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Evidence synthesis

Evidence-informed interventions and best practices for supporting women experiencing or at risk of homelessness: a scoping review with gender and equity analysis

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Abstract

Introduction: While much of the literature on homelessness is centred on the experience of men, women make up over one-quarter of Canada's homeless population. Research has shown that women experiencing homelessness are often hidden (i.e. provisionally housed) and have different pathways into homelessness and different needs as compared to men. The objective of this research is to identify evidence-based interventions and best practices to better support women experiencing or at risk of homelessness.

Methods: We conducted a scoping review with a gender and equity analysis. This involved searching MEDLINE, CINAHL, PsycINFO and other databases for systematic reviews and randomized trials, supplementing our search through reference scanning and grey literature, followed by a qualitative synthesis of the evidence that examined gender and equity considerations.

Results: Of the 4102 articles identified on homelessness interventions, only 4 systematic reviews and 9 randomized trials were exclusively conducted on women or published disaggregated data enabling a gender analysis. Interventions with the strongest evidence included post-shelter advocacy counselling for women experiencing homelessness due to intimate partner violence, as well as case management and permanent housing subsidies (e.g. tenant-based rental assistance vouchers), which were shown to reduce homelessness, food insecurity, exposure to violence and psychosocial distress, as well as promote school stability and child well-being.

Conclusion: Much of the evidence on interventions to better support women experiencing homelessness focusses on those accessing domestic violence or family shelters. Since many more women are experiencing or at risk of hidden homelessness, population-based strategies are also needed to reduce gender inequity and exposure to violence, which are among the main structural drivers of homelessness among women.

Keywords: *scoping review, women, shelters, hidden homelessness, violence, equity, gender, housing, intervention research, evidence-informed policy*

Highlights

- Women make up over one-quarter of Canada's documented homeless population, but many more are "hidden homeless" who remain uncounted, and their pathways into homelessness and their support needs are often different than those of men.
- A number of evidence-informed interventions are available to better support women experiencing or at risk of homelessness, including post-shelter advocacy interventions, permanent housing subsidies (e.g. tenant based rental vouchers) and case management or other forms of social support.
- These interventions reduce homelessness, food insecurity, exposure to intimate partner violence and psychosocial distress, leading to greater self-esteem and quality of life for women, as well as fewer child separations and foster care placements, and significant improvements in school stability and child well-being.

Highlights continued on the following page

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- Widespread implementation of evidence-informed interventions is needed, both during the COVID-19 pandemic and afterward to better support women who are experiencing or at risk of homelessness, as well as to create the structural changes required to redress persistent gender inequities and eliminate violence.
- Population-wide measures to prevent women from experiencing homelessness in the first place include improving access to child care and stable employment, flexible work conditions, reducing wage gaps, formalizing and remunerating the work of informal family caregivers (most often done by women), changing social norms that tolerate and perpetuate intimate partner violence, and ensuring that women control a fair share of household wealth and decision-making.

Introduction

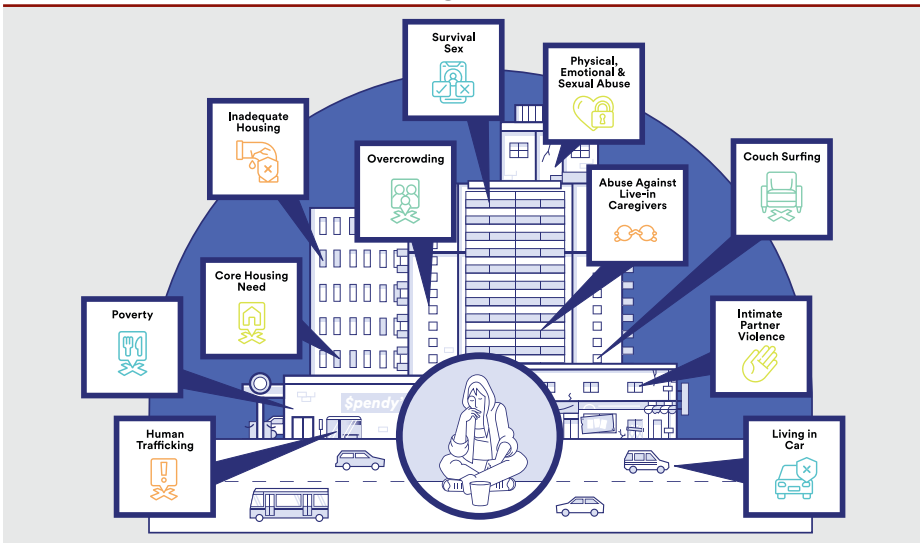
Women make up approximately 27.3% of the Canadian homeless population.[1] However, this is a major underestimate of the actual number experiencing and at risk of homelessness. According to the Canadian definition of homelessness,[2] women are considered "emergency sheltered" if they are staying temporarily at shelters, including those for victims of family violence, which is a major driver of homelessness for women and children across Canada[3] and globally.[4] However, more often, women (especially those with children) attempt to remain off the streets and out of shelters becoming "hidden homeless," moving from place to place and "couch surfing" at the homes of friends or family. These women are considered "provisionally accommodated," defined as someone who is "homeless and without permanent shelter who accesses temporary accommodation."[2,p3] This umbrella term also includes institutionalized persons who might transition into homelessness after their release in the absence of sufficient discharge planning and follow-up (e.g. girls "aging out" of foster care or incarcerated women departing from correctional services); recently arrived immigrants and refugees in temporary resettlement (e.g. multiple families sharing an overcrowded dwelling); women with cognitive or psychological disabilities; and many other groups.[2] Women may be forced to engage in "survival sex," are more likely to be exploited by human trafficking, and may even be living in their car in an attempt to stay safe, but they are often hidden behind closed doors (Figure 1), and therefore many remain uncounted.[5]

An analysis of Canadian census data from 2014 has shown that over 1 million women reported having experienced hidden homelessness at some point in their life, which was often associated with a history of adverse childhood experiences, weaker social networks and gender-diverse backgrounds.[6] In addition to these women experiencing various forms of homelessness, there is an even greater number who are considered "precariously housed,"[2] meaning they are living in homes in "core housing need"[7] that require major repairs ("inadequate housing"), have an insufficient number of rooms to accommodate the people living there ("unsuitable housing"), and cost more than 30% of the household's before-tax income ("unaffordable housing"). These women are therefore considered at imminent risk of homelessness in the event of a crisis (e.g. escalating violence, marital separation, eviction).[2]

It has been shown that women have different pathways into homelessness, as well as different support needs, than men.[8] Women are more likely to experience homelessness due to domestic violence and a lack of social support. Leaving a violent relationship can be considerably more difficult if a victim shares children, a home and resources with their partner.[9] On average, one woman in Canada is killed by her intimate partner every 5 days.[10] Over 40 000 women and their 27 000 children resort to living in shelters across Canada each year, with approximately 3600 women and their 3100 children staying in shelter facilities on any given night.[11] Shelters are a means to escape emotional or psychological abuse (89%), physical abuse (73%), financial abuse (51%), sexual abuse (33%) and even human trafficking (3%) and forced marriage (2%).[11] Women in rural and remote areas, and particularly Indigenous women,[12] experience the highest overall rates of intimate partner violence (IPV).[13] Those with dependent children often try to avoid shelters until all other options are exhausted (i.e. staying with family and friends).[14] Therefore, exploring interventions that are effective in addressing homelessness requires a gender analysis, since what works for men does not necessarily work for women.[15,16]

Intimate partner violence, poverty and homelessness among women are interlinked and a major challenge and hidden crisis in Canada that costs taxpayers an

FIGURE 1
Different forms of hidden homelessness among women, girls and gender-diverse persons experiencing homelessness



Source: Reprinted with permission from Schwan K, Versteegh A, Perri M, Caplan R, Baig K, Dej E, et al. 8 key challenges & opportunities for change, p. 6. In: Hache A, Nelson A, Kratochvil E, Malenfant J, editors. The state of women's housing need & homelessness in Canada. Toronto (ON): Canadian Observatory on Homelessness Press; 2020. Available from: http://womenshomelessness.ca/wp-content/uploads/Executive-Summary-State-of-Womens-Homelessness.pdf

estimated CAD 7 billion each year. The greatest losses are incurred by the women themselves, including the harms of witnessing violence and lost opportunities for their children.[17] Since the COVID-19 pandemic has resulted in extended lockdowns for months at a time across Canada, the situation for women at risk of or experiencing homelessness is all the more urgent.[18]

As part of a larger initiative to develop clinical practice guidelines for supporting persons experiencing homelessness in Canada,[19,20] women experiencing homelessness were considered among the priority populations identified using a modified Delphi consensus process.[21] The aim of this article is to examine evidence-based interventions and best practices specifically aimed at supporting women experiencing and at risk of homelessness, to enable a more effective approach that is tailored and adapted to the specific needs of women.

Methods

We conducted a scoping review of published primary and secondary research studies using standard methods[22] with a gender analysis to understand what interventions are effective for women experiencing homelessness and more responsive to their specific needs,[23] as well as an equity analysis to assess the potential for reducing inequities in multiple domains.[24]

Search strategy and selection criteria

A systematic search was carried out with the aid of an information scientist using relevant keywords and Medical Subject Headings (MeSH) terms for published randomized trials and systematic reviews. Keywords included "women", "vulnerable populations", "homeless" and "marginalized." Figure 2 shows the MEDLINE search strategy with a complete list of key words. Databases searched were MEDLINE, CINAHL, PsycINFO, Cochrane CENTRAL, PROSPERO and DARE from database inception to 28 March 2018. Title and abstract screening was done by two reviewers independently, in duplicate. All randomized controlled trials and systematic reviews exclusively focussed on women (aged 18 years and over) experiencing homelessness were selected for full-text review. However, since the availability of intervention research focussed on women experiencing homelessness is limited, we also included equity-relevant, mixed population studies for which disaggregated outcomes data were available to assess the intervention's impact on women (and their offspring, where applicable).[25] There was no restriction for types of intervention(s) or outcomes studied (as long as housing status was one of these outcomes). Searches were conducted using English search terms, and articles were retrieved regardless of language of publication. To ensure relevance to the Canadian context, only articles from high-income countries as defined by the World Bank were retained. Full-text review was done independently, and 20% of a random selection of excluded studies was corroborated by a second reviewer. All inter-reviewer discrepancies during both phases of screening were resolved through discussion or by a third reviewer.

Reference lists for all articles selected for full-text review were manually searched for

FIGURE 2
Search strategy for systematic review of evidence-informed interventions and best practices for supporting women experiencing or at risk of homelessness

Database: Ovid MEDLINE <1946 to Present with Daily Update>; Ovid MEDLINE Epub Ahead of Print <March 28, 2018>; Ovid MEDLINE In-Process & Other Non-Indexed Citations <March 28, 2018>

Search Date: 29 March 2018

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1 exp women/

2 (female$ or woman$ or women$)

3 or/1-2

4 vulnerable populations/

5 poverty areas/

6 ((deprived or destitute? or impoverished or imprisoned or incarcerated or low income or marginalised or marginalized or needy or poverty or prisoner? or vulnerably) adj5 (female? or woman$ or women$)).

7 homeless persons/

8 homeless$

9 (temporar$ adj2 (accommodat$ or home? or hous$))

10 ((based or housed or residen$ or temporar$) adj2 shelter?)

11 or/4-10

12 meta analysis.

13 review.pt.

14 (medline or pubmed or searched)

15 or/12-14

16 3 and 11 and 15

17 animals/ not (humans/ and animals/)

18 16 not 17

19 remove duplicates from 18

further relevant citations. These were cross-referenced against our original search results and any additional potentially relevant citations were screened. A published Campbell Evidence and Gap Map[26] and a focussed grey literature search of documents on the Government of Canada website[27] were used to identify additional studies with disaggregated women-specific data for inclusion. Finally, experts in the field were consulted to ensure inclusion of any additional relevant studies in the grey literature.

Data synthesis with a gender and equity analysis

Following title and abstract screening and full text review, a standardized data extraction form was used to systematically extract data from included studies (i.e. study design, target population, intervention, control group, outcomes). Due to the heterogeneity of the population subtypes studied (women experiencing homelessness who were shelter-based vs. community-based), the many different types of interventions included and the wide range of outcomes measured, there were insufficient data for a meta-analysis and forest plot, and therefore a qualitative (narrative) synthesis was used to describe the findings. Two independent reviewers identified emerging themes by coding data from the data extraction forms; any interpretive differences were resolved through discussion, and themes were compiled and reported narratively.

A gender analysis was carried out based on the Canadian Institutes for Health Research (CIHR) Sex/Gender-Responsive Assessment Scale for Health Research.[28] Studies were rated on a scale of 0 to 3:

Gender-blind: Disregards that different genders can be differentially affected (score = 0);

Gender-sensitive: Acknowledges sex/gender, but not part of study design (score = 1);

Gender-specific: Acknowledges sex/gender, and part of study design (score = 2);

Gender-transformative: Addresses gender-related drivers of inequities (score = 3).

An equity analysis further examined whether the studies incorporated broader health equity considerations using the PROGRESS Plus framework (**P**lace of residence, **R**ace/ethnicity/culture/language, **O**ccupation, **G**ender, **R**eligion, **E**ducation, **S**ocioeconomic status, **S**ocial capital plus other context-specific factors),[25] as well as reflecting on how future widespread implementation of the interventions under study could reduce or inadvertently lead to widening health inequities in practice, for instance, better supporting women already accessing shelter supports but potentially leaving further behind women in the community experiencing hidden homelessness.

