

# Health Promotion and Chronic Disease Prevention in Canada

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# Evidence-informed policy brief

## Evidence-based recommendations to assist adults with depression to become lifelong movers

Michelle Fortier, PhD (1); Taylor McFadden, MSc (1); Guy Faulkner, PhD (2)

This article has been peer reviewed.

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### Executive summary

Depression is the most common and prevalent mental disorder today, affecting an estimated 1 in 4 Canadians at some point in their lifetime. Physical activity is recommended as a primary treatment for mild to moderate depression and a secondary treatment for moderate to severe depression. Despite this, specific guidelines are still lacking on how to best promote physical activity in this population. Accordingly, this policy brief provides evidence-based recommendations for primary care providers and allied health professionals to promote lifelong physical activity in individuals with depression. Recommendations include asking for permission to discuss physical activity with the individual; framing physical activity as something that they have control over in order to feel better; clarifying that incorporating even a few more minutes of weekly physical activity is better than nothing and that mild forms are enough to achieve mental health benefits; and providing choices of activities to try and accompanying them on their first few sessions.

Moreover, this article highlights the importance of promoting physical activity enjoyment for this population, which can be done by guiding the individual to slowly build up the frequency, duration and intensity of activity; encouraging them to be self-compassionate toward physical activity; suggesting they engage in outdoor activity, listen to music, and/or participate with a buddy or group; and incorporate self-monitoring or journaling to solidify the link between physical activity and improved mood. Practitioners are encouraged to use these evidence-informed recommendations—especially maximizing choices, enhancing physical activity enjoyment and emphasizing personal preferences—to help individuals with depression move, recover and flourish. These recommendations may also be used to tailor future interventions and inform policy guidelines to reduce depression rates in Canada.

**Keywords:** *physical activity, depression, promotion, public health, policy*

### Introduction

Depression is the most prevalent mental disorder today, affecting an estimated 1 in 4 Canadians at some point in their lifetime.<sup>1</sup> In fact, depression is the number one cause of disability in Canada, accounting for 22.5% of disability claims—and disability represents 4% to 12% of payroll costs in Canada—a significant cost burden.<sup>2</sup> While medication and psychotherapy

are effective treatments for depression, medication has unpleasant side effects that contribute to poor compliance, and psychotherapy is not always available nor is it affordable for most. Overwhelming scientific evidence supports the antidepressant effects of physical activity,\* including many meta-analyses.<sup>5-7</sup> In Canada, the Canadian Network for Mood and Anxiety Treatments (CANMAT) has recently revised treatment guidelines and

now recommends exercise as a front-line intervention for mild to moderate major depressive disorder (MDD) and a secondary therapy for moderate to severe MDD.<sup>8</sup>

While this is clearly progress, specific guidelines for practitioners on how to best promote physical activity among individuals experiencing depression are still lacking. A scoping review was done recently on the barriers and facilitators related to physical activity among adults with depression.<sup>3</sup> The present article builds on

### Highlights

- Physical activity is proven to prevent and treat depression.
- Lower levels of physical activity and mild forms are enough for mood gains.
- Practitioners should promote enjoyable physical activity experiences by guiding individuals with depression to slowly build up their physical activity, and by suggesting they choose activities based on preferences, play outdoors, incorporate music and/or participate with a buddy or group.
- Other recommendations are to ask for permission to talk about physical activity and frame it as something that can be done to feel better; clarify that a little physical activity is better than nothing; provide choices to try; and, if possible, accompany the individual on their first few sessions.

\* Physical activity is defined as any bodily movement that increases energy expenditure.<sup>3</sup> Exercise is a type of physical activity that is planned, structured and repetitive with the objective of maintaining or improving fitness.<sup>4</sup> Sport can be defined as a type of physical activity in which an individual or team engages in competition that involves physical fitness and skills.<sup>4</sup>

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this review and is informed by many other high quality reviews, meta-analyses and studies. Specifically, the purpose of this evidence-informed policy brief is to make evidence-based recommendations for primary care providers such as physicians, physician assistants and nurses; allied health providers working in primary care or in the community, such as kinesiologists, physiotherapists and psychologists; and policy makers to activate individuals with depression and keep them moving in order to reduce depressive symptoms, prevent future episodes of depression, improve quality of life during and after treatment and save on health care spending. These recommendations may also be used to tailor future interventions and inform policy guidelines to reduce depression rates in Canada.

## **Evidence-based recommendations to promote lifelong physical activity in adults with depression**

Based on the research to date, we propose the following recommendations to optimize sustained involvement in physical activity among individuals with depression.

### **1. Ask for permission to discuss physical activity and frame it as something they can do to feel better**

Glowacki and colleagues<sup>9</sup> developed a toolkit to provide health care providers with an evidence-based resource to use in practice to guide and facilitate conversations about exercise as a treatment for depression. The toolkit is designed to be a starting point in helping health care professionals integrate the CANMAT guidelines<sup>8</sup> into practice before making a referral to an exercise specialist. The toolkit is available online at [www.exerciseanddepression.ca](http://www.exerciseanddepression.ca). When bringing up the topic of physical activity, practitioners should ask for permission to discuss this behaviour, as it creates a fertile behaviour change climate and reduces resistance.<sup>10</sup>

Moreover, in all conversations or messaging it is important to frame physical activity as something individuals can do to feel better. Indicate that it is something they have control over and can build into their life to improve their mood and increase their overall well-being. Indeed, a growing body of research is showing that discussing physical activity as a means to acquire physical health or for healthy aging or weight loss or maintenance is not activating

from a behaviour-change perspective, as compared to the more immediate “feel good” benefits.<sup>11</sup> A scoping review suggests using the following messaging in verbal and visual communications: “Physical activity can decrease negative emotions and increase positive ones.”<sup>12</sup> In line with this suggestion, another study recommended using the words “Inactivity can drag you down, and physical activity can pull you up.”<sup>12</sup> Since physicians are limited in the amount of time they can spend with each patient, referral to an exercise specialist (e.g. a kinesiologist) is recommended to support long-term physical activity behaviour change.

### **2. Volume: clarify how much (i.e. frequency and duration) physical activity is required**

Individuals with depression often experience lethargy and will likely find the prospect of having to incorporate 150 minutes of moderate to vigorous aerobic activity a week daunting.<sup>13</sup> The evidence on dose for this population has shown that, compared to that required for physiological benefits, less weekly physical activity is needed to improve mental health and reduce mental illness symptoms.<sup>14</sup> For instance, a systematic review of 30 high quality studies showed that even low levels of physical activity (e.g. walking less than 150 minutes/week) are effective for preventing depression.<sup>15</sup> With regard to the treatment of depression (i.e. reducing depressive symptoms), Stanton and Reaburn’s review<sup>16</sup> recommended supervised aerobic activity at a mild to moderate intensity for 30 to 40 minutes at a time, three to four times a week for a minimum of nine weeks. Similarly, Nyström et al.<sup>17</sup> suggested physical activity at least three times a week, for a minimum of 30 minutes at a time, preferably under supervision. This review concludes by stating that future research should focus on tailoring physical activity recommendations to the individual’s personal physical activity preferences.<sup>17</sup> Therefore, specific strategies and tools to individually customize physical activity and enhance enjoyment are offered throughout this article (see section 5).

More recently, research has shown that even less physical activity is needed to prevent and treat depression. For instance, a study of 33 908 Norwegian adults with no previous history of a mental disorder monitored their levels of physical activity and symptoms of depression over 11 years;

findings showed that just one hour of physical activity a week protects against new-onset depression.<sup>18</sup> This is in line with a recent review of the relationship between physical activity and happiness showing that as little as 10 minutes per week, or one day of physical activity per week, could result in increased levels of happiness.<sup>19</sup> This is concordant with an earlier meta-analysis on the mental health benefits of green exercise (i.e. physical activity in the presence of nature) showing that the mental health indicators self-esteem and mood showed the greatest change in the shortest duration (i.e. 5 minutes).<sup>20</sup> Therefore, practitioners and policy makers should approach the issue from the perspective that “every bit of physical activity helps, and some is better than none.” This approach also aligns well with research showing that physical activity adherence rates are significantly better with lower doses of physical activity.<sup>21</sup>

### **3. Type/domain: encourage leisure-time physical activity, active transport and domestic physical activity**

While personal physical activity preferences are very important to promote enjoyment, intrinsic motivation and ensuring maintenance,<sup>22</sup> research has shown that when it comes to decreasing depressive symptoms, optimizing mental health and fostering happiness, not all types of activities offer the same benefits. A meta-analysis by White and colleagues<sup>23</sup> found that leisure time physical activity (LTPA) such as dancing and hiking, and transport physical activity such as walking and biking to work both had a positive association with mental health. This confirmed previous studies reporting that LTPA, even in low doses, was consistently and strongly associated with reduced likelihood of depression.<sup>24</sup> In addition, a large-scale study including over 11 000 adults from 15 European countries showed that “a lot” of LTPA was positively associated with happiness.<sup>25</sup> It is hypothesized that LTPA is more strongly linked to mental health and mental illness outcomes because there is choice involved, it provides a distraction from stress and it offers opportunities for improved self-esteem and self-efficacy.<sup>23</sup> Richards et al.<sup>25</sup> also found a positive relationship between “a lot” of domestic physical activity, such as gardening, and happiness. It should be noted that this study assessed domestic activities that were recreational versus



heavy housework and chores that tend to have a more negative connotation.

