Public Health Ontario | Santé publique Ontario

SYNOPSIS

(ARCHIVED) COVID-19 – What We Know So Far About… Social Determinants of Health

Published: May 2020
Archived: December 2023

Introduction

PHO is actively monitoring, reviewing and assessing relevant information related to Coronavirus Disease 2019 (COVID-19). "What We Know So Far" documents are intended to provide a rapid review of the evidence related to a specific aspect or emerging issue related to COVID-19.

The development of these documents includes a systematic search of the published literature as well as scientific grey literature (e.g., ProMED, CIDRAP, Johns Hopkins Situation Reports) and media reports, where appropriate. For this "What We Know So Far About… Social Determinants of Health", Canadian evidence is included and supplemented by international evidence. It is recognized that there may be additional information not captured in this document, including particular exclusions of topics summarized elsewhere (e.g., long-term care facilities) and from developing countries. Relevant results are reviewed and data extracted for synthesis. All "What We Know So Far" documents are reviewed by PHO subject-matter experts before posting.

As the COVID-19 outbreak continues to evolve and the scientific evidence rapidly expands, the information provided in these documents is only current as of the date of posting.

Key Points

- Early findings demonstrate an unequal social and economic burden of COVID-19 internationally, with emerging evidence of this relationship from Ontario and Quebec.
- Social determinants of health (SDOH), such as gender, socioeconomic position, race/ethnicity, occupation, Indigeneity, homelessness and incarceration, play an important role in risk of COVID-19 infection, particularly when they limit ability to maintain physical distancing.

- Existing social inequities in health increase risk of severe COVID-19 outcomes through increased prevalence of underlying medical conditions and/or decreased access to health care.

Background

As the number of COVID-19 cases increase internationally, preliminary evidence from surveillance and media reports have highlighted that racialised (such as Black, Latino and other ethnic minorities) and low-income populations have disproportionately high rates of COVID-19 infection, hospitalization and mortality in the United States and the United Kingdom. There is emerging evidence that supports these relationships exist in Ontario and Quebec.

COVID-19 risk factors originally focused on clinical conditions associated with severe COVID-19 outcomes, including age 65 and over and underlying medical conditions. The Public Health Agency of Canada has expanded its list of risk factors to include social and economic circumstances that increase risk for COVID-19 infection and severe outcomes. Social determinants of health (SDOH) are defined as factors beyond an individual's biology and behaviours – those that form the conditions in which people are born, grow up, live, and work. Incorporating SDOH into risk considerations and assessments is essential for an equitable COVID-19 response. We present an overview of current evidence to illustrate the relationship between SDOH and COVID-19.

Social Inequities in COVID-19

Where available, preliminary evidence from surveillance and media reports support that existing structural inequities may contribute to increased risk from COVID-19 in Black, Latino and other ethnic minority and low-income populations. In addition to race/ethnicity and socioeconomic factors, increasing concerns have been noted related to sex/gender, Indigenous identity, homelessness, incarceration, and migrant and refugees status. These findings are consistent with observed social and racial inequities observed during the 2009 H1N1 pandemic in Canada. Limited individual-level data on SDOH are available to assess their impact on COVID-19 exposure or outcomes in Ontario or Canada. Routine and systematic collection of SDOH data and their relationship with COVID-19 outcomes is needed to understand where inequities exist and is crucial to informing equitable pandemic response and preparedness for future phases of the pandemic.

Individual-level Social Determinants of Health Data:

- **United States racial/ethnic inequities in COVID-19 outcomes from surveillance reports:** The Centers for Disease Control and Prevention (CDC) reported 33% (192/580) of hospitalized COVID-19 patients in March 2020 were Black compared to 18% of Black residents in the COVID-19-Associated Hospitalization Surveillance Network (COVID-NET) catchment area, representing approximately 10% of the United States population across 15 States. These results are preliminary, as race/ethnicity data was only available on 39% (580/1,482) of COVID-19 patients. Similarly, CDC reported Black patients were overrepresented in a cohort of 305 COVID-19 hospitalizations in Georgia, where 80% of the cohort was Black compared to 47% of hospitalized patients overall during March 2020. Early reports of racial inequities in COVID-19 are summarized by Yancy et al. For example, in Chicago, Black (652 cases per 100,000 cases and 48 deaths per 100,000) and Latino (434 cases per 100,000 cases and 17 deaths per 100,000) residents had higher COVID-19 case and death rates compared to White (257 cases per 100,000 cases and 14 deaths per 100,000) residents. Similarly, disproportionately high mortality has

been observed in Black populations in New York City (20 vs. 10 deaths per 100,000 in Black versus White individuals), Louisiana (56% of deaths were in Black residents who represent 33% of the population) and Michigan (33% of cases and 40% of deaths were in Black residents who represent 14% of the population).

