



Psychosocial Correlates of Outbreak Response Activities: A Supplemental Literature Report

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INTRODUCTION: *This report was developed in partnership with Seattle University to support ongoing 2020 COVID-19 response efforts at the Washington State Department of Health and other public health agencies in the region. As a supplement to the daily Literature Reports created at the Department of Health on the ever-evolving scientific literature related to COVID-19, this report provides a review of current and historical literature on the psychosocial effects of large-scale outbreak response. This report includes a brief overview of the literature followed by an extended annotated bibliography.*

OVERVIEW OF THE LITERATURE

In reviewing historical literature on previous outbreaks of emerging diseases and recent reports from the 2020 COVID-19 outbreak, clear patterns emerge around the psychosocial impacts of large-scale outbreak response. The implications for healthcare workers, people under quarantine, and especially vulnerable populations are highlighted across disciplines, with public health, psychology, and social science researchers coming to the same conclusions: stress, anxiety, fear, and depression, among other psychological effects, are not only common, but can and should be anticipated. These effects are seen strongly among those with direct relationships to the disease in question and among people who have direct contact. Others may experience these symptoms after vicarious exposures through media and government communications. Researchers almost unanimously call for increased preparedness for community and occupational mental health support structures during crises like the 2020 COVID-19 outbreak. To better prepare the global community for short and long-term psychosocial effects of this and future outbreaks, it is critical that we leverage the knowledge gained from prior response efforts.

Lessons from previous outbreaks

Prior research on psychosocial effects of quarantine associated with global pandemics, such as those associated with SARS and MERS, indicates an association between quarantine and higher distress, anxiety, and PTSD symptoms.^{4, 5, 7, 10, 18} Longer quarantine periods have been linked to more severe PTSD symptoms.⁷ High-risk populations include homeless individuals, run-away youth, unauthorized or undocumented immigrants, and minorities whose ethnicity matches the disease's country of origin.²³ Healthcare workers (HCW), especially nurses, are also at particularly elevated risk of poor mental health outcomes and would benefit from both pre- and post-event mental health interventions.^{7, 10} Loss of income has also been cited as a major social impact of quarantine, whether voluntary or involuntary.^{5, 10}

Contributors to negative psychosocial effects of global pandemics include: lack of knowledge about the situation, limited understanding of rationale, the absence of regular communication or unclear communication from officials, and lack of reinforcement from supporting agencies.⁷ These factors may also explain noncompliance with quarantine measures.^{7, 10, 18, 23} While it may seem intuitive that involuntary quarantine would create greater distress than voluntary self-quarantine, both have mixed results in terms of mental health.^{7, 25, 29} For example, Yoon et al.²⁹ noted that those involuntarily quarantined felt more confident in the measures taken by their government. Cultural differences likely play a major role in the generalizability of these studies.

It is essential that psychosocial impacts and the restriction of civil liberties that can be associated with quarantine practices be taken into consideration when preparing for and responding to global pandemics.^{3, 14, 23} When quarantine is deemed a necessary step in outbreak response, government leaders should maintain constant and clear communication with community members, health care workers, the media, and all those affected by the outbreak to limit the psychosocial effects.

Current reports from China and other countries most affected by COVID-19

In the early days of China's response to the COVID-19 outbreak, leaders recognized the behavioral health impact of the outbreak and response efforts on citizens.¹⁷ In Japan, COVID-19 was seen as yet another "unseen" threat, like radiation, contributing to cumulative trauma.²¹ China, South Korea¹⁶ and Japan²¹ all implemented interventions to attempt to address psychological distress in their populations at large and for their healthcare providers in particular, each taking different approaches.

Across these countries, citizens reported concerns about becoming infected, stigma associated with COVID-19, symptoms of anxiety and depression, insomnia, engaging in avoidance behaviors, increased hygiene behaviors, and worries about accuracy of information about the disease.^{9, 13, 28, 22} These were particularly prevalent in Wuhan, the epicenter of the outbreak.¹⁷ Meanwhile, despite wanting more

communication about the outbreak from official sources, evidence suggests that those who spent over 3 hours a day focusing on COVID-19 had increased anxiety.²⁸ Citizens over 80 years old and those with disabilities were also identified as particularly vulnerable due to their frequent social isolation, higher risk of death due to infection, and lack of access to the online and technical resources available to younger citizens.²⁷ It was also determined that healthcare workers' vulnerability to increased anxiety and depression may be exacerbated by underlying mental health issues²⁸, female sex²², balancing family obligations with work^{9,22}, concern about becoming infected, close contact with infected patients^{9,28,22}, worry about isolation and stigmatization by family and friends⁹, and having family who are suspected of or confirmed as being infected.²⁸ These effects of these risk factors can all be amplified by lack of social support.²²

