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MITIGATING UNINTENDED HARMS OF COVID-19 PUBLIC HEALTH MEASURES

Literature Review Report

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CONTENTS

Contents	2
Executive Summary	3
Methods	4
Background	6
Part 1: Rapid review	7
Research Question.....	7
PECO Definition Chart:.....	8
Methods	9
Search methods for identification of studies	11
Data collection and synthesis	12
Results	13
Eligibility.....	14
Screening.....	14
Included	14
Identification.....	14
Part 2: Narrative review	22
Discussion	27
Risk Factors.....	28
Limitations.....	31
Conclusions	32
Acknowledgements.....	33
References.....	34
References	44
References for Excluded Pre-Print Studies	47
Appendix A	50
Appendix B	52
Appendix C: Rapid Review Protocol	53
Appendix D: Search strategies	62
Appendix E: Grey Literature Search Strategy	67
Appendix F: Exclusion Table	74
Appendix G	78
Appendix H	79

EXECUTIVE SUMMARY

Background

The current COVID-19 pandemic has indicated the need to implement physical and social distancing measures that encourage populations around the world and in Ontario to stay home. Although advising or ordering whole populations to stay home may reduce the spread of COVID-19, some mental health experts are suggesting there may be worsening rates of depression, anxiety and related mental health outcomes when people self-isolate in their homes to ensure they are physically distant from friends, family, neighbours and health and social service providers. The objectives of this literature review are:

- 1) To determine if there is evidence of harm to populations experiencing lock down measures to stay home as a result of the COVID-19 pandemic
- 2) To describe what mitigation strategies are recommended by researchers, governments and non-governmental organizations.

This literature review was divided into two parts. The first part is a rapid review that addresses the first objective. The second part is a narrative review that addresses the second objective.

METHODS

Rapid Review:

Ovid MEDLINE®, Ovid MEDLINE® (Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily Update), APA PsychInfo, SocINDEX with Full Text and the medRxiv database for pre-print citations were searched. Reference lists of included studies were reviewed.

Studies were included if they sampled the general, well-population aged 25 years of age or older, if the study sample was exposed to broad population lockdown measures to stay home during a pandemic, and if the study provided appropriate comparison data to demonstrate a worsening rate of mental or social health outcomes. Samples looking at subpopulations or specific risk groups were excluded.

Citation, country, research design, sample number, participant characteristics, outcome measures, outcome results and comparison data were extracted using a data extraction template developed by the reviewers. No formal synthesis methods were used due to the heterogeneity of the studies and their limited number.

Four studies were found that met inclusion criteria - one published paper and three papers in pre-print. All four studies implemented cross-sectional online surveys conducted in China or Britain. Two studies were rated as a higher risk of bias and two were rated as a high risk of

bias. Depression, anxiety, stress and alcohol dependency were the only outcomes found in studies meeting inclusion criteria. These four studies all reported worsening rates of these outcomes.

Narrative Review:

The same published search results were used to inform our mitigation strategy question. A formal grey literature search was conducted. Published and unpublished (grey literature) sources were considered if relevant. Broad inclusion and exclusion criteria were developed that were based on the PECO definitions of the rapid review. Published research that tested mitigation interventions are presented first and results from the grey literature are presented using a social ecological model.

Two published studies were found that described the effectiveness of a text messaging program and a hotline to improve mental health outcomes, including depression, resilience and coping. The third published paper was a Cochrane review that reported no difference in loneliness scores amongst older people living in nursing homes when a video conference intervention was implemented compared to controls.

The grey literature identified mitigation strategies including virtual/online service delivery and phone line supports. In general, mitigation strategies appeared to be based on expert-opinion and focused on individual level actions, risk and mental health literacy communications and broad system level strategies. System level strategies included advocating for additional mental health system reform, additional mental health services, the integration of mental health and psychosocial supports into all phases of emergency planning, and engaging in mental health promotion capacity building amongst a wide range of community service providers.

Authors' conclusions

The evidence for the harms resulting from lockdown measures are sparse and the majority of these harms are from studies still in pre-print. All four included studies were judged to be at least at a higher risk of bias. Results presented in this review should be used with extreme caution. The best available evidence suggests worsening rates of depression, anxiety, stress and alcohol dependency that may be the result of physical and social distancing measures that encourage residents to stay home. The harms found in this rapid review may be a result of a variety of personal and contextual circumstances that relate to lockdown measures that can impact mental and social health outcomes. Individual level mitigation strategies to support mental health and well-being, the use of risk communication and mental health literacy communication, and broader system level strategies to mitigate harms related to mental health could be considered. Specifically, suggested strategies include advocacy for additional mental health system reform, additional services, integration of mental health and psychosocial support

integration into all phases of emergency planning, and mental health promotion capacity building amongst a wide range of community service providers.

BACKGROUND

The global COVID-19 pandemic was declared on March 11, 2020 by the Director General of the World Health Organization.¹ To help reduce the spread of COVID-19, the World Health Organization (WHO)² recommends governments to implement and promote physical and social distancing measures for their population, including individual level physical distancing, reduction or cancellation of mass gatherings and the need to avoid crowded spaces in different settings (e.g. public transport, restaurants, bars, theatres). Please see [Appendix A](#) for a listing of selected public health and social measures for COVID-19.

Given the increasing incidence of COVID-19 infections, the Ontario Government ordered the closure of publicly funded schools for the two weeks following spring break and subsequently declared a state of emergency³ thereby closing all non-essential businesses and health care, licenced child care, municipal and provincial parks and prohibited mass gatherings. These broad public health, population-level measures encouraged Ontarians to physically and socially distance and to stay home to prevent the spread of COVID-19.

The best-available evidence suggests that population level mandatory or voluntary quarantine, in addition to broad public health measures to physically and socially distance, has indeed been effective in ‘flattening the curve’.⁴ Despite the success of the physical and social distancing measures to encourage people to stay home to reduce the spread of COVID-19, some academics and non-governmental organizations are warning that there may be unintended consequences for the population from staying home. Indeed, the World Health Organization (WHO) has stated that there is a need to, “balance interventions to address the direct health impact of COVID-19 with strategies to limit short- and long-term consequences on health and socioeconomic wellbeing, such as [those that] arise from [the] loss of income or access to services, that may result from putting in place certain measures.” [(2), p.1]

Population-level physical and social distancing measures to keep residents home to prevent the spread of infection has not been seen at this magnitude since the 1918 Spanish Influenza epidemic. Therefore, little is known about what harms the general, well adult population may experience from staying at home for long periods of time due to the COVID-19 pandemic.

Evidence is now emerging from countries who experienced city or region-wide lockdown, such as the Chinese city of Wuhan (mandatory quarantine began on January 23rd, 2020) and the region-wide lockdown of the Lombardy region of Italy (mandatory lockdown began March 11, 2020). Indeed, the preliminary results from China, Italy and Spain who have recently

experienced severe lockdown measures because of the COVID-19 pandemic, are reporting high prevalence rates of depression (17 -38%),⁵⁻⁸ anxiety (8% - 39%)^{5,7-9} and post-traumatic stress (4-37%).^{5,10} Increased anxiety rates^{11,12} were also reported during past respiratory tract infection outbreaks. One author went as far to declare the SARS outbreak a mental health catastrophe.¹³

Indirect evidence can also be gleaned about the harms of home quarantine on people exposed or infected with a respiratory tract infection from past outbreaks. A rapid review recently concluded that individuals who experienced quarantine because of a known exposure or infection during past outbreaks have experienced emotional disturbances and exhaustion, depression, stress and low mood. Longer-term quarantine was associated with poorer mental health, alcohol abuse and dependency symptomology, post-traumatic stress symptoms, avoidance behaviours and anger.¹⁴ The authors of this rapid review commented that there may be important differences in psychological outcomes when larger containment processes are applied to larger populations (e.g. towns or cities).¹⁴

This literature review is one part of a broader situational assessment for the Simcoe and Muskoka region of Ontario. The other two parts are a review of available data indicators and an environmental scan of community partners. The purpose of this literature review is to investigate whether there is evidence of psychological or social harms experienced by the general, well, community dwelling population (without known infectious disease exposure) as a result of stay home due to physical and social distancing measures as well as describe recommended mitigation strategies for possible harms.

This literature review is structured in two parts. The first part addresses the first study objective through a rapid review of harms associated with population level physical distancing measures, and the second part addresses the second study objective through a narrative review of suggested mitigation strategies to address possible harms.

PART 1: RAPID REVIEW

Research Question

1. Does staying at home for long periods of time during current or past pandemics experienced by the general population of community dwelling adults aged 25 years and older worsen the rates of:
 - substance use
 - domestic violence
 - mental health, and
 - mental illness diagnosis, compared to non-pandemic times.

PECO Definition Chart:

Population	Exposure	Comparison	Outcomes
Community dwelling, well-adults aged 25 years of age and over. Includes pregnant women and adults over 65.	Public health physical and social distancing measures to stay home during a pandemic.	No lockdown exposure during non-pandemic times (a.k.a normative or baseline outcome data) in a similar population.	<ul style="list-style-type: none">• Worsening rates of domestic violence, physical abuse, emotional abuse or trauma.• Reported or perceived worsening of mental health (anxiety, depression, stress, suicidal thoughts, suicide attempts, completed suicides, loneliness or increasing symptomology of these conditions).• Reported increases in new cases of mental illness (diagnosed depression, generalized anxiety disorder, PTSD).• Worsening rates of substance use (alcohol, legal and illegal drug use, and tobacco).

Methods

Protocol

A protocol for the methods used in this rapid review are found in the [Appendix C](#). Due to the expedited nature of this review, the protocol was not posted before the rapid review process began.

Study design

Systematic reviews, prospective cohort studies, retrospective cohort studies, case-control studies, cross-sectional studies, case series, interrupted time series and modelling studies were included. Emphasis was placed on the higher quality study designs. A stepwise approach to study design inclusion was used.^{15, 16}

The following study characteristics were excluded: Individual case studies, abstracts and conference proceedings, editorials, dissertations, narrative reviews, opinion papers, editorials, commentaries, qualitative research designs, university-specific settings, epidemiological studies not examining exposure effects (e.g. effects of interventions unrelated to mitigation of harms), studies in other languages with no English translation, studies assessing gambling behaviours, studies assessing factors associated with compliance of physical distancing measures, or factors associated with outcomes of interest.

Population

Adults from the general population aged 25 years and older who are well, with no known exposure, and who are community dwelling was our population of interest. We included seniors aged 65 years of age and older, and pregnant and postpartum women.

We excluded studies specifically examining samples with chronic conditions/ comorbidities, intellectual disabilities, pre-diagnosed mental health disorders, health care providers and medical students, those with confirmed diagnosis of respiratory illness (cases) or who have been knowingly exposed to an infectious agent in any specific setting or who are experiencing mandatory quarantine because of their current or potential infectious state.

Exposure

We examined the impact of voluntary self-isolation or mandatory **population level** stay-at-home orders that have occurred during the current COVID-19 pandemic or that occurred during previous epidemics or acute respiratory tract outbreaks. There were no restriction on the minimum duration of stay-at-home orders. Studies assessing the harms of pandemics in general, specific to our outcomes of interest without the exposure of 'staying home' were excluded. Studies from countries (i.e. China, Italy, Germany, France, Great Britain, USA) with

high levels of government restrictions to keep populations at home published during January 2020 or after were included as these populations were assumed to have experienced mandatory lockdown measures during this time.

Comparator(s)

No lockdown exposure during non-pandemic times (a.k.a normative or baseline outcome data) in a similar population.

Outcome(s)

- worsening rates of domestic violence, physical abuse, emotional abuse or trauma
- reported or perceived worsening of mental health (anxiety, depression, stress, suicidal thoughts, suicide attempts, completed suicides, loneliness or increasing symptomology of these conditions)
- reported increases in new cases of mental illness (diagnosed depression, generalized anxiety disorder, PTSD)
- worsening rates of substance use (alcohol, legal and illegal drug use, and tobacco)

As per the protocol developed for this review ([Appendix C](#)), post hoc adjustments were made to our PECO definition based on the characteristics of studies reviewed from our search. Please see Table 1.

Table 1: Listing of post-hoc adjustments from protocol with reasons

Adjustment	Reason
Addition of any country with governmental stringency index above 50% to inclusion criteria.	Further definition of the exposure - allows for inclusion of studies that had at least partial lockdowns for its population.
Studies with no description of sampling methods or survey instruments were excluded.	Allows for the exclusion of studies that could be judged at very high risk of bias.
Study samples with greater than 50% not quarantined/stay at home during a pandemic/outbreak were excluded.	Further definition of the exposure - allows for inclusion of studies that had at least half of the population who experienced the exposure of staying at home.
Study samples with greater than 50% diagnosed mental health illness were excluded.	Further definition of the population – study samples with less than half of sample with

	diagnosed mental health condition was allowable under 'general, well population'.
Study samples with greater than 50% participants not from a first world country as defined by OECD country were excluded.	Further definition of population - study samples with more than half of sample from a country that is a member of the OECD was allowable under 'general, well population' because of generalizability to Simcoe Muskoka.

Search methods for identification of studies

The searches were developed and conducted by the Simcoe Muskoka District Health Unit (SMDHU) Library Technician [CC], and independently peer reviewed by the SMDHU Hub Librarian [AF]. The searches were sent out for comment to the Ontario Public Health Hub Librarian peers. Please see the search strategy in [Appendix D](#).

Electronic databases

Ovid MEDLINE® from inception to April Week 5 2020.

Ovid MEDLINE® (Epub Ahead of Print, In-Process & Other Non-Indexed Citations and Daily Update) from inception to May 08, 2020

APA PsychInfo from 1917 to May Week 1 2020

SocINDEX with Full Text from 1917 to April 13, 2020.

Other searches

Studies in press were searched in Ovid MEDLINE(R) Epub Ahead of Print & Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations. References were reviewed from included studies to identify further research trials that may met inclusion criteria. Grey literature was omitted from the rapid review as per the recommendations from the Cochrane Collaboration¹⁶ and because of the expedited timelines associated with this project, in the context of the current pandemic. Articles in preprint were searched in the medRxiv database and was the only type of unpublished data source searched.

