



# COVID-19 and the impacts on youth mental health: emerging evidence from longitudinal studies

## Les impacts de la pandémie de la COVID-19 sur la santé mentale des jeunes : données émergentes des études longitudinales

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### Abstract

Several experts have warned that the current coronavirus disease 2019 (COVID-19) pandemic and associated confinement measures may have taken a devastating toll on youth mental health. While the COVID-19 pandemic has certainly created important challenges for children and youth, these claims vastly rely on cross-sectional data collected during the pandemic, from which it is difficult to draw firm conclusions. In this commentary, we offer a critical appraisal of the evidence from emerging longitudinal studies spanning the pre- and intra-pandemic period with a focus on internalizing and externalizing disorders, suicidality, eating disorders and substance use. We also discuss important research considerations in the monitoring of the long-term impacts of the COVID-19 pandemic on youth mental health as well as promising interventions to help mitigate potential long-lasting consequences of this unprecedented public health crisis.

### Résumé

Plusieurs experts ont prévenu que la pandémie actuelle de coronavirus 2019 (COVID-19) et les mesures de distanciation sociale adoptées pourraient avoir un effet dévastateur sur la santé mentale des jeunes. Bien que la pandémie de COVID-19 ait certainement créé d'importants défis pour les enfants et les adolescents, les connaissances à ce sujet reposent principalement sur des données transversales collectées en cours de pandémie, à partir desquelles il peut être difficile de tirer des conclusions définitives. Dans ce commentaire, nous offrons une revue critique des évidences provenant d'études longitudinales émergentes couvrant la période pré- et intra-pandémique en mettant l'accent sur les troubles internalisés et externalisés, le risque suicidaire, les troubles alimentaires et l'usage de substances. Nous discutons également les considérations de recherche importantes pour le suivi des effets à long terme de la pandémie de COVID-19 sur la santé mentale des jeunes et proposons certaines interventions prometteuses pour réduire les conséquences permanentes potentielles de cette crise de santé publique sans précédent.

**Keywords** Mental health · Youth · Longitudinal · COVID-19 pandemic · Children

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## Introduction

The coronavirus disease 2019 (COVID-19) pandemic and associated confinement measures have created major disruptions in societal norms and public health infrastructure in Canada, and around the world. There is growing concern that social isolation resulting from these measures, combined with reduced access to mental health and support services within schools and community settings and fewer opportunities to engage in protective activities such as physical activity, may have detrimental short- and long-term effects on youth mental health and substance use (Marques de Miranda et al., 2020; Tsamakis et al., 2021). According to many experts, this constellation of factors in addition to the fear of contagion and other social and economic concerns has created a “perfect storm” that could precipitate the onset of mental health disorders among youth or lead to worsening of pre-existing ones. This may be particularly true among youth with pre-existing vulnerabilities such as being exposed to familial adversity (Cohen & Bosk, 2020; Jones et al., 2020).

## State of the evidence on the mental health consequences of COVID-19 among youth

While evidence on the short-/medium-term impacts of COVID-19 on mental health has emerged for adults (Daly & Robinson, 2021; Daly et al., 2020; Ettman et al., 2020; O’Connor et al., 2020; Pierce et al., 2020), fewer studies have been conducted among children, adolescents and emerging adults, which represent three key developmental periods characterized by significant changes in mental health symptomatology (Jones, 2013). The few studies focusing on youth vastly rely on cross-sectional information collected during the pandemic, from which it is difficult to draw firm conclusions due to the lack of comparison with pre-pandemic levels of symptoms. Only a handful of longitudinal studies with assessments of mental health before and during the pandemic are yet available. Nonetheless, certain observations can be made concerning specific mental health conditions and presentations.

**Internalizing disorders (e.g., mood and anxiety disorders)** Few longitudinal data, notably from the United Kingdom, suggest that depressive symptoms in youth may have increased during the early phases of the COVID-19 pandemic (compared with pre-pandemic levels), with some signs of recovery during the summer of 2020 (Barendse et al., 2021; Breaux et al., 2021; Daly & Robinson, 2021; Daly et al., 2020; Newlove-Delgado et al., 2021; Pierce et al., 2020; Watkins-Martin et al., 2021). Though evidence

is limited, worsening of mood symptoms during the early phases of the pandemic appears to have been associated with stricter lockdown measures (Barendse et al., 2021; Li et al., 2021). Evidence describing changes in anxiety symptoms appears more mixed, with sources indicating either improvements in symptoms, no change or minor detriments in early stages of the pandemic (Barendse et al., 2021; Big-nardi et al., 2020; Watkins-Martin et al., 2021; Widnall et al., 2020). These results may reflect differential impacts in specific populations, for instance in youth with pre-existing mental health conditions (Breaux et al., 2021; Shanahan et al., 2020).

