

# **Acceptability of vaccination against COVID-19 and its associated predictors: a systematic review and meta-analysis**

## **Supplement materials**

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**Method1: Calculation of relationship between infections and acceptance rates**

We analyzed the relationship between acceptance rates, number of cumulative infections, and daily increased infections in the global context and surveyed country context during the survey period.

The surveys tended to last for some time. We chose the median time during the survey period as the “specific survey day”, For example, the survey was performed from June 16 to June 20, and we chose the June 18 as the “specific survey day”. We estimated “specific survey day” for each survey reporting the study period. The number of cumulative infections (CI) and daily increased infections (DII) on the “specific survey day” were derived from the WHO website (<https://covid19.who.int/>).

We first analyzed the direct correlation between acceptance rate and CI and DII in the global context. For each “specific survey day”, we reported one willingness rate, CI, and DII. If the “specific survey day” for multiple articles was the same day, we would pool the acceptance rates of these articles.

Then we analyzed the direct correlation between acceptance rate and CI and DII in the surveyed country context. If the study failed to report in detail the acceptance rate of each country, we will delete the study. Similarly, if a country reported multiple rates on the same “specific survey day”, we would pool those rates. Additionally, the association between acceptance and some lagged value of cumulative/ daily infections was explored further.

**Table S1 Characteristics of 38 included studies <sup>a</sup>**

Ref	First Author	Journal	Article paper	Study period	Surveyed location	Sampling method	Sample representability	Survey method	Study population	Measurement	Sample size
1	Paul L.Reiter	Vaccine	Article	May 2020	America	Convenience sampling	NA	Online	Mixed general population	5-point Likert scale	2006
2	Harapan Harapan	Frontiers in Public Health	Article	March 25 and April 6, 2020	Indonesia	Convenience sampling	NA	Online	General population and HCWs	Dichotomy scale	1359
3	Jiahao Wang	Vaccines	Article	March 2020	China	Random stratified sampling	Representative sample	Online	Mixed general population	5-point Likert scale	2058
4	Luigi Roberto Biasio	Human Vaccines & Immunotherapeutics	Article	June 5,2020	Italy	Convenience sampling	NA	Online	Mixed general population	4-point Likert scale	885
5	Dimitrios Papagiannis	International Journal of Environmental Research and Public Health	Article	February 10-25, 2020	Greece	Convenience sampling	NA	Questionnaire via personal interviews	HCWs	5-point Likert scale	461
6	Kimberly A. Fisher	Annals of Internal Medicine	Article	April 16-20, 2020	America	NA	Representative sample	Online and telephone	Mixed general population	Trichotomy scale	991

Ref	First Author	Journal	Article paper	Study period	Surveyed location	Sampling method	Sample representability	Survey method	Study population	Measurement	Sample size
7	Ran D. Goldman	Vaccine	Article	March 26 - May 31, 2020	America, Canada, Israel, Japan, Spain, and Switzerland	NA	NA	Online	Mixed general population	10-point Likert scale	1541
8	Ran D. Goldman	Clinical Therapeutics	Article	March 26 - June 30, 2020	America, Canada, Israel, Japan, Spain, and Switzerland	NA	NA	Online	Mixed general population	Dichotomy scale	2524
9	Valerie A Earnshaw	Translational Behavioral Medicine	Article	April 13–14, 2020	America	NA	NA	Online	Mixed general population	5-point Likert scale	845
10	Gul Deniz Salali	Psychological Medicine	Correspondence	April 30-beginning of June 2020	UK and Turkey	NA	NA	Online	Mixed general population	Trichotomy scale	5024
11	Amy A. Malik	EClinicalMedicine	Article	May 20, 2020	America	NA	Representative sample	Online and telephone	Mixed general population	5-point Likert scale	672

Ref	First Author	Journal	Article paper	Study period	Surveyed location	Sampling method	Sample representability	Survey method	Study population	Measurement	Sample size
12	Jeremy K. Ward	Social Science & Medicine	Short communication	each week of April 2020	France	Random stratified sampling	Representative sample	Online	Mixed general population	4-point Likert scale	5018
13	The COCONEL Group	The Lancet Infectious Disease	Comment	March 27–29,2020	France	NA	Representative sample	Online	Mixed general population	NA	1012
14	Jeffrey V. Lazarus	Nature medicine	Brief Communication	June 16 - 20, 2020	19 countries	Random stratified sampling	NA	Online	Mixed general population	5-point Likert scale	13426
15	Kendall Pogue	Vaccines	Article	NA	America	NA	NA	Online	NA	5-point Likert scale	316
16	Kailu Wang	Vaccine	Article	February 26- March 31,2020	China	NA	NA	Online	HCWs	Trichotomy scale	856
17	Maëlle Detoc	Vaccine	Article	March 26 - April 20, 2020	France	NA	NA	Online	General population and HCWs	5-point Likert scale	3259
18	Anthea Rhodes	The Lancet Infectious Disease	Correspondence	June 15–23, 2020	Australia	NA	Representative sample	Online	Mixed general population	Trichotomy scale	2018

