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The missing link between medical science knowledge and public awareness: implications for tourism and hospitality recovery after COVID-19

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Abstract

Purpose – As the world grapples with the pervasive effects of the coronavirus pandemic, a notable disconnect has emerged in the public's understanding of scientific and medical research. Particularly, the travel industry has become unquestionably vulnerable amid the COVID-19 outbreak; this pandemic has interrupted the industry's operations with devastating economic consequences. This paper aims to highlight the importance of deconstructing barriers between medical science and public awareness related to COVID-19, taking tourism as a case in point. It also discusses the role of interdisciplinary research in facilitating the tourism and hospitality industry's recovery and alleviating tourists' uncertainties in the wake of COVID-19.

Design/methodology/approach – This paper offers a synthesis of news coverage from several media outlets, framed within the literature on knowledge transformation across disciplines. This framing focuses on the medical sciences (e.g. public health) and social sciences (e.g. tourism management) to identify gaps between medical scientific knowledge and public awareness in the context of COVID-19. The authors' experience in public health and tourism management further demonstrates a missing link between academic research and the information made available in public health and everyday settings. A potential research agenda is proposed accordingly.

Findings – This paper summarizes how salient issues related to knowledge transfer can become intensified during a global pandemic, such as medical research not being communicated in plain language, which leads



some citizens to feel apathetic about findings. Reporting on the prevalence and anticipated consequences of disease outbreaks can hence be difficult, especially early in the development of diseases such as COVID-19.

Research limitations/implications – By assuming a cross-disciplinary perspective on medical/health and social science research, this paper encourages academic and practical collaboration to bring medical research to the masses. This paper also outlines several research directions to promote public health, safety and sustainability through tourism.

Practical implications – This paper highlights that it is essential for medical knowledge to be disseminated in a manner that promotes public understanding. The tourism and hospitality industry can benefit from an essential understanding of medical findings, particularly during this pandemic. Without a firm grasp on COVID-19's origins and treatment, the tourism and hospitality industry will likely struggle to recover from this catastrophe.

Social implications – Taking COVID-19 as a case in point, this study advocates leveraging the strengths of disparate domains to bring medical findings to a wider audience and showcase cutting-edge developments for the greater good. This study also emphasizes the importance of engaging the general public in reputable scientific research findings to increase public awareness in a professional and accurate manner.

Originality/value – This paper presents a unique and critical discussion of the gap between medical science knowledge and public awareness, as well as its implications for tourism and hospitality recovery after COVID-19, with a focus on applying medical scientific knowledge to post-pandemic industry recovery.

Keywords Coronavirus, COVID-19, Interdisciplinary research, Tourism recovery, Medical science, Social science, Public health crisis

Paper type Research paper

Introduction

The novel coronavirus (COVID-19), emerged in Wuhan, Hubei province, China, in late December 2019, has brought unforeseen consequences to nearly every sector of the global economy. Supply chains have been disrupted, the world's stock markets are collapsing and a global recession looms (Fernandes, 2020). Experts around the world are striving to examine the pandemic in hopes of being able to curtail it. COVID-19 is an infection of zoonotic origin; that is, the disease was initially transferred from animals to humans and is now transmissible between persons (Huang *et al.*, 2020). The virus has been tied to the Huanan Seafood Wholesale Market in Wuhan where live animals were available for consumer purchase (Li *et al.*, 2020). COVID-19 symptoms are reminiscent of those associated with the SARS outbreak in 2003 (Wilder-Smith *et al.*, 2020); the virus attacks the respiratory system and is highly contagious, potentially leading to hospitalization and death. Countries have taken drastic measures to control the spread of the virus. In fact, the pandemic has thrown everyday life into upheaval with the closure of national borders, businesses, schools and other establishments.

The tourism and hospitality industry has been a major casualty of COVID-19: restaurant business has plummeted due to local and global shutdowns, and hotels worldwide have lost billions from cancelled reservations (Ozili and Arun, 2020). While these economic shocks are jarring, economic vulnerability in the tourism context remains underexplored (Canh and Thanh, 2020), and the ultimate consequences of economic downturns remain to be seen. Essentially, vulnerability is a fatal aspect of tourism. Researchers must therefore consider the interactions between people, environments, and space and time within tourism ecosystems (Student *et al.*, 2020). Scholars have already underlined the significance of reconceptualizing problems to better understand how the industry has been affected and disrupted by external impacts (Duvat *et al.*, 2017).

At present, researchers in various domains are exploring COVID-19 and striving to address its catastrophic effects. Early efforts to blunt the virus have focused on physical distancing (Prem *et al.*, 2020) and treating the sick. Meanwhile, medical researchers and practitioners continue to explore the epidemiology of COVID-19 to differentiate it from similar illnesses (Wu and McGoogan, 2020). Studies of genome sequencing (Brüssow, 2020; University of Cambridge, 2020), symptomology (Huang *et al.*, 2020) and risk factors (Ji *et al.*, 2020) have provided valuable insight into the transmission, detection and

progression of COVID-19. Researchers in fields such as tourism and hospitality have also considered how this pandemic may alter human behavior over the longer term, such as by changing tourists' food consumption (Ying *et al.*, 2020) or their lifestyle and holiday behavior (Wen *et al.*, 2020b; Jiang and Wen, 2020).

