

# FOOD FOR THOUGHT

## Norovirus outbreaks and coronavirus risk in hospitality

*Globally, norovirus and coronaviruses pose a significant public health challenge. In the case of norovirus, food service environments are often at the core of outbreaks. In a first-of-its-kind study, Dr. Bendegul Okumus evaluated both the epidemiology and transmission routes of virus outbreaks and the risks in different settings. This brings much-needed attention to the field and calls for collaborations between healthcare, hospitality, and business management to conduct high-quality research to better understand risk patterns for outbreaks.*

**F**lying the flag for food service and hospitality management scholars is UCF Rosen College of Hospitality Management's Dr. Bendegul Okumus. Dr. Okumus is one of the few academics in this field to bring together scholarly articles about the well-known norovirus and the lesser known (at the time of publishing) 'novel Coronavirus 2019' and their risks in hospitality. By doing so, she highlights the scarcity of literature on this topic produced by food service scholars—a perplexing finding considering norovirus is commonly spread in food service industries, with restaurants and hotels being high-risk environments for outbreaks. To address this gap in our knowledge, Dr. Okumus systematically reviewed published academic articles and other sources of data such as government reports and webpages, focusing on the risks of transmission and outbreaks in different settings and the role of food service settings in this transmission.

Her resultant publication shines a light on the epidemiology of these viruses and sets out areas of focus for future research.

### **CURBING THE SPREAD**

Worldwide, the highly contagious norovirus causes almost 12% of hospitalizations and has an estimated healthcare productivity cost of 60 billion USD. This 'stomach bug' spreads through fecal-oral routes. Food and irrigation water make those who consume it acutely ill with intestinal symptoms within 12–48 hours. It is estimated that up to 25% of norovirus transmission is through food, although data from developing countries is less clear.

Able to survive at both room temperature and even in frozen foods, norovirus is commonly transmitted through items like salads, sandwiches, and food types not thoroughly cooked or heated before eating. Most people recover within 1–3 days but those most at risk of severe illness are the very young, elderly,

and immunocompromised. In the USA, over 90% of outbreaks occur in hospitals, nursing homes, cruise ships, childcare facilities, and restaurants. Considering the public health and financial implications of norovirus outbreaks, better surveillance and diagnostics are needed to curb the spread.

The review also looks at coronaviruses' risks in different settings. It is important to note that Dr. Okumus's research was conducted in 2020, a time when little was known about the 'novel Coronavirus 2019.' However, her paper discusses what was known about it at the time as well as touching on other coronaviruses such as the Middle East Respiratory Syndrome (MERS) and SARS—a coronavirus causing severe acute respiratory syndrome. Human coronavirus spread through close contact causes respiratory symptoms which for some can be fatal. SARS is transmitted through feces and water whereas MERS has been found in camels' milk and contaminated





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vegetables such as lettuce. However, at the time of the review, the food transmission route of the 'novel Coronavirus 2019' was unknown and the review emphasized the need to research the risk of transmission through food and drink.

### UNDERSTANDING THE SOURCE

Restaurants and hotels carry the highest norovirus outbreak risk, and the handling of food without using gloves is considered a major source of infection. However, food preparation is not the only source of contamination. One study detected norovirus in the ground water of a hotel. Another study described how 800 people were infected at a resort within just over two weeks, demonstrating how quickly this virus spreads and how many people it can harm. Considering food handlers are frequently a source of contamination, it is surprising to learn that the U.S. Food and Drug Administration's (FDA) food code allows for food service employers with intestinal symptoms to still work on the condition they avoid handling food, utensils, and linen. Worryingly, one in five food service workers with intestinal symptoms continue to work, possibly because of staff shortages and/or they feel the need to secure their jobs. Considering how contagious norovirus is and the public health challenge and financial burden it presents, there are calls

from experts in the field, food industry officials, regulators, and consumers for the FDA to change this regulation. Regarding coronavirus transmission in restaurants, there are reports of infected restaurant workers in China who handled wild animals—a culinary item that is part of the food culture in this part of the world.

Cruise ships, where hundreds if not thousands of people live in close contact, can be plagued by norovirus, with an estimated 27 outbreaks per year. Sources of contamination are food and person-to-person transmission due to the close living quarters. For coronaviruses, flights and ground transportation are identified as high-risk sources. At the time, little was known about its spread on cruise ships—probably because this transportation mode had been stopped during lockdowns.