Strategies being Used in China and Other Affected Countries

- Development and utilization of online psychological resources¹³
- Tele-health utilization by psychological care providers^{9,13,26}
- Messaging that is clear, honest, and provides detailed information about the virus and ways to mitigate risk of infection^{17,21}
- Information and education on hygiene and social distancing^{17,9}
- Counteracting rumors and misinformation^{17,9,13}
- Hotlines with trained volunteers⁹
- Access to leisure activities which can be enjoyed while in isolation, including book clubs and chat rooms⁶
- Direct outreach to older citizens and those with disabilities who may have less access to or facility with technology²⁷
- Structured written communication between concerned people and mental health providers²⁶

Interventions Reported to be Helpful for Healthcare Workers with COVID-19

- Treating infection with COVID-19 as a work related injury⁹
- Rotating shifts in terms of higher and lower pressure roles⁹
- Increasing access to accurate training and information on how to mitigate risk of transmission^{9,6}
- "Reasonable" work shifts²²
- Comfortable accommodations for staff who must remain in hospitals
- Access to adequate PPE and training on how to safely don and doff⁶
- Adequate sleep²²
- Help with patient care in the hospital from hospital administrators²²
- Access to mental health providers and consultation as requested^{6,22}
- Training and assistance in working with patients who are uncooperative or exhibit agitated or aggressive behaviors⁶
- Learning relaxation techniques and physical exercise^{6,22}
- Social support²²

Preparing Communities at Large to Reduce Mental Health Effects

Evidence from the past several global pandemics suggests several potential methods for mitigating psychosocial effects among those under quarantine during a public health crisis, including financial support for lost wages, access to childcare, and supporting increased connection to loved ones through telecommunications.^{6,26,13} For both the population at large and those quarantined, clear and regular communication from officials^{7,9,13,17,18,21} and providing access to psychological services^{6,13,26,29} are strongly evidence-based approaches for supporting population and individual psychosocial wellbeing which should be prioritized by public health and government officials early and consistently.

ANNOTATED BIBLIOGRAPHY

1. Barbera, J., Macintyre, A.; Gostin, L., Inglesby, T., O'Toole, T., DeAtley, C., Tonat, K., & Layton, M. (2001). Large-scale quarantine following biological terrorism in the United States: Scientific examination, logistic and legal limits, and possible consequences. *American Medical Association, JAMA* 286 (21), pp. 2711-2717. doi:10.1001/jama.286.21.2711
 - There are moral and ethical questions about how quarantines challenge civil liberties. In the decision to invoke quarantine, the authors raise 3 key questions: 1) Do public health and medical analyses warrant the imposition of the large scale quarantine? 2) Is the implementation and maintenance of large-scale quarantine feasible? 3) Do the potential benefits of large scale quarantine outweigh the possible adverse consequences?
 - They conclude that evidence-based outbreak response should ensure the public is provided with accurate and accessible behavioral guidelines to help maximize overall reliability and compliance with public health recommendations.
2. Barbisch, D., Koenig, K. L., & Shih, F. (2015). Is there a case for quarantine? Perspectives from SARS to Ebola. *Disaster Med Public Health Preparedness*, 9(5). doi:10.1017/dmp.2015.38
 - Restrictions associated with quarantine limit personal freedoms. A risk-benefit analysis is necessary in managing the appropriate level of quarantine. Several examples of unintended consequences of quarantine from a 2003 SARS outbreak in Taipei are described. The authors developed a graphic decision tree to assist public health officials and policy makers.
3. Bensimon, C. M. & Upshur, R. E. G. (April 2007). Evidence and effectiveness in decision-making for quarantine. *American Journal of Public Health*. Online publication. <https://doi.org/10.2105/AJPH.2005.077305>
 - Authors conclude that evidence for using medical quarantine based on its effectiveness cannot be justified. Some suggestions include giving a voice to non-technical perspectives (seeking out qualitative data) on the effects and experiences of those affected by quarantine.
4. Brooks, S. K., Dunn, R., Amlôt, R., Rubin, G. J., & Greenberg, N. (2018). A systematic, thematic review of social and occupational factors associated with psychological outcomes in healthcare employees during an infectious disease outbreak. *Journal of Occupational & Environmental Medicine*, 60(3), pp. 248–257. <https://doi-org.proxy.seattleu.edu/10.1097/JOM.0000000000001235>
 - Health care providers who underwent quarantine reported feeling: stigmatization; reluctance to work or considering resigning; deterioration of work performance; PTSD symptoms; higher alcohol intake; and physiological stress when feeling as though friends, family, or co-workers were treating them differently.
 - The longer an individual was in quarantine, the more anger and avoidance behaviors were demonstrated
 - Distress positively correlated with lack of trust in equipment or infection control procedures, belief that training was inadequate, perception of greater personal disease-related risk, being directly involved with patient care (particularly nurses), and being involuntarily deployed to high-risk