However, not all information presented in scholarly research enters the public consciousness; medical science is highly technical and not necessarily accessible to a wide audience (National Academies of Sciences, Engineering, and Medicine, 2017). As the world seeks to combat COVID-19 collectively, it is imperative that experts aim to surmount relevant communication barriers. The gap between medical science and public awareness is especially dire in this case. For our purposes, "public awareness" refers to a generalized (i.e. non-specialized) understanding of the pandemic, namely, that exhibited by members of the public. The disconnect muddies public health crisis control and prevention strategies, hinders inter-country coordination in consistent and effective disease control, compromises public protection and hampers industry recovery and resilience. By providing pandemic-related information that a general audience can understand, citizens and professionals will be better able to use research findings to promote their communities' recovery from this public health crisis.

This paper is conceptual and based on a synthesis of news coverage from multiple media outlets (e.g. *The Conversation*), positioned within related literature on the medical and social sciences with a focus on tourism management amid COVID-19. Ferguson *et al.* (2021) indicated that most government information on COVID-19 is too dense for the average Australian to comprehend, as citizens may struggle to understand writing as required for broader participation in work, education and training, and society. Ferguson *et al.* (2021) further stated that much government-produced COVID-19 information is difficult to read and thus unlikely to be of great practical use. Pandemic-related warnings from the media (e.g. Ferguson *et al.*, 2021) have brought closer attention to the ways that knowledge is presented to the public – especially during a pandemic – and how science-based communication can enhance public awareness of pandemic prevention and safety. This warning also applies to academics working in the medical and social sciences. Regarding tourism, Wen *et al.* (2020) discussed the importance of interdisciplinary studies on COVID-19 in and beyond tourism by absorbing knowledge from medical and health sciences to promote public understanding. In the same vein, the current study draws from medical and health scientists' experiences applying medical research-based knowledge through evidence-based medicine (EBM) to effectively translate academic knowledge into practice. Furthermore, academics in the medical, health and social sciences have collaborated to investigate possible roadblocks to science-based communication. They have particularly sought to determine how to bring medical science into public awareness in the tourism context during COVID-19.

Overall, this paper takes COVID-19 as an example to highlight gaps between the academic literature and practice. The authors then call for more interdisciplinary research at the intersection of medical science, communications and marketing to foster the global tourism and travel industry's recovery. The remainder of this paper is structured as follows. First, an overview of roadblocks to communicating science highlights the information gap between the public and medical science. Second, ways to bring medical science into public awareness are briefly discussed as a means of enhancing the public's understanding of research implications. Third, tourism is taken as a case in point, having been one of the industries most affected by COVID-19. Finally, the authors advocate for bridging medical science and tourism through interdisciplinary research via cross-domain collaboration.

Roadblocks to communicating science

A clear gap exists between the research academics performance and the information made available in public health and everyday settings (Carbone and Thomas, 2018). The role of

research in academia differs from that in practice; for example, scholars are incentivized to study novel topics and develop new theories for academic journals, while innovation in public health and medicine is driven by different motivations (Carbone and Thomas, 2018). Inter-industry communication presents other obstacles: experts in medical science and public health may struggle to share their concerns with scholars in a way that promotes relevant research. As COVID-19 spreads across the globe, professionals in the medical and health sciences are facing mounting public pressure to address the outbreak. Meaningful discoveries continue to be made. However, the importance of medical findings is not always duly emphasized to the public. For instance, disease-related information that is shared with the government may not be transparently disseminated to a country's citizens (Brownell *et al.*, 2013). Citizens without a medical background do not always understand how government-released information applies to them (National Academies of Sciences, Engineering, and Medicine, 2017). Also, scholars outside of the medical sciences – and even professionals working on the front lines of this pandemic – may not fully grasp the minutiae of COVID-19 given the speed at which data are being released.

Indeed, numerous issues related to knowledge transfer can become intensified in the context of a pandemic. Many academic research articles are hidden behind paywalls, and medical research is not always written in plain language for a wide readership (Brownell *et al.*, 2013). Additionally, everyday citizens may have little interest in scientific and medical research. From a logistical standpoint, forecasting the global effects of pandemics such as COVID-19 is notoriously difficult (Petropoulos and Makridakis, 2020). Such predictions call for extensive historical data that can only be collected over time. Therefore, reporting on the prevalence and anticipated consequences of disease outbreaks is difficult, especially early in a disease's development. Pandemic-related reporting thus calls for a balance between providing information as accurately and comprehensively as possible while minimizing unnecessary panic.