Screening

All decisions made during screening (titles and abstracts, and full-text screening) to clarify or add detail to the inclusion or exclusion criteria are documented and outlined as post-hoc adjustments in [Table 1](#).

Screening of titles and abstracts was completed by one reviewer (BB). A second reviewer, (KG) independently reviewed 80% of the titles and abstracts. Any disagreements about which titles and abstracts met inclusion criteria were resolved by discussion.

All titles and abstracts that may have met inclusion criteria were retrieved in full-text. The first reviewer (BB) confirmed inclusion criteria eligibility. The second reviewer (KG) independently confirmed that 100% of the studies listed in the Table of Excluded Studies ([Appendix F](#)) align with the pre-specified exclusion criteria and thus should be excluded from the rapid review. Any disagreement about which full-text articles should be excluded were resolved by discussion.

Inclusion of non-English language studies

All non-English language studies were excluded.

Data collection and synthesis

Data was extracted by BB using a template created in Excel. Citation, country, research design, sample number, participant characteristics, pandemic type, outcome measures, outcome results, comparison data source, and limitations were extracted. The SMDHU Epidemiologist (EH) independently confirmed all extracted data contained in [Table 2](#) for completeness and correctness. Any disagreements about which titles and abstracts met inclusion criteria were resolved by discussion.

Risk of bias assessment

Given the time restrictions of this rapid review, only one reviewer completed a quality assessment using the [Risk of Bias Instrument for Cross-sectional surveys of Attitudes and Practices](#) developed by the Clarity Group at McMaster University. Specifically, the tool assessed the following five domains: representativeness of sample, adequacy of response rate, missing data processes, pilot testing, and use of validated survey instruments.^{17,18}

Study authors were not contacted to retrieve missing information from manuscripts.

Effect measures

Because of the limited number of studies that met inclusion criteria, no attempt was made to select studies that used the same metric to report results.

Data synthesis

All data is reported on narratively. Because all included studies were cross-sectional designs, no stepwise approach to study design inclusion was used. Instead, the quantitative data is grouped by outcome to allow for comparison of rates and then by risk of bias assessment as

suggested by Mackenzie and Brennan.¹⁹ Publication status was considered a secondary criteria. Sub-analysis findings by age for each outcome was reported if available.

Results

Description of studies

Results of the search

Published:

1022 search results from three databases yielding four separate search results. After title and abstract screening, 47 citations were retained. The most common reasons for exclusion of studies at the full-text screening stage was study was an editorial (n=11), the study had an inadequate or was missing a comparison to demonstrate a worsening rate of an outcome (n=17), or the study reported on pandemics in general with no mention of the exposure to stay at home (n=5). No citations met inclusion criteria after full-text screening. One citation was subsequently included in the rapid review once the review and confirmation of the exclusion table contents was completed by KG.

Unpublished Preprint:

Forty-nine manuscripts in preprint were found in the medRxiv database; 23 of these were reviewed in full-text. Three preprint manuscripts met inclusion criteria.

Description of Included Studies (Table 2)

Two studies^{20,21} surveyed a British population and two studies^{22,23} surveyed a Chinese population.

Three²⁰⁻²² of the four studies used cross-sectional on-line surveys distributed via on-line networks and platforms and were thus considered non-representative convenience samples. The fourth study, Qian et al., 2020²³, implemented a telephone survey using random sampling methodology. Two studies^{20,23} were rated as higher risk of bias and two^{21,22} were rated at high risk of bias. For Qian et al., 2020²³, we extracted data specific to the City of Wuhan because this city experienced severe lockdown orders compared to the City of Shanghai. This study reported a very low response rate to the survey (13.8%). No other studies reported response rates. Only one²⁰ of the four studies described how they managed missing data. For Ahmed et al., 2020²², data specific to Hubei province was extracted. No studies that met inclusion criteria reported on worsening rates of domestic violence, physical abuse, emotional abuse or trauma, suicide attempts, completed suicides, loneliness, reported increases in new cases of mental illness or worsening rates of legal or illegal drug use, hazardous or harmful alcohol use, or tobacco. There were also no studies that aligned with inclusion criteria that sampled pregnant women.

Figure 1: PRISMA 2009 Flow Diagram²⁴

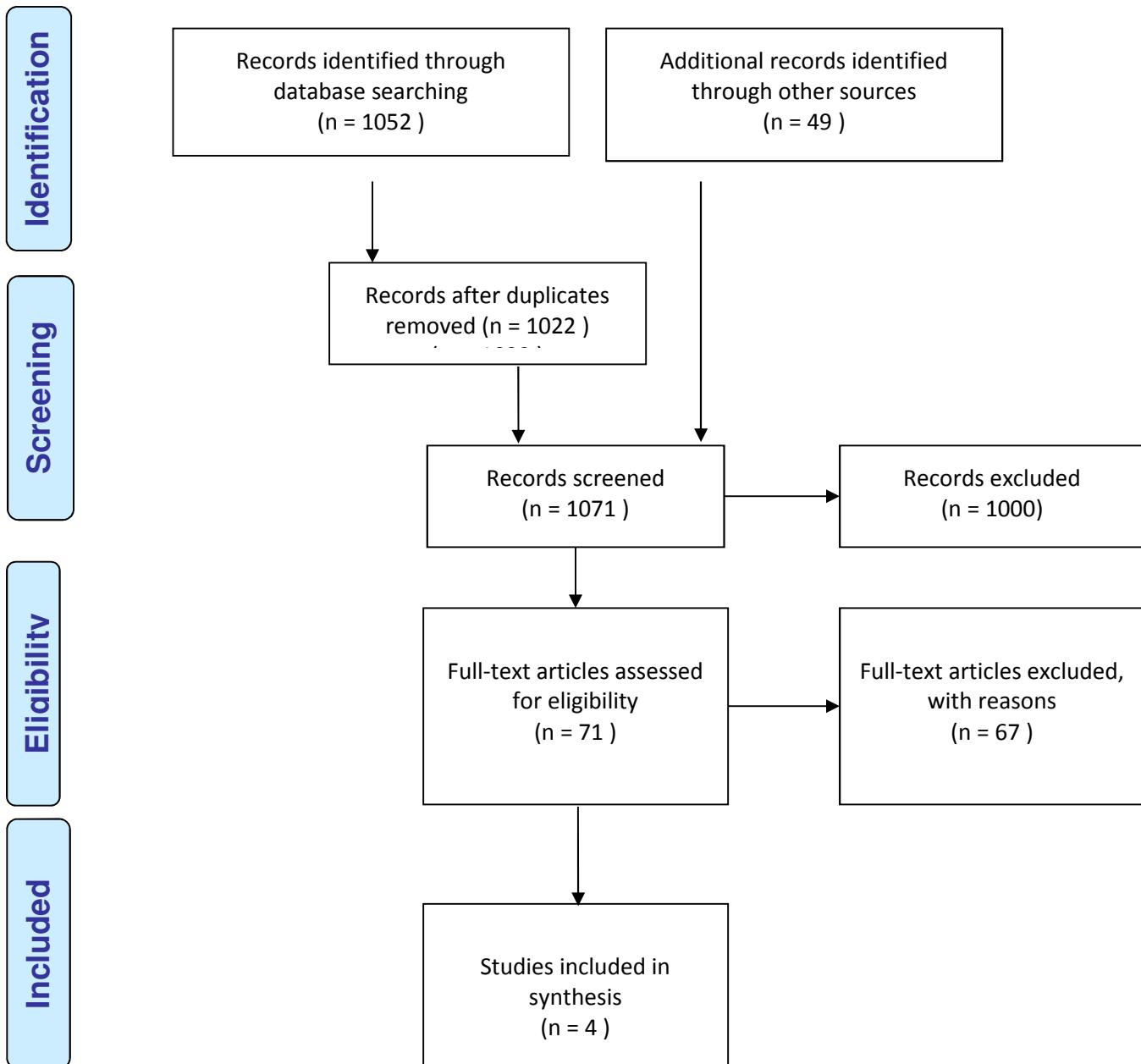


Table 2: Included studies

Citation	Country	Research Design	Sample #	Participant Characteristics	Outcome measurement tools	Outcome results	Comparison	Limitations
Ahmed et al., 2020 ²²	China	cross-sectional on-line survey, convenience sample Hubei province only.	678/1074	46.8% female, 54% had university degree of higher, more than 50% of sample from Wuhan	Beck Anxiety Inventory (BAI) Beck Depression Inventory (BDI) Alcohol Use Disorder Identification Test (AUDIT)	BDI-39.5% BAI-30.7% Alcohol dependency -4%*	2.1% (95% CI: 1.8-2.4) major depressive disorder ²⁵ 0.2% (95% CI: 0.1-0.3) general anxiety disorder ²⁵ Alcohol dependency - 2.3% ²⁵	Date of survey unclear – authors report data is based on post COVID-19 epidemic. Availability of baseline data not reported. Possible miscalculation of alcohol dependency prevalence rate.
Jia et al 2020 PREPRI NT ²⁰	UK	cross-sectional on-line survey, convenience sample. Survey was available from April 3rd-30th 2020	3097	Gender: 84.5% female, 15.4% male Age: mean:44 years (SD=15), Other characteristics: 50% were 'key workers (39% of	Generalized Anxiety Disorder scale-version 7 (GAD-7), Patient Health Questionnaire-9 depression (PHQ-9), Perceived Stress Scale-4 (PSS-4)	PHQ-9 mean score = 7.69 (Standard Deviation (SD)=6.0) GAD-7 mean score = 6.59 (SD=5.6) PSS-4 mean score = 6.48 (SD=3.3)	2.91 (SD=3.5) ^{26,27} 2.95 (SD=3.4) ^{28,29} 6.11 (SD=3.1) ^{30,31}	Absence of data on pre-existing mental health conditions; convenience sample; unable to calculate response rate; overrepresentation of females.

				these were health or social workers), 20% self-identified as having increased risk of infection		All comparisons were significantly different p <0.0001 No difference for in rates for those over aged 65.		
Qian et al 2020 PREPRI NT ²³	China – city of Wuhan only	cross-sectional, random sampling telephone survey. Survey available from February 1 -10, 2020	Wuhan (n=510)	Gender: 50% females Age: 88% aged 18-59. Other characteristics: 70% had a college degree or equivalent, 71 % employed, 75% married, 22.7% below median income, 12 % experienced COVID-19 symptoms, 34.5% reported suspected COVID-	GAD-7	Wuhan: GAD-7 mean score 7.1, 32.7% reported moderate or severe anxiety (score ≥10 on GAD-7) was 5.3% in urban China. ³²	Prevalence of moderate or severe anxiety (score ≥10 on GAD-7) was 5.3% in urban China. ³²	Possible financial conflict of interest of primary author; low response rate (13.8%). Authors asked participants to recall behaviours pre-pandemic as proxy for baseline data.

				19 cases in neighbourhood				
White et al 2020 PREPRI NT ²¹	United Kingdom	cross-sectional online survey, convenience sample. Survey was available from March 31st to April 13th, 2020.	600	Gender: 74% female, Age: mean age 36.75 years, SD=13.44, range 18-76, Other characteristics: 93.6% white, and 65% employed, 24% reported receiving treatment for mental disorders-including mood disorders (18%)	Hospital Anxiety and Depression Scale (HADS)	HADS Anxiety Subscale (M=10.23, SD=4.98) HADS depression subscale (M=7.57, SD=4.39)	HADS Anxiety subscale: Females (M=6.78, SD=4.23) Males (M=5.51, SD=4.04) HADS depression subscale: Females (M=4.12, SD=3.78) Males (M=3.83, SD=3.74) ³³	Non-representative sample, males were under-represented, limited to those with online access. This study's sample population included those aged 18+ while the normative data included those aged 25-65. Availability of baseline data not reported.

*the proportion of the sample from Hubei province reporting alcohol dependency may have been miscalculated. The 4% as reported in this table represents 27 people reporting alcohol dependency (Table 2 of Ahmed et al., 2020 manuscript) out of 678 people reporting they lived in Hubei province (Table 1 of manuscript).

Excluded studies

Please see the Table of Excluded Studies ([Appendix F](#))

Risk of bias in included cross-sectional studies

Table 3: Quality Assessment^{17,18}

Author	Representativeness of Sample	Adequacy of response rate	Missing data with completed questionnaires	Conduct of pilot testing	Established validity of survey instrument	Author reported overall RoB judgement
Ahmed et al (2020)	PN	PN	NR	NR	PY	High risk of bias
Jia et al (2020) preprint	PN	PN	N	NR	PY	Higher risk of bias
Qian et al (2020) preprint	Y	N	NR	NR	PY	Higher risk of bias
White et al (2020) preprint	PN	PN	PY	NR	PY	High risk of bias
RoB rating by domain	Higher risk of bias	High risk of bias	Higher risk of bias	Higher risk of bias	Low risk of bias	

Legend

Y= (Definitely) yes

PY= Probably Yes

N= (Definitely) no

PN= Probably No

NR= Not reported

Green font = low risk of bias

Red font = high risk of bias

Depression:

Jia et al., 2020²⁰ [Preprint] used the Patient Health Questionnaire (PHQ)-9 to assess the severity of depression and found a mean score of 7.69, SD=6.0, n=3097. This data is compared to a mean score of 2.91, SD=3.5, t=45.31, p<0.0001, using population normative data for the PHQ-9²⁷ and this tool's validation data.²⁶ There was no difference in the mean score of depression for people aged over 65 years of age compared to the population norm.²⁷ This study was rated as higher risk of bias.

