COVID-19 and the Impact on Children's Mental Health

A Research Report

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We celebrate the Indigenous Peoples on whose traditional territories we are all privileged to live and work.

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Executive Summary

The COVID-19 public health crisis has created significant challenges for children in British Columbia. These challenges have included most children facing restrictions in their contacts with family members and friends, as well as temporary school closures. Many children are also part of families that have experienced economic hardships. Beyond the social, educational and economic costs, there will also be mental health consequences. This rapid review therefore aimed to determine how the pandemic and its associated challenges may affect the mental health of BC's children, including those who may be disproportionately harmed. The overarching goal was to inform and assist policymakers to support all children in BC during COVID-19 — and beyond.

Our systematic review identified one relevant original study on the mental health consequences of previous pandemics and five systematic reviews on the mental health consequences of natural disasters for children. The findings showed dramatic increases in rates of anxiety, posttraumatic stress, depression and behavioural challenges compared to rates typically found in the general population of children. Other literature suggests that some groups may also be disproportionately affected, including children from socioeconomically disadvantaged families and those who have faced extreme or cumulative adversities. Racism may contribute to Asian-Canadian children facing added hardships. Indigenous children may also be particularly disadvantaged given the cumulative adversities associated with the legacies of colonialism. As well, children with neuro-diverse special needs such as autism spectrum disorder, fetal alcohol spectrum disorder, developmental delays or other disabilities may have greater mental health needs during the pandemic.

On balance, the available research evidence suggests that BC's response to the COVID-19 pandemic must make children's mental health a high priority — ensuring that children do not experience additional avoidable adversities due to either the pandemic or the public health responses. Central to these objectives will be: providing additional necessary prevention and treatment services; ensuring that public investments go towards effective interventions; preventing avoidable childhood adversities including reducing socioeconomic disparities; and tracking child outcomes so that all British Columbians can see the progress. Failing to address children's mental health now will lead to greater costs in the future, if mental health problems are allowed to persist into adulthood. COVID-19 is an unprecedented public health crisis. Yet it also presents an unprecedented opportunity — to make BC a place where the social and emotional wellbeing of all children is highly valued and where children are the focus of sustained collective efforts to ensure their healthy development.

BC's response to the COVID-19 pandemic must make children's mental health a high priority.

1. Background

1.1 COVID-19 and Children in BC

In March 2020, the World Health Organization declared a global pandemic regarding a novel coronavirus and the severe illness it causes, known as COVID-19.[1] Also that month, Canada — and many other countries — implemented a number of emergency measures to prevent rapid spread of this new disease.[2] British Columbia also declared a province-wide state of emergency in March 2020, enacting numerous measures across the province.[3] Almost all of these had the potential to directly affect children's daily lives and their social and emotional wellbeing, or mental health — as well as affecting their parents' lives and wellbeing. (Throughout, "child" refers to anyone aged 18 years or younger; and "parent" refers to anyone who is a primary caregiver for children, whether in a biological or other kind of relationship.)

In BC and elsewhere, initial emergency measures involved ensuring physical distancing, starting with reduced social contacts and school closures.[4] Consequently, many children began spending much of their time at home. School closures also meant that families lost access to crucial supports and services for many children.[5] Beyond this, the COVID-19 pandemic is expected to have inordinate impact for children living in families and communities where there have been substantial work closures and job losses, and where there were fewer socioeconomic resources to begin with.[6] Then there are the deep human costs. Many children and families have endured extended separations from loved ones and have experienced illnesses and deaths due to the pandemic. So COVID-19 has likely already had a substantial impact on BC's children. Therefore, it is important to understand the potential short- and long-term mental health consequences of COVID-19 for BC's children — including for those who may be disproportionately affected by the pandemic.

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1.2 The Importance of Children's Mental Health

COVID-19 arrived with a backdrop of high children's mental health needs, coupled with longstanding service shortfalls.[7] A wide range of mental disorders can prevent young people from flourishing and meeting their potential.[8] These disorders include anxiety, attention-deficit/hyperactivity, substance use, conduct, depressive, autism spectrum, posttraumatic stress, eating and psychotic disorders. If not prevented or treated early, these disorders typically persist into adulthood, adding to the individual and population burdens.[9–10] The prevalence of these disorders is also high. Data collected prior to COVID-19 showed that at any given time, an estimated 12.7% of BC children aged four to 18 years had one or more mental disorders that warranted intervention.[11] There is considerable research evidence describing effective interventions for preventing most childhood mental disorders, and for treating them all.[12] Yet recent estimates also suggest that only a minority of children with mental disorders received services for their mental health concerns.[11] Taking into account both the high prevalence and low service reach, it is not surprising that mental disorders are now the leading cause of childhood disability in Canada and globally.[13]

At the same time, it is widely recognized that *avoidable* childhood adversities contribute to the development of some of the most common mental health problems for young people. These adversities include family and community socioeconomic disadvantage and child maltreatment, which contribute to a range of child (and adult) mental disorders.[14–17] A comprehensive population health strategy can help address all these issues. Such a strategy needs to include: 1) addressing social determinants and avoidable adversities for all children; 2) providing effective prevention programs for all those at risk; 3) providing effective treatments for all those with disorders; and 4) monitoring outcomes across the population to evaluate and improve intervention efforts.[8] Responses to COVID-19 will be strengthened by taking this context into account.

