Summer Training Report

By

Joshua Jacinth T. P.

0919

MBA (Hospital and Health Management)

2019-21

IIHMR UNIVERSITY

Acknowledgements

First and foremost, I would like to give thanks to God Almighty for keeping me safe and sound during this pandemic. I would like to thank my mentor Dr. Sunil Rajpal, for understanding my situation and guiding me to complete this article in a very short time. Without his suggestions and his instructions this article would have not being completed in time.

I would like to thank my parents, friends and seniors who have helped me with their suggestions during various phases of the completion of article.

Table of Contents

Acronyms/Abbreviations

COVID -19	Coronavirus Disease of 2019
CTQ	Critical-to-quality
DMAIC	Define-Measure-Analyse-Improve-Control
EU	European Union
MERS	Middle East Respiratory Syndrome
MoHFW	Ministry of Health and Family Welfare
NHC	National Health Commission
PFA	Psychological First Aid
PHEIC	Public Health Emergency of International Concern
PTSD	Post-traumatic Stress Disorder
SARS	Severe Acute Respiratory Syndrome
UK	United Kingdom
USA	United States of America
WHO	World Health Organisation

PART-1

"Containments and Restrictions amidst COVID-19 Pandemic: Assessing Potential Impact on Mental Health"

Introduction:

China witnessed a huge outbreak in late December 2019 which presented symptoms similar like the Severe Acute Respiratory Syndrome (SARS) known to be a novel coronaviral disease, COVID-19. A cluster of 41 patients suffering from mysterious pneumonia, all of them someway connected to a seafood market in Wuhan[1,2]. The pathophysiology of the disease is that the symptoms appear after 15-20 days whereas these hosts can be walking carriers of the virus. This allowed COVID-19 to spread to multiple people and even across national and international borders via the means of transport[3]. Indonesia, Thailand, South-Korea, Iran, Italy, India, USA etc. (death rate=3.4%, number of cases worldwide = 12.6million, India= 8,78,254). As it is a viral disease, it proved more fatal in immunocompromised patients and older adults and countries with large amount of old age populations suffered the most[4]. Two weeks into the discovery of the disease cases popped up outside of China in Thailand and few days later by the end of January it spread to India, Korea, and Japan at a factor of 100 to 200 times[5]. By 24th of January first confirmed coronavirus cases were found outside of Asia in Italy through a Chinese traveller[6]. Seeing the faster spread of the disease WHO declared 2019 COVID-19 outbreak as Public Health Emergency of International Concern (PHEIC) and on 11th March WHO declared COVID-19 as a pandemic[7]. In France the first case of COVID-19 was confirmed which was later understood that it was spread locally and continued to spread so much that by mid-March of 2020 there were 36000+ cases in Europe making Europe as an active centre of the pandemic[8]. By the end of January COVID-19 hit the United States of America (USA) and the U.S. also declared a public health emergency after WHO. Italy overtook China as the country with the most deaths and USA had overtaken China and Italy with the highest confirmed cases in the world by the end of March[9]. The virus spread to every continent except Antarctica and almost every nation was under lockdown. Social distancing, sanitizing and hand washing practices were advised by many authorities and governments and face mask was made compulsory in some[10]. This shows the magnitude of the outbreak and by the end of March COVID-19 spread to 189 countries or territories, infecting more than 334,000 people, and claiming lives of more than 14,500[11]. Due to the novelty of the virus options for treating the disease were thinning out and no known therapies were helping. Authorities understood the only way to tackle this disease is to avoid contracting the disease and control the spread of the disease[12].

To keep the disease form rapidly spreading limited or no social interaction was preferred by many country governments after WHO instructed every nation to follow hand sanitisation, social distancing and covering the face with mask to avoid contracting the virus[13]. As the cases continue to increase countries had different approaches to curb the spread of the pandemic, by forcing containment measures such as lockdowns, quarantines, and curfews. From 1.7 billion people on 26th March worldwide to 3.9 billion people by the first week of April which was more than half of the world's population. 300 million in US, 59 Million in South Africa and 1.3 billion in India were under lockdown making this the largest in history[14]. On January 23rd China announced a countrywide lockdown and cancelled the new year celebrations. Interprovince bus and railway services were shutdown. By the end of January Chinese provinces implemented the curfew laws. Passengers who travelled between provinces from January 1st were screened and quarantined if necessary, in specialty hospitals and quarantine centres. All educational institutes, factories and workplaces were shut down. Only one member of the family could go buy essential goods every 2 days. All factories and workplaces were shut down and all non-residents and non-locals were strictly screened. All international and domestic travel was kept on hold[15]. As a response to China closing their international borders India has to bring their citizens who were stuck in China and evacuated 647 people including citizens of Pakistan, Maldives and Bangladesh and closed its international borders on 16th March as a precautionary measure[16]. The following day Government of India urged all its citizens to follow social distancing measures to prevent spread of the disease, eventually India went into a complete lockdown on 22nd March after the rapidly growing number of cases shutting down all public means of transport and advising states to close their borders[17]. Italy was the first EU country to take precautionary measures as the disease had reached to all regions of Italy. Quarantine was enacted on 8 March 2020 by Prime Minister Giuseppe Conte in north Italy in 15 northern provinces, to all of Italy on the following day with more than 60 million people and shutting down all non-essential businesses and restricting movement[18]. Whereas in Spain only a state of alarm was declared which placed all citizens under quarantine and closing all non-essential businesses and allowing citizens to go outside only for groceries and walking their pets[19]. UK introduced a three-week lockdown from 24th March, banning public gatherings and closing non-essential businesses[20]. Similar lockdown strategies were implemented in US, Russia, and Argentina. New Zealand introduced lockdown in 4 levels for 4weeks shutting down international borders, educational institutes and all non-essential businesses except supermarkets, petrol stations and healthcare centres[21].