environments. Distress was negatively correlated with confidence in infection control knowledge and skills and volunteering for high-risk environments

- The authors suggest approachable communication style with regular updates from management; specialized training for all staff, including psychological coping skills; and web-based support groups
5. Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (February 2020). The psychological impact of quarantine and how to reduce it: A rapid review of the evidence. *The Lancet*. Online publication. DOI: [https://doi.org/10.1016/S0140-6736\(20\)30460-8](https://doi.org/10.1016/S0140-6736(20)30460-8)
 - There are negative psychological impacts of quarantine that must be considered in addition to the public health benefits. Studies on SARS, Ebola, the 2010 H1N1 influenza, MERS, and Equine influenza examined psychological outcomes for those who were quarantined compared to those who were not. Reported symptoms among those quarantined included psychological distress, fear, exhaustion, PTSD, depression, irritability, and emotional disturbance among other symptoms.
 - Specific stressors *during* quarantine periods included duration, fears of infection, frustration/boredom, inadequate supplies, and inadequate information.
 - Specific stressors *post* quarantine: finances and stigma.
 - Suggestions for reducing quarantine consequences include providing the public with accurate data for reasons behind quarantine and supporting healthcare workers.
 6. Chen, Q, Liang, M., Li, Y et. al. (February 2020). Mental Healthcare for medical staff in China during the COVID-19 outbreak. *The Lancet*. Online publication. [https://doi.org/10.1016/S2215-0366\(20\)30078-X](https://doi.org/10.1016/S2215-0366(20)30078-X)
 - Mental health services for healthcare workers were quickly established for 5 large healthcare organizations. These included psychologist teams and online support. However, staff requested support in terms of working conditions before accepting psychological support.
 7. Hawyrluck, L., Gold, W. L., Robinson, S., Pogorski, S., Galea, S., & Styra, R. (2004). SARS control and psychological effects of quarantine, Toronto, Canada. *Emerging Infectious Diseases*, 10(7), pp. 1206–1212. <https://doi.org/10.3201/eid1007.030703>
 - A survey was administered to 129 people (including health care workers) who were quarantined in Toronto during the SARS outbreak. Psychological distress, such as feelings of anxiety and isolation, PTSD, and depressive symptoms were common, although no formal diagnoses were made in this study. PTSD symptoms were associated with longer quarantine duration, lower income, and knowing someone who was infected with SARS.
 - The authors suggest that a lack of knowledge, inadequate reinforcement by an overwhelmed public health system, and incomplete understanding of the rationale for quarantine may contribute to mental health distress among quarantined persons. Around 50% of respondents felt they had not received sufficient information about at least one aspect of their quarantine instructions.
 8. Hull, H. F. (2005). SARS control and psychological effects of quarantine, Toronto, Canada. *Emerging Infectious Diseases*, 11(2), pp. 354–355. <https://doi.org/10.3201/eid1102.040760>
 - Hull critiques Hawyrluck et al. (above), stating that “...although isolation and quarantine are stressful, that is an insufficient reason to hesitate when these measures are indicated.” The authors’

response emphasizes that while psychological effects of quarantine were noted, they do not give sufficient reason to refrain from using quarantine if necessary.