Ahmed et al., 2020²² used the Beck Depression Inventory (BDI) to assess depressive symptomology. Authors reported an overall combined prevalence rate for moderate and severe depression of 29.5% (n=141). This data is compared to a 12 month prevalence rate for major depressive disorder of 2.1% (95% CI: 3.0-4.2) (n=655) that used the Composite International Diagnostic Interview (CIDI) 3.0.²⁵ Extreme caution should be used to interpret this comparison because not all those scored with moderate and severe depression scores from the BDI may be clinically diagnosed using CIDI 3.0. Study authors did not report mean scores for the BDI and there was no sub-analysis for those > age 50 for this outcome. This study was rated at high risk of bias.

White et al., 2020²¹ [Preprint] implemented the Hospital Anxiety and Depression (HAD) Scale –depression subscale to assess depressive symptomology and found a mean score of 7.57, SD=4.39. This data is compared to normative population data³³ using the same tool but was only available for males and females separately; mean scores for females was 4.12, SD=3.78 and was for males was 3.83, SD=3.74. There was no sub-analysis by age. This study was rated at high risk of bias.

Anxiety:

Jia et al., 2020²⁰ [Preprint] implemented the Generalized Anxiety Disorder (GAD)-7 scale and found a mean score of 6.59, SD=5.6, n=3097 compared to a mean score of 2.95, SD=3.4, t=36.52, p<0.0001 using population normative data for the GAD-7²⁹ and this tool's validation data.²⁸ There was no difference in mean score of anxiety for people aged over 65 years of age compared to the population norm.²⁹ This study was rated as a higher risk of bias.

Qian et al., 2020²³ [Preprint] implemented the Generalized Anxiety Disorder (GAD)-7 scale that assesses the severity of anxiety. Results revealed a mean score of 7.1 (no SD reported). Thirty-two percent (n=510) of the sample reported they were moderately or severely anxious as rated by the measurement tool. This data is compared to a prevalence rate for moderate or severe anxiety (score ≥10 on GAD-70) of 5.3% using a national sample of urban Chinese residents.³² No statistical significance testing was conducted by the authors. This study was rated as a higher risk of bias.

Ahmed et al., 2020²² used the Beck Anxiety Inventory (BAI) to assess anxiety symptomology and found the prevalence of moderate to severe anxiety amongst people residing in Hubei province was 20.8%. This data is compared to a 12- month prevalence of general anxiety

disorder weighted percentage of 0.2% (95% CI: 0.1-0.3) using the CIDI 3.0 as the diagnostic interview tool.²⁵ Extreme caution should be used to interpret this comparison because not all the people who had BAI scores indicating moderate or severe anxiety scores may have been clinically diagnosed with anxiety using CIDI 3.0. Study authors did not report mean scores for the BAI and there was no sub-analysis for those > age 50 for this outcome. This study was rated at high risk of bias.

White et al., 2020²¹ [Preprint] used the Hospital Anxiety and Depression Scale –anxiety subscale and found a mean anxiety score of 10.23, (SD=4.98) compared to normative population data for this tool for males and females separately (mean score for females of 6.78, SD=4.23 and males of 5.51, SD=4.04).³³ No statistical significance testing was conducted. There was no sub-analysis by age. This study was rated at high risk of bias.

Stress:

Jia et al., 2020²⁰ [Preprint] implemented the Perceived Stress Scale (PSS) and found a mean score of 6.48, SD=3.3. This data is compared to a mean score of 6.11, SD=3.1, t=3.90, p<0.0001 using population normative data for the PSS³¹ and this tool's validation data.³⁰ There was no comparative population norm data for stress for people aged over 65. This study was rated as a higher risk of bias.

Alcohol Use:

Ahmed et al., 2020²² implemented the *Alcohol Use Disorder Identification Test (AUDIT)* and found 4% (n=27) of the study sample could be classified as dependent alcohol users compared to a 12- month prevalence of alcohol dependency weighted percentage of 0.7%.²⁵ The authors reported the proportion of the sample with alcohol dependency (n=27) from Hubei province (n=678) reporting alcohol dependency as 6.8%. Re-calculating these proportions results in a 4% prevalence rate.

Ahmed et al.,²² also reported on hazardous alcohol consumption and harmful alcohol consumption but there was a lack of comparison data for these outcomes and thus were not reported.

Table 4: Summary of Results: Worsening outcomes at a glance

Author	Outcome	Sample mean score	Prevalence estimate	Comparison
Jia et al., 2020 ²⁰	Depression	7.69, SD=6.0		2.91, SD= 3.5
Ahmed et al., 2020 ²²	Depression		28% (moderate + severe)	2.1% (95% CI: 1.8-2.4) major depressive disorder
White et al., 2020 ²¹	Depression	7.57, SD=4.39		Female 4.12, SD=3.78 Males was 3.83, SD=3.74
Jia et al., 2020 ²⁰	Anxiety	6.59, SD=5.6		2.95, SD=3.4
Qian et al., 2020 ²³	Anxiety		32.7% (moderate + severe)	5.3% (moderate + severe)
Ahmed et al., 2020 ²²	Anxiety		20.8% (moderate + severe)	0.2% (95% CI: 0.1-0.3) general anxiety disorder
White et al., 2020 ²²	Anxiety	10.23, SD=4.98		Females 6.78, SD=4.23 Males of 5.51, SD=4.04
Jia et al., 2020 ²⁰	Stress	6.48, SD=3.3		6.11, SD=3.1
Ahmed et al., 2020 ²²	Alcohol Dependence	4%*		0.7% (95% CI: 0.5-0.9)

* The proportion of the sample from Hubei province reporting alcohol dependency may have been miscalculated. The 4% as reported in this table represents 27 people reporting alcohol dependency (Table 2 of Ahmed et al., 2020 manuscript) out of 678 people reporting they lived in Hubei province (Table 1 of manuscript), not 6.8%.

PART 2: NARRATIVE REVIEW

This second part of the literature review describes what mitigation strategies are suggested by governmental, non-governmental organizations and researchers to address harms associated with the COVID-19 pandemic.

The methodology for the narrative review was broader compared to the rapid review. Briefly, mitigation related interventions that were found in the database search for the rapid review were included in this review. Grey literature was searched to supplement the information gleaned from the published databases. Please see [Appendix E](#) for the grey literature search. There were no strict inclusion/exclusion criteria applied for the narrative review. This allowed us to include a broader scope of information compared to the PECO question for the rapid review to assist in program planning.

Results

Summary of published literature

There is a limited number of tested mitigation interventions present in the published research literature. The interventions presented here are those few that evaluated effectiveness. The only intervention that was found assessed a mitigation-related intervention was conducted by Agyapong et al. (2016). This researcher previously conducted small randomized controlled trials to assess the effectiveness of text messages to decrease depressive³⁴ symptomology and to help treat people with alcohol disorder.³⁵ In 2016, this same researcher launched the Text4Mood text messaging program³⁶ that was evaluated to be cost-effective and supported overall mental well-being, resilience, coping and perception of connectedness.

Agyapong has recently adapted the Text4Mood program³⁶ into the Text4Hope³⁷ for the COVID-19 pandemic. These pandemic focused text messages were created by a team of mental health professionals including clinical psychologists, psychiatrists, as well as, mental health therapists and patients to alleviate stress, anxiety and depression symptoms experienced during the pandemic. One week after the launch, this new text messaging program had 32,805 subscribers. The research team has collected baseline data on demographic data, stress, depression and anxiety and plans to collect follow-up data at 6 and 12 months.³⁷

A recent Cochrane rapid review³⁸ assessed the effectiveness of video calls for residents in nursing homes to reduce symptoms of loneliness and depression found no difference in measures of loneliness when measured at three, six and 12 months. No studies were found that assessed social isolation as an outcome and none of the three quasi-randomized trials included in this review were conducted during the pandemic. Noone et al. (2020)³⁸ judged the overall quality of evidence to be very uncertain.

Hui (2004)³⁹ described the self-perceived benefits of a hotline service implemented during SARS. The authors described how the hotline improved callers' confidence and control by giving them clear and accurate information, which is what the majority of callers were

seeking. Callers were also empowered with emotional support, reassurance, education and creative reframing. Although this paper was a narrative description of perceived benefits, no formal qualitative methodology was used.

Summary of unpublished (grey) literature.

Although some grey literature identified interventions and strategies to mitigate the specific harms associated with quarantine/physical distancing measures, as noted in the rapid review, much of the grey literature identified interventions and strategies to mitigate harms associated with the pandemic more generally (e.g. anxiety and stress due to job loss/changes, financial concerns, fear of illness or death, sadness and grief for those who have died).

The World Health Organization² released an interim guidance document describing mitigation strategies for the COVID-19 pandemic. Please see [Appendix B](#) for the full listing of mitigation strategies. Strategies specific to the exposure of staying at home include:

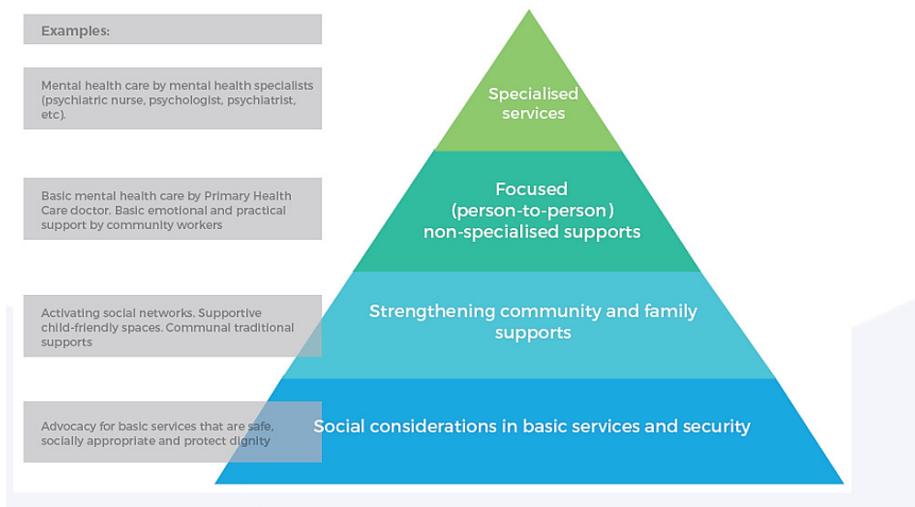
- Encourage home preparedness for quarantine or isolation, and support access to food supplies
- Encourage social interaction by virtual means
- Establish mental health strategies and crisis hotlines
- Develop social services to reduce risk and respond to domestic violence
- Income support by employers, communities, and government
- Pre-position and deploy food supplies to priority groups in populations in special circumstances, including the displaced²

Guidelines⁴⁰ and a briefing note⁴¹ from the [Inter-Agency Standing Committee](#) (IASC) (the highest level humanitarian coordination forum put in place by the United Nations to make strategic and policy decisions with system-wide implications) provide guidance and standards for providing *mental health and psychosocial support* (MHPSS) during emergencies⁴⁰ and during the COVID-19 pandemic.⁴² Their approach aligns with the recommendation that MHPSS reflect a universal whole population approach with more targeted interventions for those vulnerable to harms throughout all phases of the emergency response.^{40,42} The IASC also notes that in most countries, successful implementation of the WHO MHPSS service pyramid (Figure 1) requires systemic changes and mental health reform.

In their updated MHPSS Guidance⁴² the IASC notes mental health and psychosocial support is not a luxury or an add-on but instead is essential to a successful and comprehensive response to COVID-19. This document further supports an integrated approach to supporting MHPSS interventions across sectors. It specifically looks at the importance of psychological first aid in the context of COVID-19 and continuing comprehensive and clinical MHPSS during COVID-19. Psychological first aid is basic psychological care provided to people in distress, which involves providing supportive and practical help while respecting individual dignity, culture and abilities. Psychological first aid can be provided by anyone (professionals and non-professionals) and helps people with self-efficacy, to access the support they need and to feel safe, connected, calm and hopeful.⁴²

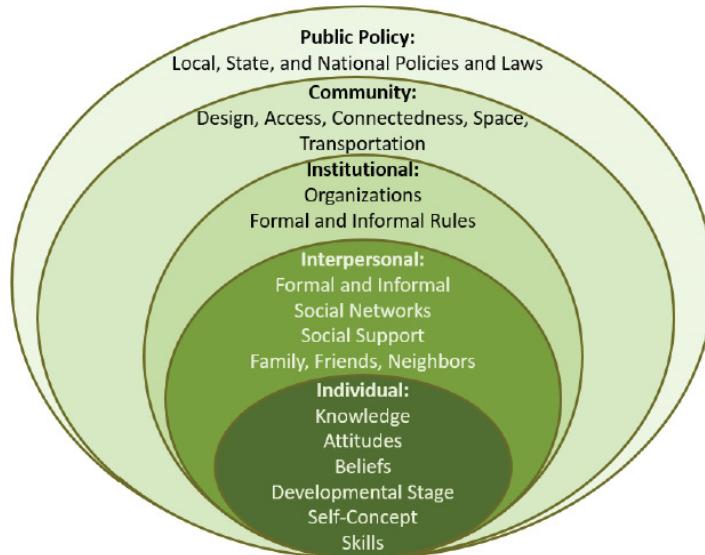
Updated MHPSS Guidance⁴² also provides considerations for children, adolescents, families, older adults, and those who use substances or have addictive behaviours (e.g. video gaming, gambling). Please see the COVID-19 scenarios and consequences for MHPSS programming, as well as guidance to adapt specific MHPSS interventions in different COVID-19 scenarios within this document⁴² for more information.

Figure 1: Intervention pyramid for mental health and social support⁴¹



There were many other reports, publications and websites from reputable organizations found in the grey literature that offered useful mitigation strategies to address the possible harms from the pandemic and for the many citizens who are staying at home as public health authorities recommend. These information sources provide advice on a variety of outcomes that focus on different levels of the ecological model. Because of the heterogeneous nature of the information found, we present these mitigation strategy results by social-ecological model (Figure 2) level to better facilitate the development of recommendations for action.

