From Social Distancing to Physical Distancing: A Challenge for Evaluating Public Health Intervention against COVID-19

Hadi Pratomo

Department of Health Education and Health Promotion, Faculty of Public Health, Universitas Indonesia, Indonesia

Abstract

The coronavirus disease 2019 (COVID-19) pandemic has affected every country. Currently, no suitable vaccine or treatment has been identified; therefore, each country has attempted to issue appropriate policies, designed to reduce and prevent increases in the numbers of extreme cases. Transmission can be prevented by implementing social restrictions, also known as social distancing. The World Health Organization (WHO) has issued several methods for the prevention of transmission, including social distancing, washing hands with soap (or using hand sanitizer containing at least 70% alcohol), and using masks. Over time, the term social distance has changed to physical distance. Evaluating the impacts of different types of non-pharmacological interventions has been challenging.

Keywords: COVID-19, physical distance, social distance

The ongoing coronavirus disease 2019 (COVID-19) pandemic has become closely associated with the introduction of the popular term “social distancing”, followed shortly by the emergence of the new jargon “physical distancing”. These two terms are very closely related to the public health emergency and quarantine protocols.

A public health emergency is an extraordinary situation, during which a communicable disease rapidly disseminates across different regions and even countries. Based on the Indonesian Law, No 06, 2018, quarantine was defined as the isolation of a person or group of persons who have been exposed to a communicable disease, regardless of the presentation of symptoms.¹

The History of Social Distancing

Over the past 35 years, I have taught public health students in a course on Health Communications. One of the required readings that we discussed was *Health Communication: A Handbook for Health Professionals*. This textbook includes a section, titled, Nonverbal Communication in Health Care Setting (Chapter 4).² This book was written by health communication expert Peter Guy Northouse, Ph.D and his wife Laurel Lindhout Northouse, RN, MSN (a nurse) from western Michigan University in the United States of America.

Nonverbal communication refers to communication without words and encompasses messages developed by body motions, the use of space, and the use of sounds and touch. One dimension of nonverbal communication is kinesics, which refers to the study of body motions as a form of communication.² The other dimension is proxemics, a term proposed by the anthropologist Edward T. Hall, which refers to how individuals use and interpret space. One area of proxemics that is relevant to the current pandemic issue is distance. Both space and distance play significant roles in how individuals interact.³

Hall (1966) in Martinez *et al.*,³ defined that individuals in a social situation used four distance zones namely intimate, personal, social, and public. The intimate distance represents an area in which persons can touch one another, representing approximately 1.5 feet (45 cm) of separation. Personal distance is defined as between 1.5 and 2.5 feet (45 – 75 cm) of separation, equivalent to approximately an arm’s length. When individuals are separated by 4 – 12 feet (120–360 cm), they are practicing social distancing. Finally, when two individuals are separated by 12–25 feet (360–750 cm), this distance is referred to as public distance.³

Social distance is currently being endorsed by World Health Organization (WHO) as one practice that can pre-

Correspondence*: Hadi Pratomo, Department of Health Education & Health Promotion, Faculty of Public Health, Universitas Indonesia, Depok, West Java, Indonesia, E-mail: hadi.pratomo@ui.ac.id, Phone: +62217863475

Received : June 29, 2020
Accepted : July 20, 2020
Published: July 31, 2020

vent the transmission of COVID-19. This term originated in the field of health communication. Putting a social distance between two people indicates that an individual is 6 feet (1 foot= 30.48 cm or 0.305 m) away from another individual, which can prevent the spread of droplets from a patient suffering from COVID-19. In Indonesia, we are unfamiliar with measurement in feet; therefore, I would suggest that a distance of 6 feet is equivalent to approximately 2 meters of separation.

From Social Distancing toward Physical Distancing

The Canadian Agency for Public Health,⁴ indicated that physical distancing refers to making changes in one's everyday routines, to minimize close contact with others, including avoiding crowded places and non-essential gatherings, avoiding common greetings, such as handshakes, and limiting contact with people at higher risk (e.g., older adults and those in poor health). In addition, maintaining a distance of least 2 arm lengths from other individuals, as much as possible, is an important component of physical distancing.

