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RESEARCH PAPER



Re-assessing vulnerability to foodborne illness: pathways and practices

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ABSTRACT

Foodborne illness is a major public health concern, often approached by focusing on socio-demographic groups who are considered most 'vulnerable' to foodborne disease such as elderly people or pregnant women. Based on a review of existing literature and original research with UK consumers, this paper proposes an alternative approach to analysing vulnerability to foodborne illness. Challenging conventional approaches that focus on the inherent vulnerability of particular socio-demographic groups, the paper emphasises the context-specific and situational nature of vulnerability and the practices and pathways through which people negotiate specific threats which may, in turn, affect their future vulnerabilities. The paper also addresses the gap between lay and expert knowledge that may increase exposure to particular food-related risks. Evidence is provided from research on the food safety and health implications of consumers' everyday domestic practices including behaviours that do not comply with current 'best practice' advice. The evidence supports a turn from notions of inherent vulnerability, based on the membership of certain socio-demographic groups, towards a more nuanced understanding of situational vulnerability, based on the context and logic informing specific social practices.

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Introduction

The WHO (2016) estimates that around 420,000 deaths are caused by foodborne disease each year, accounting for a loss of 33 million disability-adjusted life years. While most food-related deaths occur in the Global South, foodborne disease is also recognised as a major cause of illness in the UK and other countries in the Global North. The most common causes of foodborne illness are diarrhoeal agents such as norovirus and *Campylobacter spp.* Other major causes of foodborne illness are *Salmonella enterica* and *E.coli*. Listeriosis is less common but can be deadly, with the number of laboratory-confirmed cases in the UK doubling from 116 in 2000 to 234 in 2009 (Food Standards Agency, 2016).¹

Current advice about the risks of contracting foodborne illness is focused on specific groups of people who are considered particularly vulnerable. According to the UK Food Standards Agency, for example, 'Healthy, non-pregnant people rarely suffer from listeriosis. However, the illness particularly affects vulnerable groups of people, including those who have a weakened immune system due to certain illnesses or medication, particularly those over 60' (2014, p. 28). Other groups, such as pregnant women, are advised to avoid eating certain foods in order to reduce their vulnerability to foodborne illness. Rather than focusing on specific socio-demographic groups, such as older people or pregnant

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women, this paper proposes an alternative approach to analysing vulnerability to foodborne illness. Based on a review of recent literature and the findings of our own research, we emphasise the context-specific and situational nature of vulnerability and the practices and pathways that render people more vulnerable to specific threats which may also influence their future vulnerabilities. Before turning to this evidence, we summarise existing approaches to vulnerability, challenging their emphasis on specific 'vulnerable groups'.

Current approaches

Much has been written about the nature of vulnerability in the context of climate change, disaster management, poverty reduction, environmental sustainability and international development. Reflecting on this literature, Mackenzie, Rogers, and Dodds (2014) note that there has been little systematic analysis of the concept, while Schröder-Butterfill and Marianti acknowledge the 'considerable conceptual and terminological diversity' associated with the term (2006, p. 9). Sumner and Mallett conclude that 'the concept of vulnerability has infused numerous disciplines and sectors, resulting in an array of alternative and competing definitions and approaches' (2011, p. 3). The concept is increasingly mobilised in relation to a range of health concerns including food safety issues and diet-related ill-health. This literature commonly identifies a number of socio-demographic groups who are considered to be particularly 'at risk', requiring specific attention in communications strategies and the development of interventions that involve the targeting of information and advice.

In the UK, the Food Standards Agency (FSA) is currently addressing these issues having – until recently – focused its attention on specific socio-demographic groups such as elderly people and pregnant women. For example, in a report on the increased incidence of listeriosis in the UK, in a section labelled 'Definition of a vulnerable group', the FSA's Advisory Committee on the Microbiological Safety of Food (ACMSF) argued that:

For listeriosis, vulnerability is considerably increased within the following groups: elderly (i.e. people more than 60 years of age, regardless of whether they fall into other groups below), cancer patients, patients undergoing immunosuppressive or cytotoxic treatment, unborn and newly delivered infants, pregnant women, diabetics, alcoholics (including those with alcoholic liver disease) and a variety of other conditions (ACMSF, 2009, para 7).

The report continued: 'Although risk factors for listeriosis are well documented, identification of specific vulnerable groups ... is not straightforward' (ibid., para 8).² The FSA repeats this definition in its recent guidance for health and social care organisations on reducing the risks of vulnerable groups contracting listeriosis, also noting that 'Immune system capacity decreases progressively in the elderly, so elderly individuals are also included in this group' (FSA, 2016, p. 7).

