



Domestic food safety and the older consumer: A segmentation analysis[☆]

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ABSTRACT

Foodborne illness surveillance has identified an increase in sporadic cases of Listeriosis amongst adults aged 60 and over in the UK. Although the domestic food safety practices and attitudes of older adults have been hypothesised as a potential cause for this increase (ACMSF, 2009; SSRC, 2009), there is limited data on this population cohort in relation to their domestic food safety beliefs and practices. To begin the process of addressing this deficit in knowledge, the purpose of this research was to profile older consumers according to their knowledge of, and self-reported practices associated with domestic food-safety. A structured questionnaire was administered face-to-face with independently residing older adults ($n = 213$) living in the North East of England. Factor and cluster analyses revealed a three-cluster solution, which provided the basis for detailed narrative typologies of the clusters which were labelled: (i) 'independent self-assessors', (ii) 'experienced dismitter' and (iii) 'compliant minimalists'. The findings acknowledge that: (a) the over 60s are heterogeneous with respect to their living and health circumstances, social networks and their food-safety knowledge and behavioural practices and (b) levels of potential vulnerability to foodborne illness based upon knowledge and self-reported practices can be seen across all clusters.

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1. Introduction

Microbiological foodborne illness is an important global public health issue (Redmond & Griffith, 2009). In the UK, it is estimated that annually 17 million people experience foodborne illness as a result of microbial food contamination, with one million of these visiting their GP (Tam et al., 2011), 20,000 receiving hospital treatment and 500 dying. Notwithstanding the personal burdens of these illnesses, the estimated economic cost is £1.5 billion (FSA, 2011). Most of these food poisoning incidents are related to the 'big five' pathogens *Salmonella* (species (sp): *S. enterica*), *Campylobacter* (sp: *C. jejuni* and *C. coli*), *Escherichia coli* 0157:H7, *Listeria* (sp: *L. monocytogenes*), and *Clostridium perfringens* (sp: *C. perfringens*) (Foodborne Disease Strategy Group, 2000).

Over the last decade the work of the Food Standards Agency (FSA), which is tasked with protecting the UK public's food safety in relation to health, set out strategic objectives to reduce the incidence of foodborne disease, achieving reductions of 19.2% from 2000 to 2005 (FSA, 2007). Early successes were achieved by reductions in *Campylobacter* and *Salmonella* in the supply chain. However, there has been an overall increase in the prevalence of sporadic cases since 2005 (i.e. individual instances of disease unre-

lated to other cases) of foodborne illness (FSA, 2011). The most significant and worrying increases have been associated with *Campylobacter* and *Listeria monocytogenes* (*L. mono*), accounting for 56,767 and 174 verified cases in 2010, respectively (FSA, 2011). Although *Campylobacter* is responsible for the greatest percentage of hospital admissions, these are primarily for dehydration where the prognosis for patient recovery is good. In the case of *L. mono*, prognosis is poor with *Listeria* being responsible for most deaths from foodborne disease in the UK, occurring in 20–30% of cases due to complications resulting from meningitis and septicaemia (Cairns & Payne, 2009).

L. mono, is the only known *Listeria* species to cause human illness (*Listeriosis*) and is an environmental bacterial pathogen (Beumer, TE Giffel, Spoorenberg, & Rombouts, 1996; Gillespie et al., 2009). *L. mono* can survive and thrive at temperatures that are consistent with normal refrigeration (5 °C) as well as growing on foods with high pH and salt concentrations (Farber, Ross, & Harwig, 1996). Foodborne transmission is therefore associated with chilled ready to eat foods or extended refrigerated shelf-life products such as pate, smoked fish, pre-cooked and packaged meat products, soft cheeses, pre-packed salad and sandwiches and pre-cut fruit (Farber & Peterkin, 1991; Silver, 1999). *Listeriosis* is known to affect primarily people who are immunocompromised, the elderly, those receiving cytotoxic drug therapies (to treat cancer), those with liver and kidney disorders, pregnant women and their unborn children as well as newly delivered infants (Gillespie et al., 2009; Gillespie, Mook, Little, Grant, & McLauchlin, 2010). In 2009, the UK Health

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Protection Agency (HPA) revealed a steady increase in cases of *Listeria* occurring between 2001 and 2007, with an overall increase of 53% from a 2000 baseline (ACMSF, 2009; FSA, 2011; SSRC, 2009). Most of this increase had been seen exclusively in people aged over 60 (FSA, 2011). Investigations into the causes of the increase in *Listeria* in this age group concluded that such an increase could not be solely attributed to population growth alone (ACMSF, 2009) and a limited understanding of the domestic food safety behaviours and attitudes of the older food consumer was identified as an area requiring investigation (SSRC, 2009). This research aims to address this gap by developing a baseline understanding of the attitudes, knowledge and behaviours towards food and food-safety of the over 60s in the North East England.

1.1. Food safety and the older consumer

There are few peer-reviewed studies examining the older consumer and their food-safety attitudes and behaviours. Key themes affecting older adults' abilities and motivations to follow best practice food-safety guidelines relate to: demographic factors of age and gender; psychological constructs such as knowledge, risk perception and illusion of control; and factors relating to the domestic environment, in particular technology and kitchen equipment. These themes are discussed in relation to the hypotheses framing this research.

