

An organizational, management, or leadership problem within a public health organization: A critical discussion and usefulness of one named theoretical framework in understanding the problem and for developing potential solutions to address that problem.

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December 2021

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1. Introduction:

The first case of COVID-19 was detected on December 31, 2019 (Guan et al., 2020). In a rapid series of events, the virus was identified, its genomics mapped, testing developed, and a working model for containment became available worldwide. There is a significant body of scientific evidence on how to control a pandemic in the published literature (Allot et al., 2017; WHO, 2009; World Health Organization, 2009; Yamamoto, 2013). And yet, the communication from the Centers for Disease Control and Prevention (CDC) appeared disjointed, confusing, and contradictory at times.

Given the fluid nature of the newly identified infectious agent, CDC should have predicted that the shared information's uncertain nature may be perceived as organizational incompetence (J. S. Ott & Shafritz, 1994) and unreliable (Hyer et al., 2007). The changing narrative led to diminished credibility, and the perceived void in authority was occupied by alternative reality providers advocating measures for pandemic control with no scientific proof. The public health organization from WH to CDC failed to distinguish between the message delivered and what was perceived by the public. They furthermore did not recognize the need for corrective actions when the messaging gap widened.

The geopolitical implication of the COVID-19 pandemic has been discussed in the literature (Directorate General for External Policies of the Union, 2020), and it appears that most local and regional recommendations were influenced based on socioeconomic and political factors. The contradictions received by the public fueled the skepticism. Lack of leadership at the levels of the administration of the US government is examined in this report. Changes to existing theoretical frameworks are needed to accommodate the rapidly evolving 21st-century digital information and communication platforms and the widening perception of delivered public health messages.

2. Background:

CDC and the National Institutes of Health (NIH) function as independent agencies under the umbrella of the Department of Health and Human Services (HHS)(HHS, 2021). CDC

is tasked with health promotion and prevention of diseases. NIH is the premier biomedical research institution of the HHS involved in basic and applied research. The result of NIH research translates into actionable policy by CDC and is deployed throughout the entire healthcare delivery system, all under the auspices of HHS. Food and Drug Administration (FDA) (under HHS) is responsible for approving any new drugs, devices, and therapeutic or diagnostic technologies. HHS, a cabinet-level institution, coordinates the US government response with scientific guidance provided by NIH and CDC to coordinate public health measures.

At the onset of the COVID-19 pandemic, Dr. Deborah Birx¹ was appointed by the Trump administration as the White House (WH) liaison to coordinate the COVID-19 response. Dr. Anthony Fauci² of NIH, and Dr. Birx, presented the public face of the COVID 19 response. The structure of the positions held by Dr. Birx and Fauci serves as a management safeguard against political cronyism (Khatri et al., 2006). The WH and CDC briefings at the onset of the pandemic were reassuring and, at the same time minimizing in tone and message. On January 20, the first case was reported in the United States (Holshue et al., 2020). By January 22, 2020, the human-to-human transmission had become evident and was shared by WHO (WHO-Novel Coronavirus Mission Summary, 2020). By February 29, WHO had issued interim guidance for quarantine and containment for COVID-19 (WHO-Interim Guidance, 2020). The mandate for physical distancing, face masks, and other public health measures were recommended. However, the compliance and acceptance of these recommendations were not nor continue to be dependent on the medical science or public health interest for a sizable segment of society. The correlation between the politics of knowledge, the role of the media, and non-medical variables affecting health communications outcomes were described (Dutta & de Souza, 2008) and critically evaluated in all outreach programs. The dismissal of community and society-wide public health concerns and emphasis on individual behavior as the sole determinant of health has been published (Robert & Booske, 2011). The messaging should have focused on the individual

¹ Employment could be terminated by the WH

² Employment could not be terminated by the WH

behavior for personal gain rather than the individual behavior for population benefit (Bayer Ellen & Thompson Darla, 2015; Hornik et al., 2019).

3. COVID-19 Communication by CDC (US 2019-2020)

There has been an unprecedented sociopolitical shift and polarization in the United States (US) for the last three decades (Morgan & Lee, 2019), with the pace and magnitude changing significantly in the previous few election cycles (Bostdorff, 2017). The widening of the political spectrum in the US has had a dramatic impact on the healthcare delivery system (Gollust & Cappella, 2014), and as importantly, the perceived legitimacy of the information provided by public health and political leaders. The data's propagation and validity are shared is transformative at all levels of the healthcare delivery system, from the policymakers in the political circles and academia to patient contact points by first responders at the bedside (Jankelová & Joniaková, 2021). As a singular geopolitical entity, the US is the sum of broad and varied geopolitical, socioeconomic entities and municipalities of different scales (cities, counties, states). State-specific GINI index shows a wide range of income and the resultant health inequalities (Lai et al., 2008) amongst the States in the US (Frieden, 2011).

A distinct leadership and communication approach would be only productive for a subsegment of the society. The same system could not be universally successful across the US. CDC, and its public face, both within and out of the WH, had a singular linear approach to information sharing that has only been effective for a portion of the US population. The failure of the leadership at all levels of management (Norrlöf, 2020) has been catastrophic. It has disproportionately affected the lower socioeconomic and the disadvantaged (NEJM, 2020). The failure of the leadership at the local and regional levels in the US has magnified dire consequences globally, which will prolong the losses in the US and elsewhere (Godlee, 2021).

4. Theoretical Frameworks

Effective communication is critical for political (Barrett, 2006) and public health leaders (Sriharan et al., 2021). Applying the framework of public health leadership,

communication, and public relations campaigns is essential for the scientific deployment, monitoring, and evaluation of effective campaigns (Zhao, 2020). However, the theories' language, utility, and application are complex for implementation (Davidoff et al., 2015). The reasons include the problematic conceptualization, lack of concrete theoretical basis for some ideas, and non-uniform application of the theories in other implementations projects (Atkin & Rice, 2017). Furthermore, the need for a change of message and the time it takes to evaluate the effectiveness of a campaign can only be robust in a proactive, well-run organization and leadership (Waisbord & Obregon, 2012). Several theories (Health behavior model, Social-cognitive theory, Theory of reasoned action) (Fishbein & Yzer, 2003) have been used in leadership and health communications campaigns. However, incorporating these theoretical frameworks has not produced predictable or reproducible outcomes (Waisbord & Obregon, 2012).

