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Increasing seasonal influenza vaccination among high risk groups in China: Do community healthcare workers have a role to play?

Ying Song^{a,*}, Tao Zhang^b, Liling Chen^c, Bo Yi^d, Xiaoning Hao^e, Suizan Zhou^a, Ran Zhang^a, Carolyn Greene^{a,1}

^aCenters for Disease Control and Prevention, Atlanta, GA, USA

^bSchool of Public Health, Fudan University, Shanghai, China

^cSuzhou Center for Disease Prevention and Control, Suzhou, Jiangsu Province, China

^dNingbo Center for Disease Prevention and Control, Ningbo, Zhejiang Province, China

^eHealth Development Research Center of the National Health and Family Planning Commission, Beijing, China

Abstract

Background: Seasonal influenza vaccine uptake in China is low. This study aims to assess the role of community healthcare workers (HCWs) in increasing vaccination among high risk groups in China.

Methods: We analyzed data from four knowledge, attitude and practice (KAP) studies on seasonal influenza vaccination in China targeting guardians of young children, pregnant women, adults aged ≥ 60 years, and HCWs from 2012 to 2014.

Results: Thirty-one percent of pregnant women and 78% adults aged ≥ 60 years reported willingness to follow HCWs' recommendations for influenza vaccination. Guardians were more likely to vaccinate their children if they received HCWs' recommendations (35% vs. 17%, $p < 0.001$). Community HCWs were more likely to recommend seasonal influenza vaccination than hospital HCWs (58% vs. 28%, $p < 0.001$).

Conclusion: Study results suggest the value of incorporating community HCWs' recommendation for seasonal influenza vaccination into existing primary public health programs to increase vaccination coverage among high risk groups in China.

*Corresponding author at: United States Centers for Disease Control and Prevention Influenza Program China, Suite 601, Dongwai Diplomatic Office, 23 Dongzhimenwai Dajie, Beijing 100600, China. kei2@cdc.gov, songying@cn.cdc.gov (Y. Song).

¹ These authors contributed equally to this work.

Authors' contribution

Ying SONG, Suizan ZHOU, Tao ZHANG, Liling CHEN, Bo Yi, and Xiaoning HAO conceived of and designed the studies; Tao ZHANG, Liling CHEN, Bo Yi, and Xiaoning HAO coordinated the studies, assisted in data collection, and analyzed the data; Ying SONG and Carolyn Greene wrote the draft of the manuscript; Suizhan ZHOU and Ran Zhan helped revise drafts of the manuscript. All authors have seen and approved the final manuscript, and have contributed significantly to the work.

Conflict of interest

None.

Keywords

Seasonal influenza vaccine; Vaccination; Healthcare worker; Community; KAP

1. Introduction

The World Health Organization and the Chinese Center for Disease Prevention and Control recommend seasonal influenza vaccine for groups at high risk for severe illness and complications from influenza infection, including pregnant women, young children, older adults and adults with chronic diseases [1,2]. In China, vaccine uptake within these groups remains low [3–5]. Numerous factors contribute to low coverage. First, the seasonal influenza vaccine is not included in the national Expanded Program on Immunization (EPI) [6], but is available upon request, most often at cost (10–15 USD). Second, misconceptions about influenza risk and vaccine safety and efficacy are common [7–9]. While inadequate supply may contribute to low vaccine uptake in other countries, in China, from 2004 to 2009, an average of 25% of influenza vaccine was returned to manufacturers unused [10].

While studies in developed countries have shown that HCWs' recommendations promote seasonal influenza vaccination [11–13], few studies have addressed the HCW's role with respect to vaccination in China [14]. HCWs' willingness to recommend vaccination in China may be influenced by reports of patient mistrust, and patient-on-doctor violence [15,16]. Within this context, our study assessed whether community HCWs, who provide primary public health services [17], have a role in increasing influenza vaccine coverage among high risk groups in China.

