Nearly 1 in 4 Canadians was born outside of Canada. The diverse population of Canada is growing rapidly, with more than 470,000 new immigrants arriving in 2023: the highest total in over a century. These immigrants most commonly originated from India, the Philippines, and China (Fig. 1). Immigration policies shape the composition, socioeconomic characteristics, and health of migrant populations. The health of migrants is influenced by a confluence of social, economic, environmental, and political factors. Immigrants and refugees often face various barriers to accessing health care because of factors such as lack of familiarity with navigating the health care system, language barriers, systemic racism, and gaps in health insurance. Social determinants of health and access to primary care health services likely influence the burden of cardiovascular risk factors among immigrants. The relatively low burden of many cardiovascular risk factors in many immigrant populations likely contributes to the generally lower incidence rates of acute myocardial infarction, heart failure, and stroke in immigrants compared with nonimmigrants, although cardiovascular disease incidence rates vary substantially by country of origin. The “healthy immigrant effect” is the hypothesis that immigrants to high-income countries, such as Canada, are healthier than nonimmigrants in the host population. However, this effect may not apply universally across diversity.

As with previous waves of immigration, the present wave is shaped by government policies and sociopolitical events. For example, restrictions to immigration elsewhere (eg, United States) may have contributed to the rise in immigration from India and other countries. Armed conflicts have led to increases in refugees from afflicted regions. Cardiovascular disease is the most common non-communicable disease worldwide, accounting for a third of deaths in Canada and globally. At least one-half of cardiovascular events may be prevented by managing several modifiable risk factors. However, the distribution and effects of these risk factors vary substantially across and within populations.
all immigrants, including recent refugees, immigrants without formal education, and unmarried immigrants. As unfolding sociopolitical events generate new waves of global migration, policymakers and health care providers need to focus on addressing social and structural determinants of health to better manage cardiovascular risk factors and prevent cardiovascular disease, especially among the most marginalized immigrants and refugees.

Immigrant groups, who often face gaps in health care and prevention of cardiovascular disease. A better understanding of immigration selection, immigrant health coverage, and other determinants of immigrant health can provide critical insights for clinicians, researchers, and policymakers to improve the risk factors and burden of cardiovascular disease in this diverse population. We synthesized the latest evidence on the selection policies, health services, and health determinants of immigrants, and on the relationships of these factors with the prevention and incidence of cardiovascular disease. Considering the broad scope of these topics, we used a narrative review format to integrate and critically analyze a wide range of quantitative data, qualitative data, and grey literature (eg, government documents) published within the past 20 years. We posit that an understanding of cardiovascular health among immigrant populations requires consideration of the unique factors operating in their lives.

Immigration

In Canada, immigration applications are classified under 4 main streams: economic, family-sponsored, refugee, and other (including humanitarian and compassionate cases). Economic immigrants accounted for the largest proportion of new immigrants in 2023 (57.8%), followed by family-sponsored (23.2%), refugees (15.9%), and other immigrants (eg, humanitarian and compassionate: 3.0%). Immigration policies shape the composition, socioeconomic characteristics, and health of the immigrant population. For example, all immigration applicants must undergo an Immigration Medical Examination (IME; Box 1).

Economic immigrants are selected by Immigration, Refugees, and Citizenship Canada (IRCC) through a points-based system that considers age, education, Canadian and foreign work experience, proficiency in English or French, technical skills (eg, certification in a trade occupation), arranged employment, and other factors that determine their “ability to contribute to Canada’s economy.” Immediate family members (spouses, common-law partners, and dependent children) can also accompany the primary applicant through the economic stream.

Family-sponsored applicants are spouses, partners, parents, grandparents, dependent children, or other relatives who are sponsored by a current Canadian citizen or permanent resident. The points-based system does not apply to the family-sponsored class stream. However, the Canadian sponsor cannot be a recipient of social assistance for reasons other than disability and is required to financially support the applicant for a designated period of time (which varies by age and relationship). These requirements, and the lengthy nature of the application process (often requiring several years), make this stream inaccessible to many people.

