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Address for correspondence: Naoto Takahashi, 3311-1 Yakushiji, Shimotsuke-shi, Tochigi-ken 329-0498, Japan; email: naoto-t@jichi.ac.jp

Social Network as Outbreak Investigation Tool

To the Editor: The recent article by Oh et al. (*1*) discussed the utility of email surveys for the investigation of outbreaks. After they have been created, digital surveys require less time to administer than paper-based or telephone surveys and can produce high-quality and timely data. During an outbreak in Illinois, we used email and a social networking site to distribute a link to a confidential Inquisit (www.millisecond.com) survey and compared characteristics of the groups that responded to each.

In December 2010, the Illinois Department of Public Health received a report of an outbreak of gastrointestinal illness among guests at a wedding reception. Health department staff converted a standard foodborne outbreak questionnaire to a digital format. The survey link was then distributed to guests by 2 methods: email from the reception hosts and the note function on the host's Facebook page. Facebook has 500 million active users, 50% of whom check their Facebook pages every day (*2*). The Facebook note function is a blogging feature through which users can publish content visible to linked friends.

A total of 14 persons responded to the email-distributed survey link and 41 to the Facebook-distributed survey link. For each survey, data quality was high and response rates for questions were >90%. Facebook respondents were younger than email respondents (mean ages 29.8 and 37.4 years, respectively). Information provided by Facebook respondents covered persons 11 months to 80 years of age and by email respondents 1–67 years of age. Parents were asked to complete surveys for any children unable to answer the questions independently. The Facebook-distributed survey had a higher percentage of male respondents (41.5%) than did the email-distributed survey (21.4%).

Facebook-distributed surveys were answered significantly faster than email-distributed surveys ($p<0.05$). The mean number of hours from distribution to response was 42.3 for the email survey and 8.7 for the Facebook survey. The Facebook survey link was distributed at 6:00 PM on a Thursday evening; 34 (82.9%) surveys were completed by 9:00 AM on Friday morning. On the basis of these responses, health department staff were able to identify the implicated foods the day after the questionnaires were distributed.

Distributing foodborne outbreak questionnaires through Facebook generated data that were complete and timely. Facebook-distributed surveys captured a wide range of respondent age groups and more male respondents than did email-distributed surveys. Previous studies of online survey response rates found rates to be significantly higher for women than for men (*3*). In addition to low cost and significantly improved survey response times, social networking distribution holds other advantages for health departments. Recall errors are reduced by distributing the survey to persons simultaneously and immediately. Posting of surveys through a health department's social networking accounts could also enable participation of persons for whom the health department does not have contact information. Given these advantages and the widespread use of social networking, use of these tools should be considered as an option for survey distribution during outbreak investigations.

Julia F. Howland and Craig Conover

Author affiliation: Illinois Department of Public Health, Chicago, Illinois, USA

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Address for correspondence: Julia F. Howland, Division of Infectious Diseases, Illinois Department of Public Health, 7th Floor, 122 S Michigan Ave, Chicago, IL 60602, USA; email: julia.howland@illinois.gov

Susceptibility of Health Care Students to Measles, Paris, France

To the Editor: A measles epidemic is currently occurring in several countries in Europe (*1*,*2*). Although most cases concern unvaccinated children and young adults, health care professionals (HCPs) are also affected. Cases occur mostly in unvaccinated persons, but also in those who have received a single dose of vaccine.

In France, the measles vaccine was introduced in the childhood-immunization schedule in 1983. Current guidelines recommend 2 doses: one at 12 months of age and the second between 13 and 24 months of age. For persons born after 1992, one catch-up dose is recommended (*3*). Coverage by ≥1 dose, by the age of 2 years, remained at 83%–87% during 1997–2005. The latest figures show a slight increase to 90% in 2007 (*4*).

The risk for measles in HCPs has been estimated as 13× higher than that for the general population (*5*) and is also higher among students (*6*). Vaccination against measles is recommended, not mandatory, for HCPs and health care students (HCSs) (medicine, nursing, and midwifery) who have no history of measles. The objective is to prevent transmission to a nonimmunized patient or another HCP, and from patients to susceptible HCPs. HCSs are in close and repeated contact with patients and therefore targeted by the recommendations. We conducted a cross-sectional survey in the university hospitals in Paris, France, to assess measles vaccination coverage in HCSs.

The sampling frame included 15 hospitals with an obstetrics department. All midwifery students were selected. Other students were selected through a multistage random sampling. Sampling units were selected at each stage by simple random sampling. We selected 10 hospitals at the first stage, 10 clinical wards by hospital at the second stage, and all nursing students and half the medical students by ward at the third stage. A total of 116 students were required from each profession to estimate 50% coverage with 10% precision.

Students gave oral informed consent. Information was collected by face-to-face interview. Vaccination-status was assessed from a document when available. Measles vaccination coverage was defined as the number of students with no history of measles who had received ≥1 dose of vaccine divided by the total number of students with no history of measles. The study was approved by the French Ethics Board and conducted from March 2009 through July 2009.

Of the 106 selected wards, 10 could not be included (clearance from the head of department was not given). Of the 488 selected students, 432 were enrolled in the study (participation rate 88.5%); 178 (41%) were medical students, 147 (34%) nursing students, and 107 (25%) midwifery students. A document confirming the student's vaccination status was available for 376 (87%) students; 38 (10.1%) had a history of measles (removed from analysis). Median age was 22 years (interquartile range 21–24 years); 74% were female. Measles vaccination was cited by 61.5% (95% confidence interval [CI] 50.0%–71.9%) as a recommended vaccination. Measles vaccination coverage was 79.3% (95% CI 71.0%–75.8%) for ≥1 dose and 49.6% (95% CI 40.3%–59.1%) for 2 doses (Table). When considering only the students' accounts (without written confirmation), 1- and 2-dose vaccination coverage was 93.3% (95% CI 88.0%–96.3%) and 83.6% (95% CI 68.0%–92.4%), respectively. In multivariate analysis, younger students (<22 years of age) were more likely to have had 1 dose than older students ($p \leq 0.001$).

In the context of measles epidemics affecting France, and considering that the World Health Organization recommends 95% coverage of the population with 2 doses of a measles vaccine, our study

Table. Age, gender ratio, and rates of measles vaccination coverage for health care students, Paris, France*

Characteristic	Medical students, n = 178	Nursing students, n = 147	Midwifery students, n = 107	Total, n = 432
Median age, y	23	22	22	22
Gender ratio, M:F	0.68	0.09	0.05	0.26
One dose, % (95% CI)	79.9 (67.1–88.6)	85.7 (67.1–88.6)	76.8 (63.1–86.5)	79.3 (71.0–85.8)
Two doses, % (95% CI)	46.3 (31.2–62.2)	66.9 (55.2–76.8)	55.7 (41.1–69.4)	49.6 (40.3–59.1)

*CI, confidence interval.