Figure 2: Social-Ecological Model^{43,44}



Summary of Mitigation Strategies reported in Grey Literature by Social-Ecological Model Level

Provincial or National Public Policy:^{22,40-42,45-63}

- Integrate mental health care into universal health coverage
 - Fund MHPSS services
 - Allocate adequate funding to support mental health services within community initiatives
- Strengthen the integration of MHPSS throughout all phases of emergency planning including substance use and domestic violence considerations
 - See [Appendix G](#): Table of Mental Health Actions in Emergencies
- Implement regular surveillance of MHPSS including monitoring of psychosocial indicators and identifying populations at higher risk of psychosocial harms
- Implement strategies to ensure adequate internet infrastructure for rural residents to access MHPSS online and improve dissemination of risk communication messages
- Include essential services to address violence against women in preparedness and response plans
- Provide social and financial protection measures related to employment and income

Local Public Policy:

- Strengthen the integration of MHPSS throughout all phases of emergency planning^{22,40-42,45-54,56-58,61-66}
- Ensure substance use, domestic violence and prenatal and maternal mental health care are essential in the Emergency Response Plans
 - See [Appendix G](#): Table of Mental Health Actions in Emergencies
- Implement regular surveillance, monitoring and screening for mental and social conditions universally and for those with risk factors
 - Share MHPSS information/data between sectors
 - Identify individuals at risk of harms
- Fund MHPSS services within community initiatives

- Implement community development strategies to strengthen community resilience, social connectedness, social cohesion and reduce loneliness
- Include essential services to address violence against women in preparedness and response plans

Community:^{41,42,45,46,48,49,51,54,58,61,62,66-73}

- Implement community development strategies to strengthen community resilience, social connectedness, social cohesion and reduce loneliness
- Implement mental health literacy campaign
- Advocate for mental health care to be provided in alternative and innovative ways (e.g. telephone, text, video, online support)
- Implement community communications using risk communication principles that are sensitive to the potential impact on people's mental health
 - Communications should also address stigma
 - Communicate individual level mitigation focused key messages
 - Provide risk messaging specific to mental health, domestic violence and substance use

Institutional:^{22,41,42,45,47-53,56-58,61,63, 66,74-76}

- Local organizations (including hospice and faith communities) collaborate to implement mental health promotion integrated into Emergency Response Plans
 - Establish a mental health and psychosocial support strategy for emergencies
 - Share mental health literacy resources, information and training opportunities (e.g. mental health literacy, trauma informed practice including critical incident stress management, psychological first aid, cultural sensitivity/competence, domestic violence support best practices and local resources and referrals)
 - Train of staff/volunteers in health, social, education sector on mental health and domestic violence support and best practice
 - Train frontline workers, essential workers, law enforcement and other civil servants, individuals with managerial responsibilities and children and adolescents who provide peer support
 - Train those on hotlines/crisis lines
- Implement regular surveillance, monitoring
- Encourage and promote online support groups and virtual communities
- Implement telephone hotlines/support lines
- Implement screening and risk assessment to identify MHPSS issues or associated disorders and identify individuals at risk of harms
 - Integrate MHPSS into contact tracing and monitoring work
- Activate functional referral pathways for persons needing MHPSS between all relevant sectors/partners and ensure people in front-line positions are aware of and use the referral pathways
- Engage with media partners to promote messages that promote population well-being, and prevent/reduce/address stigma and discrimination

Interpersonal:^{41,42,45,61}

- Implement community telephone hotlines/support lines as a tool to support people in the community who feel worried or distressed
- Encourage informal community support networks and social interaction (virtual);

- Use technology to set up support groups/virtual communities and maintain social supports

Individual:^{22,41,42,54,56,76-82}

- Communicate individual level mitigation focused key messages including raising awareness of:
 - Self-care strategies (e.g. breathing and relaxation exercises, meditation, cognitive and physical exercise, mindfulness activities and meditation)
 - The potential harmful impacts that physical distancing, staying at home and other measures to address this pandemic are likely to have on women who are subjected to violence and their children
 - The need to restrict pandemic related media exposure
 - The value of increasing social interactions in keeping with current public health restrictions (e.g. social circles)
 - How the pandemic can increase the risk of substance-related harms
 - Local mental health services
- Individual level key messages to promote mental health and wellbeing include:
 - Minimize watching, reading or listening to COVID-19 news
 - Seek information only from trusted sources and avoid listening to, following or sharing rumours
 - Stay connected (via phone, email, social media, and video conference) and help others.
 - Create structure and keep busy engaging in activities you enjoy and those you find relaxing
 - Take notice and pay attention to your needs and feelings
 - Be aware of symptoms of stress/mental unwellness
 - Draw on skills you have used in the past during difficult times
 - Practice self-care and positive coping skills
 - Seek support and talk to people you trust
 - Have a plan where you will seek help for physical, mental, and psychosocial support
 - Maintain a healthy lifestyle, as much as your circumstances allow:
 - Be physically active
 - Limit screen time
 - Eat healthy
 - Get good quality sleep
 - Reduce/eliminate substance use

DISCUSSION

Very few studies met the inclusion criteria and three of the four studies included in this review were pre-prints. In addition, the studies included were judged to be at higher risk or at high risk of bias. Therefore, the results presented in this review are considered very uncertain should be used with extreme caution. Because of the nature of our research question and the study designs included in this rapid review, it was difficult to determine if the worsening rates of the mental health related outcomes were due to staying at home or due to the pandemic in general. It was also unclear how much these mental health related outcomes have worsened and if a particular a particular mental health outcome has

worsened at a greater magnitude compared to the other mental health outcomes investigated in this rapid review. Nevertheless, the results from all four studies included in this rapid review all report worsening rates of depression, anxiety, stress and alcohol dependency that could, in part, be the result of residents staying at home as recommended by public health authorities during this COVID-19 pandemic.

Because a global infectious disease pandemic has not been seen to this magnitude in one hundred years, it is understandable that researchers and academics have strived to gather data quickly that would describe the experiences of populations experiencing broad physical and social distancing measures. Therefore, it is possible that researchers, in an effort to rush survey implementation and publication may have sacrificed methodological rigour. Indeed, the rush to publish COVID-19 related data has led to two retractions in two medical journals.⁸³

There was some evidence of sacrificed methodology rigour in the four included studies in this rapid review. Jia et al, 2020²⁰ [pre-print], White et al., 2020²¹ [pre-print], and Ahmed et al.²², all used on-line surveys posted in social media forums to recruit their study samples. This form of recruitment could be considered convenience sampling and is thus prone to response and self-selection bias of survey respondents. As revealed in the quality assessment, very few details about response rate, missing data or pilot testing were reported in manuscripts. Despite author comments about how their survey results revealed worsening rates of mental health outcomes, only one study conducted statistical testing of mean differences. Also notable in the research studies reviewed for this rapid review was possible reporting bias by study authors. For example, only two studies reported the mean age of their sample and the proportion of respondents aged 65+ was not reported in any of the studies.

Risk Factors

Being female and being younger were two variables significantly associated with studies assessing anxiety and depression in other pre-print studies not included in this review^{5, 6} but not all.⁷ Jia et al., 2020²⁰, in an effort to explain their sample characteristics, hypothesized that younger females may perceive themselves to be more at risk of worsening depression, anxiety and stress and thus would more likely to respond to the survey. Jia et al, 2020²⁰ further explained that young females are more likely to be unemployed, have financial concerns and are at increased risk of domestic violence compared to older women. Please see [Appendix H](#) for a table of other reported risk factors for adverse mental health outcomes.

Finding appropriate comparisons to demonstrate worsening rate of outcomes:

The comparison used to develop our PECO question was very narrow in scope. Attempting to quantify a worsening rate of mental and social outcomes during physical and social distancing measures (lockdown) for whole cities, regions or countries during a global pandemic was particularly challenging. Many studies examined for inclusion were excluded because they either compared their sample prevalence rates to those reported by other

researchers during the pandemic (i.e. study samples may have not experienced lockdown measures because of the pandemic) or researchers compared their prevalence rates to other data sets using alternative outcome measurement tools from other countries. In addition, studies comparing those in lockdown to those unaffected by lockdown during the current pandemic were also excluded. All three comparisons as described above did not meet the outcome definition of *worsening rates*. As such, the comparator of interest to answer the research question was lockdown (staying at home) during the pandemic compared to non-pandemic times when broad, population lockdowns are not required.

Lockdown vs. the COVID-19 pandemic

It is difficult to determine whether adverse mental health-related outcomes reported in the current research literature is due to populations staying at home or is related to the COVID-19 pandemic in general. Emerging evidence suggests that staying at home may have a small, potentially insignificant, additive impact on adverse mental health outcomes from what people are already experiencing because of the pandemic. Qian et al., 2020²³ [pre-print] compared prevalence rates of moderate or severe anxiety amongst residents of the City of Wuhan, who experienced a severe lockdown order compared to the population of Shanghai, a city that experienced less severe lockdown restrictions. Results revealed residents of Wuhan had a significantly higher rate of moderate or severe anxiety (mean score of 7.1 vs. 5.1) compared to residents of Shanghai.

Other research not included in the current review reports the prevalence of anxiety and depression in the survey respondents affected by quarantine were significantly more depressed and anxious compared to those unaffected by quarantine.⁸⁴ Alternatively, Zhu et al., 2020⁸⁵ found no significant difference in stress, anxiety or depression comparing participants who experienced or did not experience quarantine. The authors commented that the psychological impacts of the survey respondents were due to the changes experienced to their daily lives, presumably because of the pandemic itself, and not because of being quarantined. Hu et al., 2020⁹ [pre-print] found a statistical difference between different restrictive levels of quarantine experienced during the pandemic and anxiety scores. The authors reported that the overall anxiety scores were not significantly different in Hubei province compared to outside the province, again suggesting anxiety may be due the pandemic instead of the experience of quarantine amongst Chinese survey respondents.

Alcohol – related outcomes

Ahmed et al., 2020²², commented that the main reason for the increase observed in alcohol consumption was indeed the lockdown; noting that social isolation is an established risk factor of increasing alcohol consumption. The strength of an association between social isolation and high levels of alcohol consumption is not clear, but social isolation has been reported as a significant facilitator of alcohol consumption in older adults.⁸⁶ A recent World Health Organization report⁸⁷ stated that there is some evidence that alcohol misuse is a risk factor for depression and that depression is a risk factor for harmful use of alcohol. The report cites a systematic review and meta-analysis⁸⁸ that found the odds of developing major

depression was three times higher for people with alcohol dependence compared to people without any type of alcohol disorder [OR 3.09, (95% CI: 2.38-4.03)]. Some have speculated that there is a reciprocal causal relationship between alcohol and a mental health condition (e.g. depression) such that when alcohol is consumed and depression symptoms exist, the presence of both of these conditions elevates the risk of each condition developing into a diagnosable disorder simultaneously.⁸⁹

Broader mental health outcomes:

Mental health can be conceptualized to include both positive and negative outcomes. Although outside the scope of this rapid review, preliminary evidence suggests well-being may be slightly below average but quality of life may be above average when physical and social distancing restrictions are in place. White et al., 2020²¹ [pre-print] sampled British residents and reported an above average quality of life score slightly below average well-being mean score. A similar finding was reported by Ahmed et al., 2020²² who found that 32.1% of their survey respondents reported below average well-being as assessed by the Warwick Edinburgh Mental Wellbeing Scale. Further, White et al., [pre-print] found that people who self-isolated before the lockdown or perceived that their feelings of isolation increased since the lockdown were more likely to report lower well-being and quality of life scores. Those reporting the lockdown impacted their livelihood also reported lower quality of life scores. However, those who perceived increased kindness of others, or felt more connected to their local community had higher well-being and quality of life scores and lower depression and anxiety scores. These preliminary results suggest the importance of creating and maintaining positive social connections to improve overall mental health outcomes.

Domestic Violence

Although there were no studies that met inclusion criteria that assessed the outcome of worsening rates of domestic violence, two grey literature sources were found. The first source was the World Health Organization⁶², who noted that data from China, the United Kingdom, the United States of America, as well as other countries, are all reporting significant increases in domestic violence cases related to the current COVID-19 pandemic. Stress, the disruption of social and protective networks, loss of income and decreased access or closure to social services are factors that can increase the risk of violence for women. A recent policy paper⁹⁰ published before the pandemic from the University of Calgary reported similar findings, particularly noting that women living in households with financial stressors and women partnered with heavy drinkers are particularly vulnerable. The WHO also reports there is a reduction in the number of survivors seeking services because of lockdown measures and not wanting to seek in-person health services or social services due to the fear of infection.

Limitations

Limitations of the data

Three of the four studies included in this review were unpublished research manuscripts in preprint that have not been through a peer review process. All four studies included in the review were cross-sectional survey designs and three studies used of non-representative convenience sampling. Lack of description of the amount of missing data within data sets further impacts the generalizability of the findings. Cross-sectional studies are used to generate hypotheses for more rigour research designs that can demonstrate cause and effect.

The included studies did not assess baseline mental health status or whether a survey respondent was a COVID-19 case or had known exposure to COVID-19. Therefore, statistical adjustment to mental health prevalence rates could not be made. Both Qian et al., 2020²³ and Ahmed et al., 2020²² sampled participants after the COVID-19 outbreak in China. Therefore, responses may not truly assess the impact of stay at home measures on mental health and alcohol dependency outcomes. Ahmed et al. may have miscalculated the alcohol dependency rate that then creates uncertainty in the overall findings. Self-reported validated instruments were used to assess outcomes and are thus prone to response bias. There was also a variety of assessment scales and metrics used to assess, synthesize and report outcomes thus limiting the ability to combine the data.

Limitations of the review

The harms found in this rapid review may be a result of a variety of personal circumstances and other population issues that relate to lockdown measures and can impact mental and social health outcomes, such as an increase in unemployment rates, decrease in non-essential services (e.g. some respite care) and lack of childcare, combined with the overall fear of the global pandemic. Because our research question, it was not possible to distinguish the impact of the physical and social distancing measures to stay home on populations from the impact of the COVID-19 pandemic in general on our mental health related outcomes of interest.

