



“What the mind does not know, the eyes do not see”. Placing food allergy risk in sub-Saharan Africa



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ABSTRACT

Policy makers and health geographers are increasingly intrigued by the global rise of chronic disease. While current engagement coalesce around cardiovascular disease, cancers, chronic respiratory disease, and diabetes, very little attention has been given to other important chronic conditions: e.g., allergic disease. Concerns about how health is shaped by context and experienced in place can provide important insights to understand the trajectory of allergic disease and inform policy especially in developing countries experiencing an epidemiologic transition. Using Ghana as a case study, this paper draws on theories of political ecology of health to enhance our understanding of how individual (e.g. care seeking behaviours), sociocultural (e.g. lack of education and awareness), health system (e.g. absence of logistics) and policy environments (e.g. absence of policy) influence the ways in which food allergy is perceived, diagnosed and managed. These findings highlight the need for decision makers to target structural factors that impede access to and utilization of healthcare, diagnostic practices, as well as food allergy coping and management strategies. Moreover, the findings highlight the need for a global health agenda that pays critical attention to place-based factors in the construction of emerging health risks.

1. Introduction

Geographers are interested in the epidemiologic transition (McCracken and Phillips, 2009; Jones and Moon, 1992), the idea that as infectious disease decline and life expectancy increase, partly in response to modernization and socioeconomic changes, chronic non-communicable diseases [NCDs] will emerge as critical global health issues (Mercer, 2014; McKeown, 2009; Omran, 1971). Historically, this has been the case in many European and North American countries as a number of chronic conditions including cardiovascular, cancer, diabetes, chronic respiratory disease, autoimmune and allergic diseases filled the “epidemiological vacuum left by the retreat of infectious diseases” (Mercer, 2014; Jackson, 2006, p.17; Bach, 2002).

Today, it is widely recognized similar trends are taking place in many low and middle income countries (LMICs). As life expectancy has increased in the African region, in large part due to gains in reducing AIDS and malaria related deaths and improving access to healthcare (WHO, 2016), globalization, migration and urbanization processes are exposing people to lifestyles and behaviours – e.g. smoking, drinking alcohol, unhealthy diets, and physical inactivity that put them at risk

for developing several NCDs (Allen et al., 2007; Reubi et al., 2016; Mercer, 2014, WHO, 2011). By 2020, most of the expected global increase in NCD-related deaths will occur in Africa with some estimates indicating deaths will reach about 4 million (WHO Africa Region, 2016).

While the spectrum of chronic disease is wide, policy and research attention to date has coalesced around priority diseases: cardiovascular, cancers, chronic respiratory disease, and diabetes especially in LMICs (WHO, 2014a), neglecting others such as allergic disease (Prescott, 2013). This may likely be due to the assumption that allergies are “...a scientific conundrum of only limited epidemiological, economic, social and political significance” (Jackson, 2006, p.11). For example, the focus of both global and national NCD policy on preventing deaths may overshadow concerns for allergies considering case fatality rates are generally low compared to say cardiovascular diseases. Also, the hygiene hypothesis which suggests infections and microbial environments protect against allergies may further be entrenching popular notions of a distinct pattern of disease in developed and developing countries. But as recent evidence highlights, there are growing similarities than differences in health and disease out-

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comes in most parts of the world (Atiim and Elliott, 2016; WHO, 2011).

In this paper, we focus our attention on food allergy, an adverse immune response that occurs following exposure to food (Sicherer and Sampson, 2010). It is one of the most common and earliest onset chronic conditions (Prescott, 2013) affecting between 7–10% of children and adults in western societies (Soller et al., 2015; Osborne et al., 2011). Symptoms include but are not limited to breathing difficulties, swelling, abdominal cramps, vomiting and anaphylaxis – a severe life threatening condition that can lead to death when left untreated (Hadley, 2006). Food allergies affect health and wellbeing in several ways: through restricting or disrupting participation in social events, increasing stress and anxiety; as well as experiencing stigmas and bullying (e.g. Dean et al., 2015; Pitchforth et al., 2011). There are also significant economic costs to individuals and families (Zuberbier et al., 2014) with one recent study estimating the overall cost (both direct and indirect) at over US\$24 billion dollars yearly in the United States (Gupta et al., 2013).

We are motivated by the potential for food allergies to become the next epidemic in developing regions such as sub-Saharan Africa (SSA) undergoing an epidemiologic transition. The experience of western countries suggests that, food allergy has closely followed the rise of other chronic illnesses as infectious diseases have declined (Jackson, 2006; Bach, 2002). Considering the rising tide of NCDs and its risk factors in SSA (Allen et al., 2017; WHO, 2014a; 2014b; Llyold-Sherlock et al., 2014) and reported increases in both respiratory and skin allergies (Addo-Yobo et al., 2007; Ait-Khaled et al., 2007), there is growing research interest in food allergy especially in emerging economies, of which Ghana provides a typical example.

Like most countries in SSA, though national prevalence and distribution of food allergy in Ghana is lacking, recent studies in urban populations are hinting at a rise. For example, self-reported prevalence is estimated at 11% among school children in Greater Accra region (Obeng et al., 2011), the national capital compared to 6.9% in Canada (Soller et al., 2015). Cases have also been reported among senior high school students in the Ashanti region (Ababio et al., 2016), although it is unclear how food allergies were defined and the criteria for sample selection. More recently, qualitative studies are providing insights of risk perceptions, and the health, social and economic implications for those affected by food allergies (some of our other works). While few, these studies provide preliminary basis to begin to reflect on the burden of food allergy and underscores the risk they will pose in Ghana given its ongoing rapid social and economic changes.

Over the years, a combination of sound economic policies and the discovery of oil resources for example have contributed to a steady growth in the Ghanaian economy from 4.2% to 7.9% between 2001 and 2012 (Saleh, 2013). The transformation of the economy from subsistence agriculture has resulted in a growing industry and service sector, with jobs in these areas increasing from 38% to 59% between 1992 and 2010 (World Bank, 2014). As a consequence, poverty incidence has declined, though unevenly (Saleh, 2013; World Bank, 2011) with cities such as Accra and Kumasi the primary beneficiaries. As a result, migration and urbanization has increased with over 50% of people living in major cities (Ghana Statistical Service (GSS), 2012).