9. Kang, L., Li, Y., Chen, M., Yang, C., Yang, B.X., Wang, Y., Hu, J., Lai, J., Ma, X., Chen, J., Guan, I., Wang, G., Ma, H., & Liu, Z. (2020). The mental health of medical workers in Wuhan, China dealing with the 2019 novel coronavirus. *Lancet Psychiatry*, 7(3), PE14. [https://doi.org/10.1016/S2215-0366\(20\)30047-X](https://doi.org/10.1016/S2215-0366(20)30047-X)
 - Healthcare workers in Wuhan have been facing enormous pressures, including: transmission rates, inadequate protection from contamination, overwork, and exhaustion. This is resulting in mental health issues such as stress, depression, fear, denial, and anger.
10. Kavanagh, A. M. Mason, K. E. B., Studdert, R. J., McVernon, D. M. Fielding, J., Petrony, J. E., Gurrin, S., LaMontagne, L., & Anthony, D. (2012). Leave entitlements, time off work and the household financial impacts of quarantine compliance during an H1N1 outbreak. *BMC Infectious Diseases*, 12 (311). <https://doi.org/10.1186/1471-2334-12-311>
 - Many of the infections during the 2009 H1N1 outbreak in Australia were among school-aged children, leading to school closures, enforced home-quarantine, and social-distancing measures.
 - About half of all the households were fully compliant with the quarantine recommendations.
 - Authors recommend that employers should provide flexible work arrangements and compensation for individuals, especially parents, who may experience additional financial strain.
11. Ko, C., Yen, C., Yen, J., & Yang, M. (2006). Psychosocial impact among the public of the severe acute respiratory syndrome epidemic in Taiwan. *Psychiatry & Clinical Neurosciences*, 60(4), pp. 397–403. <https://doi.org/10.1111/j.1440-1819.2006.01522.x>
 - About 1,500 participants were randomly recruited for a survey after the 2003 SARS outbreak in Taiwan. Due to the alienation that accompanies quarantine, affected individuals reported significantly higher levels of depression and encountered more economic difficulties.
 - Social support, self-perceived health conditions, taking precautionary measures, and clear disease information were protective factors for exposed patients or healthcare workers.
 - The authors suggest a mandatory and holistic approach to a mental health intervention program after an epidemic disaster.
12. Lanard, J., & Sandman, P. M. (February 23, 2020). Past time to tell the public: "It will probably go pandemic, and we should all prepare now." *Virology Down Under*. <https://virologydownunder.com/past-time-to-tell-the-public-it-will-probably-go-pandemic-and-we-should-all-prepare-now/>
 - The authors discuss the benefits and risks of different communication styles from government entities during the COVID-19 outbreak.
13. Liu, S., Yang, L., Zhang, C. et al. (February 2020). Online mental health services in China during the COVID-19 outbreak. *The Lancet*. Online publication. [https://doi.org/10.1016/S2215-0366\(20\)30077-8](https://doi.org/10.1016/S2215-0366(20)30077-8)

- This survey reveals significant levels of depression, anxiety and insomnia among Chinese citizens. The author believes that strategies like offering online counseling by professional mental health providers, online self-help using Cognitive Behavioral therapies, and using Artificial Intelligence programs to recognize and identify people at suicidal risks may all improve the efficacy of emergency response going forward.
14. Maunder, R., Hunter, J., Vincent, L., Bennett, J., Peladeau, N., Leszcz, M., Sadavoy, J., Verhaeghe, L. M., Steinberg, R., & Mazzulli, T. (2003). The immediate psychological and occupational impact of the 2003 SARS outbreak in a teaching hospital. *CMAJ: Canadian Medical Association Journal*, 168(10), 1245.
- Different groups experienced different psychological effects of the 2003 SARS outbreak. SARS patients reported feelings of guilt and anger, fear for the welfare of their friends and family, and possible loss of income. Infected healthcare workers were concerned about the risk to the staff in charge of their care. Uninfected healthcare workers expressed fear of being infected and then infecting their family members. Asian patients, even ones without SARS, reported stigmatization due to their race and the virus's connection to China.
 - The authors suggest hospital responses to infectious outbreaks should include clear communication, sensitivity to individual responses to stress, a collaboration between disciplines, authoritative leadership, and provision of relevant support.
15. Mowbray (February 2020). Letter from China: covid-19 on the grapevine, on the internet, and in commerce. *The BMJ*, 368(516). Online publication. <https://doi.org/10.1136/bmj.m643>
- Mowbray describes misinformation circulating in China about prevention, testing, and treatment of COVID-19 in the absence of evidence-based answers from both Chinese and Western medicine.
16. Park, S.C, and Park, Y.C. (2020). Mental health care measures in response to the 2019 novel coronavirus outbreak in Korea. *Psychiatry Investigation*, 17(2), pp. 85 - 86. <https://doi.org/20.30773/pi.2020.0058>
- The authors describe psychological stress of Korean citizens under quarantine. The authors agree with three factors as part of the mental health response that were proposed by their Chinese colleagues: multidisciplinary mental health teams, clear communication with regular and accurate updates on COVID-19, and establishment of secure ways to provide support via electronic and apps.
17. Qian et al. (Feb 20, 2020). Psychological responses, behavioral changes and public perceptions during the early phase of the COVID-19 outbreak in China: a population based cross-sectional survey. *MedRxiv*. Online publication. <https://doi.org/10.1101/2020.02.18.20024448>
- In this cross-sectional study with 510 persons from Wuhan and 501 persons from Shanghai, participants completed phone interviews about symptoms of anxiety and behavior changes related to COVID-19, such as increased hand washing, use of masks, and avoidance of going out. Citizens in Wuhan reported significantly greater symptoms of moderate to severe anxiety than those in Shanghai (major city with transportation ties to Wuhan). Perception of risk and severity of disease were positively associated with behavior change, and enhanced by governmental enforcement and messaging. However, confusion about the accuracy of information provided led to increased anxiety.