Rather than seeking a single definition that is suitable for every purpose, this paper explores how vulnerability to foodborne illness is context-specific, pathway dependent and temporally dynamic. It also emphasises the significance of specific social practices especially where these do not comply with official guidance, examining the many reasons why people engage in behaviours that are considered to increase the risks of becoming ill. This is similar to the approach we have taken in previous work on food-related anxieties, informed by a theories of practice approach (Jackson, 2015; Jackson & Everts, 2010). We begin by reviewing how vulnerability is conceptualised in different domains in and beyond the field of public health. The discussion then draws on our recent research where issues of vulnerability have arisen. The paper seeks to unpack some of the conceptual complexity that surrounds notions of vulnerability and cautions against the moralisation of groups or individuals who engage in particular kinds of practices that may be judged to increase their vulnerability (cf. Mackenzie et al., 2014). Additionally, we advocate an examination of how those deemed to be vulnerable perceive and manage their alleged vulnerability (whether or not they define themselves as vulnerable).

Rather than seeking to improve on the FSA's definition of those who are *inherently vulnerable* to specific foodborne illnesses, this paper takes an alternative approach, emphasising the fact that vulnerability is context-specific and situationally dependent; that individuals may have different predispositions that render them more or less vulnerable to specific threats but that they may adopt particular

practices or follow different pathways that increase or decrease their vulnerability; and that individuals have different capacities to adapt to real or perceived risks, making them more or less resilient to future threats. Drawing on the findings of recent research on domestic kitchen practices, the paper explores the knowledge and understanding that underpins people's everyday practices which may differ from the expert logic of scientifically based advice (e.g. to avoid washing raw meat and poultry in order to reduce the risk of cross-contamination). Our approach is consistent with several recent papers in this journal (e.g. Evans, 2011; Muntaner, Lynch, & Smith, 2000; Whiting, Kendall, & Wills, 2013) which have taken an assets-based approach to public health, emphasising the social capital that people have at their disposal, as opposed to a deficit approach which assumes that the public suffer from a deficient understanding of health-related issues. It also complements the work of other authors who have taken a practice-based approach to food-related health issues (e.g. Delormier, Frohlich, & Potvin, 2009; Halkier & Jensen, 2011; Meah, 2014; Milne, 2011; Wills, Meah, Dickinson, & Short, 2015). We argue that practice-based approaches are of considerable value in understanding vulnerability and are less likely than other approaches to 'blame the victim' for failing to follow official guidance, providing an alternative understanding of the reasons why people engage in behaviours that may increase their vulnerability to specific threats (cf. Evans, 2011; Holm, 2003; Meah, 2014).

Understanding vulnerability

Implicit in the etymology of the word 'vulnerable' – which implies a wound or injury – is fragility: to be susceptible to wounding and suffering (Mackenzie et al., 2014, p. 5). In the context of public health and related concerns, vulnerability denotes a susceptibility to health problems, harm or neglect, combined with the notion of danger or threat to the person (Rogers, 1997, p. 65). Whether real or anticipated, it is implied that, in the face of such threats, 'the vulnerable person is somehow helpless and in need of protection' (ibid., p. 65). Relatedly, vulnerable populations are defined as 'being at risk of poor physical, psychological and/or social health' (Aday, 1993; cited in Rogers, 1997, p. 65). According to Sumner and Mallett (2011, p. 7), a common approach to vulnerability among health researchers is to define certain demographic groups as particularly vulnerable to poor health outcomes, influenced by a range of background characteristics or susceptibilities which emphasise the links between poor health and wider social factors.

While this socio-demographic approach to determining vulnerability and vulnerable groups is a common feature of public health discourses, our analysis draws upon a broader literature in which attempts have been made to disentangle the complexity of vulnerability and its relation to notions of risk and uncertainty (e.g. Cutter, 1996; Hoogeveen, Tesliuc, Vakis, & Dercon, 2004; Løvendal, Knowles, & Horii, 2004). According to some scholars (e.g. McEntire, 2011; Sumner & Mallett, 2011), there is a general consensus that definitions of vulnerability converge around dimensions of 'susceptibility', 'proneness', or 'liability to be harmed', in combination with factors relating to resilience and the capacity to respond to, and recover from, exposure to a hazard or perturbation.³ While some have suggested that the degree of vulnerability to which an individual or household is exposed is 'produced' through the interaction between exposure to external events and the internal coping capacity' of those affected (Sumner & Mallett, 2011, p. 9), others have been more specific in distinguishing between different sources (inherent, situational and pathogenic) and states (dispositional and occurrent) of vulnerability (Mackenzie et al., 2014). These distinctions are helpful in thinking through some of the inadequacies of socio-demographic approaches which treat whole groups as inherently vulnerable.