Because of the limited time to conduct this review, decisions were made to streamline the review process. Due to time restraints, were not able to scope the research literature before the rapid review was conducted. This scoping of the research would have allowed us to realize that few studies met our pre-specified inclusion criteria and would have been an indicator for us to expand our PECO definitions to include specific populations, like health care providers, for example, or to add other mental health outcomes. The search strategy was not exhaustive. A more thorough search of additional databases may have yielded more search results. The exclusion of grey literature from the rapid review inclusion criteria limited additional studies that may have contributed to our results. Also, having only one reviewer assigned to the quality appraisal process may have led to biased risk of bias judgements for each of the four studies included.

The term quarantine used in the search generally applied to situations where people were exposed to a known infectious agent, and such studies were excluded at the title and abstract stage or at the full-text review. It is possible that studies using the term quarantine instead of lockdown of cities, towns or regions, as appropriate for this review, could have been missed. Two of our included studies were sampled Chinese residents, predominately from the City of Wuhan or Hubei province where mandatory quarantine orders were implemented on the population. Britain did not order mandatory quarantine but did implement broad population level physical and social distancing measures. Therefore, the impact of the severity of these stay-at-home orders between these two countries may have differentially impacted our mental health outcomes of interest.

CONCLUSIONS

The evidence for the harms resulting from lockdown measures are sparse and the majority of these harms are found in pre-print studies. All four studies included in this review are judged to be at least at a higher risk of bias. Results presented in this review should be used with extreme caution. The best-available evidence suggests worsening rates of depression, anxiety, stress and alcohol dependency that may be the result of physical and social distancing measures that encourage residents to stay home. The magnitude of the worsening of rates of these mental health outcomes, as well as if a particular mental health outcome has worsened to a great degree compared to others remains unknown. It is also unknown whether or not there is additional harm on populations experiencing physical and social distancing measures (i.e. lockdown) from the harms populations are already experiencing as a result of the pandemic.

The harms found in this rapid review may be a result of a variety of personal circumstances and other population issues that relate to lockdown measures and can impact mental and social health outcomes, such as an increase in unemployment rates, decrease in non-essential services (e.g. some respite care) and lack of childcare, combined with the overall fear of the global pandemic.

Although there is limited evidence, published and grey literature both describe the use of virtual/online service delivery and phone line supports to mitigate harms associated with public health measures and broader pandemic mental health harms. Individual level mitigation strategies to support mental health and well-being as well as the use of risk communication and mental health literacy communication and broader system level strategies to mitigate harms related to mental health could be considered. Specifically, suggested strategies include advocacy for additional mental health system reform, additional services, integration of mental health and psychosocial support integration into all phases of emergency planning, and mental health promotion capacity building amongst a wide range of community service providers.

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APPENDIX A

Overview of public health and social measures in the context of COVID-19: Interim guidance

Table 1. Selected public health and social measures for consideration in the context of COVID-19*

Personal measures	Physical and social distancing	Movement measures	Special protection measures
<p>Aim: limit person-to-person spread, protect individuals and their contacts, and reduce contamination of frequently touched surfaces</p> <p><u>Encourage the public to practice¹⁸</u></p> <ul style="list-style-type: none"> • Frequent hand hygiene • Physical distancing • Respiratory etiquette • Proper use of masks if unwell or attending to someone who is ill • Environmental cleaning at home 	<p>Aim: ensure safe physical distancing through reduced crowding</p> <p><u>Workplaces</u>⁹</p> <ul style="list-style-type: none"> • Support businesses and workplaces to put in place hand hygiene, physical distancing, and environmental cleaning • Plan for business continuity and minimum services • Where feasible, encourage teleworking, staggered shifts, flexible leave policies, teleconferences, virtual meetings, and protection for front-line workers and service personnel • Conduct risk assessment by workstation or function according to the environment, expected tasks, possibility of exposure, and available resources • Close non-essential businesses as transmission intensifies <p><u>Schools</u>¹⁰</p> <ul style="list-style-type: none"> • Support schools to put in place hand hygiene and distancing measures, as well as environmental cleaning • Consider distance learning, suspension of classes, rotation in attendance, or closing school buildings for a limited time • Hygiene and distancing measures in canteens and buses <p><u>Mass gatherings</u>^{8,19}</p> <ul style="list-style-type: none"> • Conduct <u>risk assessment</u>²⁰ for high visibility events, <u>sporting</u>²¹ and <u>faith-based events</u>,²² festivals, conferences • Adapt, postpone, or cancel public and private events • Limit size of public and private events • Adapt wedding, <u>funeral and burial</u>²³ customs <p>Public spaces and transportation –</p> <ul style="list-style-type: none"> • Reduce crowding, limit access to, or close public spaces, restaurants, <u>sporting events</u>,²⁴ sports clubs, entertainment venues, <u>places of worship</u>,²⁵ or venues with limited ventilation 	<p>Aim: prevent introduction of virus from infected areas to non-infected areas</p> <ul style="list-style-type: none"> • Offer advice regarding travel¹⁹ appropriate to circumstances, such as reducing non-essential travel or how to protect oneself while travelling • Limit movement locally, regionally, or nationally as necessary to interrupt transmission or prevent reintroduction • Arrange travel in advance as needed (students, workers, repatriation) • Consider a <i>cordon sanitaire</i> or border measures when justified by local epidemiology • Consider isolation or quarantine for arriving travellers, in line with national screening and testing policy 	<p>Aim: reduce the risk of exposure of vulnerable groups</p> <p>Persons at risk, vulnerable persons, and others</p> <ul style="list-style-type: none"> • Shelter-in-place advice for older age groups • Protect closed settings - <u>seniors' residences</u>, <u>long-term</u>¹¹ or psychiatric care, <u>prisons</u>²⁷ • Limit visitors or allow visits only with safe distancing • Plan for <u>migrants</u>, <u>refugees</u>,²⁸ <u>displaced</u>²⁹ or homeless • Separation from others if appropriate to context and can be done safely and voluntarily • In special settings, identify and plan for those at higher risk, e.g. in shops, public transport, hospitals <p>Plan to safely <u>maintain essential health services</u> including immunization, prenatal care, maternity care, cancer care and disease control efforts³⁰</p> <p>Health workers.³¹ frontline responders, caregivers, and the health system</p> <ul style="list-style-type: none"> • Coordinate community services, phone hotlines, health facilities, and emergency response units to support testing, isolation, quarantine, and referral • Support telemedicine and remote health services • Reschedule non-urgent health and medical care • Organize services to reduce risk and frequency of contact, ensure physical distancing in all areas • Ensure availability of <u>personal protective equipment</u>³² • <u>Implement surge plans</u> for community clinics, isolation units where preferred, hospitals, and palliative care³³

Overview of public health and social measures in the context of COVID-19: Interim guidance

	<ul style="list-style-type: none">• Encourage physical distancing in public places and transportation (e.g. in queues and in waiting areas)• Reduce mixing between individuals and households• Communicate policy on wearing masks in public²⁶		<ul style="list-style-type: none">• Coordinate health care, rehabilitation centres, and community services to ensure hospital discharge planning and safe step-down care
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* WHO has developed a series of guidance on critical preparedness, readiness and response; clinical care; infection prevention and control; essential health services; essential resource planning; laboratory and diagnosis; risk communication and community engagement; surveillance and case investigations; travel and mass gatherings, vulnerable populations; schools and institutions, and other topics, which are all available at www.who.int.

The citation for Appendix A is reference #2. Please see the original source document for the individual references found in this table.

APPENDIX B

Overview of public health and social measures in the context of COVID-19: Interim guidance

Table 3. Sample strategies and policies for limiting secondary effects of implementing public health and social measures

	For individuals and the community	Collective action and support at higher levels of governance
Support family and community	<ul style="list-style-type: none"> Propose alternatives for education¹⁰ (e.g. distance learning, coaching by library staff or older siblings, or buddy systems with phone support) Care for children of essential personnel, e.g. keeping schools open for them with strict hygiene and physical distancing Deploy alternatives to school meals for those in need Encourage communities to support the elderly, sick, or vulnerable Encourage social interaction by virtual means Orient social and community services to enhance resilience of communities 	<ul style="list-style-type: none"> Keep pharmacies open, protect access to essential medicines³⁰ Establish mental health strategies and crisis hotline Ensure services and protection for migrant workers Develop social services to reduce risk and respond to domestic violence Innovate for emergencies, e.g. establishing safe codes for victims of abuse/interpersonal violence Establish or advocate for suspension of health care user fees
Protect incomes and the economy	<ul style="list-style-type: none"> Pilot or support teleworking, shift changes, and physical distancing⁹ Initiate flexible leave and payment policies at work Encourage part-time work or adapted services (e.g. home delivery) Implement business continuity plans for essential services and business Engage occupational health and safety services Ensure access to health and social care for employees 	<ul style="list-style-type: none"> Promote employee income maintenance, flexible leave policies⁹ Plan for income support by employers, communities, government Offer social, economic, unemployment, and tax relief packages Develop an integrated all-of-society approach across sectors to ensure essential services and supplies reach when and where they are needed Devise strategies and approaches, such as public health corridors, to safely deliver supplies and services
Protect access to food and water	<ul style="list-style-type: none"> Keep food shops and supply routes open³⁷ Establish priority access to shops, markets for those who need it, e.g. early morning hours reserved for the elderly and the vulnerable Encourage home preparedness for quarantine or isolation, and support access to food and supplies Facilitate protection for store personnel – screens, distancing, masks 	<ul style="list-style-type: none"> Engage food producers, suppliers, and sellers to prepare, and to protect safe and efficient food supply³⁷ Pre-position and deploy food supplies to priority groups and populations in special circumstances, including the displaced Ensure food distribution in special settings and repeat as required, in humanitarian corridors where needed Protect harvest and food services workers; arrange safe travel as needed
Maintain essential health services	<ul style="list-style-type: none"> Schedule appointments for essential health services to reduce time in open waiting areas Pilot telemedicine and strengthen and protect access to care Facilitate protection for pharmacy staff – screens, distancing, masks Maintain elective surgeries and procedures in safe environment where possible, reschedule where necessary Guide safe care-seeking behaviours by disseminating information to the public, including new pathways for services, opening hours, precautions Establish effective patient flow (screening, triage and targeted referral) at all levels 	<ul style="list-style-type: none"> Ensure adequate capacity for testing and contact-tracing including reassignment and training of non-public health staff from national or municipal levels Establish mechanisms to govern delivery of core and community essential health services,³⁰ in coordination with response protocols, while scaling surge capacity as needed Identify context-relevant list of essential services and medicines Optimize essential service delivery settings and platforms Re-distribute health workforce capacity as needed, including re-assignment and task sharing Identify mechanisms to maintain availability of and access to essential medication and supplies

The citation for Appendix B is reference #2. Please see the original source document for the individual references found in this table.

APPENDIX C: RAPID REVIEW PROTOCOL

Inclusion and Exclusion Summary Table

Inclusion	Exclusion
<p>See chart below for study design inclusion.</p> <p>Population: Adults from the general population aged 25 years and older who are well, with no known exposure to the pandemic pathogen, and who are community dwelling. Includes seniors aged 65 years of age and older and pregnant and postpartum women.</p> <p>Exposure: Staying at home during pandemic times (voluntary self-isolation or mandatory population level stay-at-home orders). No restriction on the minimum duration of exposure to pandemics.</p> <p>Comparison: Non or pre-pandemic times in a similar population</p> <p>Outcomes (harms, as measured by authors):</p> <ul style="list-style-type: none"> Socially related: domestic violence <ul style="list-style-type: none"> ○ Worsening rates of physical and emotional abuse or trauma Mental health and substance use related <ul style="list-style-type: none"> ○ reported or perceived worsening of mental health (anxiety, depression, stress, suicidal thoughts, suicide attempts, completed suicides, loneliness or increasing symptomology of these conditions) ○ reported increases in new cases of mental illness (diagnosed depression, generalized anxiety disorder, PTSD) compared to non-pandemic times 	<p>Opinion papers, editorials, commentaries, qualitative research designs, university-specific settings, epidemiological studies not examining exposure effects (e.g. effects of interventions unrelated to mitigation of harms), abstracts, dissertations and conference proceedings, studies in other languages with no English translation, studies assessing gambling behaviours, studies assessing factors associated with compliance of physical distancing measures or factors associated with outcomes of interest, study populations with:</p> <ul style="list-style-type: none"> - any chronic conditions/ comorbidities - intellectual disabilities - pre-diagnosed mental health disorders unrelated to pandemics - health care providers - confirmed diagnosis of respiratory illness (cases) or who are considered at-risk in any specific setting or who are experiencing mandatory quarantine because of their current or potential infectious state. - studies assessing the harms* of pandemics in general, specific to our outcomes of interest without the exposure of 'staying home'. <p>Exception: Studies from countries (i.e. China, Italy, Germany, France, Great Britain, USA) with high levels of government restrictions to keep populations at home published during January 2020 or after. https://www.bsg.ox.ac.uk/research/research-projects/coronavirus-government-response-tracker</p>

<ul style="list-style-type: none"> ○ worsening rates of substance use (alcohol, legal and illegal drug use, and tobacco) <p>Local, provincial, federal level mitigation strategies/interventions.</p>	* harms are the outcomes listed in the column to the left in this table.
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STUDY AND SOURCE ELIGIBILITY

Study design	<p>Emphasis will be placed on the higher quality study designs. A stepwise approach to study design inclusion will be used.⁵</p> <p><input type="checkbox"/> Prospective cohort studies <input type="checkbox"/> Retrospective cohort studies <input type="checkbox"/> Interrupted time series <input type="checkbox"/> Case-control studies <input type="checkbox"/> Cross-sectional studies <input type="checkbox"/> Case series <input type="checkbox"/> Modelling studies <input type="checkbox"/> Systematic reviews</p> <p>Please see PECO definitions below. The general population of well, community dwelling, well adults aged 25+. Reference lists of included studies will be reviewed to identify additional studies. For additional detail, please see the Inclusion/Exclusion Summary Table above.</p>
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'PECO' ELIGIBILITY*

