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Prevalence of influenza vaccination uptake and health attitudes among adults in China: a China National Health and Wellness Survey study

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Background

Influenza vaccination significantly reduces the public health and disease burden of influenza virus infections.

However, influenza infection remains a concern despite vaccination due to vaccine hesitancy and personal beliefs.

Objective

This study assessed the prevalence of influenza vaccination and associated health attitudes among adults in urban China.

Methods

Study design and study population:

- This study utilized data from the China National Health and Wellness Survey (NHWS), a recurring self-reported, internet-based, cross-sectional survey administered to adults aged ≥18 years in 12 countries. Respondents were recruited through general-purpose web-based panels.
- To ensure representation of individuals aged ≥50 years and those without access to internet-based devices, supplemental telephone or in-person surveys were conducted, with the latter proceeding in designated facilities.
- Sampling was stratified by age and sex to align with China's demographic composition. Data were weighted based on age, sex, region and urban to reflect the national adult population (age ≥18 years) according to the National Bureau of Statistics of China.

Study outcomes and data analysis:

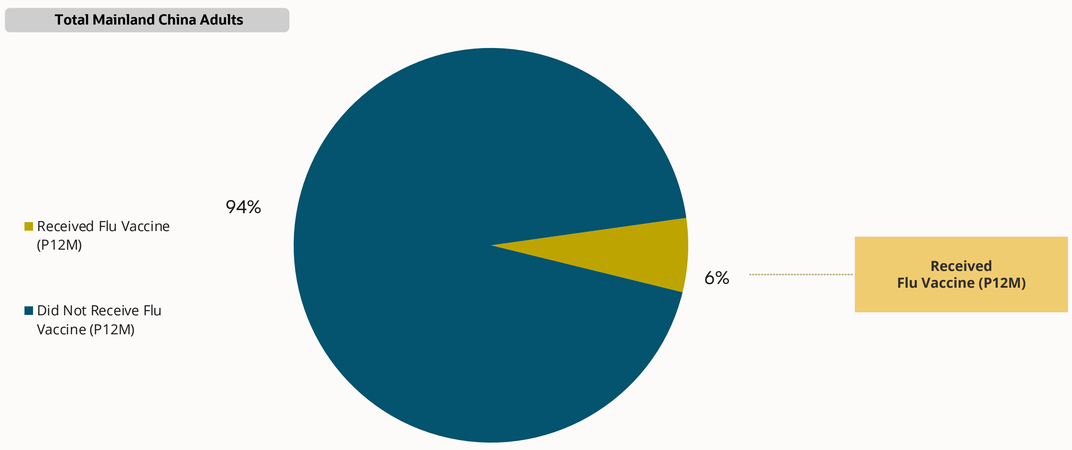
- Respondents of 2020 China NHWS were categorized based on self-reported influenza vaccination uptake within the preceding 12 months. Respondents' characteristics and health attitudes were assessed and reported descriptively.
- Work productivity and activity impairment (WPAI) scale was used to measure overall work productivity (for full-time employed) and activity impairment (for all)[1]. Higher mean % shows greater impairment with a range of 0 to 100.
- Asterisks indicate statistically significant difference at 95% confidence level between subgroups

Results

Vaccine uptake:

- Influenza vaccine uptake was ~6% (40.3 M, n=1,207) in 2020 (**Figure 1**).

Figure 1. Proportion of adults in China who had received influenza vaccine in the past 12 months (2020)



Characteristics of influenza vaccinated individuals and non-vaccinated individuals.

- Vaccinated individuals were younger than non-vaccinated individuals (40.0 years vs. 44.6years), were smokers (28% vs. 16%), had alcohol consumption (75% vs. 49%), and taking steps to lose weight (42% vs. 20%) (**Figure 2**).
- Vaccinated individuals also received more vaccines (any-type) than non-vaccinated individuals (3.37 vs. 1.41) (**Figure 2**).
- A higher proportion of vaccinated individuals had comorbidities than non-vaccinated individuals (**Figure 3**).

Figure 2. Characteristics of individuals who received the influenza vaccine and individuals who did not in the past 12 months.

	Mainland China Adults: Didn't Receive Flu Vaccine (P12M) (B)		Mainland China Adults: Received Flu Vaccine (P12M) (C)	
	625.5 M		40.3 M	
	(n=18,844)		(n=1,207)	
% Men	50		51	
Mean age	44.6	*	40.0	
% Married	74		75	
% Single, never married	18		17	
% Retired	21	*	13	
% College graduate (four year) or more	54		68	*
Mean number of adults in the household	3.0		3.0	
Mean number of children in the household	0.7		1.0	*
% Household Income < RMB 6,000*	14	*	10	
% Overweight/Obese^	22		22	
% Currently Smoke Cigarette	16		28	*
% Drink Alcohol	49		75	*
Mean days exercising in the past month	8.2		10.9	*
% Currently taking steps to lose weight	20		42	*
Mean # of vaccines ever received	1.41		3.37	
SD	2.40		3.42	
Median # of vaccines ever received	0.00		2.00	

Figure 3. Comorbidities among influenza vaccinated individuals and non-vaccinated individuals.