**Externalizing disorders (e.g., conduct and attention-deficit hyperactivity disorders)** A mixed-methods study conducted at the beginning of the pandemic highlighted increases in caregiver-reported externalizing symptoms, particularly tantrums, disobedience and attitude problems (Fitzpatrick et al., 2020). Similarly, a recent longitudinal study conducted in the United States among youth ages 7–15 years showed that increases in externalizing symptoms seen in many children were highly associated with lower levels of in-person/digital socialization and support from parents and peers (Rodman et al., 2021).

**Suicide ideation, attempt and mortality** While many experts have voiced their concerns about the impacts of the COVID-19 pandemic on suicide, such data are challenging to collect and evidence from longitudinal studies is only starting to emerge (John et al., 2020a; John et al., 2020b). Recent studies have reported no increase in the rates of death by suicide (Isumi et al., 2020; Leske et al., 2021). In terms of service utilization, evidence is mixed. One study reported a decrease in hospital presentations for self-harming behaviours (e.g., encompassing non-suicidal self-injuries and suicide attempts) in the first few months of the pandemic (Hawton et al., 2021), whereas others reported small increases in suicide ideation and attempts among youth presenting to a pediatric hospital (Hill et al., 2020) and those hospitalized for a psychiatric condition (Thompson et al., 2021).

**Substance use** Concerns around increased use of psychoactive substances as a coping mechanism for loneliness or mental distress have prompted investigations on youth substance use since the onset of the pandemic. The limited number of longitudinal studies available suggests that concern may not be warranted for all youth. Indeed, some report an initial decrease in alcohol and drug use at least in part due to fewer opportunities for social use (White et al., 2020). Other longitudinal studies suggest that while prevalence of youth

tobacco, cannabis and alcohol use remained mostly stable during the first months of the COVID-19 pandemic, frequent and problematic use of substances increased in some higher-risk youth, such as those with concurrent mental health conditions (Bartel et al., 2020; Dumas et al., 2020; Naughton et al., 2021; Pinkham et al., 2020).

**Eating disorders** In Canada and in other developed countries, specialized pediatric eating disorder programs have reported an unprecedented increase in the number of referrals and hospitalizations for restrictive eating disorders since the beginning of the pandemic (Haripersad et al., 2021; Solmi et al., 2021; Szklarski, 2021). Accordingly, studies have reported an increase in disordered eating symptomatology in the general population (Nutley et al., 2021) as well as adults and youth with pre-existing eating disorders (Castellini et al., 2020; Schlegl et al., 2020). At the time of writing, longitudinal research on eating disorders in the general youth population was still lacking from the peer-reviewed literature.

## Monitoring the impacts of the COVID-19 pandemic on youth mental health

Evidence from longitudinal studies presents a complex and nuanced picture of the impacts of the COVID-19 pandemic on youth mental health with fluctuations associated with tightening of lockdown measures (including school closures) and differential effects among youth with risk and protective factors (Robinson et al., 2021; Viner et al., 2021). Given the rapidly evolving nature of the COVID-19 pandemic and numerous methodological challenges involved with identifying the mental health impact of the pandemic, an interdisciplinary research approach and follow-up of large population-based longitudinal cohorts with repeated assessments of mental health (ideally with baseline measures) will be key to understanding the long-term impacts of the pandemic (Hotopf et al., 2020). Examples of such already existing cohorts include the Canadian Healthy Infant Longitudinal Development Study (Takaro et al., 2015) and the Quebec Longitudinal Study of Child Development (Orri et al., 2021).

