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COVID-19 and Its Impact on the Midwest United States

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Abstract

The COVID-19 pandemic has impacted many lives and livelihoods all over the world. We have looked at some infection and death rates statistics based on population globally, in the US, and in the Midwest. Unfortunately, as of December 21, 2021, all states in the Midwest region had higher infection rate than the US as a whole. The death rate, fortunately, in many states in the Midwest was lower than the US death rate as a whole. We have identified some research questions (and of course there are many more) that IS/T colleagues in the Midwest and elsewhere can pursue.

Keywords: COVID-19, Midwest US implications

1. Introduction

Since March 2020, the world has been dealing with the COVID-19 pandemic. The impact on our lives has been staggering. As of December 21, 2021, globally there have been over 275 million known cases of COVID-19, and the death toll exceeds 5.36 million. In the U.S., more than 51 million people have contracted COVID-19, and more than 808,757 have died (coronavirus.jhu.edu/map.html). The world and US population on this date was listed as more than 7.866 billion and 332 million, respectively (US Census Bureau). Hence, the percentage of infection and death rates based on population globally are 3.49 and 0.07, respectively. For the US, similar percentages are 15.36 and 0.24, respectively. We are currently in the midst of a fifth wave of contagion and spread, due to the Omicron variant, although, the implications of this new variant are not fully understood yet. Table 1 below depicts similar statistics about the States in the Midwest as of December 21, 2021. These rates are based on each states' number of infections, death, and population size.

Table 1. Midwest States' Infection and Death Rates as of December 21, 2021

State	No. of Cases	No. of Death	Population	% Infection Rate	% Death Rate
Illinois	1,975,515	29,661	12,801,989	15.43131	0.231691
Indiana	1,192,448	18,489	6,785,528	17.5734	0.272477
Iowa	557,029	7680	3,271,616	17.02611	0.234746
Kansas	501,226	6920	2,937,880	17.06081	0.235544
Michigan	1,629,362	27,901	10,077,331	16.16859	0.276869
Minnesota	982,664	10,280	5,706,494	17.2201	0.180146
Missouri	968,560	15,871	6,154,913	15.73637	0.257859
Nebraska	327,858	3,298	1,961,504	16.71462	0.168136
North Dakota	169,545	2,023	779,094	21.76182	0.259661
Ohio	1,855,222	28,028	11,799,448	15.72296	0.237537
South Dakota	174,021	2,438	886,667	19.62642	0.274962
Wisconsin	1,061,618	10,763	5,893,718	18.0127	0.182618

Sources: coronavirus.jhu.edu/map.html
Infoplease.com/us/states/state-population-by-rank

As Table 1 shows, unfortunately, all states in the Midwest region have higher infection rate than the US as a whole. The death rate, fortunately, in many states in the Midwest is lower than the US death rate as a whole. Although it is difficult to predict the long-term implications of COVID-19 for the Midwest, it is vital to plan ahead for different scenarios over the next few years and beyond.

The higher infection rates in the Midwest potentially have to do with lower vaccination rates. Even among college students, some vaccine hesitancy remains. A study by Wotring et al. (2021), based on a survey of 1,600 students in a Midwest university, indicates that only half of them were vaccinated. Among those who were not vaccinated, about 49% indicated that they do not intend to get vaccinated. About 78% of those not vaccinated feared potential side effects, and about 72% indicated that they do not trust the vaccine. The authors suggest that "targeted messaging" could potentially be effective in reducing or eliminating vaccination hesitancy.

The pandemic has already impacted how we educate individuals, regardless of their age. The lack of technology availability and access to high-speed Internet, in particular, in the rural areas of the Midwest is creating additional burden on low income and indigenous communities. This further adds to the existing equity related problems that already exist in some school districts, colleges, and universities in the Midwest region. The lack of equity is not limited to the Midwest or even the United States. Rather, it seems that it is apparent in other parts of the world. In a study about students in Germany, Händel et al. (2020) found that there were two groups of students that significantly differed in terms of their

readiness for online learning: Those who do have access to the needed technology and have prior experience with e-learning and those who do not. To avoid an additional equity gap as a result of the pandemic and moving to the online mode of course delivery, there is a significant need for supporting school districts and low-income college and university students to make sure technology and access to high speed Internet is available to all students regardless of their location and family income level.

There is also the need to look at the implications for faculty members who were not adequately familiar with and/or prepared for the online mode of course delivery. We should examine their perception, in particular, due to the fact that in many institutions, the shift to online mode of delivery occurred literally in a matter of days. Cameron-Standerford et al. (2020) looked at the perception of faculty members in a mid-sized rural Midwestern university. Among the interesting results of this study is that the authors asked respondents to identify ten words that described their experience of moving to online mode of course delivery. With the frequency of from fifteen to six, these are the words that were used: "challenging, concern, anxious, stressful, relieved, overwhelmed, hopeful, confident, uncertain, and flexible" (p. 6).