Ref	First Author	Journal	Article paper	Study period	Surveyed location	Sampling method	Sample representability	Survey method	Study population	Measurement	Sample size
19	Christopher Hogan	International Journal of Emergency Medicine	Brief Research Report	April 20, 2020	America	NA	NA	Online	Non-healthcare-worker general population	Dichotomy scale	101
20	Rine Christopher Reuben	Journal of Community Health	Article	March 30 - April 12, 2020	Nigeria	Convenience sampling	NA	Online	Mixed general population	Trichotomy scale	598
21	Ahmed Samir Abdelhafiz	Journal of Community Health	Article	March 20, 2020	Egypt	NA	NA	Online	Non-healthcare-worker general population	5-point Likert scale	559
22	Katharine J. Head	Science Communication	Research Notes	May 4-11, 2020	America	NA	NA	Online	Mixed general population	7-point Likert scale	3159
23	Luca Pierantoni	Acta Paediatrica	Brief report	July 10- August 10, 2020	Italy	Convenience sampling	NA	Online	Mixed general population	Trichotomy scale	1812
24	Sebastian Neumann-Böhme	The European Journal of Health Economics	Editorial	April 2 -15, 2020	7 European countries	NA	Representative sample	Online	Mixed general population	Trichotomy scale	7662

Ref	First Author	Journal	Article paper	Study period	Surveyed location	Sampling method	Sample representability	Survey method	Study population	Measurement	Sample size
25	A.R. Jazieh	Annals of Oncology	Abstract	April 24 - May 15, 2020	Middle East and North Africa region, Brazil, and the Philippines	NA	NA	Online	HCWs	NA	910
26	Sadie Bell	Vaccine	Article	April 19th – May 11, 2020	UK	NA	NA	Online	Mixed general population	4-point Likert scale	1252
27	Khawla F Ali	Journal of medical internet research	Article	March 28 - April 4, 2020	Arabian Gulf countries: Bahrain, Kuwait, Saudi Arabia, and United Arab Emirates	Convenience sampling	NA	Online	Mixed general population	5-point Likert scale	5677
28	Elijah Edache Ehoche	Borneo Journal of Pharmacy	Article	April 4 - May 16, 2020	Nigeria	NA	NA	Online	Mixed general population	4-point Likert scale	204

Ref	First Author	Journal	Article paper	Study period	Surveyed location	Sampling method	Sample representability	Survey method	Study population	Measurement	Sample size
29	Kate Faasse	Frontiers in Psychology	Article	March 2 - March 9, 2020	Australia	NA	NA	Online	Mixed general population	5-point Likert scale	2174
30	Dong Dong	Health Expect	Article	June and July, 2020	China	NA	NA	Online	Mixed general population	5-point Likert scale	1236
31	Guendalina Graffigna	Vaccines	Article	May 2020	Italy	Random stratified sampling	NA	NA	Mixed general population	5-point Likert scale	1004
32	Riham Muqattash	Data in Brief	Article	July 4 - August 4, 2020	United Arab Emirates	Convenience sampling	NA	Online	Mixed general population	4-point Likert scale	1109
33	Lynn Williams	British journal of health psychology	Article	April 1-11, 2020	UK	Convenience sampling	NA	Online	Older adults and chronic respiratory disease	5-point Likert scale	526
34	Li Ping Wong	Human Vaccines & Immunotherapeutics	Article	April 3 – 12, 2020	Malaysia	NA	NA	Online	Mixed general population	5-point Likert scale	1159
35	Victor Grech	Early Human Development	Article	September 11 – 16, 2020	Malta	NA	NA	Online	HCWs	5-point Likert scale	1002



Ref	First Author	Journal	Article paper	Study period	Surveyed location	Sampling method	Sample representability	Survey method	Study population	Measurement	Sample size
36	Serena Barello	European Journal of Epidemiology	Article	NA	Italy	Convenience sampling	NA	NA	Mixed general population	Trichotomy scale	735
37	Amiel A. Dror	European Journal of Epidemiology	Article	March 19, 2020	Israeli	NA	NA	NA	General population and HCWs	NA	1661
38	Rachael H Dodd	The Lancet Infectious Disease	Correspondence	April 17–21, 2020	Australia	NA	NA	Online	Mixed general population	Trichotomy scale	4362