Results

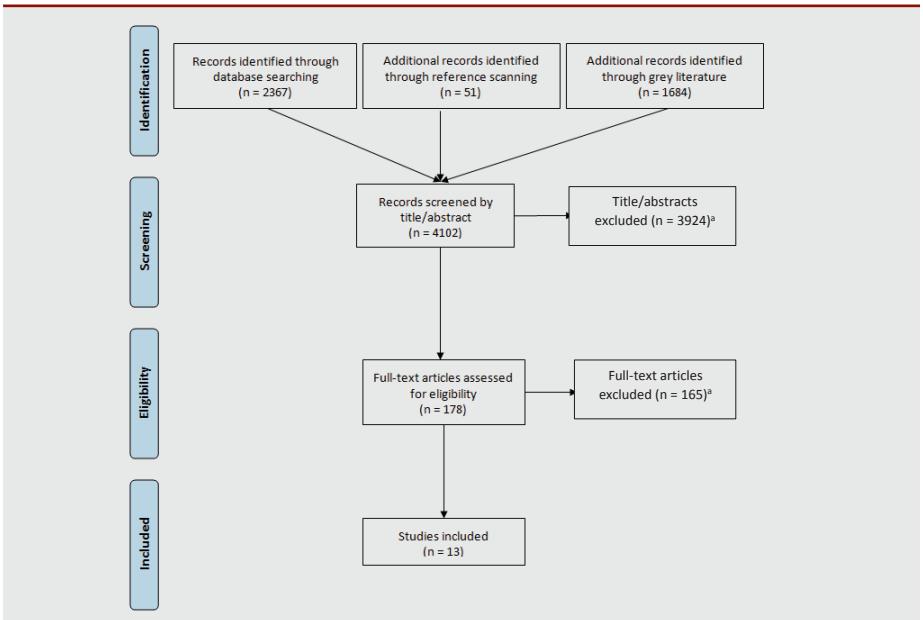
Of 4102 studies identified (2367 by systematic searching, 51 by reference scanning, and 1684 in the grey literature) 3924 were excluded during the title/abstract screening, and a further 165 following full-text review. In total, 13 articles were included in our final analysis, including 4 systematic reviews[29-32] and 9 randomized trials[33-41] conducted in the USA (n = 8), Netherlands (n = 2), UK (n = 1), Australia (n = 1) and Canada (n = 1) (Figure 3). Having satisfied the four main inclusion criteria for this review, each of these articles is based on the highest-quality evidence (i.e. systematic reviews and randomized controlled trials) relevant to the Canadian context (i.e. data collected in high-income country settings), assesses the impact of intervention(s) on housing status and enables a gender analysis (i.e. research focussed on women or disaggregated data on women participants).

Gender and equity analysis of included studies

Of the 13 included studies (Table 1), 9 studies[29,31-33,37-41] were rated as gender-specific, since they acknowledged gender-related needs or trends, and incorporated gender considerations in study design. The remaining 4 studies[30,34-36] were rated as gender-sensitive because they acknowledged gender- or sex-related differences but did not incorporate these considerations in the research design.

In terms of broader equity considerations, in addition to gender, the included studies also looked at place of residence, since identifying evidence-informed interventions

FIGURE 3
PRISMA flowchart of research studies identified by systematic searching multiple sources of evidence and including only highest-quality evidence relevant to Canadian context that allowed a gender analysis of intervention impact on housing status



Source of methodology for reporting data sources used in systematic reviews: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. BMJ. 2009;339:b2535. https://doi.org/10.1136/bmj.b2535

[a] Reasons for exclusion of research studies from the analysis:

- Study design: methodology used was not systematic review or randomized controlled trial (i.e. not highest-quality evidence).
- Study settings: data were not collected in high-income countries (i.e. results may not be applicable to the Canadian context).
- Study population: not focussed on women or did not include disaggregated data (i.e. data did not permit a gender analysis).
- Study outcomes: no outcomes reported on housing status (i.e. unable to assess homelessness before/after intervention).

TABLE 1
Gender[a] and equity[b] analysis of studies included in scoping review of evidence-informed interventions and best practices for women experiencing or at risk of homelessness

Article	Gender analysis	Equity analysis
Systematic review 1. Jonker et al.[29]	**Gender-specific** (participants were female IPV[c] victims aged >18 years, recruited through shelters)	**Place of residence** = "shelter" **Gender** = "women"
Systematic review 2. Speirs et al.[30]	**Gender-sensitive** (participants included more than 50% women aged 15–60 years)	**Place of residence** = "homeless" **Ethnicity** = "53% were of African American origin"[d] **Gender** = "women and men"
Systematic review 3. Rivas et al.[31]	**Gender-specific** (participants included women aged 15 years and over who have experienced IPV[c])	**Place of residence** = many "living with or still intimately involved with the perpetrator at study entry" **Ethnicity** = "whites, African Americans and Latinas,"[d] one study in this systematic review included "mostly Chinese women" **Gender** = "women" **Education** = "few had university studies" **Socioeconomic status** = "most of the women were on low incomes"
Systematic review 4. Wathen and MacMillan[32]	**Gender-specific** (participants included women leaving shelter after at least 1 night's stay; also included married US Navy couples where active-duty husbands had history of substantiated physical assault of female partners)	**Place of residence** = "shelter" for at least 1 night **Ethnicity** = one study had "a sample of predominantly Hispanic[d] women who were pregnant and had experienced physical abuse" **Gender** = "women" **Plus** = focussed on IPV,[c] which in this study was "defined as physical and psychological abuse of women by their male partners, including sexual abuse and abuse during pregnancy"
Randomized controlled trial 1. Constantino et al.[33]	**Gender-specific** (participants included first-time residents of a domestic violence shelter for abused women in Western Pennsylvania)	**Place of residence** = "domestic violence shelter" **Ethnicity** = "Most women were white, not Hispanic,[d] and the rest were African Americans" **Occupation** = Half were unemployed **Education** = "Most of the women completed high school, and three women had college degrees" **Socioeconomic status** = three-quarters had annual income less than USD 20 000 **Gender** = "women"
Randomized controlled trial 2. Gubits et al.[34]	**Gender-sensitive** (participants included 2282 families who enrolled in the Family Options Study and had characteristics "similar to characteristics of families who experience homelessness nationwide …. The typical family in the study consisted of an adult woman, a median of 29 years old, living with one or two of her children in an emergency shelter.")	**Place of residence** = "Most families in the study (79 percent) were not homeless immediately before entering the shelter from which they were recruited into the study …. Many reported they either had a poor rental history (26 percent had been evicted) or had never been a leaseholder (35 percent)." **Occupation** = "Most family heads were not working at the time of random assignment (83 percent), and more than one-half had not worked for pay in the previous 6 months." **Socioeconomic status** = "The median annual household income of all families in the study at baseline was $7410." **Gender** = Different family types enrolled in the study, including single-parent, women-headed families. **Plus** = "21 percent reported a disability that prevents or limits work"
Randomized controlled trial 3. McHugo et al.[35]	**Gender-sensitive** (participants included adults with "severe mental illness who were currently homeless or at high risk for homelessness")	**Place of residence** = "Participants were recruited from community mental health centers, hospitals, homeless shelters, food kitchens, drop-in centers, crisis housing, and hotels…. 85.1 percent were homeless…. The average number of months homeless in their lifetime was 51.7, and their average age at the time of their first homeless episode was 28.9 years (SD = 10.9)." **Ethnicity** = "Most of the participants were African-American (82.6%)." **Occupation** = "unemployed (90.1%)" **Gender** = "over half of the final study group members were women (52.1%)" **Plus** = "72.7 percent of the study group had schizophrenia spectrum disorders and 27.3 percent had mood disorders"
Randomized controlled trial 4. Milby et al.[36]	**Gender-sensitive** (participants included "homeless persons from the Birmingham, Alabama, area with coexisting cocaine dependence and nonpsychotic mental disorders…. We examined the relationship of gender to the outcomes of housing, employment, and abstinence. We found no evidence that gender acted as an effect modifier or a confounder.")	**Place of residence** = "lacked a fixed nighttime residence, including shelters or other temporary accommodations, or were at imminent risk of becoming homeless" **Ethnicity** = Most participants were "African American" **Occupation** = "Longest full-time job" **Gender** = about one-quarter were female **Plus** = "cocaine dependence"; "veteran"

Continued on the following page

TABLE 1 (continued)
Gender[a] and equity[b] analysis of studies included in scoping review of evidence-informed interventions and best practices for women experiencing or at risk of homelessness

Article	Gender analysis	Equity analysis
Randomized controlled trial 5. Nyamathi et al.[37]	**Gender-specific** (participants included "homeless African American, Hispanic,[d] and Anglo[d] women and their intimate partners living in an inner-city area of Los Angeles.... Both men and women mostly showed similar improvement on scores.")	**Place of residence** = "homeless…defined as one who spent the previous night in a shelter, hotel, motel, or home of a relative or friend and was uncertain as to her residence in the next 60 days or who stated that she did not have a home or house of her own in which to reside" **Ethnicity** = African American, Hispanic/Latina,[d] Anglo American,[d] other **Occupation** = unemployment **Gender** = "The vast majority of the intimate partners were male (94%); however, 7% of the partners were female" **Education** = years of education **Plus** = lifetime history of substance abuse; HIV positive
Randomized controlled trial 6. Nyamathi, Leake et al.[38]	**Gender-specific** (participants included "858 women who were residing in 10 homeless shelters and/or 11 drug recovery programs")	**Place of residence** = "homeless woman was defined as one who spent the previous night in a shelter, hotel, motel, or home of a relative or friend and was uncertain as to her residence in the next 60 days or stated that she did not have a home or house of her own in which to reside" **Ethnicity** = "Eligible candidates had to be African-American or Latina[d] women" **Occupation** = "women were predominantly single, African-American, and unemployed" **Plus** = "recent history of drug addiction, HIV positive"
Randomized controlled trial 7. Nyamathi, Flaskerud et al.[39]	**Gender-specific** (participants included "241 homeless and drug addicted women and their sexual partners")	**Place of residence** = "resided in one of 11 homeless shelters and 9 residential drug recovery programs" **Ethnicity** = "All but two of the women were African-American or Latina[d]" **Occupation** = "the vast majority of women were unemployed and had children" **Gender** = women and their sexual partners **Religion** = "Protestant (75%)" **Education** = "years of education ranged from 3 to 17 years" **Plus** = "drug user, a sexual partner of a drug user, a prostitute or homeless and housed in a shelter"
Randomized controlled trial 8. Lako et al.[40]	**Gender-specific** (participants were women who "were eligible if they: (1) were aged ≥ 18; (2) stayed at the shelter due to IPV[c] or honor-related violence [violence committed to restore or prevent violation of the family honor]; (3) stayed at the shelter for ≥ 6 weeks; (4) had a set date of departure from the shelter or received priority status for social housing; and (5) were moving to housing without daily supervision or support where they would have to pay rent or housing costs")	**Place of residence** = shelter **Ethnicity** = "the proportion of Dutch-speaking women with unmet care needs declined from 88% to 57%, while the proportion of non-Dutch-speaking women with unmet care needs declined from 100% to 90%" **Gender** = women **Education** = low, intermediate, high **Plus** = "unmet care needs"
Randomized controlled trial 9. Samuels et al.[41]	**Gender-specific** (participants included "single, female-headed households entering family homeless shelters")	**Place of residence** = "shelter" **Ethnicity** = "Most of the homeless mothers (85%) identified as African American, Latino,[d] or other ethnic minority" **Occupation** = "most (85%) were currently unemployed" **Education** = "Nearly two-fifths of the mothers did not have a high school diploma" **Socioeconomic status** = "monthly income" USD 680–810 **Plus** = "More than 1 out of 5 of the mothers reported that during their childhood, they had been involved in foster care placements"

[a] Canadian Institutes for Health Research (CIHR) Sex/Gender-Responsive Assessment Scale for Health Research: *Gender-blind*: disregards that different genders can be differentially affected (score = 0); *Gender-sensitive*: acknowledges sex/gender, but not part of study design (score = 1); *Gender-specific*: acknowledges sex/gender, and part of study design (score = 2); *Gender-transformative*: addresses gender-related drivers of inequities (score = 3).[28]

[b] PROGRESS Plus framework: **P**lace of residence, **R**ace/ethnicity/culture/language, **O**ccupation, **G**ender, **R**eligion, **E**ducation, **S**ocioeconomic status, **S**ocial capital; "Plus" includes other context-specific factors.[25]

[c] IPV = Intimate partner violence, which can be defined as physical and psychological abuse of women by their male partners, including sexual abuse and abuse during pregnancy.

[d] Terminology used in the original studies.

for women experiencing homelessness was the main objective of this review and studies that did not address housing status were excluded. However, of the included studies, most focussed on emergency-sheltered women (i.e. temporarily housed in domestic violence shelters or family homeless shelters) who would be easier to identify and recruit for research.[29,31-34,40,41] Very few studies were entirely or partly community-based and included women who were hidden homeless or at risk of homelessness (e.g. precariously housed due to exposure to intimate partner violence).[30-32] In terms of ethnicity and language, multiple studies[30,32-41] specified the ethnicity of the population studied, notably women from low-income racialized communities, but did not disaggregate or report on specific findings for minority populations.[29,32,34] The three studies by Nyamathi and colleagues[37-39] focussed on women of African American and Latin American descent diagnosed with HIV in the United States. Lako and colleagues[40] made recommendations for migrant women experiencing homelessness who face particular barriers in access to health and social services. One systematic review[31] concluded that further work is needed to ascertain how advocacy interventions can be tailored to different ethnic groups, and to abused women living in rural communities or resource-poor settings. There was little additional information in most of the studies on the women's education level, occupation, socioeconomic status, or other factors such as physical or cognitive disability, severe mental illness, substance use disorder, adverse childhood experiences or prior involvement in foster care. Even when these equity considerations were identified, they often were not integrated into the study analysis to determine whether or how these factors influenced outcomes.