In addition, behavioral approaches are utilized frequently due to the ability to evaluate behavior change (physical distancing, wearing masks, vaccination) (Zhao, 2020). Therefore, theories of change, persuasion, communication, health model, and other leadership frameworks may be needed for a deeper understanding and analysis of the socio-environmental variables that influence behavior change (Curtis et al., 2020). Furthermore, the connections between leadership, communication, and persuasion skills are even more critical when faced with a global health crisis (Friedman, 2011).

Several theoretical frameworks can evaluate communication in the public health arena from different perspectives (Nilsen, 2015). These include leadership-management, messaging, cultural, socioeconomic, policy, and geopolitical considerations (World Health Organization, 2017). There is a need to apply multiple frameworks (Suggs & McIntyre, 2015) to address successful public health outreach components. Numerous frameworks are needed to manage all aspects of a campaign, including Accuracy, Availability, Balance, Consistency, Cultural competence, Evidence base, Reach, Reliability, Repetition, Timeliness (European Centre for Disease Prevention and Control, 2004).

Public Health Leadership Model

The public health leadership (PHL) model has been described to include a broad range of skills needed. These eight skills are 1-Systems thinking, 2-Political leadership, 3-Building and leading interdisciplinary teams, 4-Communications, 5-Leading change, 6-Emotional intelligence, and 7-organizational learning and development 8-Ethics and professionalism (Czabanowska et al., 2013).

The PHL model has limitations as it views inward for the leadership qualities, not from the performance perspective.

PRECEDE-PROCEED Framework

The PRECEDE-PROCEED (PrPr) (Green, 1974) model is used to critically discuss its usefulness in understanding the leadership and management of the COVID-19 US pandemic, and potential solutions are proposed by public health leadership. This framework has both communication (Parvanta et al., 2002) and leadership perspectives (Block McLaughlin, 2004) in the published literature.

The PrPr model guides this review of the COVID 19 pandemic response from a public health perspective. As reflected by poor acceptance of public health measures by sizable

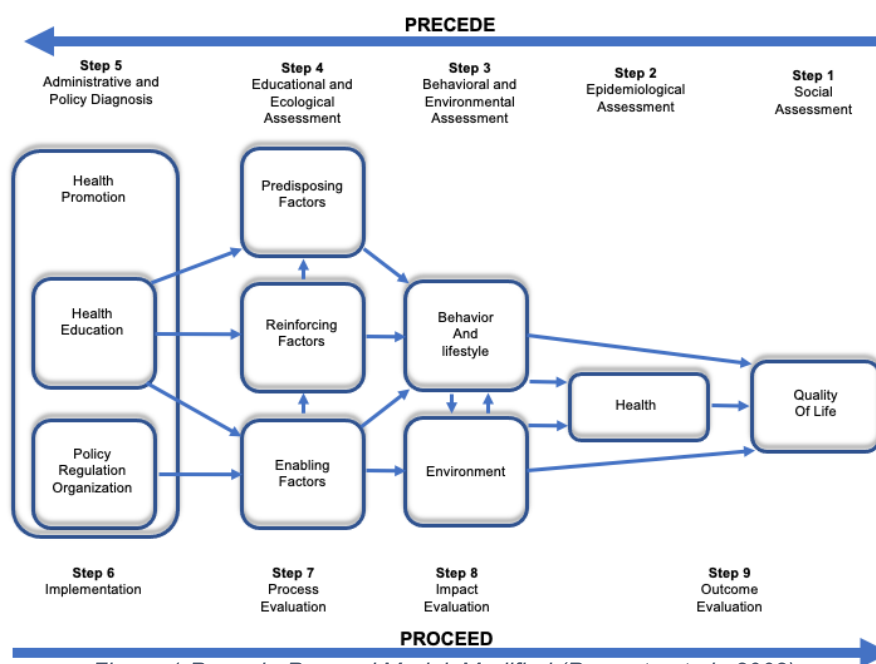


Figure 1-Precede-Proceed Model, Modified (Parvanta et al., 2002)

segments of the US society, the leadership failure (Godlee, 2021) can be examined in the context of the response generated by the public health leadership and communication skills (Gollust et al., 2020). Complete execution of the PrPr model would have allowed early recognition of the shortcomings and the undesirable and unsatisfactory outcome (reduction of the infection and death) due to lapse in leadership at the federal level (Altman, 2020a).

Critical Observation: PRECEDE-PROCEED Framework

1.1.1. Benefits:

The PrPr-model starts with an evaluation of a need. Then, assessments are performed to collate the pertinent data for a policy and regulation composition. As the health promotion goal is defined, all contributing factors are evaluated, and plans are instituted to address the underlying concerns. The model starts with a theoretical observation and goal (Precede side), and with the deployment of the action plan (Proceed), the results are evaluated at all stages for correction as needed. The ability to assess the progress is highlighted by the Process, Impact, and the Outcome evaluation of the Proceed side. The PrPr framework is versatile and used for planning, deployment, and evaluation of a broad range of public health concerns (Cole & Horacek, 2009; Phillips et al., 2012; Rahmani et al., 2021), including the COVID-19 pandemic (Nejhaddadgar et al., 2021; Yodmai et al., 2021). The PrPr model has to define approaches when applied to a uniform population body. Uniformity index measures include socio-economical, population-centered, participatory, quality of life focus, and versatility (Porter, 2015). The outcome of the PrPr (step 9) is population-centered; the population's ability to absorb and digest information delivered is a crucial variable in the result. The focus of PrPr was initially providing education and knowledge with the recognition of the connection between human health and the environment (Evans, 1982). However, this has been expanded and needs to continually be modified to accommodate the changing landscape, including the changes in the population demographics and the way we communicate using social media (Charalambous, 2019) and consume the information provided from different perspectives (Gollust et al., 2020).