A major concern with these communication challenges is that they can prevent individuals from fully protecting themselves during public health emergencies. Government decisions will not be as effective as they could be unless officials have sufficient information. Additionally, for better or worse, the media plays a central role in shaping individuals' perceptions of COVID-19 (Zheng *et al.*, 2020). For instance, South Korea has been largely complimented on its handling of the pandemic (Leslie *et al.*, 2020); the national government implemented strict risk reduction measures nearly as soon as the COVID-19 outbreak began in February. The country also implemented a comprehensive testing program and contact tracing to control the virus. Yet not all citizens agreed with officials' decisions; in some cases, the media painted these choices as draconian. In Italy, one of the countries that has been most affected by COVID-19, individuals were initially reluctant to abide by physical distancing measures to stem the spread of the virus. The nation's officials were similarly hesitant to implement strict guidelines at first (Leslie *et al.*, 2020; Remuzzi and Remuzzi, 2020). This delayed response partially led to Italy's hospital system becoming overwhelmed with its COVID-19 caseload. The United States has also faced criticism for its gradual response to the outbreak: the federal government appeared not to recognize the gravity of the situation until after the virus had already begun to spread (Leslie *et al.*, 2020). America has since surpassed Europe as the epicenter of the outbreak.

While no decision is expected to be perfect, government officials and citizens will be more empowered to make well-informed choices when armed with reliable information. Clear and unified communication is thus essential during these times. If officials and citizens do not (or cannot) leverage evidence-based findings to manage public health issues, people's lives are more likely to be risked unnecessarily. A bridge must therefore be built to bring established health findings to the public. COVID-19 has touched almost every corner of the world to an unanticipated degree, and governments and citizens are seeking concrete strategies to

manage the outbreak. Bringing medical science into public awareness will help citizens understand the implications of existing research and what the results mean for them.

Bringing medical science into public awareness

The spread of COVID-19 has understandably evoked panic as people attempt to navigate life under the looming threat of disease. It is therefore crucial that media outlets report timely information to help individuals prepare to face this emergency. Advocacy efforts to bring medical research findings to the public, especially to practitioners on the front lines of medicine, are not new. Medical scholars and practitioners have long realized that cutting-edge, research-based knowledge should be incorporated into practice to have the greatest impact. Over the past decades, EBM has come to play a major role in public health intervention and policy (Oliver and Pearce, 2017). EBM embodies knowledge transfer in medical science, referring to “the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients” (Sackett, 1997). This is a laudable and certainly worthwhile task, but one that can also seem daunting given the nature of medical practitioners’ work.

The American College of Physicians (ACP) Journal Club was developed to partly alleviate this burden (Haynes, 1991). The club’s aim is to pore over internal medicine journals and identify articles that meet specific selection criteria. Abstracts are then created for chosen studies, supplemented by professional commentary from physicians specializing in the field featured in a given article. The developed abstract and professional commentary are then shared with the article’s original author for verification prior to being released to clinicians (Haynes, 1991). This process results in concise, easily digestible medical information that practitioners can adopt in their practice without needing to review associated articles in great depth (Glasziou and Aronson, 2018). It also enables doctors to incorporate high-value clinical evidence into their work to better serve the public.

Essentially, EBM is grounded in the belief that high-quality research can reveal effective interventions to prevent and treat disease. EBM has paved the way to evidence-based practice, wherein clinicians apply EBM in treatment settings. EBM and relevant practices also have evolved since their inception. A wide range of stakeholders has been incorporated into the generation and application of evidence over time. For example, patient and public involvement boards in healthcare are intended to bring lay persons on board during health research to enhance public participation (Oliver and Pearce, 2017). Despite these advances, some scholars have argued that systemic problems continue to plague academic research – even going so far as to suggest that EBM has been “hijacked” (Ghinea, 2020; Ioannidis, 2016). For example, randomized controlled trials are the gold standard in EBM for determining the efficacy of clinical interventions. Yet these trials can apparently be gamified; clinical researchers may be offered authorship on manuscripts reporting randomized controlled trials based on the number of patients they recruit (Ioannidis, 2016). While such “gift authorship” does not uniformly characterize medical research by any stretch, this concern does highlight the general need to consider research critically rather than at face value.

The same care is needed when consuming COVID-19-related traditional and social media coverage. During this Internet era, misinformation can spread rapidly. For example, if media outlets and public figures possess a superficial understanding of a given disease, widespread miscommunication can result. The effects of biased media coverage can be especially problematic for specific populations. For example, in the case of COVID-19, Asians have been unfairly targeted in the media (Misra *et al.*, 2020). This bias has led to inequitable and even violent treatment against individuals of Asian descent (Zheng *et al.*, 2020). Researchers have also suggested that media bias could contribute to or exacerbate mental health concerns among Chinese diaspora (Wen *et al.*, 2020a).

Although limited empirical data are currently available to demonstrate how the media's and public's response to COVID-19 has influenced Asians directly, misleading media reports could inform individuals' perceptions of the Chinese as carriers of the virus. These misconceptions have already influenced the tourism industry, as evidenced by apparent distrust of Chinese restaurants and goods given COVID-19's inherent connotations with China (Depoux *et al.*, 2020).

The impacts of COVID-19 on tourism and hospitality

The tourism and hospitality industry tends to be the initial and primary affected sector upon most negative political, economic, environmental or social occurrences. To date, COVID-19 pandemic has incurred staggering losses on the tourism and hospitality industry. A report released in early February 2020 (Dass and McDermott, 2020) suggested that the tourism industry can expect to lose \$22 billion in revenue from Chinese outbound tourists and see nine million fewer inbound trips due to the pandemic. Certain niche tourism behaviors, such as game eating (Ying *et al.*, 2020), are also likely to fall out of favor (at least temporarily) based on the presumed association between COVID-19 and wildlife. Tourism stakeholders thus need to focus on industry recovery and resilience, but to do so effectively, stakeholders must first have a thorough understanding of this disease.

