

Data Article Title

Survey data for COVID-19 vaccine preference analysis in the United Arab Emirates

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Abstract

In response to the call for interdisciplinary research on the potential effects of the coronavirus pandemic [1], this article presents a novel data set on individuals' COVID-19 vaccine preferences in the United Arab Emirates (UAE). The menu of our stated preference survey questionnaire is framed based on the World Health Organization's (WHO) SAGE working group on immunization developed matrix of vaccine determinants [2], which was itself informed by a systematic review of peer reviewed and grey literature, and by the expertise of the working group. Our survey was designed in a bilingual (Arabic and English) format, using Google Forms platform and delivered to respondents aged 18 years and older using the snowball sampling method between July 4th and August 4th 2020, gathering a total of 1109 responses. Study participants were recruited across all seven emirates of the UAE (see figure 1). As presented in the conceptual framework (see figure 2), the data set comprises (i) respondents socio-economic and demographic information, (ii) respondents willingness to spend time, and money to get the Covid-19 vaccine, and (iii) the vaccine determinants identified by the WHO's SAGE working group on immunization.

Keywords

Covid-19 Pandemic, Vaccine Preference, Vaccine Skepticism, Willingness to Vaccinate, Willingness to Pay

Specifications Table

Subject	Infectious Diseases Prevention
Specific subject area	Health Economics. Econometric models (Random Utility Model) applied to stated infectious diseases' vaccine preference data to understand the determinants of COVID-19 vaccine decision.
Type of data	Table
How data were acquired	Survey (see link at: https://forms.gle/NsRehAzAyUQ7Pzrz6)
Data format	R formatted Data frame
Parameters for data collection	The target population is the set of all adults (18 years and older) living in any of the seven emirates of the UAE. No other parameters were used for the data collection.
Description of data collection	Data collection was conducted through an online questionnaire, which was delivered through snowball sampling methods to individual respondents through email, WhatsApp, and Microsoft Teams.
Data source location	The data collection covered the whole of the UAE national territory, which is made of seven emirates (See figure 1).
Data accessibility	Repository name: Mendeley repository [22] Direct URL to data: https://data.mendeley.com/datasets/pysxmjpk4/1

Value of the Data

- The data will be useful for researchers who want to investigate the determinants and the extent of COVID-19 vaccine acceptance/hesitancy/skepticism in the UAE
- The data will also assist with studies interested in addressing the direct (financial) and indirect (time) barriers to COVID-19 vaccine program effectiveness in the UAE
- The data will further assist with studies seeking to identify the determinants of individuals' adherence to COVID-19 preventive measures in the UAE
- The data could also serve researchers interested in studying the socio-professional and familial consequences of the COVID-19 pandemic in the UAE
- Researchers interested in the influence of media on individuals' attitudes towards COVID-19 in the UAE, would also find this data very handy
- Overall, the data framework presented could also assist researchers to replicate data collection in any other national setting to address any of the above mentioned questions, including cross-country comparative analyses.

Data Description

The recent emergence and global spread of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic, widely referred to as “COVID-19”, has posed significant threats to public health systems, and exacerbated national economic conditions worldwide [3-5]. Though a working vaccine remains the most awaiting intervention [6], current responses to the COVID-19 pandemic involves aggressive suppression strategies such as case identification, quarantine and isolation, contact tracing, and social distancing. In this regards, unprecedented efforts and investments in the development of an effective vaccine are being exerted by numerous stakeholders [7]. The ability however, of any prospective vaccine to eradicate the COVID-19 pandemic will still depend on its global uptake. That is, it will still have to pass the test of “vaccine hesitancy”, which was identified by the WHO’s SAGE group on immunization as a complex issue that is context specific, varying across time, place, and vaccines, with the potential to hinder vaccine program effectiveness [2]. Numerous studies also report on the complexity and multi-dimensional nature of individuals’ decision-making concerning immunization [8]. Rather than a dichotomous pro-versus anti-vaccination’s perspectives, vaccination acceptance behaviors appear to be on a continuum ranging from active demand for vaccines to a complete refusal, with hesitancy falling in between these two extremes [9]. Despite its significance for designing an effective vaccination program to successfully eradicate the COVID-19 pandemic, to date no data manuscript addresses nor provides data for analyzing COVID-19 vaccine hesitancy (or preference more broadly) within a health/economic system.