COVID-19 arrived with a backdrop of high children's mental health needs, coupled with longstanding service shortfalls.

1.3 Goals of This Rapid Research Review

Given the recent and unprecedented nature of the COVID-19 pandemic, we sought data on the impact of the COVID-19 pandemic as well as other health disasters such as previous infectious disease outbreaks and pandemics, and natural disasters such as earthquakes, wildfires and tsunamis. ("Disasters" refers to events that start suddenly and create great disruptions for most people, with potential for significant injury or death — yet that are time-limited in nature.[18–19]) Natural disasters have the potential to harm children's mental health in ways similar to COVID-19. Still, pandemics differ in that separation, isolation and quarantine are typical — and can have unintended consequences such as interrupting positive traditions, norms and values that encourage families and communities to be healthy and do well.[18] However, we did not examine the consequences of human-made disasters such as exposure to violence including war or child maltreatment. We deemed these types of disasters beyond our scope because they have different social origins, may be more sustained and require different collective remedies.[19]

For this rapid research review, our specific goals were therefore to: 1) identify recent research examining the impact of COVID-19 as well as other health and natural disasters on children's mental health; and 2) apply the findings to children in BC, including considering who may be disproportionately affected. The overarching goal was to inform and assist policymakers in planning to support all children in BC during COVID-19 and beyond.

2. Methods

For this rapid research review, we sought systematic reviews and meta-analyses examining how COVID-19, as well as other health and natural disasters, may affect children's mental health. We focused on systematic reviews because this approach involves comprehensive searches identifying all relevant original studies, as well as critical appraisal of methods and findings across multiple studies, thereby providing a robust overview of a body of research evidence. Meta-analyses, in turn, involve combining data from multiple studies that are similar, then conducting new statistical analyses, thereby providing an in-depth picture of aggregate findings. We conducted comprehensive searches for systematic reviews and meta-analyses using methods adapted from the Cochrane Collaboration and Evidence-Based Mental Health.[20–21] We sought original studies where needed to ensure adequate coverage of our topic. We also calculated prevalence rates for specific mental disorders following disasters, based on information provided in the articles, and compared these rates to expected prevalence in the general population.[11] The Appendix provides more information on our methods including our search processes, as well as explaining several research and clinical terms.

3. What We Found

3.1 Overview

We retrieved and evaluated 60 articles published over the past 70 years. We identified no relevant articles describing studies on children's mental health outcomes related to COVID-19. But we identified one original study examining the impact of health disasters on children's mental health, namely pandemics associated with: "swine flu," caused by the influenza A virus, H1N1;[22] severe acute respiratory syndrome, or SARS, caused by a novel coronavirus;[23] and avian influenza caused by the influenza A virus.[24] As well, we identified five systematic reviews that met our inclusion criteria, all examining the effects of natural disasters such as earthquakes, wildfires and tsunamis on children's mental health. All findings reported below were statistically significant with p values of less than .05, unless otherwise noted. (See Appendix for definitions of all underlined terms.) Effect sizes and meta-analytic findings are also noted where these were reported separately for children and separately for health or natural disasters.

3.2 Child Mental Health Outcomes After Health Disasters

We found one study examining the effects of health disasters, namely infectious disease outbreaks, on children's mental health. This retrospective survey, completed in 2009, used a convenience sample and included children and their parents who lived in regions of North America affected by H1N1, SARS or avian influenza.[18] Among 369 child participants, 20.9% had been isolated and 3.8% had been quarantined, while approximately 75% did not have these experiences. Researchers then compared posttraumatic stress symptoms for children who had been isolated or quarantined and those who had not.

For children who had been isolated or quarantined, 30.0% exceeded the clinical threshold for posttraumatic stress symptoms — compared to 1.1% of children who did not have these experiences.[18] (Note that the prevalence of posttraumatic stress *disorder,* or PTSD, in the overall child population is estimated to be 0.1%, based on more rigorous diagnostic measures used in epidemiological studies in representative samples conducted prior to COVID-19.[11]) Group differences were both statistically and clinically significant. (Clinical significance was measured using Cramer's V=0.5.) As well, when parents met or exceeded the posttraumatic stress symptom clinical threshold, 85.7% of their children did so, too — compared to 14.3% of children whose parents did not. The strength of this relationship was also moderate (Cramer's V=0.5).[18]

Mental health service use was also higher for children who had been isolated or quarantined. Among these children, 33.4% began using mental health services related to their experiences, either during or after the pandemic.[18] This was compared to 6.8% of children who were not isolated or quarantined. (The authors did not assess whether this difference was statistically significant.) Parents reported seeking services for their children for concerns including generalized anxiety, adjustment difficulties, acute stress, posttraumatic stress and grief.

This study also included qualitative data that further highlighted children's distress during a pandemic. For example, one parent reported, "The kids' anxiety was the hardest thing to deal with … my daughter said, 'Mommy, are you going to die?' and that was absolutely heartbreaking." A parent who was also a healthcare worker noted, "I'm now suddenly working 20 hours a day and isolating myself, and away from them, and wearing a mask when we're close and not hugging … They can't crawl into bed with you. That was tough. That was the toughest, the hardest part."[18] Table 1 summarizes the main findings from this study.

