To investigate human exposure to live poultry and changes in risk perception and behavior after the April 2013 influenza A(H7N9) outbreak in China, we surveyed 2,504 urban residents in 5 cities and 1,227 rural residents in 4 provinces and found that perceived risk for influenza A(H7N9) was low. The highest rate of exposure to live poultry was reported in Guangzhou, where 47% of those surveyed reported visiting a live poultry market >1 times in the previous year. Most (77%) urban respondents reported that they visited live markets less often after influenza A(H7N9) cases were first identified in China in March 2013, but only 30% supported permanent closure of the markets to control the epidemic. In rural areas, 48% of respondents reported that they raised backyard poultry. Exposure to live commercial and private poultry is common in urban and rural China and remains a potential risk factor for human infection with novel influenza viruses.

Previously published studies have reported that most human infections appear to have occurred as a result of exposure to live poultry, particularly through visits to live poultry markets (LPMs) in urban areas (3,5–8). No published reports have detailed population exposure to live poultry and LPMs in influenza A(H7N9) virus–affected areas in China, and few data on live poultry exposure have been previously reported in areas in which the virus has not been detected (4,9,10). In addition, little information has been reported on how the population of China responded to the outbreak and the control measures that were implemented. To clarify responses to the influenza A(H7N9) outbreak in China, we investigated patterns in human exposure to live poultry in LPMs and at home, examined risk perception and behavioral responses in the population, and compared these parameters between urban and rural areas in China that were affected or unaffected by the virus.

Methods

Study Design

We collected information on human exposure to poultry, risk perception and psychological responses to the outbreak, preventive behaviors, and attitudes toward control measures, including closure of LPMs. We used 2 approaches to collect these data. In urban areas, we conducted telephone surveys because access to mobile telephones is high, making the approach feasible. In rural areas, where telephone accessibility is lower, we conducted door-to-door surveys.

We selected 5 large cities for our study to represent diverse levels of socioeconomic development and geographic location: Chengdu, Guangzhou, Shanghai, Shenyang, and Wuhan (Figure 1). Before our study, no laboratory-
confirmed human cases of influenza A(H7N9) had been reported in these cities except Shanghai; 1 environmental sample had tested positive for the virus in Guangzhou. In each city, we aimed to interview >500 adult residents (>18 years of age) who had been living there for >1 year. The telephone surveys were conducted by using a computer-assisted interviewing system, which enabled random generation of mobile telephone numbers and systematic data collection across each city. On each call, after the study was explained and verbal consent obtained, the respondent would be recruited into the study and asked to complete the survey. If a respondent were busy, a call would be made later, when the respondent was available to finish the questionnaire. Unanswered numbers were given 4 follow-up calls, made at different hours and on different days of the week, before being classified as invalid. The online Technical Appendix shows the survey used in English and Chinese (http://wwwnc.cdc.gov/EID/article/20/8/13-1821-Techapp1.pdf).

Although we had planned to use the same telephone survey approach in rural areas, a pilot study revealed it was not feasible because the survey would occur during the busy farming season, when residents would not be readily available by telephone. Instead, in rural areas we conducted door-to-door surveys. In mainland China, some cities/counties that are administrated as rural regional areas, such as towns in a county, and rural areas, such as villages in a town/county. The living conditions and lifestyle of residents in semiurban areas are similar to those of urban residents, whereas residents in rural areas live in a different environment, with low population density and a more self-sustainable life, mainly dependent on farming. We used convenience sampling to choose 4 counties from rural rather than semiurban areas. Rural sites were selected on the basis of the level of economic development (measured by gross domestic product per capita) and the overall incidence of infectious diseases in 2012. Given the tiers of administration levels in mainland China, including province, city, county, town, and village, we selected a city from each of the 4 provinces with mid-level gross domestic product per capita compared with other cities in the province and with an incidence of notifiable infectious diseases above the provincial average. Within each province, we then selected a rural county from each of the 4 cities areas. As a result, we chose Dawa County (Panjin city, Liaoning Province), Zijin County (Heyuan city, Guangdong Province), Nanzhang County (Xiangfan city, Hubei Province), and Pengxi County (Suining city, Sichuan Province).
After the initial selections, all towns within a county were stratified into high, middle, and low levels of socioeconomic status on the basis of census data (12–15), and 1 town was selected at random within each strata. Then, 2 villages were selected at random within each town, a convenience sample of 50 households was recruited in each village, and 1 adult in each household (≥18 years of age and resident in the village for ≥1 year) was interviewed. To improve cooperation, each rural interviewee received a small gift worth ≈10 Chinese renminbi (6.1 renminbi = $1 US), such as a towel or a bottle of shampoo, after the survey was completed. All selected participants in the rural areas consented to be interviewed during the survey. The time taken to complete the survey was 16 minutes on average for each participant.

The urban surveys were conducted in May and June 2013 and the rural surveys in July and August 2013. Ethical approval was obtained from the Institutional Review Board of the Chinese Center for Disease Control and Prevention before the survey was conducted.

Survey Instrument

All surveys in urban and rural areas were conducted by using the same questionnaire, which was based on an instrument used during the outbreaks of severe acute respiratory syndrome (SARS) in 2003 (16,17) and influenza A(H1N1)pdm09 in 2009 (18). The survey instrument was pretested for face and content validity, length, and comprehensibility. Most answers were ranked on ordinal Likert scales. We used the State Trait Anxiety Inventory to measure the general level of anxiety in the population (16–18).

We investigated exposure to live poultry in backyards and in LPMs, which are defined as markets where the public can buy live chickens, ducks, pigeons, and other birds. Because LPMs are rare in rural areas and rural residents seldom visit LPMs, we did not ask rural respondents about exposures to live poultry in LPMs, only about backyard poultry exposure. In urban areas, we asked respondents about frequency of visits to LPMs and behaviors in LPMs (i.e., frequency of purchases, practice of picking up birds before purchasing, location where purchased live poultry were slaughtered). We asked all respondents about perception of risk for influenza A(H7N9) infection and perceived severity of such an infection, preventive practices in general and specifically in response to influenza A(H7N9), and attitudes toward influenza A(H7N9) and closure of LPMs.

Statistical Analysis

Statistical analyses were conducted in R version 2.13.0 (R Foundation for Statistical Computing, Vienna, Austria). We performed descriptive analyses of responses in each location and compared responses between urban areas with and without laboratory-confirmed cases of influenza A(H7N9) by using χ2 tests. For the subset of respondents who reported purchasing live poultry in LPMs during the previous year, we used a multivariate logistic regression model to estimate the associations of age, sex, educational level, and geographic location with attitudes toward closure of LPMs and changes in habits of buying live poultry after public health authorities announced the first human influenza A(H7N9) case on March 31, 2013 (19). The sample size of 500 respondents in each city and 300 respondents in each rural county was chosen to ensure precision of answers to within ±4% and ±6%, respectively, and to ensure reasonable statistical power to identify differences in responses of 5%–10% or more between locations.

