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COVID-19 deaths among immigrants: Evidence from the early months of the pandemic

by Edward Ng

Release date: June 9, 2021



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Published by authority of the Minister responsible for Statistics Canada

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COVID-19 deaths among immigrants: Evidence from the early months of the pandemic

by Edward Ng

In the initial stage of the COVID-19 pandemic, which began in early 2020, Statistics Canada reported that immigrants expressed higher concerns about their own health and the health of other household members, compared with Canadian-born individuals (LaRoche-Côté and Uppal 2020). Immigrant participants who had arrived in Canada within the last five years reported poorer mental health and were more likely to report at least one symptom of anxiety than more established immigrant and Canadian-born participants (Evra and Mongrain 2020). Immigrants, especially new arrivals, could be at increased risk of COVID-19 infection and mortality. Many newly arrived immigrants have low income, and they are more likely to live in overcrowded dwellings or multigenerational households (Dimbuene and Mongrain n.d.), thereby increasing the risk of infection. Moreover, immigrants are more likely to be employed in essential work and occupations associated with a greater risk of infection, such as in health care or long-term care settings (CPHO 2020; Turcotte and Savage 2020). Lower official language proficiency and health literacy may also make it more difficult for some immigrants to understand and follow public health guidelines and directives that are important in reducing the risk of COVID-19 infection (Bastien and Lemyre 2020; Ng and Omariba 2010). In addition, people belonging to groups designated as visible minorities, of whom close to 70% were immigrants, according to the 2016 Census, were said to be disproportionately affected by COVID-19 (Subedi, Greenberg and Turcotte 2020; Statistics Canada 2017). Neighbourhoods in Canada with higher proportions of residents belonging to groups designated as visible minorities have experienced greater COVID-19-related mortality rates—about two times higher than neighbourhoods with low proportions of visible minority residents. Despite this, a data gap remains in terms of whether immigrants bear a higher burden of COVID-19 deaths compared with their non-immigrant counterparts.

Evidence from international studies on the early impact of the COVID-19 pandemic on immigrant populations is mixed. France reported high immigrant mortality related to COVID-19 (Papon and Robert-Bobée 2020), while international migrants living in Italy showed no increased risk of poor outcomes compared with their Italian-born counterparts (Canevelli et al. 2020). Preliminary results in the United States show increased COVID-19 mortality among immigrants and ethnic minorities (Debopadhaya et al. 2020). In Canada, an Ontario study pointed to higher COVID-19 infection rates for immigrants and refugees who landed in Ontario between 1985 and 2018. COVID-19 testing rates were lower but positivity rates were higher for immigrants and especially for refugees, compared with Canadian-born and long-term residents (Guttmann et al. 2020).



Who is most at risk for COVID-19 mortality?

In the early months of the pandemic in Canada—from early March, when the first COVID-19 patient died, to July 4—8,323 deaths were assigned as directly attributable to COVID-19. During these early months, some 25% of the linked deaths were found to be of immigrants who landed in Canada between 1952 and 2018. By comparison, the same population made up 22% of the total Canadian population, according to the 2016 Census (see Table 1 and “Data sources” section for more information). This has resulted in a relative death burden ratio for immigrants of 1.1.¹ A ratio above 1 means that the relative burden of mortality attributable to COVID-19 among immigrants was disproportionately more than its share of the population. The linked database yields COVID-19 crude mortality rates of 26 and 22 per 100,000 population for immigrants and non-immigrants, respectively.²

Table 1
Distribution, proportion and relative death burden ratio among immigrants and non-immigrants, by selected characteristics

	Immigrants (N=1,905)	Non-immigrants (N=5,865)	Proportion of	Proportion of	Relative burden ratio
			immigrants among deaths attributed to COVID-19	immigrants according to 2016 Census	
	percent				ratio
Total	100	100	25	22	1.1
Age at death					
0 to 64	7	5	30	20	1.5
65 to 74	13	12	27	27	1.0
75 to 84	30	28	26	31	0.8
85 or older	50	55	23	29	0.8
Sex					
Male	55	46	28	21	1.4
Female	45	54	21	22	0.9
Province ¹					
Quebec	48	73	18	14	1.3
Ontario	45	22	40	29	1.4
British Columbia	4	2	41	28	1.5
Census metropolitan area ²					
Montréal	48	58	21	23	0.9
Toronto	37	11	51	46	1.1
Vancouver	3	1	44	40	1.1

1. Focusing on the three provinces in Canada with the highest number of deaths and of concentration of immigrants (percentages do not add up to 100%).