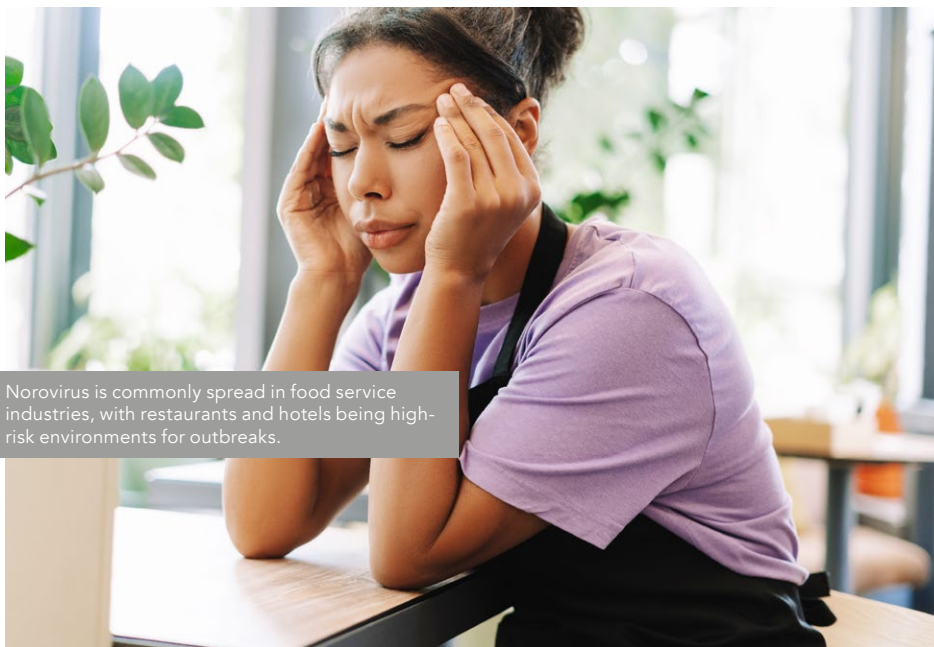
Norovirus outbreaks also occur in schools which, in the USA, are the main setting of food-related illnesses. Easily spread through toys, desks, and other surfaces, children under five years old are particularly susceptible to severe illness. The review also describes an outbreak linked to contaminated computer equipment and another related to children playing outdoors in a contaminated water fountain. Other education settings such as colleges have also been affected by norovirus outbreaks in the USA and in some cases, this has been linked to ill food workers. Another setting where food service was involved in the spread of norovirus is the military, with Dr. Okumus' research reporting studies of outbreaks in an army, a navy ship, and an air force unit.

Healthcare setting outbreaks of norovirus are of particular concern because of the vulnerability and higher risk of the people in hospital and nursing homes. The close living quarters and nature of care means frequent contact enables easy spread of the virus. In the USA, norovirus is the number one cause of infectious disease in hospitals and can lead to ward closures and significant operational challenges.

### TIGHTENING REGULATIONS

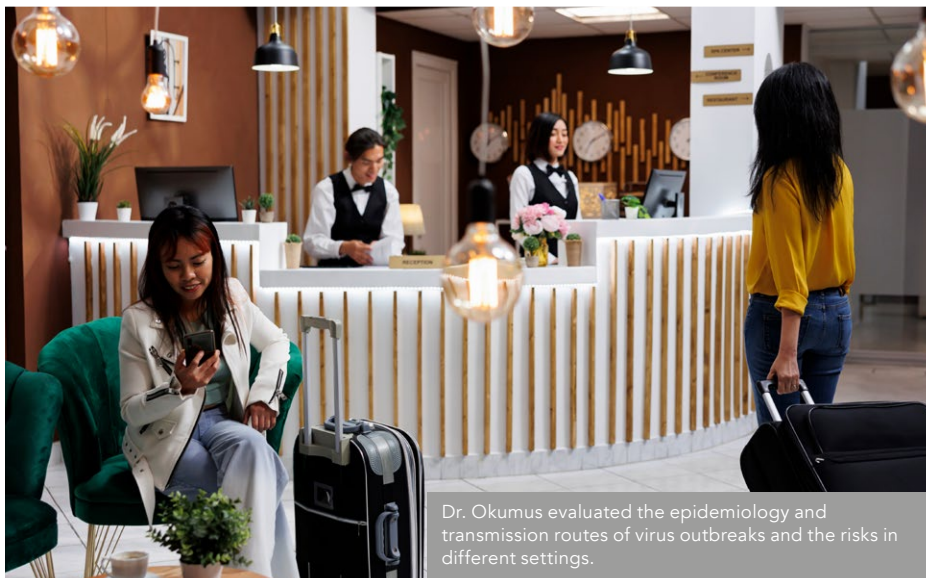
The FDA provides guidelines for food preparation such as washing hands, wearing gloves when handling food, and rules for staff showing symptoms of norovirus. However, this food code is not compulsory and different states may adopt different variations, leaving

