

A study on the factors associated with hospital staffs’ influenza at a university hospital in Japan

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- Shimane University Hospital is a tertiary referral university hospital with 600 beds.
- The hospital personnel have some opportunity that flu vaccine is inoculated for one month until December that seasonal flu is in prevalent.

Objective: The seasonal flu infection of the hospital personnel can cause the influenza hospital infection. When the hospital personnel has influenza, a period not to work by the reason of influenza occurs. This study was intended to search for the matter which could be involved more to reduce the influenza infection staff.

Methods: We enrolled hospital employees participating in the hospital program for seasonal influenza vaccination and distributed a questionnaire to them. A questionnaire survey was performed for four years, 2014 fiscal year (FY) to 2017 FY. In this study, "2017" refers to the period from September 2016 to August 2017. The following items were included: the ages of respondents, whether they lived with children aged <15 years, their preseason vaccination status, and their history of seasonal influenza infection. The source of infection for respondents who contracted influenza was also assessed. The number of vaccinated personnel was determined by the number of injected ampoules. Data were analyzed for each influenza season.

Results:

- The number of subjects who were vaccinated and the number of vaccine inoculated are shown in Table 1.
- Annual number of respondents has been gradually increasing, 1111 reports in 2014 and 1683 reports in 2017, and total number of reports was 5891. (Table 1)

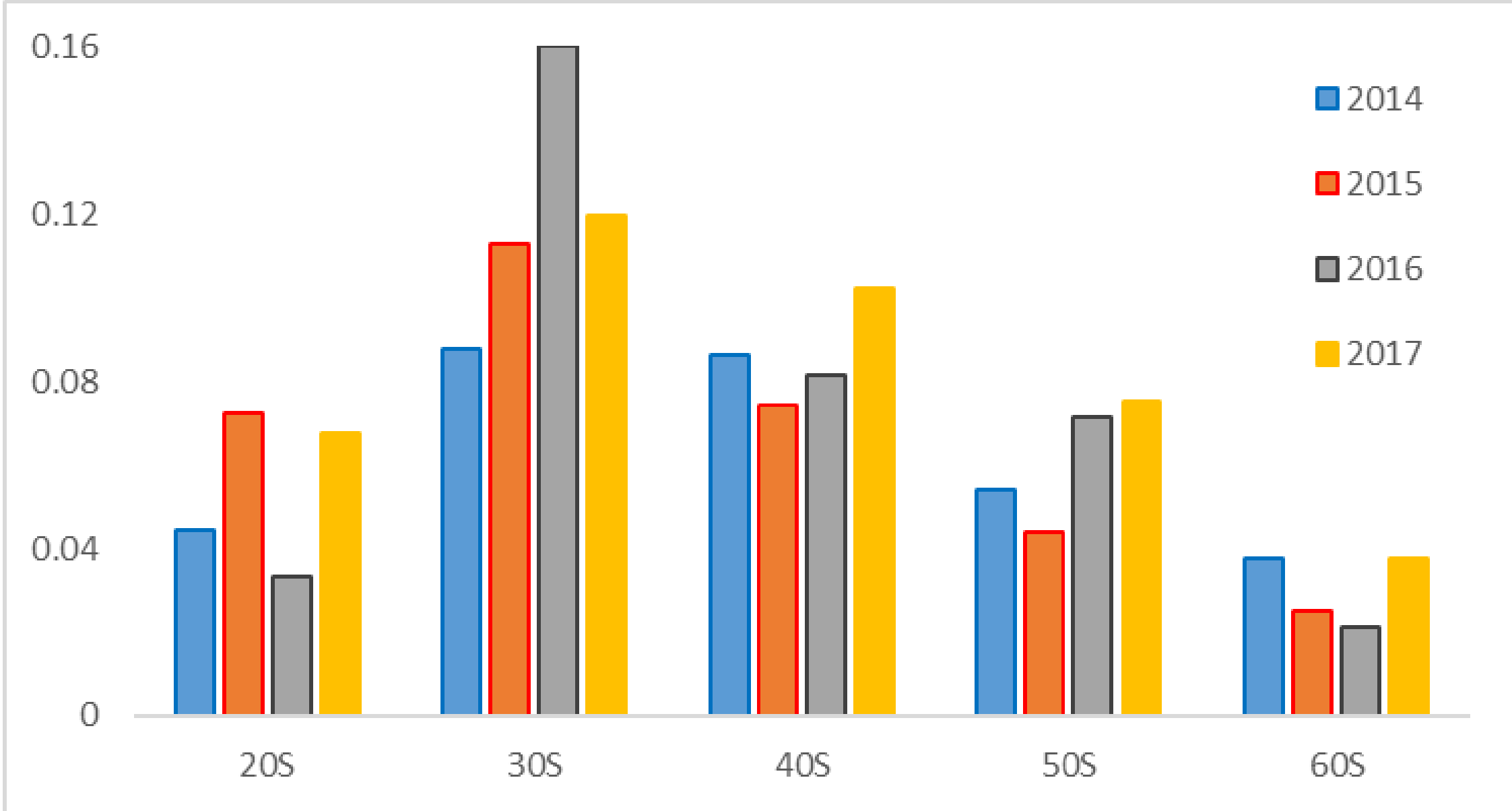
Table 1. The number of the subjects vaccinated, the number of the vaccines administered and the questionnaire collection rate