- **United Kingdom racial/ethnic inequities in COVID-19 outcomes from surveillance reports**: As of April 10, 2020, the Office of National Statistics reported the odds of COVID-19 related death was 4.2 (95% confidence interval (CI):3.8, 4.6) and 4.3 (95%CI: 3.8, 4.8) times higher in Black males and females compared to their White counterparts after accounting for age in England and Wales. Further, the odds of COVID-19 related death was also higher for other ethnic minorities in England and Wales, among both males (Bangladeshi/Pakistani: Odds Ratio (OR) 3.6, 95%CI: 3.1,4.0; Indian: OR 2.4, 95%CI: 2.1, 2.7; Chinese: OR 1.9, 95%CI: 1.4, 2.6; and Mixed ethnicities: OR 2.7, 95%CI: 2.3, 3.1) and females (Bangladeshi/Pakistani: OR 3.4, 95%CI: 2.8, 4.0; Indian: OR 2.7, 95%CI: 2.3, 3.1; and Mixed ethnicities: OR 2.1, 95%CI: 1.7, 2.5) compared with those of White ethnicity.

- **Sex and Gender:** Preliminary data show approximately equal numbers of COVID-19 cases between men and women internationally, yet report higher rates of hospitalization and mortality among men. In Canada, approximately 55% of COVID-19 cases are women. For COVID-19 cases with information on hospitalization and sex (56%), men had higher risk of hospitalization (1.4 times) and ICU admission (2.1 times) compared to women.

Area-level Social Determinants of Health Data:

- **Canadian neighbourhood deprivation and ethnic concentration:** As of April 30, 2020, a higher percentage of confirmed positive COVID-19 tests was observed in neighbourhood quintiles with the highest ethnic concentration (41% vs. 8%), greatest material deprivation (24% vs. 17%), and the lowest income (26% vs. 16%) compared to the least marginalized quintiles of each measure based on results from the Ontario Laboratories Information System (OLIS) database. In Toronto, as of April 27, 2020, the lowest income quintile (the quintile including census tracts with the highest percent of people living below the low-income measure) had higher rates of COVID-19 cases (113 cases per 100,000) and hospitalizations (20 hospitalizations per 100,000) compared to the highest income quintile (73 cases per 100,000; 19 hospitalizations per 100,000). Similarly, quintiles with the highest percent of people from racialized communities, newcomers to Canada, people with lower education levels, and unemployed people had higher COVID-19 case and hospitalization rates compared to quintiles with the lowest percent of each. Similar findings are emerging from Montreal, where a higher number of COVID-19 cases have been observed in low compared to high income neighbourhoods.

- **United States neighbourhood deprivation and racial/ethnic concentration:** In the United States, COVID-19 death rates were consistently highest in the most disadvantaged compared to the least disadvantaged counties: as characterized by percent poverty (19 vs. 10 per 100,000); percent population of colour (17 vs. 3 per 100,000); and percent crowding (17 vs. 5 per 100,000). In the United Kingdom, the age-standardized mortality rate of COVID-19 deaths was higher in the most deprived areas compared to the least deprived areas (England: 55 vs. 25 deaths per 100,000; Wales: 45 vs. 23 deaths per 100,000).

Social determinants of health and congregate settings:

- **COVID-19 outbreaks and shelters:** COVID-19 outbreaks have been reported in shelters by public health officials in Toronto, but to date there has been no comprehensive analysis of the burden of COVID-19 within Canadian shelters. The United States CDC reported COVID-19 cases among 1,192 residents and 313 staff after testing 19 homeless shelters in five cities, with higher test-positivity in shelters with a cluster, defined as two or more cases in the two weeks preceding testing (residents: 17-66%, staff: 16-30%), as compared to those without (residents: 4-5%; staff: 1-2%). Following a cluster of COVID-19 cases in a large shelter in Boston, testing all residents found a 36% positivity rate among 147 participants, 88% of which were asymptomatic.

- **COVID-19 outbreaks and correctional facilities:** As of May 6, 2020, Correctional Services Canada reported 294 confirmed COVID-19 cases in federal correctional institutions, including 166 in Quebec, eight in Ontario, and 120 in British Columbia. As of April 21, 2020, the CDC reported 4,893 cases and 88 deaths among incarcerated and detained persons and 2,778 cases and 15 deaths among staff members. Cases were reported in 86% (32/37) of the 54 jurisdictions who reported to the study, across 420 correctional and detention facilities.

Data Gaps for Assessing the Impact of COVID-19 Across SDOH

Limited individual-level data is available to understand the impact of COVID-19 across the SDOH:

- **COVID-19 data disaggregated by SDOH in surveillance reports are limited in the United States.** As of April 17, 2020, Johns Hopkins University noted that raced-based data on COVID-19 in the United States is being reported for testing in two states (Illinois and Kansas), confirmed cases in 34 states and deaths in 26 states. When reported, a substantial proportion of cases and deaths are of unknown or missing race/ethnicity (e.g., 58% of cases on CDC's website).