Inherent, situational and pathogenic vulnerability

According to Mackenzie et al.'s (2014) taxonomy, *inherent vulnerability* is intrinsic to the human condition and premised upon our corporeality, such as vulnerability to hunger, thirst or lack of sleep. The authors note that how these vulnerabilities are experienced is contingent upon a number of factors, including characteristics such as age, gender, health status and disability. For example, they report that ill health

'creates specific vulnerabilities related to the illness in question [and that] extremes of age exaggerate the everyday vulnerabilities of embodiment in proportion to the capacity of the individual to meet her everyday physical needs' (ibid., p. 10). Echoing observations made in other disciplines, Mackenzie et al. note that inherent vulnerability also varies depending on a person's resilience and capacity to cope. This is the lens through which older people's perceived vulnerability to foodborne illness is currently framed.

In contrast, *situational vulnerability* is context-specific and exacerbated by social, economic, political or environmental circumstances which may be short-term, intermittent or enduring (Mackenzie et al., 2014, p. 10). A pertinent example of this – which also reinforces the nature of dependency as a form of vulnerability (see Dodds, 2014) – are recently publicised reports regarding poor food hygiene standards deemed to be placing 'vulnerable patients' at 'high risk' of food poisoning' in some 400 hospitals, hospices, care homes, nurseries and school clubs across England, Wales and Northern Ireland (ITV 2 November 2016). Poor practices reported in one hospital included serving out-of-date chicken to patients and a failure to maintain fridge temperatures in accordance with food safety guidelines. The situational vulnerability of individuals who already have compromised immune systems is increased when they become dependent on the care of others whose own practices may be wanting. Mackenzie et al. (2014) also discuss *pathogenic vulnerability* referring to situational vulnerabilities that occur because of adverse social phenomena caused by injustice or discrimination (cf. Rogers & Lange, 2013).

Making a further distinction, Mackenzie et al. (2014, p. 11) observe that both inherent and situational sources of vulnerability may be *dispositional* or *occurrent*. By this, they are referring to the potential versus actual states of vulnerability. Pregnant women are cited as a pertinent example with all women of childbearing age being dispositionally vulnerable to life-threatening complications during childbirth, as well as having increased vulnerability to adverse health consequences following exposure to foodborne pathogens. Whether an individual woman becomes occurrently vulnerable to complications during childbirth or succumbs to foodborne illness will be contingent upon a range of inherent and situational factors, including her physical health, medical history, socio-economic status, access to healthcare, geographic location, exposure to pathogens and so on. Vulnerability to serious illness from foodborne disease during pregnancy can be approached in a similar way though it is – as we shall discuss below – generally more controllable.

Synchronic and diachronic vulnerability

Thompson (2014) distinguishes between synchronic and diachronic views of temporal vulnerability. *Synchronic* vulnerability coincides with the way that vulnerability is generally understood and takes the present as the point of reference. Within this approach, sources and causes of vulnerability are identified in relation to their current position in time. So, for example, the very young are vulnerable because they lack the ability to look after themselves, while the very old may be vulnerable as a result of declining capabilities related to the ageing process (Thompson, 2014, p. 3). In contrast, a *diachronic* perspective regards time as 'a process with no fixed point of reference [where the] present is a continually changing location in a continuum that moves inexorably into the future' (ibid., pp. 3, 4). Thompson explains how individuals can move in and out of vulnerability over time. New-born infants, for example, are vulnerable as they are completely dependent on the care of others. As they grow older they learn to become more independent, sourcing and preparing food for themselves and perhaps having families of their own when they will become carers themselves, before the ageing process potentially increases their inherent vulnerability, depending upon their health and medical history as well as situational factors such as their socio-economic situation which may leave them dependent on the care of others.

Although by no means comprehensive, these perspectives reveal some of the many challenges involved in defining 'vulnerability'. Moreover, important questions also arise regarding 'who (or what) is vulnerable?' and 'what are they vulnerable to/from?' (Malone & Engle, 2011; Sumner & Mallett, 2011). Posing these questions can help us better understand how vulnerability is conceptualised in relation to foodborne illness among those deemed most 'at risk'.