18. Reynolds, D. L., Garay, J. R., Deamond, S. L., Moran, M. K., Gold, W., & Styra, R. (2008). Understanding, compliance and psychological impact of the SARS quarantine experience. *Epidemiology and Infection*, 136(7), pp. 997–1007. <https://doi.org/10.1017/S0950268807009156>
- The authors suggest health officials use methods to quickly deliver information about protective measures and why quarantine is important
 - Most participants in this survey reported not fully complying with all household protective measures, with about half following community protective measures and few complying with all household measures. The most difficult measure to comply with was not going out to visit friends and family.
 - While most participants reported boredom, isolation, and frustration during quarantine, longer quarantine and compliance with quarantine requirements were significant contributors to PTSD symptoms. Roughly one in four participants reported loss of household income.
19. Sandman, P. M. (January 17, 2005) Adjustable reactions: The teachable moment in crisis communication. Blog entry. *Risk = Hazard + Outrage: The Peter Sandman Risk Communication Website*. <http://www.psandman.com/col/teachable.htm>
- The authors describe the steps of psychological adjustment to crisis and explore the reaction by characteristics of temperament and timing, suggesting that common responses such as gathering information, personalizing the risk, and taking unnecessary precautions serve as “rehearsal” for getting individuals ready to respond. They recommend understanding that these reactions are normal, and to partner with individuals to better guide them.
20. Sandman, P. M., & Lanard, J. (March 15, 2007). What to say when a pandemic looks imminent: Messaging for WHO phases four and five imminent pandemic standby messages. Blog entry. *Risk = Hazard + Outrage: The Peter Sandman Risk Communication Website*. <http://www.psandman.com/col/teachable.htm>
- The authors recommend a sequenced approach to risk messaging, starting with providing early information and moving on to preparing to increase a sense of efficacy, acknowledging that there is uncertainty, providing some specific ways for individuals to help themselves and their communities, and offering additional information on a regular basis.
21. Shigemura, J., Ursano, R. J., Morganstein, J. C., Kurosawa, M., & Benedek, D. M. (February 2020). Public responses to the novel coronavirus (2019-nCoV) in Japan: Mental health consequences and target populations. *Psychiatry and Clinical Neurosciences*. Online publication. <https://doi.org/10.1111/pcn.12988>
- In Japan, economic and social impacts have been reported related to COVID-19, including increased public anxiety and some social stigmatization. The authors believe that COVID-19 adds to previous traumatic events in Japan involving frightening unseen agents, including the Sarin attack, pandemic H1N1, and radiation release from the Fukushima event
22. Siyu, C., Xia, M., Wen, W. et al. (February 2020). Mental health status and coping strategy of medical workers in China during the COVID-19 outbreak. *MedRxiv*. Online publication. <https://doi.org/10.1101/2020.02.23.20026872>