(Values in Percent)	Mainland China Adults: Didn't Receive Flu Vaccine (P12M)	Mainland China Adults: Received Flu Vaccine (P12M)	
	625.5 M	40.3 M	
	(n=18,844)	(n=1,207)	
Insomnia	25	46	*
Allergies	15	36	*
Headache	15	33	*
Dysmenorrhea	15	30	*
Sleep difficulties	11	27	*
Arthritis Types experienced (Net)	8	23	*
Migraine	8	20	*
Ulcers (active/peptic stomach or duodenal)	7	20	*
High blood pressure (Hypertension)	13	19	*
Pain	10	18	*
Anemia	5	17	*
Pre-mature ejaculation	6	17	*
Heavy menstrual bleeding	5	17	*
Chronic constipation	7	16	*
Dermatitis	6	15	*
Dry Eye	5	15	*
Eczema	6	15	*
Osteoporosis	6	15	*
Chronic cough (daily, 8 weeks or longer)	3	15	*
Fibroids	9	15	*

Healthcare resource utilization among influenza vaccinated individuals and non-vaccinated individuals

- Compared to non-vaccinated individuals, a higher proportion of vaccinated individuals visited the general internists (GI) (25% vs. 13%), any healthcare provider (HCP) (77% vs. 41%), the emergency room (42% vs.13%), were hospitalized (28% vs. 7%) in the past 6 months (**Figure 4**).

Work Productivity and Activity Impairment

- A higher proportion of vaccinated individuals were employed full-time.
- Compared to non-vaccinated individuals, vaccinated individuals had higher absenteeism, presenteeism, overall work productivity loss, and activity impairment (**Figure 5**).

Figure 4. Healthcare resource utilization among influenza vaccinated individuals and non-vaccinated individuals

	Mainland China Adults: Didn't Receive Flu Vaccine (P12M) (B)	Mainland China Adults: Received Flu Vaccine (P12M) (C)	
	625.5 M	40.3 M	
	(n=18,844)	(n=1,207)	
% Visited GI in the past 6 months	13	25	*
% Any HCP in the past 6 months	41	77	*
Mean # of visits in the past 6 months*	1.2	3.9	*
% Visited ER in the past 6 months	13	42	*
% Hospitalized in the past 6 months	7	28	*

Figure 5. Work productivity and Activity Impairment among influenza vaccinated individuals and non-vaccinated individuals

	Mainland China Adults: Didn't Receive Flu Vaccine (P12M) (B)	Mainland China Adults: Received Flu Vaccine (P12M) (C)	
	625.5 M	40.3 M	
	(n=18,844)	(n=1,207)	
WPAI:	58	66	*
% Employed Full Time:	3.8	10.4	*
Mean % Absenteeism	19.7	35.0	*
Mean % Presenteeism	21.4	39.4	*
Mean % Work productivity loss	20.2	32.6	*
Activity impairment			

Attitudes towards vaccination, their relationship with physician and outlook towards prescription medications.

- Common reasons for non-vaccination included the belief that the vaccine was harmful/contained bad ingredients (13%) or was unnecessary due to infrequent flu episodes/have a strong immune system (11%) (**Figure 6**).
- Vaccinated individuals perceived their doctor as attentive (60% vs. 47%), regularly contacted their physicians for illness prevention (60% vs. 51%), or took preventive prescription medication (33% vs. 26%) (**Figure 7**).

Figure 6. Reasons for not being vaccinated against influenza. Values in percent.

Reasons for Not Getting Flu Vaccine
(Adults Didn't Receive Flu Vaccine P12M – 625.5 M; n=18,844)

I believe the flu vaccine is bad for you/contains bad ingredients	13
Do not need one because I never or rarely get the flu/I have a strong immune system	11
Have never gotten a flu vaccine and do not want to	8
Was vaccinated last year	7
Do not think the flu vaccine is effective	7
Concerned about the safety or side effects of the vaccine	6
Forgot about getting a flu vaccine	6
I was sick with the flu during the flu season and believe I am now resistant	5
I got the flu after getting vaccinated before	4
Have a fear of needles or don't like shots	4
Do not trust the vaccine	3
Do not believe in getting vaccinations	2
Flu vaccine was not available or they ran out	2
Do not want to get sick with the flu due to the flu vaccine	2
I or someone I know has gotten sick/a bad reaction from the flu vaccine	2
Have other medical conditions/allergies/take other medications and can't take the flu vaccine	1
Could not afford it/health insurance did not cover it	1
Other	16

Figure 7. Attitudes of respondents towards their relationship with their physicians and perceptions towards prescription medication.

		Mainland China Adults: Didn't Receive Flu Vaccine (P12M) (B)	Mainland China Adults: Received Flu Vaccine (P12M) (C)	
	% Agree/Strongly Agree	625.5 M	40.3 M	
		(n=18,844)	(n=1,207)	
Physician relationship	I feel that my doctor is very attentive to my needs and concerns	47	60	*
	Having regular contact with my physician is the best way for me to avoid illness	51	60	*
Outlook on Rx Meds	I prefer to treat myself with an over-the-counter medication, than to depend on a doctor to give me a prescription medication	23	28	*
	I prefer brand name medications to generic ones	61	68	*
	I am not willing to tolerate side effects from my prescription medication(s)	52	53	
	I am willing to make any lifestyle changes necessary to avoid having to take a prescription medication	57	60	*
	I am afraid of needles	33	37	*
Other/Miscellaneous	I would rather bear moderate to severe pain than treat my condition with a prescription medication	19	24	*
	I would take a prescription medication every day for the rest of my life to prevent a disease I may be at risk of having in the future	26	33	*
	I am willing to participate in a clinical trial	27	41	*

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Conclusion

- The China NHWS revealed that the influenza vaccine uptake was low, potentially due to vaccine safety or necessity concerns, and reduced engagements with healthcare providers.
- Addressing vaccine safety or necessity perceptions and enhancing healthcare communication may be crucial to improve uptake.

References

1. Reilly MC, Zbrozek AS, Dukes EM. The validity and reproducibility of a work productivity and activity impairment instrument. PharmacoEconomics 1993; 4(5):353-65.