

Systematic review of the relative proportion of foodborne disease caused by food preparation or handling within the home

Area of research interest: [Foodborne pathogens](#)

Study duration: 2016-01-01

Project code: FS101098

Conducted by: The Chartered Institute of Environment Health (CIEH)

Background

Foodborne disease is an important cause of human illness worldwide and can be acquired from a variety of sources and transmission routes. Reducing the burden of foodborne disease within the UK remains a key strategic objective for us. Most foodborne disease can be prevented by good personal hygiene and food safety practices throughout the food chain.

We have previously published research which estimates the burden of foodborne disease in the UK and by pathogens and food commodities. However, we currently do not know what proportion of foodborne disease originates in the home, as opposed to disease that occurs externally such as via the catering sector. The domestic kitchen is recognised as a key stage where foodborne disease can be acquired if good food safety and hygiene practices are not applied.

Objective and Approach

To address this knowledge gap, we commissioned the Chartered Institute of Environmental Health (in collaboration with the University of Surrey and the University of Cardiff) to undertake a systematic review to establish the proportion of foodborne disease cases caused by food preparation and handling practices within the home. This study assessed whether there is sufficient high-quality data and attempted to identify the key foods, pathogens, food practices and handling faults which lead to illness and whether it is possible to quantify their impact.

In addition to the work performed around published, peer reviewed material and 'grey literature', the research benefited from the input of a panel of experts who further frame the scope of the study (the research questions, search terms, inclusion and exclusion criteria) from the outset.

Thereafter, a workshop, involving people with expertise in a range of subjects relevant to domestic hygiene, was conducted to discuss the data obtained and to explore some of the hygiene issues in more detail.

The systematic review began with a comprehensive search of both peer reviewed literature and 'grey literature' which was put to the panel of experts to consider and critique, along with the provisional research questions established during the preliminary stage of the project. From this, a second 'search' was conducted, along with a refinement of the research questions.

Once the systematic review and workshops were completed it was possible to determine the strength of the resulting theoretical framework. Following this, we could decide where further research might be needed to reduce uncertainty in the evidence base, to consider the role played by food preparation and handling practices (the 4Cs: cleaning, cooking, chilling and avoiding cross-contamination) in the home but also from contaminated food coming into home.

Results

Results show a complicated picture for attribution of foodborne disease to the domestic setting, with variable results and many caveats around lack of information, inability to confirm organism, investigation of different agents, differing surveillance systems and levels of reporting by setting, and the use largely of reported cases. Therefore, we were unable to confirm with any accuracy the proportions of foodborne illness deriving from different settings, although most studies suggest the highest proportion of foodborne illness to derive from commercial food service settings.

Risk factors for contracting foodborne illness included inadequate temperature control in both storage (often prolonged) and cooking/reheating, handling raw meat/poultry, consumption of under cooked meat/poultry/eggs, consumption of barbequed meat/poultry, consumption of unpasteurised dairy products, inappropriate hygiene-related behaviours, contact with animals or nappies and incontinence pads, inadequate hand washing leading to contamination of many sites, and inadequate sanitation of boards/knives. However, only temperature control was linked directly to actual cases of illness, and the number of such reported cases was very small.

To fully understand the extent and causes of food poisoning deriving from the home will require a comprehensive study of foodborne illness, with timely and extensive follow up to enable attribution of illness to the home setting and identification of vehicles and practices that increase the risk of contracting foodborne illness.

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