As the pandemic and post-pandemic period continues to unfold, it will be essential to monitor important markers of youth mental health, including symptoms of internalizing and externalizing disorders, disordered eating behaviours, suicidality and substance use behaviours. Combining observations from different cohorts could help examine a broad range of mental health indicators in specific age groups and in vulnerable population groups, which may be more severely affected by the pandemic. Administrative health records capturing medical service utilization (outpatient, emergency visit, hospitalization) for mental health reasons can also be used and linked to existing cohorts to monitor

some of the impacts of the pandemic on youth mental health from a health services research lens. Another avenue can be to identify the intermediate pathways through which the pandemic can influence mental health, for example, studying the role of the loss of social connections on the likelihood of disordered eating symptoms among youth and across time. Finally, it will be crucial to consider impacts not only in representative, population-based samples but also in youth with existing vulnerabilities, including personal and family history of physical and mental illnesses as well as other genetic, developmental and environmental factors, as large studies may miss significant effects in specific subgroups.

## Potential solutions

The widespread adoption of lockdown measures in the context of COVID-19 has created the necessity for a rapid adaptation of existing mental health treatment services, and in many settings, a shift towards digital health, including telehealth/telepractice (Raballo et al., 2020; Ramalho et al., 2020). Very little evidence is available to compare the long-term effectiveness of in-person and online services for youth mental health, and it is still unknown whether services delivered digitally may adequately serve the needs of all youth, or rather exacerbate existing inequalities among more vulnerable youth populations (Pellicano & Stears, 2020). Optimal integration of digital and traditional mental health services for high-risk populations is another area requiring additional research (Couturier et al., 2020). Nonetheless, services and care delivered virtually present a unique opportunity for increased access, especially for those living in areas in which access to in-person services may be limited (Rauschenberg et al., 2020). For example, a small number of pilot studies evaluating mindfulness, art therapy and philosophy interventions delivered virtually for children and adolescents have shown high levels of feasibility and promising preliminary results on youth well-being (Chadi et al., 2018; Malboeuf-Hurtubise et al., 2021a, b).

The use of new self-reported electronic screening tools delivered via technology in the context of the COVID-19 pandemic provides a promising avenue for improved early identification and intervention for mental health problems, but should be adapted from already existing self-administered and provider-administered tools (Ransing et al., 2020). Combined with self-help resources such as mobile applications, online health communities and proper linkage with in-person or telehealth services, these can allow a full spectrum of interventions ranging from personalized care to population-based preventive measures that can be easily disseminated and brought to scale (Chew et al., 2020). For instance, the *Climate Schools* and *PreVenture* programs are two examples of promising universal and personality-targeted interventions, delivered in-person or virtually,

which have shown high levels of effectiveness in reducing the incidence of substance use and other mental health problems (Edalati & Conrod, 2019; Slade et al., 2021). Nonetheless, the use of innovative technological approaches and its integration with already existing in-person resources needs should be studied with care, to optimize both cost-effectiveness and clinical efficacy.

## Conclusion

In sum, more than one year after the adoption of wide-scale COVID-19 public health preventive measures, there is only limited longitudinal evidence on the impacts of the pandemic on child and youth mental health. Longitudinal findings paint a more nuanced picture than some cross-sectional studies from

the early stages of the pandemic, though there is reason to believe that there could be long-term impacts on youth mental health, especially in more vulnerable youth. These findings build on numerous reports from clinicians suggesting significant increases in referrals and admissions for mental health problems, notably in relation to pediatric eating disorders (Furey, 2021; Haripersad et al., 2021; Solmi et al., 2021; Szklarski, 2021; Wilton, 2021). Considering that child and adolescent mental health services were already overstretched and underfunded before the onset of the pandemic, there is a pressing need for government investment to support and improve existing services as well as research on youth mental health (Malla et al., 2018). High-quality intervention research will be key to ensure optimal delivery of child and adolescent mental health services and mitigate potential long-lasting consequences of this unprecedented public health crisis.

# Les impacts de la pandémie de la COVID-19 sur la santé mentale des jeunes : données émergentes des études longitudinales

## Introduction

La pandémie de la maladie à coronavirus 2019 (COVID-19), et les mesures de confinement connexes, ont perturbé les normes de la société et les infrastructures de la santé publique au Canada et ailleurs. On s'inquiète à présent que la distanciation sociale et l'isolement qui s'en suit (y compris l'accès réduit aux services de santé mentale, au soutien psychologique en milieu scolaire et communautaire, et aux activités protectrices telles que l'activité physique) aient un effet dévastateur sur la santé mentale des jeunes. On craint pour l'usage des substances à court et à long terme (Marques de Miranda et al., 2020; Tsamakis et al., 2021). Nombreux experts appréhendent une « tempête par excellence » de troubles de santé mentale précipités et/ou aggravés par la pandémie, par la peur de la contagion, et par les problèmes socioéconomiques, en particulier chez les jeunes en situation vulnérable telle que l'adversité familiale (Cohen & Bosk, 2020; Jones et al., 2020).