Previous epidemiological models suggested the restriction of movement key to prevent spreading of the virus initially[22]. But this came at a big cost, jeopardizing economies along with additional damage to wellbeing of the people (joblessness, social distancing have led to home isolation) a sense of lack of freedom has emerged in people. These collectively made an impact on

mental health of the people[23]. The duration of the lockdown was not disclosed as no one would know how many days it would take to completely drive out the infection. This created a panic in peoples mind as they feared they would run out of food and basic amenities this resulted in panic buying. People's social circle was restricted to their families and some people were stranded in other places because the travel was restricted. The growing cases and deaths created a fear in people's mind of contracting the disease or their loved one. This resulted in restlessness, insomnia, anxiety and even depression[24]. The lockdown was a good option but was not orchestrated in a strategic way – the authorities have taken care of essential good distribution so that everyone can buy their goods but failed to address the mental health of the people under lockdown[25]. This is a very important fact that prolonged loneliness and limited social interaction would damage the mental health. People were finding difficult to cope with this. Separation from loved ones, the loss of freedom, uncertainty over disease status, and boredom can, on occasion, create dramatic effects.

Social isolation is a state of being totally or completely out of reach between themselves and society. Its not the same as loneliness where it reflects temporary and unbeknownst lack of contact with other people. Social isolation is not restricted to an age group it can be experienced by people of any age, but it manifests differently by age group. Social isolation can include stay-at-home for long time, not talking to family, friends, and/or avoiding any contact with others consciously even when an opportunity to socialise with others exists[26]. Isolation is one of the established factors which cause psychological problems. Although all humans of different age groups are vulnerable to develop negative mental effects when kept under isolation the most effected are children and adolescents, minority groups, older adults, low socio-economic groups, females, and people with diagnosed mental health conditions[27]. Unexpected changes to the usual way of life can make people feel unsafe and anxious. Feeling unsafe can be associated with the fear of contracting a disease during a pandemic[28]. Social isolation during quarantine can be catalyst and add to the negative mental health effects even for normal healthy people. These can include acute stress disorders, irritability, insomnia, emotional distress, and mood disorders, including depressive symptoms, fear and panic, anxiety and stress because of financial concerns, frustration and boredom, loneliness, lack of supplies and poor communication[29]. The longer a person spends in confinement in quarantine the worse the mental health outcomes; symptoms of post-traumatic stress disorder (PTSD), avoidance behaviour and anger, may be seen specifically. Thus, indicating that quarantine itself can be perceived and experienced as a traumatic event. Some of the other factors include decreasing supply of food, medicine, and restrictions on daily routine[30]. Another effect of a pandemic is the growing stigma that a person who completely cured of the disease would still transmit the disease and stigma towards healthcare workers. Discrimination acts towards people who belong to an ethnic or descent from where the disease spread. This varies from country to country but mostly people with Asian descent were a target in many countries[31].

This unprecedented Crisis has brought everyone under some type of mental stress and likely causing negative mental health effects on the people in lockdown. This paper highlights the association of isolation on mental health and discusses how integral is mental health, during policy level and administrative level planning and implementing lockdown procedures.

Objectives:

1. To understand the association of lockdown on mental health and scale of its impact.
2. To understand administrative level policy response to the containment and mental health in different countries of interest.

Methodology:

Computerized literature searches were performed using the Google Scholar (2011-2020). Research articles and were searched using the search terms "COVID-19, corona virus, pandemic, lockdown, mental health, psychological evaluation, psychological effects". The same was done to evaluate different countries by adding names of countries to the keywords. Some articles were also identified by reading reference lists of published review. Inclusion criteria were the following: articles had to consider, in a scientifically valid manner, primary research articles were chosen and review articles. The exclusion criteria were articles which did not contain any information about psychological wellbeing. Articles that were duplicates of the same authors' other published studies were also excluded; the most representative of the studies was included for further consideration. Initial screening of the articles that were identified was based on their abstracts. The selection of the relevant articles was based on the information obtained from those abstracts, which gave some expectation that inclusion criteria would be met. Full-text articles that were obtained for closer inspection were again evaluated independently and made the final decision on whether an article should be included in the study. Abstracts and full-length papers were examined by the same criteria.

Observations:

Mental stress in the pressure brought to bear on the existing mental balance or emotional equilibrium of any person; the symptoms of mental stress will most commonly be exhibited when the demands of a situation are seen as exceeding the personal resources that the individual can bring to bear on them at that moment. Stress is a different psychological condition compared to anxiety, it is a feeling of lack of control over the future circumstances of one's life, its usually related to the pending present event[32]. This situation is experienced by every one of us at some point of time quite surely in this global crisis. The present world scenario where everyone is at a constant fear of contracting a virus and obeying social distancing and social isolation orders there is a high possibility of its effect on mental health[33]. It is now established that self-quarantine or lockdown be taken as an issue of healthcare globally and the society. It is the foremost public health concern not only in elder population and individuals with known history of mental illness but also normal healthy human beings with no known mental health disturbances[34]. Researchers from around the world conducted studies in the form of surveys to know and understand the effects of lockdown and social isolation on psychology of human beings.

A study conducted by Giuseppe Lippi et.al. concluded that stay-at-home orders may be associated with side effects like anxiety, stress, depression, insomnia especially when lockdowns are extended to months. This disturbs the individual's social habits and personal health[35,36]. Most reviewed studies about the impact of quarantine on psychology has several negative effects including post-traumatic stress symptoms, anger and frustation[37]. The factors include longer quarantine time, fear of infection, frustration, boredom, depleting resource supplies, insufficient information, financial loss, and stigma[38]. Similar study by Brooks et.al., 2020 suggests that prolonged confinement to loneliness increases anxiety, anger, confusion, and PTSD[39]. So, there is established evidence that prolonged confinement and social isolation has detrimental effects on one's mental health. The other two players which act as catalyst for these effects are fear and stigma. WHO, 2020c stated that fear is the breeding ground for hatred and stigma[40]. As this virus originated from China, social stigma raised in certain population towards people of Asian descent and were being targeted for the outbreak[41]. In many parts of the world the virus was transmitted through travellers so many nationalists started stigmatising foreign nationals and racially commenting on spreading the virus. Later, the Muslim community was targeted and discriminated as cases were traced to a gathering held by a Muslim missionary[42]. Students had their academics effected as every country shutdown their schools and colleges; this had a tremendous mental health consequence on the young minds. Internet search also raised as people stated to panic and experience symptoms of mental breakdown which were confirmed by studies done by Daniel Goldman et.al conducted a google trends data analysis and identified changing mental stress and patterns of behaviours as search of keywords such as anxiety, depression, therapy, suicide, and boredom increased[43]. There was also anecdotal