<sup>a</sup> NA represented not applicable; HCWs represented healthcare workers

**Table S2 Quality assessment of 38 included articles**

Ref	Introduction		Methods										Results					Discussion				Other information	Score
	Title and abstract	Background/rationale	Objectives	Study design	Setting	Participants	Variables	Data sources/ measurement	Bias	Study size	Quantitative variables	Statistical methods	Participants	Descriptive data	Outcome data	Main results	Other analyses	Key results	Limitations	Interpretation	Generalisability	Funding	
1	1	1	1	1	1	1	1	1	0	0	1	1	0	1	1	1	0	1	1	1	1	1	18
2	1	1	1	1	1	1	1	1	0	0	1	1	0	1	1	1	0	1	1	1	1	0	17
3	1	1	1	1	1	1	1	1	0	0	1	1	0	1	1	1	0	1	1	1	1	1	18
4	1	1	1	1	1	1	1	1	0	0	0	1	0	1	1	1	0	1	1	1	1	0	16
5	1	1	1	0	1	1	1	1	0	0	1	1	0	1	1	1	1	1	1	1	1	1	18

Ref	Title and abstract		Methods										Results					Discussion				Other information	Score
	Introduction	Background/rationale	Objectives	Study design	Setting	Participants	Variables	Data sources/ measurement	Bias	Study size	Quantitative variables	Statistical methods	Participants	Descriptive data	Outcome data	Main results	Other analyses	Key results	Limitations	Interpretation	Generalisability	Funding	
6	1	1	1	1	1	1	1	1	0	0	1	1	0	1	1	1	0	1	1	1	0	1	17
7	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	0	0	1	1	1	1	0	16
8	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	0	0	1	1	1	1	0	16
9	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	0	0	1	1	1	1	1	18
10	1	1	1	0	1	1	1	1	0	0	0	0	0	0	1	1	0	1	0	0	0	1	11
11	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	1	1	1	1	1	20
12	1	1	1	1	1	1	1	1	0	0	0	1	0	1	1	0	0	1	1	0	0	1	15
13	1	1	1	0	1	1	1	0	0	0	0	0	1	1	1	0	0	1	0	0	0	0	10
14	1	1	1	0	1	1	1	1	0	0	1	1	0	1	1	0	0	1	1	1	0	1	16
15	1	1	1	1	1	1	1	0	0	0	0	1	0	0	1	1	0	1	1	1	0	1	14

Ref	Title and abstract		Methods										Results					Discussion				Other information	Score
	Introduction	Background/rationale	Objectives	Study design	Setting	Participants	Variables	Data sources/ measurement	Bias	Study size	Quantitative variables	Statistical methods	Participants	Descriptive data	Outcome data	Main results	Other analyses	Key results	Limitations	Interpretation	Generalisability	Funding	
16	1	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	0	1	1	1	1	1	19
17	1	1	1	1	1	1	1	1	0	1	0	1	0	1	1	1	0	1	1	1	1	1	18
18	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	10
19	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	0	0	1	0	1	0	1	11
20	1	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	0	1	0	1	0	0	12
21	1	1	1	1	1	1	1	0	0	1	0	1	0	1	1	1	0	1	1	1	1	1	17
22	1	1	1	1	1	1	1	1	0	0	0	1	0	1	1	1	0	1	1	1	1	0	16
23	1	1	1	1	1	1	1	0	0	0	0	1	0	1	1	1	0	1	1	1	1	0	15
24	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	0	1	0	0	1	1	11
25	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	1	10

Ref	Title and abstract		Methods										Results					Discussion				Other information	Score
	Introduction	Background/rationale	Objectives	Study design	Setting	Participants	Variables	Data sources/ measurement	Bias	Study size	Quantitative variables	Statistical methods	Participants	Descriptive data	Outcome data	Main results	Other analyses	Key results	Limitations	Interpretation	Generalisability	Funding	
26	1	1	1	1	1	1	1	1	0	0	0	1	0	1	1	1	0	1	1	1	1	1	17
27	1	1	1	1	1	1	1	1	0	0	1	1	0	1	1	1	0	1	1	1	1	1	18
28	1	1	1	1	1	1	1	1	0	0	0	1	0	1	1	1	0	1	0	1	0	1	15
29	1	1	1	1	1	1	1	1	0	0	0	1	0	1	1	1	0	1	0	1	0	1	15
30	1	1	1	1	1	1	1	1	0	0	0	1	0	1	1	1	0	1	1	1	1	1	17
31	1	1	1	1	1	1	1	1	0	0	0	1	0	1	1	1	0	1	1	1	0	1	16
32	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	11
33	1	1	1	1	1	1	1	1	0	0	0	1	0	1	1	1	0	1	1	1	1	1	17
34	1	1	1	1	1	1	1	1	0	0	0	1	0	1	1	1	0	1	1	1	1	1	17
35	1	1	1	1	1	1	1	1	0	0	0	1	0	1	1	1	0	1	0	1	0	0	14