Year	2014	2015	2016	2017
Number of regular staff	1654	1746	1810	1871
Approximate number of staff *: a	1700	1850	1900	1950
Number of vaccinated staff: b (b/a)	1676 (98.6%)	1700 (91.2%)	1853 (97.5%)	1901 (97.5%)
Number of respondents: c (c/b)	1111 (66.3%)	1455 (85.6%)	1642 (88.6%)	1683 (88.5%)
Number of valid answers: d (d/c)	1069 (96.2%)	1392 (95.7%)	1427 (86.9%)	1477 (87.8%)

*Approximate number of staff includes number of regular staff and outsourcing staff. Number of outsourcing staff was not accurately grasped by the hospital.

COI: The authors declare they have no conflicts of interest.

Figure 1. The Prevalence according to the generation



- Prevalence of the staff in the 30s was high in each season. (Figure 1) We recognized significant difference for the distribution of infected subjects by the age.

Table 2. Comparison of prevalence by the presence or absence of vaccination

	Vaccination (+)		Vaccination (-)		p-value	OR (95%CI)
	Ful (+)	Prevalence (%)	Ful (+)	Prevalence (%)		
2014	61	6.3	6	5.4	0.69	1.192 (0.500-0.295)
2015	90	6.8	7	8.3	0.59	0.801 (0.356-2.119)
2016	104	7.6	5	6.4	0.69	1.205 (0.478-3.905)
2017	119	8.1	8	8.6	0.85	0.931(0.436-2.282)

Table 3. Comparison of prevalence by the presence of children living together

	Children (+)		Children (-)		p-value	OR (95%CI)
	Ful (+)	Prevalence (%)	Ful (+)	Prevalence (%)		
2014	31	8.8	36	5.4	0.0662	1.589 (0.932-2.692)
2015	52	10.7	41	4.8	< .0001**	2.400 (1.538-3.761)
2016	51	12.2	34	5.3	.0001*	2.48 (1.545-4.034)
2017	52	12	42	6.4	.0011*	2.010 (1.284-3.156)

- Prevalence was not necessarily lower among vaccinated subjects than among subjects who were not vaccinated. (Table 2) There was no marked decrease or increase in each season.
- Through 4 seasons, the prevalence was higher in the respondents living with children aged <15 years old than those not living with children aged <15 years old. (Table 3)
- Only the odds ratio in 2014 did not show significant difference in Table 3. It may effect this result that there was lesser number of the questionnaire answers.
- In the people who lived together with children, 42-74% respondents answered that the exposure to a virus in the home was main reasons of the influenza infection. Home was the most common exposure places. Whereas, in the people who did not live together with children, half or more answered that the exposure opportunity to the virus was unknown. The home was a the third most exposure place.

Conclusions: In this investigation, we determined next. The odds ratio of the influenza infection is 2.0 or more in hospital personnel living together with children aged <15 years old. These findings may suggest that protection against influenza infection at home is particularly required for hospital employees living with children aged <15 years.

References: 1. Ishikane M et al. Seasonal influenza vaccine (A/New York/39/2012) effectiveness against influenza A virus of health care workers in a long term care facility attached with the hospital, Japan, 2014/15: A cohort study. J Infect Chemother 2016; 22: 777-9. 2 .Black CL et al. Influenza Vaccination Coverage Among Health Care Personnel- United States, 2016-17 Influenza Season. Morbidity and Mortality Weekly Report 2017; 66: 1009-15.