- **Jurisdictions in Ontario are starting to collect SDOH data as part of COVID-19 surveillance.** Following early reports of social inequities in COVID-19 outcomes, Ontario, Quebec and Manitoba have announced plans to begin collect individual-level race/ethnicity and income data as part of COVID-19 surveillance. Within Ontario, Peel, Toronto and London-Middlesex public health units have all announced plans to collect and use sociodemographic and race-based data.

Pathways Linking Social Determinants and COVID-19

Accumulating evidence supports the role of social and economic factors in determining COVID-19 outcomes. These relationships are complex and often intersecting, acting through:

1. increased risk of exposure and infection; and,

2. increased severity related to social conditions that increase the prevalence of pre-existing underlying medical conditions and/or decreased access to health care.

Social Determinants of COVID-19 Exposure and Infection

The underlying reasons for increased risk of COVID-19 exposure and infection may relate to crowded living conditions and the need to continue to work in certain essential occupations, both of which make physical distancing more challenging. Related factors include:

- **Structural social inequities.** Structural factors, such as colonization, racism, social exclusion and repression of self-determination are important structural determinants of increased COVID-19

risk, for example in Indigenous and Black populations in Canada. This unequal starting point acts through more proximal and intermediary pathways, for example, First Nations people, Métis, Inuit and Black populations are overrepresented among Canadians with low socioeconomic status (e.g., education and occupation), a risk factor for increased risk of COVID-19.

- **Essential service occupations.** Workers deemed essential can be at increased risk of COVID-19 infection, particularly if they are unable to work from home or practice physical distancing and do not have access to personal protective equipment. This is pressing in public facing work with high proximity to others, such as sales and services occupations, where women, low-income and racialised workers are often overrepresented. For example, COVID-19 outbreaks of 558 confirmed cases in a meat-packing plant and 49 confirmed cases in migrant farm workers.

- **Precarious occupations.** Low-skilled workers, (e.g., male security guards: 46 deaths per 100,000; male taxi drivers: 36 deaths per 100,000) have higher COVID-19 deaths compared to general population in the United Kingdom (males: 10 deaths per 100,000), however limited evidence exists on this association in Canada. An analysis of essential sales and services workers in Toronto, of which high proportion are part-time workers and are individuals 60 years of age and over, found that many low-income workers had a high exposure risk to COVID-19 at work (measured as physical proximity to others). For example, there are 94,000 essential service cashiers in Ontario, a low wage occupation (approximately $14/hour) with high exposure to COVID-19 risk. In addition, low-income workers in precarious employment are less likely to have paid sick leave. These relationships are concerning given recent findings from the Labour Force Survey that women, those with precarious employment, and low-income workers have faced greater job loss and reduced hours relative to their peers.

- **Indigenous populations.** Unsuitable housing and resulting crowding can increase COVID-19 risk. Approximately 23% of First Nations people live in unsuitable housing, a figure that is as high as 52% in Inuit Nunangat, and is higher on reserve (37%) compared to off reserve (15%). Further, Indigenous families living in multigenerational households may be particularly at risk (e.g., 25% of First Nations people living on reserve vs. 6% of non-Indigenous population).

- **Sex and gender.** Explanations for the sex differences in severe COVID-19 infections and deaths are unclear. A commentary in the Lancet discusses how the emerging evidence proposes these sex-based variations are potentially due to sex-based immunological or gendered differences in risk behaviour, such as patterns and prevalence of smoking. Further examination is needed of the gendered variations in vulnerability to infection, exposure to pathogens, and treatment received. For example, risk for COVID-19 infection may be higher among women than men because of differences in the proportion of women working in front-line healthcare (socially prescribed care roles) and other occupations deemed essential that require close interaction.

- **Requiring assistance.** The Public Health Agency of Canada warns that other vulnerable populations may include anyone who has difficulty reading, speaking, understanding or communicating (e.g., speaking a language other than English or French); accessing health advice; doing preventive activities; accessing transportation; has ongoing specialized medical care; needs specific medical supplies; or requires supervision to support independence. Mitigating these barriers has been raised as a human rights concern.

- **Homelessness.** Shelter settings are often crowded and limit opportunities for proper hygiene and physical distancing. Further, community-level public health measures may differentially

impact people experiencing homelessness, including reducing access to public spaces and health or social services, increasing fear of involuntary hospitalization and risk of fines or arrest.

- **Incarcerated populations.** People who are incarcerated have restricted movement in crowded and confined spaces, with reduced opportunity for physical distancing and hygiene (Akiyama et al.) (Kinner et al.) (Yang et al.). Individuals may be reluctant to identify symptoms because of fear of being isolated and losing privileges. Further, resource limitations and policy constraints may impact the ability of the facility to identify, prevent or respond to a COVID outbreak in some settings (Akiyama) (Kinner) (Yang).