Finally, growing evidence is pointing towards yoga as a favourable physical activity for treating depression because, in addition to movement, it also involves breath regulation and mindfulness.<sup>26</sup> In support of this, a review of physical activity and happiness found that aerobic and stretching/balancing exercises were both associated with increased happiness.<sup>19</sup> Furthermore, another recent meta-analysis showed that resistance exercise training (RET; strength training) was associated with a significant reduction in depressive symptoms.<sup>27</sup> In sum, many types of physical activity are beneficial for preventing and treating depression but personal preference and choice is also important.

#### **4. Intensity: emphasize that mild is best but personal physical activity preferences are paramount**

There has been much debate about high intensity interval training (HIIT), which involves training at a high intensity for a short period of time. Most exercise physiologists claim that it is the most time-efficient exercise option for quick physiological results,<sup>28,29</sup> while most exercise psychologists state that it is not feasible nor sustainable as it is quite unpleasant.<sup>30,31</sup> Even among a nonclinical adult population, a 12-month intervention involving an unsupervised HITT program showed a rapid decline in regular participation throughout the study period.<sup>32</sup> Poor adherence has been attributed to a lack of enjoyment while engaging in HITT.<sup>30</sup> Indeed, Saanijoki et al.<sup>33</sup> indicated that HITT leads to greater negative emotions during and after an exercise bout. Individuals with depression are already managing negative emotions, so this form and intensity of physical activity may not be suitable for this population, and could even cause them to give up on physical activity altogether. Indeed, the most prominent barriers individuals with depression report with respect to engaging in physical activity are that they are “too tired” or have “low energy,” which makes HIIT difficult.<sup>3</sup> In line with this, a six-week physical activity intervention among Canadian university students found that high intensity exercise led to increased perceived stress, while continuous moderate training resulted in decreased depressive symptoms.<sup>34</sup>

Furthermore, there is a growing body of literature recommending mild physical activity for mental health/illness. Mild physical activity has been associated with higher levels of positive affect than vigorous physical activity.<sup>35</sup> This is in line with an earlier meta-analysis concluding that the greatest improvements in positive affect after physical activity occurred for the lowest intensity of physical activity, and this benefit was twice that of moderate-vigorous physical activity (MVPA).<sup>36</sup> As mentioned previously, yoga is one example of mild physical activity that has been shown to significantly reduce depressive symptoms.<sup>37,38</sup> In addition, a meta-analysis found that self-esteem improvements from green exercise declined with growing intensity of activity.<sup>20</sup> Another study found that physical activity of a less intense level contributes more to the well-being of individuals than more intense levels.<sup>39</sup> Finally, a recent cross-sectional study of healthy adults found that mild-intensity physical activity related positively to psychological well-being and negatively to depression scores.<sup>40</sup>

While mild forms of physical activity, including walking interventions,<sup>41</sup> appear to show promise, some studies have found the contrary—that moderate-vigorous intensities have a greater influence on reducing depressive symptoms.<sup>42,43</sup> For instance, a randomized controlled trial by Hughes and colleagues<sup>43</sup> showed that depressive symptoms were reduced more quickly in individuals engaging in vigorous physical activity compared to mild physical activity throughout a 12-week intervention. However, at follow-up, individuals in both the vigorous and mild physical activity groups showed improvement in depressive symptoms, and there were no significant differences between groups. In line with this finding, other studies have concluded that any physical activity, regardless of the intensity, is beneficial to mental health.<sup>15,18,25,44</sup> Mammen and Faulkner’s systematic review also found that any intensity of physical activity decreases the risk of developing depression.<sup>15</sup> This was followed by a review showing that the influence of physical activity intensity on happiness is minimal.<sup>25</sup> Similarly, a randomized controlled trial including adults with mild to moderate depression showed that mild (e.g. yoga), and moderate and vigorous intensity (e.g. aerobic training) physical activity are all effective in reducing depressive symptoms.<sup>44</sup> Finally, a longitudinal study conducted over 10 years among an initially

healthy cohort revealed that regular LTPA of any intensity provides protection against future depression.<sup>18</sup> Taken together, this evidence suggests that the intensity of physical activity is not particularly important when it comes to mental health and mental illness.

#### **5. Promote positive, enjoyable experiences**

What does seem vital is physical activity enjoyment. Physical activity and fun are not typically associated in most people’s minds; however, enjoyment is an important evidence-based motivator for long-term physical activity participation.<sup>22,45</sup> Moreover, physical activity enjoyment has been shown to increase self-determined motivation for physical activity, which is linked to positive mental health outcomes, including reduced depressive symptoms.<sup>46</sup>

This is particularly important for individuals with depression, who tend to have motivational deficits and typically experience less pleasure in everyday living. Therefore, enhancing physical activity enjoyment is crucial in order for individuals with depression to obtain mental health benefits.<sup>47</sup> Following are some scientifically grounded recommendations for enhancing physical activity enjoyment that may apply to both the general population and individuals with depression.

##### **a. Try the “commit 10” strategy and encourage a slow buildup**

One strategy that often works for individuals who are inactive, both for associating physical activity with positive feelings and for assisting with time management, is the “commit 10” technique.<sup>48</sup> The practitioner asks the individual whether they might be able to find 10 minutes in the next week to take a walk outside. The individual almost always says yes. Then, the practitioner specifies that they are to go outside for a 10-minute walk and if they feel as good (or better) than they did when they left, they can choose to continue. If not, then they end their physical activity session. This typically anchors walking/moving to positive feelings and experiences, which is very important to foster physical activity enjoyment. From there, the individual should be encouraged to build up walking frequency and duration slowly, to minimize discomfort and ensure enjoyable experiences. Setting small and progressive goals also helps build self-efficacy, which is a key determinant of physical activity behaviour change in the general

population,<sup>49</sup> and has been found to be both a barrier and facilitator for physical activity among individuals with depression.<sup>3</sup>

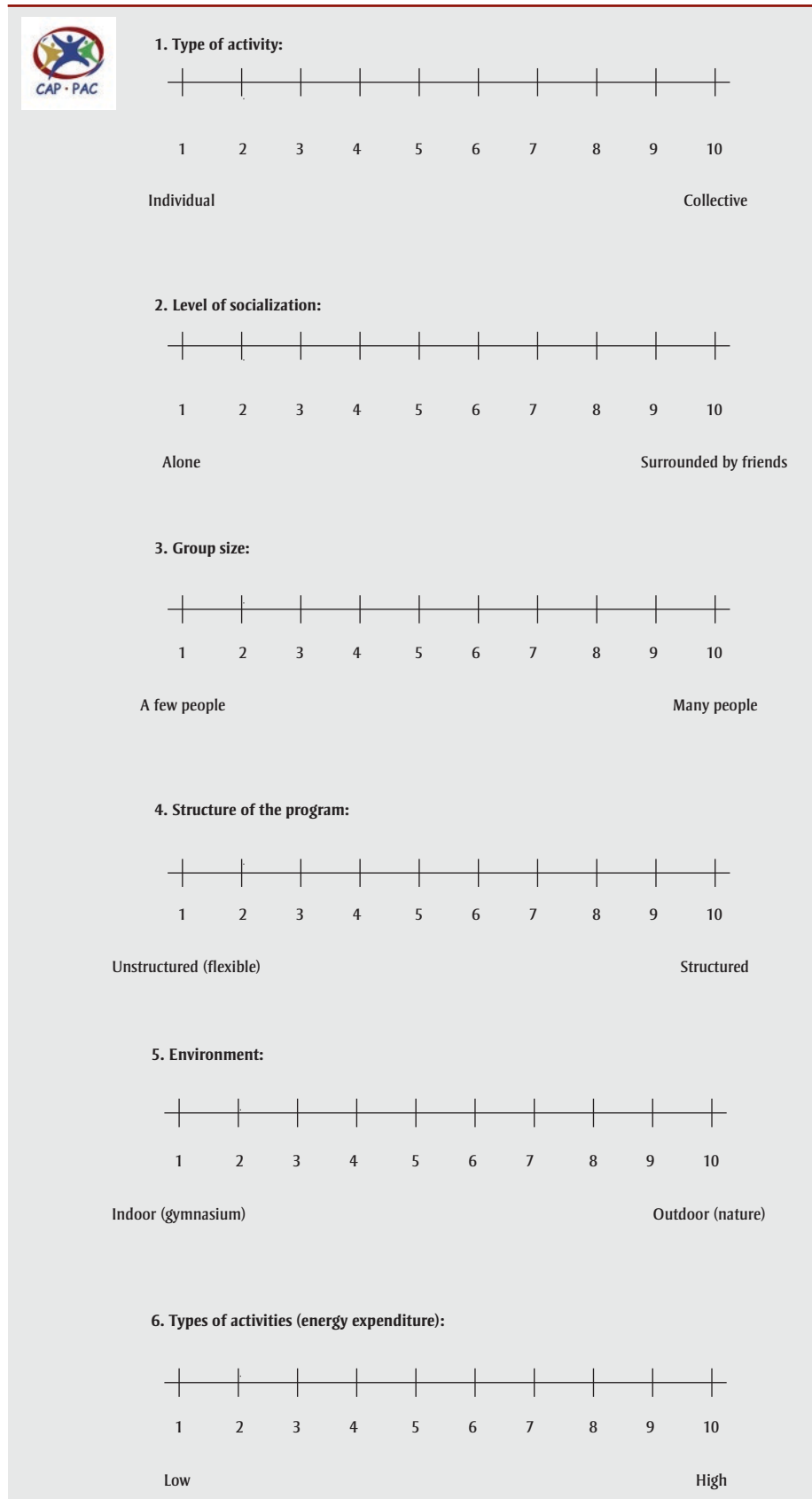
**b. Help them choose other enjoyable physical activity options**