A careful review of the above ten words clearly indicates that the respondents had a varying degree of familiarity and preparation to offer online courses. This and similar studies should serve as a warning for higher education institutions to be more prepared for these kinds of emergencies by providing appropriate levels of faculty development as well as adequate access to various educational technologies for faculty and students.

The social distancing and isolation experienced during the pandemic, unfortunately, will potentially have long term implications for the mental health of children and potentially even adults. Moriarty, Bourbeau, Fontana, McNamara, and Pereira da Silva (2021) surveyed 868 college students in a public university in the Midwest and reported that reduced exercise and sleep during the COVID-19 pandemic significantly predicted the levels of stress. Browning et al. (2021), in a study of seven universities in the United States, concluded that not recognizing and addressing mental health challenges caused by the pandemic could potentially have long-term impact on the mental health and education of students. These and similar studies may be useful for universities to develop health-promotion strategies.

Many people believe that we will never vanquish the virus, and that it will become a part of the landscape. A recent article in the *New York Times* concluded that "Eventually, as viral evolution slows down and our immune systems catch up, we will reach an uneasy equilibrium with the virus, scientists predict. We will never extinguish it, but it will smolder rather than rage (Anthes, 2021)." If true, the question becomes how do we live with it, rather than how do we return to 2019.

For information systems academics, there are many opportunities for research regarding COVID-19 that is not only interesting but that may also have important practical impacts. While this list is by no means comprehensive, there are some research areas for which we can use our particular skill sets to investigate. These include topics related to medical equipment, patient healthcare records, pandemic-related statistics, healthcare informatics, in general, and data visualization, in particular, use of Zoom-like platforms for research collaboration and teaching, and the use of social media to disseminate both information and disinformation about the virus and treatment. Examples of research in each area follow.

2. Health Related Data Collection and Visualization

The U.S. Centers for Disease Control and Prevention (CDC) has collected COVID-19 related data on a daily basis and regularly posts the data on its website. Case numbers are reproduced in chart form, as seen in the following figure from December 15, 2021. This is of course just an example of the opportunities for data collection and visualization. There are many other ways to represent the data that the CDC collects, and there are many other data sources that could be utilized. There are gaps, however, that academics could fill. In doing the research for this editorial, we were unable to find current graphics for data from the Midwest as a region, regardless of source. But beyond the reporting of daily statistics, there are no doubt many IS research questions that require access to COVID-19 data that would lend themselves to various sorts of data visualization.

Figure 1. Daily Trends in COVID-19 Cases in the United States Reported to CDC
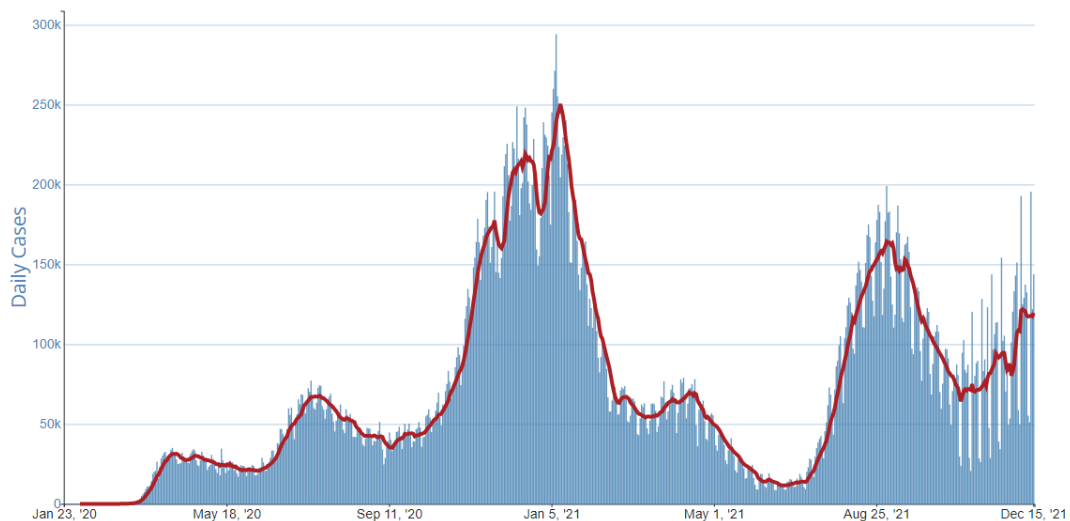
Source: CDC Web Site

Another example of what is possible and relevant comes from some work done at Iowa State University. Early in the pandemic, Hridesh Rajan and his collaborators created the BoaC platform to facilitate analysis of an open research dataset on COVID-19 (http://boa.cs.iastate.edu/boac/). This dataset contains over 44,000 research papers collected over 64 years (Even, 2020). While this project originated in a computer science department, similar opportunities are available in the information systems area as well.