Since the 1980s, trade liberalization policies and globalization has also led to a growing fast food industry, both national and transnational as well as an influx of shopping malls with cheap, convenient and energy-dense foods (e.g. fats and oil, snack, red meat) which are becoming “the hub of evening and weekend social meetings” especially among young people and the urban working class (Agyei-Mensah and de-Graft Aikins, 2010). This is creating a climate conducive for NCDs to thrive with recent estimates suggesting they account for 42% of total adult deaths (WHO, 2014a). Across the country, out-patient data show high reported incidence of hypertension, diabetes, and sickle cell in health facilities between 2011 and 2014 (Ghana Health Service, 2015). As lifestyles increasingly mirror those in western societies, public

health officials are recognizing the potential for the rise of several NCDs and consequently developing a national strategy to address both current and future burdens (Ministry of Health, 2012).

Ghana's NCD research landscape to date is characterized by concerns around cancers, diabetes, mental health, cardiovascular disease, mental health and modifiable risk factors (see de-Graft Aikins et al., 2013 for overview). Only recently is food allergy receiving attention in Ghana (e.g. Atiim et al., 2017; Obeng et al., 2011) and elsewhere in Africa (Gray et al., 2014; Kung et al., 2014). With few exceptions (Atiim et al., 2017), much of these existing studies are focused on estimating prevalence, with a tendency to overlook the structures underpinning health and disease outcomes in places. As part of a larger research project, previous studies reveal that food allergies are often unrecognized health problems in healthcare and community settings (Atiim et al., 2017). In this paper, we seek to understand why this is the case. Focused on the Greater Accra region (GAR), the paper specifically addresses the following question: what are the local level factors influencing perceptions and management of food allergy? Through the accounts of healthcare workers and those affected by food allergy, the results add to the literature on the effects of sociopolitical and cultural processes on health in the context of food allergy.

2. Political ecology of health

To understand the factors that shape risk perceptions around food allergy, this work is informed by studies within the domain of political ecologies of health (PEH) which explicitly examines the interactions between biology, broader sociopolitical and environmental processes, and how they interact at different levels to shape population health and wellbeing (Neely, 2015; King, 2010; Mayer, 1996). Earlier concerns of political ecologists centered around how structural processes including the political economy, policy and politics create environmental degradation and social injustice, gendered access to environmental resources, conflicts, marginalization and social mobilization (Bebbington, 2015; Robbins, 2012) with little attention to health and disease (but see Turshen, 1977 for historical exception).

Following calls to explore the utility of political ecology frameworks to understand disease and health (King, 2010; Mayer, 1996), several studies have demonstrated how unequal power relations, public policy, sociocultural barriers and economic incentives shape concerns around water and health linkages (Bisung et al., 2015; Hunter, 2003), environment, livelihoods and health linkages (Richmond et al., 2005), infectious disease risk (Mkandawire et al., 2013) as well as maternal and child health (Atuoye et al., 2015; Rishworth et al., 2015). For example, Hunter (2003) examined the rising incidence of Schistosomiasis hematobium in Ghana's Upper East region, linking it to agricultural initiatives (building of dams) of the 1950s. While these initiatives were intended to improve nutrition and wellbeing for inhabitants, the failure to apply knowledge of parasitic disease within the ecological and environmental context produced detrimental health outcomes (i.e. schistosomiasis) for many people. By exploring the role of these structural processes, a PEH lens moves discussions of population health and wellbeing beyond dominant biomedical models which largely conceptualizes the links between humans and disease in biological terms (King, 2010), situating health outcomes and vulnerabilities at the local level within large-scale socio-cultural, historical, economic, political influences and agendas (Richmond et al., 2005; Mayer, 1996).

In the context of food allergy, few studies explicitly invoke PEH framework despite calls for stakeholders in the allergy field to recognize that allergic diseases are “not separate from the complex of environmental relations – physical, social, economic – out of which [they] came into being” (Mitman, 2008 cited in Smith, 2015, p.10). Recently, Jackson (2006), and Smith (2015) have reflected on the rise of (food) allergic diseases and drawn attention not just to the role socioecological changes have played in the risk of developing allergies, but also the

competing discourses on the nature and characteristics of allergy, the role of socio-political forces as well as how individual and collective agency informed responses to allergies, health-related experiences and outcomes in the developed world. The effect of public health policies on health experience was underscored by Rous and Hunt (2004) who demonstrate that regulations to minimize allergic reactions do not only socially differentiate between who is allergic and who is not, but also expands management beyond the realm of parents and the home to include new actors – teachers and schools. At the heart of these studies are issues about power and decision making regarding what counts as a public health risk and the need to engage with social models of health that incorporates the sociocultural and political dynamics of places in understanding health across different levels.

While the utility of a PEH lens has been applied to several health problems (Neely, 2015; King, 2010), little work has taken place in the context of food allergy in Africa. Our focus is on understanding why food allergy, though considered an important emerging health challenge, yet remains unrecognized in sub-Saharan Africa (Atiim et al., 2017; Kung et al., 2014). This paper seeks to fill this gap by underscoring the relevance of the PEH framework to understand the health risk of food allergy in populations experiencing rapid epidemiologic changes. This framework is a useful approach because of its attention to the pathways in which structural processes and existing sociocultural knowledge regimes, public health discourses (both official & unofficial) as well as institutional norms and practices relate to create differential health outcomes in particular places, shape risk perceptions and understanding of disease and public policy responses (Jackson and Neely, 2015; Mkandawire et al., 2013). For example, the framework is important to exploring how current problematization of priority NCDs by global health institutions and leaders (Reubi et al., 2016) can miss opportunities to understand emerging risks such as food allergy despite the chronic nature of these illnesses. Also, PEH's attention to local realities is critical to challenging the dominant thinking produced by biomedical approaches and theoretical underpinning that tends to create separate spheres of health between countries. This framework is therefore useful for gaining insights into concerns about emerging health risks such as food allergy especially given a context of changing health profiles, health systems and resource constraints in sub-Saharan Africa.

3. The research context

The Greater Accra Region (GAR) though the smallest of Ghana's ten administrative areas, has a total land area of 3245 km² (Ghana Statistical Service (GSS), 2013) and is to a large extent, the most developed region. The GAR has a relatively robust healthcare system compared to other regions. For example, it has 19% of the health workforce compared to about 3.9% (authors calculation) in the Upper West region (Ghana Health Service, 2017). In 2007, the GAR had a total of 466 health facilities, only second to the Ashanti region (549) although in terms of number of beds, it has the highest (Ghana Health Service, 2008) ensuring that populations here have improved access, diagnosis and treatment for health issues.