Refugees include individuals who have fled persecution, civil war, or armed conflict. Government-assisted refugees and privately-sponsored refugees are referred from foreign countries to Canada for resettlement by organizations such as the United Nations Refugee Agency, or private sponsors, and are granted permanent resident status upon arrival. Refugee claimants (also known as asylum seekers) make a claim for protection upon or after arrival, which involves presenting before a quasi-judicial tribunal that determines whether the refugee claim is valid based on the United Nations definition of a refugee. Accepted refugee claimants receive “protected persons” status and become eligible to apply for permanent residency. The Humanitarian and Compassionate immigration category comprises a small number of immigrants selected on other humanitarian and compassionate grounds.

Many aspects of Canada’s immigration system bear similarities with other high-income countries. Immigrant selection criteria directly shape the sociodemographic composition of immigrants, which is a contributing factor to cardiovascular health outcomes.

Socioeconomic and Systemic Factors Affecting Health in Immigrants, Refugees, and Refugee Claimants

Health insurance

Successful immigration applicants are granted permanent resident status and receive provincial or territorial health care coverage after a waiting period of up to 3 months upon arrival, depending on the province or territory. The Interim Federal Health Program (IFHP) provides health care coverage for refugees and refugee claimants (Box 2).

Other social and structural determinants of migrant health

The health of migrants is influenced by a confluence of social, economic, environmental, and political factors. Premigration conditions, such as living in a refugee camp and exposure to
trauma, as well as the reasons for migration, vary substantially within and across immigrant streams. Similarly, postmigration conditions, including access to education, employment, food, and housing; social isolation; and experiences of racism and discrimination also vary among immigrants.

In addition, immigrants and refugees often face various barriers to accessing health care because of factors such as lack of familiarity with navigating the health care system, language barriers, systemic racism, and gaps in health insurance. For most immigrants, there is no facilitated connection to health care services after arrival in Canada; this gap potentially results in delays to accessing care. Lack of acceptable language interpretation services may also adversely affect health care among individuals with a language barrier.

Although social and structural factors are important determining cardiovascular health outcomes across all populations, immigrants may be especially affected by these factors as they transition from their premigration to post-migration living conditions. Furthermore, the influence of these factors likely differs across immigrant streams, as economic immigrants appear to have more favourable outcomes than family-sponsored immigrants or refugees in Canada. Studies in other high-income countries are consistent with this pattern.

### Prevention of Cardiovascular Disease

Social determinants of health and access to primary care health services likely influence behavioural and clinical risk factors that have well-established importance for prevention of cardiovascular disease.

### Physical activity

In the Cardiovascular Health in Ambulatory Care Research Team (CANHEART) cohort of Ontarian adults aged ≥ 40 years without cardiovascular disease, which used linked databases from the Canadian Community Health Survey (CCHS, 2001-2014) and IRCC, the prevalence of self-reported physical inactivity was more common among immigrants (defined across all CANHEART studies as immigrants arriving since 1985; male: 57.8%, female: 60.4%) compared with long-term residents (defined in CANHEART as pre-1985 immigrants and Canadian-born people; male: 45.9%, female: 51.3%). Other studies have focused on levels of physical activity. The prevalence of self-reported leisure-time physical activity ≥ 3 kcal/kg/day has been found to increase with time since immigration (recent immigrants < 10 years: 16%; long-term immigrants ≥ 10 years: 20%; nonimmigrants: 24%; 2000-2003), and was lower among South Asian (11%) and East or Southeast Asian (14%) than Black (19%) and White (21%) recent immigrants (< 10 years). Although some new immigrants may have limited leisure time or knowledge about physical activity, other studies have characterized the role of the built environment. Population-based studies in Ontario have shown that living in more walkable and less drivable neighbourhoods is associated with lower incidence rates of diabetes and obesity, a pattern likely explained by greater levels of physical activity. These factors may be especially important for immigrants, as immigrants living in walkable neighbourhoods had a greater incidence of diabetes and prediabetes compared with long-term residents living in the same areas.