Hypothesis 1. The over 60s are a heterogeneous group with increased age impacting upon ones ability to handle and prepare food.

In much food safety research to date, the older consumer is typically grouped into one large cohort (see, for example, Brennan, McCarthy, & Ritson, 2007; Hudson & Hartwell, 2002; Johnson et al., 1998). Given the diversity of lived experiences, attitudes, knowledge and behaviours of the over 60s and the significant role played by the ageing process on a person's ability to procure, handle, prepare, smell, taste and eat food (Nordin, 2009 cited in Raats, de Groot, & van Staveren, 2009), it is reasonable to assume the over 60s are much more heterogeneous than previously acknowledged and thus could be segmented according to food safety knowledge and practice.

Hypothesis 2. Gender influences adherence to food-safety recommendations in the over 60s cohort.

It is widely accepted that domestic environment is significantly gendered, with 'women retain[ing] the vast majority of "traditional" responsibilities for care of the household' (Thompson, 1996, p. 388), see also Davidson, Arber, and Marshall (2009, p. 110). Consequently some research has highlighted that men, particularly those divorced or widowed, may be most 'at-risk' of food-borne illness due to their lack of food handling and preparation experience (Brennan et al., 2007).

Hypothesis 3. Adults aged 60 and over will demonstrate less personal culpability and exhibit an illusion of control in relation to domestic food-safety.

Within the food safety chain, consumers are considered the 'weakest link' due to both overestimating the contribution of 'eating out' and underestimating their own food handling practices in the contraction of food related illness (Clayton, Griffith, Price, & Peters, 2002; Jevsnik, Helbec, & Raspor, 2007; Kennedy et al., 2005; Redmond & Griffith, 2003; Terpstra, Steenbekkers, de Maertelaere, & Nijhuis, 2005; Unsan, 2007). These concepts of over confidence and the illusion of control were identified as risk factors

associated with safe food handling practices amongst Irish consumers and in particular, experienced female food preparers aged 45 and over (Brennan et al., 2007; McCarthy et al., 2007). Brennan et al. (2007) also found that 'optimism' which was typified by the mindset 'it hasn't happened to me so far,' was prevalent amongst the over 60s of both genders.

Hypothesis 4. The cohort will demonstrate discrepancies between knowledge and practice of food-safety recommendations.

Consumer food-safety knowledge and risk perception have consistently identified a disconnect between food-safety knowledge and practice an artefact associated with the dominance of self-reported methodologies in this area (see for example Brennan et al., 2007; Bruhn & Schutz, 1999; Griffith, Worsfold, & Mitchell, 1998; Hanson & Caswell, 1999; Jackson, Blair, McDowell, Kennedy, & Bolton, 2007; Jevsnik et al., 2007; Kennedy et al., 2005; McCarthy et al., 2007; Miles, Braxton, & Frewer, 1999; Miles & Frewer, 2001; Redmond & Griffith, 2003; Scott, 2003; Wilcock, Pun, & Aung, 2004). This has also been observed in an over 60s cohort in Ireland (Brennan et al., 2007; McCarthy et al., 2007).

Hypothesis 5. Being aged 60 or over increases the likelihood of engaging with unsafe kitchen practices and owning poorly functioning kitchen equipment.

Differences in food safety knowledge and practice amongst the over 60s have been identified in relation to unsafe defrosting and thawing and poor personal hygiene practices, in particular hand washing and cross-contamination (Brennan et al., 2007; Gettings & Kiernan, 2001; Johnson et al., 1998; McCarthy et al., 2007). Kitchen technology, in particular ageing and poorly functioning kitchen equipment (such as refrigerators with internal temperatures higher than the recommended 5 °C), and a lack of on demand hot water have been identified as possible reasons contributing to unsafe domestic food handling practices (Johnson et al., 1998).

2. Method

In order to develop a baseline understanding of the attitudes, knowledge and behaviours towards food and food-safety of over 60s in North East England, an administered face-to-face questionnaire was selected as the most appropriate first stage research instrument to test the hypotheses outlined above.

Four question areas were developed as shown in Table 1, and related to: (1) demographics and lifestyle, eliciting data on respondents' socio demographic characteristics, household composition, social networks and social isolation; (2) perceived health status; (3) attitudes and behaviours towards food, which included statement based attitudinal questions relating to relationships with food, food safety and risk of illness (the latter two question areas informed by Brennan et al., 2007 and McCarthy et al., 2007 and food-quality assessment informed by FSA recommendations; and (4) knowledge and understanding of food-safety best practice including knowledge, associated with the '4 C's' of food-safety (namely cooking, cleaning, chilling and cross contamination).

The questionnaire, which consisted of a total of 133 questions was, following ethical approval, pilot tested in September 2010 on a mixed gender, convenience sample of $n = 20$ respondents. The questionnaire was also circulated amongst local stakeholder groups (such as 'Years Ahead – the North East's Regional Forum on Ageing') and consultations occurred with social gerontologists at Newcastle University's Institute for Ageing and Health, microbiologists from Geneus Laboratory (Newcastle University) and social scientists from the Department of Food Business and Development, University College, Cork. Questions were then revised post hoc on

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