Table 1. Study Findings: Health Disasters and Children's Mental Health

Study Details	Main Findings
Sprang & Silman (2013): Retrospective survey of 369 children and 398 parents [18] Disaster: Exposure to H1N1, SARS, or avian influenza Countries: United States, Mexico and Canada	▪ Clinically significant posttraumatic stress symptoms in children who had been quarantined or isolated: 30.0% ▪ Risk factors for posttraumatic stress symptoms included: being isolated or quarantined (Cramer's V=0.5) and having a parent with clinically important posttraumatic stress symptoms (Cramer's V=0.5)

3.3 Child Mental Health Outcomes After Natural Disasters

Among the five accepted systematic reviews, four covered a range of natural disasters such as earthquakes, wildfires and tsunamis,[19, 25–27] while one covered earthquakes only.[28] Regarding children's mental health outcomes, two reviews examined posttraumatic stress,[25, 28] one examined depression[26] and two examined a variety of concerns including anxiety, mood and behavioural challenges.[19, 27] As well as reporting the main findings for all five reviews, we also calculated prevalence rates for specific mental disorders based on information provided in three reviews and compared these rates to expected prevalence in the general population.[11]

3.3.1 Posttraumatic stress

One of the two systematic reviews on children's posttraumatic stress included 15 cross-sectional studies examining consequences of earthquakes in China, Haiti and Turkey.[28] Among these 15 studies, three assessed PTSD based on criteria from the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV).[29] Average weighted PTSD prevalence across the three studies was 5.5%. This compares to a prevalence of 0.1% in representative samples of children from high-income countries.[11] As well, this systematic review identified several factors that increased the risk for developing posttraumatic stress symptoms following earthquakes: experiencing bereavement (odds ratio or OR=2.3); experiencing fear (OR=2.3); being trapped (OR=2.2); being injured (OR=2.2); witnessing injury or death (OR=2.0); and losing property (OR=1.6). In addition to being statistically significant, all variables were clinically important — raising the odds of developing posttraumatic stress symptoms by 1.6 to 2.3 times.

The other systematic review on child posttraumatic stress examined child outcomes following a variety of natural disasters including earthquakes, floods, wildfires and tsunamis. Impact on children was evaluated in 23 case-control or cohort studies, predominately from the United States.[25] A meta-analysis confirmed a significant relationship between being exposed to a natural disaster and developing posttraumatic stress symptoms, with a small-to-moderate effect size (Pearson's *r*=0.2).

3.3.2 Depression

One of the five systematic reviews examined the risk of child depressive symptoms following earthquakes, tornadoes and tsunamis in Armenia, China, Thailand and Turkey — evaluated in 11 cross-sectional studies.[26] Two included studies assessed depression diagnoses based on DSM-IV criteria, which resulted in a weighted average prevalence of 9.7%.[26] This compares to a prevalence of 1.3% in representative samples of children from high-income countries.[11] As well, this systematic review identified four factors that increased the risk of developing depressive symptoms following natural disasters: injury (OR=3.0); bereavement (OR=2.6); prior exposure to other serious adversity (OR=1.7); and witnessing injury or death (OR=1.5). In other words, these experiences raised the odds of a young person developing depressive symptoms by 1.5 to 3.0 times. Yet this review also identified that having social supports after a disaster was a protective factor.[26] These supports included being able to talk through problems with family or friends, and having teachers who conveyed reassurance.[30]

3.3.3 Other mental health problems

The remaining two systematic reviews assessed children's outcomes after exposure to a variety of natural disasters — examining several different mental health concerns. One review provided information enabling the calculation of diagnostic rates for PTSD as well as depressive, adjustment, separation anxiety, generalized anxiety, panic and oppositional defiant disorders.[27] Among 22 studies that assessed PTSD, the weighted prevalence averaged 11.2% — compared with 0.1% in representative samples in the general population.[11] This average included two studies incorporated in the review described above.[28] Among seven studies that assessed depression, the weighted prevalence averaged 14.7% — compared with 1.3% in the general population.[11] This average included one study incorporated in a review also described above.[26] For adjustment disorder, the weighted prevalence averaged 10.7%, based on two studies (comparison data for the general population is not available). For separation anxiety disorder, the weighted prevalence averaged 8.1%, also based on two studies — compared with 1.6% in the general population.[11] Then generalized anxiety, panic and oppositional defiant disorders were each assessed in one study, with prevalence being 12.0%, 10.8% and 33.8%, respectively — and with these rates, too, all being substantially higher than rates in the general population, 0.9%, 0.1% and 3.3%, respectively.[11]

This systematic review also provided data on changes in children's posttraumatic stress symptoms over time, following exposure to disasters.[27] The authors found that symptoms typically emerged within the six months after the disaster and peaked within the first year. Then the number of children meeting diagnostic criteria for PTSD fell over time — from 60.0% to 18.9% over 19 months in one study, and from 57.3% to 2.7% over 58 months in another.