Here practitioners have a few choices on how to proceed. They may ask the individual which activities they find the most enjoyable among the types that are found to best improve depressive symptoms (e.g. walking or biking to and from work, gardening, yoga; see section 2). They could also ask the individual about their own physical activity preferences (e.g. outdoor vs. indoor, competitive vs. cooperative, group vs. individual, high-energy expending vs. low-energy expending). This can be done using preference scales (Figure 1).<sup>†</sup> An alternative method is to show them a list of numerous physical activities and ask them if there are some they have tried before and enjoyed that they might want to try again, or if there are new activities they might find enjoyable. Figure 2 presents an example of such a list, developed by a multidisciplinary team for the Physical Activity Counselling (PAC) Trial. Once the person has chosen a few activities, the practitioner should suggest that the individual choose the most suitable and sustainable one or two activities, and then provide them with a lot of encouragement to give each a try. Some practitioners (e.g. kinesiologists) could even support the individual by doing the selected activity with them for the first few times or offering to connect them with someone at a fitness centre or club. Indeed, centre-based activities such as those offered at YMCAs are an excellent option, considering that supervision is a recommendation in some of the recent reviews of this topic.<sup>16,17</sup>

**c. Encourage them to be self-compassionate**

Once the activities have been chosen and tried a few times, a reminder to the person to be gentle and compassionate with themselves is necessary to ensure maintenance. Pushing too hard when it comes to physical activity often leads to less enjoyment and sometimes injury and dropout.<sup>50</sup> Not only is it important for the individual to choose the type, frequency and duration of activity to optimize intrinsic motivation, but they should also self-select their intensity in order to promote positive feelings and experiences. Recently it was

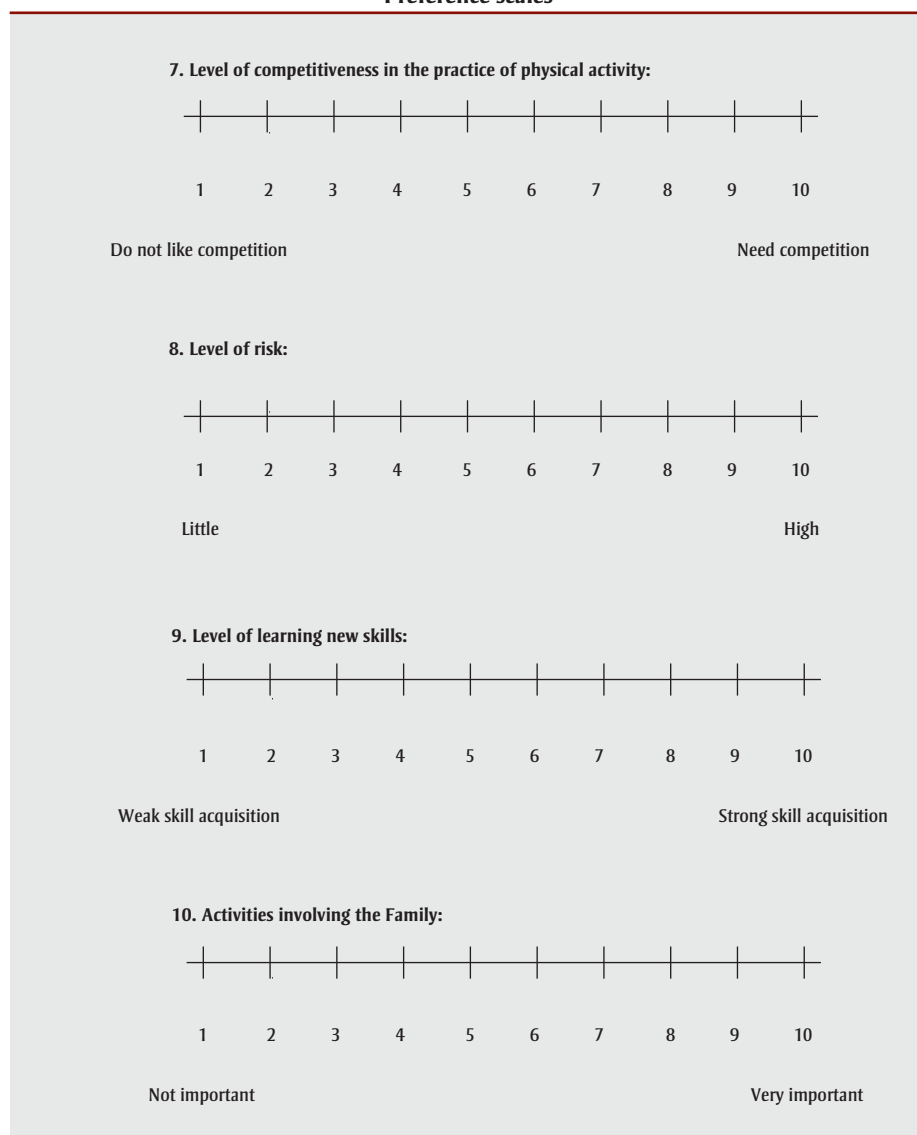
**FIGURE 1**  
Preference scales



Continued on the following page

<sup>†</sup> The preference scales were developed by a multidisciplinary team for the Physical Activity Counselling (PAC) Trial (2004–2006).

**FIGURE 1 (continued)**  
**Preference scales**



Source: The Physical Activity Counselling (PAC) Trial, 2004–2006.

concluded that physical activity participation rates among individuals with depression can be enhanced by considering participants' preferences for physical activity training.<sup>51</sup>

A kinesiologist or other practitioner can help the person to distinguish between the different intensities of physical activity, and to progress through them pleasantly. A self-compassionate mindset towards physical activity is essential for all individuals, especially those with depression, if they are to overcome setbacks and maintain their physical activity routine.<sup>52</sup> Again, the practitioner can help by reframing setbacks as “tries,” by normalizing struggles with physical activity and by helping the individual speak kindly to themselves when they experience barriers.<sup>53</sup>

If the above steps a to c do not lead the individual to have positive physical activity experiences or to engage in regular physical activity, the following extra steps d to g can enhance enjoyment and physical activity maintenance:

**d. Encourage them to play outdoors in aesthetically appealing environments**

While personal physical activity preferences are very important, there is growing evidence that outdoor activity is particularly enjoyable, restorative and healing.<sup>54-56</sup> A meta-analysis on the mental health benefits of green exercise showed a medium effect size for self-esteem and a large effect size for mood, and both of these were larger than the effects of non-green exercise.<sup>20</sup> Moving outside combines the

benefits of nature and physical activity, and is very powerful for individuals with and without depression.<sup>57-59</sup> There has been an emergence of these types of activities in the last few years and different terms have been used to refer to them (e.g. “nature walks,” “forest bathing” and “mood walks”). Finally, while all green environments improve self-esteem and mood, the presence of water may lead to even greater improvements.<sup>20</sup>

**e. Suggest energizing or soothing music while moving**

Music is healing and often used in the treatment of mental health issues.<sup>60-62</sup> Moreover, a growing literature supports the use of music as a source of motivation during physical activity.<sup>63,64</sup> Studies show that individuals who listen to music while performing physical activity are more likely to participate in and adhere to physical activity long term.<sup>65,66</sup> In a recent study of nonclinical university students, exercise enjoyment was significantly higher among participants who participated in 20 minutes of moderately paced walking with a personal music player versus without.<sup>67</sup> In another sample of university students, Chizewski found that self-selected music elicited the greatest improvements in exercise enjoyment and duration compared to classical music, as suggested in the study, or no music.<sup>68</sup> Practitioners should suggest the individual make a playlist of their favourite songs or pieces to listen to while engaging in physical activity. Depending on what symptoms are present that day, the individual could choose energizing music leading up to and during their physical activity session or soothing music if anxiety symptoms are present that day.