The GAR has a total population of a little over 4 million, the second largest after Kumasi with an estimated 90% of people residing in urban areas (Ghana Statistical Service (GSS), 2012). While natural increase has contributed to its urban growth, to a large extent, the status of the GAR as the commercial, industrial and administrative centre has also played an important role by drawing people from across the country, marking it as one of the most cosmopolitan and densely populated areas.

Urbanization and economic growth has led to reduced incidence of poverty across the country with the GAR recording a significant decline from 25.8% to 11.8% in 1992 and 2006 respectively (World Bank,

2014). An estimated 52% of people here are within the highest wealth quintile compared to just 2% each for people in the Northern and Upper East regions (Ghana Statistical Service (GSS) et al., 2015). Similarly, it has the highest proportion of females (9.6%) and males (12.9%) from 6 years and above who have completed at least a post-secondary education as well as the lowest rate for those who have never attended school compared to the rest of the regions (Ghana Statistical Service (GSS) et al., 2015).

As the national capital, the GAR is at the centre of much of the effects of economic transformation and globalization processes. Improving socioeconomic conditions in a context of easy access to unhealthy foods, lifestyle and behaviour changes over the decades is contributing to the rise of NCDs and their risk factors. Indeed, 35% of cases reported at Korle-Bu, the nation's foremost teaching hospital in Accra were attributed to hypertension. Stroke rates rose from 8% of all medical admission between 1960 and 1968 to 10.4% by 1972 (Agyei-Mensah and de-Graft Aikins, 2010). More recent analysis of risk factors show higher rates of overweight and obesity (55.2%) in Greater Accra compared to a national average of 43% in adults (Ofori-Asenso et al., 2016). It is in this context of ongoing socioeconomic inequalities and changing disease landscape that we explore the emerging health risk and the factors that influence risk perceptions around food allergy.

4. Methodology

Ethical clearance was obtained from the University of Waterloo Research Ethics Board and Ghana Health Service Ethics Review Committee. Between June and August 2015, thirty-seven (37) in-depth interviews were conducted with healthcare workers (17) and people affected by food allergy (20) in the Greater Accra region, Ghana. At health facilities, permission was obtained from heads/administrators to conduct interviews with staffs. Information letters outlining among others: the goals of the study, benefits and risks, as well as issues related to confidentiality were given to staffs and interested persons contacted the first author. Recruited health workers came from across twelve (12) public and private healthcare facilities in the study area. Snowballing was also used to extend the sample to ensure maximum variation of participants.

With respect to persons affected by food allergy (see Table 1 for participants' biography), we recruited primarily through advertisement (e.g. social media, flyers) and existing social networks. Similarly, we employed snowballing to reach other allergic individuals who could contribute to enhancing our understanding of the study objective. Based on prior literature on the characteristics of food allergy (Boyce et al., 2010), an individual ought to either (a) report a physician diagnosed or suspected food allergy or (b) self-report allergy and must (c) report the occurrence of symptoms within 1–2 h of ingestion of (or contact with) food and (d) report at least 2 symptoms of an allergic reaction (e.g. hives, itching, swelling, rash, coughing, wheezing, shortness of breath, throat tightness, nausea, vomiting, diarrhea) to be eligible.

Both interviews were conducted simultaneously and at a place of participants' choosing (either place of work or home) and time. Interviews lasted between 30 min and 1 h, focusing on perceptions of food allergy, the health policy context, as well as barriers and facilitators to management. Interviews were conducted in English, except in one case where translation was required. They were all tape recorded with permission and later transcribed verbatim for subsequent thematic analysis.

In addition, we also conducted documentary analysis in order to get a sense of the policy context around (food) allergic disease in Ghana. In doing so, the study explored a range of health policies and technical guidelines in order to gain insights of the place of food allergy and aspects of policy directly related to allergy. We purposively sampled

Table 1
Characteristics of participants affected by food allergy.

Names of participants	Allergic status				Age of allergic person	Age of diagnosis	Allergic foods
	Child		Self				
	M	F	M	F			
Kojo [*]		X			5	1	Peanut
		X			5	1 ^{1/2}	Egg, and peanut
Talata				X	25	15	Peanut and fish
Emelda	X				3	1	Soy
Jonah			X		26	18	Lobsters, shrimps, peanuts, and banana
Ekuoba	X				12	4	Oysters, lobsters, and prawns
Noela				X	20	11	Fish
Kwesi			X		23	17	Maize and yam ^{xx}
Abena				X	25	15	Peanut and pineapple
Charles		X			3	1	Milk, cowpea and peanut
Markus			X		22	13	Plantain, pineapple, kontombire ^{**}
Esi				X	24	10	Pineapple, snail and milk
Issah			X		25	19	Pineapple, prawns and shrimps
Bene [*]	X				12	3	Eggs
		X			8	2	Soya and eggs
Elikem			X		25	14	Pineapple, apple, prawns, cowpea, snails, and lobsters
Kwamina	X				4	1	Cowpea
Philemon			X		23	12	Kontombire, yam and okra
Rosemary	X				5	2	“Cantose” ^{**} , kontombire ^{**} and yam
Mary	X				4	2	Peanut, milk and eggs
Shemima		X			3	1	Pineapple and kontombire ^{**}
Zuweiba		X			4	2	Kontombire ^{**} , pineapple and peanuts
Total	12		10				

publicly available documents from the Ministry of Health, Ghana Health Service and Ghana Food and Drugs Authority (FDA) websites. Eight (8) relevant documents were collected (see Table 2). All materials with an explicit programmatic focus such as tuberculosis, HIV/AIDS, or specific concerns (e.g. healthcare waste management, transport operation manual, training manuals, grant calls) were excluded.

4.1. Data analysis

All interviews were transcribed verbatim and reviewed, after which separate thematic coding for health workers and affected persons was developed both deductively, on the basis of the research question as well as inductively in line with the ideas emerging from our transcripts. We assessed for inter-rater reliability of the codes (Miles and Huberman, 1994) and reached over 70% agreement with a second coder on both thematic codes. These were then applied to all the transcripts and continually modified to capture new categories or sub-

categories that may have been overlooked. Subsequently, we employed the qualitative data management software QSR International NVivo 11 to facilitate thematic analysis of the transcripts. Pseudonyms are used in the attribution of quotes to ensure anonymity.