The final systematic review explored the relationship between a variety of natural disasters and children's subsequent emotional and behavioural challenges — across 64 observational studies.[19] There was a small but significant correlation between experiencing a natural disaster and developing emotional challenges (such as anxiety and depressive symptoms; Pearson's r=0.2) and behaviour challenges (such as anger and aggression; Pearson's r=0.1). Child outcomes were moderated by their country's Human Development Index rating (HDI, a composite measure of life expectancy, education and per capita income).[19] Specifically, the relationship between disaster exposure and emotional or behavioural concerns was significantly stronger for children in countries with medium HDI rankings, compared to those with high or very high rankings (no countries with low HDI rankings were included in this review).[19] The authors suggested that this finding was likely due to higher-income countries having greater baseline infrastructure and resources for responding after disasters. (Although Canada has a very high HDI ranking, Indigenous communities have significantly lower rankings on related socioeconomic wellbeing indices.[31–32]) Table 2 summarizes findings from all five systematic reviews.

For children who had been isolated or quarantined,

30.0% exceeded the clinical threshold for posttraumatic stress symptoms.

Table 2. Systematic Review Findings: Natural Disasters and Children's Mental Health

Systematic Review Details*	Main Findings**
Posttraumatic Stress Disorder (PTSD)	
Tang (2017): 15 cross-sectional studies [28] Disaster: Earthquake Countries: China, Haiti, Turkey	▪ PTSD diagnostic prevalence for children exposed to earthquakes: 5.5% (3 studies) ▪ Risk factors for posttraumatic stress symptoms: bereavement (OR=2.3); fear (OR=2.3); being trapped (OR=2.2); injury (OR=2.2); witnessed injury or death (OR=2.0); loss of property (OR=1.6)
Furr (2010): 23 case-control or cohort studies [25] Disasters: Earthquake, flood, hurricane, tornado, tsunami or wildfire Countries: US (52%; other countries not reported)	▪ Posttraumatic stress symptoms significantly related to natural disaster exposure (r=0.2)
Depression	
Tang (2014): 11 cross-sectional studies [26] Disasters: Earthquake, tornado or tsunami Countries: Armenia, China, Thailand, Turkey	▪ Depression diagnostic prevalence for children exposed to earthquakes: 9.7% (2 studies) ▪ Risk factors for depressive symptoms: injury (OR=3.0); bereavement (OR=2.6); prior trauma exposure (OR=1.7); witnessed injury or death (OR=1.5) ▪ Protective factor for depressive symptoms: social support after disaster (OR=0.2)
Various Mental Disorders	
Wang (2013): 56 cross-sectional + 24 longitudinal studies [27] Disasters: Earthquake, wildfire, flood, hurricane, tornado, tsunami, or volcanic eruption Countries: 24 (specific countries not reported)	▪ PTSD diagnostic prevalence: 11.6% (22 studies) ▪ Depression diagnostic prevalence: 14.7% (7 studies) ▪ Adjustment disorder diagnostic prevalence: 10.7% (2 studies) ▪ Separation anxiety diagnostic prevalence: 8.1% (2 studies) ▪ Generalized anxiety disorder diagnostic prevalence: 12.0% (1 study) ▪ Panic disorder diagnostic prevalence: 10.8% (1 study) ▪ Oppositional defiant disorder diagnostic prevalence: 33.8% (1 study)
Various Mental Health Symptoms	
Rubens (2018): 64 observational studies [19] Disasters: Blizzard, earthquake, flood, hurricane, tornado, tsunami, volcanic eruption or wildfire Countries: Armenia, Bangladesh, Cayman Islands, Chile, China, Greece, India, Iran, Italy, New Zealand, Nicaragua, Poland, Sri Lanka, Sweden, Taiwan, Thailand, Turkey, US	▪ Natural disaster exposure significantly related to emotional† (Pearson's r=0.2) and behavioural challenges‡ (Pearson's r=0.1)

* We excluded findings on human-made disasters and adult outcomes, so the number of studies listed reflects only those that we reported on.
** We calculated prevalence by averaging rates reported from all original studies that established diagnoses using clinical interviews; all prevalence rates exceeded those found in the general population.
OR = Odds ratio effect size (all were statistically significant)
r = Pearson's r effect size (all were statistically significant)
† Included anxiety, depression, somatic symptoms and emotional dysregulation
‡ Included behavioural problems, aggression, acting out and anger

3.4 Who is Affected Disproportionately?

The articles that met our criteria provided data on who may be disproportionately affected by health and natural disasters. Regarding socioeconomic resources, one review found poorer mental health outcomes after natural disasters for children living in countries with relatively lower HDI rankings.[19] As well, one review confirmed that having fewer social supports increased children's likelihood of developing depressive symptoms after disasters.[26] Parental mental health was another factor, with one study identifying that when parents had clinically significant posttraumatic stress symptoms, children were more likely to have them as well.[18] In addition, more extreme or cumulative adversities were associated with poorer children's mental health outcomes. These adversities included events occurring due to the disaster, such as being injured or witnessing injury or death, as well as events that occurred before the disaster.[26, 28]