Gender-related drivers of homelessness among women: violence, poverty and lack of child care

Eight out of 13 studies[29,31-33,36,38,40,41] identified a high prevalence of IPV as a gender-specific driver of homelessness. The intervention target population of five studies[29,31-33,40] was women experiencing IPV. Abuse was reported to lead to more severe health outcomes and higher health care costs for women.[31-33] One study[32] emphasized the importance of intervening with perpetrators of violence, as well as victims, and the need for further research into the effectiveness of both approaches.

Women's lack of access to and control of resources (e.g. income, education or social support) was identified by six studies[29,30,33,38,40,41] as another main driver leading to women experiencing homelessness. One study[29] highlighted that combining social support with improved access to resources, leading to greater financial autonomy for women, improved their ability to leave abusive relationships. Another study[41] reported that connecting mothers to government entitlements and employment programs alleviating poverty and providing opportunities facilitated coping with the trauma of homelessness. Women's financial dependence on their abusers was identified as a barrier to them leaving abusive situations.[33]

Another resource concern that disproportionately affects women experiencing homelessness is a lack of access to child care. Family units experiencing homelessness are largely female-headed.[34,41] One study identified the lack of child care as increasing the risk of homelessness among women.[36] Three studies reported that the absence of child care acted as a barrier to attending appointments for medical or social services[30,33] or as a potential cause of loss to follow-up.[31] Samuels et al. highlighted the additional stress associated with becoming homeless with children,[41] and Speirs and colleagues reported that women experiencing homelessness need a safe place for themselves and their children.[30]

Evidence-informed interventions and best practices to support women experiencing homelessness

A number of interventions were examined through these primary and secondary research studies including social support, advocacy and case management interventions, as well as permanent housing support interventions (Table 2).

Social support, advocacy and case management interventions

Four systematic reviews and three randomized trials provided evidence on social support, advocacy and case management interventions that significantly improved mental health, social belonging, time to rehousing and health-service utilization among women experiencing homelessness.[29-33,40,41] Most often these interventions were delivered via the support staff of domestic violence shelters, which are an important type of temporary housing support used as a platform for the delivery of many other interventions.

Emergency-sheltered women experiencing homelessness

Many different types of social support, advocacy and case management interventions have been studied for emergency-sheltered women. For example, Constantino and colleagues[33] evaluated an 8-week program consisting of weekly 90-minute sessions offered by a trained nurse who provided women in domestic violence shelters guidance on how to access community resources and promote self-esteem. The program was shown to significantly improve perceived availability of support resources and to reduce women's psychological distress symptoms as compared to the control group.

Critical time interventions (CTIs) are strengths-based approaches to expand social networks and ensure continuity of care during difficult transition periods in people's lives (e.g. leaving a domestic violence shelter and moving to a new home). Case managers provide practical and emotional support for one to three hours per week over a period of several months (e.g. helping to furnish the apartment, active listening support or linking the client to support resources). This kind of support has been shown to reduce posttraumatic stress disorder (PTSD) symptoms as well as unmet health care needs, especially among minority populations who do not speak the local language.[40]

A meta-analysis by Jonker and colleagues[29] examined a variety of individual and group social support interventions provided to emergency-sheltered women experiencing homelessness following the escalation of IPV, including group counselling, coping skills training, problem-solving techniques, music therapy, cognitive behavioural techniques, the development of parenting skills, stress management and brief one-on-one advocacy services. They found that these shelter-based and post-shelter social support interventions were effective in improving women's mental health outcomes, in decreasing abuse and in improving social outcomes.

The systematic review by Wathen and MacMillan also found that among women

TABLE 2
Overview of intervention research to support women experiencing or at risk of homelessness

Populations studied
• Emergency-sheltered women experiencing homelessness (e.g. domestic violence shelter, family homeless shelter)
• Women experiencing homelessness in the community (e.g. hidden homelessness, couch surfing)
• Women at risk of homelessness (e.g. pregnant women experiencing violence escalation, women at risk of eviction)
Interventions
• Social support, advocacy and case management interventions
> Shelter-based and post-shelter interventions
• e.g. critical time interventions, group counselling, problem-solving, stress management, development of parenting skills, case management, post-shelter advocacy
> Community-based and primary care interventions
• e.g. structured education, therapeutic communities, brief advocacy interventions
• Permanent housing support interventions
> Family critical time interventions with community-based housing
> Permanent supportive housing with integrated/parallel case management
> Deep permanent housing subsidies (e.g. tenant-based rental vouchers)
Outcomes
• Access to health care and social support resources
• Access to permanent, affordable and quality housing
• Women's mental/physical health (e.g. depression, psychosocial distress, substance use)
• Personal safety (e.g. ongoing exposure to violence, rates of re-abuse)
• Self-esteem, community connectedness and individual agency/empowerment
• Family integrity (e.g. child separations, foster care placements, etc.)
• Child(ren)'s school stability, school attainment, health and well-being

who have spent at least one night in a shelter, "there is fair evidence that those who received a specific program of advocacy and counselling services reported a decreased rate of re-abuse and an improved quality of life."[32,p.589] The post-shelter advocacy services involved assisting women for four to six hours a week for 10 weeks with devising safety plans (if needed) and accessing community resources such as housing, employment and social support. Rivas and colleagues specifically examined advocacy interventions and similarly found that intensive advocacy for women in domestic violence shelters improved quality of life and reduced physical abuse for a period of one to two years after the intervention.[31]

Women in the community experiencing hidden homelessness or at risk of homelessness

Speirs and colleagues[30] conducted a systematic review of effective interventions that community nurses could use to support women experiencing homelessness in community-based settings (e.g. hidden homelessness or at risk of homelessness). They found that social support interventions such as structured education and support sessions (with or without advocates or support persons), as well as therapeutic communities, reduced psychological distress and health care use, improved self-esteem and reduced drug and alcohol use (i.e. maladaptive forms of coping).

Wathen and MacMillan[32] similarly attempted to identify evidence-based interventions that would be applicable in primary care settings to reduce IPV, and thus protect women at risk of homelessness from escalation of violence. However, they found insufficient evidence to screen all women systematically for IPV in primary care settings, though targeted case finding is still important for women presenting with violence-related issues who require referral and support.

Rivas and colleagues[31] found moderate evidence that brief advocacy may provide small, short-term mental health benefits and reduce abuse, particularly for pregnant women, since IPV can increase around the time of pregnancy and therefore increase risk of homelessness and other negative outcomes.

Permanent housing support interventions

Four randomized trials examined permanent housing support interventions that improved housing stability and positively impacted mental health, quality of life and substance use outcomes.[34-36,41]

Family critical time interventions (FCTIs) involve case managers who support mothers with children over 9 months old in creating and maintaining effective links to community resources and accessing relevant services (including mental health support, childcare, employment linkages) and through assistance in applying for benefits, to gradually identify and transition to stable community housing and supports.[41] Mothers experiencing homelessness who accessed FCTIs plus scattered-site housing exited the shelter and obtained stable housing significantly more rapidly, with three-quarters housed within 100 days compared to 300 days or more for families receiving services-as-usual.[41] Both abstinence-contingent and non-abstinence-contingent housing increased number of days women were housed, employed and abstinent, though abstinence-contingent housing was somewhat more successful in decreasing the incidence of substance use.[36]

McHugo et al.[35] examined permanent supportive housing with integrated case management services ("integrated housing") versus community-based housing with case-management services provided in parallel ("parallel housing"), and found that both interventions increased stable housing and reduced functional homelessness, time spent in institutional settings and exposure to interpersonal violence, particularly for those benefitting from integrated housing services. The authors note that "the most surprising finding in this study was the emergence of gender as a moderator variable,"[35,p.979] whereby landlords in community-based housing were more likely to consider male participants

as potentially threatening, whereas women "were often seen as victims and accorded more benign decisions regarding their housing."[35, p.979] Thus, among those in the parallel housing stream, female participants spent more time in stable housing and reported greater overall life satisfaction than their male counterparts.

The Family Options study enrolled families experiencing homelessness who had spent at least seven days in a family shelter.[34] Over two-thirds were female-headed, single-parent families. Families were randomized to receive one of three interventions or be assigned to a control group receiving usual care in which families needed to find their own housing without access to specific interventions or additional support. The most effective intervention was priority access to deep permanent housing subsidies. The permanent housing subsidies were often in the form of ongoing rental assistance using tenant-based vouchers allowing families to rent the apartment of their choice in the private housing market but only pay a maximum of 30% of their adjusted monthly income, with the rest covered by the subsidy. These subsidies were sometimes accompanied by assistance in initially finding housing but proved to be highly effective even if not coupled with additional supportive services. Families receiving the tenant-based voucher permanent housing subsidies had significant reductions in homelessness, housing instability, use of emergency shelters up to 18 months post intervention, food insecurity, exposure to violence and psychosocial distress compared to usual care.[34] These families also had fewer child separations and foster care placements, and significant improvements in school stability and multiple other measures of adult and child well-being.

In contrast, those who were instead randomized to receive community-based rapid re-housing offering only temporary rental assistance renewable up to a maximum of 18 months, or those receiving temporary housing for up to 24 months in agency-controlled buildings with support services, had almost no impact on the incidence of IPV, homelessness, housing stability or rates of family preservation. Moreover, these interventions were nearly as costly as permanent housing subsidies, but were significantly less effective across multiple outcomes, and had only marginal added value over usual care.[34]

Discussion

This scoping review with a gender and equity analysis identified evidence-informed interventions and best practices[42] that help to overcome gender-related drivers of homelessness among women, notably, exposure to intimate partner violence and lack of financial independence. These interventions include social support, advocacy and case management (e.g. post-shelter advocacy counselling, therapeutic communities, group counselling, critical time interventions, etc.), as well as permanent supportive housing (e.g. tenant-based rental assistance) with or without case management.

The interventions for which there is consistent and stronger evidence across studies included post-shelter advocacy counselling, permanent housing subsidies and case management. For women experiencing homelessness due to IPV, post-shelter advocacy counselling resulted in lower rates of re-abuse, greater access to resources and improved quality of life.[32] Permanent housing subsidies (e.g. tenant-based rental assistance vouchers) for women with children spending at least seven days in a family shelter were shown to reduce housing instability, food insecurity, exposure to violence and psychosocial distress, as well as significantly improving school stability and child well-being outcomes.[34] The addition of case management (including FCTIs) helped women exit shelters and access stable housing more rapidly,[41] while reducing exposure to IPV, homelessness and time spent in institutional settings.[35]

Support for these interventions is further corroborated by the evidence reviews of the Canadian Task Force on Preventive Health Care,[43] the US *Guide to Community Preventive Services*[44] and the new *Canadian Medical Association Journal* Clinical Guidelines for Homeless and Vulnerably Housed People and People with Lived Homelessness Experience.[19]

In addition to being evidence-informed, it is also important to be trauma-informed.[45] Women experiencing or at risk of homelessness may suffer many traumatic losses, including the loss of a safe place to live, disruptions at work and the resulting instability for their family.[46] Women should therefore be involved in the decisions that affect them, and be empowered to choose the types of interventions that are right for them and their specific situation so that they can have greater agency to determine their future and that of their family.[47]

Strengths and limitations

A major strength of this study was the inclusion of a gender and equity analysis, allowing a better understanding of different pathways into homelessness for women, as well as different approaches for supporting those already experiencing and at risk of homelessness, particularly in relation to IPV and poverty.

A limitation of this study is that much of the current evidence base focusses on women experiencing homelessness who are emergency-sheltered (i.e. in domestic violence shelters or family homeless shelters), with much less research available to guide community-based intervention decisions and much-needed outreach for the even larger proportion of women who are hidden homeless or at risk of homelessness. The evidence is also quite heterogeneous. Different studies examine a number of different study subpopulations, types of interventions (often complex, multicomponent interventions) and outcome measures, which also makes it very difficult to conduct quantitative synthesis (e.g. meta-analysis) to determine the efficacy and effect size of any given intervention. As well, while the search strategy included the terms "wom*n" and "female", we recognize the possibility that evidence specific to other subpopulations of women, for example, trans women, may not have been adequately identified and addressed by this search.

Implications for policy and practice

While women living in Canada have high rates of educational attainment, Canada falls far below other high-income countries in terms of women's economic participation, pay index and political empowerment.[48] Annually in Canada, 96 000 individuals, the majority women, are victims of police-reported intimate partner violence.[49] It is well known that this grossly underestimates the actual number of women experiencing interpersonal violence, which, combined with women's lack of financial independence, is a major driver putting women at risk of homelessness. While shelters provide temporary refuge during times of crisis, these

experiences are highly disruptive. What women and children need is to be housed in safe, affordable, permanent housing equipped with adequate social supports and resources to overcome challenges in family dynamics and exposure to violence, or at the very least to have an exit strategy that allows them to rebuild their lives without needing shelters, which often remain a "last resort."