## Données probantes sur les conséquences de la COVID-19 sur la santé mentale des jeunes

Malgré les données émergentes sur les impacts à court et à moyen terme de la COVID-19 sur la santé mentale des adultes (Daly & Robinson, 2021; Daly et al., 2020; Ettman et al., 2020; O'Connor et al., 2020; Pierce et al., 2020), il y a peu d'études à présent sur la santé mentale des enfants, des adolescents, et des jeunes adultes. Or, ces trois groupes représentent trois périodes clés du développement, périodes

caractérisées par des changements importants en ce qui concerne les troubles de santé mentale (Jones, 2013). Les quelques études ciblant des jeunes reposent largement sur des données transversales recueillies en temps de pandémie; ainsi, sans référentiels pré-pandémiques, il est difficile de tirer des conclusions définitives. Seules plusieurs études longitudinales ont publié des évaluations sur la santé mentale avant et pendant la pandémie. Cependant, on décerne quelques particularités sur certains troubles de santé mentale chez les jeunes, que nous détaillons ci-dessous.

**Troubles internalisés (ex. troubles anxieux et troubles de l'humeur)** Plusieurs données longitudinales, du Royaume-Uni notamment, suggèrent une augmentation des symptômes dépressifs chez les jeunes en début de pandémie (par rapport aux niveaux pré-pandémiques), avec quelques signes d'amélioration pendant l'été 2020 (Barendse et al., 2021; Breaux et al., 2021; Daly & Robinson, 2021; Daly et al., 2020; Newlove-Delgado et al., 2021; Pierce et al., 2020; Watkins-Martin et al., 2021). Les symptômes de l'humeur semblent, d'après les données limitées, avoir augmenté en début de pandémie, en lien avec les mesures de confinement relativement strictes (Barendse et al., 2021; Li et al., 2021). Pour les symptômes d'anxiété, les données semblent moins claires; certaines sources impliquent une amélioration des symptômes, d'autres aucun changement, et d'autres encore, des troubles mineurs en début de pandémie (Barendse et al., 2021; Bignardi et al., 2020; Watkins-Martin et al., 2021; Widnall et al., 2020). Ces résultats contradictoires reflètent peut-être un effet différentiel selon la population; ex. chez

les jeunes avec des problèmes de santé mentale préexistants (Breaux et al., 2021; Shanahan et al., 2020).

**Troubles externalisés (ex. troubles des conduites, trouble déficitaire de l'attention avec hyperactivité (TDAH))** Une étude à méthodes mixtes en début de pandémie aux États-Unis met en évidence une augmentation des symptômes d'extériorisation signalés par les parents/gardiens; en particulier, crises de colère, désobéissance, et troubles d'attitude (Fitzpatrick et al., 2020). Dans le même ordre d'idées, une autre étude récente aux États-Unis, celle-ci longitudinale, démontre qu'auprès des jeunes de 7 à 15 ans, l'augmentation des symptômes d'extériorisation observés est fortement reliée à la diminution de la socialisation (en personne/en numérique) et du soutien des parents et des pairs (Rodman et al., 2021).

**Idées suicidaires, tentatives de suicide, mortalité** Alors que de nombreux experts ont exprimé des inquiétudes concernant les impacts de la pandémie de la COVID-19 sur le suicide, ces données sont difficiles à capter et ce n'est que maintenant que les évidences d'études longitudinales commencent à paraître (John et al., 2020a; John et al., 2020b). Les dernières études ne rapportent aucune augmentation dans le taux de décès par suicide (Isumi et al., 2020; Leske et al., 2021). Quant à l'utilisation des services de santé, les données sont mixtes. Une étude (Hawton et al., 2021) signale une diminution des visites à l'hôpital pendant les premiers mois de la pandémie pour une gamme des comportements d'automutilation (du non suicidaire aux tentatives de suicide). D'autres démontrent une légère augmentation des idées suicidaires et des tentatives chez les patients se présentant à un hôpital pédiatrique (Hill et al., 2020), ainsi que chez les jeunes hospitalisés pour un trouble psychiatrique (Thompson et al., 2021).

