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**Title: COVID-19 – The Perfect Vector for a Mental Health Epidemic**

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**Summary**

In times of crisis, people have historically had to band together to overcome. What happens when they cannot? This article examines the reality of people forced to isolate from one another during one of the most turbulent events of their lives: the COVID-19 pandemic. Connecting the dots of topics including fear, social stigmas, global public response, and previous disease outbreaks, this article will discuss the negative mental health impacts that individuals and communities will likely suffer as the result of social distancing, isolation, and physical infection.

**Key words**

COVID-19; pandemic; epidemic; mental health; isolation; social distancing; public health; abuse; stigma

**The rise of a new pandemic**

On 31st December 2019, the Chinese authorities reported a disease that had appeared in the Hubei Province to the World Health Organisation (WHO) as a "pneumonia of unknown aetiology."<sup>1</sup> That "pneumonia" is now known as the novel coronavirus disease (COVID-19). As of 13<sup>th</sup> May 2020, there are 4 170 424 confirmed cases of COVID-19 with 287 399 deaths reported globally, and these numbers are only continuing to grow.<sup>2</sup>

While current strategies to fight the outbreak primarily focus on curbing the spread and treating the infected, it is crucial to consider COVID-19's impact on the wider population's mental health, in the short, medium, and long term. By studying past New Emerging Infections (NEIs), in particular, Severe Acute Respiratory Syndrome (SARS) in 2003, Middle East Respiratory Syndrome (MERS) in 2012 and 2015, and H1N1 in 2009 (with H1N1 being the only one to also be declared a pandemic)<sup>3</sup>, we can better understand, potentially predict,

and thus counteract the possible effects of COVID-19 on mental health.

The 2003 SARS epidemic is one such case study of how infectious disease outbreaks affect mental health, with this particular epidemic described as a mental health catastrophe.<sup>4</sup> Hong Kong (HK) was disproportionately affected in the SARS epidemic, with up to 1,755 individuals infected and 299 deaths.<sup>4 5 6 7</sup> A study conducted soon after the outbreak indicated that a significant proportion of the HK population, including those not infected with the disease, displayed moderate to severe psychiatric symptoms, meeting diagnostic thresholds of common mental disorders such as depression and generalised anxiety disorder.<sup>4</sup> These impacts are not specific to SARS, but are a feature seen in most, if not all, infectious disease outbreaks. A study of a hospital in South Korea found that 70% of hospitalized MERS patient presented with a psychiatric symptom, and 40% of them were later prescribed medication to alleviate the symptoms.<sup>8</sup> In both SARS and MERS, the psychiatric implications continued far beyond the outbreak, with many having persistent mental health issues years after.<sup>4 8 9 10 11 12 13</sup> The same impact, albeit of varying ferocity, can also be seen during the H1N1 outbreak .

COVID-19 is of a scale the current generation has never seen before, with The Spanish Flu of 1918 potentially being the last outbreak to have had such widespread impact. However, due to the scarcity of literature evidencing the mental health impacts of the Spanish Flu pandemic, and the time-gap of over a century when our society, health and financial systems have all changed beyond our forefathers' imagination, limited parallels can be drawn between current and older pandemics other than mortality. Drawing parallels with SARS and MERS also has its limitations. Studies of SARS patients have varying degrees of reliability due to inconsistent study design, research method, and standardized measures being used across the different studies – a common problem with research done in the early aftermath of a disaster.<sup>11</sup> Existing literature surrounding SARS and MERS are also primarily focused on Asian countries as they were most affected by the outbreaks, potentially limiting generalisability to Western countries with a more 'individualistic' structure compared to the 'collectivist' societal system of those nations. To minimise this limitation, our focus was to identify and learn from themes that recur in different disease outbreak settings. Given that the COVID-19 pandemic is already more global and longer lasting than any outbreaks we have faced in recent memory one may extrapolate that the mental health implications of COVID-19 will be at least as severe as those of others NEIs. We provide a brief overview of the potential negative ramifications in store if mental health is not given more priority in the current outbreak response.