reports of increased domestic violence, divorce, and suicide rates. They found a considerable rise in the internet searches for boredom in Europe and the United States of America (Abel Brodeur et. al). The paper suggests that people's mental health may have been severely affected by the lockdown[44]. Older adults were also experiencing such symptoms. Huali Wang et.al. published a research which stated that older people were highly vulnerable to developing mental illness and presenting anxiety, agitation and even insomnia[45]. Many researches were conducted around the world to understand the extent of people suffering from negative mental health effects due to lockdown. In China, a survey of 1,210 people found that 53.8% assessed the psychological impact of the situation as moderate-severe, 16.5% reported moderate to severe depressive symptoms, 28.8% moderate to severe anxiety symptoms, and 8.1% moderate to severe stress levels. Most respondents (84.7%) spent between 20-24 hours a day confined at home and the main concern (75.2%) was that his/her relatives would become infected with COVID-19[46]. Jyothi Koirala et.al in a case study on perceived stress centred India and Nepal mentioned the fact that India accounts for 15% percent of global mental, neurological and substance abuse disorder burden hence due to closure of alcohol, tobacco, pan etc distribution we can see numerous substance abuse withdrawal cases rapidly and it leads to more depression and anxiety and if not managed will lead to desperate consequences[47]. Research studies from India showed knowledge, attitude, and practices on Indian mental healthcare during the COVID-19 lockdown revealed that 40% of participants were paranoid about contracting the virus, 72% reported worried and 12% experiencing insomnia. 75% of the participants agreed that they needed some sort of mental health intervention for the people suffering from it and 80% people wanted professional help to deal with their psychological issues[48]. Even Italy and Spain which are one of the worst hit nations in the world showed a lot of symptoms, Nicola Cellini et.al. in a study about disturbed sleeping patterns amid general public of Italy in lockdown presented nearly 1/4th of the sample under moderate to extreme severe symptoms of depression, moderate to extreme severe symptoms of anxiety among 32.6% and around 50.12% reporting moderate to extreme severe symptoms of stress. Rodolfo R. et.al. in a cross-sectional study on a web based online survey on 18147 Italians showed that 37.14% showed PTS symptoms, 17.3% reported severe depressive symptoms, 7.3% with severe insomnia[49]. A cross-sectional study was conducted in Spain where a survey was completed by 3550 adults. Symptoms such as anxiety, stress and depression were analysed using 21-item version of the Depression Anxiety Stress Scale. Symptoms of posttraumatic stress disorder were analysed using 'Impact of Event Scale'. It showed Symptomatic scores of anxieties, depression, stress was observed in 32.4%, 44.1% and 37.0% of respondents, respectively. Also, symptomatic scores indicating psychological stress were found in 88.6% of respondents. Increased prevalence of anxiety, depression and stress symptoms was associated with female sex, younger age, self-reported COVID-19 symptoms, previous psychological or psychiatric treatment, intake of psychoactive medication and negative effect on social relationships and relationships with people living in the same place. Higher scores related to

symptoms of posttraumatic stress disorder was associated with most of those factors, and with the acquaintance with a COVID-19 patient[50]. A survey by Ipsos MORI (a market research company) conducted an online survey on the people of UK. It revealed the facts that people are facing increased anxiety, depression, and stress[51]. It is quite evident that people around the world are affected by the lockdown/quarantine mentally. A shocking incident where the finance minister of one of the states in Germany, Thomas Schaefer ended his life as he faced a lot of mental pressure over the present and future crisis of economy. (Thakur and Jain, 2020; The Hindu- Business line, 2020). Another example, 80 people committed suicide between 19th March to 2nd May 2020 because of loneliness and fear of contracting the disease in India. (Economic Times, May 05, 2020), this shows the severity of psychological distress on population under lockdown / quarantine. Increased reports of domestic violence, abuse and dysfunctional family dynamics are one of many impacts of the lockdown. (Rajkumar et al. 2020)[52]. Due to the lack of scientifically supported vaccines and antiviral therapies, mass, and indiscriminate testing, followed by high social distancing levels have been predictors of successfully curbing the spread of infection in countries like Germany and South Korea. Unfortunately, in other countries (Italy, England, France, Mexico, Brazil, etc.), due to their testing capacity, it has been limited to hospitals and patients with severe symptoms[53]. In Italy psychological support options were given to their citizens to book a teleconsultation via search engine 'psicologionline' supported by the Italian psychologist association[54]. One of the reasons why people are panicking is the amount of information they consume through digital, social, and print media. Most of the media coverage about COVID-19 highlights it as a unique threat which adds to the panic and hysteria[55].

Discussion

China, India, Italy, Spain, UK, Germany, New Zealand, and Argentina announced lockdowns at a very beginning of the outbreak. All international borders were shut down, domestic travel was suspended, all non-essential services were closed, people were forced to follow, higher fines including imprisonment is some countries were imposed, armies were deployed to take control of the situations, factories and workplaces were shutdown. Prolonged isolation has side effects and that was evident in the present crisis and the association between lockdown and negative mental health effects was drawn from several researches and surveys. These effects were not only because of social isolation alone but also because of the economic slowdown which gravely effected the poor and urban middle class. Growing stigma experienced by individuals who were diagnosed with the disease and who were quarantined reflects on global mental health illiteracy and how it is a need of the hour to be educated and understand about mental health as one of the primary health concerns. The role of media is also questionable as misinformation and fake news affected the psyche of individuals. Countries like Italy, Spain, New Zealand, Germany, and China have taken the issues

of mental health in the current crisis very seriously and since the beginning of lockdown have considered mental health as one of the essential healthcare services during lockdown.