In order to understand the policy context of food allergy, selected policies and guidelines were reviewed individually to gain insights of their content and identify their priority focus. Coding of documents were manually done and designed to provide information on the title of document, year of publication, and their key priority focus (see Table 2). Further, we performed a search of each document using the words “food allergy” or “allergic disease” or “allergic reaction” to identify and quantify references to (food) allergic disease. In reviewing these documents, we selected both implicit and explicit statements that were directly relevant to food allergy. We were also interested in the extent to which a particular document focused on allergies by paying particular attention to “the absence, sparseness, or incompleteness of documents” on food allergy (Bowen, 2009, p.33).

Table 2
Summary of health policy documents and guidelines.

No.	Policies/guidelines/technical reports	Year	Priority focus
1	Technical guidelines for integrated disease surveillance and response in Ghana	2002	– Identifying and collecting data on 23 infectious diseases
3	National health insurance policy framework	2004	– Lacks focus on NCDs including allergic disease – Providing access to healthcare – Covers asthma & allergic symptoms (e.g. urticaria, atopic eczema, swelling) though no specific mention of food allergy
2	National health policy	2007	– Set the overall context for health & disease management – Addresses barriers to healthy living including infectious and NCD risk factors
4	Standard treatment guidelines	2010	– Provides treatment guidelines for several diseases including allergic disease (e.g. asthma, eczema, urticaria), anaphylaxis and autoimmune disorders (e.g. rheumatoid arthritis, Lupus)
5	Occupational health and safety policy and guidelines for the health sector	2010	– Medical surveillance questionnaire for staff include two questions on asthma & allergies (Do you have asthma, bronchitis or other chest problems? do you have allergies?)
6	Essential medicines list	2010	– Identifies a number of anti-allergic medicines though no mention of food allergy or anaphylaxis
7	Strategy for the management, prevention and control of chronic non-communicable diseases, 2012–2016	2012	– Identifies asthma as chronic NCD – Commits to setting up asthma clinics and developing training modules for asthma management – Goal is to address NCDs and its risk factors
8	Guidelines for labeling of prepackaged foods	2013	– Requires ingredients to be declared on all prepackaged food – Identifies priority food allergens that must be declared on labels – Recognizes these priority allergens causes hypersensitivity

5. Results

The results are organized into three key thematic areas, termed here the political or policy domain, the health system domain, and socio-cultural context. Each of these major themes are linked to a number of sub-themes.

5.1. Political and policy related barriers to food allergy

Overall, findings reveal food allergy is a low priority health issue, evidenced by the virtual lack of a focus in national health policy agenda. However, we identified two policy documents with direct implications for the management of food allergy which suggests an implicit recognition of the emerging problem of (food) allergic disease in Ghana. The Standard Treatment Guidelines (STG) seeks to assist health workers in clinical decisions for specific problems. Although a key document in healthcare practice, surprisingly, only a few health workers ($n = 3$) made reference to it in discussions on treatment or management of food allergy, perhaps an indication of a lack of awareness.

Although the STG does not specifically mention food allergy, it addresses several allergic diseases (e.g. asthma, urticaria & eczema) and particularly highlights anaphylaxis, one of the key symptoms of severe food allergies. It recognizes anaphylaxis is:

“... a life-threatening but rapidly reversible condition if treated promptly. [...] can develop within minutes of injection or ingestion of medicines or contact with trigger factors” - MoH, 2010.

While recognizing triggers such as insect bites, drugs, vaccines, it also specifically identifies food allergens (particularly seafood and peanut) as important hazards for anaphylaxis and recommends several treatment options including administering adrenaline intramuscular injections, hydrocortisone intravenous therapy, and promethazine hydrochloride intramuscular injections at the first sign of anaphylaxis. As anaphylaxis is unpredictable, sudden and occurs outside hospital settings, the life-saving self-administered auto-injectors (e.g. Epi-Pens) that contains epinephrine is an important first line of treatment prior to seeking medical help (Gold and Sainsbury, 2000). Although Epi-Pens are not readily available in all major pharmaceutical outlets in the Greater Accra region, by identifying treatment options available in clinic and hospital based settings alone, the guideline fails to recognize that prompt receipt of adrenaline at health facilities can be hampered by structural barriers (e.g. lack of vehicular transport, inaccessible road networks), which may increase the risk of death.

Further, the Food and Drug Authority (FDA) guideline on labeling of prepackaged food provides the only regulatory mechanism for protecting the allergic population from accidental exposure to allergens. The text of the guideline identifies at least eight (8) food allergens and requires that any product containing them must be declared on the label:

“The following foods and ingredients are known to cause hypersensitivity and shall always be declared: cereals containing gluten (i.e., wheat, rye, barley, oats...); crustacean; eggs and egg products; fish and fish products; peanuts, soybeans; milk and milk products; tree nuts and nut products; and sulphite in concentrations” - FDA, 2013.

While the foods marked for mandatory declaration reflects priority food allergens reported to cause 90% of allergic reactions in developed countries (Boye, 2012), the guideline speaks little about local food sources of allergic reaction. Several reviews show that food allergens are heterogeneous globally (Prescott et al., 2013; Boye, 2012) and the apparent gap in identifying contextually relevant allergens will likely have negative consequences especially for individuals with allergies that lie outside conventional food allergens.

The lack of an overarching policy was an apparent issue during

interviews with most participants especially health workers, with many intimating this largely shaped their perception of the public health importance of food allergies. They reported that without a policy, many health workers assume that food allergies are an unimportant issue in health facilities, and consequently no deliberate effort is made to collect information on food allergy in healthcare settings:

None [policy guideline] exist, so many of us automatically assume it is not really an important issue. If there's no policy, no one will consciously be looking or thinking about such issues - Sam, 52 years old, > 20 years practicing physician.

For those affected by food allergy, the lack of health promotion campaigns on the signs or symptoms, causes and risks associated with allergy and the consequent limited public awareness and knowledge or skepticism was a reflection of the absence a formalized policy:

There's no public campaigns on radio or TV. So a lot of people are ignorant and unaware about it. Some are often surprised. Others don't even believe it and it becomes difficult convincing them what you're saying is true - Charles, 33 years old, father of 3year girl with multiple allergies.