Figure 2. Flow charts for recruitment of participants for telephone surveys and face-to-face interviews to determine human exposure to live poultry and attitudes and behavior toward influenza A(H7N9) in China, 2013. A) Flowchart for telephone surveys conducted in 5 urban areas: Chengdu (capital of Sichuan Province), Guangzhou (capital of Guangdong Province), Shanghai municipality, Shenyang (capital of Liaoning Province), and Wuhan (capital of Hubei Province). B) Flowchart for face-to-face interviews conducted in 3 rural areas: Dawo county (Panjin city, Liaoning Province), Zijin county (Heyuan city, Guangdong Province), Nanzhang county (Xiangfan city, Hubei Province), and Pengxi county (Suining city, Sichuan Province). CATI, computer-assisted telephone interview; SES, socioeconomic status.
Results

In the 5 urban areas, 81,266 unique telephone numbers were dialed, and the overall response rate was 8% (number of participants [2,504] divided by number of calls with eligible respondents [29,919]) (Figure 2, panel A). The selection of 1,227 participants in 4 rural sites is illustrated in Figure 2, panel B. The surveys were conducted from May 23 through August 24. During this period, the influenza A(H7N9) epidemic had passed its peak, and few cases occurred. Guangdong Province notified its first human influenza A(H7N9) case on August 9, after the completion of the survey in Guangzhou on June 26.

Respondents in urban areas tended to have white-collar jobs or were unemployed, were younger, had more education and higher income, and were less likely to be married than those in rural areas (Table 1). However, because the surveys were conducted in different forms in urban versus rural areas and the general characteristics of participants were different, including the risk for becoming infected with influenza A(H7N9) virus and the types of potential exposure to avian influenza viruses, we did not make any further direct quantitative comparisons between urban and rural respondents. For comparisons among urban areas, respondents were generally similar, but reported incomes were higher for Shanghai and Guangzhou than for the other 3 cities (data not shown).

We assessed exposures to live poultry and visits to LPMs in the 5 cities. In total, 33% of respondents reported visiting LPMs during the preceding year, the highest proportion in Guangzhou; notable differences were found between cities (Table 2). By imputing midpoints of reported purchasing rates, we estimated that the mean number of live poultry purchased per year varied between cities: 6.8 for Shenyang, 19 for Shanghai, 28 for Chengdu, and 47 for Guangzhou. Age-specific patterns in exposure to live poultry were generally similar for men and women within each city, with some exceptions. In Guangzhou, women 35–54 years of age purchased poultry in LPMs much more frequently than did men of the same age, but the reverse was true for those ≥65 years of age (Figure 3). We found no evidence of a substantial difference in poultry exposures by sex in Shanghai (Figure 3).

We further analyzed exposures in LPMs among urban residents on the basis of responses from the 829 (33%) of

Table 1. Sociodemographic characteristics of participants recruited for urban and rural surveys of influenza A(H7N9) awareness, China, 2013*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Urban, n = 2,504</th>
<th>Rural, n = 1,227</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male sex</td>
<td>1,288 (51.4)</td>
<td>626 (51.0)</td>
</tr>
<tr>
<td>Age group, y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–44</td>
<td>1,938 (77.5)</td>
<td>685 (55.8)</td>
</tr>
<tr>
<td>45–64</td>
<td>415 (16.6)</td>
<td>405 (33.0)</td>
</tr>
<tr>
<td>≥65</td>
<td>147 (5.9)</td>
<td>137 (11.2)</td>
</tr>
<tr>
<td>Educational attainment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No formal education</td>
<td>38 (1.5)</td>
<td>86 (7.0)</td>
</tr>
<tr>
<td>Primary school</td>
<td>191 (7.6)</td>
<td>259 (21.1)</td>
</tr>
<tr>
<td>Middle school</td>
<td>391 (15.6)</td>
<td>464 (37.9)</td>
</tr>
<tr>
<td>High school</td>
<td>593 (23.7)</td>
<td>268 (21.9)</td>
</tr>
<tr>
<td>College and above</td>
<td>1,291 (51.6)</td>
<td>148 (12.1)</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service workers and shop sales workers</td>
<td>601 (24.0)</td>
<td>164 (13.4)</td>
</tr>
<tr>
<td>Professionals</td>
<td>504 (20.1)</td>
<td>66 (5.4)</td>
</tr>
<tr>
<td>Retired</td>
<td>293 (11.7)</td>
<td>61 (5.0)</td>
</tr>
<tr>
<td>Unemployed</td>
<td>678 (27.1)</td>
<td>195 (15.9)</td>
</tr>
<tr>
<td>Full-time students</td>
<td>232 (9.3)</td>
<td>111 (9.0)</td>
</tr>
<tr>
<td>Homemakers</td>
<td>96 (3.8)</td>
<td>86 (7.0)</td>
</tr>
<tr>
<td>Agricultural and fishery workers</td>
<td>100 (4.0)</td>
<td>544 (44.3)</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>941 (38.1)</td>
<td>269 (22.0)</td>
</tr>
<tr>
<td>Married</td>
<td>1,458 (59.0)</td>
<td>923 (75.4)</td>
</tr>
<tr>
<td>Divorced/separated</td>
<td>35 (1.4)</td>
<td>12 (1.0)</td>
</tr>
<tr>
<td>Widowed</td>
<td>36 (1.5)</td>
<td>20 (1.6)</td>
</tr>
<tr>
<td>Average household income, in renminbi*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No income</td>
<td>65 (3.0)</td>
<td>83 (6.8)</td>
</tr>
<tr>
<td>&lt;3,000</td>
<td>368 (17.0)</td>
<td>748 (61.2)</td>
</tr>
<tr>
<td>3,001–6,000</td>
<td>627 (28.9)</td>
<td>264 (21.6)</td>
</tr>
<tr>
<td>6,001–10,000</td>
<td>408 (18.8)</td>
<td>80 (6.5)</td>
</tr>
<tr>
<td>10,001–50,000</td>
<td>396 (18.2)</td>
<td>28 (2.3)</td>
</tr>
<tr>
<td>Not sure</td>
<td>307 (14.1)</td>
<td>20 (1.6)</td>
</tr>
<tr>
<td>Recent history of travel away from home</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>479 (19.1)</td>
<td>117 (9.6)</td>
</tr>
</tbody>
</table>

*6.1 Chinese renminbi = $1 US.
2,504 participants who visited LPMs ≥1 time in the preceding year. Overall, 69% of these respondents reported that they always visited the nearest LPM; median distance from home to the nearest LPM was 1 km. Most respondents reported that they “usually” or “always” picked up poultry for examination before deciding to buy, with the highest proportion in Chengdu and lowest in Shenyang; 87% of respondents always arranged for slaughter of purchased poultry in the LPM, with no notable differences between cities.

During the study period, the general anxiety level among urban respondents (measured by the State Trait Anxiety Inventory) was low to moderate, but levels varied substantially between cities; the lowest mean scores were in Wuhan and Shenyang (Table 3). Perceived risk for influenza A(H7N9) in the following month (absolute susceptibility) and relative to others (relative susceptibility) were generally low in all cities, but highest in Shanghai. Respondents in Shanghai and Guangzhou were more likely to respond that they would be more worried than usual if they experienced an influenza-like illness (ILI). Twelve percent of respondents reported that they had worried about becoming ill with influenza A(H7N9) during the previous week; levels varied among cities, with a greater frequency of worry in Shanghai and Guangzhou (Table 3). Respondents in Shenyang reported the highest perceived severity of influenza A(H7N9) compared with seasonal influenza and avian influenza A(H5N1); respondents in Guangzhou reported the highest perceived severity of influenza A(H7N9) compared with that of SARS (Table 3).