Practices and pathways

If vulnerability is determined by susceptibility or proneness, as well as by the capacity to resist and recover from exposure to a foodborne pathogen, what might render one individual – or a group with common characteristics (such as age) – more liable to experience harm, or less able to recover, than another? Here, we emphasise the value of focusing on specific *practices and pathways* such as the handling of raw chicken or the effects of particular life-course events such as pregnancy, illness or bereavement.

Rather than homogenising groups such as ‘older people’ or ‘pregnant women’, adopting a synchronic view of vulnerability whereby an individual’s present condition is taken as the lens through which their inherent vulnerability is defined, we suggest a more dynamic approach which emphasises the practices and pathways that increase or reduce an individual’s situational vulnerability. So, for example, a non-pregnant woman may become pregnant in the future or an individual’s immune status may shift following medical treatment and recovery. Changes in personal circumstances may affect one’s vulnerability to foodborne illness including factors that have nothing to do with age, pregnancy or immune status. For example, an 85-year old person living independently may be less vulnerable than a 35-year old who is situationally vulnerable by virtue of being an in-patient in hospital. Likewise, living in poverty, becoming homeless or experiencing uncertain asylum status may all significantly increase one’s situational vulnerability.

Recognising that pregnant women have reduced resilience to the most harmful effects of exposure to listeriosis and other foodborne pathogens, the FSA and NHS have produced guidelines for expectant mothers. Among a long list of foods to avoid are mould-ripened soft cheeses, unpasteurised dairy products and pâté. Recommendations about which foods should be avoided have changed over time and are culturally specific with different foods listed in different national contexts (see, e.g. the discussion on *The Guardian’s Food and Drink* blog [23 August 2016]). One strategy for mitigating the risks of foodborne illness is to avoid all these foods and, more generally, to comply with food safety guidance. But there is evidence from the FSA’s biennial *Food and You* survey, among other sources, that many consumers do not fully comply with recommended practices such as thorough washing of hands and chopping boards, correct refrigeration, adherence to use-by dates and adequate reheating of leftover food. Ethnographic evidence – including that produced from the FSA’s Kitchen Life study (Wills, Meah, Dickinson, & Short, 2013) – also suggests that consumers may have ‘good reasons’ for their apparently ‘bad behaviour’ (as viewed from the perspective of official guidance and scientific advice).⁴ Understanding the competing logics that inform lay and expert understandings of consumer practice might therefore have a significant impact in reducing vulnerability to foodborne disease. It may also be useful to trace the specific pathways that people follow which expose them to greater threats or reduce those threats as their circumstances or practices change. We explore these issues, below, with reference to our recent work on everyday domestic practices, applying the distinctions drawn above concerning situational and inherent, synchronic and diachronic forms of vulnerability, particularly emphasising the importance of pathways and practices in shaping people’s vulnerability to foodborne illness.

Theory and methods

The remainder of this paper draws on a series of empirical studies undertaken by the authors with funding from the European Research Council (CONANX 2009-12) and the ERA-Net SUSFOOD programme (FOCAS 2014-17). We also draw on the published findings of the Kitchen Life study (Wills et al., 2013, 2015), funded by the FSA (2011-13). Each of these studies was underpinned by a theories of practice approach which we have found useful in understanding contemporary consumption practices. As outlined by Reckwitz (2002) and applied by Warde (2005, 2016), practice theorists are united in their argument that social practices should be the focus of analysis rather than individuals (who are the ‘carriers’ of practices) or social structures (that only exist as a result of the sedimentation of social practices over time) (cf. Halkier & Jensen, 2011). Practice theorists, such as Schatzki (2002), have emphasised the

inseparability of 'doings and sayings' in the analysis of social life, and this concern with situated action has led to increased interest in ethnographic observation of everyday life alongside attitudinal research or studies of reported behaviour. Consequently, each of the studies reported here utilised a combination of methods including in-depth interviews, accompanied shopping trips, household kitchen visits, photography, photo-elicitation and videography.

Taking an ethnographically informed approach extends the epistemological possibilities of research into consumer practices, facilitating a shift away from studies that have relied on verbal reports of what takes place which, as Murcott (2000, p. 78) notes, have tended to be 'used as proxy for studies of what actually does' occur. Indeed, exploring practices *in situ* makes visible both the complex relationship between what people say they do and what they are observed to do, as well as the 'linguistic incongruence' arising from the absence of a language with which to express or translate one's experiences (DeVault, 1990) or, indeed, to articulate the knowledge which underpins a particular practice which may have co-evolved with other practices over time (Blue, Shove, Carmona, & Kelly, 2016) and take place without conscious thought or reflection (Power, 2003).