## **Why do NEIs Contribute to Increases in Mental Health Issues?**

Throughout history, the emergence and increasing prevalence of infectious agents have coincided with an increased risk of psychiatric manifestations. NEIs such as SARS and COVID-19 adversely affect mental health in a multitude of ways, permeating at individual, communal, and societal levels. The most common psychological morbidities include worries, anxiety, mood disturbances, poor sleep, and hypochondriac beliefs.<sup>14 15 16 17</sup> Pervasive feelings of hopelessness, uncertainty, and fear tend to dominate society during such outbreaks, a result of life as we know it stopping or changing.<sup>13 15 16 17 18</sup> Such feelings may be borne out of an increased perceived threat which drives “safety” behaviours in individuals and community that can be maladaptive.<sup>19</sup> Most common behaviours of this nature include hypervigilance (i.e. looking out for potential dangers) and avoidance (i.e. keeping ourselves from sources of danger or threat).<sup>19</sup> Intense fear and panic are also used as an excuse, albeit often unintentional, for unjustified discriminatory behaviour, such as xenophobia and stigmatisation of particular groups, or patterns of hoarding supplies.<sup>20</sup>

### **Fear**

*“This is a time for facts, not fear. This is the time for science, not rumours. This is the time for solidarity, not stigma,”*<sup>21</sup> said Tedros Adhanom, the Director-General of WHO, in reference to COVID-19 on 12th February 2020.

Fear was preponderate in affected populations (including healthcare workers) during SARS: not only for personal safety, but for the safety of others. At the time, SARS was unique in its psychosocial impact, evoking a deep-rooted fear of infecting family and community members.<sup>7 11 12</sup> In HK, the government’s perceived lack of control in containing the SARS outbreak predicated a pervasive sense of hopelessness in the citizenry; a psycho-emotional factor amplified and perpetuated by the media. This, in turn, led to general apprehension and panic.<sup>22</sup> The impact of the “rumour mill” during an outbreak must be taken seriously; as the desire for facts escalates, any absence of clear and accurate messaging can augment popular anxiety, driving people to seek information from less reliable sources. This same trait is now evident in the context of COVID-19, exacerbated by media and popular discourse promulgating paranoia and anxiety.<sup>23 24</sup>

Social media has an important role in shaping public’s risk perception<sup>24</sup>; however, it can also be a vessel for the fast dispersal of false news which can bring with it disastrous consequences. During the H1N1 pandemic, the widespread misinformation surrounding the vaccine has been attributed to reduced uptake and increased hesitancy.<sup>25 26</sup> The current COVID-19 outbreak sees a repeat of this, with the spread of “fake news” through social media also contributing to significant misinformation, leading to fear, panic and even non-compliance in infection control measures. The influence of social media in propagating misinformation during COVID-19 has even led to protest against lockdown measures in the

U.K. with protestors chanting phrases such as “Stop 5G!” – a theory made popular through social media.<sup>27</sup> This impact has persisted despite the UK government forming a rapid response unit to tackle issues on misinformation early on in the outbreak response.<sup>28</sup>

Fear can be beneficial to a point during an outbreak, leading to behaviors which reduces the spread of the disease. Excessive fear, however, can lead to irrational beliefs that impedes on infection control measures, and probably precipitate maladaptive coping techniques, albeit unintentionally.<sup>29 30</sup> A survey showed that 66% of young adults in the UK avoided news on COVID-19 as it was unhelpful for their mental health.<sup>31</sup> This highlights how whilst fear is an important tool in public health messaging, excessive fear, could not only impede on its reach, but also potentially exacerbate a different public health issue.

### **Stigma**

Stigma was also linked to mental health morbidity in the SARS outbreak.<sup>32</sup> This included self-stigmatization (individuals continuing to feel “polluted” or “contaminated” up to 16 months after the outbreak), professional stigmatization (denigration of healthcare workers and figures of authority), and of course, racial stigmatization (people of Asian descent being painted as social pariahs).<sup>11 12 32</sup> In another parallel with the SARS and MERS outbreak, the COVID-19 pandemic has spurred racial stigmatization, especially toward those of Chinese heritage, in the form of xenophobia and discrimination.<sup>33 34 35</sup> A systematic review identified that the perception of having been a victim of stigmatization due to SARS was one of the most consistent etiological factors for the development of psychiatric disorders and Chronic fatigue syndrome<sup>11</sup> Therefore, preventing stigmatization during COVID-19 should be made a priority in order to prevent similar, adverse outcomes in COVID-19 patients and the wider population.