1.1.2. Limitation:

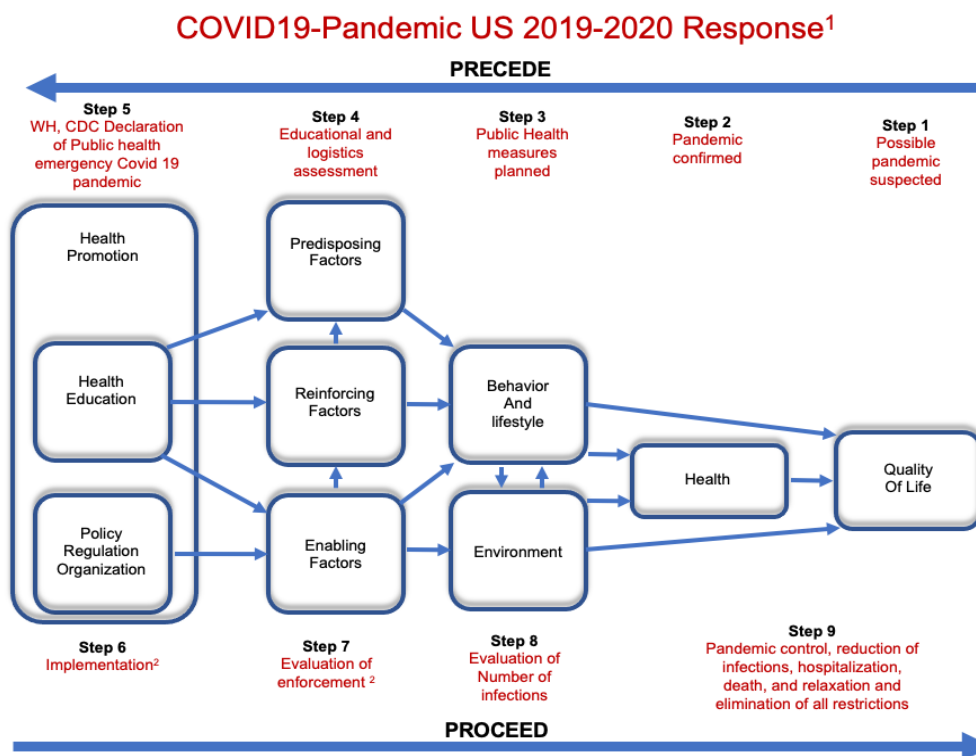
The limitation of the PrPr models is that it approaches the problem at hand in a linear format. The PrPr model does not account for the heterogeneity of the population; it is studying for intervention. An intervention designed for a health concern is evaluated in a homogenous way. This single-layer approach limits the ability of broader evaluation and management for a population where socioeconomic, educational, political views are not uniform. This wide gap in the composition of the people in the US (and abroad) translates to the diminution of the health information used by individuals for public health decisions (Hart et al., 2020; Ruisch et al., 2021). The PrPr model would be much more productive at a State (or even regional) level with a desirable outcome. The result of applying a singular PrPr framework model is that the message in a right-leaning, poor socioeconomic southern US would be receptive and responsive to a much different message and delivery than the left-leaning higher socioeconomic coastal US (Altman, 2020a; Doherty, 2017). This approach will fail, like applying an identical outreach for the same problem in two different countries, low and high income (Hanson et al., 2021). The PrPr framework can be used in a comprehensive clinical range, including limited cognitive and developmental abilities. However, a new model needs to be created for subjects requiring similar services without cognitive or developmental limitations (Binkley & Johnson, 2013).

The PrPr is a robust framework for singular messaging. However, when misinformation and peripheral "noise" obscures the message (Peters et al., 2020), there is no mechanism in PrPr for an automated correction in the planned pathway. As messaging is critical to effective leadership, defining the objective messaging for the ultimate goal (Hyer et al., 2007).

Critical Observation: PRECEDE-PROCEED, COVID-19 Communication (US 2019-2020)

The CDC and the Leadership management of COVID-19 response are outlined in Figure 2. The leadership skills dictate the steps taken for the reaction to the COVID-19. Although WHO identified and confirmed the threat and CDC developed an intervention (steps 1-4), a clear communication plan would have been critical (Hyer et al., 2007).

The leadership failed to recognize that the communicated vague (van der Bles et al., 2019) early clinical information about COVID-19 is received as unreliable by large segments of the partisan society, primarily divided based on the political lines (Ruiz & Bell, 2021). Under normal circumstances, public health measures would have been managed by professionals locally under the guidance of the CDC. As the Proceed side of the framework progressed, the implementation phase failed to distinguish between the subset of the populations subjected to the same communication and leadership skills (Kirzinger et al., 2020). The daily news briefing at the WH intended to emphasize the critical nature of the crisis, portray a sense of control and at the same time provide practical information on needed behaviors and lifestyle changes to protect the public. However, these visible leadership displays frequently went array with dangerous information presented (Rogers et al., 2020) that needed to be clarified or entirely nullified by a healthcare professional (Gollust et al., 2020). When the leadership was not getting the expected result or experiencing unexpected resistance, they failed to reassess the education and the enabling factors (step 6-7) of PrPr to reassess in a control feedback loop to recalibrate the underlying message and the leadership approach



¹ This is an academic publication and represent a hypothetical model.

² Physical distancing, Masking, closure of all public arena, restaurants, schools, halt of international and domestics flight

Figure 2 Covid 19 Precede-Proceed Model

The PrPr model does not explicitly have a feedback loop built in. However, any effective leader recognizes the need to continuously evaluate the message to avoid providing contrary information causing public confusion and distrust (Bursztyn et al., 2020).