The studies drawn on in the remainder of the paper include data from 37 households and 66 participants. Each study received ethical approval from the relevant University authorities and all of the participants have been anonymised with the use of pseudonyms. Interviews were digitally recorded and transcribed for subsequent analysis using NVivo software, while detailed analytical notes were made of the visual data which utilise photographs, video-stills and verbatim quotations.

As well as reflecting upon shopping, storage, cooking and disposal practices, including – in the Kitchen Life study – participants' earlier responses to the 2010 *Food and You* survey, ethnographic work provided opportunities to observe household members interacting with food. In some cases, these moments were directly observed and recorded by the researchers using photography and video. In others, these were either photographed by members of the household using disposal cameras or were video-recorded by participants to be watched by the researcher involved with the household and then used as a means of elicitation in subsequent interviews. Across each study, retrospective engagement with the visual data made it possible to check the accuracy of those interpretations made while immersed as a participant observer (Paterson, Bottorff, & Hewat, 2003).

Empirical evidence

The following data help shed light on a number of factors, including the situational nature of vulnerability and the practices and pathways that our participants followed in specific circumstances affecting their vulnerability to foodborne illness. These examples highlight the situational (context specific and culturally variable) nature of vulnerability among those (e.g. pregnant women) who might otherwise be defined as inherently vulnerable as a result of their condition. Importantly, they also reveal how variability in practice may arise and how advice from various sources is deployed in different ways.

We begin with some examples of how participants in the CONANX study adapted their behaviour during and after pregnancy based on their interpretation of advice received from official sources. In one case, Sally Charles (40) who was in her early 30s when she had her first child, reported how she had sought the advice of a 'very level-headed' healthcare professional with thirty years' experience in her field who had told her: 'Look, if you want to eat this, eat this'. Following this advice, Sally reported: 'I would eat a bit of brie and I would eat a few prawns and I would have a glass of wine, so I didn't restrict myself'.

A second participant, Jonathan Anderson (39), whose partner was also in her early 30s when they had their first child, reflected on cultural variations in advice to pregnant women:

I suppose we ... had to think about what we ate while [his partner] was pregnant so there was obviously an impact ... I suppose it's interesting that the pregnant English woman and the pregnant French woman have very different approaches to what you can and can't eat ... you know, the issues with types of cheeses and types of meat and fish and, I don't know, there's a friend of mine [who's married to] a French girl, she didn't really stop eating anything, whereas it seems these days we're a bit more ... it just seems like, talking to Mum [about] what they did and didn't do whilst pregnant, it's, well you're better off not eating anything really. (cf. Fox, Nicholson, & Heffernan, 2009)

These examples highlight the situational (context-specific and culturally variable) nature of vulnerability among people, such as pregnant women, who might otherwise be defined as inherently vulnerable as a result of their condition. Importantly, they also reveal how vulnerabilities may be shaped by different practices following advice from different sources and in differing national contexts.

In the FSA-funded Kitchen Life study, where age and pregnancy status were two of the selection criteria, some variation of practice was reported. For example, Gilly Windsor, who was expecting her second child at the time of interview, expressed a lack of concern about the potential risk of falling ill with Salmonella as a result of eating 'runny' egg yolks while she was pregnant (Wills et al., 2013, p. 36). Her reasoning was based on the experience of never having had Salmonella in the past. In this instance, she made an informed choice based on the perceived probability of illness following her previous experience of consuming eggs and not becoming ill. Her decision to continue eating soft-boiled yolks during pregnancy emerged from a rational and embodied logic which made perfect sense to her although it may have conflicted with official food-safety advice. In this case, we might refer to the specific practices and pathways she follows that increase her vulnerability to foodborne illness.

By contrast, Gilly spontaneously reported concerns about the risk of illness from eating leftover rice which had not been cooled down and refrigerated quickly enough. Drawing attention to the role of the Internet in replacing or supplementing more traditional sources of advice during pregnancy, Gilly reveals how she set about trying to convince her partner of the importance of changing their current practices, which focused on the officially recommended method for reheating leftover rice (Wills et al., 2015, p. 122; see also Brembeck, 2011; Fox et al., 2009). In this example, Gilly manages her family's inherent vulnerability to foodborne illness by adapting her practices in order to reduce the risk of exposure to the bacteria in question.