**f. Encourage them to engage in physical activity with a buddy or a group**

One of the most common effects of depression is social isolation,<sup>69</sup> which worsens the illness, so any physical activity that involves social contact can be positive and motivating for an individual with depression. In fact, most often the benefits of physical activity on the prevention of depression are attributed to the physical and social effects.<sup>18</sup> Engaging in interpersonal relationships while being physically active with others may satisfy the need for a sense of belonging (i.e. relatedness) which in turn has a positive influence on mental health.<sup>70</sup> In line with this, a recent review found that the effects of physical activity on happiness were

**FIGURE 2**  
List of physical activities



Already practiced	Practiced in the last year	Interested to practice		Already practiced	Practiced in the last year	Interested to practice	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Aerobics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Swimming
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Aqua for me	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Rollerblading
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Martial arts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ice skating
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Rowing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pilates
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Badminton	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Windsurfing
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Broom ball	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bowling
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Baseball	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Racquetball
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Basketball	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hiking
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Canoe	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Racket
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Curling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ringette
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Classical dancing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Skiing (alpine)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Social dancing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Skiing (cross-country)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Riding	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Soccer
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Climbing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Spinning
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Stairs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Squash
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fencing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tai chi
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Football	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tennis
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Golf	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Table tennis
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Handball	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Housework
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ball hockey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bike
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ice hockey	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Volleyball
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Gardening	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Water polo
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Jogging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yoga
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kayak	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Walking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bodybuilding				

Source: The Physical Activity Counselling (PAC) Trial, 2004–2006.



partially mediated by increases in health and social functioning.<sup>19</sup>

Classes such as CrossFit are appealing due to the social or communal atmosphere that is typical in these settings. However, because of the high intensity of this type of workout, and because this setting typically attracts more athletic types, it may not be the best option for people with depression. Indeed, this population might feel intimidated in such an environment, potentially leading to an unpleasant experience. Examples of better options are snowshoeing with a friend, taking a dance class with a partner or attending a tai chi class to make new friends. Of course, the person could build up to a CrossFit-style workout, or another more intense activity such as spinning, if they are interested, as this combines aerobic activity, music and a group atmosphere.

Team sports are also something to consider. There is growing research showing that participation in team sports during high school protects against depressive symptoms in early adulthood,<sup>71</sup> and recently a study with young adults found that informal physical activity groups and team sports were positively related to mental health and inversely related to depressive symptoms.<sup>72</sup> Enjoyable physical activities that promote positive social interactions may be the best option to reduce depressive symptoms, improve mental health and promote long-term maintenance.

#### **g. Encourage them to track their physical activity and their mood**

Self-monitoring is a self-regulation technique by which individuals keep a record of their physical activity levels. It has been linked to successful physical activity behaviour change.<sup>73-75</sup> Encouraging the individual with depression to track their physical activity (e.g. number of steps, minutes) promotes self-efficacy and accountability.<sup>76</sup> Self-monitoring also enables the individual to recognize the discrepancy between their behaviour (e.g. walking once a week) and the goal they set for themselves (e.g. walking 3 times a week). Encouraging the person to rate their mood on a scale before and after their bout of physical activity or to journal about how they feel after physical activity is also recommended because it will formalize the link between physical activity and positive feeling states or emotions to sustain motivation and physical activity maintenance.<sup>12</sup>

## **Conclusion**

Building on the strong international evidence on the power of physical activity to prevent and treat depression,<sup>6,16,17</sup> exercise is now recommended as an additional front-line treatment for depression in Canada.<sup>8</sup> However, it remains unclear how to best promote physical activity uptake and maintenance among individuals with depression. Some earlier recommendations have been made in Australia<sup>16</sup> and in Europe;<sup>17</sup> however, these guidelines are not specific to the Canadian context and more research has emerged on the importance of promoting enjoyable physical activity that is tailored to individual preferences. Moreover, while the Canadian 24-Hour Movement Guidelines, which recommend hours per day for physical activity, sleep and sedentary behaviour, are useful, they do not specify to providers how to get their patients or clients to those levels. Accordingly, the purpose of this paper was to make evidence-based recommendations for Canadian policy makers and practitioners in assisting adults with depression to become lifelong movers.

Recommendations include: asking for permission to talk about physical activity; framing physical activity as something the individual has control over to improve their mood; clarifying that “a little physical activity is better than nothing, so do what you can”; providing choices of activities to try and accompanying them on their first few sessions. Moreover, this article highlights the importance of physical activity enjoyment for everyone, but especially for adults with depression.

While more research is needed to determine which factors increase physical activity enjoyment for different subgroups of this population, such as age below or over 65 years, or the presence of comorbidities, recommendations to promote enjoyment herein include guiding individuals with depression to slowly build up the frequency, duration and intensity of activity; encouraging them to be self-compassionate with regard to physical activity; suggesting they play outdoors, incorporate music, or participate with a buddy or group to make the experience more positive; and recommending they incorporate self-monitoring or journaling to solidify the link between physical activity and improved mood. Policy makers and practitioners are encouraged to use these

scientifically based recommendations, especially maximizing choices, enhancing physical activity enjoyment and emphasizing personal preferences for frequency, intensity, type and time/duration of activity to help individuals with depression move, recover and flourish.

## **Conflicts of interest**

The authors declare no conflicts of interest.

## **Authors' contributions and statement**

MF conceived the idea for the policy brief and prepared the draft manuscript. All authors provided revisions on the draft manuscript and approved the final manuscript for submission.

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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## Original quantitative research

# Strengthening surveillance of consumer products in Canada: the vaping example

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### Abstract

**Introduction:** The overall objective of this study was to demonstrate how information collected by the Consumer Product Safety Program (“the Program”) can be used to identify emerging hazards. Specifically, this study characterized and quantified trends associated with vaping reports received by the Program over the past five years.

**Methods:** Data collated by the Program were extracted for the period from 1 January, 2015 to 30 September, 2019. The data were summarized using descriptive statistics and trends were quantified for annual percent change. In order to compare characteristics of vaping reports, the proportionate injury ratios (PIRs) and corresponding 95% CIs were used to compare vaping-related injuries to all other reports received by the Program.

**Results:** A total of 71 vaping-related reports were received between 1 January, 2015 and 30 September, 2019. During this period, the annual percent change increase in the number of reports received was approximately 73% annually ( $p < .05$ ). Among the reported injuries, 41% were burn injuries. Proportionally, there were more vaping reports involving males (PIR = 1.89; 95% CI: 1.51–2.36) and individuals between the ages of 15 and 19 years (PIR = 11.53; 95% CI: 4.95–26.8) as compared to all other reports submitted to the Program.

**Conclusion:** While the number of reports relating to vaping products is small, the results of this analysis suggest that certain groups, including males and youth, are more likely to be the subject of a vaping-related incident.

**Keywords:** *vaping, consumer, e-cigarettes, injury*

### Introduction

Surveillance of consumer product-related incidents plays a key role in identifying risks to health and guiding the response to manage and mitigate those risks. Specifically, through systematic and ongoing monitoring of consumer products, surveillance intelligence informs risk assessment, risk management, compliance, enforcement and other domestic and international activities that aim to protect the health and safety of Canadians. In support of the *Canada Consumer Product Safety Act*<sup>1</sup>

(CCPSA; “the Act”), the Consumer Product Safety Program (CPSP; “the Program”) of Health Canada collects information on safety-related incidents through its online reporting portal for a wide variety of consumer products, including reports related to vaping products.<sup>2</sup> Consumer products include appliances, housewares, children’s products, electronics, grooming products (excludes products governed by cosmetics under the *Food and Drugs Act*), home and automobile maintenance products, textiles, and outdoor living, sports and recreation products.

### Highlights

- Among those who reported gender, the majority were males.
- The number (and proportion per 100 000 reports received) of reports related to vaping products increased significantly between 2015 and 2019.
- Among those who reported age, teens (aged 15–19 years) are significantly more likely to report an incident.
- Compared to the average of all consumer product reports received by the Program, proportionally, those related to vaping involved more visits to emergency departments.

In Canada, the prevalence of vaping has been increasing in recent years, particularly among youth.<sup>3</sup> According to the 2018–19 Canadian Student Tobacco, Alcohol and Drugs Survey (CSTADS), e-cigarette prevalence rates have doubled over the past couple of years. In 2016/17, approximately 10% of students in Grades 7 to 12 reported using e-cigarettes over the past 30 days. However, this same statistic increased to 20% in 2018/19.<sup>3</sup>

Since the introduction of vaping products, there have been a number of injuries including poisoning due to ingestion of vaping liquid and burns resulting from malfunctioning vaping devices.<sup>4,5</sup> While adverse health effects associated with exposure to some types of tobacco products are well documented, the health implications of vaping are not fully understood.

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Vaping devices are relatively new products in Canada. They can place a significant strain on their lithium-ion (Li-ion) batteries by drawing large electrical currents while in operation. Although Li-ion technology is safe in general, straining a battery (particularly one of poor quality) can lead to explosions and fires. Since a vaping device is often in intimate contact with the user, this can result in a unique hazard to consumers.<sup>4,5</sup> Rossheim and colleagues<sup>4</sup> estimated that between 2015 and 2017, there were 2035 individuals who presented to US hospital emergency departments for burn injuries due to the explosion of vaping devices. Approximately 26% of these patients were treated and then either transferred to another unit, admitted or held for observation.<sup>4</sup> Many vaping liquids contain nicotine, which has high acute toxicity and has resulted in a number of fatal and non-fatal poisonings after ingestion, including among children. More recently, there has been a focus on vaping-associated lung illness, with over 2000 cases of lung injuries in the United States<sup>6</sup> and 19 cases in Canada.<sup>7</sup> The risk of injury, poisoning and other adverse health consequences underscores the need for continued monitoring and analysis of surveillance data in order to identify actionable intelligence.

The purpose of this study was to evaluate vaping information reported to the Program. Specifically, the objectives of this study were to

- describe the epidemiology (person, time and exposure) of vaping-related reports; and
- to examine temporal trends and compare reports related to vaping products to those of all other products.