The leadership in charge of the messaging, both the non-partisan and the partisan political appointee public health professionals, did not recognize the disconnect between implementation and the evaluations (steps 6, 7, 8) phases. As the testing and vaccination were promoted and taken up regionally, a mechanism should have been created between the change in behavior noted in certain states (step 7) and the ability to change the outreach message, and the leadership to adjust the enabling and reinforcing factors (step 6-7) (Robertson, 2021) (Figure 3) Given the complex social factors in play and a semi-autonomous local approach (Altman, 2020b) would have been desirable to include local control and leadership under the guidance of the CDC. Cultural and social competence are critical components of successful leadership skills (Dauvrin & Lorant, 2015).

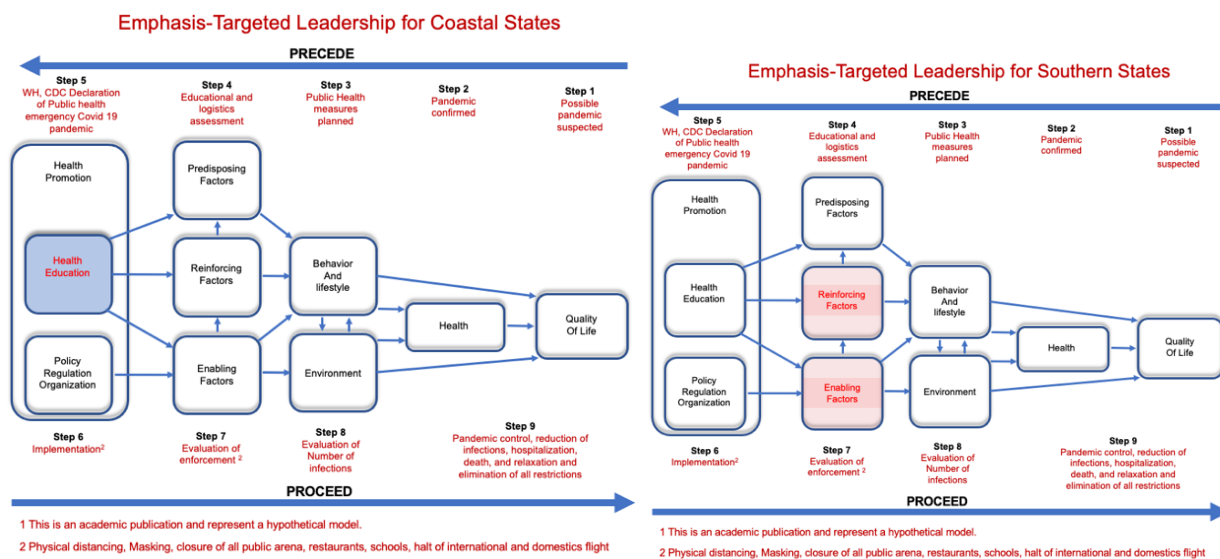


Figure 3 Comparative Emphasis Needed-Coastal Vs. Southern States

5. Potential Solutions

The root cause of the issues raised was the lack of effective leadership, and it continues to plague the response. The political ramification of an election is beyond the scope of our discussion. The failures can be divided into two divisive issues: 1- the political divide, 2-contradictory and preliminary information presented by non-partisan leaders, which was dismissed as inaccurate.

1. The political source of information is not remedied quickly and will require long-term planning for years to come.
2. As for the perception of the misinformation, the public health leaders should have considered the following:
 - 2.1.1. Providing vague and abstract concepts in virology, transmissibility, and public health may not be perceived plausible by the lower socioeconomic³ segment of the society (Siller, 1957). Specific sectors of the public would require concise, clear, digestible, and repetitive unambiguous massaging (van de Vijver & Willemsen, 1993) to avoid confusion and reinforce the known facts at hand (White et al., 1993). For example, the CDC portrayed the latest Omicron COVID 19 variant as the deadliest (November 2021) of all mutations, immediately banned travel from Africa, and soon forewarned possible restrictive mandate. However, within the same week (December 2021), CDC issued an optimistic brief with backtracking of most warnings given the previous week. This uncertainty (as valid as it may be from a scientific and statistical perspective with the limited information available) reinforces the doubts on the accuracy of the information, credibility of the leaders for those who may have difficulty with the abstract analysis (Kalter, 2021; Mahase, 2021; Weixel, 2021) of complex subject matter.

³ I recognize and acknowledge that the correlation between socioeconomic status, abstract thinking, and cognitive skills is multivariable and is influenced by broad range of social determinant including poor nutrition, housing, water, air pollution, unstable housing, and many other factors (Marioni et al., 2014).

2.1.1.1. As a cornerstone of public health, transparency should not be the basis for releasing preliminary, first-hand "gut feeling" information (O'Malley et al., 2009) without actionable scientific data. Instead, the public needs to be aware of all the facts and possible scenarios, leading to anxiety and panic (Agle & Xiao, 2021).

2.1.2. The leadership and communication skills should have been micro-targeted to the subset of the society requiring different approaches. A long-term vision and direction needed to be communicated to reassure the audience of the message and the goal (Bohmer, 2010). Free text messaging in Rural US with limited broadband and cable news would be much more effective. PSA's are of little value since the younger generation uses a mobile device and does not consume network TV (Cortellazzo et al., 2019; Kalogeropoulos, 2019).

2.1.3. Recognize what makes pockets of the population anxious and address those in the context of the problem at hand to minimize the effect of alternative reality messaging (Cook & Choi, 2020).

2.1.4. Leaders should never marginalize, dismiss concerns, or demean segments of the population (Barling & Frone, 2017).

2.1.5. Lead by example. WH and CDC mandating restrictions and, at the same time, high ranking officials attending private parties (Ha. Ott, 2021; Panetta, 2021).