*POTENTIAL FOR POST-HOC ADJUSTMENT BASED ON RESULTS

Population	<p>Community dwelling, well-adults aged 25 years of age and older.</p> <p>Special populations of interest are <i>adults over 65</i>.</p> <p>Studies including pregnant or postpartum women will be included.</p> <p>Studies with a subset of relevant participants will be excluded <i>if greater than 33% of the study age range overlaps below 25</i>.</p>
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	Study populations with diagnosed respiratory tract infection or who are identified as having specific risk-factors related to contact with an infectious person are excluded.
Exposure	<p>Primary: Public health recommendation to stay home during a pandemic (voluntary self-isolation or mandatory population level stay-at-home orders) that has occurred in the past 100 years.</p> <p>Exposure of a sub-population related to an outbreak in a specific setting is excluded. E.g. universities, hospitals, long-term care facilities.</p>
Comparator(s)	Primary: Pandemics (see exposure definition above) during the past 100 years compared to non-pandemic or pre-pandemic times (i.e. baseline or normative data) for a similar population.
Outcome(s)	<p>Outcomes (harms, as measured by authors):</p> <p>Socially related: domestic violence</p> <ul style="list-style-type: none"> ○ Worsening rates of physical and emotional abuse or trauma <p>Mental health and substance use related</p> <ul style="list-style-type: none"> ○ reported or perceived worsening of mental health (anxiety, depression, stress, suicidal thoughts, suicide attempts, completed suicides, loneliness or increasing symptomology of these conditions) ○ reported increases in new cases (worsening rates) of mental illness (diagnosed depression, generalized anxiety disorder, PTSD) compared to non-pandemic times ○ worsening rates of substance use (alcohol, legal and illegal drug use, and tobacco)

Search methods for identification of studies

SEARCH METHODS			
Expertise	<p>The searches will be developed and conducted by the SMDHU Library Technician [CC], and independently peer reviewed by the SMDHU Hub Librarian [AF]. The searches will be sent out for comment to the Ontario Public Health Hub Librarian peers.</p>		
Electronic databases	<p>Database [minimum checked – please specify one other]</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> MEDLINE <input type="checkbox"/> CENTRAL <input type="checkbox"/> EMBASE* <input checked="" type="checkbox"/> Other (APA PsycINFO, SOCIndex) <p>COVID research registers e.g.</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> covid-19.cochrane.org <input checked="" type="checkbox"/> WHO COVID-19 Global literature on coronavirus disease <input type="checkbox"/> Clinical Trial Registry (please specify) <p>Preprint sites e.g.</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> MedRivx <input type="checkbox"/> SSRN <input type="checkbox"/> Authorea <input type="checkbox"/> Research square <input type="checkbox"/> BioRxiv <p>Other sources (Please specify) * Assuming available access</p>	<p>From:</p> <p><i>[APA PsycInfo was limited to results from 1917 to current. All other databases were searched since inception]</i></p>	<p>To:</p> <p>Database: Ovid MEDLINE(R) <1946 to April Week 5 2020></p> <p>Database: APA PsycInfo <1917 to May Week 1 2020></p> <p>SOCIndex searched up to May 13, 2020.</p>
Other searches	<ul style="list-style-type: none"> <input type="checkbox"/> Systematic review references <input checked="" type="checkbox"/> Reference lists of included studies <p><input type="checkbox"/> Grey literature (positions or statements from NGOs related to outcomes, OECD developed countries only)</p> <p><input type="checkbox"/> Citation tracking</p>	<p><i>Please see Appendix 8.12</i></p>	

	<input type="checkbox"/> Data from the pharmaceutical industry <input type="checkbox"/> Data from Governments/ intergovernmental agencies (Please specify) <input type="checkbox"/> Citation tracking <input type="checkbox"/> Contact experts for references <input type="checkbox"/> Other (please specify)				
Approach to ongoing and unpublished studies	<input type="checkbox"/> Include ongoing studies <input type="checkbox"/> Unpublished studies <input checked="" type="checkbox"/> Studies in press <input type="checkbox"/> Exclude all studies that are ongoing, unpublished, or in press	<i>[searched in Ovid MEDLINE(R) Epub Ahead of Print & Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations]</i>			
METHODS FOR SCREENING SEARCH RESULTS*					
*POTENTIAL FOR POST-HOC ADJUSTMENT BASED ON RESULTS					
Expertise	Screening will be performed by <i>[BB and KG]</i> in Microsoft Word				
Screening methods	Dual; the second reviewer checks all excluded records Dual; the second reviewer checks <i>[25%]</i> of excluded records Dual; independent screen and cross check	<i>Abstract</i> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>	<i>Full text</i> <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		
Discrepancy resolution	<input checked="" type="checkbox"/> Consensus and/or third reviewer <input type="checkbox"/> Other (please specify)				
Excluded studies	All decisions taken during screening will be documented and outlined in the final report with a list of excluded studies				
Inclusion of abstracts and conference proceedings	<input checked="" type="checkbox"/> Exclude all <input type="checkbox"/> Include if clearly eligible and have usable data <input type="checkbox"/> Include if clearly eligible regardless of usable data <input type="checkbox"/> Include if eligibility is unclear and add to section in report				

Inclusion of non-English language studies	<input type="checkbox"/> Include abstracts and full texts [<i>in Chinese/any language</i>] <input type="checkbox"/> Include full texts only [<i>in Chinese only/ language</i>] <input checked="" type="checkbox"/> Exclude <input checked="" type="checkbox"/> All potentially relevant abstracts will progress to full text screen <input type="checkbox"/> [Single/dual] title/abstract screen by foreign-language speaker(s) <input type="checkbox"/> [Abstract/ <u>methods</u> /full text] will be translated for abstract/ <u>full text</u> screen <input type="checkbox"/> Listed as non-English language and not assessed further
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Data collection and analysis

DATA EXTRACTION	
Expertise	Data extraction will be performed by [BB] and checked by [EH]
Software	Data will be extracted using a data extraction template created in Excel.
Data to be extracted	Country, research design, participant characteristics [age, number], pandemic type, outcome measures, any confounding variables controlled for.
Data extraction methods	<input type="checkbox"/> Single, no second reviewer <input checked="" type="checkbox"/> Dual; the second reviewer checks all data <input type="checkbox"/> Dual; second reviewer checks [add proportion] <input type="checkbox"/> Dual; independent screen and cross check
Risk of bias tool	<input type="checkbox"/> Cochrane RCT risk of bias tool [<i>specify RoB1 or RoB2</i>] <input type="checkbox"/> ROBINS-I tool for non-randomised studies <input type="checkbox"/> Adapted-hybrid of the RCT-ROBINS-I tools (NB please provide justification for hybrid use) <input type="checkbox"/> <u>EPOC Risk of Bias tools</u> <input type="checkbox"/> Excluding Risk of Bias assessment from this review <input checked="" type="checkbox"/> Another tool [<i>please justify your use of another scale and provide a reference</i>]

	<p>https://www.evidencepartners.com/resources/methodological-resources/risk-of-bias-cross-sectional-surveys-of-attitudes-and-practices/</p> <p>https://www.evidencepartners.com/wp-content/uploads/2017/09/Risk-of-Bias-Instrument-for-Cross-Sectional-Surveys-of-Attitudes-and-Practices.pdf</p>
Method of risk of bias assessment	<input checked="" type="checkbox"/> Single, no second reviewer <input type="checkbox"/> Dual; second reviewer checks all judgements <input type="checkbox"/> Dual; second reviewer checks [add proportion] <input type="checkbox"/> Dual; independent screen and cross check
Discrepancy resolution	<input type="checkbox"/> Consensus and/or third reviewer <input checked="" type="checkbox"/> Other (expert consultation)
Contacting study authors	<input type="checkbox"/> Authors will be contacted for missing information and data <input type="checkbox"/> Authors will be contacted for missing outcome data only <input checked="" type="checkbox"/> Authors will not be contacted
DATA MANAGEMENT	
Software	EndNote will be used to manage citations.
Resolving conflicts between sources	If there is a conflict between data reported across multiple sources for a single study (e.g. between a published article and a trial registry record), we will use data from the first manuscript published from the data collection date of the trial.
DATA SYNTHESIS	
Measures of treatment effect	<input checked="" type="checkbox"/> Continuous outcome: mean difference and 95% confidence intervals (CIs) <input checked="" type="checkbox"/> Continuous outcome: standardised mean difference <i>[Specify how you will present/ interpret SMD – e.g. by converting to a recognisable scale]</i> <input checked="" type="checkbox"/> Dichotomous outcome: risk ratio / relative risk (RR) and 95% CIs

	<input checked="" type="checkbox"/> Dichotomous outcome: odds ratio (OR) and 95% CIs <input type="checkbox"/> Dichotomous outcome: risk difference (absolute risk reduction) <input type="checkbox"/> Peto odds ratio method <input type="checkbox"/> Other (please specify)
Decision rules for extraction of quantitative data	<ul style="list-style-type: none"> • Overall prevalence rates of outcomes • Mean scores of outcome scales • Any time points if included • Pandemic vs. non-pandemic times for a similar country are compared
Data standardization	All reported ORs will be converted to RR by an SMDHU Epidemiologist.
Assessment of heterogeneity	<input type="checkbox"/> Inspecting forest plots <input type="checkbox"/> Statistical test (chi-squared) for heterogeneity <input type="checkbox"/> I^2 statistic [<i>state how values of I^2 will be interpreted</i>] <input checked="" type="checkbox"/> Explore potential sources of the heterogeneity among study results <input type="checkbox"/> Sensitivity analysis by excluding outlying studies
Preparation for synthesis	<p>In preparation for synthesis (i.e. synthesis without meta-analysis), we will assess how much data are available for each of our outcomes:</p> <input checked="" type="checkbox"/> Table to compare PICO elements / study design features <input type="checkbox"/> Table of extracted numerical data for compilation of meta-analyses <input type="checkbox"/> Conversion of numerical data for meta-analysis (as needed)
Data synthesis	<input type="checkbox"/> Forest plots <input type="checkbox"/> Qualitative synthesis <input checked="" type="checkbox"/> Synthesis without meta-analysis <input type="checkbox"/> Network meta-analysis
Synthesis without meta-analysis	<input type="checkbox"/> Alternative statistical synthesis <input type="checkbox"/> Visual display of data e.g. forest plot without (pooling / other) <input type="checkbox"/> Tabulation of data by comparison <input checked="" type="checkbox"/> Summary/ synthesis of the evidence

Strategies for dealing with sparse data	In the absence of data related to the first research question, in-direct evidence will be reported from research question number two. In some cases, post-hoc adjustments will be made to the processes or definitions in some sections as outlined above.
Subgroup analyses	Data related to pregnant women and seniors aged 65 years and older will be synthesized and reported on separately.

APPENDIX D: SEARCH STRATEGIES

8.11 OVID/Medline Search Strategy

This search strategy was created for Ovid MEDLINE and was then adapted for use in APA PsycINFO and SocINDEX. Adapted search strategies are available upon request.

Database: Ovid MEDLINE(R) <1946 to April Week 5 2020>

Search Strategy:

- 1 disease outbreaks/ or epidemics/ or pandemics/ or ("community acquired infect*" or epidemic* or (disease* adj2 outbreak*) or pandemic*).ti,kw,kf. (111105)
- 2 Severe Acute Respiratory Syndrome/ or SARS Virus/ or middle east respiratory syndrome coronavirus/ or Coronavirus Infections/ or Influenza A Virus, H1N1 Subtype/ or Influenza, Human/ or Influenza Pandemic, 1918-1919/ or Hemorrhagic Fever, Ebola/ or Ebolavirus/ or ("beta corona virus** or "beta coronavirus** or "corona virus** or coronavirus* or "middle east* respiratory syndrome" or "severe acute respiratory syndrome" or "severe specific contagious pneumonia" or betacoronavirus* or MERS or post-SARS or SARS or Ebola* or "Spanish flu" or "Spanish influenza" or "Asian flu" or "Asian influenza" or "hong kong flu" or "hong kong influenza" or "swine flu" or "swine influenza" or H1N1).ti,kw,kf. (73644)
- 3 ("Coronavirus Infections" or "Betacoronavirus" or Coronavirus*).hw. or (Coronavir* or betacoronavir* or wuhan or "COVID-19" or 2019ncov or ncov2019 or ncov 2019 or 2019 ncov or Covid 19 or SARS CoV 2).ti,ab,kw,kf. or (severe acute respiratory syndrome coronavirus 2 or "COVID-19 vaccine" or "COVID-19 drug treatment" or "spike glycoprotein, COVID-19 virus" or "COVID-19 diagnostic testing" or "COVID-19 serotherapy" or "COVID-19").os,ps,rs,ox,px,rx. or (COVID or COVID 19 or nCoV or 2019nCoV or COVID19 or SARSCoV2 or pandemic* or corona virus* or coronovir* or wuhan or novel CoV or new CoV or nouveau CoV).ti,ab,kw,kf. (36726)
- 4 ((outbreak* or "respiratory illness** or "respiratory disease** or "respiratory symptom**") adj2 (China or Chinese)).ti,kw,kf. (125)
- 5 or/1-4 (172944)
- 6 Quarantine/ or (quarantin* or isolat* or (distanc* adj2 (social* or physical*)) or (stay* adj2 home) or "stay at home" or (shelter adj2 place) or "shelter-in-place" or self-quarantine* or (restrict* adj2 movement*) or lockdown* or (restrict* adj2 measure*) or (lock* adj2 down*)).mp. (1873670)
- 7 Battered Women/ or Domestic Violence/ or Intimate Partner Violence/ or Spouse Abuse/ (15640)

