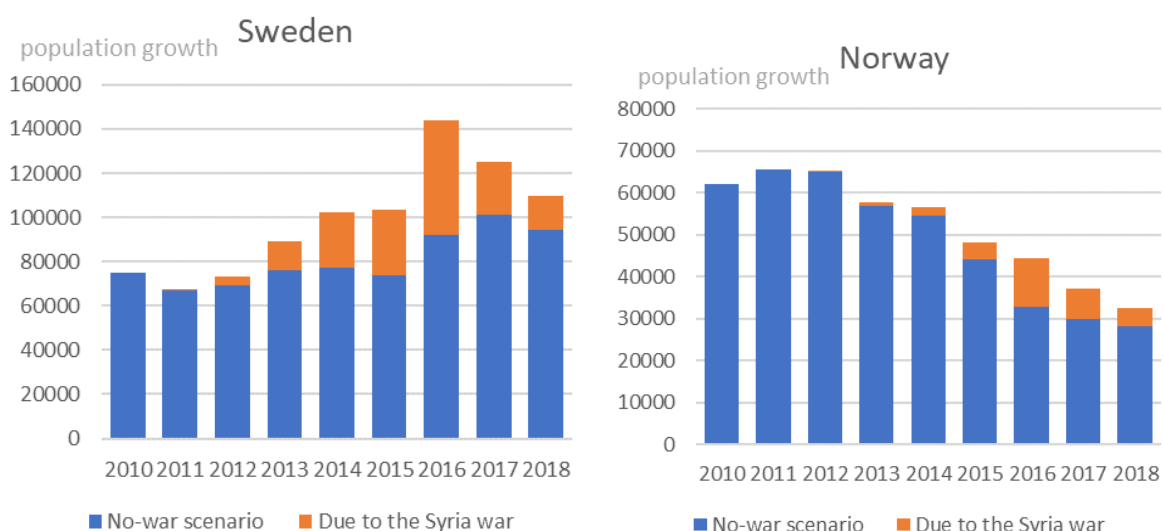


Figure 1: Population growth in Sweden and Norway 2010-2017, with and without the Syrian war.

Sweden's population would have increased between 2011 and 2017 without the mass immigration of Syrian refugees, but to a significantly smaller extent. Specifically, in 2016 the population growth in Sweden stood at more than 144,000 – which is an historical record in annual population growth. In Norway, the growth rate of the population declined after 2011-2012, which was a period with relatively high fertility, low mortality, and high immigration due to a favourable economic cycle. The decrease in the Norwegian population growth was slowed because of the Syrian war, but not enough to stop the growth from declining.

Consequently, the *population size* in Sweden and Norway would also have been lower without the war in Syria. According to our estimates, the Swedish population on the 1st of January 2018 would have been nearly 150,000 lower, or 9.97 million inhabitants instead of the actual 10.12 million. This implies that without the Syrian war, the Swedish society would not have passed the threshold of 10 million inhabitants like they did in January 2017 (Sveriges Radio, 2017). Instead, the Swedish population would have surpassed 10 million some time in 2018, and according to our estimates the Swedish population on the 1st of January 2019 would stand at 10,067,000 instead of 10,230,000. In Norway, where the population is about half of the Swedish population, the number of inhabitants on January 2019 would have been 5,298,000 without the Syrian war – about 30,000 lower than the actual population figure of 5,328,000. This is far less than the half of the corresponding number for Sweden, showing that the Syrian war put a clearly more pronounced mark on the Swedish population compared with the Norwegian, even in relative terms.

The number of *births* in Sweden would also have been lower. According to our estimates, there would have been 3,800 fewer births in 2018, or 3 per cent of all births in Sweden that year. In Norway the number of births in 2018 would have been roughly 650 lower (just over 1% of all births).