3. Recognize the socioeconomic impact of the public health measures and provide a pathway forward, and not just a pessimistic view of what was (is) to come (Viale, 2015). The population needs to feel cared for, safe, and protected (APA, 2020).

4. Carrot and Stick transactional leadership may be beneficial to encourage compliance and engagement (Frangieh & Rusu, 2021) of a specific sector of society.

6. Summary

The PrPr model is valuable for constructing the leadership pathway for a regional and local approach to a homogenous population. The same model will require modification to be accommodating for a different audience. The multimodality approach is critical to encourage compliance with the recommendations

COVID-19 and the ongoing pandemic is a global event. Managing a worldwide crisis of this magnitude requires exceptional leadership at all levels (Yphantides et al., 2015). As a critical leadership skill, communication requires continuous assessment for a message, delivery, and impact (Popescu, 2016).

Numerous frameworks models describe effective leadership, messaging, and communications theories. Few may have been tested uniformly to a large-scale global pandemic. Furthermore, the application of these frameworks needs critical evaluation and assessment. Consensus meetings have been described as several attributes for an effective leader in public health (Czabanowska et al., 2013). The leadership frameworks' modification and refinement are needed to accommodate the changing population demographics, communication methods, worsening health and income inequities (vaccine), and geopolitics (Brownson et al., 2020).

References:

- Agley, J., & Xiao, Y. (2021). Misinformation about COVID-19: evidence for differential latent profiles and a strong association with trust in science. *BMC Public Health*, 21(1), 89. <https://doi.org/10.1186/s12889-020-10103-x>
- Allot, F., Bratasena, A., Cowling, B., Gellin, B., Haas, W., Kandeel, A., Lee, V., Luangon, W., Mancha-Moctezuma, C., Nicoll, A., Oshitani, H., Phin, N., Reed, C., Salisbury, D., Simonsen, L., Kerkhove, M. van, Abrahams, J., Bergeri, I., Besselaar, T., ... Zhang, W. (2017). Pandemic Influenza Risk Management. A WHO guide to inform & harmonize national & international pandemic preparedness and response. *Global Influenza Programme. World Health Organization, May*.
- Altman, D. (2020a). Understanding the US failure on coronavirusan essay by Drew Altman. *BMJ*, 370. <https://doi.org/10.1136/bmj.m3417>
- Altman, D. (2020b). Understanding the US failure on coronavirusan essay by Drew Altman. *BMJ*, 370. <https://doi.org/10.1136/bmj.m3417>
- APA. (2020). How leaders can maximize trust and minimize stress during the COVID-19 pandemic. In <https://www.apa.org>. <https://www.apa.org/news/apa/2020/covid-19-leadership>
- Atkin, C. K., & Rice, R. E. (2017). Theory and Principles of Public Communication Campaigns. In *Public Communication Campaigns*. <https://doi.org/10.4135/9781544308449.n1>
- Barling, J., & Frone, M. R. (2017). If Only my Leader Would just Do Something! Passive Leadership Undermines Employee Well-being Through Role Stressors and Psychological Resource Depletion. *Stress and Health : Journal of the International Society for the Investigation of Stress*, 33(3), 211–222. <https://doi.org/10.1002/smi.2697>
- Bayer Ellen, & Thompson Darla. (2015). Communicating to Advance the Public's Health. In *Communicating to Advance the Public's Health*. <https://doi.org/10.17226/21694>
- Binkley, C. J., & Johnson, K. W. (2013). Application of the PRECEDE-PROCEED Planning Model in Designing an Oral Health Strategy. *Journal of Theory and Practice of Dental Public Health*, 1(3).
- Block McLaughlin, J. (2004). Leadership, management, and governance. *New Directions for Higher Education*, 2004(128), 5–13. <https://doi.org/https://doi.org/10.1002/he.161>
- Bohmer, R. (2010). Leadership with a small l. *BMJ*, 340. <https://doi.org/10.1136/bmj.c483>

- Bostdorff, D. M. (2017). Obama, Trump, and Reflections on the Rhetoric of Political Change. *Rhetoric and Public Affairs*, 20(4), 695–706.
<https://doi.org/10.14321/rhetpublaffa.20.4.0695>
- Brownson, R. C., Burke, T. A., Colditz, G. A., & Samet, J. M. (2020). Reimagining public health in the aftermath of a pandemic. In *American Journal of Public Health* (Vol. 110, Issue 11). <https://doi.org/10.2105/AJPH.2020.305861>
- Bursztyn, L., Rao, A., Roth, C. P., & Yanagizawa-Drott, D. H. (2020). *Misinformation during a pandemic*. National Bureau of Economic Research.
- Charalambous, A. (2019). Social Media and Health Policy. *Asia-Pacific Journal of Oncology Nursing*, 6(1), 24–27. https://doi.org/10.4103/apjon.apjon_60_18
- Cole, R. E., & Horacek, T. (2009). Applying PRECEDE-PROCEED to Develop an Intuitive Eating Nondieting Approach to Weight Management Pilot Program. *Journal of Nutrition Education and Behavior*, 41(2), 120–126.
<https://doi.org/10.1016/j.jneb.2008.03.006>
- Cook, N., & Choi, M. (2020). *Trump rallies his base to treat coronavirus as a 'hoax'.* *Politico*. <https://www.politico.com/news/2020/02/28/trump-south-carolina-rally-coronavirus-118269>
- Cortellazzo, L., Bruni, E., & Zampieri, R. (2019). The Role of Leadership in a Digitalized World: A Review. *Frontiers in Psychology*, 10, 1938.
<https://doi.org/10.3389/fpsyg.2019.01938>
- Curtis, V., Dreibelbis, R., Sidibe, M., Cardosi, J., Sara, J., Bonell, C., Mwambuli, K., Ghosh Moulik, S., White, S., & Aunger, R. (2020). How to set up government-led national hygiene communication campaigns to combat COVID-19: A strategic blueprint. *BMJ Global Health*, 5(8). <https://doi.org/10.1136/bmjgh-2020-002780>
- Czabanowska, K., Smith, T., Könings, K. D., Sumskas, L., Otok, R., Bjegovic-Mikanovic, V., & Brand, H. (2013). In search for a public health leadership competency framework to support leadership curriculum-a consensus study. *European Journal of Public Health*, 24(5). <https://doi.org/10.1093/eurpub/ckt158>
- Dauvrin, M., & Lorant, V. (2015). Leadership and cultural competence of healthcare professionals: a social network analysis. *Nursing Research*, 64(3), 200–210.
<https://doi.org/10.1097/NNR.0000000000000092>
- Davidoff, F., Dixon-Woods, M., Leviton, L., & Michie, S. (2015). Demystifying theory and its use in improvement. *BMJ Quality and Safety*, 24(3).
<https://doi.org/10.1136/bmjqs-2014-003627>