Globally all responses to contain the transmission of the disease is managing the health authorities to detect and separate the suspected cases as early as possible. Tracing their contacts and acquiring clinical data for diagnosis, and capacity building to accommodate the cases and increasing /diverting the medical practitioners to the regions in need. Though these measures help to fight the outbreak, the effect on mental health on practitioners and public was not given such importance. Even the mental health condition of the people under lockdown was not given importance[56]. China on the other hand facilitated the suspected and confirmed cases to receive mental health care, this was guided by National Health Commission of China (NHC). They included mental health professionals in the emergency medical teams to provide psychological first aid (PFA) immediately. They even used the online platform where people could get psychological support through mobile hotlines and teleconsultations[45]. Italy recognised mental health services as one of the fundamental services to the pandemic hit community. Through a carefully designed guidelines they took different approaches to address the inpatient and outpatient services. Patients with known serious psychological problems and with need of prescription medicines were given outpatient services restricted to only urgent visits and the public who were experiencing negative mental effects because of the pandemic were counselled remotely through online platforms. These services were also given to quarantined patients in home isolation[57]. In New Zealand, effective public communication was achieved by several government and non-government agencies. They adapted to the new patient consultation style of teleconsultations, telehealth, and e-prescribing. Several webinars were conducted to educate the public on mental health during lockdown. In India due to the shortage of mental health professionals (counsellors, psychiatrists, psychiatric nurses, psychiatric social workers) there has being a steep increase in mental health complaints[58]. Nearly 150 million Indian suffer from some form of mental illness and during such crisis the number can only go up. Of the 150million people 70-80% of them belong to rural India. With roughly 9000 psychiatrists (0.7 per 1,00,000) India is far less equipped to tackle this situation compared to other high-income countries. Mental health care spending from the total healthcare budget is only about 0.06%. Psychiatric outpatient departments were closed following the lockdown only Government OPDs were run at a very thin staffing. Ministry of Health and Family welfare (MoHFW) have set up a dedicated helpline services to address mental health issues. But half of the surveyed population have not heard of it. MoHFW provided telemedicine practice guidelines which aided practitioners to prescribe medications through video conferencing[59].

The public mental health during the SARS, MERS and Ebola outbreaks were similar to the current crisis in the affected regions. There was loads of research which was done to understand the negative mental health effects of public under lockdown, such information can be used to design

the lockdown in a better and sophisticated way such that mental health would also be one of the focal points.[60] A study on the psychological effects of quarantine in persons in Toronto, Canada, during the SARS outbreak in 2003, showed a high prevalence of psychological distress, namely post-traumatic stress disorder (PTSD) and depression (Hawryluck et al., 2004)[61]. It was also observed that longer durations of quarantine were associated with an increased prevalence of PTSD symptoms. A recent study carried out in Italy found that compliance with the social-distancing measures imposed because of the COVID-19 crisis can be negatively affected when the duration of the confinement is longer than expected (Briscese, Lacetera, Macis, & Tonin, 2020)[62]. Knowledge and understanding of the experiences of the confined persons are necessary to ensure compliance with the social-distancing measures, as well as to minimize the consequences of adverse short and long-term psychological effects of the situation on the population[63]. Deblina Roya et.al., in their study stated the repercussions of prolonged anxiety in a large population stating that it leads to panic buying eventually leading to resource exhaustion which happened in the US over the toilet paper and essential resources. Media reporting the exhaustion of resources further aggravated the panic buying phenomenon. This calls for a strong screening of media reporting by the authorities[64]. Media reporting on the positive information mainly focusing on recoveries rather than deaths and showing solidarity would help boost up the morale of the public. Healthcare workers and COVID-19 positive individuals are facing stigma in the society and this shows the level of public mental health illiteracy. Public campaigns on how the virus spreads and how home isolation helps curbing the spread need to be run to address the stigma associated with it as people who recovered from the disease are facing a lot of stigma even several instances where health workers were a victim of stigma have risen.

Conclusion:

It is important to first take public mental health into consideration while implementing a policy level decision of lockdown nationally. Recent studies across countries suggest that restrictions imposed to arrest the spread of COVID-19 and to ascertain social distancing via containment zone/complete lockdown policy have an adverse impact on mental health of the individuals.

Due to the lockdown, not much support can be found for victims of domestic violence as many may be scared as there is no escape from the perpetrators. This interplay of mental health, it is crucial for policy makers to take explicit cognizance of issue and restore the new normal.

The other effects of lockdown – pay cuts, layoffs, unemployment, the low socioeconomic groups, and urban middle class are facing a problem to run their daily economic activities disturbing the stability of their mental health.

Growing stigma and fear is a direct repercussion of public mental health illiteracy, therefore wide public information campaigns at the local level would educate people about the importance and maintenance of mental health during times of distress. Although MoHFW has detailed videos and information about mental health issues in their dedicated websites it is not multilingual.

Wider dissemination of psycho-social support is required as many of the people do not know about the psychological support helpline, these must be extensively advertised through caller tunes and televisions.

The government need to invest more in healthcare and especially in mental healthcare as there is huge shortage of psychologists to psychological patient ratio. More investment and policy level decisions must be taken to facilitate psychological support services to rural areas as well. The AarogyaSetu app can be integrated with mental health support helpline or teleconferencing services to address the need of people suffering from lockdown induced mental health problems.

