



Food safety knowledge, attitudes and practices of street food vendors and consumers in Port-au-Prince, Haiti



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ABSTRACT

This study had the major objective of determining the food safety knowledge, attitudes and practices of vendors and consumers of street food in Port-au-Prince, Haiti. Haiti currently has no food safety legislation in place. 160 consumers and 80 vendors from four different communes (Tabarre, Delmas, Pétienville and downtown Port-au-Prince) volunteered to participate in the study. In general, consumers and vendors exhibited average food safety knowledge and attitude levels. Gender, training, level of education and location did not have a significant effect ($p < 0.05$) on the level of food safety knowledge of the consumers. Vendors were determined to have higher levels of food safety knowledge than consumers, whilst trained vendors had better food safety knowledge and attitudes compared to untrained vendors. The majority of vendors and consumers were aware of the importance of washing hands and proper cleaning with regards to the prevention of foodborne diseases. However, some other aspects were of concern. Consumers and vendors did not know that Hepatitis A, *Salmonella* spp. and *Staphylococcus* spp. are pathogens responsible of foodborne diseases. They also had difficulties in identifying the groups at risk of foodborne diseases and most were unaware of the importance of reheating food to fight against foodborne diseases. In the observational part of the study, it was found that in 60% of the cases, flies and animals were evident around the stall and 65% did not have access to potable water. The majority served food with bare hands and did not wash their hands after handling money. Additionally, 70% of the vendors did not chill pre-cooked food. The conditions in which street food vendors operate in Port-au-Prince are largely unacceptable from a food safety point of view and an effort should be made to provide them with adequate infrastructure including potable water, toilets and waste disposal facilities. The results of this study should be used to generate part of the impetus towards the development of enforcement of appropriate food safety legislation in Haiti.

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1. Introduction

Street foods are defined as ready-to-eat (RTE) food and beverages prepared and/or sold by vendors and handlers especially in streets and similar public places (FAO, 2013) for immediate consumption or consumption at a later stage without further processing or preparation. Street foods are largely appreciated for their flavours, convenience, low cost and their cultural and social heritage links (Aluko, Ojeremi, Olakele, & Ajidagba, 2014; Chukuezi, 2010; Ekanem, 1998; da Silva et al., 2014). Street foods represent

a significant portion of the diet of many inhabitants in many major cities (Ag Bendech, Tefft, Seki, & Nicolo, 2013; FAO, 2010; Suneetha, Manjula, & Depur, 2011). An estimated 2.5 billion people worldwide consume street food each day. In Latin America street food accounts for up to 30% of urban household purchases (FAO, 2007).

Many countries have experienced a change in their socio-economic status during the past few decades. These changes have in part led to a significant growth in the popularity of street foods (Chukuezi, 2010; Omemu & Aderoju, 2008). As urban populations are growing, especially in developing countries, it is expected that the street-vended foods sector will continue to expand. Although street vended foods are very common in third world and developing countries such as Haiti, there is paucity in data and studies regarding the safety of these foods. However, it has been recognized that the conditions under which street vendors operate are

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often unacceptable for the purposes of preparing and selling of food (Aluko et al., 2014; Hanashiro, Morita, Matté, Matté, & Torres, 2005; Muyanja, Nayiga, Namugumya, & Nasinyama, 2011; Sharma & Mazumdar, 2014; da Silva et al., 2014). Street food vendors are very often poor, uneducated and show little concern towards the safe handling of foods (Lues, Mpeli, Venter, & Theron, 2006; Mensah, Yeboah-Manu, Owusu-Darko, & Ablordey, 2002; WHO, 1996). Consequently, some serious concerns do exist about the safety of street food (FAO, 2013; Muinde & Kuria, 2005; Rheinländer et al., 2008). The concerns have been realized as street-vended foods have dually been implicated in outbreaks of foodborne illnesses all around the world (Aluko et al., 2014; Bryan et al., 1992; Dawson & Canet, 1991). In 1988, 14 deaths were reported in Perak (Malaysia) because of foodborne diseases related to street foods whilst 300 persons became ill in Hong Kong after consumption of street vended foods (FAO, 1990). Associations have been established between the purchasing street food and foodborne illness; in particular *Salmonella* infections (Vollard et al., 2004). By means of Quantitative Microbial Risk Assessment (QMRA), Barker, Amoah, and Drechsel (2014) recently demonstrated that significant interventions are required to protect the health and safety of street food consumers in Kumasi, Ghana.

