



Short communication

Investigation of the experience of foodborne illness and estimation of the incidence of foodborne disease in South Korea

Yong Soo Kim^b, Soon Ho Lee^c, Soon Han Kim^c, Yongsung Joo^d, Gyung Jin Bahk^{a,*}^a Department of Food and Nutrition, Kunsan National University, Gunsan, Jeonbuk 573-701, South Korea^b Quality Improvement Team, Korea Health Industry Development Institute, Cheongwon, Chungbuk 363-700, South Korea^c Department of Microbiology, Ministry of Food and Drug Safety, Cheongwon, Chungbuk 363-700, South Korea^d Department of Statistics, Dongguk University-Seoul, Seoul 100-715, South Korea

ARTICLE INFO

Article history:

Received 14 October 2013

Received in revised form

3 July 2014

Accepted 4 July 2014

Available online 11 July 2014

Keywords:

Foodborne illness

Telephone survey

Simulation

Estimation

ABSTRACT

The national incidence of foodborne illness reported by public health surveillance systems is lower than the actual incidence due to underdiagnosis and underreporting. Therefore, it is necessary to estimate the actual cases of foodborne illness at a national level. This study used a simple method of polling and estimation that overcomes the problem of lack of data. A national survey of the experience, diagnosis with and/or treatment for, and/or hospitalization for foodborne illness among a representative sample in South Korea was conducted. The survey results were then used to estimate the actual incidence of foodborne disease using a simulation method that expressed the estimated values as 95% confidence intervals (CI) to address uncertainty. Among the 1439 respondents for whom valid data were collected, 19.18% had experienced, 3.13% had been diagnosed with and/or treated for, and 0.28% had been hospitalized for foodborne disease. Using these results, it was estimated that 9.59 (95% CI: 8.57–10.61) million individuals experience, 1.56 (95% CI: 1.11–2.01) million are diagnosed with and/or treated for, and 140,000 (95% CI: 30,000–280,000) are hospitalized for foodborne diseases annually in South Korea. The estimated number of patients hospitalized for foodborne disease is approximately 20 times higher than that of the number of reported cases in Ministry of Korean Food and Drug Safety, indicating that a large number of cases are unreported. Consideration of these results will be useful for the prevention and control of foodborne disease in South Korea and allow for international comparison of the incidence of foodborne illness.

© 2014 Elsevier Ltd. All rights reserved.

1. Introduction

As foodborne disease outbreaks occur throughout the world and affect many individuals, foodborne disease is a public health concern globally (Hall et al., 2005; Newell et al., 2010). Between 2008 and 2012, a total of 769 foodborne disease outbreaks affecting a mean of 6773 individuals per year were reported in South Korea (KMFDS, 2013). Between 2009 and 2010, a total of 1527 foodborne disease outbreaks were reported in the United States (CDC, 2013a). However, these figures only account for those cases that were identified and reported. Many cases of foodborne illness are not identified by public health surveillance systems because of underdiagnosis (i.e. cases for which medical care is not sought, that do

not undergo testing, or for which laboratory testing does not identify a causative agent) or underreporting (i.e. cases for which positive laboratory test results are obtained but not reported to surveillance systems) (MacDougall et al., 2008). Concerned with the extent of underdiagnosis and underreporting, Arendt et al. (2013) emphasized the importance of identifying the reasons healthcare consumers and professionals do not report foodborne illness. More specifically, Hall et al. (2005) asserted the need to provide more robust estimates of the level of underreporting for comparison with the true level in the community to adjust for underreporting when using surveillance data collected during outbreaks.

To overcome the limitations posed by underreporting or underdiagnosis, many researchers have attempted to accurately estimate the number of cases of foodborne illness at a national level (e.g. Adak, Long, & O'Brien, 2002; Arendt et al., 2013; Hall et al., 2005; Mead et al., 1999; Thomas et al., 2013). However, calculating these estimates can be challenging, given the large variability

* Corresponding author. Department of Food and Nutrition, Kunsan National University, 1170-Daehakro, Gunsan, Jeonbuk, 573-701, Republic of Korea. Tel.: +82 63 469 4640; fax: +82 63 466 2085.

E-mail address: bahk@kunsan.ac.kr (G.J. Bahk).

and uncertainty regarding the incidence of foodborne illnesses (Hall et al., 2005). However, estimating the incidence and understanding the causes of foodborne illness is necessary for not only establishing and implementing food safety policies but also determining the most effective food-risk management strategies (Woteki & Kineman, 2003), setting food safety priorities, and establishing public health policies (Thomas et al., 2013). Nevertheless, to our knowledge, there have been no attempts to accurately estimate the burden of common foodborne illness in South Korea.

The aim of this study was to estimate the incidence of foodborne illness in South Korea. To overcome the lack of data, a challenge faced by many other countries, we conducted a national telephone survey to collect data regarding the experience of foodborne illness among a representative sample of the South Korean population. Using the collected survey data, we then estimated the national incidence of the experience of, diagnosis and/or treatment for, and/or hospitalization for foodborne disease in South Korea using a simulation method while accounting for uncertainty in the estimate and compared our results with those obtained by analysis of the 2013 KMFDS data.