Stigma does not only impact the mental health of individuals; it can also disrupt infection-control measures. Barrett and Brown<sup>36</sup> identified four elements of stigma that can contribute to this:

- Stigma can present major barriers against healthcare-seeking, thereby reducing early detection and treatment and furthering the spread of disease.
- Social marginalisation often can lead to poverty and neglect, thereby increasing the susceptibility of certain groups to infectious diseases.
- Potentially stigmatised populations may distrust health authorities and resist cooperation during a public health emergency.

- Social stigma may distort public perceptions of risk, resulting in mass panic among communities, and the disproportionate allocation of healthcare resources by politicians and health professionals.

Stigmatization and discrimination have socio-economic ramifications within populations, as well as related feelings of fear, creating a destructive, mutually reinforcing dynamic.<sup>32</sup>

### **Quarantine and Social Isolation**

The negative impact of quarantine and isolation on mental health have been described at length.<sup>23 37</sup> Adverse mental health impacts often persist for months after the end of isolation, and those with pre-existing mental health conditions are also at higher risk of prolonged adverse effects, as shown in both the SARS and MERS outbreak.<sup>13 38 39</sup> Discrimination, social shunning, violence, and vandalism of property are among the consequences of the maltreatment faced by quarantined people at the hands of others in society.<sup>23</sup>

Most adverse effects from quarantine stem from restricted liberties, whereas voluntary quarantine is associated with less distress and fewer long-term complications.<sup>37</sup> Earlier in the pandemic response, the UK relied on the altruistic nature of the public to practice 'social distancing', but as of 23rd March 2020, police have the authority to enforce this through fines and other penalties. In a report recently published, the specific concerns of the UK population in regards to isolation measures included having to separate from others in household (45%), getting supplies (41%), mental health implications (37%), social life implications (24%), loss of income (22%), and finding someone to cover caring responsibilities (12%). Additionally, those between 18-34 years old were more likely to report negative mental health effects.<sup>40</sup>

The economic sequelae of COVID-19 lock down measures in the UK has led to businesses closing and many losing employment; to this, the Bank of England has warned that unemployment rates could go on rise to 9% (compared to the 4% that it was earlier this year).

<sup>41</sup> Increased unemployment poses significant public health risk. For instance, in 1981 when unemployment rates in the UK increased by 3.6%, suicide rates also increased by 2.7%.<sup>42</sup>

Reports from the 2008 recession echoed this and showed that the resultant mass unemployment was associated with a 4.45% increase in suicide rates in 26 EU countries.<sup>42</sup>

Whilst the end of lockdown is expected to improve the economic downturn, many that have

lost their jobs will struggle to find new employment as companies reduce hiring.<sup>41</sup> Further protracting the financial and psychological impact COVID-19 will have on them.

Quarantine and isolation is a necessary measure, and as of now, has been shown to be one of the most effective measures in containing the outbreak.<sup>43 44</sup> With the possibility of mass quarantine measures having to be reimplemented subsequently due to 'second waves' of COVID-19, as seen in several countries,<sup>45 46 47</sup> the concerns of the public have to be addressed to mitigate the negative impact from this potentially recurring 'necessary evil'.

### **Loss of Protective Factors**

Rutter defined protective factors as those that "modify, ameliorate or alter a person's response to some environmental hazard that predisposes to a maladaptive outcome".<sup>48</sup> Protective factors may exist in individuals or in the family, in institutional or community contexts. They can also be biological or psychosocial in nature.<sup>49</sup> In times of duress, social support is one of the protective factors against the development of mental health disorders such as depression and PTSD.<sup>50 51</sup> Nevertheless, social distancing is a necessary public health response to NEIs. In the UK, people are now prohibited from both large and small gatherings with those from different households. This has, for example, led to religious institutions cancelling services, which ordinarily constitute a major source of support, particularly for the elderly.<sup>52</sup>

Social support is just one of many examples of a lost protective factor resulting from COVID-19. The public also has to face the financial instability, unemployment, and disrupted routine.

