

Exploring Teens Perception of Health Protocols During COVID-19: A Case Study of Chakdara KPK Pakistan

Syed Ishtiaq Ahmad¹, Muhammad Irfan², Muhammad Yaseen³,
Muhammad Ismail⁴, and Fazal Shakoor⁵

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Abstract

This cross-sectional study investigates the perspectives of 200 teenagers (aged 13–18) in Chakdara, Dir Lower, regarding the effectiveness of COVID-19 SOPs implemented by the Government of Pakistan. Using a self-administered questionnaire based on the WHO's Secondary Structure Survey Model, data was collected from various institutions over six months through convenience sampling. Among the participants, 60.7% were male and 39.3% female, with the majority holding either Matric or FSc qualifications. Findings revealed that 84% of the teenagers did not support government-implemented SOPs, while only 16% were in favor. Statistical analysis indicated no significant association between gender and attitudes toward SOPs; however, a notable relationship was found between educational level and SOP perception. Males scored higher than females in their perception of COVID-19-related issues and internet use. These findings highlight a general skepticism among adolescents toward pandemic measures, emphasizing the need for targeted awareness campaigns to improve compliance and public health outcomes among youth.

Keywords: Prospective of a Teenager, Effectiveness of SOP, SOPs for COVID-19, Chi-Square.

Introduction

The COVID-19 pandemic, first identified in Wuhan, China, quickly escalated into a global health emergency, prompting the World Health Organization (WHO) to declare it a pandemic on March 11, 2020. By July 2020, the virus had infected over 10.5 million individuals across 216 countries, resulting in more than 500,000 deaths. With a relatively short incubation period averaging 5.1 days but extending to 14 days understanding this aspect became crucial in shaping surveillance and control strategies Meo et al. (2020).

In the early stages, health authorities worldwide implemented precautionary measures to curb the spread of the virus. These included regular handwashing, the use of sanitizers, remote working, the avoidance of public gatherings, and the cancellation of major events. The primary aim of these interventions was to reduce the basic reproduction number (R_0), thereby limiting virus transmission. Social distancing, quarantine, isolation, and public awareness campaigns became central strategies to reduce the rate of infection Benden et al. (2021).

¹Lecturer, Emergency Care Technology at Gandhara Medical University Peshawar.

Email: syedishtiaq447@gmail.com

²Emergency Care Technologist at MMC General Hospital Peshawar. Email: mrirfan9885@gmail.com

³Operation Theater (OT) Manager at PIMS Peshawar. Email: yassen5322203@gmail.com

⁴Department of Statistics University of Peshawar. Email: ismailfromdir@gmail.com

⁵Department of Statistics University of Peshawar. Email: fazalstate47@gmail.com



Despite global efforts, adherence to Standard Operating Procedures (SOPs) varied. Countries that enforced strict compliance witnessed relatively better outcomes in managing the virus. In contrast, nations with limited public cooperation faced rapid transmission and health crises. Educational materials and media campaigns, developed by institutions like WHO, played a vital role in raising awareness, though misinformation often hindered progress Seyed et al. (2021) and Oraby et al. (2021).

In Pakistan, the first confirmed COVID-19 case was reported in Karachi. Within 45 days, the virus had spread across the country, leading to lockdowns, travel restrictions, school closures, and the enforcement of SOPs Elsayed et al [2020]. As of May 9, 2020, Punjab was the most affected province with 10,471 confirmed cases, followed by Sindh and Khyber Pakhtunkhwa (KPK), which reported 4,327 cases, 221 deaths, and 1,033 recoveries Atalan (2020). To combat the spread, the Ministry of National Health emphasized strict adherence to SOPs such as social distancing, wearing masks, hand hygiene, and the avoidance of face-touching. Awareness campaigns were launched through various media channels to educate the population WHO (2020).

Among the most significant consequences of the pandemic was the closure of educational institutions, which profoundly impacted students, teachers, and families alike. In Pakistan, this disruption delayed examinations and the admissions process, highlighting the educational system's vulnerability to such crises, Lauer et al. (2020).