In rural areas, as in urban areas, the mean State Trait Anxiety Inventory was low to moderate (Table 4). A total of 48% of respondents reported that they raised ≥1 type of poultry on their farms. Finally, we asked of respondents in Shanghai because Shanghai was the only area where LPMs were closed at the time of the survey. Respondents who reported that market closure caused great/some inconvenience were categorized as “More inconvenient.” This question was only asked of respondents in Shanghai because Shanghai was the only area where LPMs were closed at the time of the survey.
Human Exposure to Live Poultry and Responses to Influenza

poultry at home. Overall, 47% reported raising chickens, 15% raised ducks, and 8% raised geese; these proportions varied between counties (Table 4). In rural areas, levels of perceived absolute and relative susceptibility and concern about ILI or confirmed influenza A(H7N9) infection were generally low; some differences were seen between the 4 rural areas. Respondents in Nanzhang and Zijin were more likely to respond that they would be more worried than usual if they had an ILI; 24% of respondents in Zijin reported that they had worried about becoming ill with influenza A(H7N9) in the previous week, and the average level of worry in Zijin was higher than that for other counties (Table 4). Most respondents in each area perceived influenza A(H7N9) to be more severe than seasonal influenza but less severe than influenza A(H5N1) and SARS.

Among respondents in urban areas who visited LPMs ≥1 time in the preceding year, 77% reported that they had stopped buying or bought lower amounts of live poultry since March 2013; this proportion was highest (91%) for Shanghai (Table 2). We examined factors affecting the likelihood of supporting the closure of LPMs and found greater support among persons 55–64 years of age (odds ratio [OR] 3.28, 95% CI 1.71–6.29) and ≥65 years of age (OR 2.36, 95% CI 1.04–5.32). We also found greater support for closure of LPMs in Shanghai (OR 1.77, 95% CI 1.05–2.99) than in Chengdu but no significant differences by sex or educational attainment (Table 5). However, 32% of respondents in Shanghai reported that the closure of LPMs had caused them inconvenience.

Discussion

We have reported empirical information on human exposures to live poultry, perception of risk for influenza A(H7N9), and behavioral responses to the 2013 influenza A(H7N9) outbreak in China. We found that exposure to LPMs in urban areas is common: 20%–50% of urban residents report >1 visit to an LPM in the preceding year (Table 2). We examined factors affecting the likelihood of changing habits of buying live poultry and found greater changes among women, those with higher educational attainment, and those residing in Shanghai and Wuhan rather than in Chengdu. We found no statistically significant differences by age group (Table 5).

On average, across the 5 cities, 30% of respondents reported that they would support the closure of LPMs to control the epidemic; the proportion in support of closures was highest in Shanghai (39%) and lowest in Guangzhou (27%) and Chengdu (25%) (Table 2). We examined factors affecting the likelihood of supporting the closure of LPMs and found greater support among persons 55–64 years of age (odds ratio [OR] 3.28, 95% CI 1.71–6.29) and ≥65 years of age (OR 2.36, 95% CI 1.04–5.32). We also found greater support for closure of LPMs in Shanghai (OR 1.77, 95% CI 1.05–2.99) than in Chengdu but no significant differences by sex or educational attainment (Table 5). However, 32% of respondents in Shanghai reported that the closure of LPMs had caused them inconvenience.
virus in certain LPMs (6), whereas official surveillance data from the Ministry of Agriculture identified the virus in only a small proportion of samples collected from across the country (of 4,488 samples tested, 0.9% were positive for the virus) (11). The absolute risk for human infection after close contact with poultry infected with the influenza A(H7N9) virus remains unclear.

We found that men in the 55–64-year age group had more exposures to live poultry than women in that age group, but no difference by sex among the small number of respondents ≥65 years of age in Shanghai (Figure 3). We had previously hypothesized that exposure to poultry in LPMs might be higher for older men than for older women (3). Our findings suggest that the higher risk for laboratory-confirmed influenza A(H7N9) virus infection among men during the spring 2013 outbreak in the Yangtze River Delta might not be explained by sex differences in exposure but rather by increased susceptibility to serious disease after infection among men (e.g., because of greater prevalence of co-existing conditions) or by increased access to health care and laboratory testing for men. However, our sample size was relatively small, particularly for respondents ≥65 years of age. As in a previous report of live poultry exposures in the southern China cities of Guangzhou in 2006 and Shenzhen in 2007 (9), we did not identify major differences in exposures among middle-aged adults compared with exposures among the elderly. However, most laboratory-confirmed influenza A(H7N9) cases have been in persons ≥60 years of age (3), consistent with our hypothesis that exposures in middle-aged adults may have led to milder disease that was less likely to result in laboratory testing (3,9).

A minority of respondents reported willingness to accept LPM closures in the event of future outbreaks of influenza A(H7N9). During the winter 2013–14 influenza season, in some areas where human cases of influenza A(H7N9) had been reported, local governments implemented short-term LPM closures; other administrations, including that of Shanghai, closed LPMs for longer periods. However, such interventions can have serious economic consequences. Given the lack of public support for LPM closure and the related economic concerns, whether
to make additional closures should be considered carefully. Regular rest days (i.e., days on which live poultry are not sold and stalls must be disinfected and left empty of live birds) and bans on overnight retention of live poultry in markets have been successful in controlling the transmission of avian influenza viruses in LPMs in Hong Kong (20,21) and have been proposed in some areas of China (8).

Although almost all cases of influenza A(H7N9) cases have been identified in areas within or surrounding large cities, about half of the laboratory-confirmed avian influenza A(H5N1) cases in China were identified in rural residents, which indicates that avian influenza viruses can reach backyard poultry flocks and pose a risk to human health (3). Influenza A(H7N9) virus does not appear to have spread to backyard flocks at this time, however. Most confirmed human cases have occurred in urban areas among persons who have reported recent exposure to live poultry in LPMs, although a smaller number of cases occurred in persons who have reported recent exposure to backyard poultry (3). However, if the circulation of influenza A(H7N9) virus in backyard poultry were to increase, the number of potential exposures could be substantial because almost half of rural residents report raising backyard poultry (23). However, if the circulation of influenza A(H7N9) virus in backyard poultry were to increase, the number of potential exposures could be substantial because almost half of rural residents report raising backyard poultry (23). However, if the circulation of influenza A(H7N9) virus in backyard poultry were to increase, the number of potential exposures could be substantial because almost half of rural residents report raising backyard poultry (23). However, if the circulation of influenza A(H7N9) virus in backyard poultry were to increase, the number of potential exposures could be substantial because almost half of rural residents report raising backyard poultry (23). However, if the circulation of influenza A(H7N9) virus in backyard poultry were to increase, the number of potential exposures could be substantial because almost half of rural residents report raising backyard poultry (23). However, if the circulation of influenza A(H7N9) virus in backyard poultry were to increase, the number of potential exposures could be substantial because almost half of rural residents report raising backyard poultry (23). However, if the circulation of influenza A(H7N9) virus in backyard poultry were to increase, the number of potential exposures could be substantial because almost half of rural residents report raising backyard poultry (23). However, if the circulation of influenza A(H7N9) virus in backyard poultry were to increase, the number of potential exposures could be substantial because almost half of rural residents report raising backyard poultry (23). However, if the circulation of influenza A(H7N9) virus in backyard poultry were to increase, the number of potential exposures could be substantial because almost half of rural residents report raising backyard poultry (23). However, if the circulation of influenza A(H7N9) virus in backyard poultry were to increase, the number of potential exposures could be substantial because almost half of rural residents report raising backyard poultry (23).