Conclusion

During the COVID-19 pandemic, responding to the needs of women experiencing or at risk of homelessness has become more urgent than ever, as families are at home in close quarters, with schools and daycares closed for extended periods and rates of domestic violence on the rise worldwide.[50] Women accounted for almost three-quarters of job losses in Canada during the first wave of COVID-19. The pandemic also revealed the extent to which women work in child care and elder care, sectors that are often underfunded and involve large proportions of informal and unpaid work, even though it is critical to the functioning of our economy and society.[51]

Even before COVID, women with children, particularly single mothers, earned less than women without children.[52] Women's economic empowerment interventions and legal reforms are central to IPV prevention approaches,[53] which in turn can prevent homelessness. It is now possible to imagine a post-COVID Canada where there is an end to woman and child homelessness through greater investments in promoting gender equity.[51] This could involve a number of structural changes, including formalizing care work with pay scales and benefits, transforming gender norms, improving access to child care, ensuring pay equity, creating opportunities for parental leave and work-life balance, ensuring job protection for persons with disabilities and other pro-equity policies and programs.

Creating more supportive social environments for health across the life course involves helping to support families in creating stronger adult-adult and adult-child attachments and nurture social-emotional competencies for families through prenatal classes and nurse home visitation programs, as well as in daycares and schools, to create greater family stability and to reduce IPV and adverse childhood experiences, which are often precursors to homelessness.

Since the number of women and children in shelters is only the "tip of the iceberg," a population approach can improve outcomes for many more women and their children, before they reach a crisis situation.[54] Greater efforts are therefore needed to measure the iceberg "below the surface" of IPV and hidden homelessness among women to better appreciate the true magnitude of the situation and the specific causes, to better support women with lived experience and to prevent homelessness.

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Conflicts of interest

No competing interests are declared by the authors.

Authors' contributions and statement

All authors were involved in the conception of the study. SM, CM and OM led the data extraction and initial analysis of the data. AA drafted the final version of the manuscript, and all authors reviewed and approved the final version for publication.

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Original qualitative research

Early childhood oral health promotion for First Nations and Métis communities and caregivers in Manitoba

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This article has been peer reviewed.

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Abstract

Introduction: Early childhood caries is a public health concern, and the considerable burden exhibited by Indigenous children highlights the oral health inequities across populations in Canada. Barriers include lack of access to oral health care and lack of culturally appropriate oral health promotion. The purpose of this study was to determine where and how First Nations and Métis parents, caregivers and community members learn about caring for young children's oral health, and what ideas and suggestions they have on how to disseminate information and promote early childhood oral health (ECOH) in Indigenous communities.

Methods: Sharing circles and focus groups engaged eight groups of purposively sampled participants (n = 59) in four communities in Manitoba. A grounded theory approach guided thematic analysis of audiorecorded and transcribed data.

Results: Participants said that they learned about oral health from parents, caregivers and friends, primary care providers, prenatal programs, schools and online. Some used traditional medicines. Participants recommended sharing culturally appropriate information through community and prenatal programs and workshops; schools and day care centres; posters, mailed pamphlets and phone communication (calls and text messages) to parents and caregivers, and via social media. Distributing enticing and interactive oral hygiene products that appeal to children was recommended as a way to encourage good oral hygiene.

Conclusion: Evidence-based oral health information and resources tailored to First Nations and Métis communities could, if strategically provided, reach more families and shift the current trajectory for ECOH.

Keywords: *early childhood oral health, early childhood caries, First Nations, Métis, oral health promotion*

Highlights

- First Nations and Métis people say that improving early childhood oral health involves getting the attention of community members.
- Caregivers need to be constantly reminded about the importance of young children's oral hygiene.
- Oral hygiene supplies such as toothbrushes should be provided to caregivers who cannot afford them.
- Oral health providers and non-dental health providers, such as nurses, can share oral health information, including anticipatory guidance, with the entire community.
- Information about dental care and good oral health behaviours can be given out at community events, through schools and health centres, and via community prenatal programs and social media.

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Introduction

First Nations, Métis and Inuit in Canada, and especially children, have significant oral health disparities.[1,2] Early childhood caries affects children's health and well-being, including eating, speech development and self-image.[3,4]

Early childhood caries disproportionately affects Indigenous children.[5,6] Lack of access to oral health care is a leading barrier. Other barriers are a lack of oral health awareness, social determinants of health and caregiver hygiene behaviours for children aged less than 72 months.[5,7] Increasing caregivers' awareness can help modify behaviours known to contribute to early childhood caries.[8,9]

The Healthy Smile Happy Child (HSHC) initiative has taken a community development approach to promoting young children's oral health.[10] Community development focusses on enabling communities to identify strategies, develop resources and determine teaching tools to prevent diseases in their particular contexts.[11,12] Community participation, which includes enhancing capability of service providers and community members to mobilize vital health messages, is essential. Community members, rather than service providers, often know their community best.[12] Understanding caregivers' and health care providers' knowledge of and attitudes towards existing oral health services is crucial in this process.[13] Particularly important is the recruitment and training of Indigenous and non-Indigenous health care providers on the specific contexts and oral care needs of Indigenous communities.[14]

HSHC oral health promotion programs have adopted key Indigenous engagement strategies to encourage both uptake and reintegration of healthy traditional child-rearing practices by caregivers.[15] The overall goal of attaining early childhood oral health (ECOH) includes reducing caregiver risk behaviours and supporting health-promoting behaviours associated with early childhood caries. The continuation of these and other oral health promotion efforts will greatly benefit from a clearer understanding of the ECOH landscape in First Nations and Métis communities.

The purpose of our study was to understand:

- where and how First Nations and Métis families and caregivers learn to take care of children's teeth; and
- the best ways to provide caregivers and communities with ECOH information to improve uptake and encourage the actions that reduce early childhood caries.

This article describes the suggestions of First Nations and Métis people on how to promote ECOH and prevent early childhood caries in Indigenous communities.

This baseline qualitative study was part of a larger mixed-methods ECOH intervention to prevent early childhood caries. In this study, we adopted community-based participatory research principles and Indigenous research methods to engage with four First Nations and Métis communities and residents. Community-based participatory research is often chosen as an equitable and trust-building approach in research with Indigenous peoples.[16,17]

The study was conducted in collaboration with the First Nations Health and Social Secretariat of Manitoba (FNHSSM) and the Manitoba Metis Federation (MMF). These Indigenous organizations represent registered First Nations and Métis peoples in Manitoba. The FNHSSM and the MMF representatives were key members of the research team from the start and assisted in every phase of the project. The representatives participated in designing the study, devising research questions, identifying and contacting communities to invite them to participate in the study, organizing meetings and data collection in the communities, and reviewing of data and manuscripts. These partners also shaped the nature and process of knowledge translation by reviewing documents and helping to organize community visits and activities to share findings and carry out ECOH promotion activities based on caregivers' recommendations. Representatives had real-time access to data, were updated on process in monthly meetings, were part of all key decision-making, and reviewed information and relevant documents.

Ethics approval was obtained from the University of Manitoba's Health Research Ethics Board. Approvals were also obtained from the FNHSSM and the MMF. The research process was guided by First Nations ownership, control, access and possession (OCAP) principles[18] and MMF ownership, control, access and stewardship (OCAS) principles.[19] Implementation of OCAP and OCAS means that, although data are analyzed at the University of Manitoba campuses, partners can access de-identified data at any time and in any format, upon request. Having decision-making roles on the research team means that communities have oversight in guiding how their data are used and disseminated. All information, documents and actions pertaining to the data are brought to the team for review and approval.

Participating communities gave free and informed consent prior to study commencement.[20] Written informed consent was obtained from participants prior to their taking part in the sharing circles or focus groups.

Methods

We used Indigenous research methods that foster cultural respect by mainstreaming Indigenous worldviews and perspectives.[21] Sharing circles congruent with Indigenous values were used to engage participants.[22] In total, 59 parents, grandparents and community members with children aged 72 months and under were purposively recruited by oral health promoters who lived and worked in the same rural communities as the study participants. Oral health promoters promote ECOH by providing oral health information and resources. Participants in urban communities were recruited by Indigenous-focus program coordinators.

Data collection

Sharing circles and focus groups were conducted at Indigenous-friendly programs in Winnipeg, Manitoba, and where community-based groups met in rural First Nations and Métis communities.[20] Sessions were facilitated by an experienced qualitative researcher and supported by HSHC staff.

There were 11 key questions (Table 1).

This article addresses responses to three of the questions, numbers 5, 6 and 10:

- Where did you learn about baby teeth and how to take care of them?

TABLE 1
Focus group and sharing circles questions[a]

	Study questions
1	Do you think healthy baby teeth make a difference in the child's overall health?
2	Do you think what you eat and how you take care of your teeth while pregnant will affect your child's teeth?
3	What do you think makes young kids get cavities or decay in their baby teeth?
4	How and why do you to take care of your children's teeth? a. What are some of the things you currently do to take care of your baby's or young child's teeth? b. What are (other) things you could do?
5	Where did you learn about baby teeth and how to take care of them? a. What or who influenced what you now know about taking care of baby's teeth? b. Did you find these resources respectful of your cultural traditions?
6	What do you think are the best ways to get important information and tips to parents and families to keep kids' teeth cavity-free and avoid getting serious tooth decay? Are there any particular places where you would like to see more information about children's dental health? Where and from whom?
7	What are some of the challenges or problems you face when taking care of your child's teeth? Has this led to any problems regarding their dental health (e.g. tooth decay)?
8	What are your thoughts about getting dental work done under general anesthesia? a. Do kids in your community go to have dental surgery in the operating room? How did it make you feel? b. Why do you think so many kids go to the operating room?
9	Some people say tooth decay can be prevented, even in young children. What do you think about this?
10	What is the best way to get oral health information across to you?
11	Any stories you would like to share with us about your child or children's dental experiences?

[a] Subquestions marked a and b in questions numbers 4, 5 and 8 were for use as prompts if the respondents needed the questions reframed to be able to answer.

- What do you think are the best ways to get important information and tips to parents and families to keep kids' teeth cavity-free and avoid getting serious tooth decay?
- What is the best way to get oral health information across to you?

These three questions yield data and themes specific to oral health promotion relevant to Indigenous caregivers and communities.

Responses to the other questions have been addressed elsewhere.

Data analysis

We conducted a thematic analysis to generate themes in direct response to the questions asked. A grounded theory approach[23] guided the study. We applied grounded theory because, although there has been some research on early childhood caries in First Nations communities, very little data exist for Métis populations. In addition, there were no published articles detailing community-driven health promotion strategies. Our aim was not to test the theory, but to understand the experiences of people living in First Nations and Métis communities.

Our process involved constant comparison of data, which is a key element in grounded theory. We conducted preliminary data analysis after each focus group and then compared the findings with those from previous groups to gauge similarities, differences and/or any outlying ideas and themes.[23] The preliminary findings guided the next round of data collection. The research team's knowledge of the literature and the qualitative researchers' experience with Indigenous communities and Indigenous research methods influenced the theoretical approach.

In applying grounded theory, the researchers and data analysts avoided any theoretical preconceptions when designing open-ended, semistructured questions to explore the subject matter. The experienced interviewers used prompts to adjust any questions for a better understanding of participants' perspectives.

All sharing circles and focus group sessions were audiorecorded and transcribed verbatim. Thematic data analysis was completed using NVivo 12 qualitative software (QSR International Pty Ltd. 2018). Data were coded to conceptual headings determined through open-coding in the preliminary data analysis phase.

We sorted into themes recurring terms and ideas participants used to describe conditions that shape their experiences. These themes were checked and cross-checked as more focus groups and sharing circles were conducted. We also coded for similarities and differences between groups and between First Nations and Métis groups/data. Emerging categories were compared between predominantly First Nations and Métis groups/data to determine and illustrate the majority views of all First Nations and Métis respondents. Data were cross-checked by two data analysts. Quotes are reproduced verbatim with minimal edits for clarity only.

Results

Of the 59 recruited participants (mean age 35.7 ± 11.0 years), 52 reported having at least one child or grandchild. Most identified as female (n = 46; 78%) and 13 as male (22%). Overall, 25 were single and 29 were married or living with common-law partners. Five participants did not indicate their marital status or educational levels. Half (n = 30) had less than a high school diploma, while 24 had a college or university education. Just over a half (n = 33; 60%) were employed full-time or part-time, and 26 (44%) were either not employed or did not indicate their employment status.

Participants suggested how best to disseminate oral health information in their communities and how best to deliver this information directly to caregivers (Table 2). Responses of female and male participants did not differ significantly. In all groups, men tended to agree with or reiterate the responses given by the women. The men seemed to implicitly defer to women

TABLE 2
Summary of study participants' suggestions on how best to disseminate oral health information in their communities and directly to families

Reaching First Nations and Métis communities with ECOH information	Reaching First Nations and Métis caregivers and families with ECOH information
Enticing oral care products	Culturally appropriate information in local languages
Dentists' and doctors' instructions	Accessible oral health programs
Community health fairs	Books on oral care
Information at community locations	Community programs
Oral health information marketing	Home visits for hands-on teaching
	Information sheets and visual teaching aids
	Provided oral health care products
	Primary care providers
	Schools and day care centres
	Social media

Abbreviation: ECOH, early childhood oral health.

regarding the oral care of young children. The women expressed the value of having men at oral health education sessions to hear about the importance of ECOH and start to take more active roles in supporting children's oral hygiene.

In this section, we present converging First Nations and Métis participants' responses. Each participant's statements and unique experiences are reflected in the quotes (which have been edited for clarity only).

Where did you learn about baby teeth and how to take care of them?