The transmissibility of the virus has led to sweeping regulations to constrain tourist mobility. Many countries have enacted travel bans to limit traffic into and out of the country, with border closures adversely affecting the travel industry (Ozili and Arun, 2020). Perhaps more concerning than these transient changes in the international tourism landscape is the fact that traveler behavior is likely to shift until the virus is better controlled. As a case in point, the Chinese are known for participating in group tours (Chen *et al.*, 2019; Jin and Sparks, 2017) and engaging in high-frequency travel during public holidays such as the Spring Festival during Lunar New Year (Li *et al.*, 2019). The COVID-19 outbreak is likely to change these tourists' perceptions of travel: they may prefer to travel alone or in small groups, and they may visit less popular tourist destinations to avoid crowds. Behavioral changes such as these manifested after the SARS outbreak in 2003 (Mao *et al.*, 2010; Wen *et al.*, 2005), and similar outcomes can be expected post-COVID-19.

Tourism scholars have begun to propose ways to address these behavioral changes and promote the industry's resilience (Wen *et al.*, 2020b). Although such suggestions can be insightful, they also exemplify a lack of connection between medical science and other industries. First and foremost, such recommendations are merely speculative at this point. Insufficient data are available on the tourism-related effects of COVID-19 to inform appropriate recovery decisions, and the pandemic evolves every day. At the same time, if tourism practitioners do not have a clear understanding of how COVID-19 functions, it will be difficult to adopt risk mitigation measures to ensure tourists' safety. The tourism and hospitality industry will also need to reconceptualize its operations for the foreseeable future. A solid understanding of COVID-19 based on medical knowledge will help affiliated businesses and consumers adapt to a "new normal."

Bridging medical science and tourism through interdisciplinary research

COVID-19 must be managed to protect the public and various industries, particularly because this outbreak will likely not be the last of its kind. Therefore, experts in the health and social sciences should cooperate to determine ways to disseminate relevant information to the general public and tourism key stakeholders. Doing so will promote a shared understanding of disease outbreaks such as COVID-19 to help government officials

and the public better protect themselves in times of crisis. Indeed, the collaboration between tourism scholars and medical/public health experts would better examine the influence of COVID-19 and similar outbreaks on the travel industry, which assists tourism and hospitality businesses to adopt effective strategies to recover sooner. Tourism practitioners and travelers will benefit from clear information to make smart decisions in the aftermath of COVID-19.

Kozak and Kozak (2016) noted that tourism, as an inter-, multi- and trans-disciplinary field (e.g. Jamal and Higham, 2021), has received greater attention from a range of academic domains over the last few decades. Due to its unique characteristics and relative immaturity as a field, tourism has often imported more knowledge than it has exported to other areas (e.g. Crouch and Perdue, 2015). Its background dates back to the early 1900s when scholars began to unearth tourism's economic impacts. This revelation was followed by contributions from disciplines such as geography, anthropology and sociology. Tourism later became more management-oriented in the 1980s (e.g. Xiao and Smith, 2006).

Social scientists have already begun to take a proactive approach to pandemic-related research. In one case, Yang *et al.* (2020) constructed a macroeconomics model to evaluate the economic impacts of COVID-19 on tourism, and their method can be applied to future disease outbreaks. As daily life, lifestyles and the academic landscape continue to change – both amid COVID-19 and otherwise – interdisciplinary collaboration is likely to become even more common (Wen *et al.*, 2020c). Tourism research welcomes contributions from an array of disciplines and is well suited to cooperation that will enhance consumers' and stakeholders' satisfaction now and in the future.

To this point, interdisciplinary research will play an integral part in discovering how the tourism and hospitality industry can recover from these catastrophes such as COVID-19. For example, public health scholars and tourism researchers can devise risk reduction strategies for the industry. Interdisciplinary findings can also inform public health policy to enhance the tourism and hospitality industry's resilience against pandemic outbreaks and other health threats. For instance, tourism and hospitality employees could participate in safety-related trainings to improve cleanliness throughout their establishments (e.g. by instituting thorough cleaning and disinfection protocols). Employees could also be informed about disease transmission and how to lower the risk of viral spread. COVID-19 is spread via respiratory droplets and can survive for several hours to days on surfaces (Lai *et al.*, 2020; Wong *et al.*, 2020); raising awareness of these facts will promote better hygiene. To put research findings into practice more directly, subject area experts could also assume temporary or longer-term roles to assist businesses on site. For instance, hoteliers could be required to hire public health consultants to oversee facility sanitation procedures or to recommend specific interventions, such as checking employees' and guests' temperatures upon arrival to prevent potential viral transmission. Public health experts could also recommend control measures related to food preparation to ensure on-site eateries are following safety guidelines.