### Table 4. Risk perception related to influenza A(H7N9) and backyard poultry exposure among participants recruited for surveys in rural areas, by area, China, 2013*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Dawa, n = 310</th>
<th>Zijn, n = 308</th>
<th>Nanzhang, n = 308</th>
<th>Pengxi, n = 301</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean STAI scores (95% CI)</td>
<td>1.52 (1.47–1.57)</td>
<td>1.85 (1.80–1.90)</td>
<td>1.66 (1.62–1.70)</td>
<td>1.54 (1.48–1.61)</td>
<td>&lt;0.001††</td>
</tr>
<tr>
<td>Self-perceived susceptibility to influenza A(H7N9)‡</td>
<td>Higher</td>
<td>2 (0.6)</td>
<td>1 (0.3)</td>
<td>1 (0.3)</td>
<td>9 (3.0)</td>
</tr>
<tr>
<td></td>
<td>Even</td>
<td>29 (9.4)</td>
<td>41 (13.3)</td>
<td>21 (6.8)</td>
<td>31 (10.3)</td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td>279 (90.0)</td>
<td>266 (86.4)</td>
<td>286 (92.9)</td>
<td>261 (86.7)</td>
</tr>
<tr>
<td>Perceived susceptibility to influenza A(H7N9) compared with others§</td>
<td>Higher</td>
<td>0</td>
<td>1 (0.3)</td>
<td>2 (0.6)</td>
<td>8 (2.7)</td>
</tr>
<tr>
<td></td>
<td>Even</td>
<td>10 (3.2)</td>
<td>25 (8.1)</td>
<td>3 (1.0)</td>
<td>36 (12.0)</td>
</tr>
<tr>
<td></td>
<td>Lower</td>
<td>300 (96.8)</td>
<td>282 (91.6)</td>
<td>303 (98.4)</td>
<td>257 (85.4)</td>
</tr>
<tr>
<td>Worry induced by ILI symptoms¶</td>
<td>More</td>
<td>69 (22.3)</td>
<td>79 (25.6)</td>
<td>118 (38.4)</td>
<td>49 (16.3)</td>
</tr>
<tr>
<td></td>
<td>Same as usual</td>
<td>73 (23.5)</td>
<td>113 (36.7)</td>
<td>118 (38.4)</td>
<td>113 (37.5)</td>
</tr>
<tr>
<td></td>
<td>Less</td>
<td>168 (54.2)</td>
<td>116 (37.7)</td>
<td>71 (23.1)</td>
<td>139 (46.2)</td>
</tr>
<tr>
<td>Infection with influenza A(H7N9) in next week#</td>
<td>Worry</td>
<td>32 (10.3)</td>
<td>75 (24.4)</td>
<td>71 (23.1)</td>
<td>51 (16.9)</td>
</tr>
<tr>
<td></td>
<td>Think about it but no worry</td>
<td>51 (16.5)</td>
<td>42 (13.7)</td>
<td>20 (6.5)</td>
<td>33 (11.0)</td>
</tr>
<tr>
<td></td>
<td>Never think about it</td>
<td>227 (73.2)</td>
<td>190 (61.9)</td>
<td>217 (70.5)</td>
<td>217 (72.1)</td>
</tr>
<tr>
<td>Severity of influenza A(H7N9) compared with**</td>
<td>Seasonal influenza</td>
<td>201 (64.8)</td>
<td>181 (58.8)</td>
<td>224 (72.7)</td>
<td>182 (60.5)</td>
</tr>
<tr>
<td></td>
<td>Avian influenza A(H5N1)</td>
<td>105 (33.9)</td>
<td>112 (36.4)</td>
<td>67 (21.8)</td>
<td>92 (30.6)</td>
</tr>
<tr>
<td></td>
<td>SARS</td>
<td>51 (16.5)</td>
<td>63 (20.5)</td>
<td>30 (9.7)</td>
<td>44 (14.6)</td>
</tr>
<tr>
<td>Distance, km ††</td>
<td>482</td>
<td>2448</td>
<td>351</td>
<td>665</td>
<td></td>
</tr>
<tr>
<td>Raising backyard poultry</td>
<td>141 (45.5)</td>
<td>135 (43.8)</td>
<td>166 (53.9)</td>
<td>168 (49.7)</td>
<td>0.067</td>
</tr>
<tr>
<td>Type of backyard poultry raised</td>
<td>Chicken</td>
<td>120 (38.7)</td>
<td>134 (43.5)</td>
<td>162 (52.6)</td>
<td>161 (53.5)</td>
</tr>
<tr>
<td></td>
<td>Ducks</td>
<td>49 (15.8)</td>
<td>45 (14.6)</td>
<td>20 (6.5)</td>
<td>65 (21.6)</td>
</tr>
<tr>
<td></td>
<td>Geese</td>
<td>34 (11.0)</td>
<td>17 (5.5)</td>
<td>2 (0.6)</td>
<td>43 (14.3)</td>
</tr>
<tr>
<td>Median no. live poultry raised</td>
<td>6</td>
<td>20</td>
<td>13</td>
<td>12</td>
<td>&lt;0.001††</td>
</tr>
</tbody>
</table>

*Values are no. (%) persons except as indicated. STAI, State Trait Anxiety Inventory; ILI, influenza-like illness; SARS, severe acute respiratory syndrome.
†Differences between groups were examined with the Kruskal-Wallis Test (assuming nonhomogeneous variances).
‡Respondents who answered certain/very likely/likely to the question “How likely do you think it is that you will contract H7N9 avian flu over the next 1 month?” were categorized as “High”; those who answered never/very unlikely/unlikely were categorized as “Low.”
§Respondents who answered certain/much more/more to the question “What do you think is your chance of getting infected with H7N9 avian flu over the next month?” were categorized as “High”; those who answered never at all/much less/less were categorized as “Low.”
¶Respondents who answered extremely concerned/concerned much more than normal/concerned more than normal to the question “If you were to develop ILI symptoms tomorrow, would you be...?” were categorized as “More”; those who answered not at all all/much less less than normal/concerned less than normal were categorized as “Less.”
#Respondents who answered worried about it all the time/worried a lot/worried a bit to the question “Did you worry about H7N9 in the past week?” were categorized as “Worry.”
**Respondents who answered much higher/a little higher regarding the severity of influenza A(H7N9) compared with seasonal influenza, avian influenza A(H5N1), and SARS.
††Distance between the survey location and the nearest area in which influenza A(H7N9) case(s) were reported.