In addition to its physical health impacts, COVID-19 brought about substantial psychological effects, particularly among teenagers and healthcare workers. Adolescents, due to their developmental stage and emotional sensitivities, experienced heightened levels of stress, anxiety, and sleep disturbances, especially as their daily routines and social interactions were disrupted Hossain et al. (2021). Meo et al. (2020). Furthermore, the restriction of religious congregations integral to the socio-cultural fabric of countries like Pakistan posed both a social and spiritual challenge for many communities (2020). Several studies have highlighted that the success of SOP implementation heavily depends on public perception and compliance. A recent study in Pakistan found that nearly 40% of youth believed SOPs were only partially effective due to inconsistent enforcement, while over 30% admitted to rarely following these measures themselves. Factors such as misinformation, mistrust in government institutions, and socioeconomic pressures were found to influence attitudes toward preventive guidelines, Meo et al. (2020).

Given these considerations, it becomes essential to understand the perception and behavior of teenagers a significant yet vulnerable segment of the population toward COVID-19 prevention strategies. Their level of awareness and compliance not only reflects the effectiveness of public health campaigns but also indicates the challenges faced in ensuring community-level adherence to SOPs.

Objectives

1. To determine teenagers' perspectives on the effectiveness of SOPs proposed by the government of Pakistan.
2. To examine the association between demographic factors (such as gender and educational level) and teenagers' attitudes toward government-implemented COVID-19 SOPs using Chi-square analysis.

Literature Review

The SARS-CoV-2 virus, a single-stranded RNA virus, has caused widespread respiratory diseases, including the COVID-19 pandemic. It is characterized by spherical particles with protein spikes

resembling crowns, which allow the virus to attach to human cells. The spike protein's binding affinity is 10 to 20 times stronger than that of SARS, leading to greater human-to-human transmission Fiala (2020). The pandemic has had a severe impact globally, not only on health but also on economies worldwide, as the virus spreads unpredictably and indiscriminately across different populations. As of the latest reports, over 2.2 million confirmed cases and 152,551 deaths have been recorded globally. The infection rate varies by region, with Europe, the Americas, the Western Pacific, the Eastern Mediterranean, and Africa all experiencing varying numbers of cases and deaths. In Europe, over 1.1 million cases and 100,000 deaths have been reported, while in Africa, 13,892 cases and 788 deaths have been recorded. Although SARS-CoV-2 primarily spreads from infected individuals, there is evidence to suggest that the virus can also be transmitted from animals to humans, as noted in a study by Olum et al. (2020).

According to the Centers for Disease Prevention and Control (CDC) a healthy individual can contract the SARS-CoV-2 infection from an infected person, particularly if they are within six feet of each other. Transmission can occur through droplets produced by coughing or sneezing, as well as physical contact such as handshakes. Additionally, the virus can spread via contaminated surfaces and objects. While the airborne transmission is not the primary method, asymptomatic individuals can also spread the infection Azlan et al. (2020).

Policies of Various Countries to Control COVID-19

The COVID-19 pandemic, declared an international concern in 2020, emphasized the need for education about the virus and the importance of precautionary measures to prevent its spread. Despite the lack of an FDA-approved drug for treating COVID-19, effective treatment regimens rely on research-based evidence. This research is essential not only for treatment but also for addressing broader issues such as economic, political, and social stability through the prevention of the virus's spread Güner et al. (2020).

Countries have implemented various policies over time, but researchers and policymakers have struggled to obtain high-quality, real-time data needed for in-depth analyses of the effectiveness of these policies. The Corona Net dataset gathers daily information on government policy responses to COVID-19, including:

- Types of implemented policies (e.g., quarantine or school closures)
- The governmental level enacting the policies (national or provincial)
- Geographic targets (e.g., national, provincial, or municipal)
- Targeted groups or materials (e.g., travellers or masks)
- The directionality of policies (e.g., inbound, outbound, or both)
- Mode of transportation affected (e.g., flights or trains)
- Implementation of nature (e.g., mandatory or voluntary)
- The entity responsible for enforcement (e.g., national government or military)

Implementation of standard operating procedures in different countries

The steps taken by the Pakistani government in response to the COVID-19 pandemic reflect a comprehensive approach to tackling the crisis, despite the numerous challenges faced by the country. Given the porous borders and the healthcare system's limitations, Pakistan's strategies of implementing lockdowns, enforcing SOPs, and establishing quarantine centres were vital in curbing the spread of the virus. The emphasis on hand hygiene, social distancing, and limiting public gatherings, especially in high-risk areas, helped slow the transmission to an extent, despite difficulties in full enforcement and public compliance Sokhna et al. (2021).