Beyond the lack of a policy framework, inadequate national and local financial resources and funding was also identified as a barrier. Participants articulated that, given existing funding limitations, policy makers are often unable to conduct surveillance, undermining the building of evidence to influence policy changes on food allergy:

The problem is there is simply little money to go around and this undermines surveillance on these kind of issues [food allergy]. So it's a huge problem because without evidence, it's difficult to change policy - Tim, 40 years old, > 9yrs in policy practice.

The notion that there is “simply little money to go around” implies the need for decision makers to find ways which are “realistic and practical” in order to navigate the difficult task of allocating limited funding resources to address competing health problems. As the comment below indicates, it is only health problems that are perceived to impose a heavy burden on the healthcare system in Ghana that receives financial investments.

It is just realistic and practical if not the sensible thing to do. You have to focus your limited finances on your top five or ten causes of admission to hospital - Tina, 37 years old, 8 years physician.

Consequently, health issues that get reported and recorded frequently attract the much needed attention. In this regard, it was suggested that the prominence of communicable and maternal/child health issues (e.g. malaria, anemia, cholera) and other non-communicable diseases (e.g. hypertension, diabetes, stroke) meant food allergies were frequently considered “marginal” health concerns. The consequent result is the missed opportunity in recognizing, managing and meeting the needs of those affected by food allergies:

I think there has been little room because we have too much to handle in terms of malaria, maternal health and child malnutrition issues. With such pressing issues, everything is focused there and nothing much on allergies issues - Sylvia, 45 years old, 20 years practicing nurse.

After our fourth hospital visit, I realized that our system is not really big on this allergy thing compared to say malaria or typhoid. All they know is the malaria, fevers, diarrhea and those kinds of things - Mary, 32 years old, mother of 4year old boy with multiple allergies.

The apparent policy neglect, limited resources, and emphasis on communicable and noncommunicable diseases highlighted by participants should also be understood within the broader context of global health governance especially in developing countries (Ollila, 2005). While Ghana's health priority agenda is driven by the Ministry of

Health, donors and multi-national organizations have long occupied a space, providing critical financial resources to shape national health priorities. Participants perceived that if donor and development partners took interest in the issue of food allergy, the low priority focus, the need for surveillance and data challenges would be addressed in Ghana as donor priority shifts are often accompanied by financial commitments.

I don't see government devoting its limited resources to this issue. If our development partners take interest, things will naturally change because funding will be available. We will be able to collect information and all of a sudden you see the commitment from the ministry - Isaac, 51 years old, > 14 years practice in alternate medicine.

Given these accounts, it is important to understand the role of key actors in the global health arena in shaping health agendas in developing countries. Understanding their role in the production of disease priorities – through research and funding allocations – can provide important insights to contextualize the dynamics of food allergy in LMICs.

5.2. Health system barriers

Barriers within the healthcare system also featured prominently in discussions on management of food allergy. A general consensus was that many healthcare workers' lacked the knowledge, expertise and personnel to identify, diagnose, and to provide management guidelines that addresses the needs of those with a food allergy.

I have always said what the mind does not know, the eyes do not see. If you don't know or understand the causes of food allergy or how it is diagnosed, providing a timely diagnosis will be a problem. That is the issue we face - Tammy, 39 years old, 13 years practicing nurse.

In other places, allergists are the key focus because of their training in immunology. Most of us are trained in general medicine and so right away, there is difficulty. We need trained allergists to complement what we are trying to do here - Aseidu, 35 years old, 6 years practicing physician.

As a result, both health workers and affected persons intimated the quality of services provided was often sub-optimal, sometimes leading to misdiagnosis and affecting psychosocial wellbeing as the experience of Charles, a parent of a child with multiple allergies illustrates:

"...it was an annoying and stressful period because we were given wrong medicine. In our first visit, they gave us antibiotics because they thought it was an infection. When it reoccurred, the next person also recommended antibiotics..."

The potential to misdiagnose was not missed by health workers. Indeed, a constant concern they raised was the difficulty to accurately detect allergy considering that some of the symptoms of allergic diseases (e.g. diarrhea, vomiting, nausea) can mimic those of infectious disease.

Some of the common diseases have similar symptoms with food allergy. So if one does not know the kind of questions to ask the patient in order to do an accurate diagnosis, it is likely food allergy may be misdiagnosed as something else because of its similarities - Ken, 45 years old, 15 years practicing physician.

These concerns should also be situated within a context of the absence of diagnostic guidelines, and lack of diagnostic infrastructure (e.g. skin prick tests, food challenges), considered critical tools for accurately diagnosing the presence or otherwise of allergy (Boyce et al., 2010). Health workers intimated that these resources were unavailable in their place of work. Despite these constraints, diagnostic decisions often involved collaborating with their patients to obtain detailed

medical histories about the occurrence of allergic reactions. Where a medical history is unclear, food elimination was employed to help isolate the culprit food, a process that can be time-consuming and a frustrating experience for patients.

Elimination is not straight forward but a back and forth thing. At some point, people get so frustrated that they stop coming - Tina, 37 years old, 8 years practicing physician.

I gave up by the third week because we were not seeing light at the end of the tunnel. The whole process was just draining and took too long - Emelda, 29 years old, mother of allergic boy.

Diagnosis through food elimination was however not systematic and largely depended on the individual physician and their support staffs clinical practice and experience. As a result, many were worried about divergent diagnostic practices and suggested the need for guidelines to ensure a consistent practice and accurate diagnosis across health facilities.

Each [physician] goes about it differently. Not that this is bad but we need a logic table that should clearly state what you need to do or look for. If you see for example A, B, and C, conclude this is an allergy. In that way, everybody is on the same page - Abigail, 40 years, > 10 years practicing physician.

Even when diagnosis via skin prick tests, serum specific IgE or food challenges were available, they were outside the periphery of both public and private formal hospitals and mostly occurred in private laboratories. Participants reported that the overall associated costs were an important factor discouraging continued use of health services and determining one's "actual" allergic status:

You refer patients for tests at private labs and most come back complaining about the cost. They leave and don't come back because costs are on the high side. And without this, we will never know who has an actual allergy - Tina, 37 years old, 8 years practicing physician.

We didn't go further because of the cost. It was really expensive for just one visit - Noela, 20 year female, allergic to fish.

