



Norovirus Outbreak Attribution

Human noroviruses are the leading cause of foodborne disease in the United States, responsible for around 5.5 million illnesses annually, and accounting for 58% of all domestically acquired foodborne illness from known causes. Human noroviruses are transmitted through the fecal-oral route, via person-to-person spread; contact with contaminated surfaces, food, or water; or ingestion of aerosolized vomitus. Food may become contaminated at any point in the farm-to-fork continuum. Identifying potential contamination pathways and attribution to specific foods is essential for developing effective intervention strategies.

NoroCORE collaborators at the CDC have shed light on this critical information by analyzing data on U.S. norovirus outbreaks between 2001-2008 and 2009-2012. They identified outbreak trends and attribution to specific foods, settings, and contamination factors. Of foodborne outbreaks with known causes, about 50% were attributed to norovirus, equating to roughly 365 foodborne norovirus outbreaks annually, with most illnesses caused by genogroup II (GII) norovirus strains. Their work identified food handlers as the most common pathway for contamination, responsible for 70% of norovirus outbreaks linked to a contaminated food from 2009-2012. Food prepared in commercial settings was involved in over 80% of outbreaks, most commonly restaurants and delicatessens. However, institutional setting outbreaks resulted in a significantly larger total number of illnesses per outbreak.

Complex food items accounted for the largest share (41%) of outbreaks where at least one food item was implicated. Within this category, sandwiches, salads, and similar foods that are eaten raw or lightly cooked were linked to almost half of outbreaks. Leafy greens, fruits/nuts, and mollusks were the most frequent foods associated with outbreaks involving a simple (single-component) food. From 2001-2008, food handler contact with a ready-to-eat-food was identified in 82%, and specifically implicated in 53% of outbreaks. Likewise, among the outbreaks attributed to simple foods, contamination during preparation or service was the most frequent likely point of contamination (85%, increasing to 90% from 2009-2012).

These results underscore the importance of food handler contact as a source of contamination in raw and ready-to-eat foods and thus inform intervention strategies. Key locations to target would include restaurants, delicatessens, and other commercial settings. Key commodities to monitor and further investigate would include raw and ready-to-eat foods, as well as fresh produce and mollusks. These results highlight areas requiring more research, as much information is still needed regarding the role of contamination in production and processing, which may account for outbreaks with no point of contamination identified.