The John Hopkins University,⁵ defined social distancing as a public health practice that aims to prevent sick people from coming into close contact with healthy people, to reduce opportunities for disease transmission. While, the US Centers for Disease Control and Prevention (CDC),⁶ defines social distancing as remaining out of congregate settings, avoiding mass gatherings, and maintaining distance (approximately 6 feet) from others when possible. Social life is a part of human to survive. We could not live in an isolated world. Maria van Kerkhove, an epidemiologist from WHO urged that, "We're changing to say physical distance from social distance and that's on purpose because we want people to still remain connected".⁷ Physical distancing represents the maintenance of physical distance from other people, to prevent the spread of COVID-19 while remaining socially connected to others, through the internet or social media. Therefore, currently, the term physical distancing is preferable to social distancing.⁷

Physical Distancing as an Applied Public Health Practice against COVID-19

Since COVID-19 is a relatively new disease, to assess the effectiveness of physical distancing, I attempted to identify literature examining the impacts of physical distancing for the spread of another, similar disease, namely severe acute respiratory syndrome (SARS). I found a study report by Ahmed, *et al.*,⁸ using certain criteria, a systematic review was conducted to look for publication within 2000–2017, then it found 13 research models and two epidemiology studies. The research model indicated that physical distance could only reduce approximately one-fourth (23%) of the attack rate and could reduce the

peak attack rate of SARS.⁸ This reduction would be even more effective faster if physical distancing was combined with other non-pharmacological interventions, such as the use of masks, washing hands with soap, or using hand-sanitizer, according to the WHO recommendations. Epidemiology research has shown that physical distance has a strong association with the reduction of influenza-like illnesses and the serum conversion of flu A (H1N1).⁸ However, careful interpretations of these data should be made, as there was potential for bias.

In the United States of America (USA), the stay-at-home orders were not coordinated at the national level. Fowler, *et al.*,⁹ analyzed publicly available data sources regarding the timing of stay-at-home orders and confirmed the reported daily COVID-19 cases, at the county level, for the USA. The results indicated that a coordinated, nationwide, stay-at-home order may have significantly reduced the numbers of both infections and deaths caused by COVID-19. In this case, stay-at-home orders reduced the infection growth rate and are the most beneficial when the infection counts are still low.⁹ In contrast, in the United Kingdom (UK), the implementation of physical distance measures was widely adopted by the UK public, which substantially reduced COVID-19 transmission. However, this decrease is projected, and will not occur immediately due to delays in the onset of symptomatic disease and hospitalization, in addition to delays in these events being reported. Tracking behavioral changes can provide a more rapid assessment of the impacts of physical distancing measures compared with routine epidemiological surveillance.¹⁰

The absence of evidence regarding the effectiveness of mask use from clinical trials should not be regarded as being equivalent to evidence of ineffectiveness. Xiao, *et al.*,¹¹ argued that cough etiquette (proper behavior when coughing and sneezing, such as covering your nose and mouth with a tissue or inner sleeve) is based on this consideration, and not on evidence provided by clinical trials. Cheng, *et al.*,¹² stated that mass masking to control the viral source represents a useful and low-cost complement to social distancing and hand washing (with soap or 70% alcohol hand sanitizer) during the COVID-19 pandemic. These measures shift the focus from self-protection to altruism and actively involve every citizen. In addition, these actions are considered symbols of social solidarity during the response to the global COVID-19 pandemic.

Various studies have examined the use of masks. Surgical masks are known to prevent the inhalation of large droplets and sprays but are limited in their ability to filter submicron-sized airborne particles.¹³ Because SARS-CoV-2, the virus responsible for COVID-19, can also be embedded in aerosols < 5 µm in diameter, evidence remains necessary regarding whether surgical masks are effective for preventing transmission. In one

study, conducted in Hong Kong, surgical mask use was found to significantly prevent the transmission of coronavirus and influenza viruses from asymptomatic people.¹⁴ Based on reports by Esposito, *et al.*,¹⁵ more study remains necessary regarding the effectiveness of mask use.

The impacts of physical distance on the spread of COVID-19, in combination with other non-pharmaceutical interventions, including staying and working at home, frequent handwashing with disinfectants, wearing masks in the community (mass masking), and practicing coughing etiquette, remain poorly understood. A study conducted by Singh A, *et al.*,¹⁶ reported a mathematical model showing that the implementation of non-pharmacological interventions could potentially reduce viral spread. Study conducted in Hong Kong and the Netherlands revealed similar results.¹⁷⁻¹⁹ Study by Kucharski AJ, *et al.*,²⁰ found that the application of self-isolation, testing, and physical distancing would increase the likelihood of controlling COVID-19 transmission. However, these studies all have limitations, including large uncertainties regarding estimates and the duration of infectiousness; therefore, further study must be performed, which should be carefully evaluated by public health researchers, especially epidemiologists, who have a keen interest in this field of study.