The Syrian war clearly also affected the composition of immigrants in Sweden and Norway. By January 2019, the Syrian-born population became the largest immigrant group in Sweden, even surpassing the Finnish population (150,877 individuals) that has been the largest foreign-born population in the country for decades (SCB 2016). Without the war in Syria, however, the group of Syrian-borns in Sweden would have been slightly above 31,000 individuals making them the 16th largest group, more in line with the number of immigrants from China or India.

In Norway, there were slightly more than 30,000 Syrian-born persons in 2019, which made them the 4th largest immigrant group, having passed the number of immigrants from Somalia during 2018. Without the Syrian war the number of immigrants from Syria in Norway is estimated at around 2,000 in 2019, making them smaller than immigrants from 50 other origin countries.

	Sweden 2018		Sweden 2019		Norway 2018		Norway 2019	
1	Syria <i>(without the war)</i>	172,258 <i>(31,343)</i>	Syria <i>(without the war)</i>	185,991 <i>(33,208)</i>	Poland	98,212	Poland	98,691
2	Finland	150,877	Finland	147,883	Lithuania	38,371	Lithuania	39,300
3	Iraq	140,830	Iraq	144,035	Sweden	35,813	Sweden	35,586
4	Poland	91,180	Poland	92,759	Somalia	28,754	Syria <i>(without the war)</i>	30,795 <i>(2,046)</i>
5	Iran	74,096	Iran	77,386	Syria <i>(without the war)</i>	27,392 <i>(1,970)</i>	Somalia	28,642
6	Somalia	66,369	Somalia	68,678	Germany	24,445	Germany	24,567
7	Yugoslavia (rest)	65,877	Yugoslavia (rest)	65,124	Iraq	23,118	Iraq	23,228
8	Bosnia and Herzegovina	58,880	Bosnia and Herzegovina	59,395	Eritrea	21,747	Eritrea	22,560
9	Germany	50,863	Afghanistan	51,979	Philippines	21,383	Philippines	22,272
10	Turkey	48,299	Germany	51,140	Pakistan	20,372	Pakistan	20,674
11	Afghanistan	43,991	Turkey	49,948	Thailand	19,507	Thailand	20,383
12	Norway	42,028	Thailand	42,394	Denmark	19,267	Denmark	19,150
13	Thailand	41,240	Eritrea	42,300	Iran	17,728	Iran	18,075
14	Denmark	40,563	Norway	41,747	Russia	17,480	Russia	17,783
15	Eritrea	39,081	Denmark	40,011	Afghanistan	16,782	Afghanistan	17,023
16	China	31,333	India	35,234	United Kingdom	14,261	Romania	14,505
17	India	29,673	China	33,288	Romania	14,206	United Kingdom	14,485
18	Romania	29,546	Romania	31,040	Vietnam	13,973	Vietnam	14,100

Table 2: Largest groups of foreign-born/immigrants in Sweden and Norway per 1.1.2019. The numbers in normal fonts show the actual numbers (sources: Statistics Sweden and Statistics Norway), whereas the numbers in parenthesis and italics for Syrians show the no-war scenario.

Contrary to popular perception that immigration mainly affects urban populations, the demographic impact of the Syrian war was seen even in the furthest reaches of each country. According to our estimates, 42 of Norway's 428 (nearly 1 in 10) municipalities would have experienced population decline in 2016 instead of a population growth, and most of these municipalities are rural or semi-rural. Even in 2017, when the net immigration of Syrians had slightly declined, according to our estimates 24 of the municipalities with population growth would have had a decline without the Syrian war.

In Sweden the regional effects are relatively similar; 34 and 32 of Sweden's 290 municipalities (more than 1 in 10) would have experienced population decline instead of an increase in 2016 and 2017, respectively, in the absence of the Syrian war.

It may be surprising that the share of municipalities experiencing an increase instead of a decrease is so similar between Sweden and Norway, even though Sweden received a

substantially higher share of refugees from Syria during this period. One main reason for this may be the Norwegian settlement policy for immigrants, where refugees are assigned to municipalities by a governmental agency (Valenta and Bunar, 2010). In 2016, many Syrians were settled in Norwegian municipalities with small and in some cases declining populations.