3. Zoom-like Platforms for Research and Teaching

As we all experienced in 2020, the use of Zoom and related platforms expanded greatly, as we used it for meetings (after meetings after meetings) and for teaching. In fact, the use of Zoom, in particular, expanded from 200 million meeting minutes in 2013, when it was first introduced, to over 3.3 trillion meeting minutes by March 2021 (Dean, 2021) during the pandemic. Since the beginning of the pandemic, behavioral researchers have studied how work and life have changed. Some of the best-known research was conducted in by communication scholars at Stanford University on the topic of 'zoom fatigue' (see, for example, Ramachandran, 2021, and Bailenson, 2021). There are many other topics related to the use of Zoom-like platforms, at work, at home, and for other activities, and IS faculty are well suited to explore these topics.

Many of us also employed videoconferencing platforms in our teaching, and some of us have already written about our experiences (cf. Barber 2021). As the pandemic continues, and as COVID-19 moves from pandemic to endemic, we will still be relying on these platforms, to some extent, in our teaching. Again, there are plenty of opportunities for IS faculty to write about their experiences and about the best practices they have discovered.

4. Social Media

Research on social media and its use during the pandemic has attracted much attention from researchers in IS and related fields. This is a very fertile field for research, and there are still many interesting research questions to be investigated. Here are two recent examples of published work in this area:

Zhong, Huang and Liu (2021) conducted an online study of 320 residents of Wuhan, China, in February 2020. They

found an increase in depression among respondents as the virus spread. Wuhan is considered the location of the initial incidence of the virus, so a study based there, inquiring about initial reactions to the pandemic, is especially worthwhile. The authors found that social media (in this case, WeChat), had a positive role. Respondents reported social media use helped mitigate stress and health risks through the exchange of "informational, emotional, and peer support."

Allington, Duffy, Wessely, Dhavan and Rubin (2021) conducted three online surveys in the UK (N = 949; 2250; 2254 – the last two were panels) about social media, health behaviors, and conspiracy theories. In all three studies, they found evidence of a negative relationship between conspiracy beliefs about COVID-19 (e.g., the virus was created in a lab; 5G mobile radiation causes the symptoms) and health protective behaviors, such as hand washing and staying inside. They also found a positive relationship between relying on social media as a key source of information and conspiracy beliefs.

5. What is Unique about the Pandemic in the Midwest?

While the research we publish in JMWAIS is not limited geographically, we have a special bond with the members of the MWAIS chapter and with faculty and IS/T professionals living and working in the Midwest. Our journal was created as a platform to communicate with each other about our research and to provide a way to highlight our work. All of the COVID related topics we've mentioned here (and there are certainly others) could be investigated anywhere. The research we cited was conducted in the UK, Germany, China, and elsewhere in the U.S., but note that some of the work was local. We referenced work done in both Iowa and Illinois and other part of the Midwest. And this calls attention to the question: What is unique about the pandemic in the Midwest? What can we say about it that reflects our region and its unique attributes?

Note that the Midwest has been the location of several COVID-19 hotspots since the pandemic began: South Dakota in September 2020; Indiana in November 2020; Michigan in April 2021; Missouri in July 2021. Why is that the case? And what research can we as IS scholars do to help understand the reasons behind this? There are other issues as well, related to our region's location and conditions. How can we extend and improve upon these research foci in our work in the Midwest? Here are some suggested research questions (but there are many others as well):

1) Why are we seeing COVID-19 hotspots in the Midwest? And what is the role of social media in the origins – and perpetuation – of these hotspots?

2) What can we learn about COVID-19 from large data sets dedicated to the number of cases, testing, hospitalizations, and deaths in the Midwest? Why is the Midwest more like the South than like the West or Northeast?

3) What are the best teaching practices we have developed in Midwestern colleges and universities for remote and hybrid classes? Are these practices influenced by anything unique to our region?

4) What are the best practices we have developed in the Midwest for remote work? Again, are these practices influenced by anything unique to our region?

5) What's unique about COVID-19 and how we are coping with it in the Midwest? And what role do information systems – at any level – play in this uniqueness?

Should you decide to pursue some of these questions, we wish you good luck in your research. And we look forward to receiving your manuscripts.

6. Overview of the Contents of this Issue

This issue of the journal includes two traditional research articles.