2. Methods

From 2012 to 2014, the United States (US) Centers for Disease Control and Prevention supported four knowledge, attitude and practice (KAP) studies on influenza infection and vaccination in China. We analyzed vaccination coverage, factors influencing influenza vaccination, preferred sources for information, whether HCWs recommended vaccination, and willingness to follow HCWs' recommendations.

From October 2012 to January 2013, we conducted two cross-sectional surveys in Suzhou among guardians of children aged 6 months to 3 years at three vaccination clinics, and pregnant women at four prenatal clinics. Trained staff conducted face-to-face interviews using structured questionnaires.

In December 2014, we conducted a cross-sectional survey among adults aged 60 years at three senior centers in Ningbo. Participants completed self-administered questionnaires, with support from trained study staff.

In November 2013 and May 2014, we conducted two cross-sectional surveys among HCWs in Qingdao, recruiting all HCWs providing direct patient care on investigation days at 10 healthcare institutions. We defined two groups: community HCWs were those who worked at community health centers providing primary health services. Hospital HCWs were those

who worked at secondary and tertiary hospitals and focused on curative medicine. Enrolled HCWs completed self-administered questionnaires.

3. Ethics statement

Fudan University, Suzhou CDC, Ningbo CDC and the Health Development Research Center received local IRB approval for their site's survey. All survey participants provided verbal consent.

4. Results

4.1. KAP among guardians of children aged 6 months to 3 years

Among responding guardians, 86/323 (27%) reported receiving a HCW's recommendation for influenza vaccination and 70/317 (22%) reported that their child was vaccinated in the prior year. Guardians who reported receiving a HCW recommendation were more likely to vaccinate their child than those who did not (35% vs. 17%, $p < 0.001$). The main reported reasons for not vaccinating their child were concerns for vaccine safety (62%), not receiving a HCW's recommendation (37%); believing vaccination was unnecessary (25%), and limited vaccine effectiveness (23%). Reported preferences for information about vaccines included television (64%), internet (57%) and educational leaflets (51%).

4.2. KAP among pregnant women

Among 1673 pregnant women interviewed, 4% reported receiving a HCW recommendation for influenza vaccination in the prior year. None reported receiving the vaccine during pregnancy, and none planned to get vaccinated in the current year. The most common reasons reported for not getting vaccinated included fear of harm to the fetus (83%), vaccine safety for the pregnant woman herself (28%), and believing vaccination was unnecessary (22%). Preferred sources for vaccine information included television (56%), internet (39%), and doctors (34%). Nearly one third (31%) stated they would get vaccinated if they received a HCW's recommendation.

4.3. KAP among adults aged >60 years

Among 379 adults aged 60 years interviewed, 0.8% reported receiving the influenza vaccine in the prior year. The most common reasons for not getting vaccinated among those who responded ($n = 268$) were vaccination was unnecessary (33%), medical insurance did not pay for influenza vaccination (24%), and HCWs had not recommended vaccination (23%). Among all interviewed, 78% (296/379) reported willingness to get vaccinated if they received a HCW's recommendation. Most (280/379, 74%) reported a preference for receiving health information from HCWs.

4.4. KAP among HCWs

Among 1852 HCWs approached, 1301 (70%) completed both surveys; among these, 17% were community HCWs.

Post-influenza season, 5% HCWs reported receiving influenza vaccination during the prior season. Main reasons for not getting vaccinated included concerns about vaccine safety (43%), perceiving vaccination as unnecessary (27%), having insufficient time for vaccination (24%), and believing the vaccine was ineffective (20%).

HCWs wanted to learn more about influenza disease severity (68%), populations most susceptible to influenza illness (52%), vaccine contraindications (72%), safety (72%) and effectiveness (71%). Preferred sources of information on vaccines included internet (76%), television/radio (75%), newspapers/books (55%), and colleagues (50%).