As a robustness check, we also calculated an alternative no-war scenario where we simply used the municipality's actual population change and subtracted the annual increase in number of Syrian immigrants living in the municipality.⁹ In this approach, the Syrian war reversed population trends in 2016 in even more municipalities; population increase instead of decrease was found in 49 (one in six) of Sweden's and 59 (one in seven) of Norway's municipalities.

Discussion and limitations

Despite the world seemingly becoming more peaceful with a decreasing number of fatalities in organized violence since 2014, there has been a new peak in the number of conflicts (Pettersson et al., 2019). Some conflicts may have large effects also outside the area where the fighting takes place. Our analyses indicate that the war in Syria did have a substantial impact on population change even far away in Sweden and Norway, with the largest effect in 2016 when population growth would have been roughly 36 per cent lower in Sweden and 26 per cent lower in Norway without the war. Compared with all the suffering and the upheaval of societies both in Syria and in the neighbouring countries, the effects in Sweden and Norway are minor. But still these results show that conflict and wars have noticeable impacts even in very distant parts of the world – a demographic butterfly effect.

The estimated effects in Sweden and Norway may be in the lowest range. As previously mentioned, most of our assumption may give estimates of the excess population that are too low, indicating that the war in Syria may actually have affected the population in Sweden and Norway to a greater extent than our study suggests. However, there are important factors that we have not included in our estimations, mainly because of the difficulties creating credible counterfactuals to the actual situations. For instance, we do not know how the Syrian war

⁹ *This does not take into account births or the fact that there would be some immigration also in the absence of a war.*

affected immigration to Sweden and Norway from other immigrant groups. During the period of relatively large immigration from Syria to Europe in 2015, also people fleeing from other countries came in relatively large numbers, and the political tightening of EU borders – which possibly would not have taken place without the Syrian war – also affected people fleeing from other countries, who could otherwise have come to Sweden and Norway to a larger extent. We also do not know whether additional Middle Eastern countries would have experienced an Arab spring if the war in Syria had not broken out, with other refugee flows, and we do not know to what extent Syrian refugees filled up the UNHCR-quotas that would otherwise be filled by refugees from other countries. In addition, possible indirect demographic effects are not taken into account, such as whether the Syrian war affected native Nordic people's fertility (for instance if they were less tempted to give birth in a world of wars) or emigration (for instance if they did not want to stay in a country full of refugees) or internal migration (for instance if refugee centres created work for natives in remote municipalities). Thus, many other possible effects are not taken into account in our model. However, we argue that many of these are either very uncertain or of minor importance for the outcomes we study here.

Hence, our choice of a simple method is in line with the huge uncertainty described above. We could have used a more complex model, for instance a full cohort component model broken down by sex and age, where in- and out-migration was treated separately (allowing for the use of emigration rates by sex and age). With figures also broken down by duration of stay we could incorporate falling fertility by years since migration. However, given the general uncertainty about our scenarios, it is unclear whether more detailed method would have made the scenarios more or less precise. In a world with much uncertainty, simple scenarios may be better because they may be more easily understood, and also more easily calculated in settings with limited data.

Our estimates only show the effects in a relatively short time span. The long-term effects of the Syrian war on the population in Sweden and Norway are harder to estimate, because the war is not yet over (as of March 2020), and we do not yet know what emigration back to Syria will look like after the war. Calculations from Statistics Norway (Cappelen et al., 2016), however, suggest that for non-Western immigrants in Norway, the population size effects of fertility almost offsets the contributions of mortality and emigration. This implies that the long-term effect of, say, 10,000 extra arrivals in this group, is a population which is

almost 10,000 higher during the next 50 years. As we estimated above, by 2019 the Syrian war had enlarged the Swedish population by more than 160,000 and the Norwegian population by 30,000. If Syrian immigrants in Norway and Sweden were to display similar demographic behaviour as other non-Western immigrants in Norway, we may assume that the long-term population size effect of the Syrian war (so far) will remain about 160,000 in Sweden and 30,000 in Norway in the 50 years to come.