- Psychological protective factors include exercise, access to sufficient PPE, reduced rate of nosocomial infection, reasonable shifts, and comfortable accommodations for staff. Additionally, hospital, department, and ward based care provided by hospital and department administrators were protective for acute stress, depression, and anxiety.
23. Sundwall, D. N. (2019). Quarantine in the 21st century: To be effective, public health policies must be inclusive. *American Journal of Public Health, 109* (9), pp. 1184-1185
<https://doi.org/10.2105/AJPH.2005.077305>
- The author recommends inclusive policy changes for quarantine, e.g. “the creation of safe harbors,” employment protection and income relief, revising state law-making regulations to be more effective and inclusive, and educational campaigns to raise general public awareness of the importance of following quarantine requirements. They also identify groups who may be less likely to comply with quarantine requirements, such as those experiencing homelessness.
24. The Substance Abuse and Mental Health Services Administration (2014). Taking care of your behavioral health: Tips for social distancing, quarantine, and isolation during an infectious disease outbreak. Author. *HHS Publication No. SMA14-4894*. <https://store.samhsa.gov/system/files/sma14-4894.pdf>
- In this resource sheet, SAMHSA lists out information about social distancing, quarantine, and isolation; typical reactions to expect in outbreaks that require quarantining; ways to support individuals during social distancing; experiences after social distancing; and helpful resources.
25. Wang, Y., Xu, B., Zhao, G., Cao, R., He, X., & Fu, S. (2011). Is quarantine related to immediate negative psychological consequences during the 2009 H1N1 epidemic? *General Hospital Psychiatry, 33*(1), pp. 75 - 77.
- This study examined the relationship between quarantine and immediate negative psychological impacts at a Chinese university during the 2009 H1N1 outbreak.
 - Researchers concluded that there was no significant difference in symptoms of PTSD and general mental health between the groups who were and were not quarantined, though those who were dissatisfied with the control measures or who perceived hazard to their health demonstrated worse psychological symptoms than those who did not.
 - Findings were inconsistent with some prior literature; however, long-term psychological effects on quarantine groups were not evaluated nor were data broadly representative of the general population. The authors advise against concluding that quarantine has no connection to negative psychosocial effects, emphasizing the importance of specific circumstances.
26. Xiao, C. (2020). A novel approach of consultation on 2019 novel coronavirus (COVID-19)-related psychological and mental problems: Structured letter therapy. *Psychiatry Investigation, 17*(2), pp. 175 - 176. <https://doi.org/10.30773/pi.2020.0047>
- The author describes the difficulties of accessing timely psychological intervention during the COVID-19 outbreak, particularly when patients are under quarantine. He suggests a potential method to address this issue via what is described as Structured Letter Therapy.

27. Yang, Y., Li, W., Zhang, Q., et al. (February 2020). Mental health services for older adults in China during the COVID-19 outbreak. *The Lancet*. Online publication. [https://doi.org/10.1016/S2215-0366\(20\)30079-1](https://doi.org/10.1016/S2215-0366(20)30079-1)

- Online mental health services are available, but older individuals have limited access and knowledge to take advantage of these resources. The author also notes very long wait times for these patients to access direct mental health care. He suggests more attention be paid to these vulnerable members of society.

28. Yeen, H., & Zhao, N. (February 2020). Generalized anxiety disorder, depressive symptoms and sleep quality during COVID-19 epidemic in China: A web-based cross-sectional survey. *MedRxiv*. Online publication. <https://doi.org/10.1101/2020.02.19.20025395>

- The authors recommend increased focus on vulnerable populations and for healthcare workers to limit time spent focused on COVID-19 to less than 2 hours daily, avoid rumors and emphasize facts, exercise to improve sleep quality, and avoid reminders of the epidemic prior to sleep.

29. Yoon, M., Kim, S., Ko, H., & Lee, M. (2016). System effectiveness of detection, brief intervention and refer to treatment for the people with post-traumatic emotional distress by MERS: a case report of community-based proactive intervention in South Korea. *International Journal of Mental Health Systems*, 10 (51). Online publication. <https://doi.org/10.1186/s13033-016-0083-5>

- During the 2015 MERS outbreak in South Korea, the province of Gyeonggi was fully quarantined. Among 6,157 citizens surveyed, 19.6% demonstrated emotional difficulties (e.g., depression), 71.3% received one counseling service, and 28.7% sought ongoing counseling services. Of those requiring ongoing counseling, only about 10% were contacted by the national service providers, suggesting that despite increased need, traditional hospital systems and medical facilities were not equipped to respond. The authors called for improved psychological care referral programs and preparedness, recommendations with international relevance.

Please direct questions to about this report to:

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