Other actionable suggestions to reduce disease transmission could include adopting smart tourism devices in place of face-to-face contact. In hotel settings, service robots could be used during visitor check-in/-out and for service delivery (e.g. in on-site restaurants or for room service). In a restaurant context, managers could continue to emphasize takeaway in addition to providing contactless delivery options to reduce interpersonal interaction during food delivery. As COVID-19-related dining restrictions begin to be lifted once the outbreak subsides, restaurant managers may wish to move tables farther apart to reduce unnecessary crowding, at least in the short term. More broadly, destination managers could be encouraged to manage tourist attraction queues more closely to discourage crowding and disease transmission.

It is also likely that domestic tourism will be gradually accepted over international travel as the pandemic begins to subside. This trend is especially probable given the risk of additional waves of the COVID-19 (Xu and Li, 2020). To maintain social distancing, people could opt to travel by car, while hotels and public transportation (e.g. airlines and motor coaches) could work under capacity. At the same time, fares would likely increase to compensate for lower visitor traffic. Relevant research-based recommendations can maintain public awareness of COVID-19 and other public health issues over time. These types of recovery strategies could also be applied intermittently, such as to minimize the effects of subsequent waves of the virus.

It is important to note that service-related suggestions in the hospitality industry are likely to evolve as scientists and other experts learn more about COVID-19. Because the virus is new, few aspects of the illness are for certain. More concrete conclusions will take shape as the outbreak persists and more epidemiological studies are performed (Lipsitch *et al.*, 2020). As a supplement to medically focused work, interdisciplinary research about COVID-19 and other diseases could lead to business-focused technological and practical innovations. These advances will enable businesses to serve more customers and maintain revenue while prioritizing consumer safety. In line with the prior discussion, a conceptual model was developed to situate this study's key points as shown in Figure 1.

Conclusion and implications

It is essential for medical knowledge to be disseminated in a manner that promotes public understanding, similar to the ACP's journal club. The tourism and hospitality industry particularly needs to acquire the essential understanding and "know-how" from the medical perspective. Without a firm grasp of COVID-19's origins and treatment, the tourism and hospitality industry will likely struggle to recover from this catastrophe. For example, if tourism professionals do not have comprehensive information from public health organizations on how to prevent the spread of COVID-19 in their establishments, customers will not feel comfortable patronizing these businesses.

Even now, as the tourism industry seeks ways to recover from COVID-19, stakeholders' decisions must be informed by scientific evidence whenever possible. Indeed, COVID-19 is not the only outbreak to affect the tourism community; SARS had similarly detrimental effects on this industry in 2003. Although the similarities between these viruses suggest that the

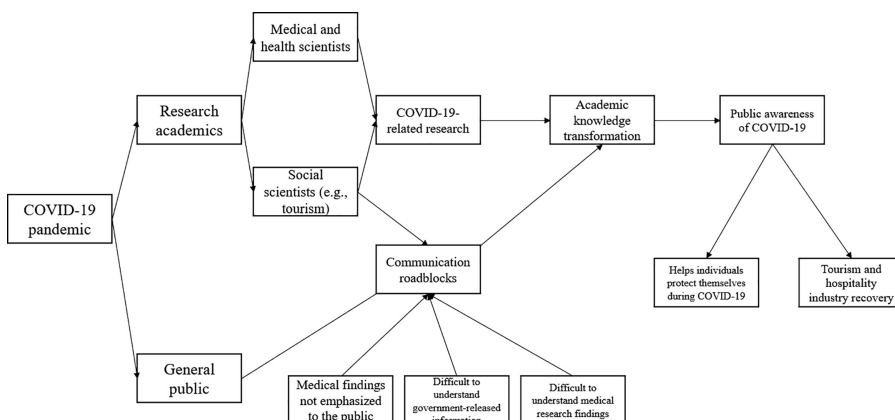


Figure 1.
Conceptual framework

tourism industry could recover over time as it did from SARS, the scale of the COVID-19 pandemic is much greater; therefore, extensive recovery measures will be needed to ensure the tourism industry's sustainability and continued success.

Naturally, the potential for pandemic-related interdisciplinary research involving the natural and social sciences extends beyond medicine and tourism. But it is important to note that such collaboration is highly salient amid COVID-19. As noted earlier, many subsectors of tourism offer promise for interdisciplinary research around pandemic recovery: business management, public health, nutrition and technology (e.g. artificial intelligence and robotics), among others. Relevant insight will not only promote business recovery, it will also help to alleviate potential travelers' concerns about the steps being taken in various service settings, such as hotels and restaurants, to protect visitors' and employees' health.

Additional directions of interest include identifying strategies to prevent COVID-19 and similar diseases or developing policies to protect and enhance public health. Furthermore, early research into pandemic-related effects on mental health, including depression and anxiety (e.g. Holmes *et al.*, 2020; Vahia *et al.*, 2020), suggests the need for additional studies involving psychology and psychiatry that could potentially include tourism. In particular, because a 14-day quarantine is often mandatory for tourists, people may have difficulty transitioning from quarantine to ordinary life after experiencing loneliness and negative emotions due to social isolation (Fu and Lee, 2020). Similarly, it is urgent to study how tourists or international students manage their mental health when they cannot return home during crisis situations (e.g. if their host country is under lockdown or upholding a COVID-19-related travel ban). Scholars could also continue investigating the implications of pandemic-associated discrimination, including how such behavior affects targets' and perpetrators' mental health and self-esteem.