2. Focusing on the three census metropolitan areas in Canada with the highest concentration of immigrants.(percentages do not add up to 100%).

Source: Statistics Canada, provisional data from the Canadian Vital Statistics - Death Database linked to the 2018 Longitudinal Immigration Database, and data from the 2016 Census of Population.

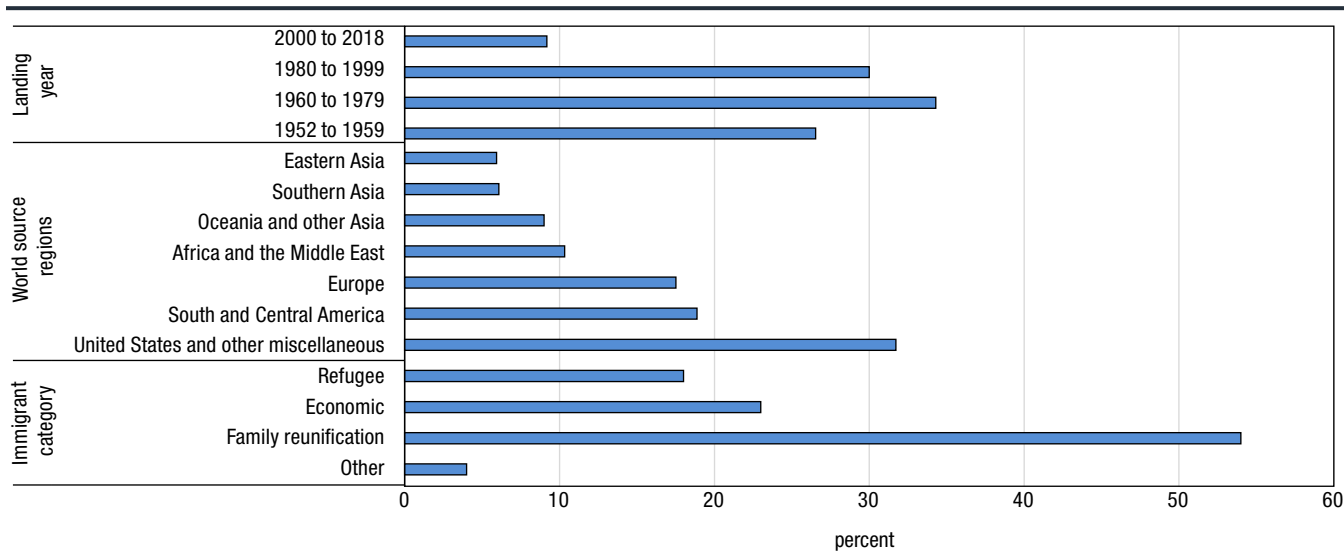
Among immigrants who died from COVID-19, the majority of these linked deaths (about 60%) were among those who landed before 1980 (see Chart 1) and were older. About 9% of immigrant deaths were among those who landed between 2000 and 2018. Correspondingly, close to half of the total immigrant deaths were of immigrants from traditional source countries, including the United States and European countries, and 12% were of immigrants from Asia (South and East Asia combined). Among the deceased who landed in Canada between 1980 and 2018, approximately 18% were refugees. The majority (54%) arrived under the family reunification class, mainly parents and grandparents who came to join their family members and who were older.

1. Since COVID 19 deaths among immigrants under age 65 is disproportionately higher than for the non-immigrant counterpart, standardization would make the relative death ratio higher.

2. The COVID-19 insights report on ethnocultural neighbourhoods provided a crude COVID-19 mortality rate of 25 per 100,000 population, based on a total of 8,796 COVID-19 deaths reported to Statistics Canada between March 2020 and the end of July 2020. This study used an earlier version of the provisional death file with 8,323 COVID-19 deaths, including deaths from early March to July 4th, that produced a slightly lower crude COVID-19 mortality rate of 23 per 100,000 population.