Besides the general impacts on the population, it can be argued that the Syrian war will play an important role in regional developments in Sweden and Norway. In both countries, rural and semi-rural municipalities have been facing pressures as a result of gradual depopulation. Young people have increasingly migrated to urban centres leading to population aging concerns in these settings (Niedomysl & Amcoff 2011; Rye 2006). Our study shows that at least some of these municipalities reversed this trend as a result of the Syrian migration, and this has the potential to revitalize the local economies of some of these regions as long as the immigrants stay. As such, the role that the Syrian immigrants can play to help municipalities struggling with depopulation to become self-sustainable must not be understated.

Summary and conclusion

The recent war in Syria has had numerous consequences, most notably in Syria. But even far away from the war zones, in the North Eastern corner of Europe, it has affected the demography of Sweden and Norway. Our estimates indicate that the Swedish population would have grown substantially slower without the excess immigration from Syria. This is particularly the case for 2016 when the actual population growth was record high – in a scenario without the war it would have been 36 per cent lower. Similarly, in Norway the population growth in 2016 would have been 26 per cent lower without the Syrian war, according to our estimates. In the absence of a war, the Swedish society could not have marked the passing of 10 million inhabitants like they did in 2017, Finnish-born persons would still constitute the largest immigrant group in Sweden by 1.1.2019, and the number of births in 2018 would have been 3,750 (3 %) lower in Sweden and 650 (1 %) lower in Norway. Around 1 in 10 of the municipalities in both Sweden and Norway would have seen a population decline in 2016 instead of a population increase.

These results are obtained using a simple but innovative method which takes into account that some migration would have taken place from Syria to Sweden and Norway even in the absence of a war, and it also accounts for births among those immigrant women estimated to have come due to the war. As such, this article brings distant effects into the literature on demography of conflict, which until now mainly has been concerned with estimating demographic effects within areas of conflict and war, and it also brings tools from demography of conflict into the literature on migration's effect in destination countries. The results also illustrate that in today's world, wars and conflicts do not necessarily stop at borders, but may have consequences far away.

Acknowledgements

We are grateful for valuable feedback and help from participants at Nordic Demographic Symposium 2019 as well as from Terje Skjerpen in Statistics Norway and Ann-Marie Persson in Statistics Sweden. Financial support for the research has been provided by Statistics Norway as well as by the Swedish Research Council through the Swedish Initiative for Research on Microdata in the Social and Medical Sciences (grant 340-2013-5164) and the Swedish Research Council for Health, Working Life and Welfare FORTE (grant 2016-07105).

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Appendix A: Comparisons with net migration trends from similar countries

Figure A1 compares our no-war scenarios with registered trends in net migration from neighbouring countries (indexed so 2010=100). In the Swedish case, the no-war scenario for Syria trend is most similar to that for Egypt, a country that also experienced the Arab spring but where this did not end in a civil war. For the majority of the other countries, the net migration trend did not increase as quite as much as in our no-war scenario for Syria. This indicates that our results on the excess migration from Syria may be somewhat too low, and thus that the demographic effect of the Syrian war may have been larger in Sweden than our results indicate. In the Norwegian case, some of these flows are small and thus the yearly net migration fluctuations are large. However, our no-war scenario does not stand out compared to the net migration from neighbouring countries.