References:

1. Reducing animal-human transmission of emerging pathogens. (n.d.). WHO | World Health Organization. https://www.who.int/health-topics/coronavirus/who-recommendations-to-reduce-risk-of-transmission-of-emerging-pathogens-from-animals-to-humans-in-live-animal-markets

2. Li, Q., Guan, X., Wu, P., Wang, X., Zhou, L., Tong, Y., Ren, R., Leung, K. S., Lau, E. H., Wong, J. Y., Xing, X., Xiang, N., Wu, Y., Li, C., Chen, Q., Li, D., Liu, T., Zhao, J., Liu, M., Tu, W., Chen, C., Jin, L., Yang, R., Wang, Q., Zhou, S., Wang, R., Liu, H., Luo, Y., Liu, Y., Shao, G., Li, H., Tao, Z., Yang, Y., Deng, Z., Liu, B., Ma, Z., Zhang, Y., Shi, G., Lam, T. T., Wu, J. T., Gao, G. F., Cowling, B. J., Yang, B., Leung, G. M. and Feng, Z. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus–Infected Pneumonia

3. Clinical and epidemiological characteristics of coronavirus disease 2019 (COVID-19) patients. (n.d.). https://doi.org/10.37473/fic/10.1101/2020.04.02.20050989

4. Q&A on coronaviruses (COVID-19). (n.d.). WHO | World Health Organization. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-coronaviruses

5. JOAO, B. N. (2020). Geographic information systems and COVID-19: The Johns Hopkins University dashboard. https://doi.org/10.21203/rs.3.rs-15447/v1

6. Coronavirus disease (COVID-19) - events as they happen. (n.d.). WHO | World Health Organization. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen

7. COVID-19 public health emergency of international concern (PHEIC) global research and innovation forum. (n.d.). WHO | World Health Organization. https://www.who.int/publications/m/item/covid-19-public-health-emergency-of-international-concern-(pheic)-global-research-and-innovation-forum

8. WHO announces COVID-19 outbreak a pandemic. (2020, March 12). WHO/Europe. https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/news/news/2020/3/who-announces-covid-19-outbreak-a-pandemic

9. AFP. (2020, March 27). Coronavirus | US tops world in COVID-19 cases, overtaking China and Italy. The Hindu. https://www.thehindu.com/news/international/us-has-worlds-most-confirmed-coronavirus-cases-overtaking-china-and-italy/article31178493.ece

10. Which countries have made wearing face masks compulsory? (2020, April 23). Breaking News, World News and Video from Al Jazeera. https://www.aljazeera.com/news/2020/04/countries-wearing-face-masks-compulsory-200423094510867.html

11. Www.ETHealthworld.com. (2020, March 24). Comprehensive timeline of COVID-19 outbreak highlights why virus could have been contained in initial phase. ETHealthworld.com. https://health.economictimes.indiatimes.com/news/diagnostics/comprehensive-timeline-of-covid-19-outbreak-highlights-why-virus-could-have-been-contained-in-initial-phase/74794515

12. Harvard Health Publishing. (2020, May 29). Preventing the spread of the coronavirus. Harvard Health. https://www.health.harvard.edu/diseases-and-conditions/preventing-the-spread-of-the-coronavirus

13. Advice for the public on COVID-19 – World Health Organization. (n.d.). WHO | World Health Organization. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public

14. A third of the global population is on coronavirus lockdown — here's our constantly updated list of countries and restrictions. (2020, April 17). Business Insider. https://www.businessinsider.in/international/news/a-third-of-the-global-population-is-on-coronavirus-lockdown-x2014-hereaposs-our-constantly-updated-list-of-countries-and-restrictions/slidelist/75208623.cms

15. Fang, H., Wang, L., & Yang, Y. (2020). Human mobility restrictions and the spread of the novel coronavirus (2019-nCoV) in China. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3559382

16. India to airlift more of its citizens from Wuhan as COVID-19 continues to spread. (2020, February 17). Deccan Herald. https://www.deccanherald.com/national/india-to-airlift-more-of-its-citizens-from-wuhan-as-covid-19-continues-to-spread-805634.html

17. Pulla, P. (2020). COVID-19: India imposes lockdown for 21 days and cases rise. BMJ, m1251. https://doi.org/10.1136/bmj.m1251

18. Pepe, E., Bajardi, P., Gauvin, L., Privitera, F., Lake, B., Cattuto, C., & Tizzoni, M. (2020). COVID-19 outbreak response: A first assessment of mobility changes in Italy following national lockdown. https://doi.org/10.1101/2020.03.22.20039933

19. Iacobucci, G. (2020). COVID-19: UK lockdown is “crucial” to saving lives, say doctors and scientists. BMJ, m1204. https://doi.org/10.1136/bmj.m1204

20. Covid 19 coronavirus alert 3: New Zealand to move to alert 4 lockdown for next four weeks - Jacinda Ardern says schools closed, essential services only. (2020, March 23). NZ Herald. https://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=12319029

21. COVID-19: Travel restrictions for those coming from China extended. (2020, February 24). RNZ. https://www.rnz.co.nz/news/national/410233/covid-19-travel-restrictions-for-those-coming-from-china-extended

22. Ferguson, N., Laydon, D., Nedjati Gilani, G. et al., 2020. Report 9: Impact of non-pharmaceutical interventions (NPIs) to reduce COVID19 mortality and healthcare demand. Imperial College London.