- Directorate General for External Policies of the Union. (2020). *The geopolitical implications of the COVID-19 pandemic*. <https://doi.org/10.2861/526114>
- Doherty, C. (2017). Key takeaways on Americans' growing partisan divide over political values. In *Pew Research Center*. <https://www.pewresearch.org/fact-tank/2017/10/05/takeaways-on-americans-growing-partisan-divide-over-political-values/>
- Dutta, M. J., & de Souza, R. (2008). The past, present, and future of health development campaigns: Reflexivity and the critical-cultural approach. In *Health Communication* (Vol. 23, Issue 4). <https://doi.org/10.1080/10410230802229704>
- European Centre for Disease Prevention and Control. (2004). *What is health communication?* <https://www.ecdc.europa.eu/en/health-communication/facts>
- Evans, S. (1982). Health education planning: A diagnostic approach. *Social Science & Medicine*, 16(5). [https://doi.org/10.1016/0277-9536\(82\)90316-1](https://doi.org/10.1016/0277-9536(82)90316-1)
- Fishbein, M., & Yzer, M. C. (2003). Using theory to design effective health behavior interventions. *Communication Theory*, 13(2), 164–183. <https://doi.org/10.1093/ct/13.2.164>
- Frangieh, M., & Rusu, D. (2021). The Effect of the Carrot and Stick Transactional Leadership style in Motivating Employees in SMEs. *Review of International Comparative Management*, 22(2). <http://www.rmci.ase.ro/no22vol2/10.pdf>
- Frieden, T. R. (2011). *CDC health disparities & inequalities report – United States 2011*. <https://www.cdc.gov/mmwr/pdf/other/su6001.pdf>
- Friedman, K. (2011). You're on! How strong communication skills help leaders succeed. *Business Strategy Series*, 12(6). <https://doi.org/10.1108/17515631111185941>
- Godlee, F. (2021). Covid-19: Failures of leadership, national and global. *BMJ*, 373. <https://doi.org/10.1136/bmj.n1540>
- Gollust, S. E., & Cappella, J. N. (2014). Understanding Public Resistance to Messages About Health Disparities. *Journal of Health Communication*, 19(4), 493–510. <https://doi.org/10.1080/10810730.2013.821561>
- Gollust, S. E., Nagler, R. H., & Fowler, E. F. (2020). The Emergence of COVID-19 in the US: A Public Health and Political Communication Crisis. *Journal of Health Politics, Policy and Law*, 45(6), 967–981. <https://doi.org/10.1215/03616878-8641506>
- Green, L. W. (1974). Toward Cost-Benefit Evaluations of Health Education: Some Concepts, Methods, and Examples. *Health Education Monographs*, 2(1_suppl), 34–64. <https://doi.org/10.1177/10901981740020S106>

- Guan, W., Ni, Z., Hu, Y., Liang, W., Ou, C., He, J., Liu, L., Shan, H., Lei, C., Hui, D. S. C., Du, B., Li, L., Zeng, G., Yuen, K.-Y., Chen, R., Tang, C., Wang, T., Chen, P., Xiang, J., ... Zhong, N. (2020). Clinical Characteristics of Coronavirus Disease 2019 in China. *New England Journal of Medicine*, 382(18), 1708–1720. <https://doi.org/10.1056/nejmoa2002032>
- Hanson, K., O'Dwyer, E., & Lyons, E. (2021). The national divide: A social representations approach to US political identity. *European Journal of Social Psychology*. <https://doi.org/10.1002/ejsp.2791>
- Hart, P. S., Chinn, S., & Soroka, S. (2020). Politicization and Polarization in COVID-19 News Coverage. *Science Communication*, 42(5), 679–697. <https://doi.org/10.1177/1075547020950735>
- HHS. (2021, July 14). *HHS Organizational Chart*. HHS. <https://www.hhs.gov/about/agencies/orgchart/index.html>
- Holshue, M. L., DeBolt, C., Lindquist, S., Lofy, K. H., Wiesman, J., Bruce, H., Spitters, C., Ericson, K., Wilkerson, S., Tural, A., Diaz, G., Cohn, A., Fox, L., Patel, A., Gerber, S. I., Kim, L., Tong, S., Lu, X., Lindstrom, S., ... Pillai, S. K. (2020). First Case of 2019 Novel Coronavirus in the United States. *New England Journal of Medicine*, 382(10), 929–936. <https://doi.org/10.1056/nejmoa2001191>
- Hornik, R. C., Volinsky, A. C., Mannis, S., Gibson, L. A., Brennan, E., Lee, S. J., & Tan, A. S. L. (2019). Validating the Hornik & Woolf approach to choosing media campaign themes: Do promising beliefs predict behavior change in a longitudinal study? *Communication Methods and Measures*, 13(1). <https://doi.org/10.1080/19312458.2018.1515902>
- Hyer, R. N., Organization, W. H., & Covello, V. T. (2007). *Effective Media Communication During Public Health Emergencies: A WHO Field Guide*. World Health Organization. <https://books.google.com/books?id=VleQ1V4GCxUC>
- Jankelová, N., & Joniaková, Z. (2021). Communication Skills and Transformational Leadership Style of First-Line Nurse Managers in Relation to Job Satisfaction of Nurses and Moderators of This Relationship. *Healthcare (Basel, Switzerland)*, 9(3), 346. <https://doi.org/10.3390/healthcare9030346>
- Kalogeropoulos, A. (2019). How Younger Generations Consume News Differently - Reuters Institute Digital News Report. *Digital News Report*. https://reutersinstitute.politics.ox.ac.uk/sites/default/files/inline-files/DNR_2019_FINAL.pdf