### Diet

Food intake and nutritional status among immigrants are influenced by the economic, physical, and policy conditions in Canada, which differ from those of immigrant origin countries. Specifically, financial constraints, food insecurity, limited availability of traditional foods, challenges adapting to new foods, and time constraints may influence a shift in dietary practices following immigration. For example, a qualitative study of 22 immigrant and refugee children and their parents in Saskatchewan found that many families shopped at large supermarkets that did not offer the fresh fruits and vegetables routinely available in their countries of origin.
origin, whereas supermarkets containing ethnic fruits, vegetables, and other foods were often inaccessible because of cost or location. Parents felt uninformed about how to select healthy foods among the array of unfamiliar food options, and food-purchasing decisions were influenced by Western culture and peer pressure faced by their children. This transition from a traditional to Westernized diet may be modified by socioeconomic status and duration of time in Canada, as a study in Montréal found that younger age, longer duration in Canada, and high socioeconomic status were associated with a higher likelihood of consuming a Westernized diet among Haitian immigrants, which contained more total fat, saturated fat, and cholesterol than a traditional Haitian diet. Additional factors influencing diet among immigrants include limited time available for food preparation, language barriers, and unavailability of traditional ingredients and equipment in Canada. Accordingly, the CANHEART study reported that the prevalence of consuming < 5 servings of fruits and vegetables per day was slightly lower among immigrants (female: 54.6%, male: 68.6%) than long-term residents (female: 57.8%, male: 73.0%). However, the specific contribution of diet to cardiovascular outcomes requires further characterization in Canadian immigrants.

Box 1. Immigration Medical Examination

The Immigration Medical Examination (IME) consists of a medical history, physical examination (including weight, height, blood pressure, and pulse measurements, as well as heart, lungs, abdominal, skin, basic limb, hearing, and vision examinations), and standardized diagnostic tests (including chest x-ray for those ≥ 15 years of age, syphilis and HIV blood tests for those ≥ 15 years of age, and urinalysis for those age ≥ 5 years of age). The IME is overseen by “panel physicians” who are designated by Immigration, Refugees, and Citizenship Canada (IRCC); they do not provide ongoing management of conditions. Based on these results, medical officers from the IRCC Migration Health Branch assess for “medical inadmissibility” based on 3 criteria:

1. Danger to public health (eg, active tuberculosis or active syphilis)
2. Danger to public safety, defined as risk of “sudden incapacity” or “unpredictable or violent behaviour”
3. Excessive demand on health or social services, in which treatment of the condition would negatively affect wait times for health and social services in Canada or the cost of services required to manage the condition are estimated to surpass a cost threshold ($128,445 over 5 years, as of 2023). Since 2002, the excessive demand criteria is waived for refugees and their dependents, protected persons, and family-sponsored dependent children, spouses, and common-law partners.

No specific health conditions automatically lead to medical inadmissibility; each case is assessed individually. When concerns for medical inadmissibility are flagged, the applicant has the opportunity to outline a mitigation strategy, updates on the condition, or a request for exemption on humanitarian and compassionate grounds, which is reviewed by immigration authorities to make a final decision on medical inadmissibility.

Standardized age-based screening for cardiovascular risk factors (eg, blood glucose, lipids) are generally not included in the IME. However, individuals with established histories of some cardiovascular risk factors (eg, diabetes and hypertension; obesity does not affect the IME) or pre-existing cardiovascular disease require screening for signs and symptoms of end-organ damage to investigate the likelihood of “excessive demand.”

Box 2. Interim Federal Health Insurance

The Interim Federal Health Program (IFHP) provides health care coverage for refugees and refugee claimants, including “basic coverage” comparable with provincial health insurance plans (eg, physician, hospital, and laboratory and imaging diagnostic services), as well as “supplemental coverage” comparable with coverage under provincial territorial social assistance, such as prescription medications (drugs listed under provincial formularies and some additional medications), allied health care provider services (eg, physical therapy), medical devices, and basic dental and vision care. Refugee claimants use the IFHP for both basic and supplemental coverage, whereas government-assisted and privately sponsored refugees receive provincial health insurance for basic coverage and the IFHP for supplemental coverage, generally for the first year of resettlement. However, refugees and claimants are sometimes turned away or face prohibitive fees because health care providers are unfamiliar or unregistered with the IFHP.