23. Lourenco, J., Paton, R., Ghafari, M., Kraemer, M., Thompson, C., Simmonds, P., Klenerman, P., & Gupta, S. (2020). Fundamental principles of epidemic spread highlight the immediate need for large-scale serological surveys to assess the stage of the SARS-Cov-2 epidemic. https://doi.org/10.1101/2020.03.24.20042291

24. Leigh-Hunt, N., Bagguley, D., Bash, K., Turner, V., Turnbull, S., Valtorta, N., & Caan, W. (2017). An overview of systematic reviews on the public health consequences of social isolation and loneliness. Public Health, 152, 157-171. https://doi.org/10.1016/j.puhe.2017.07.035

25. Verme, P. (2009). Happiness, freedom, and control. Journal of Economic Behavior & Organization, 71(2), 146-161. https://doi.org/10.1016/j.jebo.2009.04.008

26. Victor, C., Scambler, S., Bond, J., & Bowling, A. (2000). Being alone in later life: Loneliness, social isolation and living alone. Reviews in Clinical Gerontology, 10(4), 407-417. https://doi.org/10.1017/s0959259800104101

27. Perrin, P. C., McCabe, O. L., Everly, G. S., & Links, J. M. (2009). Preparing for an influenza pandemic: Mental health considerations. Prehospital and Disaster Medicine, 24(3), 223-230. https://doi.org/10.1017/s1049023x00006853

28. An epidemic of fear. (n.d.). https://www.apa.org. https://www.apa.org/monitor/2015/03/fear

29. Hawryluck, 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), 1206-1212. https://doi.org/10.3201/eid1007.030703

30. Person, B., Sy, F., Holton, K., Govert, B., Liang, A., Garza, B., Gould, D., Hickson, M., McDonald, M., Meijer, C., Smith, J., Veto, L., Williams, W., & Zauderer, L. (2004). Fear and stigma: The epidemic within the SARS outbreak. Emerging Infectious Diseases, 10(2), 358-363. https://doi.org/10.3201/eid1002.030750

31. Njiri, K. (2020). Mental health and COVID-19: The right to mental health during the COVID-19 pandemic. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3598916

32. Mental stress. (n.d.). Encyclopedia.com | Free Online Encyclopedia. https://www.encyclopedia.com/sports/sports-fitness-recreation-and-leisure-magazines/mental-stress

33. Rubin, G. J., & Wessely, S. (2020). The psychological effects of quarantining a city. BMJ, m313. https://doi.org/10.1136/bmj.m313

34. Coronavirus disease (COVID-19) - events as they happen. (n.d.). WHO | World Health Organization. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen

35. Armitage, R., & Nellums, L. B. (2020). COVID-19 and the consequences of isolating the elderly. The Lancet Public Health, 5(5), e256. https://doi.org/10.1016/s2468-2667(20)30061-x

36. Bélair, M., Kohen, D. E., Kingsbury, M., & Colman, I. (2018). Relationship between leisure time physical activity, sedentary behaviour and symptoms of depression and anxiety: Evidence from a population-based sample of Canadian adolescents. BMJ Open, 8(10), e021119. https://doi.org/10.1136/bmjopen-2017-021119

37. Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3532534

38. Forbes, D. (2020, March 19). What is COVID-19 doing to our mental health? Pursuit: Cutting-edge research and insightful commentary by world-leading experts | The University of Melbourne. https://pursuit.unimelb.edu.au/articles/whatis-covid-19-doing-to-our-mental-health?

39. Zhou, X. (2020). Psychological crisis interventions in Sichuan Province during the 2019 novel coronavirus outbreak. Psychiatry Research, 286(February), 112895. https://doi.org/10.1016/j.psychres.2020.112895

40. A guide to preventing and addressing social stigma associated with COVID-19. WHO | World Health Organization. https://www.who.int/publications/m/item/a-guide-to-preventing-and-addressing-social-stigma-associated-with-covid-19

41. WHO. (WHO/2019-nCoV/MentalHealth/2020.1). Mental health and psychosocial considerations during the COVID-19 outbreak. WHO | World Health Organization. https://www.who.int/publications/i/item/mental-health-and-psychosocial-considerations-during-the-covid-19-outbreak

42. Lin, C. (2020). Social reaction toward the 2019 novel coronavirus (COVID-19). Social Health and Behavior, 3(1), 1. https://doi.org/10.4103/shb.shb_11_20

43. Goldman, D. S. (2020). Initial observations of psychological and behavioral effects of COVID-19 in the United States, using Google trends data. https://doi.org/10.31235/osf.io/jecqp

44. Brodeur A., Clark A. E., Fleche S., Powdthavee N. (2020). Assessing the impact of the coronavirus lockdown on unhappiness, loneliness, and boredom using Google Trends.

45. Wang, H., Li, T., Gauthier, S., Yu, E., Tang, Y., Barbarino, P., & Yu, X. (2020). Coronavirus epidemic and geriatric mental healthcare in China: How a coordinated response by professional organizations helped older adults during an unprecedented crisis. International Psychogeriatrics, 1-4. doi:10.1017/S1041610220000551

46. Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., Ho, C. S., y Ho, R. C. (2020). Immediate Psychological Responses and Associated Factors during the Initial Stage of the 2019 Coronavirus Disease (COVID-19) Epidemic among the General Population in China. International Journal of Environmental Research and Public Health, 17(5). https://doi.org/10.3390/ijerph17051729

47. Koirala, J., Acharya, S., Neupane, M., Phuyal, M., Rijal, N., & Khanal, U. K. (2020). Government preparedness and response for 2020 pandemic disaster in Nepal: A case study of COVID-19. https://doi.org/10.33774/coe-2020-ghj8v

48. Roy, D., Tripathy, S., Kar, S. K., Sharma, N., Verma, S. K., & Kaushal, V. (2020). Study of knowledge, attitude, anxiety & perceived mental healthcare need in Indian population

during COVID-19 pandemic. Asian Journal of Psychiatry, 51, 102083. https://doi.org/10.1016/j.ajp.2020.102083

49. Cellini, N., Canale, N., Mioni, G., & Costa, S. (2020). Changes in sleep pattern, sense of time, and digital media use during COVID-19 lockdown in Italy. https://doi.org/10.31234/osf.io/284mr. Rodolfo Rossi, Valentina Socci, Dalila Talevi, Sonia Mensi, Cinzia Niolu, Francesca Pacitti, Antinisca Di Marco, Alessandro Rossi, Alberto Siracusano, Giorgio Di Lorenzo (Pre-print) medRxiv 2020.04.09.20057802; doi: https://doi.org/10.1101/2020.04.09.20057802

50. Odriozola-González, P., Planchuelo-Gómez, Á., Irurtia-Muñiz, M. J., & De Luis-García, R. (2020). Psychological symptoms of the outbreak of the COVID-19 crisis and confinement in the population of Spain. https://doi.org/10.31234/osf.io/mq4fg