Ref	Title and abstract		Methods										Results					Discussion			Other information	Score	
	Introduction	Background/rationale	Objectives	Study design	Setting	Participants	Variables	Data sources/ measurement	Bias	Study size	Quantitative variables	Statistical methods	Participants	Descriptive data	Outcome data	Main results	Other analyses	Key results	Limitations	Interpretation	Generalisability	Funding	
36	1	1	1	1	1	1	1	0	0	0	1	0	1	1	1	0	1	0	0	0	0	0	12
37	1	1	1	1	1	1	1	1	0	0	1	0	1	1	1	0	1	0	1	0	0	0	15
38	1	1	1	1	1	1	1	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	10

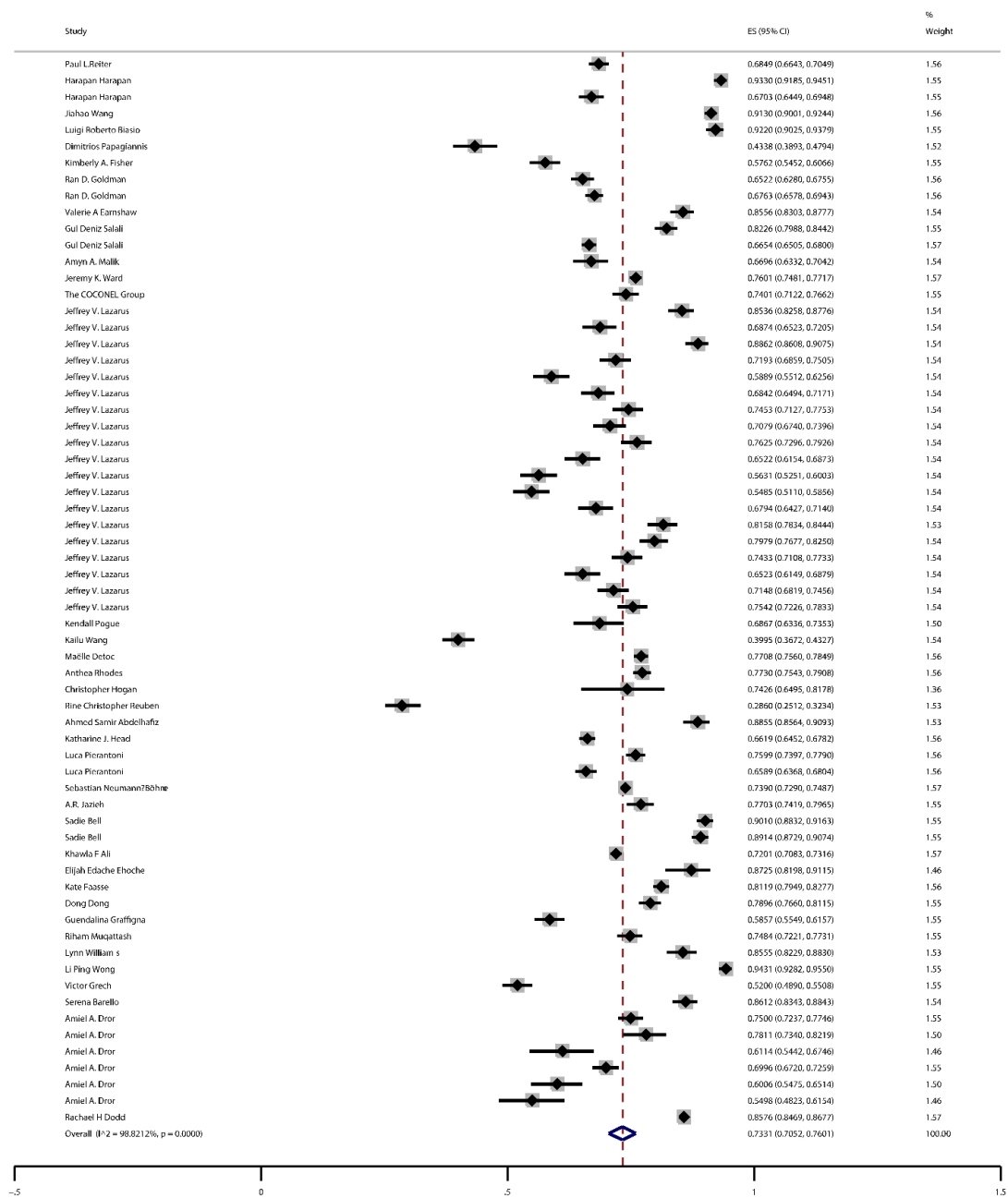


Figure S1 Forest plot of acceptance rate

**Table S3 Results of meta-regression <sup>a</sup>**

Variables		Coefficient	95% CI	t	P	Adjusted R <sup>2</sup> (%)
<b>Univariate analysis</b>						
Sampling method	Convenience sampling	ref	ref	ref	ref	-3.35
	Random stratified sampling	-0.017	(-0.114,0.079)	-0.36	0.719	
	Not mentioned	-0.013	(-0.104,0.078)	-0.29	0.772	
Sample representativeness	Non-representative sample	ref	ref	ref	ref	-1.74
	Representative sample	0.004	(-0.063,0.070)	0.11	0.909	
Survey population	Mixed general population	ref	ref	ref	ref	14.56
	HCWs	-0.158	(-0.253,-0.064)	-3.34	0.001	
	General population without HCWs	0.090	(-0.104,0.283)	0.93	0.358	
	Older adults and chronic respiratory disease patients	0.116	(-0.132,0.364)	0.93	0.354	
WHO region	Not mentioned	-0.053	(-0.311,0.205)	-0.41	0.684	1.06
	Americas	ref	ref	ref	ref	
	Europe	-0.015	(-0.106,0.076)	-0.33	0.743	
	South-East Asia	0.063	(-0.106,0.232)	0.75	0.458	
	Eastern Mediterranean	0.062	(-0.107,0.231)	0.73	0.468	
	Africa	-0.072	(-0.228,0.084)	-0.93	0.358	