Among all 1301 HCWs, 8% reported always recommending influenza vaccination to patients during the prior influenza season. Community HCWs were more likely to be vaccinated than hospital HCWs ($P < 0.01$) (Fig. 1), and were also more likely to recommend vaccination to patients at least once in the prior season (58% vs. 28%, $P < 0.001$).

Seasonal influenza vaccination coverage and factors influencing vaccination among high risk groups and healthcare workers are summarized in Table 1.

5. Discussion

5.1. High risk groups in China cited similar reasons for not getting vaccinated for seasonal influenza, and all had suboptimal influenza vaccination coverage

A common barrier to vaccination was concern about vaccine safety. Another common barrier was perceiving vaccination as unnecessary (22–33%); 23% guardians also cited low vaccine effectiveness as a barrier. These findings, in addition to the low seasonal influenza vaccine coverage among children less than 3 years of age and adults aged 60 years, are consistent with prior studies conducted in China [4,5,7–9]. We also found minimal coverage among HCWs (5%) and none among pregnant women.

5.2. High risk groups reported willingness to follow HCWs' advice for vaccination, and HCWs' recommendations were associated with increased coverage

More than a third of pregnant women and three quarters of adults aged 60 years reported wanting to receive information from HCWs regarding vaccination. Further, 31% pregnant women and 78% adults aged 60 years stated they would get vaccinated if a HCW recommended vaccination. Similarly, 37% guardians listed not receiving a HCW's recommendation as a main barrier to vaccination, and guardians who received a HCW recommendation were more likely to vaccinate their child. These findings are consistent with studies in the US and China [11–14,18], in which high risk groups expressed trust in their physician, whose recommendation was a strong determinant of influenza immunization uptake.

5.3. Community HCWs may offer a practical way to increase seasonal influenza vaccine uptake among high risk groups in China

Only 8% HCWs in Qingdao reported always recommending influenza vaccination, and only 4% pregnant women and 27% guardians of young children reported receiving a HCW's recommendation for influenza vaccination in the prior year.

Several factors may prevent HCWs in China from routinely recommending influenza vaccination. First, in our study, HCWs themselves were not vaccinated due to concerns about vaccine safety, effectiveness, and perceiving vaccination as unnecessary. HCWs may also avoid recommending optional vaccines not included in EPI, such as influenza vaccine, to decrease risk of being held liable for adverse events.

Most HCWs, however, expressed interest in learning about vaccine contraindications, safety and effectiveness. As one Australian study found, improving HCWs' knowledge in influenza infection and vaccination may increase the likelihood of their recommending influenza vaccine [19].

China's health system may impact which HCWs are more likely to incorporate vaccine recommendations into their routine work. Community HCWs provide primary healthcare, disease prevention and health education, which target pregnant women, young children, older adults and adults with chronic diseases residing in the community [17]. Influenza vaccination services are usually offered at EPI clinics, which, in China, are most often located in community health centers. Therefore, when high risk groups receive recommendations from community HCWs, they have immediate access to on-site immunization. Although most HCWs in China do not routinely recommend seasonal influenza vaccination, we found that community HCWs were more likely than hospital HCWs to recommend vaccination and to get vaccinated themselves. These findings are consistent with studies conducted in the US and Australia [19,20].

6. Limitations

Our studies have several limitations. First, the convenient samples of high risk groups surveyed may not adequately represent these populations in the community. Second, vaccination status was self-reported and not verified through records. Finally, this study discusses just one component of what should become a multi-pronged strategy to increase seasonal influenza vaccination.

7. Recommendations

Our results suggest the utility of the following steps: (1) providing community HCWs with accurate information about influenza infection and seasonal influenza vaccination to ensure the knowledge required to make effective recommendations; (2) promoting annual influenza vaccination among community HCWs themselves; and (3) incorporating community HCWs' recommendation for seasonal influenza vaccination into existing immunization, maternal healthcare, and chronic disease management programs in China.