Human Exposure to Live Poultry and Responses to Influenza
Table 5. Factors associated with attitudes and behavior toward influenza A(H7N9) among survey respondents from urban areas who had visited a live poultry market during the previous year, China, 2013*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Support closure of LPMs</th>
<th>Change purchase behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>Referent</td>
<td>Referent</td>
</tr>
<tr>
<td>F</td>
<td>1.19 (0.84–1.68)</td>
<td>2.42 (1.61–3.63)</td>
</tr>
<tr>
<td>Age group, y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18–24</td>
<td>0.73 (0.37–1.45)</td>
<td>0.70 (0.36–1.36)</td>
</tr>
<tr>
<td>25–34</td>
<td>1.36 (0.85–2.17)</td>
<td>0.81 (0.49–1.34)</td>
</tr>
<tr>
<td>35–44</td>
<td>Referent</td>
<td>Referent</td>
</tr>
<tr>
<td>45–54</td>
<td>1.43 (0.72–2.83)</td>
<td>0.62 (0.3–1.26)</td>
</tr>
<tr>
<td>55–64</td>
<td>3.28 (1.71–6.29)</td>
<td>0.86 (0.39–1.9)</td>
</tr>
<tr>
<td>&gt;65</td>
<td>2.36 (1.04–5.32)</td>
<td>1.42 (0.51–3.97)</td>
</tr>
<tr>
<td>Educational attainment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary or below</td>
<td>Referent</td>
<td>Referent</td>
</tr>
<tr>
<td>Secondary</td>
<td>1.80 (0.92–3.50)</td>
<td>1.95 (1.01–3.76)</td>
</tr>
<tr>
<td>Tertiary or above</td>
<td>1.78 (0.90–3.53)</td>
<td>1.79 (0.91–3.51)</td>
</tr>
<tr>
<td>Urban sites</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chengdu</td>
<td>Referent</td>
<td>Referent</td>
</tr>
<tr>
<td>Guangzhou</td>
<td>1.13 (0.69–1.85)</td>
<td>0.99 (0.62–1.60)</td>
</tr>
<tr>
<td>Shanghai</td>
<td>1.77 (1.05–2.99)</td>
<td>4.89 (2.42–9.89)</td>
</tr>
<tr>
<td>Shenyang</td>
<td>1.40 (0.74–2.64)</td>
<td>1.95 (0.97–3.95)</td>
</tr>
<tr>
<td>Wuhan</td>
<td>1.07 (0.62–1.86)</td>
<td>2.05 (1.15–3.65)</td>
</tr>
</tbody>
</table>

*Odds ratios were estimated by adjustment for all variables shown. Boldface indicates significance (p<0.05).

difficulties for policy measures such as closure of LPMs. Indeed, we found generally low levels of public support for long-term closure of LPMs (Table 2), particularly in cities that had not been affected by influenza A(H7N9). Respondents in Guangzhou and Shanghai reported higher likelihood than residents of other cities that they would be worried if they showed signs and symptoms of IILI. This finding is unsurprising for Shanghai, but there had been no confirmed influenza A(H7N9) cases in Guangzhou at the time of our survey.

Our study has several limitations. First, the cross-sectional study design did not enable us to identify changes over time in risk perception or preventive behaviors. Having access to data on live poultry exposures before the identification of influenza A(H7N9) virus infections would have been helpful because the epidemic may have led to changes in exposure patterns by the time our survey was conducted. Second, because the survey was conducted by telephone in urban areas and face-to-face in rural areas, our results may have been affected by selection bias. We did attempt multiple calls to un answered telephone numbers in an attempt to mitigate this bias, but the overall response rate for the telephone survey was low. Also, because the respondents self-reported their behaviors, the results might be affected by response biases (e.g., if respondents had incomplete recollection of past visits to LPMs). In particular, results could have been affected by social desirability bias if respondents felt uncomfortable reporting true patterns of poultry exposure or attitudes toward government interventions and preferred to report what they perceived to be ideal or most acceptable.

Third, our analyses did not explore in depth the social or psychological factors underlying behavioral responses to influenza A(H7N9), such as the effect of perceived risk or severity. This area might be productive for further investigation. Fourth, similar to other cross-sectional knowledge–attitude–behavior studies, our survey could only provide descriptive data on live poultry exposure, risk perception, and behavioral changes. Inferences on the associations between different psychosocial factors will require further study. Furthermore, we did not investigate seasonal variation in poultry-purchasing behaviors, which could also be studied in longitudinal surveys.

In conclusion, exposures to live poultry are common in many areas of China. If influenza A(H7N9) virus were to become more prevalent among poultry, the number of human exposures could be substantial in the absence of control measures. Our findings highlight possible problems in the structure of the live poultry trade in China and the potential for improved protection of human and animal health (8,24).

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L.W., B.J.C., P.W., G.M.L., and H.Y. designed the study; L.W., J.Y., F.L., and L.Z. collected data; and L.W., B.J.C., P.W., and J.Y. analyzed data. L.W. and B.J.C. wrote the first draft of this article, and all authors contributed to review and revision of the report.

Dr Wang is a director of the Branch of General Affairs on Infectious Disease, Division of Infectious Disease, Key Laboratory of Surveillance and Early-warning on Infectious Disease, Chinese Center for Disease Control and Prevention. Her research interests include notifiable infectious diseases surveillance and related policy research.
References


Human exposure to Live Poultry and Psychological and Behavioral Responses to Influenza A(H7N9), China

Technical Appendix

The following pages contain English and Chinese language versions of the questionnaire used for the telephone survey conducted in 5 cities in China to determine human exposure to poultry, risk perception, and psychological responses to influenza A(H7N9) outbreaks, preventive behaviors, and attitudes toward control measures, including closure of live poultry measures. At least 500 adult residents (age ≥18y) who had been living in the city for at least 1 year were interviewed. The telephone surveys were conducted using a Computer-Assisted Telephone Interviewing system, which enabled random generation of mobile telephone numbers and systematic data collection across each city. After explaining the study and obtaining verbal consent from respondents, they were recruited as study subjects and asked to complete the survey. If the respondents were busy at the time, a telephone call would be made later when the respondents were available to finish the questionnaire. Unanswered numbers were given 4 more follow-up calls, made at different hours and days of the week, before being classified as invalid.
H7N9 Avian Flu Survey in China

Version 1.0

Greetings: Hello, This is a national Tele-survey, conducted by Chinese Center for Disease Control and Prevention. We are collecting H7N9 Avian Flu-related information, which will be very important for the H7N9 control in China. It will take you around 10 minutes. Thank you for your cooperation, which will be highly appreciated.

SG1. Where do you live? *(Don’t ask, could be recorded automatically.)
① Beijing ② Shanghai
③ Shenyang ④ Wuhan
④ Guangzhou ⑤ Chengdu
⑥ Dizha County, Panjin City ⑦ Nanhuang County, Xiangyang City
⑧ Pengsi County, Saining City ⑨ Zijin County, Heyuan City

SG2. How many years do you live here: ______ (excluded, if reside less than 1 year)

SG3. Gender *(Don’t ask if obvious, must record)
① Female ② Male

SG4. What is your age?
   a) *(required) ______ years old
   b) ① 18-24 ② 25-34
      ③ 55-64 ④ 55-64
      ⑤ 65 or above
      ⑥ Refused

SG5. What is your occupation? *(required)
① Retired ② No job, unemployed, seeking job
③ Full-time students ④ Home makers
⑤ Professionals ⑥ Service workers and shop sales workers
⑦ Health care worker ⑧ Skilled agricultural and fishery workers; and occupations not classified
⑨ Businessman selling live poultry or meat
⑩ Others

Part 1 Self-Rated Health

PH1. How do you perceive your health in the past 1 week?
① Excellent ② Very good
③ Good ④ Fair
⑤ Poor