## Methods

### Data source

The Program receives reports from industry and consumers (including third parties such as health care providers) through its online reporting portal.<sup>8</sup> On average, the Program received 2500 reports on all types of consumer products annually during the study period. These reports provide related health and safety information about consumer products. Industry (i.e. manufacturers, importers and sellers) is required to report under Section 14 of the Act for consumer products. Although consumers

are not required to submit this information, the Program routinely receives voluntary reports from them. Reports may originate from Canada or from abroad. In addition, the Program scans media articles involving consumer products and includes them in its database. Using Google alerts, the Program scans media articles primarily from major news outlets.

The online reporting portal is used to collect information on the affected persons (date received, gender, age range, type of injury incurred and treatment outcome), the narrative (what happened and how), the product involved (brand, model number, serial number, bar code, etc.), and how the product was acquired (date of purchase, business name and address). All of this information is stored in a database called RADAR, a bilingual palindromic acronym that stands for Regulatory Action Depot/Dépôt d'actions réglementaires. Information pertaining to the person (age and gender), time (year, day of the week and time of day) and exposure (e.g. products used) was extracted from RADAR for analysis. Once the reports are received into RADAR, triage analysts code additional information such as product category, injury type, injury severity, treatment and primary hazards, which were then extracted for analysis.

### Study period

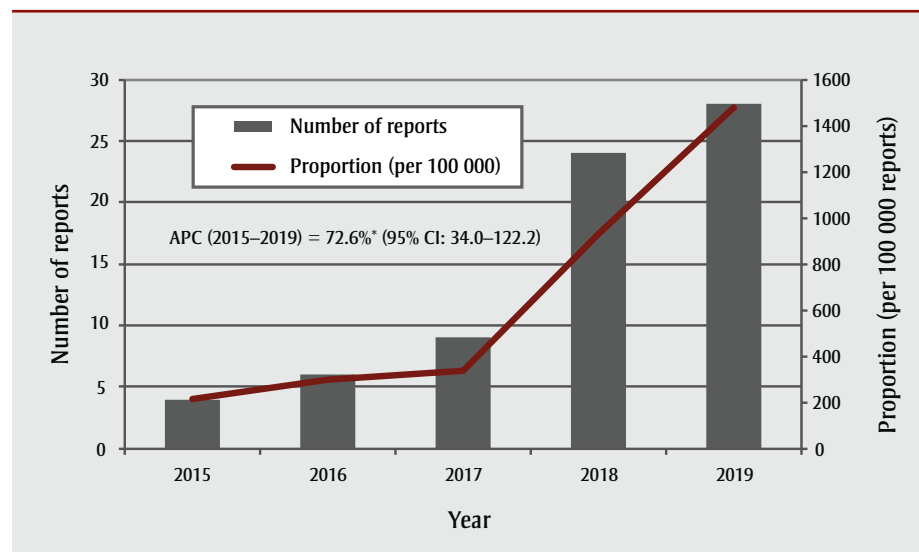
The study period included all reports collected in RADAR for the period between

1 January, 2015 and 30 September, 2019. The unit of analysis for this study is any report relating to vaping. Vaping-related reports were identified from RADAR using two methods. The first method relied on coding of reports using the injury and hazard coding manuals developed by the Program. The Program coding manual is similar to the National Electronic Injury Surveillance System (NEISS) coding system used by the U.S. Consumer Product Safety Commission (CPSC).<sup>4</sup> All reports coded as “vaping device” were extracted. In addition, a second method using search strings was applied to incident description narratives to extract syndromic events (e.g. “breath”, “cough”, “chest pain”, “nausea”, “vomit”, “lung”, “pulmonary”, “poumon”, “pulmonaires”, “empoisonner”, “à l’abri”, “respiratoire”, etc.) occurring in either English or French. Furthermore, search strings were also used to identify cases in the product brand and name description field (e.g. “atomiser”, “cartomiser”, “vap\*”, “dab”, “cig\*”, etc.). A list of search terms is available upon request. All extracted records were reviewed manually to avoid coding errors.

### Statistical analysis

Descriptive statistics were generated to examine the distribution of different characteristics of vaping reports identified. Counts and percentages were calculated for all relevant variables. Proportionate injury ratios (PIRs) and 95% confidence

**FIGURE 1**  
Number of vaping-related reports, expressed as proportions and annual percent change, reported to RADAR between 1 January, 2015 and 30 September 30, 2019



**Abbreviations:** APC, annual percent change; CI, confidence interval; RADAR, Regulatory Action Depot/Dépôt d'actions réglementaires.

\*APC significantly different from zero at  $\alpha = .05$ .

intervals (CIs) were computed to compare specific characteristics of vaping cases (N = 71). The PIR was calculated as a ratio of the observed number of cases for a given characteristic (for example, injury type) to the expected number of cases of that characteristic based on all RADAR reports.<sup>9-11</sup> A PIR of unity (1.00) indicates that the expected number of injuries attributed to vaping is the same as that of all other RADAR reports. If the PIR is higher than unity and the lower confidence limit excludes 1.00, then the result is interpreted as being significantly higher than expected. The analysis included reports submitted by consumers and industry, and those found in the media. To determine the robustness of the study results, sensitivity analyses were conducted (excluding all reports identified from the media). Annual percent change was computed using Joinpoint regression.<sup>12</sup> Statistical significance level (alpha) of .05 was determined prior to any analyses. Analyses were conducted using Microsoft Excel, SAS version 9.4 (SAS Institute Inc., Cary, NC, USA), and Joinpoint Desktop software version 4.7 (National Cancer Institute, Bethesda, MD, USA).

## Results

A total of 71 vaping-related reports were received by the Program between January 2015 and September 2019. Figure 1 shows the distribution of reports over the years. In 2015, four reports were submitted to the Program. In 2019 (up to September only), 28 reports were received. Proportionally, this represents an annual percent increase of 72.6% ( $p < .05$ ) for the study period.

Table 1 presents summary demographic and injury characteristics of those described in the reports. Overall, the mean age (in years) was 34.1 (standard deviation [SD] 18.6). Among those who reported age (N = 26; 37%), most were adults aged 35 to 59 (38.5%), whereas children under 14 and seniors aged 60 or older accounted for 11.5% and 7.7% of cases, respectively. Among those reports that included gender, most involved males (69.8%). The most commonly reported hazard was toxicological (e.g. poisonings through ingestion; 53.5%), followed by explosion (23.9%) and other hazards (e.g. mechanical; 22.5%). Overall, 45.1% (N = 32) of the reports did not involve injuries.

**TABLE 1**  
Demographic and injury data analyzed from vaping-related reports submitted to Canada's Consumer Product Safety Program, January 2015 to September 2019

Characteristics	N (%)
<b>Gender</b>	
Male	37 (52.1)
Female	16 (22.5)
Unknown	18 (25.4)
<b>Age group (years)</b>	
0–14	3 (4.2)
15–19	5 (7.0)
20–34	6 (8.5)
35–59	10 (14.1)
≥ 60	2 (2.8)
Unknown	45 (63.4)
<b>Age (years)</b>	
Mean (SD)	34.1 (18.6)
Median (IQR)	34 (18–46.5)
<b>Primary hazard</b>	
Toxicological	38 (53.5)
Explosion	17 (23.9)
Other	16 (22.5)
<b>Injury type</b>	
No injury	32 (45.1)
Injury specified	39 (54.9)
Burn (41.0%)	
Asphyxia or poisoning <sup>a</sup> (15.4%)	
Irritation or allergic reaction (10.3%)	
Fracture (5.1%)	
Other/unknown (28.2%)	
<b>Injury severity</b>	
No injury	32 (45.1)
Minor	10 (14.1)
Moderate	14 (19.7)
Severe	8 (11.3)
Fatal, life-threatening or disabling	2 (2.8)
Unknown	5 (7.0)
<b>Treatment</b>	
No injury—no treatment	32 (45.1)
Injury—no treatment	5 (7.0)
Other medical professional	7 (9.9)
Emergency department visit	13 (18.3)
Hospital—admission	3 (4.2)
Unknown	11 (15.5)

**Abbreviations:** IQR, inter-quartile range; SD, standard deviation.

<sup>a</sup> Includes difficulty breathing.

Among those that reported an injury (N = 39; 54.9%), 41.0% (N = 16/39) were due to burns. Other injury types reported include asphyxia or poisoning (15.4%), irritation or allergic reaction (10.3%) and fractures caused by the exploding battery (5.1%). The largest proportion of injury severity reported was moderate (N = 14; 35.9%); followed by minor (N = 10; 25.6%); severe (N = 8; 20.5%); and fatal, life threatening or disabling (N = 2; 5.1%). Of the injuries involving a treatment, 13 (18.3%) resulted in an emergency room visit, 7 were treated by another medical professional and 3 resulted in hospital admission.