Provider registration for the IFHP is simple and reimbursement for services is comparable with provincial health plans (registration available at: https://secure.medavie.bluecross.ca/pcp/en/request-account).

Obesity

In CANHEART, the prevalence of obesity (defined as a body mass index ≥ 30 kg/m²) was lower among immigrants (male: 11.4%, female: 14.2%) compared with long-term residents (male: 22.9%, female: 21.7%). These prevalence rates were higher than those reported in earlier studies, which demonstrated variation in prevalence by ethnicity among recent immigrants (< 15 years; White: 11.2%, South Asian: 7.0%, Chinese: 2.2%, Black 14.8%; CCHS, 1996-2007; obesity defined as body mass index ≥ 30 kg/m²). However, ethnic-specific body mass index thresholds for obesity, which have been shown to predict type 2 diabetes risk in Ontario and other countries, were not used in these studies.

Smoking

According to the CCHS (1996-2007), the prevalence of self-reported smoking among South Asian, Chinese, and Black recent immigrants (< 15 years) was generally low (7.5%, 8.9%, 8.3%, respectively) compared with White recent immigrants (20.8%) and White long-term residents (including immigrants living in Canada for ≥ 15 years or Canadian-born people; prevalence: 25.1%). Moreover, self-reported smoking prevalence was higher among recent immigrants than long-term residents for both South Asian women (6.3% vs 1.8%) and Black women (10.7% vs 3.5%). More recent data from CANHEART reported smoking prevalence rates of 8.3% and 19.7% among female and male immigrants, respectively, compared with 18.7% and 23.3% among female and male long-term residents (2011).

Hypertension

Hypertension is common among recent immigrants, with prevalence rates varying among White (13.2%), Chinese (14.5%), Black (15.0%), and South Asian (15.9%) recent immigrants (< 15 years) according to the CCHS (1996-
Table 1. Prevalence of behavioural and clinical risk factors among immigrants and nonimmigrants in Canada, stratified by sex, as reported in the CANHEART study.15

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Immigrants</th>
<th>Nonimmigrants</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>Physical inactivity (% physically inactive)</td>
<td>60.4</td>
<td>57.8</td>
</tr>
<tr>
<td>Diet (% consuming &lt; 5 fruits/vegetables per day)</td>
<td>54.6</td>
<td>68.6</td>
</tr>
<tr>
<td>Obesity (body mass index ≥ 30 kg/m²)</td>
<td>14.2</td>
<td>11.4</td>
</tr>
<tr>
<td>Current cigarette smoking</td>
<td>8.3</td>
<td>19.7</td>
</tr>
<tr>
<td>Hypertension</td>
<td>29.3</td>
<td>26.8</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>22.6</td>
<td>29.6</td>
</tr>
<tr>
<td>Diabetes</td>
<td>12.7</td>
<td>13.7</td>
</tr>
</tbody>
</table>

CANHEART, Cardiovascular Health in Ambulatory Care Research Team.
*All values are crude percentages.