In learning how to care for children's teeth, First Nations and Métis caregivers indicated six sources of oral health information: culture; caregivers and family members; dentists and primary care sources; schools and daycares; prenatal and postnatal programs; and online and print sources.

> I used traditional medicine for teething and it helped sooth the gums as he was going through teething. (First Nations participant)

> I learned about baby teeth and how to take care of them, I guess, just from my parents. (Métis participant)

> I was in the hospital… when I was breastfeeding [I learned] from the nurse. Then I also had a public health nurse visit me at home and she also talked about [ECOH]. (Mixed group participant)

> When I was going to school, they [dental hygienists] used to come in. We used to have the dental hygienist come and clean our teeth. They used to do the fluoride school. They stopped those. (Métis participant)

> Just seeing these posters around like daycares and, like, the schools. (Mixed group participant)

What do you think are the best ways to get important information and tips to parents and families to keep kids' teeth cavity-free and avoid getting serious tooth decay?

Participants' ideas and suggestions on how best to communicate important ECOH information to Indigenous communities can be sorted into five key themes: enticing oral hygiene products, such as toothbrushes and toothpastes; seeking advice from dentists and doctors; disseminating information through community events and health fairs; providing ECOH information at specific locations in the communities; and using marketing and social media.

Enticing toothbrushes and toothpastes

Caregivers suggested that flavoured, coloured or themed oral hygiene products could help motivate children to brush their teeth and practice daily oral hygiene. This might include turning daily brushing and oral hygiene routines into a game, incentivizing brushing with rewards or providing children with toothbrushes that light up.

> My daughter, she loves brushing her teeth. We have to buy her a certain kind of toothpaste with ponies on it… She is really a girlie girl so it really helped with the toothpaste. It is "My Little Pony" on her toothbrush. I think it's what is on the toothpaste, like she'll brush her teeth more often. And my third child, he uses [a] Ninja Turtle [toothbrush]. (Mixed group participant)

> My girls also didn't like mint—any mint, and it took me a while to be like, "Come on, girls, we've got to do this," and they would be like, "I hate brushing my teeth." But I got them the strawberry stuff that is [both] toothpaste and mouthwash … ever since then, they are like, "Oh this is pink." (Mixed group participant)

Advice from dentists and doctors

Receiving anticipatory guidance from health professionals including dentists and medical providers was seen as integral to engaging families and encouraging them to practise good oral hygiene at home:

> Go to the dentist. Yeah, because you have to, like, every 6 months. You go to the dentist for your child. (Mixed group participant)

> I think the best way also is to get the doctors more informed too, because when you are pregnant, that's when you're trying to get all the information. [People] need all that information then. [Doctors], well make sure you're talking about baby teeth. Bring up the dentist. (Mixed group participant)

> If the dentist tells him that he's got to do something, he'll come home, and he'll do it, and he'll tell me, "This is what the [dentist] told me to do." (Métis participant)

Community events and health fairs

Health fairs are important community events where health programs and health-related information can be showcased. Participants suggested that the informal atmosphere of health fairs could be conducive to engaging caregivers, families and children, delivering key oral health messages, and distributing oral hygiene supplies to families.

> Health fairs to have your booths and [give out] brushes. We have a yearly health fair [where] we do that, but the whole community [does not] participate. (First Nations participant)

> You could go to neighbourhood barbecues, like meet the parents and stuff, and go there and be like, "Here, this is our program. Here's a toothbrush and toothpaste." As a friendly thing—not be like, "Here, take it." Just so you know, when I was a kid I loved bringing toothbrushes home. (Mixed group participant)

> I think also getting kids involved, like you said you mostly reach, like, [a] parent. We go to festivals for the kids. So we have games we participate in but [we] also take part in different activities. (Mixed group participant)

Making ECOH information available in centres in the community

School gymnasiums and health centres were reported to be places families frequent and where they might easily pay attention to oral health information.

> I think another way would probably be to go into the school, go into the day care[s], show the kids the pictures [of rotten teeth] because you'll shock them when you show the teeth and I think that would probably be good. (First Nations participant)

> They should put posters up everywhere, like at the day care and just wherever people will see them. (First Nations participant)

Participants also suggested being strategic in setting up booths that have oral health resources to increase community awareness at every opportunity.

> I'd say that if there is something happening in the community, set up a booth. Visual is always better than paper. Having it on paper, for myself—they gave me all the information. I knew that I could read it, but I chose not to, until they came along with the baby bottle showing me how much sugar is in an apple juice, how much sugar is in a pop. Then I was like, "Holy! Now that's not going to happen." So visual is better than paper. (First Nations participant)

> When I was in elementary [school]… the dentists would set up one of those [booths] and then parents would have that [source of information]. (Métis participant)

Information displays, including booths at community events and health fairs, encourage families and children to think about oral health, to interact with and pose questions to health promoters while develop relationships that can lead to behaviours that include seeking dental services.

Using marketing and social media to promote oral health

Participants recommended actively marketing oral health information and resources to discourage risky behaviours and to encourage healthy oral care behaviours for children.

> …[T]he same scope of thinking [like] they do with cigarettes: they should put [warning labels] on the candy bars. (First Nations participant)

> I … learned some lessons from the food industry, how they saturate everywhere using messages. I think the government is the one that has the money to […] focus on that. I think we need to focus on getting the [ECOH] message everywhere. Social media is better because it's relatively cheap. Get it over and over again, like from the food industry where you are constantly exposed to foods all the time. You need to […] get the dental messages in the same kind of volume. So we have to think outside the box. (Métis participant)

Participants mentioned several ways to engage meaningfully with First Nations and Métis communities in oral health promotion. Suggestions included providing creative oral care products, meeting community members to actively discourage risk-related behaviours and promoting healthy behaviours through focused marketing.

What is the best way to get oral health information across to First Nations and Métis parents?

Ten themes emerged from among the best ways to give First Nations and Métis caregivers' oral health information (Table 2):

Culturally appropriate information in local languages

Participants said it is important to have information and resources in the languages spoken in the communities and in ways that align with local cultural norms and expectations.

> … our program provides information to young kids that is culturally appropriate. (First Nations participant)

> I think you should have, like, a brochure that has certain languages [on] how to take care of a child's teeth. Or someone who can talk to [caregivers] in person that knows about teeth and can talk to them in their language if they can't understand English. Yeah, some people just refuse to want to take care of the child's teeth, maybe because of religion, culture. (Mixed group participant)

Accessible oral health programs

Several participants mentioned that increased access to and availability of oral health services would also help improve ECOH.

> I think that [oral health programs] should be made more open for everybody. Every child that's 4 or 3 [years old] in the community, give them [oral hygiene products] – not just because they are in your program – and the information to go along with it. (First Nations participant)

> Anything free, really, for parents, is pretty awesome … I'm a full-time stay-at-home mom with both girls. (Métis participant in a mixed group)

Books on oral care

Some caregivers suggested that books could help educate families on how to care for young children's teeth and establish good oral health behaviours in the home.

> Books that have the modules and activities on how to care for your baby's teeth [and] when to care for them. (First Nations participant)

> Yeah, books… kids' books in the mail every month. (Mixed group participant)

Community programs

Participants recommended collaborating with existing prenatal and postnatal programs

in the community. These programs already have well-established networks within communities and are a valuable resource for disseminating oral health care information in fun and engaging ways.

> I think, like in the community, like [through] these little programs like Maternal Child Health. (First Nations participant)

> [Prenatal programs] are a really good way to inform parents [about] what they can do in trying to help the children because that's where it starts, right? We [moms] are the ones that are responsible for these kids. But it needs to be something that doesn't seem like work, you know that [is] enjoyable, that gets us engaged. [Oral health promoters]… can send a couple of people once every 2 months just to come to a program like this, and we [can] play Dental Bingo or something, you know. Those are the types of things, and we learn as we're doing it. I don't know if that's the only game to play but you know. (Mixed group participant)

> Wiggle Giggle Munch. It's [a program] for parents with kids about one. It's a program where you do arts and crafts and stuff. But if you could maybe reach out to one of the people that run it and they could [help]. They give away something every day or every time we go. This week, we were given new toothbrushes, toothpastes, pamphlets, stuff like that with contact information. Maybe have more resources you can [use] about teeth, like say, [if] people can't afford the dentist. Put a list of three or more dentists on there, because it's so hard to research it. I've been trying to research, but the waiting lists are so long that by the time that'll happen… (Mixed group participant)

> Support groups or parental support groups. (Métis participant)

> Baby programs—they could help reach the younger moms. (Métis participant)

Participants also said that friendly oral health promoters make programs more inviting to the people in the community.

> Well, my daughter was in the [community] program, but she left the program because she didn't like the way she was being treated. So, she never came back to anything. She felt she was being talked down to. She had a lot of issues. So she has a 5-month-old baby now, and she doesn't want to join anything because [workers] are not supposed to talk down to community members: you are there to help them, not put them down. (First Nations participant)

> I think now that myself and my coworker are in the community for an extended period of time, we are making those connections stronger [than] before for the first time. I think we now have stable staffing at our centre, and we are building those relationships. So, I think we are getting more information out there and people [are] trusting us, because we've been here, we're still going to be here again for the next step. (Métis participant)

Home visits for hands-on teaching

Some participants indicated that visiting families at home may lead to adoption of healthy oral health-related behaviours among young children.

> I go into the house and I teach them, show them or explain to them whatever, but I know there is that, like they brush their teeth at the day care, they brush their teeth at Head Start [program], so I think it begins, like, at home. (First Nations participant)

> I'm not even sure, just talking to our parents and [a] one-on-one kind of thing. Some people would say like go online and that, but who really has time to go looking for stuff online. (First Nations participant)

> I think when you want parents to start taking care of their kids, it's better to have that one-on-one person contact, to have a direct link to that parent or just to make sure the parents are informed. (Métis participant)

Information sheets and visual teaching aids

Some participants said they do not frequent dental offices. This made it difficult for them to get information from office newsletters or dental clinic displays. Instead, they recommended mailing out newsletters. Some suggested distributing pamphlets and brochures with images of severe early childhood caries to families.

> Sending home an information package to people who are expecting or have a new child and then updating that information for older kids too, because the older kids need different kinds of care. (First Nations participant)

> Just mail them a newsletter about how to take care of [a] child's teeth. Some people come to the program. We can get their names and ask if they are interested in getting a newsletter. (Mixed group participant)

> Meetings like this or something like brochures, mailboxes or something. (Métis participant)

> Community letters. (Métis participant)

Participants also said that they were willing to receive text messages and phone calls with key oral health messages.

> My dentist texts me all the time. (Mixed group participant)

Provided oral hygiene supplies

Participants said that receiving free oral health care products (i.e. toothbrushes and toothpaste) was helpful, particularly for those who may not be able to afford those items regularly.

> Also, I think giving resources to the families sometimes. Like you know, who has enough money to buy 10 kids' toothbrushes that are $3.00 And they only get a welfare check that is $600.00, that means it has to last [for] groceries all month. So, I think, like, if they were standing in a social assistance line, social assistance says, "Oh here, look at our free toothbrush for your kids and tube of toothpaste." Then it goes through the line. This way they have that resource. How is that kid going to learn if mom is not doing it and

she can't afford a toothbrush? (First Nations participant)

I'd say give them a toothbrush and toothpaste. Hand them out. If I knew somebody like as a friend, I would give him a toothbrush and toothpaste for their kids. Well, maybe if they come here and they want to know more about health care or more about the teeth, give them a toothbrush, toothpaste and maybe a letter saying steps on how to brush their teeth. (Métis participant in mixed group)

Primary care providers

Participants recommended that primary care providers, including public health nurses, be involved in disseminating oral health care information and resources, as they are more likely to see families early on in the process of taking care of children.

[Public health nurses] can check your baby's teeth, stop by here real quick for a checkup and, like I said earlier, to give information packages out. So yeah, just making sure more people are getting the [oral health information] every once in a while. (First Nations participant)

When the public health nurse comes to the school, usually you get a lot of their information. They always bring toothbrushes. The girls love those. That's the most common way—through those workshops with the public health nurses. Lots and lots of posters. I've read so many. (Mixed group participant)

Schools and day care centres

Participants reported learning about oral care from daycares and schools, indicating that these places are important venues for promoting oral health.

The best way, like I said, is going into the schools. I think [this] is big because you can call the teacher and parents, but for me, to go into the schools is a lot more. I don't even know what's happening right now with any of the schools for oral health. (First Nations participant)

The way my brain is interpreting [ECOH] is that [this] is the individual's responsibility and [that] the best way for them would be, like in schools for younger kids, and then having charts up, something like, "Oh, did you brush your teeth today?" and like, "Put your sticker on. Here's your prize." You know what I mean? Having that and reminding children constantly, constantly and constantly. If the parents aren't doing it, then the school's doing it so it will be intact. (Mixed group participant)

Social media

Participants recommended using social media as a practical way to reach some people.

I'd say Facebook, media, like draw on their phones, make like bulletins, and send down bulletins and … maybe more commercials for kids like on their cartoon channels or whatever if they are watching something. (Mixed group participant)

Everybody's on social media right now. So try to find a way to implement all the information on there. Not just like a Google search, actually like media ads, Facebook or Twitter and stuff like that. (Mixed group participant)

Another suggested strategy was to have people share their personal experiences of having a child with early childhood caries.