Abbreviations

COVID-19: Coronavirus Disease 2019; WHO: World Health Organization; CDC: Centers for Disease Control and Prevention; SARS: Severe Acute Respiratory Syndrome.

Ethics Approval and Consent to Participate

Not Applicable

Competing Interest

There is no competing interest.

Availability of Data and Materials

Not Applicable

Authors' Contribution

Hadi Pratomo as an author initiated the paper with ideas and finally wrote the manuscript.

Acknowledgment

The author would like to thank Ms. Paskalinda M. Y. Bandur STr. Keb., MKM, who provided support for literature review.

References

1. Undang-Undang Republik Indonesia No. 06 Tahun 2018 Tentang Kekarantinaan; 2018.
2. Northouse PG, Laurel L. Health communication: a handbook for health professionals. USA: Prentice Hall; 1985.
3. Rios-Martinez J, Spalanzani A, Laugier C. From proxemics theory to socially-aware navigation: a survey. *International Journal of Social Robotics*. 2015; 7: 137-53.
4. The Canadian Agency for Public Health. Physical distancing: actions for reducing the spread of Covid-19; April 15, 2020 [cited 2020 May 3].
5. John Hopkins University. What is social distancing and how can it slow the spread of Covid-19; 2020 [cited 2020 May 3].
6. Center for Disease Control and Prevention (CDC). Social distancing: what is social distancing ?; July 15, 2020 [cited 2020 May 3].
7. World Health Organization. Physical distancing; 2020 [cited 2020 May 3].
8. Ahmed F, Zviedrite N, and Uzicanin A. Effectiveness of workplace social distancing measures in reducing influenza transmission: a systematic review. *BMC Public Health*. 2018 [cited 2020 May 3]; 18: 518.
9. Fowler JH, Hill SJ, and Levin, Obradovich N, Levin R. The effect of stay-at-home orders on COVID-19 infections in the United States. *medRxiv*; Posted May 12, 2020.
10. Jarvis CI, Zandvoort KV, Gimma A, Prem K, CMMID Covid-19 Working Group, Klepac P, et al. Quantifying the impact of physical distance measures on the transmission of Covid-19 in the UK. *BMC Medicine*. 2020; 18: 124.
11. Xiao J, Shiu EYC, Gao H, Wong JW, Fong MW, Ryu S, et al. Nonpharmaceutical measures for pandemic influenza in nonhealthcare settings-personal protective and environmental measures. *Emerging Infectious Disease*. 2020; 26 (5): 967-75.
12. Kar KC, Tai HL, Chi CL. Wearing face masks in the community during the COVID-19 pandemic: altruism and solidarity. *Lancet*. Published online April 26, 2020.
13. Migliori GB, Nardell E, and Yedilbayev A. Reducing tuberculosis transmission: a consensus document from the World Health Organization regional for Europe. *European Respiratory Journal*. 2019 [cited 2020 May 14].
14. Leung NHL, Chu DKW, Shiu EYC, Chan KH, McDevitt JJ, Hau BJP, et al. Respiratory virus shedding in exhaled breath and efficacy of face masks. *Nature Medicine*. 2020 [cited 2020 May 14]; 26: 676-80.
15. Esposito S, Principi N, Leung CC, Migliori GB. Universal use of face mask for success against COVID-19: evidence and implications for prevention policies. *European Respiratory Journal*. 2020; 55: 2001260.
16. Singh A, Chandra SK and Bajpai MK. Study of non-pharmacological interventions on COVID-19 spread. *medRxiv*. 2020 [cited 2020 May 14].
17. Cowling BJ, Ali ST, Ng TWY, Tsang TK, Li JCM, Fong MW, et al. Impact assessment of non-pharmaceutical interventions against coronavirus disease 2019 and influenza in Hong Kong: an observational study. *Lancet Public Health*. 2020; 5 (5): E279-88.
18. Backer JA, Mollema L, Klinkenberg D, de Melker HE, Van der Klis FRM, Van den Hof S, et al. The impact of physical distancing measures against covid-19 transmission on contacts and mixing patterns in the Netherlands: repeated cross-sectional surveys. *medRxiv*. Posted May 20, 2020.
19. Prem K, Liu Y, Russell TW, Kucharski AJ, Eggo RM, Davies N. The effect of control strategies to reduce social mixing on outcomes of the