The screening, prevalence, and incidence rates of type 2 diabetes among immigrants have been described in several Ontarian population-based studies.53-56 During 2004 to 2007, the rate of diabetes screening was similar among immigrants (arriving between 1985-2000; 76.0%) compared with long-term residents (including pre-1985 immigrants and Canadian-born people; 74.4%) adults aged ≥ 40 years.57 The incidence rates of diabetes were highest among South Asian, Caribbean, Latin American, and Sub-Saharan African immigrants (15.7, 12.1, 10.0, 9.4 per 1000 person-years, respectively), and lowest among Western European immigrants (4.8 per 1000 person-years) aged ≥ 20 years.58 The prevalence of diabetes was similarly higher among immigrant than long-term resident adults aged ≥ 25 years, with an especially large gap between women recent immigrants and women long-term residents (2005).59 The relatively high prevalence and incidence of diabetes in South Asian immigrants (especially those born in Sri Lanka and Bangladesh) was characterized by diagnosis occurring 15 years earlier in life, and more than twice as rapid conversion from prediabetes to diabetes, compared with Western European immigrants. Furthermore, living in Canada for ≥ 15 years was associated with increased odds of diabetes compared with living in Canada for 5 to 9 years (odds ratios: male, 1.52, 1.48-1.56; female, 1.40, 1.36-1.44).59 Although this pattern was also observed among Chinese immigrants, the incidence rates of diabetes among ethnic Chinese immigrants born in mainland China, Hong Kong, and Taiwan were respectively higher than, similar to, and lower than the corresponding incidence rates measured in the population of origin.60

The distinctive patterns of type 2 diabetes and other cardiovascular risk factors across immigrant populations is likely influenced by immigrant selection criteria as well as the social and structural determinants of health. The relatively low burden of many cardiovascular risk factors may in turn contribute to the observed incidence rates of cardiovascular disease in Canadian immigrants.

Incidence of Cardiovascular Disease

Acute myocardial infarction
In a 2010 Ontarian study of 965,829 recent immigrants (defined in this study as a new provincial health card registration < 10 years ago) and 3.3 million long-term residents (defined in this study as having an active provincial health card for ≥ 5 years; mean age 35 years, 50% female), the crude incidence rates of acute myocardial infarction were 4.14 and 6.61 per 10,000 person-years among immigrants and long-term residents, respectively. After adjustment for age, socioeconomic status, and other clinical characteristics, immigrants had a 34% lower hazard for acute myocardial infarction compared with long-term residents.69 However, there were no significant disparities in in-hospital, 30-day, and 1-year mortality rates among immigrants and long-term residents with acute myocardial infarction.69

These findings were extended in the CANHEART study (Fig. 2), which used IRCC data to define immigration, and had a slightly older immigrant population (n = 824,662; age 30 to 74 years, mean age 35.6 years; 50% female) than the 2010 study.69 The age-standardized incidence rates of acute myocardial infarction in CANHEART were 2.1 and 3.0 per 1000 person-years among male immigrants and long-term residents, respectively, and 0.8 and 1.2 per 1000 person-years among female immigrants and long-term residents, respectively.69 However, acute myocardial infarction incidence rates varied substantially based on country of origin. For example, the lowest acute myocardial infarction age-standardized incidence rate was among East Asian men (0.7 per 1000 person-years), but the corresponding age-standardized incidence rate among South Asian men was 5 times higher (3.5 per 1000 person-years): a rate exceeding that of long-term residents.69 A similar pattern was observed in female immigrants, with acute myocardial infarction age-standardized incidence rates ranging from 0.2 per 1000 person-years in East Asian women to 1.4 per 1000 person-years in South Asian women.69
Heart failure

In the CANHEART cohort, the age-standardized 10-year incidence rates of heart failure were 0.90 and 1.93 per 1000 person-years among male immigrants and male long-term residents, respectively. In women, the age-standardized incidence rates of heart failure were also lower among immigrants (1.13 per 1000 person-years) compared with long-term residents (1.78 per 1000 person-years). Substantial variation in incidence of heart failure was also observed according to country of birth, with the lowest male heart failure incidence among East Asian immigrants (0.38 per 1000 person-years) and the highest among Black immigrants (1.19 per 1000 person-years). Among women, the lowest heart failure incidence rate was among East Asian immigrants (0.51 per 1000 person-years), whereas the highest was among West Asian and Arab immigrants (1.13 per 1000 person-years). Despite these substantial variations, none of the immigrant groups had higher heart failure incidence rates than long-term residents.