**Usage des substances** Depuis le début de la pandémie, le problème se pose quant à l'usage potentielle des substances psychoactives comme mécanisme de survie face à la solitude ou à la souffrance psychologique. Le peu d'études longitudinales à date suggèrent qu'il ne faut pas nécessairement s'inquiéter pour tous les jeunes. Effectivement, certaines enquêtes rapportent une diminution initiale de la consommation d'alcool et de drogues, possiblement en raison des restrictions sur les opportunités de consommation sociale (White et al., 2020). Par contre, d'autres études longitudinales suggèrent que la consommation de tabac, de cannabis, et d'alcool demeurerait relativement stable pendant les premiers mois de la pandémie; cependant, elle aurait augmenté en fréquence et en problématique chez les jeunes à risque élevé, ex. troubles psychologiques concomitants (Bartel et al., 2020; Dumas et al., 2020; Naughton et al., 2021; Pinkham et al., 2020).

**Troubles du comportement alimentaire** Les programmes pédiatriques spécialisés en matière de troubles de l'alimentation, au Canada et ailleurs dans les pays développés, ont vu une augmentation sans précédent du nombre de consultations et d'hospitalisations pour des troubles restrictifs depuis le début de la pandémie (Haripersad et al., 2021; Solmi et al., 2021; Szklarski, 2021). Effectivement, les études démontrent une augmentation des symptômes du comportement alimentaire dans la population générale (Nutley et al., 2021), ainsi que chez les adultes et les jeunes avec des troubles alimentaires préexistants (Castellini et al., 2020; Schlegel et al., 2020). Au moment de l'écriture, la littérature scientifique manquait encore de recherches longitudinales chez les jeunes de la population générale.

### Suivi continu de l'impact de la pandémie sur la santé mentale des jeunes

Les données provenant d'études longitudinales dépeignent un portrait complexe et nuancé de l'impact de la pandémie sur la santé mentale des jeunes, portrait qui reflète les variations dans les mesures de confinement (y compris les fermetures d'écoles) et les facteurs de risque et de protection de chaque individu en particulier (Robinson et al., 2021; Viner et al., 2021). Étant donné l'évolution rapide du virus et de la pandémie, et les nombreux défis méthodologiques pour identifier les impacts, on entrevoit une approche interdisciplinaire et un suivi à long terme sur de grandes cohortes longitudinales et représentatives de la population, avec des évaluations de référence (idéalement) et répétées au fil du temps (Hotopf et al., 2020). Certains exemples de telles cohortes existent déjà, soit l'étude *Canadian Healthy Infant Longitudinal Development (CHILD)* (Takaro et al., 2015) et l'*Étude longitudinale du développement des enfants du Québec (ELDEQ)* (Orri et al., 2021).

À mesure que la pandémie et la période post-pandémique continuent à évoluer, il sera important de surveiller certains marqueurs de la santé mentale des jeunes, y compris les symptômes de troubles internalisés et extériorisés, de troubles du comportement alimentaire, de suicidalité, et de comportements liés à l'usage des substances. Il sera utile d'explorer un large éventail d'indicateurs de la santé mentale, en jumelant des observations provenant de plusieurs cohortes, dont différents groupes d'âge et de populations vulnérables et susceptibles d'être plus affectés par la pandémie. Les bases de données administratives comprenant l'utilisation des services médicaux pour des raisons de santé mentale (visites en clinique externe, visites à l'urgence, hospitalisation) pourraient être jumelées à des cohortes existantes pour surveiller les impacts par le biais de la recherche sur les services de santé. Alternativement, on pourrait chercher à identifier les intermédiaires par

lesquels la pandémie affecte la santé mentale; ex. en explorant le rôle que joue la perte des relations sociales dans le développement des symptômes alimentaires chez les jeunes et avec le temps. Et finalement, il serait essentiel de considérer non seulement l'impact sur des échantillons représentatifs de la population, mais aussi l'impact sur les jeunes avec des vulnérabilités liées à des antécédents de santé mentale/physique personnels ou familiaux, ou sur les jeunes avec des vulnérabilités sur le plan génétique, développemental, ou environnemental. Les études à grande échelle pourraient ne pas déceler les impacts chez certains sous-groupes en particulier.