Table 2 provides results of the comparison of vaping-related reports to all other reports received by the Program. Proportionally, males are overrepresented compared to all other reports received by the Program (PIR = 1.89; 95% CI: 1.51–2.36). Vaping-related reports from those between the ages of 15 and 19 years represented 12 times more reports than all others received by the Program (PIR = 11.53; 95% CI: 4.95–26.8). The most common hazards for vaping were toxicological (PIR = 2.79; 95% CI: 2.24–3.47) and explosions (PIR = 6.39; 95% CI: 4.22–9.61). Many of the reports coded as toxicological were due to poisoning attributed to ingestion of vaping substances. Reports coded as poisoning (including breathing difficulties) were overrepresented among vaping reports when compared to all other reports submitted to the Program (PIR = 2.33; 95% CI: 1.08–5.01). Similarly, the explosions caused burns to those reporting this hazard, and lithium-ion batteries were also responsible for the high proportion of vaping reports involving burns (PIR = 3.50; 95% CI: 2.27–5.39) as compared to all other reports received by the Program. Many of the reports involving burn injuries mentioned severe injuries (PIR = 2.21; 95% CI: 1.15–4.24), requiring visits to the emergency department (PIR = 2.00; 95% CI: 1.22–3.27).

## Discussion

Surveillance is an important public health tool for identifying emerging hazards that can potentially cause harm to individuals and populations. The systematic and ongoing monitoring of these hazards allows for early detection of potential health threats and provides opportunities for collating actionable intelligence. In this context, the Program has been monitoring reports on a

**TABLE 2**  
Proportionate injury ratio by selected demographic and injury characteristics reported to Canada's Consumer Product Safety Program, January 2015 to September 2019

Vaping characteristics	Number of incidents	Expected values	PIR (95% CI)	
<b>Gender</b>				
Male	37	19.60	1.89	(1.51–2.36)
Female	16	20.35	0.79	(0.51–1.21)
<b>Age (years)</b>				
0–14	3	9.08	0.33	(0.11–1.00)
15–19	5	0.43	11.53	(4.95–26.8)
20–34	6	2.91	2.06	(0.96–4.94)
35–59	10	6.89	1.45	(0.81–2.57)
60+	2	3.63	0.55	(0.14–2.16)
<b>Primary hazard</b>				
Toxicological	38	13.62	2.79	(2.24–3.47)
Explosion	17	2.66	6.39	(4.22–9.61)
<b>Injury type</b>				
No injuries	32	43.73	0.73	(0.51–0.95)
Burns	16	4.57	3.50	(2.27–5.39)
Poisoning <sup>a</sup>	6	2.57	2.33	(1.08–5.01)
Irritation or allergic reaction	4	7.53	0.53	(0.20–1.38)
<b>Injury severity</b>				
Minor	10	9.93	1.01	(0.57–1.79)
Moderate	14	9.31	1.50	(0.94–2.40)
Severe	8	3.63	2.21	(1.15–4.24)
<b>Treatment</b>				
No treatment	32	43.73	0.73	(0.56–0.95)
Emergency department	13	6.49	2.00	(1.22–3.27)
Admitted to hospital	3	3.83	0.78	(0.25–2.37)

**Abbreviations:** CI, confidence interval; PIR, proportionate injury ratio.

<sup>a</sup> Includes difficulty breathing.

wide variety of consumer products, including vaping products, and collating them once received through the online reporting portal. In this study, analysis of the reports received by the Program for vaping showed that the majority of the reports for vaping products involved males (N = 37; 69.8% of those who reported gender), and that the number of total reports related to vaping products increased significantly between 1 January, 2015 and 30 September, 2019. The increase in the number of vaping reports received is consistent with the increase in the prevalence of vaping in Canada.<sup>3</sup>

This situation is not unique to Canada. Injuries related to vaping have previously been reported in the United States using data from the National Electronic Injury Surveillance System (NEISS).<sup>4,5</sup> Similar to

the aforementioned studies, most of the cases seen in this study involved males, and many of the reports described burns due to the malfunction of vaping devices' lithium-ion batteries, which overheated to the point of catching fire or exploding.<sup>5</sup> However, these problems could be mitigated as new devices are designed to conform to newly introduced hardware safety standards. In addition to burns, a number of physiological effects were also observed. These include poisoning (including breathing difficulties), irritation and/or allergic reaction and fracture (due to exploding batteries).

## Strengths and limitations

The preceding analysis relied on records of consumer and industry reports submitted to the Program. A strength of this data

is that reporting of incidents is a mandatory requirement for industry; however, identifying industry's compliance with that provision of the *Canada Consumer Product Safety Act* is challenging if industry is not aware of the problems with their products. Furthermore, the reports received almost certainly do not reflect all reports that have taken place in Canada over the study period, particularly since consumer reporting is voluntary. While the study reflects an analysis of the data presently available, there are several key limitations. The number of reports related to vaping products is small and does not capture all incidents in Canada. Additionally, Health Canada does not validate the details of every report it receives. Finally, it is likely that a variety of unquantified factors may lead to over- or underreporting, and this reporting bias may differ by subgroup. Despite these limitations, this study highlights issues that can provide valuable insight into the health risks associated with new and emerging product categories, such as vaping products.

## Conclusion

The number of vaping-related reports received by the Program annually has increased significantly since 2015. The available data suggest that certain subgroups (i.e. males, youth) are more likely to be involved in such incidents. Furthermore, reports related to vaping mentioned more visits to emergency departments proportionally than all other reports received by the Program. This study highlights the importance of surveillance systems in the monitoring of potential hazards posed by consumer products.

## Conflicts of interest

The authors declare there are no conflicts of interest.

## Authors' contributions and statement

MTD and JH contributed to conceptualizing the study. MTD, L. Guttman and L. Ghandour contributed to the literature review. MTD, SRM, L. Guttman and L. Ghandour analyzed the data. All authors contributed to drafting and revising the article.

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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## Commentary

# Intersectoral action on the social determinants of health and health equity in Canada: December 2019 federal government mandate letter review

Kelsey Lucyk, PhD

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Reducing health inequalities is a globally recognized challenge that requires intersectoral action on determinants of health.<sup>1</sup> In Canada, cabinet ministers receive policy objectives from the prime minister in “mandate letters” that outline expectations for their role and identify key priorities for their department. Ministerial mandate letters can be considered a tool for identifying opportunities for such action, as a starting point in the policy-making process. Since most determinants of health lie outside of the health sector,<sup>2,3</sup> mandate letters to non-health sector ministers reveal openings where the health sector can support policies that contribute to improving health equity. The following review of 33 mandate letters identifies key commitments outside of the health sector that address the conditions in which people are born, live, grow, work and age—known as the social determinants of health.<sup>4</sup> For the majority of commitments highlighted in this review, non-health sectors do not link their directives explicitly to health or its social determinants. This illustrates a well-documented and ongoing challenge to intersectoral action for health: the pursuit of health equity may be considered a lower priority than, or even incompatible with, the policy priorities of other sectors.<sup>5</sup> It is anticipated that this review will be of interest to public health and other professionals working across sectors to improve health equity.

### Health equity and social determinants of health: windows of opportunity

As part of a commitment to open and transparent government, Prime Minister

Justin Trudeau’s office publicly released ministerial mandate letters for the 29th Canadian Ministry on 13 December, 2019.<sup>6</sup> In some cases, mandate letters lay the foundation for intersectoral action on determinants of health by articulating which ministers should work together, on which issues and to what end. A notable example is the upstream directive to the Associate Minister of Finance to incorporate quality of life measurements into federal decision-making and budgeting by working with colleagues from the social development and science sectors.<sup>7</sup>

Thematic areas were not determined a priori in this review; letters were reviewed to consider known factors that could shape health and health equity (e.g. the distribution of money, power and resources),<sup>8</sup> and grouped according to key determinants, using the Public Health Agency of Canada (PHAC) framework for social determinants of health as a guide.<sup>4</sup> Other relevant frameworks (e.g. ecological, commercial and Indigenous determinants of health) were beyond the scope of this review. Comprehensive findings on mandate commitments for the key determinant areas are provided in Table 1. More specifically, Table 1 maps mandate letter commitments to the lead ministers as well as those who are explicitly named in the commitment.

The results that follow are intended to show the scope and breadth of commitments related to the social determinants of health in non-health sectors, not to evaluate the positive or negative impacts that such actions may have on health and

### Highlights

- Mandate letters for the current federal government cabinet ministers identify opportunities for intersectoral action on social determinants of health and health equity.
- Key areas for intersectoral action identified in 2019 mandate letters include adopting measures of well-being in the federal budget, redistributive tax policies, and initiatives in employment, housing, education and other sectors.
- Continued monitoring and reporting on health inequalities in Canada is important in assessing progress and identifying areas where intersectoral collaboration can be strengthened.