中国城市和农村人感染 H7N9 禽流感调查问卷

2013年5月24日 第1.14稿

开头语：您好，这里是疾病控制中心正在实施的全国性电话调查，以下问题将占用您约10分钟的时间，请问您的个人意见对我国H7N9疫情的防控非常重要，谢谢您的配合！

（副本）开头语：嗨，先生/女士您好，我姓***，我是北京益行市场咨询有限公司的访问员，我们受国家疾病控制中心的委托进行一项全国性的调查，想了解公众对于H7N9禽流感的认知，我只会占用您几分钟时间，请您放心。您的电话号码是由我们通过电脑随机抽中的，您提供的资料将绝对保密，并只会用作综合分析。为保障数据的准确性，我们的访问将被录音，但只用作内部参考，并会在短期内销毁。

（访问员注意：如被访者对这次访问有任何疑问或查询，您可以拨打热线电话：****，或010-58900548，与有关专家联系）。

请问现在我们可以开始访问吗？可以，即开始；不可以，则结束。

SG1. 请问您是居住在XX吗？*(不必提问，CAT1自动记录)
① 北京 ② 上海
③ 沈阳 ④ 武汉
⑤ 广州 ⑥ 成都
⑦ 辽宁盘锦市大洼县 ⑧ 湖北襄阳市南漳县
⑨ 四川遂宁市蓬溪县 ⑩ 广东河源市紫金县

SG2. 请问您在本地居住________年（少于1年则不填入调查条件）

SG2a. 您目前的居住状态：
① 与家人同住 ② 不与家人同住

SG3. 性别 *(如果已经很明显，不需再问，但请记录下来)
① 男性  ② 女性

请自动生成调查时间及访问员姓名，并纳入数据库
SM1. Have you had any of the following signs or symptoms in the past 2 weeks?

- Fever ≥37.8°C (100°F) for 1 day or more
- Cough

SM2. If you had fever in the last 2 weeks (SM1a=yes), when did the fever start?
- (dd-mm-yyyy)
- Don’t know

AX1. A number of statements which people have used to describe themselves are given below; please tell me how you feel to the statements right now:

- I feel rested
- I feel content
- I feel comfortable
- I am relaxed
- I feel pleasant
- I feel anxious
- I feel nervous
- I am jittery
- I feel “high strung”
- I feel over-excited

Not at all
Sometimes
Moderately So
Very Much So

SMG. Your age?

- ① 18-24
- ② 25-34
- ③ 35-44
- ④ 45-54
- ⑤ 55-64
- ⑥ 65 or older
- Don't know

SGS. Your occupation?

- ① Retired
- ② Full-time student
- ③ Professional
- ④ Medical personnel
- ⑤ Farmer
- ⑥ Other

Part 2 Exposure to live poultry markets (Only for the urban cities; go to EM7 directly for Beijing respondents)

EM1. How often did you go to live poultry markets in last year?

- Live poultry markets mean the markets where public could buy the live chicken, ducks and pigeons, etc.
- ① 1-2/year
- ② 3-5/year
- ③ 6-11/year
- ④ 1-3/month
- ⑤ 1-2/week
- ⑥ 3-5/week
- ⑦ Almost every day

PH1. Please rate the current level of your worry towards H7N9 avian flu, 1 being very mild, 10 being very severe (1 = Very Mild, 10 = Very Severe): ______.

AX1. 下面是10个反映自我感觉的方面，请分别回答最能表达您目前感觉的答案:

- 完全没有
- 有些
- 中等程度
- 非常明显

<table>
<thead>
<tr>
<th>完全没有</th>
<th>有些</th>
<th>中等程度</th>
<th>非常明显</th>
</tr>
</thead>
<tbody>
<tr>
<td>①</td>
<td>②</td>
<td>③</td>
<td>④</td>
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<td>①</td>
<td>②</td>
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<td>②</td>
<td>③</td>
<td>④</td>
</tr>
</tbody>
</table>

Page 3 of 10
易激动
j. 我感到过于激动和慌张

BF4b. 如果可以用1-10分来表达您对H7N9禽流感的担心程度，1表示很少担心，10表示非常担心，您目前担心程度是______分。

第二部分：活禽市场暴露情况（城市和农村调查内容不同）

（以下内容针对沈阳、北京、武汉、成都、上海和广州城市居民，其中北京居民直接跳到EM7题）

EM1. 在过去一年中，您多久去一次活禽市场？
（活禽市场：主要是指公众去购买活禽活鸡等的市场）
① 每年1-2次
② 每年3-5次
③ 每年6-11次
④ 每月1-3次
⑤ 每周1-2次
⑥ 每周3-5次
⑦ 几乎每天
⑧ 不去（如果选择⑧，直接跳至第三部分）

EM1a. 您最近一次去活禽市场的时间是：____月____日（或者____天以前）

EM1b. 您最近一次去的活禽市场距离您家有多远？_______公里

EM1c. 您总是去距离最近的活禽市场吗？
① 是 ② 不一定，您常去的活禽市场距离您家多远？_______公里

EM2. 一年里平均在活禽市场购买多少活禽？
① 每年1-2只
② 每年3-5只
③ 每年6-11只
④ 每月1-3只
⑤ 每周1-2只
⑥ 每周3-5只
⑦ 基本每月1只
⑧ 没买过（如果选择⑧，直接跳至第三部分）

EM3. 在决定购买活禽前，您会自己挑选接触活禽吗？
① 总是
② 有时
③ 从不

EM4. 当您购买活禽后，会去哪里进行宰杀？
① 一直在活禽市场
② 通常在活禽市场
EM7. Has the closure of LPMs caused you any inconvenience in your life? (Only ask the respondents from Beijing/Shanghai that has closed the markets)
① Great inconvenience ② Some inconvenience ③ Inconvenience a bit ④ No inconvenience ⑤ No inconvenience at all

Raising the backyard poultry at home (Only for the 4 rural cities)
EM8. Do you raise backyard poultry in the past year?
① Yes
② No (go to Part 3)

EM8.1. What type of backyard poultry do you raise at home? (Multiple choice questions)
① Chicken ② Ducks ③ Geese ④ Others

EM8.2 How many backyard poultry do you have? (Including chicken, ducks, geese and others in total?)

Part 3 Health Services Utilization
HS1. Have you used any of the following health services in the past 2 weeks?
Yes  No
a. Hospital (including 24-hour clinics/A&E services) ☐  ☐
   □  ☐  ☐
   Self treatment (Drug/acupuncture) ☐  ☐
   □  ☐  ☐

Part 4 Contacts with Flu Cases
The following questions refer to the past 2 weeks:
CT1. Has anyone in your household had any flu symptoms in the past 2 weeks (e.g. fever, runny nose, cough, sore throat)?
① Yes, me (may include others); please specify the ages of the members (oldest first): __________
② Yes, others but not me (please specify the ages of the members (oldest first): __________
③ No (go to Part 5 perception on H7N9 avian flu)

CT2. If yes, as a result of this did you personally take any preventive measures?
Yes  No  Don't know
a. Wash hands more frequently ☐  ☐  ☐