Such endeavors will amplify benefits for researchers, readers and communities while raising awareness. Furthermore, leveraging the strengths of disparate domains can bring medical findings to a wider audience and showcase cutting-edge developments for the greater good. On the whole, as COVID-19 upends transactions, operations and experiences in the tourism industry, it is necessary to acknowledge the importance of cross-disciplinary research to promote understanding and awareness. In this vein, medical/health and social scientists must work together toward eradicating COVID-19 and prevent other pandemic outbreaks in the future.

References

- Brownell, S.E., Price, J.V. and Steinman, L. (2013), "Science communication to the general public: why we need to teach undergraduate and graduate students this skill as part of their formal scientific training", *Journal of Undergraduate Neuroscience Education*, Vol. 12 No. 1, p. E6.
- Brüssow, H. (2020), "The novel coronavirus—a snapshot of current knowledge", *Microbial Biotechnology*. doi: [10.1111/1751-7915.13557](https://doi.org/10.1111/1751-7915.13557).
- Canh, N.P. and Thanh, S.D. (2020), "Domestic tourism spending and economic vulnerability", *Annals of Tourism Research*, Vol. 85, p. 103063.
- Carbone, E.G. and Thomas, E.V. (2018), "Science as the basis of public health emergency preparedness and response practice: the slow but crucial evolution", *American Journal of Public Health*, Vol. 108 No. S5, pp. S383-S386.
- Chen, N., Masiero, L. and Hsu, C.H.C. (2019), "Chinese outbound tourist preferences for all-inclusive group package tours: a latent class choice model", *Journal of Travel Research*, Vol. 58 No. 6, pp. 916-931.
- Crouch, G.I. and Perdue, R.R. (2015), "The disciplinary foundations of tourism research: 1980-2010", *Journal of Travel Research*, Vol. 54 No. 5, pp. 563-577.

- Dass, M. and McDermott, H. (2020), *Travel & Tourism: Global Potential Impact of the Coronavirus*, Tourism Economics: An Oxford Economics Company.
- Depoux, A., Martin, S., Karafillakis, E., Preet, R., Wilder-Smith, A. and Larson, H. (2020), "The pandemic of social media panic travels faster than the COVID-19 outbreak", *Journal of Travel Medicine*, Vol. 27 No. 3, taaa031.
- Duvat, V.K., Magnan, A.K., Wise, R.M., Hay, J.E., Fazey, I., Hinkel, J., Stojanovic, T., Yamano, H. and Ballu, V. (2017), "Trajectories of exposure and vulnerability of small islands to climate change", *Wiley Interdisciplinary Reviews: Climate Change*, Vol. 8 No. 6, p. e478.
- Ferguson, C., Merga, M. and Winn, S. (2021), "Most government information on COVID-19 is too hard for the average Australian to understand", *The Conversation*, available at: <https://theconversation.com.cdn.ampproject.org/c/s/theconversation.com/amp/most-government-information-on-covid-19-is-too-hard-for-the-average-australian-to-understand-153878>.
- Fernandes, N. (2020), "Economic effects of coronavirus outbreak (COVID-19) on the world economy", available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3557504.
- Fu, Y.C. and Lee, H.W. (2020), "Daily contacts under quarantine amid limited spread of COVID-19 in Taiwan", *International Journal of Sociology*, Vol. 50 No. 5, pp. 434-444.
- Ghinea, N. (2020), "A return to reasonableness and virtue in medical epistemology", *Journal of Evaluation in Clinical Practice*, Vol. 26 No. 2, pp. 447-451.
- Glasziou, P. and Aronson, J.K. (2018), "A brief history of clinical evidence updates and bibliographic databases", *Journal of the Royal Society of Medicine*, Vol. 111 No. 8, pp. 292-301.
- Haynes, R.B. (1991), "The origins and aspirations of ACP Journal Club", *ACP Journal Club*, Vol. 114 Suppl 1, p. A18.
- Holmes, E.A., O'Connor, R.C., Perry, V.H., Tracey, I., Wessely, S., Arseneault, L., Ballard, C., Christensen, H., Silver, R.C., Everall, I., Ford, T., John, A., Kabir, T., King, K., Madan, I., Ballard, C., Michie, S., Przybylski, A.K., Shafran, R., Sweeney, A., Worthman, C.M., Yardley, L., Cowan, K., Cope, C., Hotopf, M. and Bullmore, E. (2020), "Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science", *The Lancet Psychiatry*. doi: 10.1016/S2215-0366(20)30168-1.
- Huang, C., Wang, Y., Li, X., Ren, L., Zhao, J., Hu, Y., Zhang, L., Fan, G., Xu, J., Gu, X., Cheng, Z., Yu, T., Xia, J., Wei, Y., Wu, W., Xie, X., Yin, W., Li, H., Liu, M., Xiao, Y., Gao, H., Guo, L., Xie, J., Wang, G., Jiang, R., Gao, Z., Wang, J. and Cao, B. (2020), "Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China", *The Lancet*, Vol. 395 No. 10223, pp. 497-506.
- Ioannidis, J.P.A. (2016), "Evidence-based medicine has been hijacked: a report to David Sackett", *Journal of Clinical Epidemiology*, Vol. 73, pp. 82-86.
- Jamal, T. and Higham, J. (2021), "Justice and ethics: towards a new platform for tourism and sustainability", *Journal of Sustainable Tourism*, Vol. 29 Nos 2-3, pp. 143-157.
- Ji, D., Zhang, D., Chen, Z., Xu, Z., Zhao, P., Zhang, M., Zhang, L., Cheng, G., Wang, Y., Yang, G., Liu, H., Li, B., Ji, J., Lau, G. and Qin, E. (2020), "Clinical characteristics predicting progression of COVID-19", available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3539674.
- Jiang, Y. and Wen, J. (2020), "Effects of COVID-19 on hotel marketing and management: a perspective article", *International Journal of Contemporary Hospitality Management*, Vol. 32 No. 8, pp. 2563-2573.
- Jin, X.C. and Sparks, B. (2017), "Barriers to offering special interest tour products to the Chinese outbound group market", *Tourism Management*, Vol. 59, pp. 205-215.
- Kozak, M. and Kozak, N. (2016), "Institutionalisation of tourism research and education: from the early 1900s to 2000s", *Journal of Tourism History*, Vol. 8 No. 3, pp. 275-299.
- Lai, C.-C., Shih, T.-P., Ko, W.-C., Tang, H.-J. and Hsueh, P.-R. (2020), "Severe acute respiratory syndrome coronavirus 2 (SARS-Cov-2) and corona virus disease-2019 (COVID-19): the epidemic and the challenges", *International Journal of Antimicrobial Agents*, Vol. 55 No. 3, p. 105924.