Country income levels <sup>b</sup>	Western Pacific	0.066	(-0.047,0.179)	1.18	0.244	4.42
	High-income economies	ref	ref	ref	ref	
	Upper-Middle-income economies	0.082	(0.000,0.164)	1.99	0.051	
Study period	Lower-Middle-income economies	-0.028	(-0.151,0.095)	-0.46	0.646	2.22
	February	ref	ref	ref	ref	
	March	0.275	(0.001,0.55)	2.01	0.049	
	April	0.306	(0.034,0.579)	2.25	0.028	
	May	0.310	(0.038,0.583)	2.28	0.026	
	June	0.296	(0.027,0.564)	2.21	0.031	
	July	0.288	(-0.012,0.589)	1.92	0.059	
	August	-	-	-	-	
	September	0.086	(-0.279,0.451)	0.47	0.639	
Vaccine recipient	Not mentioned	0.345	(0.023,0.667)	2.14	0.036	-1.21
	For self	ref	ref	ref	ref	
Measurement method	For children	-0.027	(-0.116,0.062)	-0.61	0.542	3.62
	Dichotomy scale	ref	ref	ref	ref	
	Trichotomy scale	-0.081	(-0.231,0.070)	-1.07	0.288	
	4-point Likert scale	0.091	(-0.076,0.258)	1.10	0.278	
	5-point Likert scale	-0.029	(-0.167,0.108)	-0.43	0.670	
	7-point Likert scale	-0.094	(-0.373,0.184)	-0.68	0.500	
	10-point Likert scale	-0.104	(-0.385,0.177)	-0.74	0.461	
Vaccine payment	Not mentioned	-0.063	(-0.223,0.097)	-0.79	0.433	-0.26
	No free assumption	ref	ref	ref	ref	
	Free assumption	0.086	(-0.096,0.268)	0.95	0.348	
<b>Multivariate analysis</b>						
Survey population	Mixed general population	ref	ref	ref	ref	28.02
	HCWs	-0.183	(-0.334,-0.031)	-2.43	0.019	
	General population without HCWs	0.137	(-0.085,0.36)	1.25	0.219	
	Older adults and chronic respiratory disease patients	0.120	(-0.128,0.367)	0.97	0.336	
Country income levels <sup>b</sup>	Not mentioned	-0.226	(-0.572,0.119)	-1.32	0.193	0.045
	High-income economies	ref	ref	ref	ref	
	Upper-Middle-income economies	0.083	(0.002,0.165)	2.06	0.045	