I think more outreach. If I saw someone more like me talking, talking to me about teeth, I'd be more open to it, I guess. Because lots of people… have perfect teeth … But if you don't [have perfect teeth] like me, because I have a calcium deficiency so my teeth decay a lot faster than others. (Mixed group participant)

Discussion

This study engaged First Nations and Métis community members to identify approaches to promote ECOH and address the oral health disparity of early childhood caries in Indigenous populations. Several themes emerged from among the strategies for reaching and involving First Nations and Métis caregivers and families in oral health promotion. A variety of approaches were suggested on how to disseminate information to First Nations and Métis communities and caregivers specifically.

It is worth noting that a lack of access to oral health professionals may be resulting in community members seeking information from less reliable sources. Professionally driven, evidence-based oral health information and resources provided to communities could increase oral health care adherence and related behaviours of parents, grandparents and caregivers. Studies in other health care areas support this recommendation.[24,25]

Approaches that have been effective against early childhood caries in lower-risk populations have not translated consistently to Indigenous communities.[26,27] A recent randomized trial of oral health promotion with American Indian communities had tepid results; the study concluded that interventions may need to be personalized and shaped by cultural perspectives while also addressing the social determinants of health.[27,28] Given that First Nations and Métis populations are distinct, tailored approaches to prevention are warranted.[1,29] These approaches, in seeking to modify health behaviours, advocate for a holistic perspective that takes all determinants of Indigenous health into account. These determinants of health include employment and income, education, food security, health care systems awareness and resources.[30]

A Canadian review of dental interventions for early childhood caries among Indigenous children recommends incorporating cultural and traditional knowledge as well as integrating and aligning ECOH promotion activities into existing community services and programs.[14] This is in keeping with study participants' recommendations to use culturally appropriate oral health promotion strategies that include Indigenous worldviews.

Cultural safety and appropriateness is particularly important for First Nations and Métis peoples in light of the history of the colonial health care system in Canada.[31,32] It is important to establish trusting relationships and facilitate culturally sensitive care. For example, health promotion conducted by Indigenous persons may be more effective at promoting trust among Indigenous families.[33]

The importance of making personal connections in order to reach families more effectively was determined in a previous study by the same research team.[34] Indigenous caregivers recommended asking Elders to share traditional knowledge and also use the language of the population to communicate information.[34] Educating community oral health workers and Indigenous and non-Indigenous health care professionals on culturally safe practices is a critical step in advancing oral health promotion and preventing early childhood caries.[35]

In calling for the sharing of information through existing community health programs, study participants highlighted the role of long-term and close relationships between those involved.[36]

Some participants suggested that sending ECOH key messages via text messaging to parents and caregivers with young children may have advantages of the recipients getting and responding to information easily and faster. Studies have also shown that sending key oral health messages via text can improve parental knowledge and change oral health behaviours.[37-39] The challenge lies in that many rural Indigenous communities do not have basic cellular service, let alone Wi-Fi.

Participants also recommended engaging dental and primary care providers in efforts to prevent early childhood caries. There is a case for engaging non-dental primary care providers to disseminate ECOH information and possibly conduct caries risk assessments (CRAs). A recent systematic review revealed that non-dental providers can successfully perform CRA to control early childhood caries.[40]

Several dental and pediatric organizations have developed CRA tools, some specifically for use by non-dental providers.[41] Such CRA tools can be used to screen children with limited access to dental care, determine their risk and provide prevention services, including fluoride varnish, anticipatory guidance and referral to a dental office.[41]

A recent Canadian study found that primary care providers in Indigenous communities are willing to incorporate preventive oral care into their clinics.[42] This aligns with American Academy of Pediatrics and Canadian Paediatric Society suggestions to work interprofessionally to address early childhood caries in Indigenous communities.[43,44]

A Canadian CRA tool has been developed for use by non-dental primary care providers on children younger than 6 years. The Canadian Caries Risk Assessment Tool (< 6 Years)[45] may help improve young Indigenous children's access to oral health assessments and referrals for dental care. It could be a sustainable option in communities where there are few or no dental professionals.

Fun oral hygiene products and books that show how to care for teeth attract children's attention and encourage healthy oral hygiene habits of brushing, flossing and reducing intake of sweetened beverages.[46,47] While such resources may be widely available elsewhere, they are not easily accessible or affordable in rural and/or remote First Nations and Métis communities. Study participants suggested it would be useful if copies of such resources were mailed to their homes in the communities.

The Scaling Up the Healthy Smile Healthy Child team have taken these ideas and suggestions and are incorporating them in our ECOH promotion efforts with First Nations and Métis communities. The team also maintains a Facebook page (https://www.facebook.com/HealthySmileHappyChild/), a YouTube channel (https://www.youtube.com/channel/UCd6ZyKUqiqnBEhQJoO-hrjg) and social media links (https://wrha.mb.ca/oral-health/early-childhood-tooth-decay/) to share information with communities and caregivers.

Strengths and limitations

Our Implementation Research Team includes Indigenous community members, Indigenous community leadership (including FNHSSM and MMF), health professionals, local, provincial and national decision-makers and academics. This team structure promotes the sharing of recommendations with stakeholders in real time. This study's partnership with the First Nations and Métis organizations and communities also made it possible to communicate with participants and access communities. Having urban and rural groups provided well-rounded perspectives on families' experiences and knowledge of available oral health services.

Our findings could inform First Nations and Métis community programs and improve uptake by community members. As rural and remote Indigenous communities often face similar health issues and health care access challenges, program coordinators and managers may find the participants' suggestions suitable for informing change in their own contexts. However, urban and rural experiences may differ when considered on their own, which this study has not explicitly focused on analyzing. The results may also not be generalizable to every First Nations and Métis community in Canada. Robustness to the recommended strategies can be added by increasing the sample size and including the perspectives of other communities in future studies.

Conclusion

First Nations and Métis communities and caregivers' ideas and suggestions on how to promote ECOH and reduce early childhood caries point to the importance of implementing widely available approaches and resources in ways that encourage uptake in specific contexts. Indigenous populations do not have access to services that the larger population takes for granted. Targeted and funded oral health promotion activities with Indigenous promoters at the forefront may close existing gaps. Social media may also be a way to send many people important ECOH information.

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Conflicts of interest

The authors have no conflicts of interest to declare.

Authors' contributions and statement

GKA: Study design, data acquisition, data analysis and interpretation, manuscript drafting and revision; RS: Study conceptualization and design, data interpretation and manuscript revision; JS: Data interpretation and manuscript revision; RC: Study conceptualization; DD: Study design and data acquisition; MS: Study design and data acquisition; JE: Study design and manuscript revision; MB: Study design and manuscript revision; LD: Study design and manuscript revision; KHS: Study design and manuscript revision; FC: Study design and manuscript revision; TD: Data acquisition; BP: Data acquisition; JL: Data acquisition; MM: Study design.

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At-a-glance

Increases in exposure calls related to selected cleaners and disinfectants at the onset of the COVID-19 pandemic: data from Canadian poison centres

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Abstract

Little is known about the use or misuse of cleaning products during the COVID-19 pandemic. We compiled data from January to June in 2019 and 2020 from Canadian poison centres, and report on calls regarding selected cleaning products and present year-over-year percentage change. There were 3408 (42%) calls related to bleaches; 2015 (25%) to hand sanitizers; 1667 (21%) to disinfectants; 949 (12%) to chlorine gas; and 148 (2%) to chloramine gas. An increase in calls occurred in conjunction with the onset of COVID-19, with the largest increase occurring in March. Timely access to Canadian poison centre data facilitated early communication of safety messaging for dissemination to the public.

Highlights

- The Canadian Surveillance System for Poison Information (CSSPI) led by Health Canada is a developing network of poison centres, health authorities and regulatory agencies that facilitates early detection of poisoning incidents and alerting at the national level to inform harm reduction interventions.
- In response to the COVID-19 pandemic, concerns were raised over the potential for misuse of cleaning products and disinfectants; the CSSPI network monitored and assessed these concerns.
- An overall increase in calls about select cleaning products and disinfectants occurred concurrently with the pandemic, with percentage increases for selected products as high as 400% compared to the same period in the previous year.

Introduction

The first Canadian case of novel coronavirus disease 2019 (COVID-19), caused by infection with SARS-CoV-2, was recorded on 15 January, 2020, and at the time of writing in August 2020, 117 792 COVID-19 laboratory-confirmed cases had been reported, including 8958 deaths.[1,2] Through February and March 2020, messaging from Canadian public health officials increasingly focussed on strategies to reduce the spread of SARS-CoV-2, including physical distancing, proper cough etiquette, hand-washing, use of alcohol-based hand sanitizers and cleaning and disinfecting of high-touch surfaces.[3] On 11 March, 2020, the World Health Organization formally declared the COVID-19 epidemic to be a global pandemic,[4] and in the following days, federal, provincial and territorial and municipal authorities across Canada implemented stringent physical distancing measures, including travel restrictions, the temporary closures of businesses and schools, and the cancellation of nonurgent medical appointments and procedures. Daily messages from public health officials at all levels of government reinforced the urgency of taking steps to limit the spread of SARS-CoV-2.

With an increased focus on cleaning and disinfecting comes the possibility of increased exposure to chemicals in cleaning products; more specifically, to the fumes and by-products created by the inappropriate combination of these products.[5,6] In a report from the US Centers for Disease Control and Prevention, the authors reported an increase in calls to poison centres related to exposures to cleaners and disinfectants for the first three months of 2020, compared to the same period in 2019.[5] While increases in exposures were reported for all age groups, exposures in young children

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consistently represented a large proportion of the calls. Poison centres in France raised similar issues, hypothesizing that the increased presence of young children in the home, combined with changes in cleaning behaviour, might be leading to increases in poisonings.[6] In Canada, little is known about the reporting of these products, especially during pandemic periods; in this report we present data from the five poison centres across Canada.

Methods

We report on de-identified data obtained from the five Canadian poison centres through a data request process, and compiled by the Canadian Surveillance System for Poison Information (CSSPI) program led by Health Canada. These data consist of information collected on exposure calls received from January to June 2019, and from January to June 2020, for which exposures were identified using the American Association of Poison Control Centers (AAPCC) codes for hand sanitizers: 200613, 200614, 200615 and 200616; disinfectants: 39282, 40280, 42281 and 77286; bleaches: 42280, 62280, 77280 and 77282; chlorine gas: 116400 and 116401; and chloramine gas: 77403. Exposure calls were presented as counts overall and stratified by age of the exposed individual (i.e. ≤ 19 years, and adults ≥ 20 years) and assessed monthly for all five poison centres between January and June for the years 2019 and 2020, and weekly for four of the five poison centres between March and April 2020. We calculated percentage change in year-over-year estimates as follows:

$$\%\Delta_{\text{year-to-year}} = \frac{(\text{Month}_{2020} - \text{Month}_{2019})}{\text{Month}_{2019}} * 100\%$$

Note that for one poison centre, data were unavailable prior to 6 February 2019, meaning that information presented at the national level is partially missing for the specified time period. We contacted the Health Canada Research Ethics Board (REB) to discuss the CSSPI initiative, and determined that a REB review was not required, given the mandatory suppression of small cell sizes that ensures minimal risk of re-identification.

Results

There were a total of 8187 calls reporting exposures between January and June for 2019 and 2020. Of these, 3408 (42%) calls were related to bleaches; 2015 (25%) to hand sanitizers; 1667 (21%) to disinfectants; 949 (12%) to chlorine gas; and 148 (2%) to chloramine gas. We observed a 35% rise in the total number of exposures related to these cleaning products in January 2020 when compared to January 2019, but no apparent difference for February. However, there was significant heterogeneity among the various types of cleaning products in February 2020, with hand sanitizers and disinfectants each showing an increase of approximately 40%, and bleaches, chlorine gas and chloramine gas showing decreases of 3%, 9% and 12%, respectively, compared to February 2019 (Figure 1). We observed greater increases for the months of March to June, particularly among disinfectants and chloramine gas exposures. Weekly estimates show that the number of calls peaked during the week of 22 March 2020, predominantly among those aged older than 19 years (Figure 2) and there was a general decrease in the percentage change after April 2020, with the exception of hand sanitizers and chloramine gas.

Discussion

Using data from Canadian poison centres, we observed an increase in exposure calls concerning selected cleaners and disinfectants in March 2020 compared to March 2019. Weekly data collected from March through May 2020 suggest the increase peaked in the third week of March, shortly after the WHO declared the global pandemic. These results are consistent with reports from the US, and given the timing, may indicate increased exposures to these products associated with the onset of the COVID-19 global pandemic.[5] The reason(s) for this increase are unclear, but may be related to an increased use of cleaning products in an attempt to mitigate risk of infection from COVID-19. Additionally, limited availability of certain cleaners could lead to inappropriate use of or mixing of other products, as well as misuse of products for personal hygiene or decontamination.[6] With the closures of schools and daycares, young children were at home, which might be expected to create greater opportunity for exposure. However, our results do not suggest that there was a large increase among those aged 19 years or younger. Percentage changes in January and February are possibly related to pre-pandemic concerns, but are more likely incidental as the magnitude of these differences is not substantial.