Taken together, findings from the articles we reviewed suggest that children will struggle much more, particularly with anxiety, posttraumatic stress and depression, when they are coping with adversities that pre-date COVID-19. High rates of exposure to violence and other serious adversities have recently been documented for some young British Columbians.[33] Young people experiencing these kinds of adversities will need greater levels of service. Children in foster care are already, by definition, coping with significant challenges, such as exposure to child maltreatment.[34] They, too, will likely need more services. Pre-existing mental health conditions also constitute a form of adversity, particularly if children have been underserved. Given high estimated numbers of children with mental disorders before the current pandemic, and given chronic service shortfalls,[11] mental health service needs are expected to become even more acute during and after COVID-19, as has occurred in other pandemics.[18] Sharp increases in service demands may already be emerging. The Kids Help Phone, which offers "24/7" counselling via text or telephone, has reported a 51% increase in text messages and a 70% increase in calls from young people in BC since May 2020, with contacts focusing on an array of mental health concerns.[35]

Apart from the articles we reviewed, emerging literature warns of expected disparities in COVID-19's impact — mainly pertaining to socioeconomic status. Economic losses due to the pandemic have been widespread in Canada, as elsewhere, and have not been fully mitigated by federal and provincial/territorial support programs.[36–37] As well, these losses have not been uniformly distributed and are predicted to cause even more daunting hardships for families that were already struggling economically. Children in such families are predicted to experience greater exposure to stress and increased risk for additional problems such as family violence.[6] Canadian data show that the pandemic has already had more severe negative effects for workers who have a limited education, who have been exposed to the illness, or who cannot work at home.[38] When these workers are also parents, stresses are intensified for them and for their children. Related pre-existing issues such as food and housing insecurity — both longstanding problems for many Canadians — exacerbate the burdens. As well, many children from low-income families rely on essential services such as school programs, not only for education but also for the provision of food in some cases.[5, 39–42] So temporary school closures have likely already had a disproportionate impact. Furthermore, there is considerable research evidence showing that children who experience socioeconomic inequalities are much more likely to develop emotional and behavioural concerns.[15, 43] The pandemic has the potential to amplify these inequalities — in turn putting less advantaged children at even greater risk for mental health concerns.

Racism may also contribute to COVID-19 having a disproportionate impact on some children. In BC and elsewhere, anti-Asian racism, in particular, flared after the first known outbreaks were identified in China.[44–46] The situation has been severe enough to necessitate remarks by BC's Premier that "racism is also a virus."[47] Children are affected when their families and communities are targeted and have even been specifically targeted in some cases in association with COVD-19.[48] Racial discrimination has long been identified as a pressing public health problem with many deleterious mental and physical health effects for both children and adults.[49–50] Racism is also an unacceptable violation of children's rights.[51]

In addition, children with neuro-diverse developmental conditions may have greater mental health needs during the pandemic. For example, for children with autism spectrum disorder, the demands of quarantine, coupled with reductions in crucial services, may result in added distress for children and stress for parents.[52–53] Mental health needs are also predicted to be higher for children with other kinds of special needs, such as fetal alcohol spectrum disorder, developmental delays or other disabilities.[54–55]

Indigenous communities have been dealing with multiple pre-existing adversities, namely those associated with the legacies of colonialism. These have included: exposure to past infectious disease outbreaks; forced removal of children into residential schools and the aftermath for multiple generations who were no longer connected to Traditional Knowledge about healthy communities and healthy parenting; continuing over-representation of Indigenous children in the child protection and youth justice systems; sequestering of many communities on "reserves" with few natural resources and the resultant fracturing of traditional economies and ways of living; legislation that undermined traditional governance systems and precluded basic human rights such as voting, owning land and practicing cultural ceremonies; and ongoing exposure to individual and systemic racism.[56–57] This legacy has also created continuing socioeconomic disadvantage for many Indigenous communities that is unparalleled in Canada — including inadequate access to health and social programs and educational opportunities, chronic high unemployment, lack of potable water, extreme food insecurity, and overcrowded and unsafe housing.[56–57, 31] These conditions have long been recognized as putting children's mental and physical wellbeing and development at risk.[14, 58]

Yet Indigenous leaders and communities have long persevered in addressing this legacy constructively, showcasing strengths as a route to resilience. Historically, this has involved actions such as pursuing legal right to land title,[59–60] negotiating contemporary treaties,[61] enacting self-governance systems including for child welfare,[62] and revitalizing Indigenous languages.[63–64] Most recently, this has also involved the First Nations Health Authority assuming governance for public health and healthcare services across BC's nearly 200 First Nations.[65] Even during COVID-19, the Authority has encouraged people to define wellness on their own terms[66] and has showcased learning from Elders who recall previous infectious disease outbreaks.[67] There is early evidence that these strategies may have slowed the transmission of COVID-19 in Indigenous communities.[68–69] If borne out over time, these successes will be extraordinary, particularly given the underlying disadvantages. Yet this pandemic presents a vital opportunity to rectify the deep inequalities that Indigenous Peoples have faced and that have affected child wellness and development — changes that have long been called for.[56–57, 70]

The literature we reviewed also suggested factors that may confer resilience, equipping children to cope with adversities such as health and natural disasters, and their related outcomes. The data suggest that children are protected when their surrounding communities have more socioeconomic resources[19] and when children have more social supports.[26] While parental mental health problems can cause risk,[18] conversely, effective parenting is crucial in mitigating children's distress and improving their coping after disasters.[27] Long-term follow-up after a variety of natural and human-made disasters has also shown that while dosage — or the intensity and duration of exposure to adversity — is crucial in determining how well children do, so too are community supports and family functioning.[71] This is in keeping with previous research showing that resilience is more likely when children have not only good learning abilities but also close relationships with competent caregivers, access to positive schools and safe neighbourhoods — including freedom from racism — and beliefs that their lives have hope and meaning.[49–50, 71]

The data suggest that children are protected when their surrounding communities have more socioeconomic resources and when children have more social supports.