However, the pandemic also exposed areas where further improvements were needed. For example, Pakistan's efforts to expand testing capabilities and enhance contact tracing, though commendable, still had room for growth in terms of infrastructure, human resources, and diagnostic facilities. These gaps highlight the importance of building resilient systems for future health crises, much like the work you're doing with Ridge Regression and simulation studies, which aim to enhance model accuracy and reliability. In a way, both public health responses and advanced statistical methods seek to improve predictions, manage uncertainty, and refine interventions, whether in healthcare or data modelling Anser et al. (2020).

As you're likely familiar with in your work adapting to rapid changes is essential. Just as Pakistan has had to modify its response plans to new challenges, your research continuously evolves to address new complexities in data modelling. Similarly, the role of public compliance ranging from social distancing to vaccine adoption demonstrates how essential collective action is in combating a crisis. Yet, as in many fields, communication, and education are key, especially when it comes to ensuring adherence to strategies, whether for pandemic control or statistical modelling Ahmad et al. (2020).

Materials and Methods

Study Design

A cross-sectional survey was conducted from April 20 to September 20, with ethical approval obtained. The data collection adhered to institutional and national ethical standards, ensuring participant confidentiality and anonymity.

Sampling Technique

A non-probability convenience sampling technique was utilized to collect data for this study. This method involves selecting participants who are readily available and willing to take part, rather than using a random selection process. In this case, teenagers aged 13–18 were approached from various educational institutions within Chakdara, Dir Lower, based on ease of access and their willingness to participate. While this approach allowed for efficient data collection within the six-month timeframe, it may limit the generalizability of the findings due to potential sampling bias and lack of representation from the broader adolescent population.

Study Location

Data was collected from the general population in Chakdara District, Dir Lower, KP, Pakistan's Union Council. The sample size was calculated using the Raosoft sample size calculator, yielding 200 participants at a 95% confidence level and a 5% margin of error. The sample size was increased to enhance the study's validity and generalizability.

Sample Selection

Data were collected from high school and college students in Chakdara, Dir Lower, aged 13 to 18 years. Participants included those enrolled in Matric and FSc programs. These institutions were selected based on accessibility and willingness to participate, aligning with the convenience sampling method used in the study.

Data Collection Procedure

Primary data was collected physically by visiting different institutions in the area. Ethical guidelines were strictly followed to ensure data confidentiality. Participants were informed about

the survey's objectives and provided informed consent. They had the option to skip questions or withdraw at any time.

Data Collection

A structured survey based on the World Health Organization's secondary Structure Survey Model (SSSM) was developed. After an expert review and a pilot study with 35 students, the survey was finalized for the research.

Statistical Analysis

The collected data were analyzed using SPSS version 22. Descriptive statistics were used to summarize participant demographics and response patterns. Inferential analysis, including the Chi-square test, was conducted to examine associations between variables such as gender, education level, and attitudes toward COVID-19 SOPs, with significance set at $p < 0.05$.

Chi-square test

Chi-square analysis was employed to assess the association between key categorical variables such as gender, educational level, and attitudes toward government-implemented COVID-19 SOPs. The Chi-square test statistic was calculated using the formula of chi-square as:

$$X^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

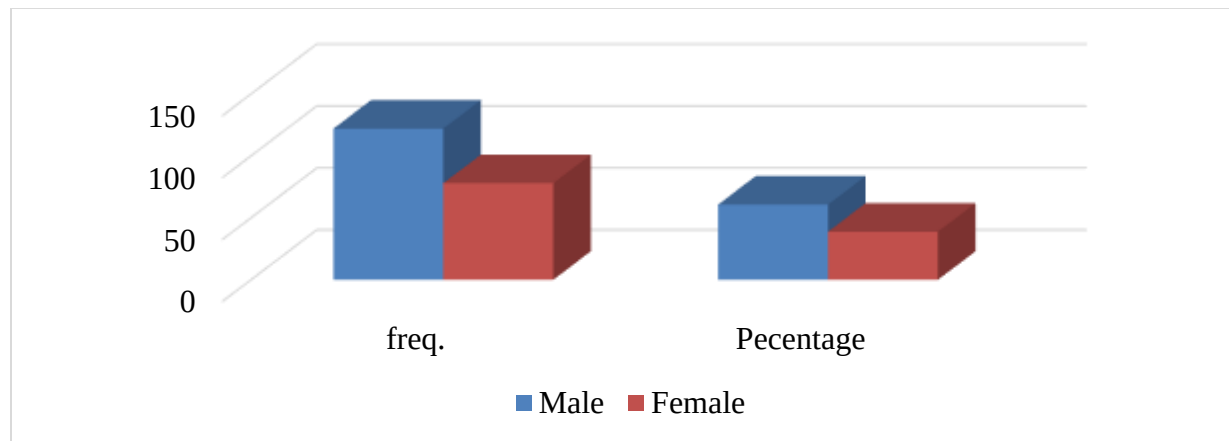
where O_i denotes observed frequencies and E_i denotes expected frequencies under the assumption of independence. Results revealed no significant association between gender and SOP attitudes ($p > 0.05$), indicating similar perception patterns across male and female respondents. However, a statistically significant relationship was observed between educational level and SOP perception ($p < 0.05$), suggesting that educational background influences teenagers' views on pandemic protocols, McHugh, (2013).

Results and Discussion

The data was analyzed using SPSS with descriptive statistics, including frequencies and percentages. The questionnaire was divided into two sections: attitudes and perceptions. In the attitude section, scores of 13–17 indicated positive attitudes, while scores of 1–12 showed negative attitudes. The perception section included 20 items, with scores above 15 considered adequate. A pilot study confirmed the reliability of the questionnaire with a Cronbach's alpha of 0.79. Overall, the analysis reflected participants' levels of awareness and attitudes towards the subject.

Gender Wise Distribution

Gender is the socio-cultural division between males and females. It plays an important role in demographic data. Table 1 shows the division of respondents on the basis of gender. The data was collected from 200 respondents. Among the total respondents. Result indicate that majority (60.70 %) of participants were male as compared to 38.30% females.

Figure 1: Gender Distribution of study participants

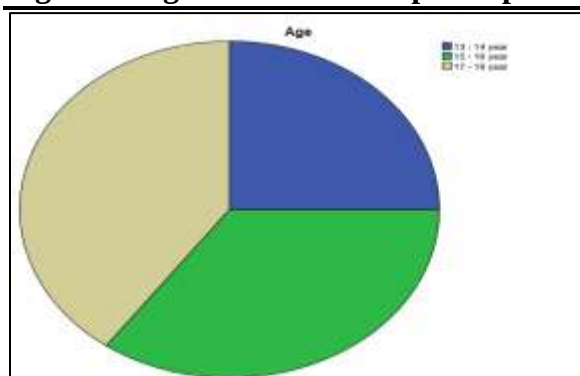
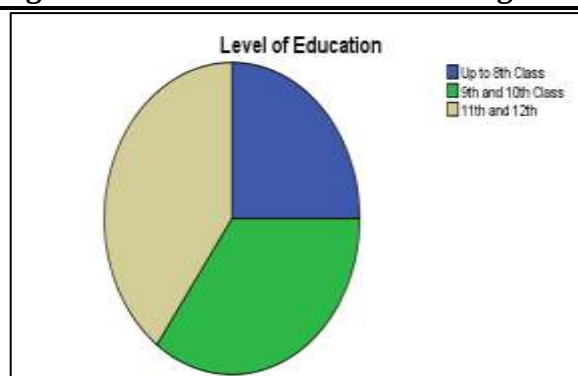
The age-wise distribution of the respondents was analyzed using three equal class intervals. Among the participants, 50 individuals (24.9%) belonged to the 13–14 age group. A larger portion, 70 respondents (38.5%), were in the 15–16 age group. The highest proportion, 80 participants (39.8%), fell within the 17–18 age group, indicating that most respondents were older teenagers.

Education Wise Status

Among all participants, 70 (34.8%) were matriculated while 80(39.8%) completed FSC, the information is shown in table 03 and figure 03.