Our results indicate an opportunity for proactive messaging to effectively communicate the potential risks related to cleaners and disinfectants during the COVID-19 pandemic. In reaction to early surveillance data, public health officials and regulatory agencies advocated for the safe use of these products, and stressed the importance of timely access to poison centre data at the national level. Following initial observations in March 2020, we held discussions with the five poison centres and the Canadian federal government programs responsible for improving the safety of the selected cleaning products. This preliminary meeting was used as a starting point to generate messaging (both for social media and for online dissemination) aimed at reinforcing the safe use of those cleaners and disinfectants. Between March and June 2020, Health Canada deployed a number of communication tactics in order to provide information to Canadians on the safe use of household cleaners, disinfectants and hand sanitizers. This included concurrent social media campaigns broadcast through various departmental channels on Twitter, Facebook and LinkedIn. Social media content encouraged the cleaning of hands and surfaces, and provided information on how to do so safely. Social media content also featured information on the risks of making hand sanitizers at home and mixing cleaning products together, and on using bleach safely and the importance of keeping these types of products away from children. In addition to social media, Health Canada developed a web portal (https://www.canada.ca/en/health-canada/services/drugs-health-products/disinfectants/covid-19.html) dedicated to hand sanitizers and disinfectants. This website is updated regularly and includes information on actions taken by the Government of Canada to increase the supply of these products, as well as how to use them safely. Furthermore, Health Canada has issued a variety of public advisories and news releases on the importance of cleaning, disinfecting and sanitizing hands and surfaces safely.

Strengths and limitations

A major strength of this work is that it combines regional information and expertise from Canadian poison centres to report on national statistics across Canada.

FIGURE 1
Number of calls made to Canadian poison centres regarding selected cleaning products and disinfectants in 2019 and 2020 (January to June), with year-over-year percentage changes

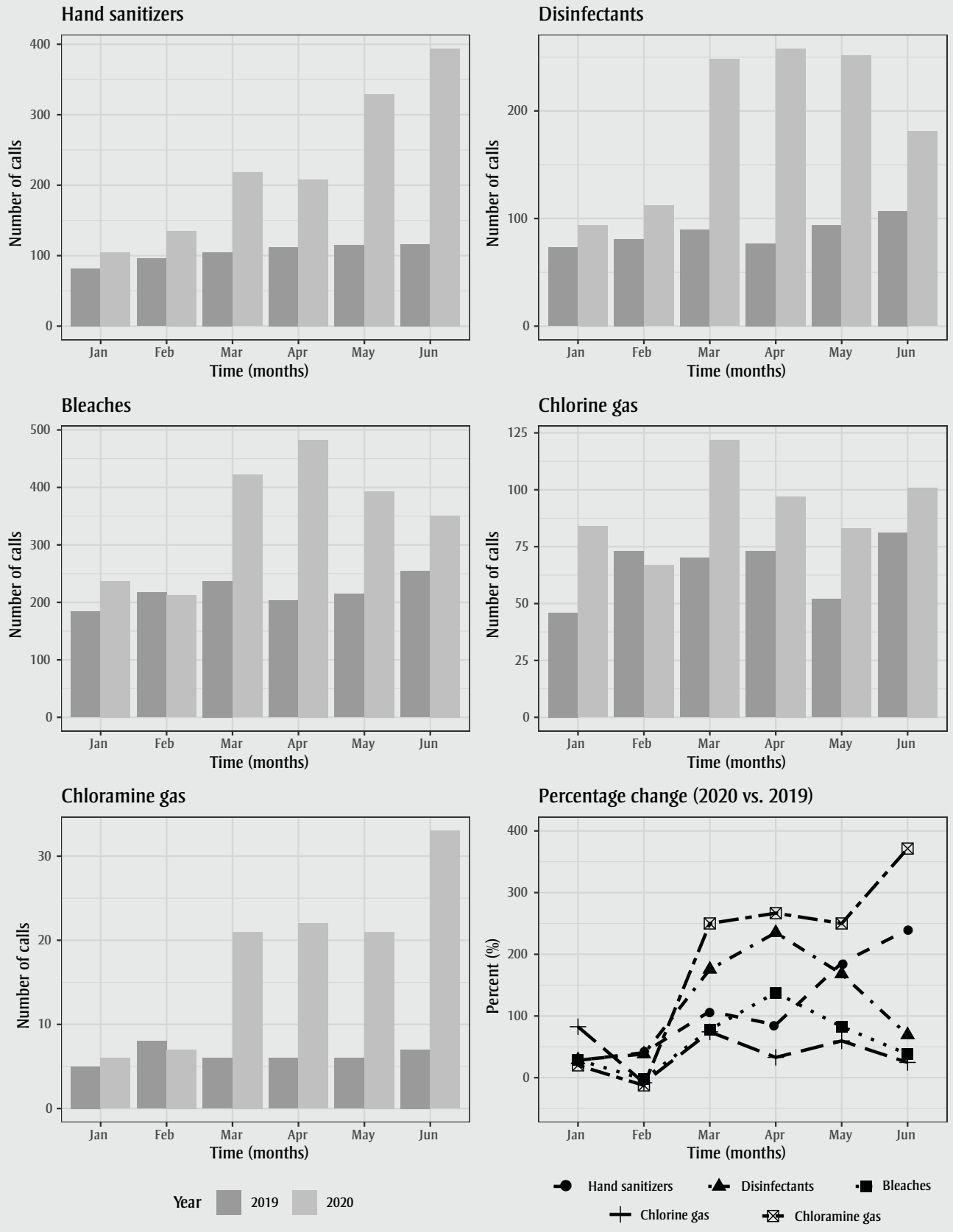
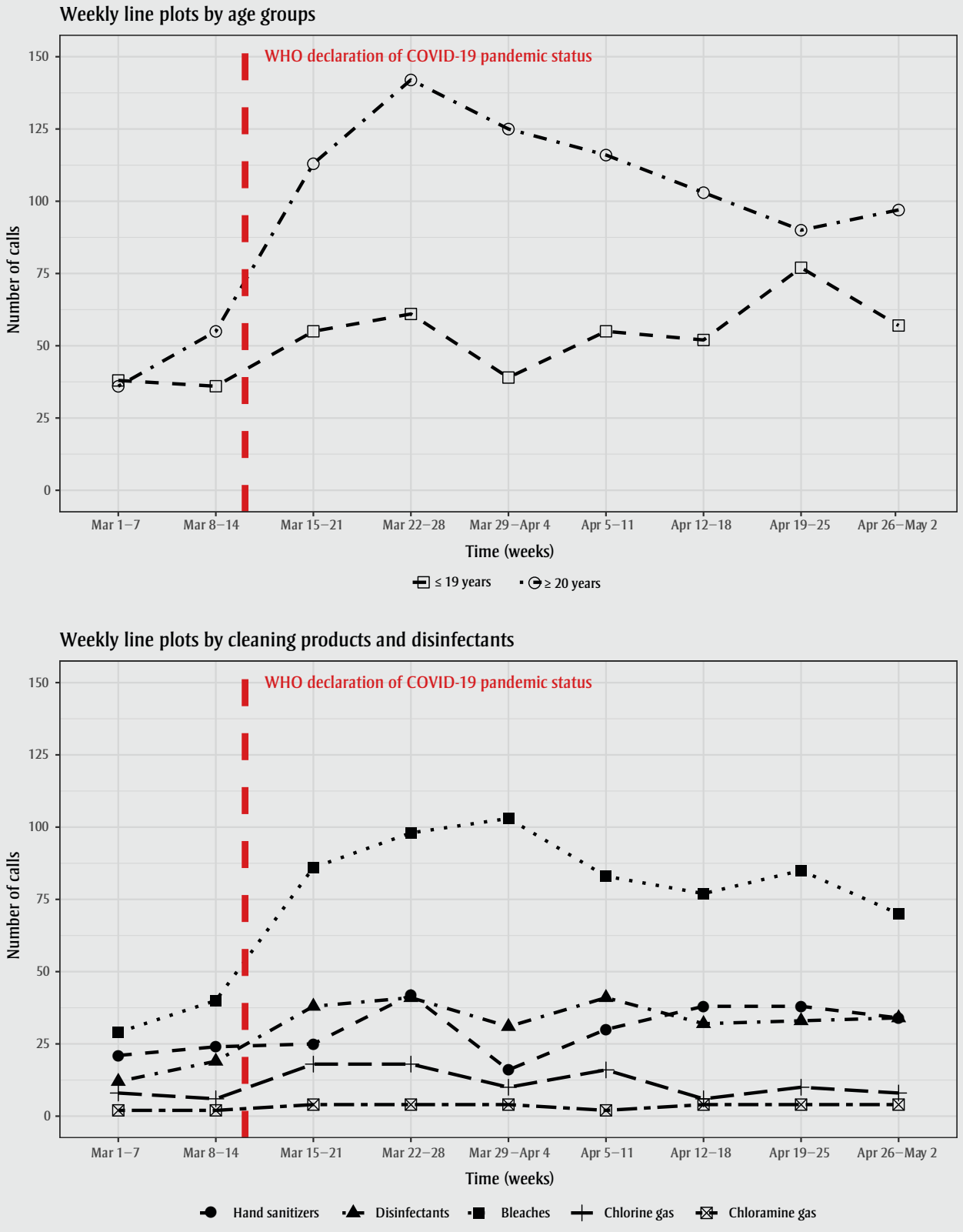


FIGURE 2
Weekly exposure call counts for all exposure calls regarding cleaning products in 2020, stratified by age group and cleaning products, for four of the five Canadian poison centres[a]



[a] One poison centre was unable to contribute weekly data and was excluded from this analysis.

We disseminated preliminary versions of this report through the CSSPI network, which includes clinical specialists, public health officials and personnel from regulatory agencies, in order to collectively develop guidelines and enable knowledge translation and the exchange of messaging on the appropriate use of these products. Additionally, this report makes use of poison centre information that is unavailable from other health administrative data sources and remains a relatively untapped resource for understanding the epidemiology of environmental exposures in Canada.

However, as with any secondarily collected data, there are potential biases that may affect interpretation of the observed results. Our analyses are based on calls made to Canadian poison centres, and likely only represent a small portion of total exposures, as some will self-manage at home while others will directly seek in-person medical attention. Furthermore, Specialists in Poison Information at the poison centres rely on self-reported responses to treat or manage adverse exposures. Accordingly, the information documented in their case management systems is subject to the ability of the caller to accurately describe the exposure. Most, but not all, regions in Canada have access to a poison centre; therefore, the data are not fully represented nationally. However, the information presented in this report represents our best estimates at the time of publication. Additionally, at the time of publication, historical data on cleaning products and disinfectants prior to 2019 was unavailable and precluded further statistical analysis. While efforts to improve poison centre data quality and comparability are ongoing, inconsistencies in coding between and within poison centres do exist. Lastly, these results show an association between increases in exposure calls to Canadian poison centres related to cleaners and disinfectants and the COVID-19 pandemic in Canada; however, causality should not be inferred as this relationship is not well understood and there may yet be unknown influential drivers.

Conclusion

An increase in calls to poison centres regarding selected cleaners and disinfectants occurred in conjunction with the onset of the COVID-19 pandemic in Canada. This work highlights the importance of timely access to poison centre data at the national level. Calls to poison centres represent a relatively untapped resource for understanding Canadian exposures to potentially hazardous chemical substances, as this information is not readily available via health administrative data sources.

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Conflicts of interest

The authors declare no real or perceived conflict(s) of interest.

Authors' contributions and statement

AY, DW, SR, ND, MM and RW conceived and planned the study and developed the protocol. AY, DW, SR, ND, and MM developed the analysis plan and analyzed the data. AY and DW drafted the initial article, distributed this draft to SR, ND, MM, and RW for initial review, then to all other listed authors for quality checks, appraisal of results, and review of text. All authors helped critically revise the article throughout the development and review process.

The content and views expressed in this article are those of the authors and do not necessarily reflect those of the Government of Canada.

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https://doi.org/10.24095/hpcdp.41.1.04

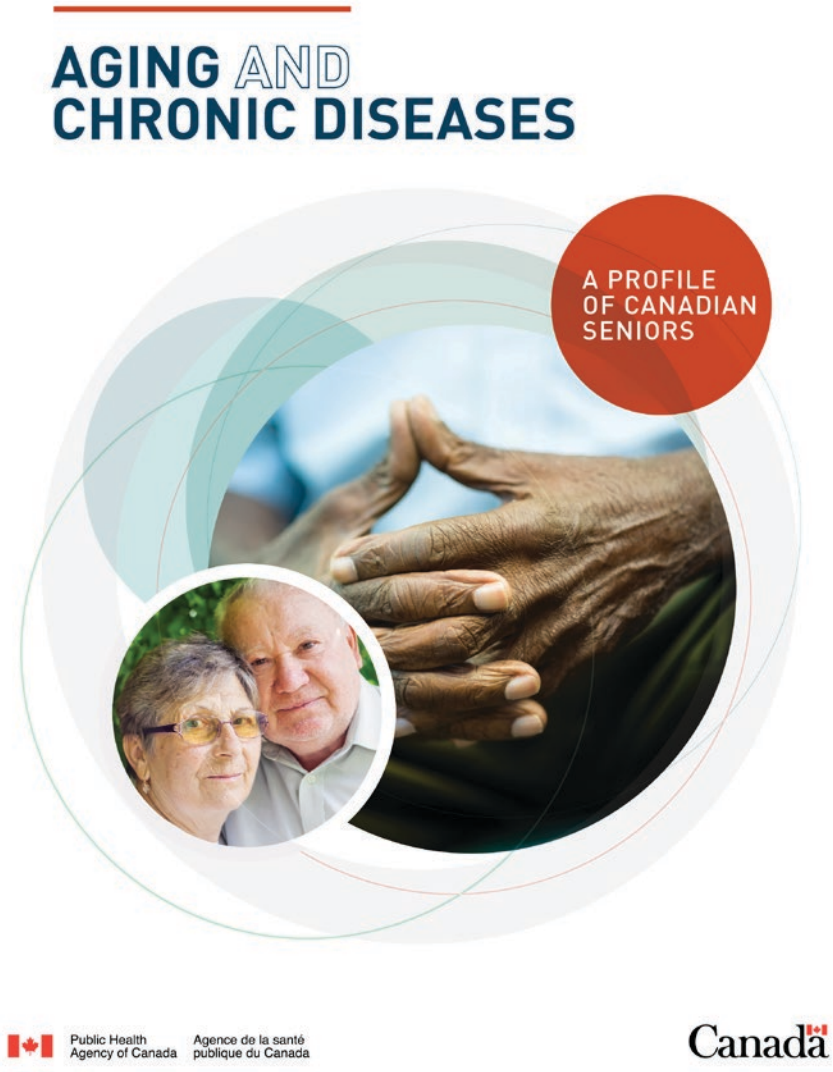
Release notice

Aging and Chronic Diseases: A Profile of Canadian Seniors

Tweet this article

The Public Health Agency of Canada has released the report *Aging and Chronic Diseases: A Profile of Canadian Seniors*.