- Leslie, T., Gourlay, C., Byrd, J., Hanrahan, C., Elvery, S., Liddy, M. and Spraggon, B. (2020), "What we can learn from the countries winning the coronavirus fight", *ABC News*, available at: <https://www.abc.net.au/news/2020-03-26/coronavirus-covid19-global-spread-data-explained/12089028?nw=0&pfmredir=sm>.
- Li, N., Han, W., Wei, X., Shen, M. and Sun, S. (2019), "Chemical characteristics and human health assessment of PM₁ during the Chinese spring festival in Changchun, Northeast China", *Atmospheric Pollution Research*, Vol. 10 No. 6, pp. 1823-1831.
- Li, Q., Guan, X., Wu, P., Wang, X., Zhou, L., Tong, Y., Ren, R., Leung, K., Lau, E., Wong, J., Xing, X., Xiang, N., Wu, Y., Li, C., Chen, Q., Li, D., Liu, T., Zhao, J., Liu, M., Tu, W., Chen, C., Jin, L., Yang, R., Wang, Q., Zhou, S., Wang, R., Liu, H., Luo, Y., Liu, Y., Shao, G., Li, H., Tao, Z., Yang, Y., Deng, Z., Liu, B., Ma, Z., Zhang, Y., Shi, G., Lam, T., Wu, J., Gao, G., Cowling, B., Yang, B., Leung, G. and Feng, Z. (2020), "Early transmission dynamics in Wuhan, China, of novel coronavirus-infected pneumonia", *New England Journal of Medicine*, Vol. 382, pp. 1199-1207.
- Lipsitch, M., Swerdlow, D.L. and Finelli, L. (2020), "Defining the epidemiology of covid-19—studies needed", *New England Journal of Medicine*, Vol. 382, pp. 1194-1196.
- Mao, C.-K., Ding, C.G. and Lee, H.-Y. (2010), "Post-SARS tourist arrival recovery patterns: an analysis based on a catastrophe theory", *Tourism Management*, Vol. 31 No. 6, pp. 855-861.
- Misra, S., Le, P.D., Goldmann, E. and Yang, L.H. (2020), "Psychological impact of anti-Asian stigma due to the COVID-19 pandemic: a call for research, practice, and policy responses", *Psychological Trauma: Theory, Research, Practice, and Policy*, Vol. 12 No. 5, pp. 461-464.
- National Academies of Sciences, Engineering, and Medicine (2017), "Using science to improve science communication", *Communicating Science Effectively: A Research Agenda*, available at: <https://www.ncbi.nlm.nih.gov/books/NBK425715/>.
- Oliver, K. and Pearce, W. (2017), "Three lessons from evidence-based medicine and policy: increase transparency, balance inputs and understand power", *Palgrave Communications*, Vol. 3 No. 1, pp. 1-7.
- Ozili, P.K. and Arun, T. (2020), "Spillover of COVID-19: impact on the global economy", available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3562570.
- Petropoulos, F. and Makridakis, S. (2020), "Forecasting the novel coronavirus COVID-19", *PLOS ONE*, Vol. 15 No. 3, p. e0231236.
- Prem, K., Liu, Y., Russell, T.W., Kucharski, A.J., Eggo, R.M. and Davies, N. (2020), "The effect of control strategies to reduce social mixing on outcomes of the COVID-19 epidemic in Wuhan, China: a modelling study", *The Lancet Public Health*, Vol. 5 No. 5, pp. 261-270, doi: [10.1016/S2468-2667\(20\)30073-6](https://doi.org/10.1016/S2468-2667(20)30073-6).
- Remuzzi, A. and Remuzzi, G. (2020), "COVID-19 and Italy: what next?", *The Lancet*. doi: [10.1016/S0140-6736\(20\)30627-9](https://doi.org/10.1016/S0140-6736(20)30627-9).
- Sackett, D.L. (1997), "Evidence-based medicine", *Seminars in Perinatology*, Vol. 21 No. 1, pp. 3-5.
- Student, J., Lamers, M. and Amelung, B. (2020), "A dynamic vulnerability approach for tourism destinations", *Journal of Sustainable Tourism*, Vol. 28 No. 3, pp. 475-496.
- University of Cambridge (2020), "COVID-19: genetic network analysis provides 'snapshot' of pandemic origins", available at: <https://www.cam.ac.uk/research/news/covid-19-genetic-network-analysis-provides-snapshot-of-pandemic-origins?from=timeline&isappinstalled=0>.
- Vahia, I.V., Blazer, D.G., Smith, G.S., Karp, J.F., Steffens, D.C., Forester, B.P., Tampi, R., Agronin, M., Jeste, D. and Reynolds, C.F. (2020), "COVID-19, mental health and aging: a need for new knowledge to bridge science and service", *The American Journal of Geriatric Psychiatry*. doi: [10.1016/j.jagp.2020.03.007](https://doi.org/10.1016/j.jagp.2020.03.007).
- Wen, Z., Gu, H. and Kavanaugh, R. (2005), "The impacts of SARS on the consumer behaviour of Chinese domestic tourists", *Current Issues in Tourism*, Vol. 8 No. 1, pp. 22-38.
- Wen, J., Aston, J., Liu, X. and Ying, T. (2020a), "Effects of misleading media coverage on public health crisis: a case of the 2019 novel coronavirus outbreak in China", *Anatolia: An International Journal of Tourism and Hospitality Research*, Vol. 31 No. 2, pp. 331-336.