	<b>Variables</b>	<b>Coefficient</b>	<b>95% CI</b>	<b>t</b>	<b>P</b>	<b>Adjusted R<sup>2</sup>(%)</b>
	Lower-Middle-income economies	-0.093	(-0.213,0.027)	-1.56	0.125	
Study period	February	ref	ref	ref	ref	
	March	0.163	(-0.126,0.452)	1.14	0.261	
	April	0.119	(-0.176,0.415)	0.81	0.420	
	May	0.101	(-0.199,0.400)	0.68	0.502	
	June	0.091	(-0.192,0.375)	0.65	0.519	
	July	0.095	(-0.231,0.421)	0.59	0.559	
	August	-	-	-	-	
	September	0.086	(-0.237,0.409)	0.54	0.593	
	Not mentioned	0.297	(-0.083,0.677)	1.57	0.123	
Measurement method	Dichotomy scale	ref	ref	ref	ref	
	Trichotomy scale	-0.021	(-0.183,0.142)	-0.25	0.800	
	4-point Likert scale	0.170	(0.001,0.340)	2.02	0.049	
	5-point Likert scale	0.031	(-0.122,0.185)	0.41	0.682	
	7-point Likert scale	-0.024	(-0.277,0.230)	-0.19	0.852	
	10-point Likert scale	-0.052	(-0.325,0.220)	-0.39	0.701	
	Not mentioned	0.029	(-0.199,0.258)	0.26	0.798	

<sup>a</sup> HCWs: healthcare workers; -: No data; ref: as the reference

<sup>b</sup> division came from <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>

**Table S4 Association between willingness rate and cumulative/daily increased cases<sup>a</sup>**

Context	Variables	Lagged 0 day		Lagged 1 day		Lagged 2 days		Lagged 5 days	
		r	p	r	p	r	p	r	p
Global	Number of cumulative infections	-0.037	0.842	-0.027	0.883	-0.032	0.861	-0.032	0.861
	daily increased infections	-0.077	0.674	0.013	0.943	0.021	0.908	0.108	0.556
Country	Number of cumulative infections	-0.062	0.668	-0.044	0.762	-0.041	0.781	-0.055	0.709
	daily increased infections	-0.092	0.523	-0.035	0.814	-0.073	0.621	-0.075	0.610

<sup>a</sup> the association between willingness rate and cumulative/daily increased in different lagged values (0 day, 1 day, 2 days, and 5 days).

**Table S5 Description of different predictors using HBM framework<sup>a</sup>**

HBM framework		Predictors	Reference	
Perceived susceptibility and severity of COVID-19	Perceived susceptibility and severity of COVID-19	Likelihood of being infected with COVID-19	2,6,10,16,17,29,34	
		Concern about outbreak	23,29	
Perceived benefits and risks of acceptance	Perceived benefits of acceptance Perceived risks of acceptance	Protecting self or others	17,26	
		Concerns about side effects and safety	6, 18,24,26	
Modifying Factors	Socio-demographics	Gender	1,2,5,6,7,10,11,12,14,16,17,18,27,29,30,34,35	
		Age	1,2,5,6,7,11,12,14,16,18,22,26,27,29,34,35	
		Education level	1,2,6,7,10,11,12,14,18,22,23, 29,34	
		Income	1,2,6,12,14,18,22,23,26,34	
		Race/Ethnicity	1,6,11,22,26,29,34	
		Employment Status	6,11,18,22,26,37	
		Urbanicity	1,2,6,30,34	
		Geographic location	1,6,23,29	
		Having child(children)	10,22,30	
		Marital status	1,2,6	
		Occupation	2,34	
		Knowledge, attitude, beliefs, and prior experience	Having chronic conditions	16,17,34
			Self-rated overall health	6,29
		Trust	Influenza vaccination in the past season	6,7,16,29
Trust in government	14,29			
Cues to Action	Interpersonal relationships Community	Family member/friend ever diagnosed with COVID-19	1,14,34	
		Media exposure	10,29	
		Political leaning	1,15,22	