Furthermore, there were significant differences in heart failure etiology between immigrants and long-term residents. Among male long-term residents, ischemic heart disease was the most common cause of heart failure (46.1%), followed by hypertension or diabetes (25.9%). By contrast, hypertension or diabetes was the most common etiology in Black male (51.7%), South Asian male (47.9%), and East Asian male (41.8%) immigrants. Among women, the etiology of heart failure was relatively more similar among immigrants and long-term residents, with hypertension or diabetes as the most common etiology (immigrants: 43.1%, long-term residents: 33.6%), followed by ischemic heart disease (immigrants: 26.9%, long-term residents: 32.8%).

Stroke

Incidence rates of stroke vary according to stroke type. In an Ontario population-based study, immigrants had a lower crude incidence rate of stroke and a 33% lower adjusted risk of stroke than other Canadians (crude incidence rate 10.9 vs 23.4 per 10,000 person-years, respectively). These differences were less pronounced for intracerebral hemorrhage (ICH) compared with ischemic stroke: a pattern that may suggest differential effects of age and hypertension, the leading risk factors for both stroke types, in immigrants compared with nonimmigrants. These findings may be related to country of origin. For example, the incidence of ICH is similar in nonimmigrants and immigrants from the Caribbean, East Asia, Africa, and Latin America, whereas the incidence of ischemic stroke in immigrants from East Asia is lower compared with nonimmigrants. By contrast, immigration class was not found to influence the risk of stroke according to a study from Ontario.

The incidence rates of acute myocardial infarction, heart failure, and stroke vary across immigrant populations, especially when comparing across different countries of origin.
birth. Although selection, socioeconomic, structural, and behavioural factors are all important influences on immigrant cardiovascular health, an increasing body of evidence suggests that the immigrant selection may play an especially important role in determining cardiovascular outcomes among immigrants in high-income countries such as Canada.

**Healthy Immigrant Effect**

The selection of immigrants intersects with other social and structural determinants of health to influence their cardiovascular health, which is manifested by differences in cardiovascular risk factor burden and downstream rates of cardiovascular events. The generally lower rates of acute myocardial infarction, heart failure, and stroke in Canadian immigrants relative to nonimmigrants are consistent with the "healthy immigrant effect," which is the hypothesis that immigrants to Canada and other high-income countries are healthier than nonimmigrants in the host population. Many immigration systems—including Canada's economic immigration stream, which accounts for the majority of immigrants—preferentially select for socioeconomically advantaged people who are highly educated and skilled. According to the healthy immigrant effect, this socioeconomic advantage may correlate with favourable social conditions and healthy behaviours, which translates into better cardiovascular health outcomes for immigrants compared with nonimmigrants. However, this advantage is also postulated to be gradually lost over time, as immigrants adopt more adverse and westernized dietary, physical activity, and other behaviours after immigration and may also face adverse social determinants of health, such as racism and economic disparities.

For example, the landmark Nippon-Honolulu-San Francisco (Ni-Hon-San) study (1977) showed that the risk of cardiovascular events in Japanese people was higher among those living in Hawaii and California, compared with Japanese people living in Japan. More recent studies have demonstrated consistent findings, with longer duration of residence in the host country being generally associated with increased risk of cardiovascular disease among immigrants to high-income countries. However, a population-based study in Ontario found that lower cardiovascular events in immigrants may persist for greater than 10 years after arrival to Canada. In fact, East Asian immigrants were the only group of immigrants in the CANHEART study in which cardiovascular event rates were observed to increase after 10 years. Ultimately, these differences in the burden of cardiovascular disease likely contribute to the generally higher life expectancy among immigrants compared with nonimmigrants in Canada and other high-income countries, with a relatively larger margin observed among men than women.

However, the healthy immigrant effect may not apply universally across all immigrants, as many are not selected based on economic criteria. In Ontario, the rates of cardiovascular events and mortality among recent refugees, immigrants without formal education, and unmarried immigrants were similar to Canadian-born people. This effect may also be lost among Canadian-born children of immigrants. A 5-year study of 24 inner-city elementary schools in Montréal found that the annual rate of increase in body mass index in a cohort of first-generation immigrant children (0.59 kg/m²) was lower than those of second-generation immigrant children and Canadian-born children (0.73 and 0.82 kg/m², respectively), suggesting that the healthy immigrant effect might be lost after the first generation.