In different studies conducted to assess the food safety knowledge and attitudes of street food vendors, it has been observed that street food vendors generally have poor levels of food safety knowledge (FAO, 2013; Rane, 2011). Demographic characteristics such as age and gender do not appear to play a role in food safety knowledge of street food vendors (Annor & Baiden, 2011; Soares, Almeida, Cerqueira, Carvalho, & Nunes, 2012). Contrasting results have been reported on the relationship between the level of educational of street food vendors and their food safety knowledge. Soares et al. (2012) reported that a positive correlation occurred between the educational level and food safety knowledge of vendors whilst Annor and Baiden (2011) did not find any significant effect of educational level on the food safety knowledge. Additionally, whilst some studies have found a significant correlation between the level of food safety knowledge and the food safety attitude (Cuprasitrit, Srisorrachatr, & Malai, 2011) others have not reported no correlation between the two (Omemu & Aderoju, 2008).

To date, the food knowledge safety, attitudes and practices of food handlers (including street food vendors) in several countries has been reported in several studies i.e. in Turkey (Bas, Ersun, & Divan, 2006), Bangkok, Thailand (Cuprasitrit et al., 2011), Shijiazhuang City, China (Liu, Zhang, & Zhang, 2014), and Santos City, Brazil (da Cunha, Stedefeldt, & de Rosso, 2014). The food knowledge safety and attitudes of consumers have been reported to a lesser extent. Unlike the countries evaluated in studies performed to date, Haiti presents a peculiar and unique case in that it has no food safety legislation. Grandesso et al. (2014) recently evaluated the risk factors for cholera transmission in Haiti during inter-peak periods. They determined that eating street foods and washing disease with untreated water were significant risk factors. Grandesso et al. (2014) also determined that (insufficient) essential hygiene practices are an important issue to tackle in Haiti. The major objective of this study was to establish the levels of food safety knowledge, attitudes and practices of the vendors and consumers of street food in Haiti. The results of this study could potentially provide part of the impetus for development and enforcement of legislation regulating the quality and safety of street foods in Haiti.

2. Materials and methods

The study was conducted in the capital city of Haiti, Port-au-Prince from July 2012 to September 2012. Four communes –

Tabarre, Delmas, Pétion-ville and downtown Port-au-Prince – were selected for the survey. 80 street vendors, 160 consumers and 20 street food vending stalls were involved in the survey. The numbers of street vendors, consumers and vending stalls were evenly distributed between the four communes. Structured written questionnaires were used to assess the food safety knowledge and attitudes of the consumers and vendors whereas a checklist was used to evaluate the food handling practices of the street vendors.

2.1. Food safety knowledge and attitude questionnaire

The questionnaire used to assess the food safety knowledge and attitudes of the street food vendors and consumers was adopted from Angelillo, Viggiani, Greco, and Rito (2001), Bolton, Meally, Blair, Mcdowell, and Cowan (2008) and Ansari-Lari, Soodbakhsh, and Lakzadeh (2010). These can be seen in Tables 7–10. The questionnaire was first translated to French and a pilot test was conducted using twenty people in Tabarre, one of the selected communes. Based on the comments of the respondents, very slight changes were made before adoption of the final version. The questionnaire was organized into three main sections i) demographic information ii) food safety knowledge and iii) food safety attitudes. It was filled in either by the participants themselves or by the researcher for illiterate participants.

The demographic section contained information regarding gender, age, educational level and training in food safety. The food safety knowledge section was designed to assess the awareness of the vendors and consumers to food poisoning pathogens, food and personal hygiene, high risk groups, proper cleaning etc. This section contained 18 questions with 3 possible answers – ‘yes’, ‘no’ and ‘do not know’. Each correct answer considered as one point whilst no marks were awarded for incorrect answers or when the respondent indicated that they did not know the answer. The score was then converted to 100 on a basis of maximum possible score of 18 points. A score less than 50 (9 points) was considered as indicating poor food safety knowledge. Scores between 50 and 75 were considered as indicating average (adequate) food safety knowledge, whilst

Table 1
Demographic characteristics of street food consumers in Port-au-Prince, Haiti.

Characteristics	Number (%)	Mean \pm stdev ^a	Range
Sex			
Female	60 (37.5%)		
Male	100 (62.5%)		
Age (years)			
15–25	74 (46.2%)	29.6 \pm 11.3	15–74
26–35	49 (30.6%)		
36–45	23 (14.4%)		
46–55	6 (3.8%)		
56–60	5 (3.1%)		
>60	3 (1.9%)		
Education			
Illiterate	13 (8.2%)		
Primary school	25 (15.6%)		
High school	69 (43.1%)		
University	53 (33.1%)		
Food safety training			
Yes	18 (11.3%)		
No	142 (88.7%)		
Location			
Port-au-Prince	40 (25%)		
Pétion-ville	40 (25%)		
Delmas	40 (25%)		
Tabarre	40 (25%)		
Total	160		

^a stdev = standard deviation.

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