Table 1: Age-wise Distribution study participant

Variables		Mean $\pm$ SD (Range)	
Mean Age		17.15 $\pm$ 0.79 (ranged 13-18)	
Mean years of Education		10.15 $\pm$ 0.79 ((ranged from 0-12)	
S/N	Age Categories	Frequency	Percent
1	13-14	50	24.9
2	15-16	70	34.8
3	17-18	80	39.8
Education Level			
	< 8 th class	50	24.9
	Matric	70	34.8
	Fsc	80	39.8

Figure 2: Age Distribution of participant**Figure 3: Level of education of teenagers**

Cross Tabulation Between Gender and attitude towards SOPs

Among total 116 were of the view that they ignored government strategies regard the COVID-19 SOPs, as compared to 52 of female, however the difference was not statistically significant. There is no association between gender and teenager attitudes toward COVID-19 SOPs implemented by the government.

Table 2: Gender wise Cross tabulation

		Status of attitude towards SOPs		P-value
		Negative	Positive	
Gender	Male	116	21	0.70
	Female	52	11	
Total		168	32	200

Education wise Cross tabulation

There is an association between individual education level and attitude toward government SOPs.

Table 3: Cross tabulation between Level of Education attitudes toward SOPs

Level of Education		Status attitude toward SOPs		Total
		Negative	Positive	
	Up to 8 th	32	18	0.003
	Matric	55	25	
	Fsc	65	15	
Total		152	58	210

Table 4: Chi-Square Tests

Statistics	χ^2	Df	p-value
Pearson χ^2 (r)	16.050 ^a	Df= (R-1, C-1)	0.003
Ration	14.625	(3-1)(2-1)=2	
Linear relationship	12.648	2.0	

Frequency of Individual Acceptance Status

Results in Table below demonstrate the mean gender differences on perception of COVID-19 and their construct scales. The mean difference between male and female participants is found to be significant on perception about effectiveness of SOPs $\{t(198) = 4.86, p < .05\}$. It implies that males were higher on perception as compared to females.

Table 5: Comparison of Males and Females on perception of COVID-19 (N = 200)

Variables	Males (n = 122)		Females (n = 77)		t (198)	95% CI	
	M	SD	M	SD		LL	UL
Perception of covid	119.01	6.82	114.70	4.71	4.86	2.56	6.06

* $p < .05$. ** $p < .01$.

Conclusion

The findings of the study reveal that approximately 50% of Pakistani youth are well-informed, yet many exhibit negative behaviors, such as reluctance to follow preventive measures. A significant portion of the youth population was hesitant to comply with the COVID-19 SOPs issued by the Government of Pakistan. There is a clear positive correlation between the level of education and the acceptance of SOPs, highlighting the importance of educational attainment in promoting health-conscious behavior. The study also identifies critical gaps in knowledge and practices that need to be addressed through future awareness and education campaigns. Moreover, it was observed that many young individuals rely on less credible sources of information, which affects their perceptions and practices regarding COVID-19. Therefore, it is essential for the Ministry of Health to adopt a more integrated and inclusive approach that targets all segments of society—particularly the underprivileged, less educated, and adolescent groups. Such an approach will help ensure balanced access to accurate COVID-19 information and promote effective implementation of health guidelines and preventive strategies.

References

- Ahmad, T., Baig, M., & Hui, J. (2020). Coronavirus disease 2019 (COVID-19) pandemic and economic impact. *Pakistan Journal of Medical Sciences*, 36(COVID19-S4), S73–S78. <https://doi.org/10.12669/pjms.36.COVID19-S4.2638>
- Anser, M. K., Yousaf, Z., Khan, M. A., Nassani, A. A., Abro, M. M. Q., Vo, X. H., & Zaman, K. (2020). Social and administrative issues related to the COVID-19 pandemic in Pakistan: Better late than never. *Environmental Science and Pollution Research*, 27, 34567–34573. <https://doi.org/10.1007/s11356-020-09633-w>
- Atalan, A. (2020). Is the lockdown important to prevent the COVID-19 pandemic? Effects on psychology, environment and economy—Perspective. *Annals of Medicine and Surgery*, 56, 38–42. <https://doi.org/10.1016/j.amsu.2020.06.010>
- Azlan, A. A., Hamzah, M. R., Sern, T. J., Ayub, S. H., & Mohamad, E. (2020). Public knowledge, attitudes and practices towards COVID-19: A cross-sectional study in Malaysia. *PLOS ONE*, 15(5), e0233668. <https://doi.org/10.1371/journal.pone.0233668>
- Benden, P., Feng, A., Howell, C., & Dalla Riva, G. V. (2021). Crime at sea: A global database of maritime pirate attacks (1993–2020). *Journal of Open Humanities Data*, 7. <https://doi.org/10.5334/johd.44>

