

Overlooking the Canadian Indigenous demographic data: a response to Mallard *et al*'s call for data on COVID-19 and Indigenous populations

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INTRODUCTION

Mallard *et al*'s¹ commentary brings into sharp focus the dire need to collect data on COVID-19 in Indigenous populations around the world. They argue that because Indigenous populations have a history of suffering more severe outcomes relative to non-Indigenous populations during pandemics in the past, it is pertinent to document the Indigenous experience during the current COVID-19 pandemic. Furthermore, the data collation process should be standardised.

Ironically, the authors found that rates of COVID-19 were higher in non-Indigenous populations compared with Indigenous in six of the nine countries included in the study. They attributed this phenomenon to countries having a better handle on disease control.¹ In the case of Canada, complete and accurate COVID-19 data facilitated the early implementation of Indigenous focus preparedness and response plans, as well as having the added benefit of Indigenous involvement in the development of these plans that were tailored to the needs of their communities.¹ Another reason for the lower rates, especially for confirmed cases, may be an artefact of low COVID-19 notification rates among the First Nations (FN) population; at the time of publication it was stated that notification was 3.2 times less than the rest of Canada.

The authors' calculations and interpretation of the COVID-19 experience in FN in the Canadian context, unfortunately, are flawed for three reasons: (1) the population size estimates for FN population and Canada are incorrect, and without citations, readers cannot tell the provenience and the intended year of estimate; (2) actual counts for the COVID-19 cases and deaths were not provided; and (3) information on how COVID-19 rates for FN varied regionally was not considered.

Summary box

- ⇒ Mallard *et al* aptly argue for the need to collect COVID-19 data on Indigenous populations because during times of pandemics, they experience more severe health outcomes in relation to their non-Indigenous counterparts.
- ⇒ Although the authors point to major gaps in data collation and analysis of nine Indigenous populations around the world, they have failed to notice that the Canadian COVID-19 data for First Nations are recorded for those *living on reserves only*.
- ⇒ Without citations, the population sizes for both First Nations and non-First Nations could not be confirmed, nor the COVID-19 counts in the non-First Nations populations; rates were adjusted with government-reported population estimates (for the fourth quarter of 2020) and COVID-19 counts.
- ⇒ When adjusted for population size for First Nations on reserves and corrected COVID-19 counts, prevalence and mortality rates are much higher than those reported in the Mallard *et al* study.
- ⇒ The findings that non-First Nations have higher COVID-19 prevalence and mortality rates are maintained when corrected for the aforementioned errors; however, a month after the data published by Mallard *et al* (by the end of December 2020), the prevalence among First Nations on reserves surpassed those of non-First Nations, similarly the COVID-19 death rate in First Nations on reserves exceeded the non-First Nations rate by at least the end of April 2021.

WRONG POPULATION SIZE ESTIMATES AND LACK OF SOURCING

In Mallard *et al*'s¹ table 1 the population of FN was estimated to be 1 400 685. This number appears to have been obtained from the 2011 census,² which represents *all* Aboriginal people in the country. This estimate would otherwise be correct if the number of confirmed cases also represented confirmed cases among *all* Aboriginal people in Canada.

Table 1 COVID-19 cases and deaths and associated rates* beginning with 24 November 2020, and every end of month, until 14 January 2022