Pandemics and epidemics do not only increase the many risk factors for mental health morbidities, but also pull away protective factors simultaneously, which effectively compound one another.

### **Increased Risk of Abuse**

Reports have already emerged of increased cases of domestic abuse among the populations affected by COVID-19, with a UK abuse charity, Refuge, seeing a 700% increase in traffic to their hotline website in a day.<sup>53</sup> It is important to note that domestic abuse is not always physical - it can also be psychological, financial or sexual. COVID-19 can not only exacerbate existing cases of abuse; the stress associated with it can also lead to new cases. Social isolation can mean spending significantly more time at home with

abusive family members, with no escape or respite.<sup>54</sup> Furthermore, a pandemic increases financial and psychological stress, which is associated with increased likelihood of abusive behavior.<sup>55</sup>

The significant risk of abuse towards the elderly should not be overlooked. A study carried out by Reay and Browne in 2001 identified 15 risk factors in caregivers that increase the risk of mistreatment. Three of them are particularly relevant during the current outbreak: (1) caregivers who are subject to high stress and strain; (2) those who live with elderly patients; and (3) those who are isolated and lack community and personal support.<sup>56</sup> Furthermore, feelings of anxiety in caregivers are also associated with neglect.<sup>56</sup> For the elderly who require greater assistance with daily activities, as well as those with dementia, caregiver stress is a predominant factor in the onset of abuse.<sup>57</sup> COVID-19 intensifies all these risk factors in caregivers, thus placing the elderly at a higher risk of abuse or neglect. Whilst the UK government has already issued measures to address the impact of abuse<sup>58</sup>, there remains a question of how accessible and practical these technology-driven measures are for the elderly population.

Pandemics, such as COVID-19, may also make it more difficult for victims to receive help through its impact on an already overwhelmed public health infrastructure<sup>59</sup>, such as the social care system, reduced philanthropic donations to abuse charities, and imposed travel limitations.<sup>54</sup> Involvement in abuse, either as a perpetrator or a victim, exerts an enduring impact on both physical and mental health.<sup>60</sup> The stress factors associated with COVID-19, if not properly mitigated, will make the current pandemic an ideal environment for abuse to thrive, exerting a lifelong, adverse impact on the health of those involved.

### **COVID-19, PTSD and ITU**

Approximately one in five critically ill patients and their partners will develop clinical symptoms of PTSD and reduced reported health-related quality of life as a result of their intensive treatment unit (ITU) stay.<sup>61</sup> The estimated number of COVID-19 patients necessitating intensive care due to, for instance, Acute Respiratory Distress Syndrome (ARDS) currently stands at about 15-30 percent.<sup>62</sup> Patients admitted to ITUs, as well as their families, are at risk of developing Post Intensive Care Syndrome (PICS) - a physical, cognitive, and mental disorder associated with an ITU stay. The mental health impairments that can arise among these patients include depression, anxiety, and PTSD.<sup>63</sup> Existing



mental health conditions also increases the risk of developing PICS, in both patients and their family.<sup>64</sup>

Furthermore, the use of extracorporeal membrane oxygenation (ECMO), also known as extracorporeal life support (ECLS), in the treatment of COVID-19 poses a specific mental health risk that warrants consideration.<sup>65 66</sup> ECMO, which supports the lungs and/or the heart, is considered one of the most invasive rescue therapies with high rates of adverse mental health outcomes in patients (e.g. PTSD) post-treatment. The prevalence of PTSD in patients who were on ECMO is estimated to be between 11 and 27 percent, at least a four- to five-fold increase from general population prevalence figures.<sup>67 68</sup> Moreover, compared to other ARDS survivors, those who were on ECMO also reported lower quality of life and lower rates of return to employment.<sup>67</sup>

### **Mental Health Services and COVID-19**

The UK government does not currently recognize people with existing mental health conditions as part of the “vulnerable population”, because their risk of getting seriously ill from COVID-19 is perceived as low. These groups are vulnerable to an exacerbation of pre-existing mental health conditions, however. Those with pre-existing mental health conditions often suffer greater psychological distress in instances of an adverse event or situation.<sup>69 70</sup>

Moreover, this cohort is often in poorer physical health with fewer protective factors, such as a healthy lifestyle or active social support network, making them physically and mentally vulnerable to the effects of COVID-19. One example is smoking; smoking is estimated to be two times more prevalent among people with mental disorders, with higher reported mental health disease severity directly correlated with numbers of cigarettes smoked.<sup>71</sup> In addition, there is also a higher incidence of chronic infections in these patients due to substance abuse and socio-economic deprivation.<sup>72</sup> This is particularly relevant to COVID-19, as those with chronic respiratory illness, such as COPD (which is directly correlated with smoking frequency), are at higher risk of death from the disease.