Social Determinants and Risk Factors for Severe COVID-19 Outcome

Pre-existing social inequities in health may increase risk of severe COVID-19 outcomes, such as hospitalization and death. Comorbidities that may be associated with increased risk for severe outcomes from COVID include: obesity, hypertension, diabetes, cardiovascular disease, and chronic respiratory disease (chronic obstructive pulmonary disease (COPD) and asthma). Examples of existing social inequities in these comorbidities, include:

- **Racialised populations.** Chronic exposure to racism is associated with negative mental and physical health outcomes. Racism has been shown to impact health through economic and social deprivation, environmental and occupational health inequities, psychosocial trauma and inadequate access to health care. In Canada, Black populations have higher rates of obesity, hypertension and diabetes as well as difficulty accessing health care, such as access to a regular doctor.

- **Socioeconomic status.** Low SES is associated with obesity, hypertension, diabetes, cardiovascular disease and chronic respiratory disease in Canada.

- **Indigenous populations.** Many indigenous communities face health inequities associated with complex influences of colonization, residential schools and continued experiences of systemic racism. Health inequities are well established in Indigenous populations in Canada. For example, there is a higher prevalence of high blood pressure, diabetes and cardiovascular disease, among First Nations people and higher rates of asthma and COPD among Métis people. Further, geographic isolation can lead to difficulty accessing medical care, including preventive medical care and advice.

- **Homeless populations.** People experiencing homelessness have higher prevalence of comorbidities and mortality related to diabetes, cardiovascular disease and respiratory diseases and lower access to care.

- **Incarcerated populations.** Incarcerated individuals experience limited access to medical care (Akiyama et al.) (Kinner et al.) (Rubin et al.) (Wurcel et al.) (Yang et al.). Further, racialised populations and adults who identify as an Indigenous people are overrepresented in corrections in Canada.

References

Akiyama MJ, Spaulding AC, Rich JD. Flattening the curve for incarcerated populations - Covid-19 in jails and prisons. N Engl J Med. 2020 Apr 2 [Epub ahead of print]. Available from: https://doi.org/10.1056/NEJMp2005687

Amarasinghe U, Motha-Pollock A, Felder M, Oschinski M. COVID-19 and Ontario's sales and service workers: who is most vulnerable? [Internet] Toronto, ON: MaRS Discovery District; 2020 [modified 2020 Apr 17; cited 2020 May 10] Available from: https://www.marsdd.com/research-and-insights/covid-19-and-ontarios-sales-and-service-workers-who-is-most-vulnerable/

Amin F. Ontario to begin collecting race-based data during coronavirus pandemic. CityNews [Internet], 2020 May 6 [cited 2020 May 17]. Available from: https://toronto.citynews.ca/2020/05/06/ontario-to-begin-collecting-race-based-data-during-coronavirus-pandemic/

Andrew-Gee E. Manitoba charts new course by collecting race-based data on COVID-19. Globe and Mail [Internet], 2020 May 12 [cited 2020 May 17]. Available from: https://www.theglobeandmail.com/canada/article-manitoba-charts-new-course-by-collecting-race-based-data-on-covid-19/

Baggett TP, Keyes H, Sporn N, Gaeta JM. Prevalence of SARS-CoV-2 infection in residents of a large homeless shelter in Boston. JAMA. 2020 Apr 27 [Epub ahead of print]. Available from: http://dx.doi.org/10.1001/jama.2020.6887

Barr C, Kommenda N, Voce A. Ethnic minorities dying of COVID-19 at higher rate, analysis shows. The Guardian [Internet], 2020 Apr 23 [cited 2020 Apr 29]. Available from: https://www.theguardian.com/world/2020/apr/22/racial-inequality-in-britain-found-a-risk-factor-for-covid-19

Beckett M, Firestone MA, McKnight CD, Smylie J, Rotondi MA. A cross-sectional analysis of the relationship between diabetes and health access barriers in an urban First Nations population in Canada. BMJ Open. 2018;8(1):e018272. Available from: http://dx.doi.org/10.1136/bmjopen-2017-018272

Boshra B. Quebec to collect data on race, economic status of COVID-19 patients, director of public health says. CTV News (Montreal) [Internet], 2020 May 6 [cited 2020 May 17]. Available from: https://montreal.ctvnews.ca/quebec-to-collect-data-on-race-economic-status-of-covid-19-patients-director-of-public-health-says-1.4927486

Canadian Public Health Association. Policy and position statements: racism and public health. Ottawa, ON: CPHA; 2020 [modified 2018 Dec 17; cited 2020 Apr 29]. Available from: https://www.cpha.ca/racism-and-public-health

CBC News. Lower income people, new immigrants at higher COVID-19 risk in Toronto, data suggests. CBC News (Toronto) [Internet], 2020 May 12 [cited 2020 May 17]. Available from: https://www.cbc.ca/news/canada/toronto/low-income-immigrants-covid-19-infection-1.5566384