Time period	Estimated number of cases from Mallard <i>et al</i> ¹		Prevalence rate (per 100 000)		Ratio of prevalence rates (FN/NFN)		Estimated number of deaths from Mallard <i>et al</i>		Death rate (per 100 000)		Ratio of death rates (FN/NFN)		Case fatality rate (%)	
	NFN	FN	NFN	FN	NFN	FN	NFN	FN	NFN	FN	NFN	FN	NFN	FN
24 Nov 2020	331 473.39	3840.68	882.94	782.39	0.89	41.18	90.77	8.39	0.09	10.28	1.07			
Number of cases from government of Canada ^{6,†}														
24 Nov 2020	342 444	3316	912.16	675.50	0.74	28	31.05	5.70	0.18	3.40	0.84			
30 Nov 2020	378 139	3989	1007.24	812.60	0.81	34	32.42	6.93	0.21	3.22	0.85			
31 Dec 2020	581 427	8493	1548.73	1730.11	1.12	81	41.69	16.50	0.40	2.69	0.95			
31 Jan 2021	779 853	16 376	2077.27	3335.96	1.61	157	53.36	31.98	0.60	2.57	0.96			
28 Feb 2021	867 694	20 882	2311.25	4253.88	1.84	224	58.58	45.63	0.78	2.53	1.07			
31 Mar 2021	982 110	24 843	2616.02	5060.78	1.93	283	61.16	57.65	0.94	2.34	1.14			
30 Apr 2021	1 219 418	27 228	3248.13	5546.63	1.71	317	64.51	64.58	1.00	1.99	1.16			
31 May 2021	1 381 573	29 548	3680.06	6019.23	1.64	341	68.05	69.47	1.02	1.85	1.15			
30 June 2021	1 415 284	32 091	3769.86	6537.27	1.73	360	70.04	73.34	1.05	1.86	1.12			
31 July 2021	1 431 252	33 095	3812.39	6741.80	1.77	381	70.84	77.61	1.10	1.86	1.15			
31 Aug 2021	1 496 256	35 225	3985.54	7175.70	1.80	394	71.74	80.26	1.12	1.80	1.12			
30 Sept 2021	1 624 725	41 017	4327.74	8355.59	1.93	421	74.24	85.76	1.16	1.72	1.03			
31 Oct 2021	1 716 559	46 731	4572.35	9519.59	2.08	491	77.17	100.02	1.30	1.69	1.05			
30 Nov 2021	1 792 494	50 330	4774.62	10 252.74	2.15	543	79.07	110.61	1.40	1.66	1.08			
31 Dec 2021	2 188 309	53 961	5828.94	10 992.42	1.89	564	80.76	114.89	1.42	1.39	1.05			
14 Jan 2022	2 720 411	61 532	7246.29	12 534.71	1.73	572	83.43	116.52	1.40	1.15	0.93			

*Population size estimate for 2020 FN is 490 893.⁴ The population size estimate for 2020 NFN is 37 542 121, and is estimated from subtracting the total population size (38 033 014)⁵ from the FN population estimate.

[†]Includes both probable and confirmed cases.

FN, First Nations; NFN, non-First Nations.

Table 2 COVID-19 confirmed cases* and associated rates for each province and FN (living on reserves) in the respective provinces on 14 January 2022†

Province	Number of confirmed cases for FN ³	FN population size estimate ⁴	Prevalence rate for FN (per 100 000)	Number of confirmed cases for the province ⁶	Population size estimate of the province ⁵	Provincial prevalence rate
British Columbia	6871	62 700	10 958.53	293 521	5 156 587	5692.16
Alberta	15 485	76 793	20 164.60	436 495	4 424 557	9865.28
Saskatchewan	14 102	77 770	18 132.96	97 545	1 178 164	8279.41
Manitoba	14 266	93 975	15 180.63	107 838	1 380 447	7811.82
Ontario	5993	97 056	6174.79	926 904	14 740 704	6288.06
Quebec	3840	57 402	6689.66	783 102	8 579 476	9127.62
Atlantic (New Brunswick, Nova Scotia, PEI, and Newfoundland and Labrador)	975	25 197	3869.51	67 559	2 446 405	2761.56

*The ISC³ does not provide COVID-19 death counts for the provinces, thus the provincial COVID-19 rates for FN could not be generated.

†COVID-19 counts at the provincial level for FN³ are for the present day, past/archived counts are not available on the website, thus an examination of the FN provincial variation in COVID-19 could not be conducted at the time of the Mallard *et al*¹ study. FN, First Nations; ISC, Indigenous Services Canada; PEI, Prince Edward Island.

Mallard *et al* sourced the COVID-19 data on Indigenous populations in Canada from the Indigenous Services Canada (ISC),³ which provides the number of cases and deaths among FN with registered Indian status who reside on reserves (which is the only data on Aboriginal peoples available at the national level). The case and death counts for the FN population living on reserves are derived from the 10 provinces, where the Atlantic provinces (Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick) are grouped together.

Since Mallard *et al*'s study time frame was near the end of November 2020, an appropriate population estimate for the FN living on reserves is the 2020 population provided by the ISC (490 893),⁴ which considerably lower than that of 1.4 million. Similarly, the population estimate for the non-FN (NFN) can be estimated from the 2020 Statistics Canada fourth quarter minus the FN population (37 542 121).⁵ With the more recent population estimates and using the number of confirmed cases for FN interpolated from table 1 of Mallard *et al*,¹ the prevalence rate is 782.39 per 100 000; at this corrected rate, the FN prevalence rate is shy of the NFN population (882.94 per 100 000) (see table 1).

Using the same estimated population size for FN on reserves, the corrected death rate is 8.39 per 100 000; with this corrected rate, the original finding that NFN (corrected) death rate (90.77 per 100 000) is higher than that of the FN population is still maintained.