That an individual's vulnerability to foodborne illness can be pathogen-specific is suggested by our ethnographic research in relation to *Campylobacter*. The FSA offers advice on how to store, prepare and cook raw chicken in order to reduce consumers' inherent vulnerability to illness following exposure to *Campylobacter*. While public health campaigns have drawn attention to the importance of covering and chilling uncooked chicken, not washing it (or any uncooked meat or fish), avoiding cross-contamination via utensils and chopping boards and cooking chicken thoroughly, consumers frequently apply their own logic and adaptive strategies which may contravene official 'best practice' advice and increase their vulnerability to foodborne illness.

In spite of annual campaigns advising against it – particularly in relation to 'the Christmas turkey' (FSA, 2014) – evidence points to the continued practice of washing meat, fish and poultry by people across different age groups and ethnicities. For example, in *Food and You*, the FSA's biennial survey of reported behaviour, attitudes and knowledge, 53% of respondents indicated that they washed raw chicken at least some of the time, compared with 36% who said they never washed chicken (Prior, Phillips, & O'Driscoll, 2014). Data from our research indicate that rather than being an ignorant, un-reflexive or cavalier practice, practical and reasoned logics are deployed by individuals when explaining their decision to wash uncooked meat, fish or poultry. This was particularly prevalent among some older people taking part in the Kitchen Life study who explained this practice in terms of a desire to remove excess blood, dust and bone fragments arising during butchery. The claim that 'you're supposed to wash meat' perhaps indicates an awareness of some prior best-practice advice from food safety or other culinary authorities which contradicts current guidance (Wills et al., 2013, p. 52). Among other participants, however, there were more specific concerns regarding 'threats' that are invisible to the human eye, but which – it was suggested – can be removed or mitigated by washing with water, vinegar, salt or lemon juice. In our present work on convenience foods, for example, Maryam Ahmed (39) – a health worker – expressed disgust at her colleagues' practices while preparing food for a community event. Here, she draws attention to their failure to wash the chicken they were preparing prior to cooking:

You're not gonna believe, it was really disgusting for me to watch, oh my god... these people working with the food ... I really felt sick ... it's just a very basic hygiene thing, using the same knife for the chicken and the vegetables, not washing the chickens before cooking them, brought from the shop in the carrier bag, straightaway they are cooking, you can't tell ten people ... [laughs].

For Maryam, the implication is that failure to wash uncooked chicken is a food safety lapse on a par with using the same knife to prepare uncooked chicken and raw vegetables. That this is 'common sense', not requiring further explanation, is indicated by the way she prefaces her statement with 'you're not gonna believe it', suggesting, along with her ensuing laughter, that among the 10 volunteers someone should have known what constitutes good food hygiene practice.

As with other Pakistani participants who took part in our work, washing uncooked meat apparently required little, if any, explanation. For example, the second author (Angela Meah) observed Nazra Habib (55) preparing a meal during Ramadan, during which Nazra spoke about a range of kitchen-related practices, past and present. Occasionally she interrupted the conversation to explain what she was doing at that particular moment. At one point, she moves away from the pan of frying onions she had been attending to on the hob and goes over to the sink, where she empties a bag of chicken pieces – bought from her local halal butcher – into a plastic tub. She casually chatted to Angela while rinsing the chicken under the tap, turning the pieces over with her hand (see Figure 1). Nazra interrupts the conversation and – barely audibly over the sound of the running water – casually explains: 'I have to wash this, you don't know where it has been, innit [laughs] I have to washing this, I just think 'eurgh', like some people don't wash it, I would not, y'know...!', before returning to the hob.

Washing the chicken is a brief interlude in the observation, a small but significant part of Nazra's food preparation. Like Maryam, Nazra contrasts her own practices with those of other people. While both women are aware of different ways of cooking chicken and other types of meat, they have their own preferred techniques which warrant explanation only insofar as they contrast them with those they deem to be unacceptable. While Maryam's tone is one of disgust and disbelief – her laughter perhaps signifying embarrassment, or an assumption that Angela will concur with her own views – Nazra is more casual in accepting other ways of doing things which might not be for her. However, her use of the word 'innit' and the conclusion of this brief component of her food preparation with the expression 'y'know' perhaps signal not so much inarticulacy but rather a request for understanding from Angela who is of Mixed Bangladeshi-Irish heritage – based upon an imagined shared awareness of the importance of ritual purity within Islam.

What these risks might be were more evident in our work with Nazra's son, Azam (35). When Angela arrived at his home, there was a colander of already-washed chicken pieces draining in the kitchen sink. When asked why he has rinsed the chicken, Azam's response – like his mother – is also conceptualised in terms of discomfort regarding 'where it's been.' His response suggests anxieties concerning storage and handling at the point of retail as well as environmental exposure en route to his home:



Figure 1. Nazra Habib washing chicken.