- 8 ((Domestic adj3 (violence or abuse or assault*)) or (family adj3 (violence or abuse or assault)) or "Intimate partner violence" or (interpersonal violence or inter personal violence) or (battered adj3 (wife or wives or husband* or women or woman or man or men or spouse or spousal))).ti,kw,kf. (8728)
- 9 ("psychological trauma*" or ((emotional* or verbal* or cyber* or online or mental* or psychological* or intellectual*) adj2 (cruelt* or threat* or profanit* or defam* or harrass*)) or ((purposeful* or intentional*) adj2 injur*) or gaslight* or gas light* or attack* or beat* or slap* or punch* or kick* or hostil* or fight* or fought or abuse or abusive or abused or antiviolence or assault* or attack* or battery or Wound* or Beat or beating or victim or revictim or Bodily harm or bullying or bully or bullied or femicid* or Fight* or fought or harass* or Harm* or Hate crime* or cyberstalk* or homicide* or hostil* or murder* or name-calling or Offense* or perpetrator* or rape? or rapist* or "sex offense**" or sex crime* or stalking or stalker* or injur* or wound* or threat* or choked or coerc* or violen*).ti,kw,kf. (547261)
- 10 (marriag* or husband* or partner or partners or spous* or dating or relationship* or domestic or gender or spousal or boyfriend* or girlfriend* or wife or wives).ti,kw,kf. (324951)
- 11 9 and 10 (17127)
- 12 or/7-8,11 (24421)
- 13 Anxiety/ or Anxiety Disorders/ or Loneliness/ or Depression/ or Depressive Disorder, Major/ or Depressive Disorder, Treatment-Resistant/ or Depressive Disorder/ or Mental Disorders/ or Mental Health Services/ or Mental Health/or Mood Disorders/ or Self Mutilation/ or Self-Injurious Behavior/ or Stress Disorders, Post-Traumatic/ or Stress Disorders, Traumatic, Acute/ or Stress Disorders, Traumatic/ or Stress, Psychological/ or Suicide Ideation/ or Suicide, Attempted/ or Suicide/ or (anxiet* or anxious or depressed or depression or depressive or ((mental* or psyc* or mood*) adj2 (disorder* or illness* or ill or disease* or sick* or condition* or ailment* or affliction* or syndrome* or health)) or lonely or loneliness or loner or alone or ((self or self-inflict* or self-harm*) adj2 (cut* or injur* or mutiliat*)) or stress or stressed or suicide* or suicidal).ti,kw,kf. (880616)
- 14 Cigarette Smoking/ or Electronic Nicotine Delivery Systems/ or Ex-Smokers/ or Non-Smokers/ or Pipe Smoking/or Smokers/ or Smoking Cessation/or Smoking Devices/ or Smoking Pipes/ or Smoking Prevention/ or Smoking Prevention/or Smoking Reduction/ or Smoking Water Pipes/ or Smoking, Non-Tobacco Products/ or Tobacco smoke pollution/ or Tobacco Smoke Pollution/or Tobacco, Smokeless/ or Tobacco, Waterpipe/ or Tobacco/ or Vaping/ or Water Pipe smoking/ (85816)
- 15 ("smoke free" or tobacco or cigar* or nicotine or smok* or snuf or smoker* or smoking).ti,kw,kf. (129492)
- 16 (vape or Mig Vapo?r* or vapo?r* pen? or e butt? or e juic* or e liquid? or vaper? or vapes or ("heat not burn" adj1 tobacco) or cigalike? or vape juice or eliquid* or ecig* or ejuic* or

SUORIN or vape pen? or vapo?r* device* or alternative nicotine delivery system* or battery-powered vapo* or cig-alikes or cig-a-likes or digital cig* or digital vapo?r* or e cig* or E lites or e pipe* or e smoke* or e vapo?rise or e vapo?r or ECIGs or electr* vapo* or electri* shisha* or electric cig* or electronic cig* or elites or epipe* or evapo?rise or evapo?rise or g pen? or hookah pen? Or Juul* or Green Smoke or non-medicinal nicotine delivery system* or personal vapo?r* or pod mod? or protonated nicotine or Puritane or tank model? or technofogger* or tobacco-free cig* or vap* nicotine* or vapelife or vaping* or vapo?r tank? Mod? or vapo?rette* or Vuse or Vype).ti,kf,kw. (3566)

- 17 or/14-16 (153863)
- 18 Alcohol Drinking/ or Alcoholic Beverages/ or Beer/ or Wine/ or Drinking Behavior/ (88324)
- 19 (((bing* or episodic or excessive* or hazardous or heavy* or intake or low-level* or minimal or misuse or moderate* or overconsum* or consume? or problem or social or sensible or reasonable or responsible or irresponsible or risk? or drunk or intoxicat* or abuse or abuse? or abusing or excess*) adj2 drink*) or ((bing* or episodic or excessive* or hazardous or heavy* or intake or low-level* or minimal or misuse or moderate* or overconsum* or consum* or problem or social or sensible or reasonable or responsible or irresponsible or risk? or drink* or drunk or intoxicat* or abuse or abuse? or abusing or excess* or disorder* or abstain* or abstinence) adj2 (alcohol* or beer or liqueur? or liquor? or wine or booze or vodka or bourbon or scotch or wine or beer or mead or aperitif or champagne or tequila or rum or ale or mead or lager or stout or sherry or vermouth or sangria or marsala or madeira or sake or brandy or schnapps or gin or absinthe or cognac or liqueur or cocktail* or cider*)) or (alcoholic* or alcoholism)).ti,kf,kw. (69192)
- 20 alcohol-related disorders/ or alcohol-induced disorders/ or alcohol-induced disorders, nervous system/ or cardiomyopathy, alcoholic/ or exp liver diseases, alcoholic/ or pancreatitis, alcoholic/ or psychoses, alcoholic/ or alcoholic intoxication/ or alcoholism/ or binge drinking/ or Alcohol Abstinence/ (106375)
- 21 ((alcohol or drinking) adj3 (withdraw* or detox* or treat* or therap* or reduc* or cessation or intervention* or abstain* or abstinence)).ti,kf,kw. (8261)
- 22 or/18-21 (188354)
- 23 Cannabaceae/ or Cannabinoids/ or Marijuana Smoking/ or Marijuana Abuse/ or Humulus/ or Marijuana Smoking/ or Cannabis/ or Smoking, Non-Tobacco Products/ or Trema/ or Cannabaceae/ or Cannabinoid Receptor Modulators/ or Endocannabinoids/ or Receptor, Cannabinoid, CB2/ or Medical Marijuana/ (30942)
- 24 (bhang or weed or 9THC or cannabi* or Cesamet or cesamet or delta 9 tetrahydrocannabi* or delta 9 THC or delta9 tetrahydrocannabi* or delta9 THC or delta-9-tetrahydrocannabinol or dronabinol or endocannabinoid* or ganja or ganja* or ha?chi?ch\$1 or hashis?h\$1 or marihuana* or marijuana* or marinol or medical marijuana

or nabilone or non-opiate phamarcotherapy or non-opioid analgesics or pot or synthetic 9-THC or tetrahydrocannabi* or THC or CBD or bangs or bhangstar or cannabutter or doobie* or gagas or gajas or honeycomb or mary jane* or moon rock or reefer* or roach*).ti,kf,kw. (34985)

25 or/23-24 (43926)

- 26 "Drug and Narcotic Control"/ or Amphetamine-Related Disorders/ or Behavior, Addictive/ or Buprenorphine/ or Buprenorphine, Naloxone Drug Combination/ or Cocaine/ or Cocaine-Related Disorders/ or Cocaine Smoking/ or Counterfeit Drugs/ or Crack Cocaine/ or Designer Drugs/ or Drug Overdose/ or Drug Misuse/ or Drug Users/ or Drug-Seeking Behavior/ or exp Amphetamines/ or exp Benzodiazepines/ or exp Benzofurans/ or exp Fentanyl/ or exp Neuregulins/ or Harm Reduction/or Heroin Dependence/ or Heroin/ or Inhalant Abuse/ or Methadone/ or Morphine Dependence/ or Morphine Derivatives/ or Naloxone/ or Naltrexone/ or Narcotic Antagonists/ or exp Narcotic-Related Disorders/ or Narcotics/ or Opiate Substitution Treatment/ or Opioid Epidemic/ or Opioid-Induced Constipation/ or Opioid-Related Disorders/ or Opium Dependence/ or Oxycodone/ or Phencyclidine Abuse/ or Prescription Drug Misuse/ or Psychoses, Substance-Induced/ or Risk-Taking/ or Street Drugs/ or Substance Abuse Detection/ or Substance Abuse, Oral/ or Substance Withdrawal Syndrome/ or Substance-Related Disorders/ (387359)
- 27 ((abus* or addict* or dependen* or disorder* or habit* or illegal* or illicit* or misus* or overdos* or recreation* or relian* or street* or withdrawal*or seeking or designer) adj2 (alprazolam or Ambien or amphetamine* or Ativan or barbiturate* or bath salt? or benzo* or cathinone* or chlordiazepoxide* or diazepam or drug* or eszopiclone or Halcion or hallucinogen* or inhalant* or inhale* or Librium or lorazepam or morphine or narcotic* or Nembutal or opioid* or prescrib* or prescrip* or solvent* or sonata or steroid* or stimulant* or substance* or triazolam or valium or Xanax or zaleplon or zolpidem)).ti,kf,kw. (44590)
- 28 (((opiat* or opioid* or heroin* or morphin* or morfin* or narcot* or amphetamine* or methamphetamine*) adj2 (self-administ* or intravenous or inject* or vein?)) or (crack adj2 (cocaine or smok* or pipe*)) or 2 dpmp or 2ce or angel dust or benzodiazepine* or benzofuran compound or benzos or buprenorphine or carfentanil or catha or cathinone or cesamet or codeine or crystal meth or cyclizine or dextromoramide or diacetylmorphine or diamorphine or diconal or dihydrocodeine or dihydromorphine or dilaudid or drug user* or ecstasy or ephedrine or fentanyl or foil chasing or heroin or hydrocodone or hydromorphone or ketamine or khat lisdexampetamine dimesylate or lsd or lysergic acid diethylamide or magic mushroom* or methadone or methamphetamine or methoxetamine or morphine or msj or nabilone narcotic* or nbome compound or nrg1 or opium or oxycodone or oxymorphone or palfium or pcp or pethidine or phenazepam or poppers or shooting-up or skin-popping or suboxone or temazepam or temgesic or tramadol or valium or Vicodin or xanax or zopiclone).ti,kf,kw. (94880)

- 29 Substance Abuse, Intravenous/ or ("injection drug user*" or "intravenous drug user*" or IDUs or "person* who inject* drug*" or "people who inject* drug*" or PWID).ti,kf,kw.
(15463)
- 30 or/26-29 (432310)
- 31 12 or 13 or 17 or 22 or 25 or 30 (1583795)
- 32 5 and 6 and 31 (446)
- 33 limit 32 to English language (416)
- 34 limit 33 to ("all aged (65 and over)" or "aged (80 and over)") (63)
- 35 33 not 34 (353)

APPENDIX E: GREY LITERATURE SEARCH STRATEGY

GREY LITERATURE WEB SEARCHING CHECKLIST	
Date	May 15, 2020
PICOT/Search Strategy	<p>Most resources were searched by using the website index to navigate to relevant documents. Where a workable search field was available, the following searches were used. They were separated into concepts because of the term limits in the search engines.</p> <p>(quarantine OR "social distancing" OR "physical distancing" OR "stay home order" OR "stay home advice" OR "shelter in place" OR self-quarantine) AND ("domestic violence" OR intimate partner violence" OR "domestic abuse" OR "family violence" OR battered)</p> <p>(quarantine OR "social distancing" OR "physical distancing" OR "stay home order" OR "stay home advice" OR "shelter in place" OR self-quarantine) AND ("drug use" or drug abuse" or "substance use" OR substance abuse" OR opioid OR heroin OR cocaine OR methamphetamine)</p> <p>(quarantine OR "social distancing" OR "physical distancing" OR "stay home order" OR "stay home advice" OR "shelter in place" OR self-quarantine) AND (cannabis OR marijuana OR tobacco OR cigarette OR smoking OR vaping OR alcoholic OR drinking)</p> <p>(quarantine OR "social distancing" OR "physical distancing" OR "stay home order" OR "stay home advice" OR "shelter in place" OR self-quarantine) AND ("mental health" OR "mental illness" OR anxiety OR depression OR loneliness OR suicide or suicidal)</p>
WHO, COVID-19 Global literature on coronavirus disease	<p>General link:</p> <p>https://search.bvsalud.org/global-literature-on-novel-coronavirus-2019-ncov/</p> <p>Filtered to mental health, mental disorders, stress, depression, anxiety, quarantine, isolation.</p> <p>https://search.bvsalud.org/global-literature-on-novel-coronavirus-2019-ncov/</p>

	ncov/?u_filter%5B%5D=fulltext&u_filter%5B%5D=mj_cluster&u_filter%5B%5D=type_of_study&u_filter%5B%5D=clinical_aspect&u_filter%5B%5D=la&u_filter%5B%5D=year_cluster&u_filter%5B%5D=ta_cluster&fb=&where=&range_year_start=&range_year_end=&filter%5Bmj_cluster%5D%5B%5D=Mental+Health&range_year_start=&range_year_end=
OUTCOME: MENTAL HEALTH	
CAMH	Quarantine and isolation: http://www.camh.ca/en/health-info/mental-health-and-covid-19#quarantine General: http://www.camh.ca/en/health-info/mental-health-and-covid-19
WHO	http://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/novel-coronavirus-2019-ncov-technical-guidance-OLD/coronavirus-disease-covid-19-outbreak-technical-guidance-europe-OLD/mental-health-and-covid-19
UN POLICY BRIEF ON COVID-19 AND MENTAL HEALTH	https://www.un.org/sites/un2.un.org/files/un_policy_brief-covid_and_mental_health_final.pdf
Angus Reid Poll	http://angusreid.org/covid19-mental-health/
Nanos Poll	https://www.mentalhealthcommission.ca/English/news-article/13958/new-nanos-poll-reveals-people-canada-are-more-stressed-era-covid-19