**Keywords:** *social determinants of health, policy review, health equity, health in all policies*

health inequalities. This report is an analysis of 33 of the 37 letters published; excluded from this review were letters to the Leader and Deputy House Leader of the House of Commons, President of the Privy Council and President of the Treasury Board. Analysis was completed in December 2019 to January 2020, meaning that some policies or programs may have been implemented or redirected since the time of writing (i.e. in the context of the COVID-19 pandemic). As both aspirational policy tools and primary source material, the mandate letters capture a

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Minister(s) responsible  
\* indicates lead minister, as applicable

Mandate directive	AA	CH	CIR	DG	DI/Y	DPM/IA	ECC	ED/OL	EWDI	F	FA	FCS	FOCG	H	IC	ID	IRC	IS	ISI	J/AG	L	MCP/AF	NA	ND	NR	NRes	PSE	PSP	S	SEP	T	VA/AND	WAGE/RED					
Ensure Canada's response to the current opioid crisis is robust, well-coordinated and effective														X																								
Expand community-based services, build more in-patient rehabilitation beds, scale up effective programs														X																								
Continue to fully implement Jordan's Principle <sup>a</sup> so that First Nations children have access to health, social and educational supports and services when and where they need them																		X																				
Co-develop and invest in distinctions-based community infrastructure plans, and move forward with addressing critical needs including housing, all-weather roads, high-speed internet, health facilities, treatment centres and schools in First Nations, Inuit and Métis communities by 2030																			X																			
Study and analyze the possibility of national dental care														X																								
Incorporate quality of life measurements into government decision-making and budgeting												X							X				X*															
<b>Food security</b>																																						
Move forward a food policy that includes support for food security in northern and Indigenous communities	X																																					
<b>Aging</b>																																						
Increase survivor benefits in the Canada Pension Plan and Quebec Pension Plan by 25%										X*																											X	
Promote healthy aging, including building on federally supported programs that support the needs of seniors and their families, and ensure investments in care are coordinated and have the intended impacts												X																									X*	
Increase Old Age Security pension by 10% for seniors when they turn 75, indexed to inflation																																					X	
Establish a national definition for elder abuse and establish new <i>Criminal Code</i> offences and penalties																					X																X*	
Review the government's capacity to connect seniors to benefits and programs to which they are entitled												X																									X*	
<b>Language</b>																																						
Modernize and reinforce the <i>Official Languages Act</i> to better account for and serve minority language communities																																						X
Leverage expertise of the Translation Bureau to preserve, protect and revitalize First Nations, Inuit and Métis languages by increasing the availability of translation and interpretation services																																					X*	
Fully implement the <i>Indigenous Languages Act</i> to preserve, promote and revitalize Indigenous languages in Canada																																					X	

Continued on the following page





moment in history and the analysis herein illustrates plans for intersectoral action during that time.

### **Income and employment**

Redistributive tax policies and additional supports (e.g. employment security and benefits, enhanced social safety net) can improve determinants of health where they improve access to the resources needed to maintain health, including other determinants—such as employment or income—that are linked with health and well-being.<sup>9</sup> In the financial sector, Canada proposed to introduce a new wealth tax on luxury vehicles and will review tax breaks to ensure the wealthy do not benefit unfairly. Middle-class Canadians should receive tax cuts and an increase to the basic personal amount, and the federal minimum wage should be raised to at least \$15 per hour. For seniors, enhancements should be made to the Old Age Security pension (an increase of 10% at age 75), and both the Canada Pension Plan and the Quebec Pension Plan (survivor benefits increased by 25%). For new parents, the Canada Child Benefit should be increased for children under one year of age, and the Child Disability Benefit should be doubled. Canada will also seek to better connect eligible seniors and low-income Canadians to benefits and programs. Addressing income inequality, the recently passed *Pay Equity Act*<sup>10</sup> will require employers to correct gender-based discrimination in compensation, so that employees receive equal compensation for work of equal value in predominantly male and female job classes.

In the area of employment, new benefits should be introduced for seasonal workers and employees who have lost their job due to an employer ceasing operations, and employment services will be offered to military and policing families. The Employment Insurance program should extend sickness benefits, support lost income due to disasters and develop special benefits for new parents.

### **Racism**

Racism influences health at multiple levels through reducing access to positive determinants of health, increasing exposure to risk factors and resulting in adverse physical or mental health outcomes.<sup>11</sup> In the criminal justice sector, all judges in Canada will be required to

undergo unconscious bias training and law enforcement will receive access to unconscious bias and cultural competency training. Investments will be made to celebrate and build capacity in Black Canadian communities and support the United Nations (UN) International Decade for People of African Descent. More broadly, the Minister of Diversity, Inclusion and Youth is directed to develop policies that tackle systemic discrimination and anti-Black racism. Across government, departments will work to support self-determination, improve service delivery and advance reconciliation among Indigenous peoples, supported in part through legislation implementing the UN Declaration on the Rights of Indigenous Peoples.

### **Sex and gender**

Sex and gender (and related concepts) shape individual and population health by influencing the distribution of health risks, protective factors, access to health services and other determinants.<sup>12</sup> In addition to horizontal initiatives, such as gender-based plus and diversity analyses, several other initiatives propose improvements for people who have been disadvantaged because of their sex, gender or sexual orientation. For instance, steps will be taken to ban conversion therapy through amending the *Criminal Code* and enhance the reach and capacity of LGBTQ2 organizations. Concerning gender-based violence, a response to the Calls for Justice of the National Inquiry into Missing and Murdered Indigenous Women and Girls will be developed; free legal advice will be provided to survivors of sexual assault and trauma, with training on these topics delivered to all Canadian judges.

### **Housing**

Housing is a determinant essential to disease prevention on its own and for its influence on other determinants, such as social stability or environment.<sup>13</sup> Initiatives to improve the affordability of housing in Canada will include the Canada Housing Benefit, and housing for veterans, as well as the recently implemented First-Time Home Buyer Incentive. The National Housing Strategy will create over 40 000 new units, repair over 200 000 and continue to improve availability through construction and renovation. Steps will also be taken to ensure the needs of seniors, women and girls are reflected in the Strategy, and a new plan will be developed for urban Indigenous

housing. Innovative solutions will be explored through implementation of a new competition, the Housing Supply Challenge, which will offer \$300 million in prizes.<sup>14</sup> Support will also be provided to help Canadians make their homes more energy efficient and climate resistant.

### **Early childhood**

Between the ages of 0 and 6 years, children experience a critical period of physical, cognitive, emotional and social development that impacts well-being in childhood and later in life.<sup>15</sup> Steps to improve early childhood will include implementation of a new parental leave for adoptive parents and guaranteed paid leave during a child's first year of life. New parents will also be able to pause student loan repayments until their youngest child turns 5. Up to 250 000 new spaces for before- and after-school care will be created for children under 10, and the groundwork will be laid for a pan-Canadian childcare services system. For Indigenous communities, new child welfare legislation will come into effect that allows communities to develop policies and laws for child and family services, based on their distinct histories, cultures and circumstances.

### **Education and skills training**

Education and its related determinants (e.g. skills) can shape determinants of health by influencing employment opportunities, decision-making, social position and other pathways.<sup>16</sup> To improve the affordability of post-secondary education, Canada Student Grants amounts will be increased, along with the income threshold for student loan repayment assistance. Efforts will be made to ensure First Nations, Inuit and Métis students have support to access and succeed in post-secondary education, as well as students in northern and arctic regions. A new refundable tax credit will be introduced for working Canadians pursuing training, with worker transition centres established to support development in Western and Eastern Canada. Finally, the Canadian Apprenticeship Service will be created to ensure Red Seal apprentices have sufficient opportunities to gain necessary work experience. Youth work experience will be supported through enhancements to both the Youth Employment and Skills Strategy and Canada Summer Jobs program. Job creation underlies many initiatives across

government (e.g. infrastructure projects, shipbuilding, new technologies).

## International commitments on determinants of health and health equity

Since health inequities are created through the unequal distribution of money, power and resources within and between nations,<sup>8</sup> it is important to consider how Canada's international policy investments address determinants of health. International activities and assistance will maintain a gender equality focus and will champion women's empowerment, for instance by creating opportunities for poverty reduction among women in developing countries, reducing inequalities in pay among care workers and implementing Canada's Women, Peace and Security agenda. Implementation of the UN's 2030 Agenda for Sustainable Development will continue. This Agenda includes many targets related to determinants of health, including ending poverty and hunger and reducing inequalities.<sup>17</sup> Programming will be developed to support sustainable and equitable international development that addresses the intersection of women's rights with climate adaptation.

## New directions for health research

In light of the above review, it is also worth considering opportunities for new research that will support health equity and determinants of health. In health research, a National Institute for Women's Health Research will be created to tackle gaps in research and care, and will adopt an intersectional approach. Both the Canadian Institutes of Health Research and the Social Sciences and Humanities Research Council will implement new grants for studies of race, diversity and gender. Outside of the health sector, the Minister of Diversity and Inclusion and Youth will make research investments for visible minority newcomer women, and finally, the National Research Council of Canada will drive research on challenges such as climate change, clean growth and a healthy society—all factors that shape conditions for health.

This review focussed on federal mandate letters, which can be considered as both a governance structure and governance action for health equity, from the perspective of "health in all policies."<sup>18</sup> As a

structure, the letters facilitate collaboration by bringing together intersectoral actors (i.e. ministers) on specific initiatives that may impact health or health equity. As an action, the letters contribute to policy development by setting ministerial agendas and outlining the objectives they are expected to achieve while in office. However, mandate letter objectives are not binding, and while the federal government does track mandate commitments to concrete policy outcomes,<sup>19</sup> additional exploration is needed to determine the role of mandate letters in achieving these actions throughout the policy process. This exploration may include assessing how commitments outside of the health sector link to short- and long-term population health improvements, or determining which sectors show leadership and effectiveness in implementing intersectoral initiatives. It may also involve analyzing how commitments evolve from inception to implementation and the factors that lead to sustainable implementation amid changing priorities, mandates, governments and other contextual factors.