Angela: Why do you rinse it?

Azam: ...it's come from the shop, it's been in the fridge or the freezer ... because, y'know, they handle it-

Angela: Yeah

Azam: For me that's an issue.

Angela: Do you not trust them to-

Azam: They, they do but (.) it's all that transition, innit, bringing it from there, bringing it in the bag, bringing it home; it's meat and I'm a bit more wary of meat.

As with his mother, Azam's use of expressions such as 'innit' and 'y'know' – along with the confidence with which he makes his points – arguably point to an assumption that Angela will understand the risks to which he refers.

These examples all show that following specific hygiene practices, with their own internal logic, may increase participants' vulnerability to foodborne disease. They are not inherently vulnerable because of their age or ethnicity but their situational vulnerability is increased because of the pathways and practice they pursue.

Across each of the studies referred to here, concern about uncooked meat (although not necessarily its capacity to cause one to become unwell) was most likely to be expressed by older people and those of Pakistani origin in relation to meat purchased directly from a butcher – rather than pre-packaged at a supermarket – where butchery and storage practices were more visible. Some older people who took part in the Kitchen Life study offered greater clarification in articulating their discomfort regarding where meat has 'been'. For example, seeing meat on display in the shop prompted Vera Jones (60+) to comment: 'You don't know how long it's been hanging round the butchers in the open air; it could get something on it' (Wills et al., 2013, p. 52). What this 'something' might be remains unspecified. Another participant, Jim North (60+), drew attention to potential anxieties concerning the food hygiene practices of those from whom he purchased meat:

I know some of the things that go on, perhaps not these days – that used to go on in butchers' shops. Perhaps not now because we have better protection, but meat can be handled by someone else before you. (ibid.)

Jim's concerns derive from his memory of past practices. While he acknowledges that greater regulation has mitigated the likelihood of perceived mishandling, he is sufficiently affected by what he has seen in the past for his own practices not to have caught up with current best-practice advice. Jim's wife – Shirley – was more specific in explaining her concerns which are reflected in her husband's suggestion that 'it would seem wrong... not to wash out the carcass of [a chicken] before you cook it'. Here, she reports a particular example when she witnessed a delivery driver carrying a carcass slung over his shoulder, across the street to the rear entrance of the butchers on their local high street: 'To my mind, I thought that was wrong... that meat should be covered going out into the atmosphere of a high street' (Wills et al., 2013, p. 52).

While the FSA regard washing raw meat and poultry as a risky practice which increases exposure to foodborne pathogens such as *Campylobacter*, among these participants, washing meat is seen as a sensible precaution that is thought to *increase* food hygiene. It is an adaptive strategy, deployed routinely as a common-sense practice which mitigates anxieties regarding risks which are not perceived to be inherent within uncooked meat itself but can be introduced to it at various points along the supply chain. Indeed, one might argue that, according to this logic, it is the meat *itself* that is situationally vulnerable to contamination or 'infection', for example from debris from butchery, from other people's handling of it, as well as environmental exposure in how it is stored in the shop and how it is transported to their homes. Washing uncooked meat enabled these participants to feel that they were being 'clean with food' (Wills et al., 2013, p. 52).

The possibility that their own efforts to ameliorate concerns associated with uncooked meat might, in fact, increase their situational vulnerability does not appear to feature in these participants' logics. For example, Azam was temporarily silenced as he listened intently to Angela's explanation regarding why



Figure 2. Azam Habib rinsing chicken.

the FSA advises against washing meat. Having processed the suggestion that bacteria could be splashed around the sink – as with other participants (young and older) who reported washing uncooked meat, poultry and fish (cf. Meah, 2014) – Azam quickly explained how he tried to avoid this risk: ‘I am wary of that... I try not to leave dishes’ on the drainer. Ironically, however, as he turns round to demonstrate this point, the video footage reveals a range of clean crockery on the draining board, the colander of chicken just out of view in the sink (see Figure 2). Clearly, awareness about or even *wariness* of a particular risk is not always consciously translated into practice as individuals get distracted by other things which simultaneously occur during food handling and preparation. Regardless of the potential risk that washing uncooked meat presents to these individuals, one might suggest that they feel that they have regained psychological control in deploying a common-sense strategy for making something ‘clean’.