Chart 1
Distribution of provisional COVID-19 deaths among immigrants during the early months of the pandemic, by selected immigrant-specific characteristics



Note: Immigrant category information is available only for those who arrived from 1980 onward.
Source: Statistics Canada, provisional data from the Canadian Vital Statistics - Death database linked to the 2018 Longitudinal Immigration Database.

Immigrants' relative COVID-19 death burden varies by age and sex

COVID-19 deaths in Canada were overwhelmingly of seniors, particularly during the early months of the pandemic. More than 90% of COVID-19 deaths occurred among those aged 65 and older, and more than 50% among those aged 85 and older. Among non-immigrants, 5% of COVID-19 deaths occurred among those younger than 65. However, while the corresponding figure among immigrants was 7%, these immigrant deaths were found to be proportionately higher than these immigrants' share of the total Canadian population. Although immigrants made up 20% of the total Canadian population younger than 65, they accounted for 30% of all COVID-19 deaths among those younger than 65—a relative burden ratio of 1.5 (see Table 1). Conversely, deaths attributable to COVID-19 among immigrants aged 65 and older were proportionately lower than these immigrants' share of the total Canadian population. For example, immigrants comprise 29% of the total Canadian population aged 85 and older, and they accounted for 23% of COVID-19 deaths in this age group—a relative burden ratio of 0.8 (see Table 1). The Canadian Institute for Health Information reported that, in the early months of the pandemic, some 81% of COVID-19 deaths occurred among residents of nursing homes (CIHI 2020). The lower prevalence of COVID-19 deaths among immigrant seniors may be related to lower long-term care institutionalization rates among immigrants, especially among recent arrivals (Garner et al. 2018). This may in turn be related to the observation that immigrants and their seniors are more likely to live in multigenerational households (Dimbuene and Mongrain n.d.).



Worldwide, being of male sex has been identified as a high risk factor for the need for intensive treatment and for mortality attributable to COVID-19 (Bwire 2020; Peckham et al. 2020). Similarly, COVID-19 deaths among Canadian immigrants in the early months of the pandemic were more often of males (55%), even though the 2016 Census showed that the immigrant population was 52% female (58% for immigrants older than 85). While immigrants comprised 21% of the male Canadian population, they accounted for 28% of male COVID-19 deaths in the early months of the pandemic (a relative burden ratio of 1.4 for males, compared with 0.9 for females). Conversely, among non-immigrant COVID-19 deaths, more than half were females (54%). This female dominance in COVID-19 deaths among the non-immigrant population in Canada warrants further monitoring (Lien et al. 2020).

Immigrants' relative COVID-19 death burden varies by geography

In the early months of the pandemic, 95% of COVID-19 deaths were concentrated in Quebec and Ontario (67% and 28%, respectively), and less in British Columbia (3%). Among immigrants, close to half of COVID-19 deaths were reported in Quebec (48%), followed by 45% in Ontario and 4% in British Columbia. Among non-immigrants, the proportions were 73%, 22% and 2%, respectively (Table 1).

Immigrants made up about 14% of Quebec's population, while 18% of COVID-19 deaths in that province were among immigrants, yielding a relative death burden ratio of 1.3. In Ontario, the relative death burden ratio was higher, at 1.4—immigrants comprised 29% of Ontarians and accounted for 40% of COVID-19 deaths in Ontario. In British Columbia, the relative death burden ratio was the highest, at 1.5. Immigrants comprised 28% of British Columbians but accounted for 41% of COVID-19 deaths in the province.

The majority of immigrants in Quebec, Ontario and British Columbia were concentrated in the gateway centres of Montréal, Toronto and Vancouver. For Quebec, some 86% of immigrants resided in Montréal, while for Ontario and British Columbia, 71% and 77% of immigrants resided in Toronto and Vancouver, respectively. While Montréal, Toronto and Vancouver had high proportions of immigrants (23%, 46% and 40%, respectively), immigrants accounted for 21%, 51% and 44% of COVID-19 deaths in these census metropolitan areas in the early months of the pandemic. This resulted in relative burden ratios of 0.9 in Montréal, 1.1 in Toronto and Vancouver. Further analysis showed that male immigrants in Toronto had an elevated relative burden ratio of 1.3 (data not shown). Specifically, 57% of all COVID-19 deaths among males in Toronto were of immigrants, who made up 44% of male Torontonians.