Although the factors explaining the healthy immigrant effect are complex, health-related behaviours—and the social and structural determinants of health that shape these behaviours—likely play a strong role in influencing cardiovascular disease and its established risk factors. In the CANHEART study, cardiovascular risk among immigrants was strongly correlated with the burden of smoking, diabetes, hypertension, and dyslipidemia (correlation coefficient, male: 0.76; female: 0.92). However, cardiovascular risk factors may confer different degrees of cardiovascular risk across various immigrant groups compared with nonimmigrant populations. For example, despite the greater burden of diabetes in immigrants, the risk of cardiovascular complications or mortality was 24% lower among immigrants than long-

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**Figure 3.** Schematic diagram depicting the selection of individuals who immigrate to Canada (host country), based on Lee and Feliciano.
term residents with diabetes in Ontario. In terms of obesity, a body mass index of $\geq 30$ kg/m$^2$ in White immigrants confers a similar risk of type 2 diabetes as body mass indices of 24, 25, and 26 kg/m$^2$ among South Asian, Chinese, and Black immigrants, respectively. Moreover, it has been shown that the distribution of obesity and diabetes within countries is likely determined by both socioeconomic status and country-level economic development, with the greatest burden among high socioeconomic status individuals in low-income countries and among low socioeconomic status individuals in high-income countries. Therefore, interplay of immigrant selection, individual-level socioeconomic status, and national-level income of the country of origin may yield distinctive patterns of cardiovascular risk factors and outcomes (Fig. 3), as demonstrated by the heterogeneous incidence rates of type 2 diabetes among Chinese immigrants to Ontario.

Conclusions and Future Directions

Over the past few decades, a substantial number of new immigrants have integrated into countries such as Canada, which are becoming increasingly diverse. Coupled with the growing availability of rich population-based health data, we have accrued a large body of evidence suggesting that understanding the generally low burden of cardiovascular risk factors and cardiovascular disease among many recent immigrants requires consideration of the unique social, structural, and behavioural factors that influence immigrant health. However, it is imperative that this "healthy immigrant" effect is understood in the context of the highly selective, policy-driven process of immigration, which favours exceptionally skilled and educated individuals in the economic stream. In fact, studies suggest that the well-described cardiovascular health benefits associated with immigration do not extend to socioeconomically disadvantaged refugees and immigrants without formal education. Furthermore, postmigration factors—such as structural racism; marginalization; psychosocial stress; and disparities in income, employment, housing, education, nutrition, and access to health care can have a profound and under-recognized impact on cardiovascular health. As unfolding sociopolitical events generate new waves of global migration, policymakers and health care providers need to focus on addressing social and structural determinants of health to manage cardiovascular risk factors and prevent cardiovascular disease better, especially among the most marginalized immigrants and refugees. In particular, improving upstream factors such as the built environment, food security, and financial status will likely reap meaningful benefits for immigrants, who are disproportionately affected by these factors. Furthermore, as immigrants’ cardiovascular health needs continue to evolve with aging, it will be important for health systems to recognize and address the varying needs of these diverse populations, to provide high-quality and equitable care to all.

The achievement of these objectives may be further accelerated by research in several key areas. Firstly, a rigorous implementation science approach is needed to develop and refine interventions for effective cardiovascular risk factor screening, detection, and management in diverse immigrant populations, with an important focus on addressing the social and structural determinants of health. Moreover, a better understanding of premigration factors—including premigration socioeconomic status and level of economic development in countries of origin—may identify a role for using these factors to inform cardiovascular risk stratification and tailoring of interventions across heterogeneous immigrant populations. Finally, better data on the health of refugee claimants, who are often unrepresented in provincial health data before obtaining permanent residency, are needed to help improve health services and cardiovascular outcomes in this group.

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Ethics Statement

This review did not require ethics approval as no human subjects research was performed.

Patient Consent

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