- Wen, J., Kozak, M., Yang, S. and Liu, F. (2020b), "COVID-19: potential effects on Chinese citizens' lifestyle and travel", *Tourism Review*. doi: [10.1108/TR-03-2020-0110](https://doi.org/10.1108/TR-03-2020-0110).
- Wen, J., Wang, W., Kozak, M., Liu, X. and Hou, H. (2020c), "Many brains are better than one: the importance of interdisciplinary studies on COVID-19 in and beyond tourism", *Tourism Recreation Research*. doi: [10.1080/02508281.2020.1761120](https://doi.org/10.1080/02508281.2020.1761120).
- Wilder-Smith, A., Chiew, C.J. and Lee, V.J. (2020), "Can we contain the COVID-19 outbreak with the same measures as for SARS?", *The Lancet Infectious Diseases*. doi: [10.1016/S1473-3099\(20\)30129-8](https://doi.org/10.1016/S1473-3099(20)30129-8).
- Wong, J., Goh, Q.Y., Tan, Z., Lie, S.A., Tay, Y.C., Ng, S.Y. and Soh, C.R. (2020), "Preparing for a COVID-19 pandemic: a review of operating room outbreak response measures in a large tertiary hospital in Singapore", *Canadian Journal of Anesthesia/Journal Canadien d'anesthésie*, Vol. 67, pp. 732-745.
- Wu, Z. and McGoogan, J.M. (2020), "Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72 314 cases from the Chinese center for disease control and prevention", *Jama*, Vol. 323 No. 13, pp. 1239-1242.
- Xiao, H. and Smith, S.L.J. (2006), "The making of tourism research: insights from a social sciences journal", *Annals of Tourism Research*, Vol. 33 No. 2, pp. 490-507.
- Xu, S. and Li, Y. (2020), "Beware of the second wave of COVID-19", *The Lancet*. doi: [10.1016/S0140-6736\(20\)30845-X](https://doi.org/10.1016/S0140-6736(20)30845-X).
- Yang, Y., Zhang, H. and Chen, X. (2020), "Coronavirus pandemic and tourism: dynamic stochastic general equilibrium modeling of infectious disease outbreak", *Annals of Tourism Research*. doi: [10.1016/j.annals.2020.102913](https://doi.org/10.1016/j.annals.2020.102913).
- Ying, T., Wang, K., Liu, X., Wen, J. and Goh, E. (2020), "Rethinking game consumption in tourism: a case of the 2019 novel coronavirus pneumonia outbreak in China", *Tourism Recreation Research*. doi: [10.1080/02508281.2020.1743048](https://doi.org/10.1080/02508281.2020.1743048).
- Zheng, Y., Goh, E. and Wen, J. (2020), "The effects of misleading media reports about COVID-19 on Chinese tourists' mental health: a perspective article", *Anatolia: An International Journal of Tourism and Hospitality Research*, Vol. 31 No. 2, pp. 337-340.

Further reading

Johns Hopkins University (2020), "COVID-19 map", available at: https://coronavirus.jhu.edu/map.html?mod=article_inline.

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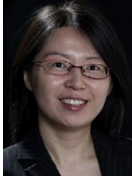
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