- Kalter, L. (2021, November 30). *Fauci: Omicron 'Very Different From Other Variants.'* WebMD. <https://www.webmd.com/lung/news/20211130/omicron-very-different-variant>
- Khatri, N., Tsang, E. W. K., & Begley, T. M. (2006). Cronyism: A Cross-Cultural Analysis. *Journal of International Business Studies*, 37(1), 61–75. <http://www.jstor.org/stable/3875215>
- Kirzinger, A., Hamel, L., Muñana, C., Kearney, A., & Brodie, M. (2020). KFF Health Tracking Poll-late April 2020: Coronavirus, social distancing, and contact tracing. *Kaiser Family Foundation*.
- Lai, D., Huang, J., Risser, J. M., & Kapadia, A. S. (2008). Statistical Properties of Generalized Gini Coefficient with Application to Health Inequality Measurement. *Social Indicators Research*, 87(2), 249–258. <https://doi.org/10.1007/s11205-007-9170-y>
- Mahase, E. (2021). Covid-19: Do vaccines work against omicron and other questions answered. *BMJ*, 375. <https://doi.org/10.1136/bmj.n3062>
- Marioni, R. E., Davies, G., Hayward, C., Liewald, D., Kerr, S. M., Campbell, A., Luciano, M., Smith, B. H., Padmanabhan, S., Hocking, L. J., Hastie, N. D., Wright, A. F., Porteous, D. J., Visscher, P. M., & Deary, I. J. (2014). Molecular genetic contributions to socioeconomic status and intelligence. *Intelligence*, 44, 26–32. <https://doi.org/https://doi.org/10.1016/j.intell.2014.02.006>
- Morgan, S. L., & Lee, J. (2019). Economic Populism and Bandwagon Bigotry: Obama-to-Trump Voters and the Cross Pressures of the 2016 Election. *Socius*, 5, 2378023119871119. <https://doi.org/10.1177/2378023119871119>
- Nejhaddadgar, N., Azadi, H., Mehedi, N., Toghroli, R., & Faraji, A. (2021). Teaching adults how to prevent COVID.19 infection by health workers: The application of intervention mapping approach. *Journal of Education and Health Promotion*, 1(1). https://doi.org/10.4103/jehp.jehp_1398_20
- NEJM, E. (2020). Dying in a Leadership Vacuum. *New England Journal of Medicine*, 383(15), 1479–1480. <https://doi.org/10.1056/NEJMe2029812>
- Nilsen, P. (2015). Making sense of implementation theories, models and frameworks. *Implementation Science*, 10(1), 53. <https://doi.org/10.1186/s13012-015-0242-0>
- Norrlöf, C. (2020). Is COVID-19 the end of US hegemony? Public bads, leadership failures and monetary hegemony. *International Affairs*, 96(5), 1281–1303. <https://doi.org/10.1093/ia/iiaa134>

- O'Malley, P., Rainford, J., & Thompson, A. (2009). Transparency during public health emergencies: from rhetoric to reality. *Bulletin of the World Health Organization*, 87(8), 614–618. <https://doi.org/10.2471/blt.08.056689>
- Ott, Ha. (2021, December 9). *Amid scandal over breaking its own COVID rules, U.K. government reimposes restrictions to fight Omicron*. <https://www.cbsnews.com/news/uk-boris-johnson-party-scandal-covid-omicron-variant-restrictions/>
- Ott, J. S., & Shafritz, J. M. (1994). Toward a Definition of Organizational Incompetence: A Neglected Variable in Organization Theory. *Public Administration Review*, 54(4), 370–377. <https://doi.org/10.2307/977385>
- Panetta, G. (2021, September 20). *14 prominent Democrats stand accused of hypocrisy for ignoring COVID-19 restrictions they're urging their constituents to obey*. <https://www.businessinsider.com/democratic-politicians-who-violated-covid-19-rules-guidance-list-2020-12>
- Parvanta, C., Maibach, E. W., Arkin, E. B., Nelson, D. E., & Woodward, J. (2002). *Public health communication: a planning framework*.
- Peters, J. W., Plott, E., & Haberman, M. (2020). 260,000 words, full of self-praise, from Trump on the virus. *The New York Times*.
- Phillips, J. L., Rolley, J. X., & Davidson, P. M. (2012). Developing Targeted Health Service Interventions Using the PRECEDE-PROCEED Model: Two Australian Case Studies. *Nursing Research and Practice*, 2012, 279431. <https://doi.org/10.1155/2012/279431>
- Popescu, G. H. (2016). THE ROLE OF LEADERSHIP IN PUBLIC HEALTH. *American Journal of Medical Research*, 3(1), 273. <https://doi.org/10.22381/ajmr31201610>
- Porter, C. M. (2015). Revisiting Precede–Proceed: A leading model for ecological and ethical health promotion. *Health Education Journal*, 75(6), 753–764. <https://doi.org/10.1177/0017896915619645>
- Rahmani, D., Zeng, C., Goodarzi, A. M., & Vahid, F. (2021). Organizational Compliance During COVID-19: Investigating the Effects of Anxiety, Productivity, and Individual Risk Factors Among Iranian Healthcare Employees. *Frontiers in Communication*, 6, 7. <https://www.frontiersin.org/article/10.3389/fcomm.2021.560451>
- Robert, S. A., & Booske, B. C. (2011). US opinions on health determinants and social policy as health policy. *American Journal of Public Health*, 101(9), 1655–1663. <https://doi.org/10.2105/AJPH.2011.300217>