4. Conclusions

4.1 Discussion

Even with limited research to date on the impact of COVID-19 on children's mental health, this rapid research review highlights that the needs will be high and will likely remain high over the short and medium terms — based on evidence from past health and natural disasters. These needs will undoubtedly include a diverse range of children's mental health problems. In particular, anxiety, depression, behaviour problems and posttraumatic stress may be significantly increased during the pandemic and in its aftermath, by as much as tenfold for the children who are most severely affected, based on our review. Service demands will also likely grow therefore — beyond the increases that have already been documented.[35] At the same time, the pandemic is predicted to have differential effects. Children and families in more precarious socioeconomic circumstances will struggle much more and will need many more supports. Those who experience more extreme adversities associated with COVID-19, or who were already coping with significant adversities before the pandemic, will also likely struggle more and need additional supports. Pre-existing children's mental health service shortfalls will exacerbate this situation. While higher socioeconomic status does not confer automatic immunity from COVID-19-related social and emotional concerns for individual children,[72] it nevertheless appears to confer benefits when looking across the population.[19] In essence, COVID-19 has the potential to fuel social inequalities[73] that in turn underlie many children's mental health problems.

We also acknowledge several important limitations in our review. We found no studies directly investigating COVID-19's impact on children's mental health, likely because the pandemic is recent and still unfolding. The research reported in this review also had limitations. These included: convenience samples; retrospective and cross-sectional data; varying attention to issues such as recall bias; and limited data on factors such as socioeconomic disadvantage. Therefore, new high-quality research examining the pandemic's impact on children's mental health is greatly needed to inform policy. Ideally this research will use robust measures and large samples that are representative of the general population,[74–75] comparing child outcomes before and after the pandemic and following children longitudinally, given the likelihood of new or continuing public health restrictions.

Data on children's mental health during other health and natural disasters nevertheless constitute the best available evidence for responding to COVID-19. Much can also be learned about building resilience by examining factors that have helped children deal with adversity in the past — including learning from the particular strengths of Indigenous communities. Several specific policy implications arise from this review of the available research.

4.2 Policy Implications

4.2.1 Ensure effective prevention and treatment services for all children in need

Effective children's mental health services — including both prevention and treatment — must be provided for all those in need. As well, pre-existing service shortfalls must be addressed. Given predictions of as much as tenfold increases in the needs for the most affected children, in the short-term this will require ensuring comprehensive plans, substantially increasing budgets for children's mental health, protecting these budgets, and ensuring efficient whole-of-government service coordination.[8, 18] While the front-end costs of such investments will be high, the long-term benefits will be high as well — including reducing costs associated with avoidable long-term mental health problems. For children with mild or transient symptoms, effective prevention programs can stop the progression to mental disorders, which often become entrenched and persist into adulthood with ensuing distress and disability; meanwhile, for those with disorders, effective treatments can reduce distress and speed the return to healthy development and functioning.[76–77]

4.2.2 Offer proven children's mental health interventions

Numerous interventions have been tested covering the span of children's mental health problems. Effective prevention approaches have been delineated for most, and effective treatments have been delineated for all.[12] For the specific problems expected to increase due to COVID-19 — namely childhood anxiety, depression, behavioural problems and posttraumatic stress — there is ample research evidence on effective prevention and treatment options that have been evaluated using rigorous measures in randomized controlled trials (RCTs) with children. (Although RCTs provide the best evidence on intervention effectiveness, they also have important limitations, including underrepresenting Indigenous Peoples as well as Indigenous Methods and perspectives.[78–79]) Table 3 outlines effective intervention options which can be used to guide new and enhanced public investments. As well, interventions like cognitive-behavioural therapy and parent training can be culturally enriched and adapted with input, for example, from Indigenous communities.[80–81] At the same time, ineffective or unproven options should not be supported during COVID-19, or at any time.[8]

Table 3. Effective Prevention and Treatment Options for Children's Mental Health

Mental Health Problem	Effective Prevention Interventions	Effective Treatment Interventions
Anxiety	▪ Cognitive-behavioural therapy (CBT) [77]	▪ CBT and the medication fluoxetine in some cases [77]
Depression	▪ CBT [82]	▪ CBT, interpersonal therapy and fluoxetine in some cases [12]
Behaviour Problems	▪ Parent training [76]	▪ Parent training and child behaviour therapy [76]
Posttraumatic Stress	▪ Reduce child exposure to avoidable adversities [83]	▪ CBT [83]