Conclusion

COVID-19 has had a disproportionately high impact among certain population subgroups. The findings here show that immigrants' share of deaths attributable to COVID-19 was proportionately higher than immigrants' share in the total Canadian population. This is especially true among those younger than 65 and among males, as well as in British Columbia, Ontario and Quebec. The observation that 44% to 51% of COVID-19 deaths in Vancouver and Toronto were of immigrants was noteworthy, despite the high concentration of immigrants in these census metropolitan areas. These findings can help inform targeted public health efforts to minimize COVID-19 deaths among immigrants.



Data sources

Provisional data from the Canadian Vital Statistics - Death Database (pCVSD) and data from the 2018 Longitudinal Immigration Database (IMDB) and the 2016 Census of Population were used in this analysis. As individual-level analyses (rather than the ecological level of neighbourhood-based analyses) are optimal for understanding the impact of COVID-19 on immigrants, the pCVSD was linked to the 2018 IMDB to provide immigration landing information for the deceased individuals.

The pCVSD used in this analysis was based on data released on October 28, 2020, and includes COVID-19 deaths that occurred during the early months of the pandemic. This dataset includes data from January 1 to July 4, 2020, based on information received from the provinces and territories except for Yukon. The dataset includes demographic information (e.g., age, sex) and the cause of death of the deceased. Special International Classification of Diseases codes were created by the World Health Organization to report deaths attributable to COVID-19 (U107.1 and U107.2), and this approach was implemented in Canada.

The 2018 IMDB includes administrative data for all immigrants who have landed in Canada since 1952 and temporary residents who have entered the country since 1980. It includes demographic information (e.g., age, sex, country of birth) and programmatic information (e.g., immigrant admission category, landing date). Linking the IMDB to the pCVSD enabled the analysis of deaths attributable to COVID-19 at the individual level for immigrants. The linkage was conducted in the Social Data Linkage Environment by linking both databases to the Derived Record Depository (DRD), a national dynamic relational database containing only basic personal identifiers (Lu 2020). About 350, or 5%, of the linked COVID-19 deaths were identified as deaths of temporary residents, such as temporary foreign workers, international students or refugee claimants. They were included as part of the non-immigrant population.

Three limitations should be noted. First, the pCVSD does not have complete coverage of deaths in the reference period because of many factors, including collection methods and timeliness of reporting. Therefore, death counts may not correspond to figures from other sources, including estimates from provincial or territorial health authorities, other agencies, or news or media sources. Second, the IMDB includes information for immigrants who landed in Canada between 1952 and 2018, but only those who landed in or after 1980 have an assigned admission category. Therefore, analyses examining admission category were limited to this cohort. Relatedly, immigrants who landed before 1952 or after 2018 could have been included in the non-immigrant category. According to the 2016 Census, 1.5% of the immigrant population landed prior to 1952; as a result, the extent of bias from the absence of immigration records before 1952 should be minimal. Third, some 93% of deaths in the pCVSD were linked to the DRD at Statistics Canada. The remaining 552 deaths could be, for example, of immigrants or temporary residents who arrived in 2019 and early 2020 and who were not included in the 2018 IMDB. However, an analysis of the non-linked COVID-19 deaths showed that 97% were of seniors and 84% were of Quebec residents, and therefore not likely to be temporary foreign workers or international students in Canada. The inclusion of more recent immigration and temporary resident records in this linkage when they become available will help to determine their extent.



To measure the proportion of COVID-19 deaths among immigrants compared with non-immigrants in Canada, the relative death burden ratio was calculated as the ratio of the percentage of COVID-19 deaths among immigrants who arrived between 1952 and 2018 relative to these immigrants' estimated population share (from the 2016 Census). As noted earlier, a ratio above 1 means that the relative burden on immigrants was disproportionately higher than their population share. Age-standardization would generally result in higher relative death burden ratios, given that immigrant death under age 65 due to COVID-19 is disproportionately higher than its share in the overall population, and that the majority of the population is younger than 65 (and is therefore given more weight in the standardization process). However, the impact of age-standardization may vary depending on the local situation.

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