This report provides a pan-Canadian profile of chronic diseases among seniors aged 65 years and older. It examines socioeconomic and demographic characteristics of the senior population in Canada, its global health status (such as life expectancy and self-reported health and mental health), chronic diseases, conditions and other health outcomes (such as cancer, cardiovascular diseases, diabetes, musculoskeletal disorders, neurological diseases and oral diseases), as well as health determinants.



https://doi.org/10.24095/hpcdp.41.1.05

Release notice

The *Rourke Baby Record 2020 Edition* and the Canadian Caries Risk Assessment Tool for Pre-Schoolers

Newly released!

The Canadian Caries Risk Assessment Tool (CCRAT) is now included in the 2020 edition of the *Rourke Baby Record*, a pediatric record widely used by family physicians and pediatricians in Canada. The CCRAT is intended for non-dental primary health care providers and oral health care providers in non-traditional clinical settings to assess the risk of and act on tooth decay in children under six years of age. It is endorsed by the Canadian Paediatric Society, the Canadian Academy of Pediatric Dentistry and the Canadian Association of Public Health Dentistry.

The CCRAT is linked within the *Rourke Baby Record 2020 Edition*.

Background

- Commissioned by the Office of the Chief Dental Officer of Canada (OCDOC) in 2017, a team at the University of Manitoba, led by Dr. Robert Schroth, conducted a comprehensive analysis of the global body of evidence on caries risk assessment in pre-schoolers.
- Interprofessional review participants convened by OCDOC included scientific representatives of the Canadian Paediatric Society, the Canadian Academy of Paediatric Dentistry and the Canadian Association of Public Health Dentistry.
- Observers of the process included scientific representatives from the Canadian Dental Association, Canadian Dental Hygienists Association, Canadian Dental Assistants Association, Canadian Dental Therapists Association, College of Family Physicians of Canada, Canadian Dental Regulatory Authorities Federation and the Association of Canadian Faculties of Dentistry.
- Further validation research on the Tool funded by the Network for Canadian Oral Health Research and the Canadian Institutes of Health Research is currently being conducted and the results are expected to be published by the fall of 2021.

https://doi.org/10.24095/hpcdp.41.1.06

Release notice

The Chief Public Health Officer of Canada's Report on the State of Public Health in Canada 2020

Tweet this article

On October 28, Dr. Theresa Tam, the Chief Public Health Officer of Canada (CPHO), released her 2020 annual report on the state of public health in Canada, entitled *From risk to resilience: An equity approach to COVID-19*. The report describes COVID-19's broader consequences and is a call to incorporate a health equity approach into pandemic preparedness, response and recovery.

The report reviews the unprecedented impacts the pandemic posed to Canadian society. It shows that the pandemic unfolded differently across the country from January to the end of August 2020 and that the severity of outcomes was influenced by factors such as age, underlying medical conditions and inequities. The report highlights how some individuals and groups, such as long-term care home residents, workers in essential services, groups working and living in confined spaces and those who face systemic marginalization, faced disproportionately higher rates of illness and mortality during the first part of the pandemic.

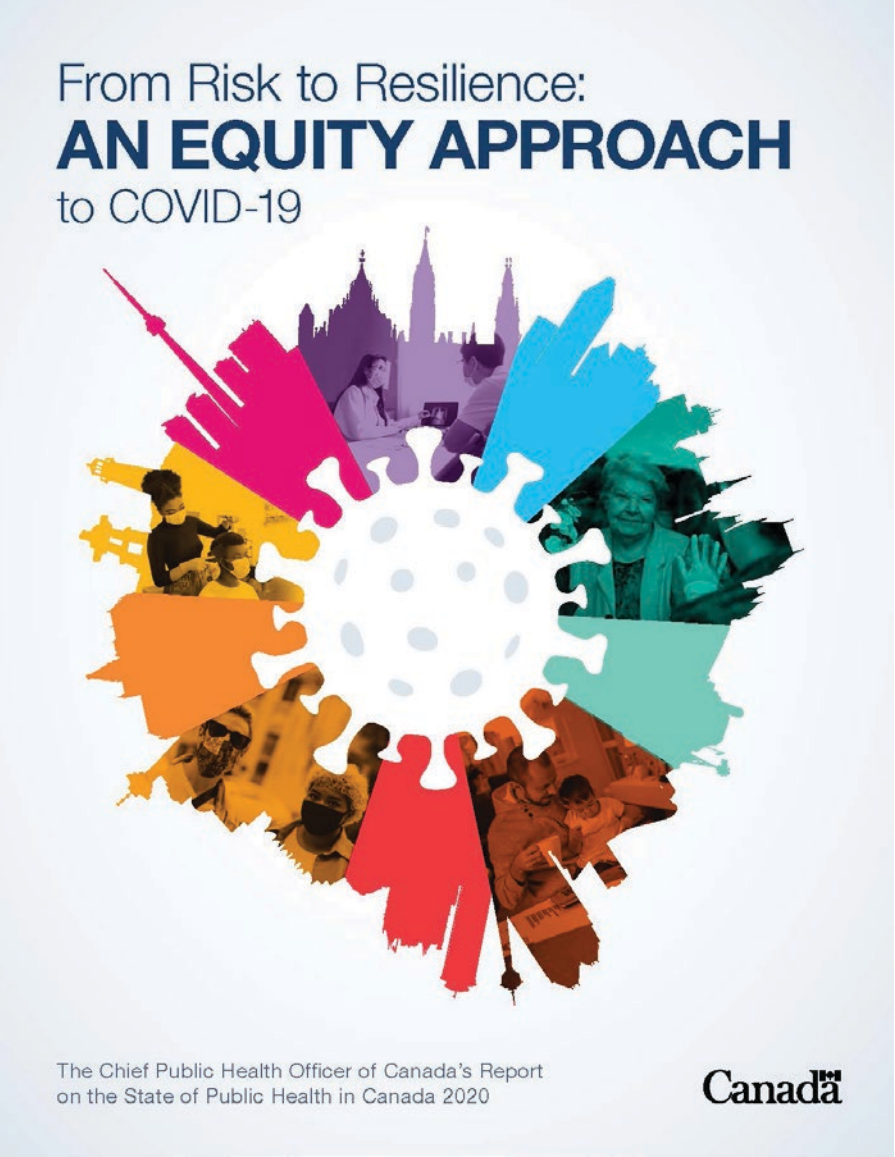
Driven by the evidence identified in the report, the CPHO calls for action in three key areas to mitigate the impacts of COVID-19 and strengthen our nation's preparedness for future public health emergencies:

1. **Sustained leadership, engagement and governance** at all levels for structural change across the health, social and economic sectors. Practically, this means that pandemic plans need to be multisectoral and that progress on collaborative actions is measured and adjusted until inequities are eliminated.

2. **Harnessing the power of social cohesion** as a key ingredient to controlling and minimizing the negative impacts of this pandemic. Communities and countries that have strong norms of taking care of each other can better prevent and control resurgences.

3. **Strengthening public health capacity** to ensure that Canada has a health system that is able to surge and adapt during a crisis while maintaining capacity to address ongoing critical issues. A robust and agile public health system that has the necessary workforce and tools is critical in tackling emergencies and inequities.

For the full report, see canada.ca/CPHOreport, and for up-to-date information on COVID-19, consult canada.ca/COVID-19.



https://doi.org/10.24095/hpcdp.41.1.07

Corrigendum

What popular bars post on social media platforms: a case for improved alcohol advertising regulation

This corrigendum is being published to add a missing author to the following article:

Paradis C, Zhao J, Stockwell T. What popular bars post on social media platforms: a case for improved alcohol advertising regulation. Health Promot Chronic Dis Prev Can. 2020;40(5/6):143-52. https://doi.org/10.24095/hpcdp.40.5/6.03

The two senior authors of this paper (CP and TS) would like to correct the authorship list of this paper to include Sasha Joy-Goatley, and so give proper acknowledgment of her involvement in its early design and implementation of data collection at the first University site. We apologise to her for this omission. The correct citation for the paper now reads:

Paradis C, Zhao J, Joy-Goatley S, Stockwell T. What popular bars post on social media platforms: a case for improved alcohol advertising regulation. Health Promot Chronic Dis Prev Can. 2020;40(5/6):143-52. https://doi.org/10.24095/hpcdp.40.5/6.03

Before correction

Catherine Paradis, PhD (1); Jinhui Zhao, PhD (2); Tim Stockwell, PhD (2)

After correction

Catherine Paradis, PhD (1); Jinhui Zhao, PhD (2); Sasha Joy-Goatley, BA (3); Tim Stockwell, PhD (2)

[3] University of Victoria, Victoria, British Columbia, Canada

The original online version and the PDF version of the article have been modified on January 13, 2021, to reflect this change. The original PDF version of the article is available upon request to the editorial team. The records in PubMed, PubMed Central, DOAJ and other full-text repositories have also been modified to reflect this change.

https://doi.org/10.24095/hpcdp.41.1.08

Call for papers – 2021 special issue
Tobacco and vaping prevention and control in Canada

Editors: Jennifer O'Loughlin (University of Montreal), Thierry Gagné (University College London) and Robert Geneau (Editor-in-Chief, Public Health Agency of Canada)

It is estimated that more than 45 000 Canadians die from a tobacco-related disease each year,[1] making tobacco use the leading preventable cause of premature death in Canada.[2] In recent years, the growing use of vaping products, especially among youth, has also raised significant public health concerns. There is emerging evidence that vaping products are not without risks for individual users, with more research needed to determine the long-term risks. The electronic cigarette market, if left to expand without an appropriate mix of regulations in place, could also threaten the "Tobacco Endgame."[3,4] Tobacco and vaping control policies are now largely intertwined.

Canada continues to implement comprehensive tobacco control policies and programs as part of its commitment to reach a national target of less than 5% tobacco use by 2035.[5] Regulations on vaping products have also been introduced in recent years at the federal level and across several provinces and territories, with one of the clear aims being to curb the use of vaping products among youth.

The objective of this special issue is to disseminate current and emerging scientific evidence on tobacco and vaping-related epidemiology, prevention and control, with a focus on youth. To this effect, *Health Promotion and Chronic Disease Prevention in Canada: Research, Policy and Practice* seeks relevant topical research articles that present new findings or synthesize existing evidence on:

- Policies, interventions and regulations related to tobacco and/or vaping initiation, use and consumption, and cessation, including tobacco and vaping-related policy gaps and implementation challenges;
- Health inequalities in tobacco/vaping use and related harms; and
- Associations between the use of vaping products, smoking cessation and harm reduction behaviours in both smokers and non-smokers.

International submissions will be considered if they include Canadian data, results (e.g. as part of global comparisons) and/or evidence-based discussion of implications for public health in Canada.

Consult the journal's website for information on invited article types and detailed submission guidelines for authors. Kindly refer to this call for papers in your cover letter. All manuscript submissions, pre-submission inquiries and questions about suitability or scope should be directed to PHAC.HPCDP.Journal-Revue.PSPMC.ASPC@canada.ca.

Submission Deadline: March 31st, 2021.

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Other PHAC publications

Researchers from the Public Health Agency of Canada also contribute to work published in other journals and made available elsewhere. Look for the following articles and tools published in 2020:

Boutin A, Cherian A, Liauw J, **Dzakpasu S**, […] for the **Canadian Perinatal Surveillance System (Public Health Agency of Canada)**. Database autopsy: an efficient and effective confidential enquiry into maternal deaths in Canada. J Obstet Gynaecol Can. 2020;S1701-2163(20)30584-3. https://doi.org/10.1016/j.jogc.2020.06.026

Dufner TJ, Fitzgerald JS, **Lang JJ**, Tomkinson GR. Temporal trends in the handgrip strength of 2,592,714 adults from 14 countries between 1960 and 2017: a systematic analysis. Sports Med. 2020;50(12):2175-91. https://doi.org/10.1007/s40279-020-01339-z

Schroth RJ (commissioned by the **Office of the Chief Dental Officer of Canada**). Canadian Caries Risk Assessment Tool (< 6 years). Winnipeg (MB): Rady Faculty of Health Sciences, University of Manitoba; 2020. Available from: https://umanitoba.ca/CRA_Tool_ENG_Version.pdf

Tugwell P, Welch VA, Karunananthan S, […] **Avey MT**, et al. When to replicate systematic reviews of interventions: consensus checklist. BMJ. 2020;370:m2864. https://doi.org/10.1136/bmj.m2864