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Dr. Okumus evaluated the epidemiology and transmission routes of virus outbreaks and the risks in different settings.

## CONSIDERING THE PUBLIC HEALTH AND FINANCIAL IMPLICATIONS OF NOROVIRUS AND CORONAVIRUS OUTBREAKS, BETTER SURVEILLANCE AND DIAGNOSTICS ARE NEEDED TO CURB THE SPREAD.

the door open for violations and foodborne illness outbreaks. When contaminated food is found to be the source of an outbreak, health departments will work with food regulatory agencies providing clean-up procedures and guidelines to follow to minimize the spread.

The Centers for Disease Control and Prevention (CDC) use reporting systems and surveillance networks to understand and predict outbreak trends. The importance of training to improve food handlers' awareness of outbreaks is one way to increase safety and there is a call for

more training, workshops, and even social media initiatives in this area.

The review highlights the significant burden of these viruses. With outbreak statistics believed to be underreported, the true global prevalence may well be higher than we know. There is no vaccine or treatment for norovirus, so efforts must be focussed on preventing the spread, disinfection, and containment.

But what are the risk patterns for norovirus outbreaks? Future research should focus on understanding these risks and more studies are needed at each stage of the norovirus infection transmission cycle to understand this process better and identify where it can be interrupted with control measures.

Research is also needed into how outbreaks affect consumer behavior and their eating choices, hygiene practices, and level of safety risk reporting and to determine the true financial burden of these outbreaks to the hospitality sector. Overall, the quality of research in this area needs improving, and this could be achieved through collaborative working across sectors like healthcare, business, and hospitality management. Perhaps now is the time for food service and hospitality scholars to make their mark on an illness that their sector is intrinsically linked to.



# RESEARCHERS IN FOCUS

## RESEARCH OBJECTIVES

Dr. Bendegul Okumus reviewed scholarly articles about the norovirus and coronavirus and their risks in hospitality. Her work brings much-needed attention to the field and calls for collaborations between healthcare, hospitality, and business management to conduct high-quality research to better understand risk patterns for outbreaks.

## REFERENCES

Okumus, B. (2023). Norovirus and coronavirus risks in food service settings: A systematic review for future research. *Journal of Culinary Science & Technology*, 21(1), 71–98. [doi.org/10.1080/15428052.2021.1888835](https://doi.org/10.1080/15428052.2021.1888835)

## PERSONAL RESPONSE

### **What advice would you give a young researcher who is interested in getting started in your field?**

// Foundation in Food Science: Pursue education in food safety and microbiology. Practical Experience: Seek internships to develop hands-on skills. Industry Standards: Understand regulations from organizations like the FDA, NRA, and FRLA in the United States. Networking: Connect with professionals at industry events. Continuous Learning: Stay updated on research and technology. Each researcher can connect with organizations in their respective regions. //

## Dr. Bendegul Okumus



Dr. Bendegul Okumus worked for the Florida Department of Health in Orange County's WIC program, a federally funded nutrition program for Women, Infants, and Children.

She also has work experience in the hospitality industry, particularly in food preparation, food services, and event management. Her primary teaching areas include Nutrition Concepts and Issues in Food Services, International Cuisine and Culture, Sanitation in the Food Service Industry, and Health and Wellness in Hospitality and Tourism. Her research focuses on food safety, eating behavior and habits, food and culinary tourism, food waste, health & and wellness, and disability in hospitality and tourism.

Dr. Okumus has worked in multidisciplinary research teams and secured and completed research grants. She has also authored/co-authored numerous academic journal articles, conference presentations, and books and book chapters. Her recent publications and citations can be seen at Google Scholar.

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