Centers for Disease Control and Prevention. Coronavirus disease 2019: cases in the U.S. [Internet]. Atlanta, GA: CDC; 2020 [modified 2020 Apr 28; cited 2020 Apr 29]. Available from: https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/cases-in-us.html

Chen JT, Krieger N. Revealing the unequal burden of COVID-19 by income, race/ethnicity, and household crowding: US county vs ZIP code analyses. HCPDS Working Paper Series. 2020;19(1). Available from: https://cdn1.sph.harvard.edu/wp-content/uploads/sites/1266/2020/04/HCPDS_Volume19_No_1_20_covid19_RevealingUnequalBurden_HCPDSWorkingPaper_04212020-1.pdf

Chiu M, Maclagan LC, Tu JV, Shah BR. Temporal trends in cardiovascular disease risk factors among white, South Asian, Chinese and black groups in Ontario, Canada, 2001 to 2012: a population-based study. BMJ Open. 2015;5(8):e007232. Available from: https://doi: 10.1136/bmjopen-2014-007232

Chicago Department of Public Health. Latest data [Internet]. Chicago, IL: City of Chicago; 2020 [cited 2020 Apr 29]. Available from: https://www.chicago.gov/city/en/sites/covid-19/home/latest-data.html

Chung H, Fung K, Ferreira-Legere LE, Chen B, Ishiguro L, Kalappa G, et al. COVID-19 laboratory testing in Ontario: patterns of testing and characteristics of individuals tested, as of April 30, 2020 [Internet]. Toronto, ON: ICES; 2020 [cited 2020 May 17]. Available from: https://www.ices.on.ca/Publications/Atlases-and-Reports/2020/COVID-19-Laboratory-Testing-in-Ontario

Correctional Service Canada. Inmate COVID-19 testing in federal correctional institutions (April 28 2020). Ottawa, ON: Government of Canada; 2020 [cited 2020 Apr 29]. Available from: https://www.csc-scc.gc.ca/001/006/001006-1014-en.shtml

Croxford R. Coronavirus cases to be tracked by ethnicity. BBC News [Internet], 2020 Apr 18 [cited 2020 Apr 29]. Available from: https://www.bbc.com/news/health-52338101

Earles L. Understanding chronic disease and the role for traditional approaches in Aboriginal communities [Internet]. Prince George, BC: National Collaborating Center for Aboriginal Health; 2013 [cited 2020 May 8]. Available from: https://www.ccnsa-nccah.ca/docs/emerging/FS-UnderstandingChronicDisease-Earle-EN.pdf

Fazel S, Geddes JR, Kushel M. The health of homeless people in high-income countries: descriptive epidemiology, health consequences, and clinical and policy recommendations. Lancet. 2014;384(9953):1529-40. Available from: https://doi.org/10.1016/S0140-6736(14)61132-6

Ferrante L, Fearnside PM. Protect Indigenous peoples from COVID-19. Science. 2020;368(6488):251. Available from: https://doi.org/10.1126/science.abc007

Garg S, Kim L, Whitaker M, O'Halloran A, Cummings C, Holstein R, et al. Hospitalization rates and characteristics of patients hospitalized with laboratory-confirmed coronavirus disease 2019 — COVID-NET, 14 States, March 1–30, 2020. MMWR Morb Mortal Wkly Rep. 2020;69:458–64. Available from: http://dx.doi.org/10.15585/mmwr.mm6915e3

Gershon AS, Hwee J, Victor JC, Wilton AS, To T. Trends in socioeconomic status-related differences in mortality among people with chronic obstructive pulmonary disease. Ann Am Thorac Soc. 2014;11(8):1195-202. Available from: https://doi.org/10.1513/AnnalsATS.201403-094OC

Gershon AS, Khan S, Klein-Geltink J, Wilton D, To T, Crighton EJ, et al. Asthma and chronic obstructive pulmonary disease (COPD) prevalence and health services use in Ontario Metis: a population-based cohort study. PloS one. 2014;9(4):e95899. Available from: https://doi.org/10.1371/journal.pone.0095899

Global Health 50/50. COVID-19 sex-disaggregated data tracker [Internet]. Global Health 5050; 2020 [modified 2020 Apr 22; cited 2020 Apr 29]. Available from: https://globalhealth5050.org/covid19/

Gold JA, Wong KK, Szablewski CM, et al. Characteristics and clinical outcomes of adult patients hospitalized with COVID-19 — Georgia, March 2020. MMWR Morb Mortal Wkly Rep. 2020;69:545–50. Available from: http://dx.doi.org/10.15585/mmwr.mm6918e1

Government of Canada. Coronavirus disease (COVID-19): Outbreak update [Internet]. Ottawa, ON: Government of Canada; 2020 [cited 2020 Apr 29]. Available from: https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection.html?topic=tilelink#risk