51. COVID-19 and mental wellbeing. (2020, April 16). Ipsos MORI. https://www.ipsos.com/ipsos-mori/en-uk/Covid-19-and-mental-wellbeing

52. Rajkumar, R. P. (2020). COVID-19 and mental health: A review of the existing literature. Asian Journal of Psychiatry, 52, 102066. https://doi.org/10.1016/j.ajp.2020.102066

53. Gopal, A., Sharma, A. J., & Subramanyam, M. A. (2020). Dynamics of psychological responses to COVID-19 in India: A longitudinal study. https://doi.org/10.1101/2020.06.12.20129791

54. Marazziti, D., Pozza, A., Di Giuseppe, M., & Conversano, C. (2020). The psychosocial impact of COVID-19 pandemic in Italy: A lesson for mental health prevention in the first severely hit European country. Psychological Trauma: Theory, Research, Practice, and Policy, 12(5), 531-533. https://doi.org/10.1037/tra0000687

55. World Health Organization. (2020). Mental health and psychosocial considerations during the COVID-19 outbreak, 18 March 2020. World Health Organization. https://apps.who.int/iris/handle/10665/331490. License: CC BY-NC-SA 3.0 IGO

56. Hiremath, P., Suhas Kowshik, C. S., Manjunath, M., & Shettar, M. (2020). COVID 19: Impact of lock-down on mental health and tips to overcome. Asian Journal of Psychiatry, 51, 102088. https://doi.org/10.1016/j.ajp.2020.102088

57. Pileggi, C., Bianco, A., Di Stasio, S. M., & Angelillo, I. F. (2004). Inappropriate hospital use by patients needing urgent medical attention in Italy. Public Health, 118, 284–291. https://doi.org/10.1016/j.puhe.2003.06.002

58. Bandyopadhyay, G., & Meltzer, A. (2020). Let us unite against COVID-19 – a New Zealand perspective. Irish Journal of Psychological Medicine, 1-4. https://doi.org/10.1017/ipm.2020.44

59. Gaur, K., Sharma, A., Keshri, K., & Pachori, H. (2020). Onslaught of COVID-19 and Psychological Concerns in India.

60. Hull, Harry. (2005). SARS Control and Psychological Effects of Quarantine, Toronto, Canada. Emerging infectious diseases

61. Hawryluck, 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), 1206-1212. https://doi.org/10.3201/eid1007.030703

62. Briscese, G., Lacetera, N., Macis, M., & Tonin, M. (2020). Compliance with COVID-19 social-distancing measures in Italy: The role of expectations and duration. https://doi.org/10.3386/w26916

63. Md Mahbub Hossain, MBBS, MPH, CPH, Abida Sultana, MBBS, Neetu Purohit, PhD, Mental health outcomes of quarantine and isolation for infection prevention: A systematic umbrella review of the global evidence, 2020.

64. op ten COVID-19 anxiety reduction strategies. (n.d.). Anxiety and Depression Association of America, ADAA. https://adaa.org/learn-from-us/from-the-experts/blog-posts/consumer/top-ten-covid-19-anxiety-reduction-strategies

Literature Review:

S.no.	Author(s)	Country	Objective	Study Design	Sample	Conclusion/Result
1.	Cuiyan W. et.al (2020)	China	Assess psychological impact of Lockdown	Cross-sectional, online survey using snowball sampling	1210	More than half of the respondents rated their psychological impact as moderate-to-severe, and about one-third reported moderate-to-severe anxiety.
2.	Deblina Roy et.al., (2020)	India	Assess the knowledge, attitude, anxiety experience, and perceived mental healthcare need.	Cross-sectional, observational study using snowball sampling technique through online semi-structured questionnaire	662	Nearly half the participants felt panic by the reports of COVID-19 pandemic. 40 % of the participants were paranoid with the thought of contracting the Novel Coronavirus infection. 75 % agreed on the necessity of mental healthcare for individuals who panic amid the pandemic situation. More than 80 % of participants felt the need for the professional help from mental health experts

3.	Odriozola-González et.al. (2020)	Spain	Analyze the psychological symptoms on the confined persons in Spain during the outbreak of the COVID-19 crisis.	A web based 64 item questionnaires was circulated which was further evaluated using 21-item version of DASS-21	3550	Substantial proportion of the analysed sample shows symptoms of depression, anxiety, stress, and PTSD as measured by validate scales. Also, respondents showed high levels of concern about their own health and that of relatives such as their parents, as well as about the social and economic situation resulting from the COVID-19 crisis.
4.	Rodolfo Rossi, et. al. (2020) medRxiv 2020.04.09.20057802; doi: https://doi.org/10.1101/2020.04.09.20057802	Italy	To assess mental health outcomes in the Italian general population after 3 to 4 weeks from start of lockdown measures and to explore the impact of probable risk factors related to COVID-19	Cross-sectional study on data collected through web-based survey design advertised in social networks	18147	Showed high rates of PTSS, depression, anxiety, insomnia, Perceived stress, and ADS, with young women having higher odds of endorsing a mental health outcome. These outcomes were associated with several COVID-19-related risk factors, including being under quarantine, having a loved one deceased by COVID-19, working activity discontinued due to lockdown

						measures, or experiencing other stressful events (i.e. working, financial, relationship or housing problems) due to the pandemic or lockdown measures.
5.	Claire L Niedzwiedz. Et.al. (2020)	UK	COVID-19 lockdown's impact on mental health on the people and on alcohol, tobacco, and e-cigarettes consumers and whether the impacts observed differs by age, gender, ethnicity, and education level.	Cross-sectional analysis was done on Longitudinal Study data from UK households	48426	It was found that UK's women, younger people, and most educated people suffered from psychological distress after the pandemic hit. This was observed to be increased from the measurements taken after one month of lockdown due to the restrictions on day-to-day activities and most activities which most people enjoy. There were also increasing complaints of unhappiness and not able to sleep.
6.	Nilima et.al. (2020)	India	To investigate the association between Covid-19's nationwide lockdown and	Cross-sectional study based on online survey was conducted using snowball sampling	1316	Growing concerns about losses, job, health, and family created psycho-social impact on the masses. Which have a long-