- Elsayed, S. A., Abu-Hammad, O., Alolayan, A. B., Althagafi, N., Ayed, Y., Eldeen, Y. S., & Dar-Odeh, N. (2020). Getting to know SARS-CoV-2: Towards a better understanding of the factors influencing transmission. *Pesquisa Brasileira em Odontopediatria e Clínica Integrada*, 20, e0122. <https://doi.org/10.1590/pboci.2020.121>
- Fiala, M. J. (2020). Ultrasound in COVID-19: A timeline of ultrasound findings in relation to CT. *Clinical Radiology*, 75(7), 553–554. <https://doi.org/10.1016/j.crad.2020.05.001>
- Güner, H. R., Hasanoğlu, İ., & Aktaş, F. (2020). COVID-19: Prevention and control measures in community. *Turkish Journal of Medical Sciences*, 50(9), 571–577. <https://doi.org/10.3906/sag-2004-146>.
- Hossain, S., Hasan, M. N., Islam, M. N., Mukto, M. R., Abid, M. S., & Khanam, F. (2021). Information-based mobile application to tackle COVID-19 circumstances. *Journal of Scientific Research and Reports*, 27(1), 78–92. <https://doi.org/10.9734/jsrr/2021/v27i130370>
- Lauer, S. A., Grantz, K. H., Bi, Q., Jones, F. K., Zheng, Q., Meredith, H. R., & Lessler, J. (2020). The incubation period of coronavirus disease 2019 (COVID-19) from publicly reported confirmed cases: Estimation and application. *Annals of Internal Medicine*, 172(9), 577–582. <https://doi.org/10.7326/M20-0504>
- McHugh, M. L. (2013). *The Chi-square test of independence*. *Biochemia Medica*, 23(2), 143–149. <https://doi.org/10.11613/BM.2013.018>
- Meo, S. A., Abukhalaf, A. A., Alomar, A. A., AlMutairi, F. J., Usmani, A. M., & Klonoff, D. C. (2020). Impact of lockdown on COVID-19 prevalence and mortality during 2020 pandemic: Observational analysis of 27 countries. *European Journal of Medical Research*, 25, 1–7. <https://doi.org/10.1186/s40001-020-00475-6>
- Meo, S. A., Alhowikan, A. M., Al-Khlaiwi, T., Meo, I. M., Halepoto, D. M., Iqbal, M., & Ahmed, N. (2020). Novel coronavirus 2019-nCoV: Prevalence, biological and clinical characteristics comparison with SARS-CoV and MERS-CoV. *European Review for Medical and Pharmacological Sciences*, 24(4), 2006–2011.
- Olum, R., Chekwech, G., Wekha, G., Nassozi, D. R., & Bongomin, F. (2020). Coronavirus disease-2019: Knowledge, attitude, and practices of health care workers at Makerere University Teaching Hospitals, Uganda. *Frontiers in Public Health*, 8, 181. <https://doi.org/10.3389/fpubh.2020.00181>
- Oraby, T., Tyshenko, M. G., Maldonado, J. C., Vatcheva, K., Elsaadany, S., Alali, W. Q., & Al-Zoughool, M. (2021). Modeling the effect of lockdown timing as a COVID-19 control measure in countries with differing social contacts. *Scientific Reports*, 11(1), 3354. <https://doi.org/10.1038/s41598-021-82873-2>
- Seyed Alinaghi, S., Afsahi, A. M., MohsseniPour, M., Behnezhad, F., Salehi, M. A., Barzegary, A., & Dadras, O. (2021). Late complications of COVID-19: A systematic review of current evidence. *Archives of Academic Emergency Medicine*, 9(1), e14. <https://doi.org/10.22037/aaem.v9i1.1005>
- Sokhna, C., Goumballa, N., Bassene, H., Parola, P., & Gautret, P. (2021). The Grand Magal of Touba was spared by the COVID-19 pandemic. *International Journal of Infectious Diseases*, 105, 470–471. <https://doi.org/10.1016/j.ijid.2021.02.035>
- World Health Organization. (2020, March 15). *Coronavirus disease (COVID-19) advice for the public*. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public>