WRONG NUMBERS FOR COVID-19 COUNTS

The COVID-19 rates for Canada presented in Mallard *et al* cannot be taken at face value; however, because without

referencing, the COVID-19 counts (and population estimates) cannot be verified. The COVID-19 counts for 24 November 2020 (the date of data collation from Mallard *et al*¹) from the government of Canada⁶ and ISC³ websites provide numbers that are drastically different from those in Mallard *et al*,¹ and as such the associated rates do not correspond with those shown in their commentary (see table 1, rows 1 and 2). In fact, the number of COVID-19 deaths in NFN estimated from Mallard *et al* exceeds the number presently observed across the country (as of 14 January 2022).

Because COVID-19 rates can fluctuate over time, a simple exploration of the FN and NFN COVID-19 monthly numbers and rates (end of month) until 14 January is provided in table 1. For the month of November, NFN COVID-19 rates were higher than the FN rates; by at least 31 December 2020, the COVID-19 prevalence rate for FN was higher than that of NFN (1730.11 vs 1548.73 per 100 000), and that trend persists to the present day (see table 1 and online supplemental figure 1). As for COVID-19 mortality rates, during the month of April 2021, FN death rates surpassed those of the rest of the country and remain higher throughout the pandemic (see online supplemental figure 2). As Mallard *et al* propose, the COVID-19 counts are grossly under-reported in FN, as such the disparities in prevalence rates are most likely even greater. The apparent 'good control of COVID-19' in Canada did not benefit the reserves in terms of COVID-19 prevalence rates, but it mitigated deaths early in the pandemic.

VARIATION IN THE CANADIAN FN COVID-19 EXPERIENCE

As the second largest country in the world, with an area of nearly 10 million km², undoubtedly there has been geographical variation in COVID-19 rates in the population at large and for FN populations as well. Regional variation in Canada was alluded to in Mallard *et al*, as they discussed the possibility of significant disparities between NFN and FN in isolated and/or remote areas such as in Saskatchewan.¹ A current examination of the variation in confirmed cases at the provincial level compared with FN (living on reserves) for each province highlights the diversity in the COVID-19 experience. The highest rates for FN are found in Alberta (20 164.60 per 100 000), and the lowest for FN are in Ontario at 6174.79 per 100 000 (see table 2).

In general, the FN prevalence rate for each province was higher than the overall provincial rate; the only two exceptions were Ontario and Quebec. The prevalence rates were highest in the western provinces (British Columbia, Alberta, Saskatchewan and Manitoba), where more than half of FN reside, and declined in an eastwardly fashion. This finding would have most likely been observed at the time of publication of Mallard *et al*'s commentary¹; from the end of 2020 until at least June 2021, prevalence rates in the FN western provinces surpassed those of their respective provinces,⁷ and FN populations experienced more severe outcomes because they represented half of hospitalisation in some provinces.⁸ Reasons for elevated prevalence rates in western FN populations include the following: overcrowded living environments; social gatherings; relaxed protective measures; food insecurity; underlying morbidities; limited access to healthcare; and travelling in and out the community for work and commodities.^{7,8} The epigenetic impact (alteration of how genes creates proteins) from intergenerational trauma associated with colonialism stressors, such as the residential school system and displacement, is also a major player in FN vulnerability to COVID-19.⁷

CONCLUSION

The assessment of any population, let alone Indigenous populations, and COVID-19 data must be done with an appreciation of data context: the start and duration of the pandemic, and the type of data available (FNs on reserves vs. all FN). Researchers not familiar with the demographic data of a country should scrutinise the data and as it is best practice in academia to endeavour to be transparent by providing the sources of the data.

In Canada, the first case of COVID-19 was on 25 January 2020,⁶ and the first cases in FN appear around 14 March 2020⁶; with so few deaths in the FN population beginning in early May 2020 and remaining below 10 deaths until mid-September, there is no question that the first wave of the pandemic did not affect FN populations as hard as it did NFN. A single point in time for assessing the COVID-19 impact on Indigenous populations around the world is not sufficient to capture the overall and regional

COVID-19 situations; by November 2020, in Canada, it was simply too early in the pandemic for SARS-CoV-2 to enact its toll on the more isolated FN communities.

Unfortunately, Canada's COVID-19 data on the Indigenous populations are far from ideal, not only does it exclude many FNs *not* living on reserves, but FN populations and Inuit residing in the three territories (this is most likely because there are not any Indian reserves in the Yukon, only two in the Northwest Territories, and none in Nunavut).⁹ Métis are excluded from the counts as well. Further, the websites for FN organisations, from the provinces, which are purported to contain both on and off reserve COVID-19 data are not up to date (the only exception being Manitoba).¹⁰ Despite these limitations, if scholars do not take the time to carefully analyse the data available, we will run the risk of creating misleading conclusions that is perpetuated over time.

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