EDITORIAL COMMENTARY

When Diarrhea Gets Deadly: A Look at Gastroenteritis Outbreaks in Nursing Homes

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(See the article by Kirk et al, on pages 907–914.)

Although generally self-limited, infectious gastroenteritis can be associated with substantial morbidity and mortality. Elderly persons are at particularly high risk of adverse outcomes. There are currently >1.4 million people living in nursing homes in the United States [1], including almost 14% of the population aged ≥84 years. Residents of long-term care facilities (LTCFs) in the United States are 4 times more likely to die from gastroenteritis than community dwellers [2] and account for 17.5% of deaths due to diarrheal disease [3]. The article by Kirk et al [4] in this issue of Clinical Infectious Diseases describes gastroenteritis outbreaks in LTCFs in Australia, with important lessons for other countries as well.

This Australian study used data from a register of foodborne disease outbreaks in sentinel surveillance sites, which was expanded in 2002 to include gastroenteritis outbreaks due to any mode of transmission. Unfortunately, it is only in the past year that such a comprehensive surveillance system has been instituted in the United States; thus, it will be some time before reliable national data are available here. Studies in the United States and other countries, however, suggest that the findings in Australia are generalizable enough to help guide preventive interventions elsewhere [5–8].

The data from Australia demonstrated wide variation among different jurisdictions. The same problem is faced in the United States, with a ≥20-fold variation in rates of foodborne disease outbreaks reported by states to the Centers for Disease Control and Prevention. It is likely that this primarily reflects differences in surveillance and reporting rather than dramatic inherent differences in true disease rates among states. It is important that sufficient resources are available to public health agencies to aggressively address the appropriate prevention and control of outbreaks in high-risk settings such as LTCFs.

Although this study used a quite liberal definition of “outbreaks” (requiring only ≥2 cases of suspected infectious gastroenteritis in a facility), most outbreaks studied were quite large. It is reasonable to question the importance of aggressively investigating all nursing home outbreaks if the etiology appears to be viral and appropriate interventions are implemented. Although judgment is of course warranted, a variety of pathogens were identified in this study. In a population at high risk of person-to-person spread of infections, which also shares meals and other risk factors, rapidly and confidently determining an etiology and mode of transmission can be challenging. A relatively small investment in laboratory and basic epidemiologic investigation can have a big impact in such high-risk settings.

One of the notable findings in the Kirk et al study is the high proportion of outbreaks with unidentified etiology, which is a problem which plagues the United States as well, regardless of outbreak setting. Of Australian LTCF outbreaks, 63% had an unknown etiology, as do 32% of foodborne disease outbreaks in the United States [9]. In this study, 37% of the “unknown” outbreaks had no stool specimen collected, and in 1 United States study, two-thirds of foodborne outbreaks without an etiology identified had no stool specimens collected [10]. Dramatic advances in technology and funding of laboratory resources cannot help improve these numbers if there is nothing to test. In LTCFs, with medical staff available and the ill people readily accessible, prompt collection of diagnostic specimens during outbreaks should be a priority when a potential outbreak is recognized.

With the increasing accessibility of laboratory testing for norovirus, it is clear that this pathogen is responsible for well over one-half of outbreaks in LTCFs [5–8], with a marked increase in frequency in recent years [11]. In this population, norovirus is not benign, and because it is so common, it results in substantial numbers of hospitalizations and death. It is also important to note the substantial proportion of staff affected in these outbreaks [4,
As with influenza, which has received much attention recently, staff carrying pathogens that are easily transmitted person to person put their patients at serious risk. The LTCF industry is plagued by high turnover and low pay [12], which presents challenges in educating and motivating staff to appropriately use strict infection-control precautions and avoid working while ill. Guidelines to control norovirus in LTCFs must be implemented rigorously and immediately at the first indication of a problem to be most effective [13, 14]. This will require the cooperation of not only medical and public health authorities but also LTCF management.

Clostridium difficile outbreaks were not reported in the study by Kirk et al [4]. Although the spread of C. difficile may not manifest itself as an acute “outbreak,” it is an increasingly common and severe pathogen in United States LTCFs [15]. As C. difficile continues its seemingly inexorable spread, it is important that medical and public health professionals associated with LTCFs include it in their list of potential concerns during investigations of gastroenteritis and development of preventive interventions.

Appropriately, very few of the outbreaks identified by Kirk et al were considered to be foodborne, which might not be surprising given the ease with which disease can spread from person to person in congregate living settings. The term “foodborne” tends to be used rather loosely in epidemiologic circles, often referring to enteric pathogens in general. In outbreak settings, specifically, there is a reasonable chance that a specific food vehicle can be implicated. In the >90% of cases of infectious gastroenteritis in the community that are “sporadic,” however, it is rare that an infection can be attributed to food with any certainty, and care should be taken to avoid unjustified assumptions. With norovirus in particular, the idea of “foodborne disease” becomes especially nuanced. Norovirus has no natural reservoir other than humans, is relatively stable in the environment, does not replicate in food, and requires a very low infectious dose. In such settings, the concept of “foodborne” infection begins to lose some of its significance. If most cases in an outbreak resulted from an ill food handler’s dirty finger in the coleslaw shortly before serving, it could be labeled “foodborne,” though once the cat is out of the bag, rigorous institutional infection control measures are critical for controlling it, and care must be taken to not be lulled into a sense of security after disposal of the lunch leftovers.

It is important to consider the health of LTCF residents in assessing the overall burden of disease in a community. In an earlier study by the same authors, they estimated that 96% of gastroenteritis in LTCFs was associated with outbreaks [16], which seems implausibly high (but may also be affected in part by a loose definition of “outbreaks”). As with foodborne disease in general, it is easy to make large inferences on the basis of the epidemiology of outbreaks, because that is where we get a disproportionate amount of our data. In the community, only a small proportion of infectious gastroenteritis cases are associated with recognized outbreaks, and it is likely that the epidemiology of “sporadic” cases differs importantly from that of clusters. We need to take advantage of any data we can get but continue to make efforts to improve surveillance beyond the “low-hanging fruit.” Large studies on which estimates of the societal burden of disease are based, for example, rely on telephone surveys, which typically do not capture populations living in congregate settings and institutions [17]. As this study nicely demonstrates, these populations experience disproportionately high rates of morbidity and mortality, which must be considered in population-based studies of disease.

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References