4.2.3 Address underlying social disparities and build resilience

Another crucial step is to address the social disparities that amplify the risks for harm following an event such as COVID-19. Particular attention should be paid to children who are already disadvantaged. The pandemic can be the instigation to launch initiatives such as: ensuring that no children are living in precarious socioeconomic circumstances; augmenting support services for children in need; reducing the number of avoidable adversities that children face in addition to COVID-19, including addressing racism; and rectifying inadequate living conditions in many Indigenous communities, as well as raising the levels of funding and support for child health, social and educational programs to achieve parity with non-Indigenous communities.[18, 41, 84] Related to this, approaches that strengthen families and communities can promote resilience when children do have to face adversities. Given the likelihood that the impact of COVID-19 may be enduring, building these foundations for resilience are crucial — through initiatives that reduce disparities and ensure that all BC children can flourish.

4.2.4 Track collective progress

Finally, it is important to establish ongoing systems for monitoring mental health needs and outcomes for all children — to accurately depict the needs over time and to inform the evaluation of initiatives designed to meet these needs.[85] Such efforts should focus first on problems that are expected to increase in the short-term including anxiety, depression, behaviour problems and posttraumatic stress — in addition to tracking progress at addressing underlying issues such as socioeconomic disparities. Monitoring could take the form of pragmatic yet robust population-based short surveys conducted in representative samples of children.[74–75, 86] Our review also suggests that many children who experience mental health problems after disasters eventually recover. So tracking outcomes is also a way of measuring success.

Effective children's mental health services — including both prevention and treatment — must be provided for all those in need.

4.3 Conclusions

On balance, the available research evidence suggests that BC's response to the COVID-19 pandemic must make children's mental health a high priority — ensuring that children do not experience additional avoidable adversities due to either the pandemic or the public health responses. Central to these objectives will be: providing additional necessary prevention and treatment services; ensuring that public investments go towards effective interventions; preventing avoidable childhood adversities including reducing socioeconomic disparities; and tracking child outcomes so that all British Columbians can see the progress. Failing to address children's mental health now will lead to greater costs in the future if mental health problems are allowed to persist into adulthood. COVID-19 is an unprecedented public health crisis. Yet it also presents an unprecedented opportunity — to make BC a place where the social and emotional wellbeing of all children is highly valued and where children are the focus of sustained collective efforts to ensure their healthy development.

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6. Appendices

6.1 Methods

For this rapid review, we searched for systematic reviews and meta-analyses examining the impact of COVID-19 and other health and natural disasters on children's mental health outcomes. Table 4 outlines our search strategy, which followed database conventions for ensuring comprehensive identification of potentially relevant articles. Our search was not limited by date and therefore could include publications since the inception of the databases.

Table 4. Search Strategy

Databases	▪ Cochrane, ERIC, Medline and PsycINFO
Search Terms	▪ Mental health, mental disorders, mental illness, psychological wellbeing or psychological stress *and* coronavirus, disasters, disease outbreaks, influenza A virus, patient isolation, physical distancing, quarantine, school closure, severe acute respiratory syndrome, social isolation or trauma
Limits	▪ Peer-reviewed articles published in English ▪ Child participants aged 18 years or younger ▪ Systematic review or meta-analysis methods used to identify and evaluate data from multiple observational studies