EM5. 2013年3月底国家公布首次人感染H7N9禽流感病例以来，您家购买活禽的生活习惯是否有变?
① 一直在家中宰杀 ② 宰杀地点变 ③ 其他地方

EM6. 为了控制H7N9禽流感疫情而永久关闭活禽市场，您如何看待?
① 坚决支持 ② 支持 ③ 不支持 ④ 坚决反对 ⑤ 无所谓

EM7. 关闭活禽市场对您的日常生活带来不便吗？（仅询问北京、上海的市民）
① 极不方便 ② 有些不便 ③ 稍微有点不便 ④ 几乎没有不方便 ⑤ 完全没有不方便

(以下内容仅针对4个县的农村居民)
EM8. 在过去一年中，您家饲养鸡/鸭/鹅吗？
① 是  ② 否（直接跳至第三部分）

EM8.1 您家饲养的畜禽是？  ① 鸡  ② 鸭  ③ 鹅  ④ 其他

EM8.2 总共饲养多少只（含鸡/鸭/鹅/其它）？

下面将问您医疗服务使用的问题。

第三部分 医疗服务利用
b. Wear face mask
   Yes  No  Don't know
   ①  ②  ③

CT3. As a result of this did the sick family member take any preventive measures?
   a. Wash hands more frequently
      Yes  No  Don't know
      ①  ②  ③
   b. Wear face mask
      Yes  No  Don't know
      ①  ②  ③
   c. Isolation
      Yes  No  Don’t know
      ①  ②  ③

CT4. How many days, after the onset of the first flu symptom, did the sick family member (include you if you are sick) seek medical advice?

<table>
<thead>
<tr>
<th>Sick family members (oldest first)</th>
<th>Self</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Additional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Did not seek medical advice</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Don’t know</td>
<td></td>
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</tbody>
</table>

Part 5 Perception on H7N9 Flu

BF1. How likely do you think it is that you will contract H7N9 avian flu over the next 1 month?
   ① Never
   ② Unlikely
   ③ Likely
   ④ Certain

BF2a. What do you think are your chances of getting H7N9 avian flu over the next 1 month compared to other people outside your family of a similar age?
   ① Not at all
   ② Much less
   ③ Less
   ④ More
   ⑤ Certain

BF3. Do you think H7N9 avian flu is spread by:
   a. Droplets
      Yes  No  Don’t know
      ①  ②  ③
   b. Air
      Yes  No  Don’t know
      ①  ②  ③
   c. Direct hand contact (e.g. via handshake)
      Yes  No  Don’t know
      ①  ②  ③
   d. Indirect hand contact (e.g. via doorknob)
      Yes  No  Don’t know
      ①  ②  ③
   e. Oral-faecal
      Yes  No  Don’t know
      ①  ②  ③
   f. Cold weather
      Yes  No  Don’t know
      ①  ②  ③
   g. The air over long distances
      Yes  No  Don’t know
      ①  ②  ③

CT1. 过去2周内，您家中有没有人出现流感症状（例如：发烧、咳嗽、流涕、咽痛）？(仅问与家庭同住者)
   ① 有，是我（可包括其他家庭成员）(跳至CT2)
   请填写出现流感症状者的年龄（年龄由大到小顺序）：__________
   ② 有，是其他家庭成员（跳至CT2）
   请填写出现流感症状者的年龄（年龄由大到小顺序）：__________
   ③ 没有（直接跳至第五部分，对H7N9禽流感的的认知）

CT1a. 过去2周内，您有没有出现过流感症状（例如：发烧、咳嗽、流涕、咽痛）？(仅问与家庭同住者)
   ① 有（跳至CT2，仅问CT2）
   ② 没有（直接跳至第五部分，对H7N9禽流感的的认知）

CT2. 您是否采取了以下个人防护措施？
   a. 频繁洗手
      是  否  不记得
      ①  ②  ③
   b. 戴口罩
      是  否  不记得
      ①  ②  ③
   c. 自我隔离
      是  否  不记得
      ①  ②  ③
   d. 自行服用中药
      是  否  不记得
      ①  ②  ③

CT3. 出现流感症状的同行是否采取了以下个人防护措施？
   a. 频繁洗手
      是  否  不记得
      ①  ②  ③
   b. 戴口罩
      是  否  不记得
      ①  ②  ③
   c. 自我隔离
      是  否  不记得
      ①  ②  ③
   d. 自行服用中药
      是  否  不记得
      ①  ②  ③

CT4. 自出现流感症状当天算起，您或您的家人是在多长时间后去就诊的？(按照年龄顺序排列)

<table>
<thead>
<tr>
<th>患病家庭成员</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>其他成员</th>
</tr>
</thead>
<tbody>
<tr>
<td>(年龄由大到小排列)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>没去就诊</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>发病到就诊的间隔（天）</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>不记得</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

第五部分对H7N9禽流感认知

BF1. 您认为在接下来的1个月内，自己患上H7N9禽流感的可能性多大？
   ① 根本不可能       ② 很不可能
   ③ 不可能             ④ 说不定
   ⑤ 可能                ⑥ 很可能

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<table>
<thead>
<tr>
<th>BF4a. If you were to develop flu-like symptoms tomorrow, would you be</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Not at all worried</td>
</tr>
<tr>
<td>2. Much less worried than normal</td>
</tr>
<tr>
<td>3. Worried less than normal</td>
</tr>
<tr>
<td>4. About same</td>
</tr>
<tr>
<td>5. Worried more than normal</td>
</tr>
<tr>
<td>6. Worried much more than normal</td>
</tr>
<tr>
<td>7. Extremely worried</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BF4b. In the past one week, have you ever worried about catching H7N9 avian flu?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No, never think about it</td>
</tr>
<tr>
<td>2. Think about it but it doesn't worry me</td>
</tr>
<tr>
<td>3. Worries me a bit</td>
</tr>
<tr>
<td>4. Worries me a lot</td>
</tr>
<tr>
<td>5. Worry about it all the time</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BF5a. How does H7N9 avian flu compare with seasonal flu in terms of seriousness?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Much higher</td>
</tr>
<tr>
<td>2. A little higher</td>
</tr>
<tr>
<td>3. Same</td>
</tr>
<tr>
<td>4. A little lower</td>
</tr>
<tr>
<td>5. Much lower</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BF5b. How does H7N9 avian flu compare with H5N1 avian flu in terms of seriousness?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Much higher</td>
</tr>
<tr>
<td>2. A little higher</td>
</tr>
<tr>
<td>3. Same</td>
</tr>
<tr>
<td>4. A little lower</td>
</tr>
<tr>
<td>5. Much lower</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BF6. If you were to develop flu-like symptoms tomorrow, where would you seek medical consultation? (can choose 1 item or more)</th>
</tr>
</thead>
<tbody>
<tr>
<td>① Public clinics/A&amp;E department consulting Western medical doctors</td>
</tr>
<tr>
<td>② Public clinics/A&amp;E department consulting Traditional Chinese medicine</td>
</tr>
<tr>
<td>③ Self-treatment</td>
</tr>
<tr>
<td>④ Telephone to a medical professional, such as 12320 hot-line</td>
</tr>
<tr>
<td>⑤ Internet</td>
</tr>
<tr>
<td>⑥ Others (please specify): __________</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BF3. You believe H7N9 influenza is transmitted through which means? Please answer separately.</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Fly</td>
</tr>
<tr>
<td>b. Air</td>
</tr>
<tr>
<td>c. Direct contact with infected people (e.g.,握手)</td>
</tr>
<tr>
<td>d. Indirect contact with infected people (e.g.,门把手)</td>
</tr>
<tr>
<td>e. Oral infection</td>
</tr>
<tr>
<td>f. Airborne transmission</td>
</tr>
<tr>
<td>g. Person-to-person infection</td>
</tr>
<tr>
<td>h. Contact with H7N9 influenza virus contaminated objects</td>
</tr>
<tr>
<td>i. Contact with live poultry</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BF4. If you experience symptoms of influenza (e.g., fever, cough, sore throat), what will you do?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Completely no concern</td>
</tr>
<tr>
<td>2. Somewhat concern</td>
</tr>
<tr>
<td>3. Very much concern</td>
</tr>
<tr>
<td>4. Somewhat more concern</td>
</tr>
<tr>
<td>5. Very much more concern</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BF4a. Over the past week, have you ever worried about catching H7N9 influenza?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No, never think about it</td>
</tr>
<tr>
<td>2. Think about it but it doesn't worry me</td>
</tr>
<tr>
<td>3. Worries me a bit</td>
</tr>
<tr>
<td>4. Worries me a lot</td>
</tr>
<tr>
<td>5. Worry about it all the time</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BF5a. Compared to ordinary influenza, how do you believe H7N9 influenza severity is?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Very severe</td>
</tr>
<tr>
<td>2. Somewhat severe</td>
</tr>
<tr>
<td>3. A little severe</td>
</tr>
<tr>
<td>4. Not severe</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BF5b. Compared to H5N1 influenza, how do you believe H7N9 influenza severity is?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Very severe</td>
</tr>
<tr>
<td>2. Somewhat severe</td>
</tr>
<tr>
<td>3. A little severe</td>
</tr>
<tr>
<td>4. Not severe</td>
</tr>
</tbody>
</table>
BF7. How would you evaluate the current performance of the national government in controlling H7N9 avian flu?
Effectiveness of prevention measures: _____ (0=extremely poor, 5=moderate, 10=excellent)