Considering the overall costs incurred because of frequent visits to hospitals and transportation related expenses, yet "with nothing to show for it", some participants resorted to self-management practices, which involves observing foods eaten and allergic reactions in order to self-identify the allergenic food.

It's a lot of money especially after going around different hospitals with nothing to show for it. What was the point? So I basically took all they were saying and through observing we noticed maize and yam - Kwesi, 23 years' male with allergy.

Lastly, many persons affected by food allergy reported that health worker's attitudes and behaviours negatively shaped their experience and healthcare utilization behaviour. Many recounted that their food allergies were not taken seriously, received inadequate information on diagnosis, or that medical treatment failed to improve their allergic experience resulting in self-care practices and default in seeking further care for diagnosis.

We decided not to step foot there again because they didn't take his issue seriously and we also didn't see much change. So we started observing by ourselves and luckily we were able to know it was peanut, milk, and cowpea - Charles, 33 years, father of 3 year old girl with multiple allergies.

When you delay in providing care or skip to another patient because you think the person's reactions are not serious, they will go and never come back because basically you're telling them their issue does not deserve your serious attention - Abigail, 40 years old, > 10 years practicing physician.

Despite challenges receiving a proper diagnosis in formal hospital settings, several others affected by food allergy ($n = 6$) also shared positive encounters with health workers. For such individuals, communication was a critical aspect of this experience as they were informed that there were no allergy tests, and the process of identifying the cause of their reactions could last a while.

It took a long time to know it was peanut and seafood. That's the only part I didn't like and frankly, that was something I already knew. They told me they suspected an allergy and that it might take some time because they didn't have the tests to help them easily find out - Jonah, 26 years old, male with multiple allergies.

As diagnosis, care and treatment is critical, removing health system barriers is essential to improving the wellbeing of those affected by food allergy. Opportunities for improvement suggested by participants include developing refresher courses, organizing workshops, and integrating food allergy in training curriculum of health institutions to ensure health professionals have the competency to manage food allergy.

5.3. Socio-cultural context

Participants also discussed factors within the sociocultural environment that affected the experience of food allergy. Many shared stories that suggested, poor healthcare seeking behaviour particularly delays seeking healthcare and the common practice of self-management of illness resulted in missed opportunities to understand the scope of food allergy and to provide a timely diagnosis. Delays were often influenced by people perceptions that their symptoms were not severe or were unsure if symptoms required treatment at hospitals.

There are those who delay and those who won't come at all because they believe the reactions are not severe and so try to manage it. Until they start reporting to us, we have no way of knowing how many have it and how best to help them - Julie, 43 years old, 14 years practicing dietician.

I didn't go because I wasn't sure this was something to take to hospital. So I managed it myself. So for people like us, we are not in their records - Esi, 24 years old female with multiple allergies.

Beyond delayed health seeking, lack of awareness and knowledge at the individual and community level was also highlighted as a barrier affecting food allergy experience. Many acknowledged that knowledge of the signs and symptoms were generally poor. Indeed, most allergic individuals and parents admitted that prior to diagnosis, food allergy was not a familiar health issue to them.

I didn't know until we went to the hospital. For a while, I actually didn't believe them. It took some before I came to accept it - Kwesi, 23 years old male with multiple allergy.

At the community level, both health workers and affected individuals intimated that some of the symptoms of food allergy, particularly those related to the skin (e.g. itching, rashes, hives, eczema) were unrecognized and often misattributed to unhygienic practices (e.g. unwashed clothes or bedding; irregular bathing). This poor awareness was attributed to the fact that, it is a "relatively new problem", one that is overshadowed by the focus on and prominence of other health issues. Because food allergy is "a less talked about issue", many people were considered uninformed, which perhaps explains the skepticism around food allergy and poor utilization of health services by affected persons.

We have an uninformed population. So it's not a surprise when people doubt that my son has an allergy. For me, it is ignorance because this is a less talked about issue when you put it beside the others - Bene, 35 years old, mother with 2 allergic children.

I think it is because it is a relatively new problem. As we know more,

information will get out there and the more informed people are, the more people hopefully will seek treatment - Abigail, 40 years old, > 10 years practicing physician.

Also, health workers indicated that food allergy like many other health conditions was affected by the acceptance and pervasiveness of alternative healthcare systems (e.g. traditional medicine) as well as easy access of over-the-counter medicines at pharmacies. This impedes diagnosis, affecting the ability of healthcare workers and policy makers to obtain an adequate picture of the number of people suffering from food allergy.

Many people do traditional medicine. They are everywhere, cheap, and people believe they are effective. Those people won't be part of official records so we won't know the real numbers. The other problem is the frequent use of these pharmacy shops as the first point of call - Sadia, 42 years old, 11 years practicing nurse.

Such perspectives were also confirmed by an alternative medicine practitioner who indicated, biomedical health services were often not the first point of call for those seeking treatment. While traditional medicine is common, most affected persons were however adamant that hospitals and clinics were their preferred first choice for treatment.

Another issue, closely related to the role of traditional medicine was cultural beliefs and practices around disease causation and how this shaped perceptions and management of food allergy. Although this was not an issue addressed by those affected by food allergy, health workers frequently indicated that beliefs that diseases do not necessarily have natural causes may be contributing to under-reporting as many go about seeking alternative explanations for their or children illnesses.

Some believe certain diseases are not natural. So they go to traditional healers. Others may try faith remedies. We have to keep that in mind when we talk about the number of people with allergy. They will be missed by surveillance systems - Sam, 52 years old, > 20 years practicing physician.

As indicated earlier, food allergy is often unrecognized as a significant health issue. Affected individuals in particular mentioned that, because society did not place allergy in the same category as other health issues, their allergy is considered a normal part of life. In this light, frequent complaints often engendered ridicule with some reluctant to initially seek a diagnosis or treatment at hospitals or disclosure of their allergic status following diagnosis.

We certainly didn't tell them we went to the hospital. They always said it was a normal thing and for them, we were simply spoiling her. We didn't want such uninformed comments - Bene, 35 years old, mother with 2 allergic children.

They also come to accept it as normal and don't see why they should be going to the hospital - Monica, 39 years old, 11 years practicing nurse.