Government of Canada. Social determinants of health and health inequities. Ottawa, ON: Government of Canada; 2019 [cited 2020 Apr 29]. Available from: https://www.canada.ca/en/public-health/services/health-promotion/population-health/what-determines-health.html#a2

Human Rights Watch. Human rights dimensions of COVID-19 response. New York, NY: Human Rights Watch; 2020 [cited 2020 May 10]. Available from: https://www.hrw.org/news/2020/03/19/human-rights-dimensions-covid-19-response

Hwang SW, Ueng JJ, Chiu S, Kiss A, Tolomiczenko G, Cowan L, et al. Universal health insurance and health care access for homeless persons. Am J Public Health. 2010;100(8):1454-61. Available from: https://doi.org/10.2105/AJPH.2009.182022

Hwang SW, Wilkins R, Tjepkema M, O'Campo PJ, Dunn JR. Mortality among residents of shelters, rooming houses, and hotels in Canada: 11 year follow-up study. BMJ. 2009;339:b4036. Available from: https://doi.org/10.1136/bmj.b4036

Johns Hopkins University & Medicine. Racial data transparency: states that have released breakdowns of Covid-19 data by race [Internet]. Baltimore, MD: John Hopkins University; 2020 [modified 2020 Apr 17; cited 2020 Apr 29]. Available from: https://coronavirus.jhu.edu/data/us-state-data-availability

Kinner SA, Young JT, Snow K, Southalan L, Lopez-Acuna D, Ferreira-Borges C, et al. Prisons and custodial settings are part of a comprehensive response to COVID-19. Lancet Public health. 2020;5(4):e188-e9. Available from: https://doi.org/10.1016/S2468-2667(20)30058-X

Kirby T. Efforts escalate to protect homeless people from COVID-19 in UK. Lancet Respir Med. 2020;8(5):447-49. Available from: https://doi.org/10.1016/S2213-2600(20)30160-0

Lancet. COVID-19 will not leave behind refugees and migrants. Lancet. 2020;395(10230):1090. Available from: https://doi.org/10.1016/S0140-6736(20)30758-3

Leng B, Yana J, Ge L, Ling C Nan J. Socioeconomic status and hypertension: a meta-analysis. J Hypertens. 2015;33(2):221-9. Available from: https://doi.org/10.1097/HJH.0000000000000428

Louisiana Department of Health. Louisiana coronavirus COVID-19 updated [Internet]. Baton Rouge, LA: Louisiana Office of Public Health; 2020 [modified 2020 Apr 27; cited 2020 Apr 29]. Available from: http://ldh.la.gov/coronavirus/

Lowcock EC, Rosella LC, Foisy J, McGeer A, Crowcroft N. The social determinants of health and pandemic H1N1 2009 influenza severity. Am J Public Health. 2012;102(8):e51-8. Available from: https://doi.org/10.2105/AJPH.2012.300814

MacDonald D. COVID-19 and the Canadian workforce: reforming EI to protect more workers [Internet]. Ottawa, ON: Canadian Centre for Policy Alternatives; 2020 [cited 2020 May 10]. Available from: https://www.policyalternatives.ca/sites/default/files/uploads/publications/2020/03/CCPA%20Report_COVID19%20and%20the%20Canadian%20Workforce.pdf

Madrigal A. Tracking race and ethnicity in the COVID-19 pandemic. The COVID Tracking Project, The Atlantic [Internet], 2020 Apr 15 [cited 2020 May 10]. Available from: https://covidtracking.com/blog/tracking-race-and-ethnicity

Malakieh J. Adult and youth correctional statistics in Canada, 2017/2018 [Internet]. Ottawa, ON: Statistics Canada; 2019 [modified 2019 May 9; cited 2020 Apr 29]. Available from: https://www150.statcan.gc.ca/n1/pub/85-002-x/2019001/article/00010-eng.htm

Michigan Government. Coronavirus: Michigan data [Internet]. State of Michigan; 2020 [modified 2020 Apr 28; cited 2020 Apr 29]. Available from: https://www.michigan.gov/coronavirus/0,9753,7-406-98163_98173---,00.html

Mojtehedzadeh S. Their work is keeping Canada safe. But they earn a fraction of the national average. Toronto Star [Internet], 2020 Mar 31 [cited 2020 Mar 31]. Available from: https://www.thestar.com/business/2020/03/31/these-workers-are-keeping-canada-safe-but-they-earn-a-fraction-of-the-national-average.html

Mojtehedzadeh S. Toronto public health to start collecting COVID-19 data on race in a bid to track health inequities. Toronto Star [Internet], 2020 Apr 21 [cited 2020 May 17]. Available from: https://www.thestar.com/news/gta/2020/04/21/toronto-public-health-to-start-collecting-covid-19-data-on-race-in-a-bid-to-track-health-inequities.html