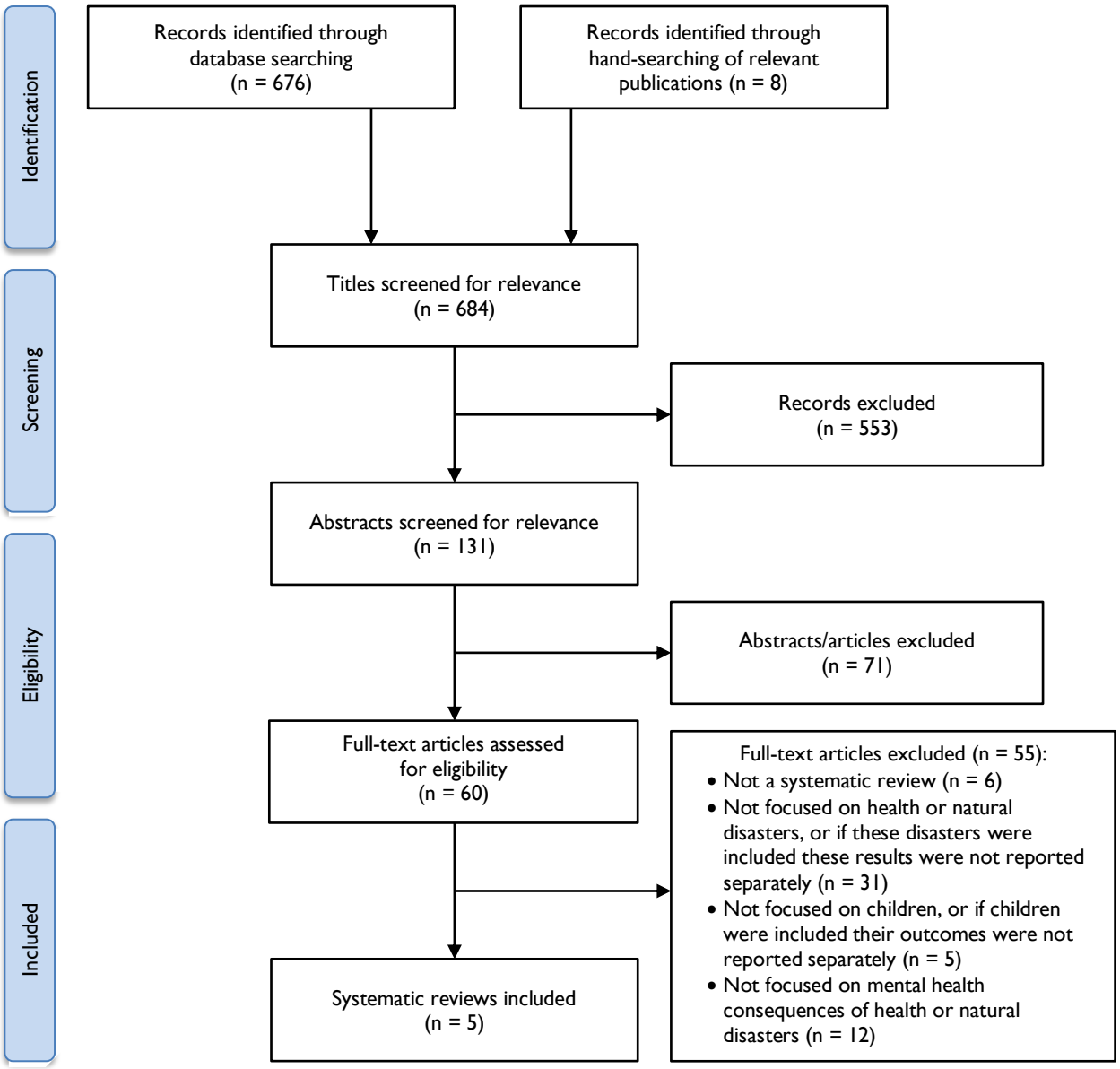
To identify additional reviews, we also hand-searched reference lists from relevant publications found through our searches. Using this approach, we identified 60 potential articles for inclusion. Two team members then independently assessed these, applying the inclusion criteria outlined in Table 5.

Table 5. Inclusion Criteria for Systematic Reviews and Meta-Analyses

▪ Review was focused on the human impact of health or natural disasters
▪ Child mental health outcomes were reported, inclusive of populations up to age 18 years
▪ Comprehensive search strategies and clear inclusion criteria were described
▪ Quality of original included studies was assessed and/or considered in the analysis
▪ Original studies using weaker methodologies, such as case studies, were excluded
▪ Statistical significance and/or magnitude of effect was reported for meta-analyses

As Figure 1 outlines, five systematic reviews met all inclusion criteria. Because these reviews only focused on the impact of natural disasters, from our searches we identified and included one original study – on the effects of quarantine for disease outbreaks. Data were then extracted, summarized and verified by two or more team members. Throughout our process, we resolved any differences by consensus.

Figure 1: Search Process for Systematic Reviews*



*Adapted from Preferred Reporting Item for Systematic Reviews and Meta-Analyses [87]

6.2 Research and Clinical Terms Explained

To quantify the impact of health and natural disasters, researchers typically use observational methods. Case-control designs are an example of these methods and involve identifying a cohort of children who were exposed to the event in question, then assessing outcomes in these children compared to those who were not exposed. However, the ideal is to identify **representative samples** of children in the population who were affected, and not affected. This approach eliminates selection biases that can occur when **convenience samples** are used. For example, if researchers rely on online ads and surveys, children whose families cannot access the internet may be left out.

By comparing groups of children who have been exposed to a disaster with those who have not, potential outcomes can be identified. When assessing mental health outcomes, it is ideal to conduct clinical interviews to determine if a child meets the threshold for a given diagnosis. However, given the associated costs, many researchers instead rely on validated symptom measures. In such situations, researchers often use the established **clinical threshold**, a specific numerical value for the given measure, to determine which children are particularly impacted.

Regardless of whether the outcome of interest is a diagnostic or symptom measure, researchers conduct analyses to determine if any group differences found are **statistically significant**. This criterion helps provide certainty that the event in question had a meaningful impact, rather than it appearing that way simply due to chance. Usually researchers set a value enabling at least 95% confidence that the observed outcomes are real, expressed as a **p value of less than 0.05**. If case-control designs cannot be used, researchers may instead measure child outcomes within the same population before and after the event, to determine if there are statistically significant changes over time.

Beyond assessing statistical significance, it is also important to assess the magnitude of the impact of the event in question for children's lives — or the **effect size**. Effect size measures reported in this rapid research review include **Cramer's V**, **odds ratio (OR)** and **Pearson's *r***. Values for Cramer's V can range from 0 to 1. Standard interpretations are that 0.1 to < 0.3 = small effect; 0.3 to 0.5 = medium effect; and > 0.5 = large effect. Meanwhile, OR indicates the odds of a given outcome occurring. For example, an OR of 1.5 indicates that the children's risk for a given outcome was 1.5 times higher. Pearson's *r* can range from -1 to +1. Standard interpretations are identical to Cramer's V.