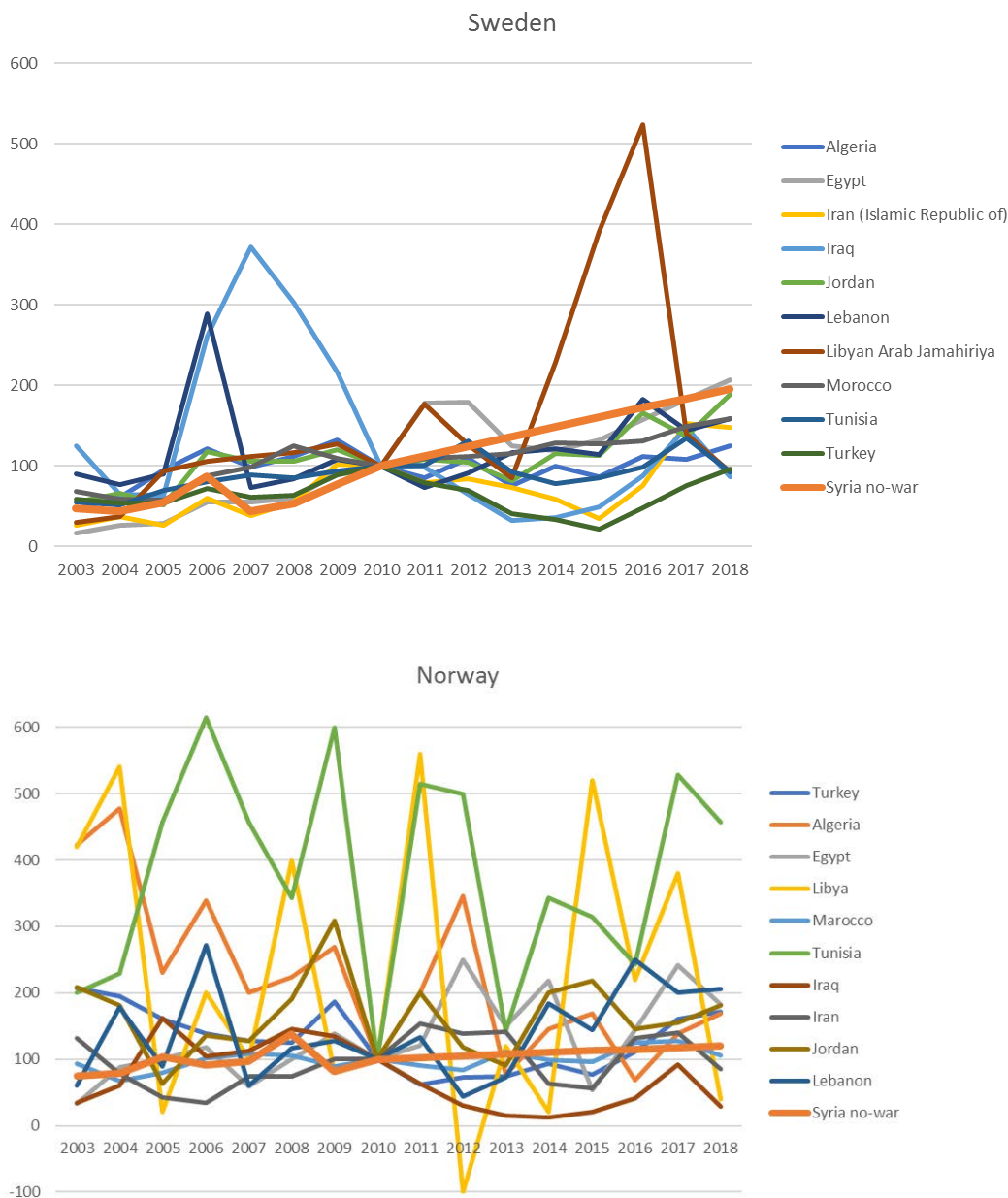


Figure A1: Net migration from Middle Eastern countries to Sweden (upper panel) and Norway (lower panel), indexed (2010=100) and compared with no-war scenario for Syrian net migration (orange line).

Note: Figures from Sweden are by country of birth, figures from Norway are by citizenship

Stockholm Research Reports in Demography

Stockholm University, 106 91
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