One surprising issue to emerge though only among a few affected individuals ($n = 2$) was food beliefs and its role in contributing to late diagnosis, and treatment seeking. They believed their food allergy was a taboo, and hence saw allergy as a normal condition of their lives. Allergic reactions therefore were simply an indication of a violation of these food taboos. Thus, while framing food allergy as a taboo made it easy to disclose allergic status to others, it also hindered utilizing health services because they did not believe this was an issue for biomedical health treatment.

Something that's a taboo does not require going to the clinic. I treat it at home because it is not a hospital issue - Noela, 20 year female, allergic to fish.

Understanding the influence of cultural factors on health outcomes should therefore be a crucial part of any research design or protocol aimed at documenting the prevalence of food allergy, or developing

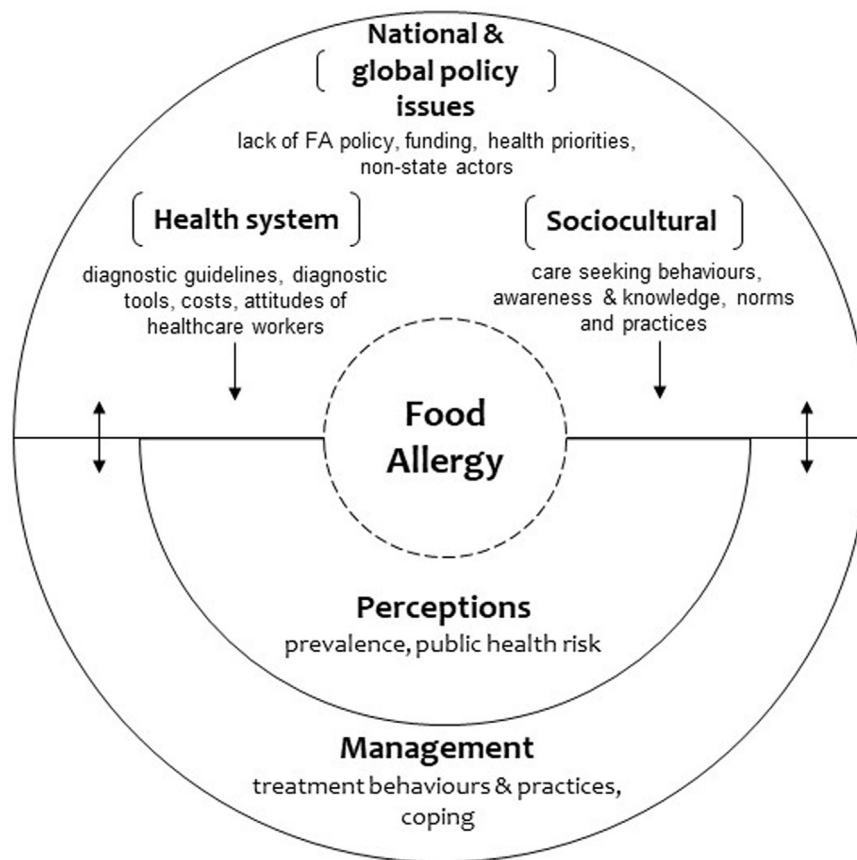


Fig. 1. Factors shaping understanding of food allergy.

appropriate initiatives to respond to unmet needs of those with allergy, and reducing social barriers to health in LMICs.

6. Discussion

This study examines the factors influencing risk perceptions and experiences of living with food allergy in Ghana. Using the political ecology of health lens (Fig. 1), the findings reveal there is a low priority focus on food allergy both in national health policy, within health facilities and communities in the Greater Accra region. Globally, food allergy is perceived to be increasing in prevalence, with an estimated 220 – 520 million people suffering from the disease (Pawankar et al., 2011) with significant economic costs – estimated at about 24.8 billion annually (Gupta et al., 2013). The low priority on food allergy is therefore worrying as it is thought to be spreading to developing and emerging economies in Asia and Africa (Du-Toit et al., 2015; Kung et al., 2014; Gray et al., 2014). In Ghana, the self-reported prevalence among urban schoolchildren is estimated at 11% (Obeng et al., 2011), which is higher than national prevalence in populations under 18 years in Canada (Soller et al., 2015). Although national prevalence on food allergy is lacking, similar rates may be occurring in other urban populations in Ghana and elsewhere in sub-Saharan Africa considering the high rates recorded for respiratory allergies (Addo-Yobo et al., 2007; Ait-Khaled et al., 2007). A critical assessment of sociocultural and political context related to food allergy is important to understanding and managing the disease.

In this context, the accounts of participants revealed that food allergy in Ghana is shaped by several political factors, in particular the apparent absence of an overall policy framework. With infectious, maternal and child health issues coupled with NCDs namely: cardio-

vascular disease (CVD), cancer, diabetes accounting for 51% and 42% of mortality respectively (WHO, 2014a), Ghana national policy agenda is largely (see Table 2) structured towards addressing HIV, malaria, risk factors of NCDs as well as scaling up nutrition and maternal health interventions as participants also highlighted. However, the silence of recent policies especially the control and management of noncommunicable diseases on (food) allergic disease raises concerns about population vulnerability especially as studies (Prescott et al., 2013; Boye, 2012) suggest there is more to the epidemiologic transition in LMICs than the narrow focus on CVDs and cancers. As the health of populations around the world become increasingly similar, policy makers and researchers need to take heed and pay attention to the risk of food allergy in contexts such as Ghana and Africa in general (Atiim and Elliott, 2016; Kung et al., 2014).

Additionally, as the body of work on political ecologies of health suggest, risk perception, diagnosis and management of food allergy should also be contextualized within existing structural barriers operating outside Ghana. While budgetary allocation to health is improving, most is focused on remunerations of health sector workers (Al-Bader et al., 2010), with limited resources available to expand health service infrastructure. Compounding this is the gradual withdrawal of donor investments as Ghana attains middle income status, creating shortfalls in government revenue and competition among various health programs (e.g. malaria, tuberculosis) for the limited financial resources. Further, perceived disinterest in food allergy issues by key actors (e.g. WHO, Bill and Melinda Gates Foundation) as noted by participants contributes to undermining food allergy as a legitimate health concern, perpetuating a culture of poor data collection, and poor awareness about food allergy as attention continues to be placed on conditions perceived to cause the greatest burden in Ghana. In this

regard, participants intimated if food allergy is to gain attention in Ghana and elsewhere in the developing world, the global health community, including governance institutions and donors have an important role to play given their contributions in reducing health inequities and shaping disease priorities (Mwisongo and Nabyonga-Orem, 2016). In short, it is time for the global health community to take interest in food allergy in LMICs.