Mosites E, Parker EM, Clarke KE, Gaeta JM, Baggett TP, Imbert E, et al. Assessment of SARS-CoV-2 infection prevalence in homeless shelters- four U.S cities, March 27-April 15 2020. MMWR Morb Mortal Wkly Rep. 2020;69(17):521-2. Available from: http://dx.doi.org/10.15585/mmwr.mm6917e1

Navaranjan D, Rosella LC, Kwong JC, Campitelli M, Crowcroft N. Ethnic disparities in acquiring 2009 pandemic H1N1 influenza: a case-control study. BMC public health. 2014;14:214. Available from: https://doi.org/10.1186/1471-2458-14-214

Newport A. Peel Public Health to begin collecting race- and occupation-based data amid COVID-19 pandemic. inbrampton [Internet], 2020 Apr 27 [cited 2020 May 17]. Available from: https://www.inbrampton.com/peel-public-health-to-begin-collecting-race-and-occupation-based-data-amid-covid-19-pandemic

New York City Health. Age adjusted rate of fatal lab confirmed COVID-19 cases per 100, 000 by race/ethnicity group [Internet]. New York, NY: City of New York; 2020 [modified 2020 Apr 6; cited 2020 Apr 29]. Available from: https://www1.nyc.gov/assets/doh/downloads/pdf/imm/covid-19-deaths-race-ethnicity-04082020-1.pdf

Office for National Statistics. Coronavirus (COVID-19) related deaths by ethnic group, England and Wales [Internet]. Newport: Office for National Statistics; 2020 [cited 2020 May 10]. Available from: https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/articles/coronavirusrelateddeathsbyethnicgroupenglandandwales/2march2020to10april2020

Ontario Agency for Health Protection and Promotion (Public health Ontario). COVID-19 –What we know so far about….clinical severity [Internet]. Toronto, ON: Queens's Printer for Ontario; 2020 [cited 2020 May 10]. Available from: https://www.publichealthontario.ca/-/media/documents/ncov/covid-wwksf/what-we-know-clinical-severity.pdf?la=en

Pan- Canadian Public Health Network; Public Health Agency of Canada. Key health inequities in Canada: a national portrait. Ottawa, ON: Her Majesty the Queen in Right of Canada, as represented by the Minister of Health; 2018.. Available from: https://www.canada.ca/content/dam/phac-aspc/documents/services/publications/science-research/key-health-inequalities-canada-national-portrait-executive-summary/hir-full-report-eng.pdf

Paradies Y, Ben J, Denson N, Elias A, Priest N, Pieterse A, et al. Racism as a determinant of health: a systematic review and meta-analysis. PLoS One. 2015;10(9):e0138511. Available from: https://doi.org/10.1371/journal.pone.0138511

Pareek M, Bangash MN, Pareek N, Pan D, Sze S, Minhas JS, et al. Ethnicity and COVID-19: an urgent public health research priority. Lancet. 2020;395(10234):1421-2. Available from: https://doi.org/10.1016/S0140-6736(20)30922-3

Public Health Agency of Canada. Coronavirus disease 2019 (COVID-19): Daily epidemiological update [Internet]. Ottawa, ON: Public Health Agency of Canada; 2020 [modified 2020 Apr 28; cited 2020 Apr 29]. Available from: https://www.canada.ca/content/dam/phac-aspc/documents/services/diseases/2019-novel-coronavirus-infection/surv-covid19-epi-update-eng.pdf

Public Health Agency of Canada. Coronavirus disease (COVID-19): vulnerable populations and COVID-19. Ottawa, ON: Public Health Agency of Canada; 2020 [cited 2020 Apr 29] Available from: https://www.canada.ca/content/dam/phac-aspc/documents/services/diseases-maladies/vulnerable-populations-covid-19/vulnerable-eng.pdf

Reading, C.L, Wein, F. Health inequalities and social determinants of Aboriginal People's health [Internet]. Prince George, BC: National Collaborating Centre for Aboriginal Health; 2009 [cited 2020 May 10]. Available from: https://www.ccnsa-nccah.ca/docs/determinants/RPT-HealthInequalities-Reading-Wien-EN.pdf

Rubin R. The challenge of preventing COVID-19 spread in correctional facilities. JAMA. 2020 Apr 7 [Epub ahead of print]. Available from: https://doi.org/10.1001/jama.2020.5427

Seglins D, Guerriero L, Clementson L. Canadian flight crews demand protective suits as more than a dozen fall ill with COVID-19. CBC News [Internet], 2020 Mar 28 [cited 2020 Apr 29]. Available from: https://www.cbc.ca/news/health/flight-attendants-protective-suits-1.5513439

Shingler B, Stevenson V. COVID-19's devastating toll on families in Montreal's poorest neighbourhoods. CBC News (Montreal) [Internet], 2020 May 15 [cited 2020 May 17]. Available from: https://www.cbc.ca/news/canada/montreal/montreal-low-income-inequality-covid-19-1.5570296