Each of these examples demonstrates the situational nature of vulnerability, its temporal dynamics and contextual dependence on the pathways and practices that participants pursue. Participants engaged in a variety of practices, some of which depart from official ‘best practice’ advice. But, in each case, there is a logic to the practices they adopt, even if this is different from the scientific logic of expert guidance. Some practices may increase participants’ vulnerability to specific threats such as those associated with cross-contamination and some rely on different sources of authority besides official food safety advice.

Conclusions

This paper has sought to problematise the concept of vulnerability and to apply a theories of practice approach to understand the way that everyday domestic practices may increase consumers’ susceptibility to foodborne illness. Rather than focusing on the inherent vulnerabilities of particular socio-demographic groups, such as the elderly or pregnant women, the paper has emphasised the situational, contextual and dynamic nature of vulnerability. Rather than assuming that all people within certain categories are equally vulnerable to foodborne disease as a result of their socio-demographic

characteristics, the paper has examined the context and circumstances that render people more or less vulnerable to specific threats as a result of the practices they engage in and the pathways they follow.

Our empirical work demonstrates how participants' domestic practices often depart from official guidance and how they rely on a variety of authorities and sources of information. One consequence of this process is that those who may be regarded as inherently vulnerable such as older people or pregnant women may not perceive themselves to be at additional risk of foodborne illness compared to the general population. Instead, we suggest, food safety authorities might be better advised to adopt a more situational view of vulnerability where particular pathways and practices are emphasised rather than, or in addition to, the current emphasis on the inherent vulnerability of particular socio-demographic groups.

The paper has examined a variety of evidence regarding the domestic practices that make certain people potentially more vulnerable to foodborne disease than others and the pathways that, when followed, increase their vulnerability or reduce their resilience to future threats. Rather than blaming those who 'fail' to adhere to the recommended practices prescribed by food safety authorities (such as hand-washing, refrigeration or correct storage and reheating practices), our evidence highlights the different kinds of knowledge and understanding that informs such practices and the anxieties that surround them.

Our research supports earlier attempts to reframe vulnerability in terms of its situational and contextual nature. So, for example, Schröder-Butterfill and Marianti argue that 'Vulnerability is not intrinsic to personal characteristics, but arises from combinations of characteristics and, importantly, from interactions between exposure, threats and coping in specific contexts' (2006, p. 7). While they acknowledge how coping behaviours may increase resilience to future threats (*ibid.*, p. 4), our approach goes further in examining the pathways and practices that increase or reduce people's situational vulnerability to specific threats.

Our approach places less emphasis on predispositions (often associated with particular socio-demographic groups such as those mentioned in the ACMSF report on Listeria) and more emphasis on the contextual factors that increase people's susceptibility to risk. Consistent with our use of practice-theory, the approach also emphasises the routinised nature of everyday food practices and the different kinds of knowledge that underpin these practices which may depart significantly from the scientific evidence on which expert advice is based. We suggest that such an approach might help food safety authorities to develop a more nuanced understanding of vulnerability which might, in turn, lead to better targeted and more effective public health interventions. Rather than addressing undifferentiated groups such as 'the elderly' or pregnant women, our approach focuses on specific pathways and practices that affect people's vulnerability to foodborne illness. While the approach might have wider applicability, we have limited the discussion here to food-related practices and their health consequences. Understanding the different logics that inform official guidance and everyday practice might also help avoid undue moralising about those whose behaviour currently departs from 'best practice' guidance.

Notes

1. The numbers have since fallen back a little but remain over 150 cases/year. For recent UK food poisoning data, see <https://www.food.gov.uk/news-updates/news/2014/6097/foodpoisoning> (accessed 25 November 2016).
2. The FSA recently held a workshop on vulnerable groups (April 2016) which provided a spur to the current paper. While the first author (Jackson) was involved in organising the workshop and the second (Meah) has undertaken commissioned research for the FSA, this paper is written in our independent capacity as academic researchers.
3. Although hazard and risk are often used interchangeably, hazard relates to the potential harm or adverse effects caused by exposure to a threat or perturbation, while risk refers to the probability that an individual will be harmed or that they will experience an adverse effect or undesirable outcome following exposure to a threat or perturbation. Uncertainty is more unpredictable than risk as it involves too many unknown variables to allow one to estimate the likelihood of different possible outcomes.
4. The Kitchen Life study (Wills et al., 2013; 2015) was commissioned by the FSA and led by Wendy Wills at the University of Hertfordshire. The second author (Meah) was engaged in the fieldwork and the first author (Jackson) acted in an advisory capacity for the study.

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