<sup>a</sup> HBM: health belief model

**Table S6 Factors associated with vaccine willingness during influenza pandemic in four systematic reviews**

<b>Variables</b>	<b>Nguyen et al <sup>39</sup></b>	<b>Bish et al <sup>40</sup></b>	<b>Prematunge et al <sup>41</sup></b>	<b>Brien et al <sup>42</sup></b>	<b>Our study</b>
Included studies	10	37	20	27	38
Using model/theory	NA	Protection Motivation Theory	Health Belief Model	NA	Health Belief Model
Populations	General populations	General population, health care professionals, pregnant women, clinical risk groups or parents	Healthcare workers	All populations	All populations
Factors	<b>Personal risk perception</b> <ul style="list-style-type: none"> <li>Proximity/severity of public health issue <sup>a</sup></li> <li>Severity of personal consequences from illness <sup>a</sup></li> <li>Risk of infection <sup>a</sup></li> <li>Harm/adverse events from vaccine <sup>b</sup></li> </ul>	<b>Threat appraisal</b> <ul style="list-style-type: none"> <li>Perceptions of personal risk (high vs low) <sup>a</sup></li> <li>Perceptions of the severity of the pandemic (severe vs mild) <sup>a</sup></li> <li>Anxiety (high vs low) <sup>a</sup></li> </ul>	<b>Perceived barriers to pandemic H1N1 (pH1N1) vaccination</b> <ul style="list-style-type: none"> <li>Pandemic vaccine safety and vaccine related adverse effect <sup>b</sup></li> <li>Rapidity of pandemic vaccine development <sup>b</sup></li> <li>Pandemic vaccine will NOT be effective or efficacious <sup>b</sup></li> </ul>	<b>Socioeconomic and demographic factors</b> <ul style="list-style-type: none"> <li>Sex <sup>c</sup></li> <li>Age <sup>c</sup></li> <li>Ethnicity <sup>c</sup></li> <li>Occupation <sup>c</sup></li> <li>Education level <sup>c</sup></li> </ul>	<b>Perceived susceptibility and severity of COVID-19</b> <ul style="list-style-type: none"> <li>Likelihood of being infected with COVID-19 <sup>c</sup></li> <li>Concern about outbreak <sup>c</sup></li> </ul>

Variables	Nguyen et al <sup>39</sup>	Bish et al <sup>40</sup>	Prematunge et al <sup>41</sup>	Brien et al <sup>42</sup>	Our study
	<b>Vaccination attitude</b> <ul style="list-style-type: none"> <li>Acceptance of previous vaccination <sup>a</sup></li> <li>Belief of vaccine (in)effectiveness or (not) necessary <sup>c</sup></li> <li>Anti-vaccination attitude <sup>c</sup></li> </ul>	<b>Coping appraisal</b> <ul style="list-style-type: none"> <li>Perceived efficacy of vaccine in protecting against H1N1 influenza (yes vs no) <sup>a</sup></li> <li>Perceived barriers to having the vaccine (more concerns about safety and fear of side effects) <sup>b</sup></li> <li>Social influences (trust in health professionals or the health care system) <sup>a</sup> (uptake of family and friends) <sup>a</sup> (healthcare workers and colleague recommend) <sup>a</sup></li> <li>Sources of information about vaccination (get information from official departments) <sup>a</sup></li> <li>Previous vaccination against seasonal influenza <sup>a</sup></li> </ul>	<b>Perceived benefits of pH1N1 vaccination</b> <ul style="list-style-type: none"> <li>Pandemic vaccine will protect self <sup>a</sup></li> <li>Pandemic vaccine will protect loved ones (e.g. family and friends) and colleagues <sup>a</sup></li> <li>Pandemic vaccine will protect patients <sup>a</sup></li> </ul>	<b>Regional and household characteristics</b> <ul style="list-style-type: none"> <li>Region of residence <sup>c</sup></li> <li>Household numbers <sup>a</sup></li> </ul>	<b>Perceived benefits of acceptance</b> <ul style="list-style-type: none"> <li>Protecting self or others<sup>a</sup></li> </ul>
	<b>Communications/ information sources</b> <ul style="list-style-type: none"> <li>Recommendations from health care professionals <sup>c</sup></li> <li>Public health messages <sup>c</sup></li> <li>Knowledge of disease/vaccine <sup>c</sup></li> <li>Influence of family and friends <sup>c</sup></li> </ul>	<b>Demographic factors</b> <ul style="list-style-type: none"> <li>Age <sup>c</sup></li> <li>Gender (men vs women) <sup>c</sup></li> <li>Ethnicity (ethnic minorities vs ethnic majorities) <sup>a</sup></li> <li>Professional role <sup>c</sup></li> <li>Socio-economic factors<sup>c</sup></li> <li>Actual risk (actual high-risk vs actual low-risk) <sup>a</sup></li> </ul>	<b>Perceived susceptibility</b> <ul style="list-style-type: none"> <li>Risk of pH1N1 influenza infection <sup>a</sup></li> <li>Immunity from pandemic influenza infection due to previous exposure <sup>b</sup></li> </ul>	<b>Health status and behaviors</b> <ul style="list-style-type: none"> <li>Seasonal influenza vaccination receipt <sup>a</sup></li> <li>Priority group (high-risk) <sup>a</sup></li> </ul>	<b>Perceived risks of acceptance</b> <ul style="list-style-type: none"> <li>Concerns about side effects and safety <sup>b</sup></li> </ul>