Statistics Canada. Canada's Black population: education, labour and resilience [Internet]. Ottawa, ON: Government of Canada; 2020 [modified 2020 Feb 25; cited 2020 Apr 29]. Available from: https://www150.statcan.gc.ca/n1/pub/89-657-x/89-657-x2020002-eng.htm

Statistics Canada. First Nations people, Métis and Inuit and COVID-19: health and social characteristics [Internet]. Ottawa, ON: Government of Canada; 2020 [modified 2020 Apr 17; cited 2020 Apr 29]. Available from: https://www150.statcan.gc.ca/n1/en/daily-quotidien/200417/dq200417b-eng.pdf?st=hzeXqyDx

Statistics Canada. Labour force survey, March 2020 [Internet]. Ottawa, ON: Government of Canada; 2020 [modified 2020 Apr 9; cited 2020 Apr 29]. Available from: https://www150.statcan.gc.ca/n1/daily-quotidien/200409/dq200409a-eng.htm

Tjepkema M, Wilkins R, Long A. Socio-economic inequalities in cause-specific mortality: a 16-year follow-up study. Can J Public Health. 2013;104(7):e472-8. Available from: https://doi.org/10.17269/cjph.104.4075

Toronto Public Health. Update on COVID-19: Dr. Eileen de Villa, Medical Officer of Health [Internet]. Presented at Members' Lounge, Toronto City Hall. Toronto, ON: Toronto Public Health; 2020 Apr 14 [cited 2020 May 10]. Available from: https://www.toronto.ca/wp-content/uploads/2020/04/9765-MOH-Statement_Shelters_14April2020.pdf

Tsai J, Wilson M. COVID-19: a potential public health problem for homeless populations. Lancet Public Health. 2020;5(4):e186-7. Available from https://doi.org/10.1016/S2468-2667(20)30053-0

United States Census Bureau. QuickFacts: Louisiana [Internet]. Washington, DC: U.S. Department of Commerce; 2020 [cited 2020 Apr 29] Available from: https://www.census.gov/quickfacts/LA

Veenstra G, Patterson AC. Black-white health inequalities in Canada. J Immigr Minor Health. 2016;18(1):51-7. Available from: https://doi.org/10.1007/s10903-014-0140-6

Walker JD, Slater M, Jones CR, Shah BR, Frymire E, Khan S, et al. Diabetes prevalence, incidence and mortality in First Nations and other people in Ontario, 1995-2014: a population-based study using linked administrative data. CMAJ. 2020;192(6):E128-E35. Available from: https://doi.org/10.1503/cmaj.190836

Wallace M, Hagan L, Curran KG, et al. COVID-19 in correctional and detention facilities — United States, February–April 2020. MMWR Morb Mortal Wkly Rep. 2020 May 6 [Epub ahead of print]. Available from: http://dx.doi.org/10.15585/mmwr.mm6919e1external icon

Wenham C, Smith J, Morgan R, Gender, Group C-W. COVID-19: the gendered impacts of the outbreak. Lancet. 2020;395(10227):846-8. Available from: https://doi.org/10.1016/S0140-6736(20)30526-2

Wood LJ, Davies AP, Khan Z. COVID-19 precautions: easier said than done when patients are homeless. Med J Aust. 2020;212(8):384.e1. Available from: https://doi.org/10.5694/mja2.50571

Wurcel AG, Dauria E, Zaller N, Nijhawan A, Beckwith C, Nowotny K, et al. Spotlight on jails: COVID-19 mitigation policies needed now. Clin infect Dis. 2020 Mar 28 [Epub ahead of print]. Available from: https://doi.org/10.1093/cid/ciaa346

Yancy CW. COVID-19 and African Americans. JAMA. 2020 Apr 15 [Epub ahead of print]. Available from: https://doi.org/10.1001/jama.2020.6548

Yang H, Thompson JR. Fighting COVID-19 outbreaks in prisons. BMJ. 2020;369:m1362. Available from: https://doi.org/10.1136/bmj.m1362

Citation

Ontario Agency for Health Protection and Promotion (Public health Ontario). COVID-19 – What we know so far about... social determinants of health. Toronto, ON: Queen's Printer for Ontario; 2020

Disclaimer

This document was developed by Public Health Ontario (PHO). PHO provides scientific and technical advice to Ontario's government, public health organizations and health care providers. PHO's work is guided by the current best available evidence at the time of publication.

The application and use of this document is the responsibility of the user. PHO assumes no liability resulting from any such application or use.

Public Health Ontario

Public Health Ontario is an agency of the Government of Ontario dedicated to protecting and promoting the health of all Ontarians and reducing inequities in health. Public Health Ontario links public health practitioners, front-line health workers and researchers to the best scientific intelligence and knowledge from around the world.

For more information about PHO, visit publichealthontario.ca.

Ontario