## Conclusion

This review highlighted a broad range of areas where federal departments will be taking action toward the common goals of social, health and economic well-being in ways that address key social determinants of health, based on the PHAC framework.<sup>4</sup> Intersectoral partnerships and collaboration to address determinants such as income, employment, racism and others are paramount to improving health equity, and working together to achieve progress is a key overarching message across mandate letters. PHAC undertakes such work through its partnerships with government and other stakeholders, through its investments in populations that experience health inequalities (e.g. Black Canadians, Indigenous peoples) and through its ongoing efforts to measure and report on health inequalities in Canada.<sup>20</sup> Yet, as identified from this review, additional opportunities exist where initiatives outside the health sector can be further explored and leveraged in ways that improve health equity. Lessons learned from promising approaches underway in other jurisdictions (e.g. "health in all policies," impact assessment) will continue to be monitored with great interest to inform efforts to achieve health equity through intersectoral action.

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## Conflicts of interest

None.

## Author's contributions and statement

KL was responsible for the design, conceptualization, analysis, and drafting of the manuscript.

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## Release notice

# ***Dementia and Stroke Comorbidity among Canadians aged 65 years and older: Highlights from the Canadian Chronic Disease Surveillance System***

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The Public Health Agency of Canada is pleased to announce the release of *Dementia and Stroke Comorbidity among Canadians aged 65 years and older: Highlights from the Canadian Chronic Disease Surveillance System* in celebration of World Alzheimer's Day.

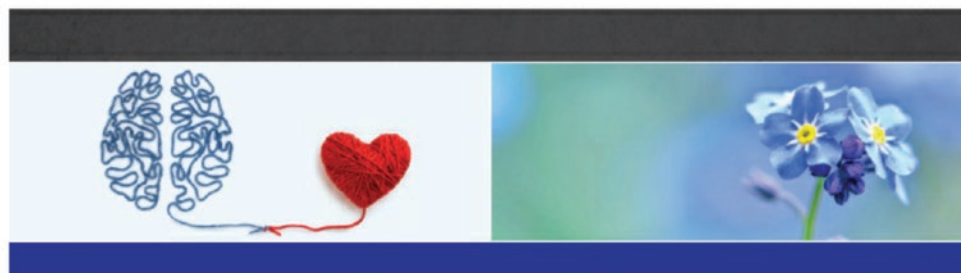
Dementia and stroke are common, debilitating, chronic conditions that pose significant health challenges, especially among older individuals (65+ years). The risk of developing these conditions, either separately or together (i.e. comorbidity), increases with age.

This publication describes the prevalence and mortality (all-cause) patterns of comorbid dementia and stroke among Canadians aged 65+ in 2016–2017 using data from the Canadian Chronic Disease Surveillance System (CCDSS). The CCDSS identifies chronic disease cases in provincial/territorial administrative health databases linked to provincial/territorial health insurance registries.

### **Highlights**

- About 1.8% (110 000) of Canadians aged 65+ had comorbid dementia and stroke, while 5.1% (322 000) were living with dementia (without a stroke) and 7.8% (492 000) had a stroke (without dementia).
- Crude prevalence of this comorbidity increased with age, from 0.2% in individuals aged 65–69 to 8.9% in those aged 90+ . Crude prevalence of dementia and stroke comorbidity was greater in males until 90 years of age, where crude prevalence was greater in women (9.1%) than men (8.3%).
- All-cause mortality among Canadians aged 65+ with comorbidity was 6.9 times greater compared to those without this comorbidity.

View the latest surveillance data on dementia and stroke, independently, at <https://health-infobase.canada.ca/ccdss/data-tool/>



## DEMENTIA AND STROKE COMORBIDITY AMONG CANADIANS AGED 65 YEARS AND OLDER

HIGHLIGHTS FROM THE CANADIAN CHRONIC  
DISEASE SURVEILLANCE SYSTEM



## Release notice

# *Canadian Cancer Statistics: A 2020 special report on lung cancer*

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### Just released!

The *Canadian Cancer Statistics: A 2020 special report on lung cancer* was released on September 22, 2020.

Developed by the Canadian Cancer Statistics Advisory Committee in collaboration with the Public Health Agency of Canada, Statistics Canada and the Canadian Cancer Society with data provided by the provincial and territorial cancer registries, this year's *Canadian Cancer Statistics* publication is a special report providing statistics on lung cancer incidence, mortality, survival and prevalence. Where relevant, statistics are presented by sex, age, geography, stage, histology and time. The report also includes contextual information about lung cancer prevention, screening and treatment.

Some highlights from the report:

- Lung cancer is the most commonly diagnosed cancer and the leading cause of cancer death in Canada. More Canadians die of lung cancer than colorectal, pancreatic and breast cancers combined.
- Lung cancer incidence and mortality rates are decreasing for males and decreasing or remaining stable for females in most provinces and territories.
- About half of all lung cancer cases in Canada were most likely to be diagnosed after they have metastasized (stage 4).
- The 3-year survival for lung cancer at stage 4 is only 5%. However, for lung cancer cases diagnosed at stage 1, the 3-year net survival rises to 71%.
- Organized lung cancer screening in Canada over 20 years can lead to 7000–17 000 fewer stage 4 diagnoses and 5000–11 100 fewer deaths.
- About 86% of lung cancer cases are due to modifiable risk factors, making it one of the most preventable cancers in Canada.

Download or print the latest and past editions of *Canadian Cancer Statistics* and related resources.

# Open call for papers: COVID-19 pandemic

*With a rapid publication process*

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## Special Call for Peer Reviewers

The HPCDP Journal is currently seeking volunteer peer reviewers with interdisciplinary expertise to conduct timely reviews of manuscripts submitted to the journal through the issued open call for papers on the COVID-19 pandemic and its links to the fields of health promotion and chronic disease prevention.

Relevant topic areas include, but are not limited to:

- Chronic diseases, their risk factors and links with COVID-19 (e.g., increased risk of severe illness and longer term health effects)
- Mental health
- Problematic substance use
- Impact and consequences of public health measures
- Delivery of preventive health care
- Emerging evidence for promising interventions
- Health equity

To be considered as a potential peer reviewer for the HPCDP Journal COVID-19 series, please email us at [PHAC.HPCDP.Journal-Revue.PSPMC.ASPC@canada.ca](mailto:PHAC.HPCDP.Journal-Revue.PSPMC.ASPC@canada.ca), and briefly indicate your areas of expertise, institutional affiliation(s) and availability. A concise biosketch, C.V. or biolinks may be provided to assist in the selection process.

Reviewers are asked to commit to completing at least one peer review within 5 days of accepting a request.

The societal impact of the novel coronavirus disease (COVID-19) pandemic is multifaceted, and all Canadians, one way or another, have been affected. From a public health perspective, we also see this pandemic colliding with the slow-motion chronic disease epidemic that is affecting all parts of the globe.

*Health Promotion and Chronic Disease Prevention in Canada: Research, Policy and Practice* (the HPCDP Journal) is the monthly, online scientific journal of the Health Promotion and Chronic Disease Prevention Branch of the Public Health Agency of Canada. The HPCDP Journal is hereby inviting original quantitative and qualitative research papers, commentaries, editorials and At-a-glance manuscripts that address the links between the COVID-19 pandemic and health promotion, chronic disease and health equity.

There are many relevant topics, including, but not limited to:

- Associations between chronic diseases (and their risk factors) and the risk for infection, severe illness and poorer outcomes.
- The longer-term health effects of COVID-19 on survivors, including long-lasting mental health issues such as depression, anxiety and more.
- Studying the public health response and its impact and unintended consequences at the individual level (e.g. physical and mental health, health and health-seeking behaviours), family level, and the community or societal level.
- The delivery of preventive health care during the pandemic.
- Emerging scientific evidence, including through natural experimental studies, about promising interventions to improve the public health response (e.g. social distancing measures, protecting people with underlying chronic conditions) or to mitigate the negative impacts of the response (e.g. mental health consequences).
- Health equity and the social determinants of health as cross-cutting issues.

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To ensure lasting relevance, we expect all submissions to discuss the implications of their findings for the recovery phase of the current crisis, and beyond.

Manuscripts will be considered as they are received. Those selected for further consideration will be assigned to a special editorial committee dedicated to this series, as well as to two peer reviewers if appropriate for the article type.

We will strive to provide an initial editorial decision on submitted manuscripts within 15 business days of completed submission for peer-reviewed papers and five business days for non-peer-reviewed manuscripts. Accepted manuscripts will be prioritized for publication and will appear online, in HTML format, and be indexed as “ahead of print” articles prior to being produced in PDF and included in a regular issue of the Journal.

Refer to our website for information on invited article types and detailed submission guidelines for authors: <https://www.canada.ca/en/public-health/services/reports-publications/health-promotion-chronic-disease-prevention-canada-research-policy-practice/information-authors.html>.

For any pre-submission questions about suitability or scope, please direct inquiries to [PHAC.HPCDP.Journal-Revue.PSPMC.ASPC@canada.ca](mailto:PHAC.HPCDP.Journal-Revue.PSPMC.ASPC@canada.ca).

**Submission information:** Kindly refer to this call for papers in your submission covering letter and submit manuscripts by email to [PHAC.HPCDP.Journal-Revue.PSPMC.ASPC@canada.ca](mailto:PHAC.HPCDP.Journal-Revue.PSPMC.ASPC@canada.ca). This call will continue until further notice.

**Submission deadline:** Open until further notice.