2. Methods

2.1. Study design and data collection

Data regarding foodborne illness were collected from a nationally representative telephone poll of 1439 people in South Korea conducted by Gallup Korea between August 12 and September 5, 2013. The sample was selected through random-digit dialing (RDD) using both landline and cell phone numbers. Respondents were weighted to match the population parameters of sex, age, and region of residence as reported in the Korea Population and Housing Census (KPHC, 2013).

2.2. Structured questionnaire and case definition

A structured questionnaire was designed to include 3 items that collected the required demographic data (i.e. sex, age, and region of residence; Table 1). These items were followed by items that collected data regarding whether the respondent had experienced, been diagnosed with and/or treated for, and/or been hospitalized for foodborne disease during the past year. These items were designed to obtain data rapidly, simply, and sequentially by provision of an affirmative ('yes') or negative ('no') answer (Table 2). If a respondent affirmed the presence of a child or children under 13 years of age in the household, a parent or guardian of the child or children was asked the number and ages of the children and whether any child had experienced, been diagnosed with and/or treated for, and/or hospitalized for foodborne disease during the past year. Foodborne illness can be defined as any form of infectious gastroenteritis caused by consumption of food, including food contaminated immediately prior to ingestion (Hall et al., 2005). Thus, a case of foodborne disease was defined as the development of symptoms such as diarrhea, vomiting, and abdominal pain after food consumption that could not be attributed to other factors, such as excessive alcohol consumption, drug therapies, and/or pregnancy.

2.3. Data analysis

Data analysis, including calculation of descriptive statistics, was performed using SPSS 12.0 (Data Solution Inc., Seoul, South Korea). The associations between variables were examined using the χ^2 test. Results that reached a p -value of less than 0.05 were

Table 1
Sociodemographic characteristics of the respondents ($n = 1439$).

Sociodemographic characteristics	Respondent	100 × Respondent/ Total	Illness	100 × Illness/ Respondent
Gender				
Male	717	49.8	159	22.2
Female	722	50.2	117	16.2
Age (years)				
<13 ^a	231	16.1	57	24.7
14–19	85	5.9	15	17.7
20–29	187	13.0	43	23.0
30–39	201	14.0	45	22.4
40–49	240	16.7	48	20.0
50–59	230	16.0	36	15.7
>60	265	18.4	32	12.1
Region				
Seoul	282	19.6	56	19.9
Busan	96	6.7	24	25.0
Daegu	69	4.8	11	16.0
Incheon	78	5.4	19	24.4
Gwangju	38	2.6	7	18.4
Daejeon	46	3.2	6	13.0
Ulsan	33	2.3	6	18.2
Gyeonggi	351	24.4	64	18.2
Gangwon	47	3.3	11	23.4
Chungbuk	44	3.1	7	15.9
Chunnam	58	4.0	10	17.2
Jeonbuk	51	3.5	1	2.0
Jeonnam	53	3.7	16	30.2
Gyeongbuk	78	5.4	10	12.8
Gyeongnam	98	6.8	22	22.5
Jeju	17	1.2	6	35.3
Total	1439	100.0	276	19.2

^a If a respondent affirmed the presence of a child or children under 13 years of age in the household, a parent or guardian was asked the number and ages of the children and whether any had experienced, been diagnosed with and/or treated for, and/or hospitalized for foodborne disease during the past year.

considered statistically significant. We calculated 95% confidence intervals (CI) for the proportion of respondents who experienced foodborne illness (Bluman, 2007, pp. 369–370).

3. Results

Among all the respondents surveyed, 1439 respondents provided valid data. As shown in Table 1, which presents the distribution of the sociodemographic characteristics of the study population, the sample consisted of 717 (49.8%) men and 722 (50.2%) women. Most individuals were aged over 60 years ($n = 265$, 18.4%), followed by those aged 13 years ($n = 231$, 16.1%) and those aged 40–49 (16.7%). The most common regions of residence were Seoul and Gyeonggi ($n = 282$, 19.6% and $n = 351$, 24.4%, respectively). Male patients had a significantly higher rate of foodborne illness than female patients did (22.2% vs. 16.2%; $p = 0.004$). In addition, age had a significant effect on the foodborne illness rate ($p = 0.006$). The highest rate of foodborne illness was noted among those aged less than 13 years (24.7%), while those aged more than 60 years had the lowest rate (12.1%). Regarding regional distribution, no significant differences in foodborne illness experience were found among the 16 regions ($p = 0.166$).

As shown in Table 2, most respondents ($n = 1163$, 80.82%) had not experienced a foodborne illness during the previous year. Of the 276 individuals (19.18%, 95% CI: 17.15%–21.21%) who had experienced symptoms of foodborne illness (i.e. foodborne gastroenteritis), such as diarrhoea, vomiting, and abdominal pain, in the previous year, 45 (3.13%, 95% CI: 2.23%–4.03%) had been diagnosed with and/or treated for foodborne disease, but only 4 (0.28%, 95% CI: 0.01%–0.55%) had been hospitalized for foodborne disease.

Download English Version:

<https://daneshyari.com/en/article/6391379>

Download Persian Version:

<https://daneshyari.com/article/6391379>

[Daneshyari.com](https://daneshyari.com)