			psychosocial factors	technique employing special analysis		term effect on the community's wellbeing. It was found out that following lockdown and stress have a significant association.
7.	Kaushal S. et.al. (2020)	India	Evaluate and study similar outbreaks from the past to understand its adverse impact on mental health, implement adequate steps to tackle and provide a background to physicians and healthcare workers at the time of such outbreaks to apply psychological first aid.	Review	-	Substantial evidence from the past studies of the impact of SARS, MERS, influenza, and Ebola epidemics on the at-risk population, the suffering individuals and healthcare providers showed neuropsychiatric linkage. Results are relative to the current COVID-19 pandemic; they infiltrate fear, anxiety, emotional distress, and post-trauma stress symptoms as the affected individuals are viewed as minority and secluded from the rest of the population.
8.	Gaur K. et.al. (2020)	India	Understand the mental health concerns of COVID-19 and India's preparedness to tackle it. It	Review of existing literature on earlier epidemics as well as the ongoing COVID-	-	Suggestions on policy level decisions need to be taken and also possible future recommendations on addressing the

			further proposes the measures to manage the psychological repercussions of this menace.	19 pandemic and mental health		healthcare spending on public mental health.

PART - 2

Online Course: Data Analytics for Lean Six Sigma

Hours: 16hrs

Website: Coursera

Organisation: University of Amsterdam

Tutor: Dr. Inez M. Zwetsloot, Amsterdam Business School, Economics and Business

Course description: This course explains how Lean Six Sigma as a methodology uses data and data analytics improve processes. Process improvement is a methodology to deal with redundancies in a process which would delay projects, demoralize employees, and decline productivity. To achieve this, Lean Six Sigma requires to analyse data of the different processes to understand where in the process map redundancies are occurring and how to reduce or eliminate these occurrences. It also helps to decide which process is the best with the least such occurrences. This course explains how to approach a problem using the DMAIC (Define-Measure-Analyse-Improve-Control) cycle, how to quantify the problem which involves selecting the Critical-to-quality (CTQ) characteristics of the process and how to analyse these CTQs in a world standard data analytics software 'Minitab'. It also teaches on how to understand and visualise data (both numerical and categorical data) through descriptive statistics, graphs and charts as different processes need to be analysed differently bases on the characteristic of the data. The course deals with plotting sample data on various distribution plots and compare that data to the population / whole data and data-based testing and improvements and how to use different data-based tests on Minitab. Ultimately to learn data analytics on Minitab to achieve Lean Six Sigma.

Course Objectives:

1. To understand data analysis tools commonly useful in a Lean Six Sigma improvement project.
2. To gather, analyse and interpret data of a process to improve it.
3. To understand how to use and when to use different data analysis tools within the world standard data analysis software 'Minitab'.
4. To be able to interpret the results of the data analysis process.

Course contents:

1. Data and Lean Six Sigma:
    - Introduction to Data Analysis and Lean Six Sigma
    - Data and DMAIC (Define-Measure-Analyse-Improve-Control)
    - Selecting CTQs (Critical-to-quality characteristics)
    - Units and Operational Definition
    - Sampling
    - Organise your data
    - Understanding the data analysis software Minitab
2. Understanding and visualising data:
    - Numerical and Categorical Data
    - Descriptive statistics
    - Visualising numerical data
    - Visualising categorical data
    - Pareto Analysis
    - Visualising two variables
3. Using probability distributions:
    - Population versus sampling
    - Estimation and Confidence intervals
    - Normal, Lognormal and Weibull distribution
    - Probability plot
    - Empirical CDF
    - Properties of the normal distribution
4. Introduction to testing:
    - Introduction to data analysis
    - Hypothesis testing
    - Causality
5. Testing: Numerical Y and Categorical X
    - Introduction to ANOVA
    - ANOVA analysis
    - ANOVA residual analysis
    - Kruskal-Wallis Test
    - Two sample t-test
    - Test for equality of variances

6. Testing: Numerical Y and Numerical X
    - Correlation
    - Introduction to Regression
    - Regression analysis
    - Regression residual analysis
    - Regression prediction interval
    - Quadratic regression
7. Testing: Categorical Y
    - Chi-square analysis
    - Logistic regression

Learning methodology used in the course: 48 interactive video lectures, exercises to be completed on Minitab software based on real time Lean Six Sigma project data, module wise readings from the resources provided and module wise graded quizzes. Finally, a graded quiz which covers all topics through the 5-week program.

Key Learnings:

Module 1:

- Understood what Lean Six Sigma and its application in the DMAIC framework is.
- Quantify problems using CTQs
- How to choose representative samples and collect data?
- Organise data and differentiate units and variables and use Minitab

Module 2:

- Interpretation of descriptive statistics
- How to visualise data and interpret results through different charts, graphs and plots

Module 3:

- Understood the concept and use of estimation
- How to quantify precision of an estimate using confidence intervals
- Understand different types of probability distributions – Normal, Lognormal and Weibull distributions
- Determine probabilities and percentages using Empirical CDF

- Understand probabilities of the normal distribution

Module 4:

- Identify the different dependent and independent variables and select the appropriate test
- How to interpret results correctly by differentiating causality and relation

Module 5:

- Understood when to perform ANOVA and interpret the output
- Validation of ANOVA using residual analysis
- Understood when and how to perform and interpret Kruskal-Wallis test
- Perform two sample t-test

Module 6:

- How to use and interpret correlation
- When and how to use regression and validate it using residual analysis
- How to interpret prediction interval and quadratic regression

Module 7:

- Understood how to perform and interpret Chi-square analysis
- How to perform and interpret logistic regression analysis