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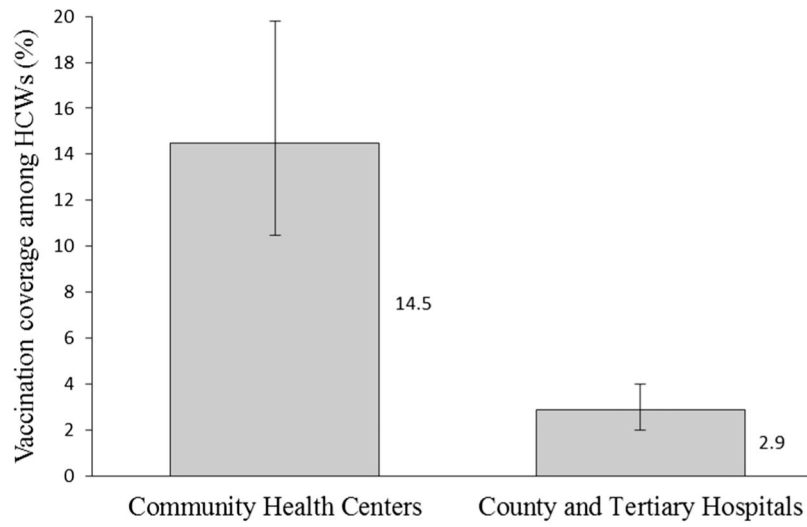


Fig. 1. Proportion of healthcare workers vaccinated for seasonal influenza by hospital level, Qingdao, 2013–14 influenza season.

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Table 1

Summary of seasonal influenza vaccination coverage and factors influencing seasonal influenza vaccination among four target populations: guardians of young children, pregnant women, adults aged 60 years and older and healthcare workers – China 2011–2014.

Seasonal influenza vaccination factor	Guardians of children aged 6 months to 3 years n = 360	Pregnant women n = 1673	Adults 60 years of age n = 379	Healthcare workers n = 1301
Received seasonal influenza vaccine in past year	22% (children vaccinated) (95% CI: 18–27%)	0 (95% CI: < 0.2%)	0.8% (95% CI: 0.3–2.3%)	5% (95% CI: 4–6%)
Received HCW ^a recommendation for seasonal influenza vaccination in past year	27% (95% CI: 23–32%)	4% (95% CI: 2.8–4.6%)	Not asked	Not asked
Reported willingness to get vaccinated if HCW recommended vaccine	Not asked	31% (95% CI: 29–33%)	78% (95% CI: 74–82%)	N/A
Main barriers to vaccination reported ^b	(1) Vaccine safety (62%) (2) No HCW recommendation (37%) (3) Vaccination not necessary (25%) (4) Limited vaccine effectiveness (23%)	(1) Harm to fetus (83%) (2) Vaccine safety for pregnant women (28%) (3) Vaccination not necessary (22%)	(1) Vaccination not necessary (33%) (2) Medical insurance does not cover influenza vaccine (24%) (3) No HCW recommendation (23%) (4) Vaccine safety (22%)	(1) Vaccine safety (43%) (2) Vaccination not necessary (27%) (3) No time for vaccination (24%) (4) Limited vaccine effectiveness (20%)
Preferred resources for receiving vaccine information	(1) TV (64%) (2) Internet (57%) (3) Educational leaflets (51%)	(1) TV (56%) (2) Internet (39%) (3) HCWs (34%)	(1) HCWs (74%) (2) Community health lecture (41%) (3) TV/Radio (24%) (4) Friends/Family member (24%)	(1) Internet (76%) (2) TV/Radio (75%) (3) Newspapers/books (55%) (4) Colleagues (50%)

^aHCW – Healthcare worker.

^bCost and poor access were listed as options for main barriers to vaccination in the surveys to guardians, adults aged 60 years and older and HCWs, however only adults 60 years and older listed cost as one of the main barriers to vaccination. In 2014, the average cost of the seasonal influenza vaccine in China was 10–15 USD. Cost and access were not included as options in the vaccine barrier question to pregnant women.