Variables	Nguyen et al <sup>39</sup>	Bish et al <sup>40</sup>	Prematunge et al <sup>41</sup>	Brien et al <sup>42</sup>	Our study
	<b>Access</b> <ul style="list-style-type: none"> <li>• Priority group <sup>c</sup></li> <li>• Convenience/inconvenience <sup>c</sup></li> <li>• Financial costs/insurance <sup>c</sup></li> <li>• Vaccine delivery <sup>c</sup></li> </ul>		<b>Perceived severity</b> <ul style="list-style-type: none"> <li>• Severity or seriousness of pH1N1 influenza infection (severe vs mild) <sup>a</sup></li> </ul>	<b>Belief and perceptions</b> <ul style="list-style-type: none"> <li>• Believing that the vaccine is safe or without risk of side effects <sup>a</sup></li> <li>• Believing in the efficacy/effectiveness of the vaccine and its benefits <sup>a</sup></li> <li>• Perception of susceptibility to infection <sup>a</sup></li> <li>• Perception that pandemic influenza infection is severe <sup>a</sup></li> </ul>	<b>Modifying Factors</b> <ul style="list-style-type: none"> <li>• Socio-demographics (Gender, man vs women) <sup>a</sup> (Age) <sup>c</sup> (Education level, college degree or higher vs high school or below) <sup>a</sup> (Income) <sup>c</sup> (Race/Ethnicity) <sup>c</sup> (Employment Status) <sup>c</sup> (Urbanicity) <sup>c</sup> (Geographic location) <sup>c</sup> (Having child) <sup>c</sup> (Marital status) <sup>c</sup> (Occupation) <sup>c</sup></li> <li>• Knowledge, attitude, beliefs, and prior experience (Having chronic conditions) <sup>c</sup> (Self-rated overall health) <sup>c</sup> (Having influenza vaccination in the past season) <sup>a</sup></li> <li>• Trust Trust in government <sup>a</sup></li> </ul>

Variables	Nguyen et al <sup>39</sup>	Bish et al <sup>40</sup>	Prematunge et al <sup>41</sup>	Brien et al <sup>42</sup>	Our study
	<b>Demographic</b> <ul style="list-style-type: none"> <li>• Age <sup>c</sup></li> <li>• Sex <sup>c</sup></li> <li>• Ethnicity (non-Caucasian VS Caucasian) <sup>a</sup></li> <li>• Education <sup>c</sup></li> <li>• Community/household-related factors <sup>c</sup></li> <li>• Personal health <sup>c</sup></li> <li>• Occupation/social grade/work status <sup>c</sup></li> <li>• Marital status <sup>c</sup></li> </ul>		<b>Cues to action</b> <ul style="list-style-type: none"> <li>• Mass media <sup>b</sup></li> <li>• Access of scientific literature and information sources <sup>a</sup></li> <li>• Trust in public health authority</li> <li>• Person based cues to action (i.e. physician, family members, supervisor, co-workers, or political figures) <sup>a</sup></li> </ul>	<b>Information, knowledge and advice</b> <ul style="list-style-type: none"> <li>• Having the correct knowledge <sup>a</sup></li> <li>• Obtaining information from official sources <sup>a</sup></li> <li>• Receiving a recommendation or advice from a health professional, an employer/co-worker, or a spouse/family/friend <sup>a</sup></li> </ul>	<b>Cues to Action</b> <ul style="list-style-type: none"> <li>• Family member/friend ever diagnosed with COVID-19 <sup>c</sup></li> <li>• More Media exposure <sup>a</sup></li> <li>• Political leaning <sup>c</sup></li> </ul>
	<b>Others</b> <ul style="list-style-type: none"> <li>• Societal role/responsibility <sup>a</sup></li> <li>• Self-protection <sup>c</sup></li> <li>• Alternative methods of protection <sup>a</sup></li> <li>• Government preparedness/ Trust in government <sup>c</sup></li> <li>• Employment <sup>c</sup></li> </ul>		<b>Other factors</b> (take seasonal influenza vaccination vs no) <sup>a</sup>		

<sup>a</sup> increase the willingness to be vaccinated, <sup>b</sup> reduce the willingness to be vaccinated, <sup>c</sup> no clear/no significant result

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