Canadian and Ontario government websites	<p>Taking care of your mental health during the COVID-19 pandemic https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/mental-health.html</p> <ul style="list-style-type: none"> - Includes links to all provincial COVID-19 mental health pages http://www.health.gov.on.ca/en/pro/programs/publichealth/coronavirus/docs/resources_ontarians_experiencing_mha.pdf
Psychosocial annex: Canadian Pandemic Influenza Preparedness: Planning Guidance for the Health Sector	<p>https://www.canada.ca/en/public-health/services/flu-influenza/canadian-pandemic-influenza-preparedness-planning-guidance-health-sector/pandemic-influenza-psychosocial-annex.html</p>
BC Community Pandemic Influenza Psychosocial Support Plan	<p>https://www2.gov.bc.ca/assets/gov/health/about-bc-s-health-care-system/office-of-the-provincial-health-officer/reports-publications/bc-pandemic-influenza-community-psychosocial-support-plan-2012.pdf</p>
For Providers and Community Leaders: Helping People Manage Stress Associated with the COVID-19 Virus Outbreak	<p>https://www.ptsd.va.gov/covid/COVID_providers_comm_leaders.asp</p>
The psychological impact of quarantine and how to reduce it: rapid review of the evidence	<p>https://www.sciencedirect.com/science/article/pii/S0140673620304608</p>

OUTCOME: ALCOHOL/DRUG CONSUMPTION

Page Title	Location
Impacts of COVID-19 on Substance Use	https://www.ccsa.ca/Impacts-COVID-19-Substance-Use
COVID-19 and Increased Alcohol Consumption: NANOS Poll Summary Report	https://www.ccsa.ca/covid-19-and-increased-alcohol-consumption-nanos-poll-summary-report
WHO: Alcohol	http://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/novel-coronavirus-2019-ncov-technical-guidance-OLD/coronavirus-disease-covid-19-outbreak-technical-guidance-europe-OLD/alcohol-and-covid-19-what-you-need-to-know,-7-april-2020
WHO: Tobacco	http://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/novel-coronavirus-2019-ncov-technical-guidance-OLD/coronavirus-disease-covid-19-outbreak-technical-guidance-europe-OLD/resources-for-tobacco-use-control-as-part-of-covid-19-response
Australians' Drug Use: Adapting to Pandemic Threats (ADAPT) Study	https://www.adaptstudy.org.au/ (recruiting)
BC Overdose Prevention and COVID-19	https://www.stopoverdose.gov.bc.ca/theweekly/overdose-prevention-and-covid-19

OUTCOME: ALCOHOL/DRUG CONSUMPTION

Page Title	Location
Why is the COVID-19 Pandemic Linked to More Gender-Based Violence?	https://canadianwomen.org/blog/covid-19-pandemic-gender-based-violence/
Gendered Impacts of Coronavirus	https://canadianwomen.org/blog/gendered-impacts-of-coronavirus/
The Coronavirus Is a Disaster for Feminism: Pandemics affect men and women differently.	https://www.theatlantic.com/international/archive/2020/03/feminism-womens-rights-coronavirus-covid19/608302/
COVID-19 and violence against women What the health sector/system can do	https://www.who.int/reproductivehealth/publications/emergencies/COVID-19-VAW-full-text.pdf general page: https://www.who.int/news-room/q-a-detail/violence-against-women-during-covid-19
National Resource Center on Domestic Violence DOMESTIC VIOLENCE AND THE HOLIDAYS, Holiday Toolbox	https://vawnet.org/sites/default/files/assets/files/2016-11/TAGuidance-DVHolidays2011.pdf https://vawnet.org/sc/holiday-toolbox
DOMESTIC VIOLENCE AND THE HOLIDAYS	https://www.policyschool.ca/wp-content/uploads/2018/12/Social-Policy-Trends-Domestic-Violence-December-2018-Ritas-Edits.pdf

The connection between professional sporting events, holidays and domestic violence in Calgary, Alberta	https://prism.ucalgary.ca/bitstream/handle/1880/52200/A9_Boutilier_et_al_2017_SPP_Professional_sporting_events_holidays_and_DV_in_Calgary.pdf?sequence=1&isAllowed=y
FAQ: Does domestic violence increase during the holidays?	https://www.violencefreecolorado.org/2014/12/faq-dv-during-the-holidays/
How Will COVID-19 Affect Women and Girls in Low-and Middle-Income Countries?	https://www.cgdev.org/blog/how-will-covid-19-affect-women-and-girls-low-and-middle-income-countries
A Gender Lens on COVID-19: Pandemics and Violence against Women and Children	https://www.cgdev.org/blog/gender-lens-covid-19-pandemics-and-violence-against-women-and-children
Evidence from Campbell reviews on the immediate response to coronavirus	https://campbellcollaboration.org/blog/covid19-campbell-evidence.html see: Intimate partner violence and child abuse
COVID-19 and Violence Against Women & Children	http://www.learningtoendabuse.ca/our-work/covid19_and_violence_against_women_children.html
Region of Peel Family Violence Covid-19 Response Table Meeting #1 – March 30th, 2020	https://www.peelregion.ca/coronavirus/community-response-table/pdf/COVID-19-peel-family-violence-CRT-%20meeting-march-30.pdf

WEBSITES SEARCHED		
World Health Organization (WHO) http://www.who.int/en/	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
National Institute for Health and Clinical Excellence (NICE) http://www.nice.org.uk/	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
CDC https://www.cdc.gov/	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
NCCMT (National Collaborating Centre for Methods and Tools) https://www.nccmt.ca/knowledge-repositories/covid-19-evidence-reviews	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
The Campbell Collaboration http://www.campbellcollaboration.org/	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Public Health Agency of Canada http://www.phac-aspc.gc.ca/index-eng.php	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Public Health Ontario https://www.publichealthontario.ca/	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Health Evidence http://www.healthevidence.org/	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
Health Systems Evidence https://www.healthsystemsevidence.org	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	
OPHLA Grey Literature Wiki for Ontario Health Units Custom Search Engine for Canadian Public Health Information	<input type="checkbox"/> N/A <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

APPENDIX F: EXCLUSION TABLE

Note: No comparison to demonstrate worsening rate means the study did not report any comparative data or inappropriate data was presented that inhibited comparison to demonstrate a worsening rate.

AUTHOR	REASON FOR EXCLUSION
<i>Published</i>	
Adler, A., et al., 2018	Sample with known risk of infection
Bangerjee et al., (2020)	editorial
Barratt, R.L., (2011)	Not respiratory tract infection pandemic (staph aureus)
Berg-Weger, M., J.E. Morley (2020)	editorial
Burtscher, J., M. Burtscher et al. (2020)	editorial
Carney, T et al., (2014)	Narrative review
Casale, S., G.L. Flett, (2020)	Pandemic in general- not stay at home
Chevance, A., et al., (2020)	Pre-existing mental health illness
Choi, K.R., et al., (2020)	editorial
Clerici et al., 2020	Hospital admission is proxy measure for increase in mental health cases – no diagnostic process
Da, B.L., G.Y. Im, and T.D. Schiano, (2020)	Sample with pre-existing chronic disease/morbidity
de Girolamo, G., et al., (2020)	Qualitative design
Dodgson, J.E., et al., (2010)	Qualitative design
Dutheil, F., et al., (2020)	editorial
Earnshaw, V.A. and D.M. Quinn, (2013)	Not outcome of interest

Faherty, L.J., et al., (2019)	Qualitative design
Galea, S., R.M. Merchant, N. Lurie (2020)	editorial
Garcia-Alvarez, L., et al., (2020)	Non-English language editorial
Hawryluck, L., et al (2004)	Sample with known risk of infection
John, N., et al., (2020)	editorial
Jones, J.H. and M. Salathe (2009)	Pandemic in general- not stay at home
Ko, C.H., et al., (2006)	No comparison to demonstrate worsening rate
Lei et al., 2020	No comparison to demonstrate worsening rate
Lima, C.K.T., et al., (2020)	Not the correct population
Lohm, D., et al., (2014)	Pandemic in general- not stay at home
Losada-Baltar, A., et al. (2020)	Reports on factors
Matias et al., (2020)	No comparison to demonstrate worsening rate
Mazza et al. (2020)	No comparison to demonstrate worsening rate
Moccia, L., et al., (2020)	No comparison to demonstrate worsening rate
Mucci, F., et al., (2020)	Narrative review
Ozamiz-Etxebarria, N., et al., (2020)	No overall prevalence rates presented
Porcelli, P., (2020)	Narrative review
Qiu, J., et al., (2020)	No comparison to demonstrate worsening rate
Reynolds, D.L., et al., (2008)	Sample with known exposure to infection
Riblet, N.B., et al., (2020)	Exposure is not population level lockdown measures to physically and socially distance
Roy et al., 2020	No overall rate for anxiety reported

Shader, R.I., (2020)	editorial
Sprang et al. (2013)	Pandemic in general – not stay at home
Usher, K., et al., (2020)	editorial
Venkatesh, A., et al., (2020)	editorial
Webb, L., et al., (2020)	editorial
Xiao et al., 2020	Not exposure of interest, not prevalence study
Yip, P.S., et al., (2010)	Pandemic in general on seniors
Yip, P.S., P.H. Chau (2020)	editorial
Yuan et al., 2020	No overall prevalence rate of stress, no comparison to demonstrate worsening rate
Zhu et la., 2020	No methods
<i>medRxiv Pre-Print papers</i>	
Ammar et al 2020 a	No comparison to demonstrate worsening rate
Ammar et al 2020 b	No comparison to demonstrate worsening rate
Banerjee et al., 2020	Not outcomes of interest
Barari et al., 2020	No methods
Brooks et al 2020	Pandemic in general- not stay at home
Hu et al., 2020	No comparison to demonstrate worsening rate
Huang et al., 2020	No comparison to demonstrate worsening rate
Jung et al. 2020	No methods
Song et al., 2020	No comparison to demonstrate worsening rate
Lim et al., 2020	No outcomes of interest- doesn't meet PECO definition

Limcaoco et al. 2020	Majority of sample participants were not from OECD country.
Newby et al., 2020	70% of sample had diagnosed mental health illness
Plomecka et al., 2020	No comparison to demonstrate worsening rate
Rossi et al., 2020	No comparison to demonstrate worsening rate
Sorokin et al. 2020	No description of sampling methodology, no overall prevalence rate of anxiety or stress
Sun et al., 2020	No comparison to demonstrate worsening rate
Taghizadeh F., 2020	No comparison to demonstrate worsening rate
Ueda et al., 2020	Japan had governmental stringency index below 50%. Pandemic in general.
Wang et al., 2020	No comparison to demonstrate worsening rate
Wissmath et al, 2020	No methods section
Zhang et al., 2020	No comparison to demonstrate worsening rate

APPENDIX G

Table of Mental Health Actions in Emergencies⁴⁰

Period: psychological and social manifestations among the population	Mental health actions
<u>Before:</u> <ul style="list-style-type: none"> - Expectation of the inevitable high level of stress among the population - Over- or under-estimation (denial) of the potential epidemic - Exaggeration of preexisting personality traits (positive and negative) - Anxiety, stress, insecurity, and hyper vigilance for symptoms of the disease 	<ul style="list-style-type: none"> - Communication of risk to the population, emphasizing vulnerable groups. - Sensitization about and information on the subject - Location of competent mental health personnel - Training of mental health teams and PHC workers in this area - Preparation of emotional support and counseling groups - Identification of vulnerable groups from a psychosocial standpoint - Preventive protection: imposed in an authoritarian manner, if necessary - Promotion of community spirit and community participation - Organization of mental health services for adequate response during the emergency, particularly the formation of mobile teams, crisis intervention units, and liaison services in general hospitals - Interinstitutional coordination - Creation of work networks
<u>During:</u> <ul style="list-style-type: none"> - Fear and a sense of abandonment and vulnerability - Need to survive - Loss of initiative - Spontaneous leadership (positive or negative) - Behaviors that can fluctuate between heroic and horrible, violent and passive, and sharing or selfish - Adaptation to changes in the normal patterns of living: restriction of movement, use of masks, reduction in direct physical contact, temporary schools closures, etc. - Anxiety, depression, grief, peri- 	<ul style="list-style-type: none"> - Rapid evaluation of the psychosocial needs of the population depending on the specific conditions of the location where the epidemic is unfolding - Support for the basic activities of early detection, reporting, care, and control the spread of the disease - Mass communication: Information and recommendations on: what is happening, what is being done, and what people should do; Transmission of: organization, safety, authority, morale, calm, support, and encouragement - Continuation of in situ training during

APPENDIX H

Table of reported risk and protective factors for mental health outcomes^{6,84,91,92}

CONDITIONS/FACTORS/GROUPS ASSOCIATED WITH HIGHER MENTAL HEALTH VULNERABILITY	
Conditions/Associated Risk Factors - General	Associated Risk Factors – COVID-19 specific
<ul style="list-style-type: none"> • Age <ul style="list-style-type: none"> ◦ Younger to middle-aged adults ◦ Older adults • Female • Existing mental health problem and their caregivers • Low SES (education and income) • Poorer general health status • Low/no psychosocial support • Poorer sleep quality • Physical inactivity/sedentariness • Unhealthy diet • Living alone 	<ul style="list-style-type: none"> • Quarantine, physical distancing and duration of quarantine • Being a health care worker • Perceived risk/susceptibility of contracting COVID-19 • Contact/knowing someone who had disease including those who died • Perceived increased risk of adverse/severe outcomes • Financial concerns or stress • Job loss • Longer exposure to COVID-19 information and media
Conditions/factors/groups associated with lower mental health vulnerability/increased resilience	
Associated Protective Factors - General	Associated Protective Factors – COVID-19 specific
<ul style="list-style-type: none"> • Perceived level of social support and social capital • Being physically active 	<ul style="list-style-type: none"> • Continuing to work • Being an essential worker • Perceived control, self-efficacy

- Adapt messaging to better suit sub-populations at particular risk