Our findings also reveal that to fully understand food allergy in Ghana and elsewhere in Africa, structural influences such as health knowledge and institutional discourses deserve some attention (King, 2010). As Mkandawire et al. (2013) have argued these often unpinning much of policy responses shaping how disease is conceptualized and managed. For example, the account of health workers that without evidence policy changes will be difficult underlies assumptions that, in the presence of clear evidence, the policy environment will improve, thereby increasing awareness and effectiveness of diagnosis and treatment (Sanderson, 2002). However, considering both the potential and actual associated food allergy burden, previous studies suggest interventions need not wait for the numbers or evidence before acting (Atiim et al., 2017) especially considering the risk of anaphylaxis.

Over the years, government policies such as the National Health Insurance Scheme (NHIS) was developed to reduce geographical and financial access to healthcare with the expectation of increasing contact and utilization of health services in Ghana. While symptoms of food allergies are covered under the NHIS, health system barriers (e.g. the lack of health workers with expertise in allergy, diagnostic testing facilities) act alone or collectively to affect the experience of diagnosis and quality of health services. For example, in GAR and to the best of our knowledge, only one private allergy testing laboratory exist, suggesting for many relying on public and even private formal hospitals, getting a diagnosis can be a frustrating experience, even so in other urban and rural areas where health facilities are inadequate compared to the GAR. The lack of allergists and diagnostic tools have the potential not only to lead to misdiagnosis, impact psychosocial wellbeing of affected persons but also to risky self-management practices and poor health seeking behaviours. Providing health workers with training in the epidemiology of food allergy, and disseminating existing diagnostic and management guidelines as well as investments in diagnostic facilities (Boyce et al., 2010; Gupta et al., 2008) can help to address knowledge and competency barriers as well as reduce the risk of misdiagnosis, while also providing a timely diagnosis to help reduce anxiety in those affected by food allergy.

As Fig. 1 also suggests, structural influences related to sociocultural belief systems are essential to understanding how food allergy is conceptualized. In Ghana like many parts of sub-Saharan Africa, biomedical health systems exist alongside traditional medicine. Although a significant number of persons affected by food allergy said they use biomedical health facilities, considering the pervasiveness of traditional medicine and with 60% of Ghanaians thought to be using this as the first line of treatment (Al-Bader et al., 2010), this may likely be contributing to missed opportunities to detect food allergy in formal health facilities. Closely related is that, cultural beliefs and norms regarding health are equally important dimensions that may provide insights of under-reporting of food allergy. Some allergic individuals explained their food allergies were a taboo and as a result, they generally avoided care or treatment at health facilities for their symptoms. Further, poor knowledge, and perception of disease severity influence decisions to seek diagnosis and treatment. At the local level, physical and bodily manifestations of food allergy such as hives, rashes, and/or diarrhea are often perceived as conditions that are not severe and hence do not require health services. Consequently, many delay or refuse to seek treatment or simply self-manage, potentially keeping food allergy under the public health radar and ensuring it remains an unrecognized health problem.

The barriers we identify are not unique to food allergy. Several studies in Ghana and elsewhere have revealed how various structural processes (e.g. poor quality of care, costs, proximity, transportation, and inequality in resource distribution); and sociocultural factors (e.g. cultural and religious norms, stigma) affect vulnerability and shape patterns of health outcomes among some subgroups. These include studies that examine enrollment in health insurance (Fenny et al., 2016), access to maternal and child care services (Atuoye et al., 2015), lack of water and water-related behaviours and practices (Bisung et al., 2015) and nutrition policy implementation (Vine and Elliott, 2013). While national prevalence in Ghana and sub-Saharan Africa remains a challenge, and may possibly reflect low incidence, we know from the experience of developed countries that, structural factors particularly actors and institutions (e.g. medical experts, allergic groups, the media) played key roles in successfully transforming food allergy from a relatively obscure to a major public health problem (Haeusermann, 2015; Waggoner, 2013; Nettleton et al., 2009). In many ways, this literature highlights the need to pay attention to the socioecological context of health and how the experience of affected groups have contributed to galvanizing growing support for food allergy.

This study is limited to the experience of healthcare workers and persons affected by food allergy in one large urban centre of Ghana. Although we employed several recruitment strategies, the eventual sample was mostly skewed towards persons of high socioeconomic status. Similarly, our sample does not include other equally critical health personnel such as dermatologists, midwives, community health nurses, and pharmacists. As a result, our findings are not generalizable to all health workers, allergic individuals or their families. However, this was an exploratory qualitative study and therefore not meant to be representative. This research makes a strong contribution by adding a layer (food allergy) to the literature on chronic disease in sub-Saharan Africa.

7. Conclusion

By placing food allergy in a LMIC context, this research highlights how people (e.g. health seeking attitudes), and place attributes (e.g. social norms, health system and policy characteristics) affect perceptions of prevalence, diagnostic practices, and management of food allergy. In doing so, the paper moves discussions beyond the absence of prevalence data by identifying the complex interplay of social, political and environmental factors embedded in place that maybe shaping the trajectory of food allergy in developing countries (Cummins et al., 2007; Poland et al., 2005; Macintyre et al., 2002). It stresses the importance of understanding the everyday realities of inadequate funding, lack of diagnostic resources, and poor health seeking behaviours and how these inform our understanding of food allergy risk. As a result, this paper suggests the need for discussions on the trajectory of food allergy in the developing world to take into account both sociopolitical and cultural barriers influencing health and wellbeing in such settings. From a public policy standpoint, the study reveals important structural barriers for possible public policy intervention: e.g. poor management, funding priorities and constraints, and the lack of diagnostic infrastructure for food allergies. Public policies must also seek to address cultural norms and practices around health and disease in order to increase reporting and utilization of health services. In addition, the role of global health actors suggest disease priority setting is not simply the sole responsibility of local decision makers and institutions. It is therefore important that global health institutions incorporate allergic disease in the overall context of the global NCDs prevention agenda in LMICs. We call on researchers and organizations in both developing and developed regions with interest in allergic disease and the changing epidemiology of health in LMICs to build strategic partnerships for research that provides insights into the food allergy front.

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