- Robertson, L. S. (2021). Association of COVID-19 mortality with politics and on-demand testing in 217 U.S. counties. *BMC Public Health*, 21(1), 2203. <https://doi.org/10.1186/s12889-021-12063-2>
- Rogers, K., Hauser, C., Yuhas, A., & Haberman, M. (2020). Trump's suggestion that disinfectants could be used to treat coronavirus prompts aggressive pushback. *New York Times*, 1A.
- Ruisch, B. C., Moore, C., Granados Samayoa, J., Boggs, S., Ladanyi, J., & Fazio, R. (2021). Examining the Left-Right Divide Through the Lens of a Global Crisis: Ideological Differences and Their Implications for Responses to the COVID-19 Pandemic. *Political Psychology*, 42(5). <https://doi.org/10.1111/pops.12740>
- Ruiz, J. B., & Bell, R. A. (2021). Predictors of intention to vaccinate against COVID-19: Results of a nationwide survey. *Vaccine*, 39(7), 1080–1086. <https://doi.org/https://doi.org/10.1016/j.vaccine.2021.01.010>
- Siller, J. (1957). Socioeconomic status and conceptual thinking. *Journal of Abnormal and Social Psychology*, 55(3). <https://doi.org/10.1037/h0045237>
- Sriharan, A., Hertelendy, A. J., Banaszak-Holl, J., Fleig-Palmer, M. M., Mitchell, C., Nigam, A., Gutberg, J., Rapp, D. J., & Singer, S. J. (2021). Public Health and Health Sector Crisis Leadership During Pandemics: A Review of the Medical and Business Literature. In *Medical Care Research and Review*. <https://doi.org/10.1177/10775587211039201>
- Suggs, S., & McIntyre, C. (2015). COMMUNICATING HEALTH MESSAGES A FRAMEWORK TO INCREASE THE EFFECTIVENESS OF HEALTH COMMUNICATION GLOBALLY. <https://www.imperial.ac.uk/media/imperial-college/institute-of-global-health-innovation/public/Complex-health-messages.pdf>
- van de Vijver, F. J. R., & Willemsen, M. E. (1993). Abstract Thinking. In J. Altarriba (Ed.), *Advances in Psychology* (Vol. 103, pp. 317–342). North-Holland. [https://doi.org/https://doi.org/10.1016/S0166-4115\(08\)61670-2](https://doi.org/https://doi.org/10.1016/S0166-4115(08)61670-2)
- van der Bles, A. M., van der Linden, S., Freeman, A. L. J., Mitchell, J., Galvao, A. B., Zaval, L., & Spiegelhalter, D. J. (2019). Communicating uncertainty about facts, numbers and science. *Royal Society Open Science*, 6(5), 181870.
- Viale, P. H. (2015). Communication of Bad News to Patients: Is Honesty the Best Policy? *Journal of the Advanced Practitioner in Oncology*, 6(3), 189–190. <https://doi.org/10.6004/jadpro.2015.6.3.1>
- Waisbord, S., & Obregon, R. (2012). Theoretical Divides and Convergence in Global Health Communication. In *Obregon/The Handbook of Global Health Communication*. <https://doi.org/10.1002/9781118241868.ch1>

- Weixel, N. (2021, December 7). *Fauci: Omicron appears to be less severe*. The Hill. <https://thehill.com/homenews/administration/584733-fauci-omicron-appears-to-be-less-severe>
- White, S. B., Reynolds, P. D., Thomas, M. M., & Gitzlaff, N. J. (1993). Socioeconomic Status and Achievement Revisited. *Urban Education*, 28(3), 328–343. <https://doi.org/10.1177/0042085993028003007>
- WHO. (2009). Pandemic Influenza Preparedness and Response: A WHO Guidance Document. *Pandemic Influenza Preparedness and Response: A WHO Guidance Document*.
- WHO-Interim Guidance. (2020, February 29). *Considerations for quarantine of individuals in the context of containment for coronavirus disease (COVID-19)*. Considerations for Quarantine of Individuals in the Context of Containment for Coronavirus Disease (COVID-19). https://apps.who.int/iris/bitstream/handle/10665/331299/WHO-2019-nCov-IHR_Quarantine-2020.1-eng.pdf?sequence=1&isAllowed=y
- WHO-Novel Coronavirus Mission Summary. (2020, January 20). *WHO-Novel Coronavirus Mission Summary*. WHO-Novel Coronavirus Mission Summary. <https://www.who.int/china/news/detail/22-01-2020-field-visit-wuhan-china-jan-2020>
- World Health Organization. (2009). Pandemic Influenza Preparedness and Response: A WHO Guidance Document. *Pandemic Influenza Preparedness and Response: A WHO Guidance Document*.
- World Health Organization. (2017). WHO Strategic Communications Framework. *World Health Organization*, 2017(July).
- Yamamoto, T. (2013). Pandemic control measures. *Japan Medical Association Journal*, 56(1), 51–54.
- Yodmai, K., Pechrapa, K., Kittipichai, W., Charupoonpol, P., & Suksatan, W. (2021). Factors Associated with Good COVID-19 Preventive Behaviors Among Older Adults in Urban Communities in Thailand. *Journal of Primary Care & Community Health*, 12, 21501327211036252. <https://doi.org/10.1177/21501327211036251>
- Yphantides, N., Escoboza, S., & Macchione, N. (2015). Leadership in public health: new competencies for the future. *Frontiers in Public Health*, 3, 24. <https://doi.org/10.3389/fpubh.2015.00024>
- Zhao, X. (2020). Health communication campaigns: A brief introduction and call for dialogue. *International Journal of Nursing Sciences*, 7, S11–S15. <https://doi.org/https://doi.org/10.1016/j.ijnss.2020.04.009>