For current mental health patients, the American Psychiatric Association has already raised the alarm that the spread of COVID-19 can create barriers for access to psychiatric services.<sup>73</sup> One prime example concerns patients on medication-assisted treatment (MAT) such as methadone and buprenorphine who may face difficulty in physically attending their drug service or pharmacy in the frequency needed. In the UK, reports on pharmacies restricting

access for MAT due to reduced capacity, and patients stopping their treatment due to anxieties surrounding COVID-19 have emerged.<sup>74 75</sup> The implications for access to other medication that requires frequent monitoring, such as clozapine, also need to be considered carefully. This is especially so when monitoring is indicated due to the treatment's side effect profile; which could also increase mental health patients' vulnerability to COVID-19.<sup>76</sup>

In a recent survey done by the Royal College of Psychiatrists (RCPsych), 43% of psychiatrist reported an increase in emergency cases, despite seeing a 45% decrease in their routine appointments.<sup>77</sup> Professor Wendy Burns, president of RCPsych in her statement<sup>77</sup> stated:

*“Our fear is that the lockdown is storing up problems which could then lead to a tsunami of referrals”.*

COVID-19 might not just lead to increased incidences of mental health disorder; it can also exacerbate existing conditions in current mental health patients and unmask existing symptoms in those without a current mental health diagnosis. Patients' reluctance to seek help during the current pandemic, coupled with the reduced availability for routine appointments, can lead to a 'tsunami of referrals' post-lockdown - a situation that can easily overwhelm an overstretched and underfunded mental health service.<sup>77 78</sup> This is further exacerbated by reduced provisions for services deemed "non-essential" in treating the acute medical problem, like mental health services in outbreak response.<sup>59</sup> Without timely and adequate interventions, the compromised mental health system might not be able to cope with the potential surge in demand, as in HK during the SARS outbreak.<sup>79</sup>

### **COVID-19 - The Perfect Vector**

Anxiety, anger, and stress are normal reactions to extremely adverse events such as the COVID-19 pandemic.<sup>80</sup> For this reason, it is important that early mental healthcare intervention is provided to prevent progression into longer-term psychiatric conditions, such as PTSD. The psychological needs of the population needs to be part of the public health response.<sup>80</sup>

As discussed, infected individuals are more likely to face severe psychological crises and secondary trauma after the disaster, a fact that must be taken into account when devising treatment strategies for COVID-19 patients. Efforts must be focused on identifying vulnerable populations, such as those with pre-existing mental health conditions, healthcare workers, and family of affected individuals.<sup>16</sup> Establishing key target groups during the initial stage of the outbreak, where the burden on services is significant and resources are scarce,

allows for efficient and optimal use of limited resources.<sup>81</sup> Providing precise and clear information regarding measures that enhance individuals' perceived control over the threat may help engender coping methods that limit anxiety.<sup>19 29 30</sup> Specific measures should also be taken to ensure that the psychological needs of quarantined or isolated individuals are accounted for.

Mental health services should brace themselves for the "*mental health tsunami*"<sup>77</sup> in the months, and potentially years to come, as the question of a secondary mental health epidemic is not a matter of whether it will happen, but rather, to what extent will it happen. The concept of "flattening the curve" in response to COVID-19 cases has been repeated by Prime Minister Boris Johnson on multiple occasions<sup>82</sup>; similarly, steps should also be taken to account for the mental health impacts of COVID-19 as part of the curve which needs to be flattened, as to not overwhelm, our already overstretched, mental health services.

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INH conceived of the project and developed the initial draft. BD contributed with the management of references and refinement of writing for the initial draft. SG, JS, and GT contributed to the revision and refinement of the writing. All authors read and approved the final manuscript.

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