In their timely article, Kent Marett and Shan Xiao look at the relation between the availability of broadband Internet access and users' security knowledge. For their analysis, the authors have used both primary and secondary data. The findings of this study add another important reason to make broadband Internet access available as widely as possible.

Akmal Mirsadikov and Achita Muthitacharoen in their interesting article look at the possible connection between website user's motivation and their assessment of the site's credibility. The authors use eye tracking technology in this

study.

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7. References

Allington, D., Duffy, B., Wessely, S., Dhavan, N., & Rubin, J. (2021). "Health-protective behavior, social media usage and conspiracy belief during the COVID-19 public health emergency." *Psychological Medicine* 51, 1763–1769. https://doi.org/10.1017/S003329172000224X

Anthes, E. (2021). "What the future may hold for the coronavirus and us." *New York Times*, October 12, 2021. https://www.nytimes.com/2021/10/12/health/coronavirus-mutation-variants.html

Bailenson, J.N. . (2021). "Nonverbal overload: A theoretical argument for the causes of Zoom fatigue." *Technology, Mind, and Behavior*, 1-6.

Barber, C. (2021). "From stress to success: Leveraging the online experience for information systems students. *Communications of the AIS* 48. https://doi.org/10.17705/1CAIS.04817

Browning, M. H. E. M, Larson, L.R., Sharaievska, I., Rigolon, A., McAnirlin, O., Mullenbach, L. et al. (2021). "Psychological impacts from COVID-19 among university students: Risk factors across seven states in the United States." PLOS ONE 16(1): e0245327. https://doi.org/10.1371/journal. pone.0245327

Cameron-Standerford, B., Menard, K., Edge, C., Bergh, B., Shayter, A., Smith, K., & VandenAvond, L. (2020)."The phenomenon of moving to online/distance delivery as a result of COVID-19: Exploring initial perceptions of higher education faculty at a rural Midwestern university." *Frontiers in Education*, 5, 583881 doi 10.3389/feduc.2020.583881.

Dean, B. (2021) "Zoom user stats: How many people use Zoom in 2021?" https://backlinko.com/zoom-users.

Even, J. (2020). "Open data set to increase efficiency of COVID-19 research." *Iowa State Daily*. https://www.iowastatedaily.com/news/open-data-set-to-increase-efficiency-of-covid-19-research-boac-scientists-efficiencies-coronavirus-coronaviruses-papers-projects-hridesh-rajan-computer-science-yijia-huang-rangeet-pan-robert-dyer-simon-galetta-des-moines-public-health-jianqiang-zhang-tomislav-jelesijevic-professors-allen-institute-remotely-pandemics/article_87b3ae82-7523-11ea-bae1-e369cab7bad1.html

Händel, M., Stephan, M., Gläser-Zikuda, M., Kopp, B., Bedenlier, S., & Ziegler, A. (2020). Digital readiness and its effects on higher education students' socio-emotional perceptions in the context of the COVID-19 pandemic. *Journal of Research on Technology in Education*, 1-13.

Moriarty, T., Bourbeau, K., Fontana, F., McNamara, S., & Pereira da Silva, M. (2021). "The Relationship between psychological stress and healthy lifestyle behaviors during COVID-19 among students in a US Midwest university." International Journal of *Environmental Research and Public Health* 18, 4752, https://doi.org/10.3390/ijerph18094752

Ramachandran, V. (2021). "Stanford researchers identify four causes for 'Zoom fatigue' and their simple fixes." https://news.stanford.edu/2021/02/23/four-causes-zoom-fatigue-solutions/.

Wotring, A. J., Hutchins, M., Johnson, M. K., Ferng, S., Strawser, C., Pfrank, H., Warner, M., & Behrendt, L. (2021). "COVID-19 vaccine uptake among college students at a Midwest University." *Journal of Community Health* 20, November 2021, https://doi.org/10.1007/s10900-021-01051-7

Zhong, B., Huang, Y. & Liu, Q. (2021). "Mental health toll from the coronavirus: Social media usage reveals Wuhan

residents' depression and secondary trauma in the COVID-19 outbreak." *Computers in Human Behavior* 114, 1-10.
 https://doi.org/10.1016/j.chb.2020.106524

Author Biographies

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Rassule Hadidi is Dean of the College of Management, Metropolitan State University, Minneapolis, Minnesota. His current research areas of interest include online and blended teaching and learning pedagogy and its comparison with face-to-face teaching; curriculum development and quality assessment; cloud computing and its applications for small and medium-sized enterprises; and quality of online information. He has served as the president as well as the At-Large Director of the Midwest Association for Information Systems and is the founding Managing Editor of the *Journal of the Midwest Association for Information Systems*. He is a member of the Board of Directors of the Society for Advancement of Management.