BF7a. How would you evaluate the current performance of the provincial/city government in controlling H7N9 avian flu?
Effectiveness of prevention measures: _____ (0=extremely poor, 5=moderate, 10=excellent)

Part 6 Preventive Measures
PM1. Did you receive flu vaccine in the past 3 years?
① Yes  ② No  ③ Don’t know
The following questions refer to the past 3 days:
PM2. Did you cover your mouth when you sneeze or cough?
① Always  ② Usually  ③ Sometimes  ④ Never  ⑤ Don’t know
PM3. Did you wash your hands after sneezing, coughing or touching nose?
① Always  ② Usually  ③ Sometimes  ④ Never  ⑤ Don’t know
PM3a. Did you wash your hands after returning home?
① Always  ② Usually  ③ Sometimes  ④ Never  ⑤ Don’t know
PM4. Did you use liquid soap when washing your hands?
① Always  ② Usually  ③ Sometimes  ④ Never  ⑤ Don’t know
PM5. Did you wear face mask?
① Always  ② Usually  ③ Sometimes  ④ Never (go to PM6)  ⑤ Don’t know (go to PM6)
PM5d. The reason(s) of your wearing mask: * (can choose 1 item or more)

BF5c. 与非典（SARS）相比，您认为 H7N9 禽流感严重程度是？
① 严重很多  ② 一般  ③ 差不多  ④ 较轻微  ⑤ 轻微很多  ⑥ 不知道
BF6. 如果这三天您突然出现了流感症状（例如：发烧、咳嗽、流涕、咽痛）您可能会（可多选）?
① 去医院就医  ② 去诊所或社区医院  ③ 去私人诊所就医  ④ 自我医学、如服中药、理疗等
⑤ 打专业热线电话咨询，例如：12320 热线  ⑥ 上网查询有关信息
⑦ 其他（请注明）：

BF7. 对国家目前防控 H7N9 禽流感的成效，用 0-10 分进行评价，您会给出______分（0 代表极差，5 代表中等，10 代表非常棒）

BF7a. 对本地目前防控 H7N9 禽流感的成效，用 0-10 分进行评价，您会给出______分（0 代表极差，5 代表中等，10 代表非常棒）

下面还有几个问题，我们的访问就会结束。

第六部分 预防措施
PM1. 过去 3 年中您曾接种过流感疫苗吗?
① 有  ② 没有  ③ 不记得
请注意：以下问题是针对过去 3 天的；
PM2. 过去 3 天内，您打喷嚏或咳嗽时是否有遮掩的动作?
① 总是  ② 通常  ③ 有时  ④ 从不  ⑤ 不记得（无打喷嚏或咳嗽）
PM3. 过去 3 天内，您有搓鼻涕、咳嗽和打喷嚏后是否洗手?
① 总是  ② 通常  ③ 有时  ④ 从不  ⑤ 不记得（无搓鼻涕、咳嗽或打喷嚏）
PM3a. 过去 3 天内，您外出回家后是否马上洗手?
PM6. Did you use serving utensils when dining with others?
① Always ② Usually ③ Sometimes ④ Never ⑤ Don’t know

PM7. In the past 7 days did you: (please answer directly with "yes" or "no"). Note: If answered "yes", interviewer should immediately inquiry whether it is because of H7N9 flu.

- a. avoid eating out?
  Yes, due to H7N9 flu ① Yes, but not due to H7N9 flu ② No ③ Don’t know
- b. avoid using public transport?
  ① ② ③ ④
- c. avoid going to crowded places?
  ① ② ③ ④
- d. keep good indoor ventilation?
  ① ② ③ ④
- e. reschedule travel plan?
  ① ② ③ ④
- f. clean or disinfect house more often?
  ① ② ③ ④

PM8. If free H7N9 flu vaccine is available in the coming month, would you consider receiving it?
① Yes ② No ③ Not sure ④ Don’t know

Part 7 Demographics

SG6. What is your marital status?
① Single ② Married ③ Divorced/separated ④ Widowed ⑤ Refuse to answer

SG7. How many people live in your household, including yourself and domestic help(s)? ___

SG8. What is your education level?
① primary school and illiteracy ② Middle school ③ High school ④ College and above

SG9. Do you or your family members have the hobbies to raise chicken, duck or homing pigeon in your home?
① Yes ② No

PM4. ① 总是 ② 通常 ③ 有时 ④ 从不 ⑤ 不记得了 ⑥ 不适用（无外出）

PM5. ① 总是 ② 通常 ③ 有时 ④ 从不（跳到 PM6） ⑤ 不记得了

PM5d. 您戴口罩的原因是（可多选）？
① 保护自己 ② 保护他人 ③ 安全感 ④ 其他人戴，所以我也要戴

PM6. ① 通常 ② 从不（跳到 PM6）

PM5d. 您戴口罩的原因是（可多选）？

PM7. 如果政府下个月为市民免费接种 H7N9 禽流感疫苗，您是否考虑接种？
① 是 ② 否 ③ 不一定 ④ 不知道

下面我将再了解您的一点个人情况，我们的访问就结束了。
SG10. 上个月您是否离开本地去其它的城市/省份？（根据访问的不同城市分别设置题面）

a) 是
b) 如果选“是”，最近一次的目的地: ________________ (国内到地市，国外到国家)

c) 您何时返回: __月__日 (或者 __天以前)

SG14. Would it be possible to contact you again in a few weeks for a follow-up survey?

a) Yes
b) No

c) It depends

SG3. 请问您贵姓（中文）： ___________ 先生/女士