## Solutions pratiques

Les mesures de confinement prises pendant la pandémie ont nécessité une réinvention rapide des services de santé mentale, et certains contextes ont privilégié le déploiement de la pratique virtuelle et la télé-médecine (Raballo et al., 2020; Ramalho et al., 2020). Il y a très peu d'évidences comparant l'efficacité à long terme des services à distance et en ligne versus la pratique en présentiel. Par ailleurs, on ne sait pas non plus si les services à distance sont adéquats pour tous les jeunes, ou si au contraire, ils n'exacerbent pas les inégalités déjà existantes parmi les différentes populations, dont les populations vulnérables (Pellicano & Stears, 2020). L'intégration optimale des services de santé mentale traditionnels et virtuels pour les populations à risque constitue un domaine d'investigation complémentaire (Couturier et al., 2020). Néanmoins, l'accès virtuel offre la possibilité inouïe de procurer des soins et des services sur une plus grande distance, ce qui avantagerait les résidents où l'accès en présentiel est limité (Rauschenberg et al., 2020). Par exemple, certaines études ont piloté des interventions virtuelles de pleine conscience, d'art-thérapie, et de philosophie pour enfants et adolescents; les résultats préliminaires dévoilent une bonne faisabilité ainsi que des effets prometteurs sur le bien-être (Chadi et al., 2018; Malboeuf-Hurtubise et al., 2021a, b).

L'utilisation de nouveaux outils d'auto-dépistage électronique via la technologie virtuelle dans le contexte de la pandémie de la COVID-19 constitue une voie prometteuse dans le cadre de la santé mentale, pour l'identification et l'intervention précoces. Ces outils doivent cependant être adaptés à partir de questionnaires existants, qu'ils soient auto-administrés ou administrés par des professionnels (Ransing et al., 2020). En considération des ressources autodidactiques (applications mobiles, communautés de santé en ligne) et des références/liens appropriés aux services de télé-médecine ou en présentiel, on peut offrir toute une gamme d'interventions, à partir des soins personnalisés jusqu'aux mesures préventives à l'échelle de la population, facilement diffusables et adaptées au public ciblé (Chew

et al., 2020). Deux exemples sont *The Climate Schools Programme* et *PréVenture*, interventions prometteuses virtuelles et/ou en personne, universelles et/ou ciblées sur la personnalité, qui se sont montrées fort efficaces à réduire l'incidence de l'usage de substances et d'autres problèmes de santé mentale (Edalati & Conrod, 2019; Slade et al., 2021). Ceci dit, l'utilisation des technologies innovatrices et leur intégration parmi les ressources existantes devraient être étudiées de près, afin d'optimiser à la fois le rapport coût-efficacité et l'efficacité clinique.

## Conclusion

En somme, plus d'un an après l'instauration des mesures de prévention de la COVID-19 par la santé publique, nous n'avons que peu d'évidences longitudinales sur les impacts de la pandémie sur la santé mentale des enfants et des jeunes. Les données disponibles dépeignent un portrait plus nuancé que celui des études transversales en début de pandémie. Il y a raison de croire qu'il pourrait y avoir des effets à long terme sur la santé mentale des jeunes, particulièrement chez les jeunes plus vulnérables. Ces conclusions sont en amont avec les nombreux rapports cliniques suggérant une augmentation importante de consultations et d'hospitalisations pour des problèmes de santé mentale, notamment des problèmes de troubles alimentaires pédiatriques (Furey, 2021; Haripersad et al., 2021; Solmi et al., 2021; Szklarski, 2021; Wilton, 2021). En vue du fait que les services de santé mentale pédiatriques et adolescentes étaient déjà surchargés et sous-financés bien avant la pandémie, il y a un besoin urgent d'investissement de la part du gouvernement pour soutenir et améliorer les services existants ainsi que la recherche sur la santé mentale des jeunes (Malla et al., 2018). La recherche interventionnelle de haut calibre sera la clé pour assurer la prestation optimale des services de santé mentale pour les enfants et les adolescents, afin de mitiger les conséquences potentielles à long terme de cette crise de santé publique sans précédent.

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## Declarations

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