As of now, a number of data manuscripts address various consequential aspects of the COVID-19 pandemic in numerous settings. For example within the context of Vietnam, [10] describes the risk perception of COVID-19 in a sample of 391 respondents aged 15 to 47 years. On the other hand, [11] focuses on examining the learning habits of 420 students in Hanoi during school closure due to COVID-19, while [12] presents a novel data on the perceptions and behaviors of 440 university students collected after the beginning of the COVID-19 outbreak in Vietnam. Similarly in Indonesia, [13] presents a data set examining COVID-19-related knowledge, attitude, and practice among 6249 Indonesian undergraduate students, while [14] turns it focus to studying the behavioral intentions of 307 ex-pat teachers to leave five Southeast Asian’s countries (Singapore, Thailand, Vietnam, Philippines, and Indonesia), because of the COVID-19 pandemic. Within the African context, [15] examines COVID-19 related knowledge, risk perceptions and

precautionary health behavior among 1357 respondents from 180 cities in the 6 geopolitical zones of Nigeria; while [16] presents raw inferential statistical data determining the coronavirus readiness strategies at 10 retail stores, and their consequences for the behavioral intentions of 344 consumers in South Africa. Within the European context, [17] presents a longitudinal data reflecting a bird's eye view of Belgium residents' fears towards getting ill, their news media consumption, and their attitudes towards the Belgian government's handling of the COVID-19 crisis. Adopting a more comprehensive view, [18] provides a collection of times series for 131 countries with 192 variables compiled from 35 datasets obtained from UN Data, for a multidisciplinary understanding of the COVID-19 pandemic. Similarly, [19] presents a cross-sectional dataset of 18 COVID-19 variables generated based on official reports from 138 countries, useful for analyzing governmental, trade, and competitiveness relationships of countries during the COVID-19 pandemic. Despite this diversified source of COVID-19 related data, a manuscript providing data for the analysis of COVID-19 vaccine preference (including hesitancy) remains needed, hence our current contribution.

On March 2012, the WHO's SAGE group on immunization developed a matrix of the determinants of general vaccine hesitancy informed by a systematic review of peer reviewed and grey literature, and by the expertise of the working group [20]. The matrix mapped the key factors influencing the decision to accept, delay or reject some or all vaccines under three categories: contextual, individual and group, and vaccine-specific. The menu of survey questions used to collect our COVID-19 vaccine preference data is framed based on this matrix. The link to our online survey questionnaire is provided as a supplementary file. Although applied to COVID-19 vaccine preference analysis in the UAE, our presented data framework [see figure (2)] is general combining three key research paradigms in the scientific literature: the (bio) technology acceptance model (TAM), the framework on vaccine skepticism, and Random utility theory.

Figure (1) below shows the geographical map along with the frequency count, and relative percent frequency count of respondents across the seven emirates of the UAE. It shows that our data contains 1109 respondents, 796 (71.78%) of which are from Abu Dhabi, 129 (11.63%) from Dubai, 80 (7.21%) from Sharjah, 13 (1.17%) from Ras Al Khaimah, 50 (4.51%) from Ajman, 34 (3.07%) from Fujairah, and finally 7 (0.63%) from Umm al Quwain.

The vaccine decision outcome of the above respondents are described in the Random Utility based conceptual framework in figure (2), which shows the relationships between the

different collected variables. The framework suggests that observed determinants of vaccine utility combine with unobserved determinants to influence individual subjectively perceived utility from vaccination; this latter in turn identify the chosen position by the individual on the vaccine outcome continuum (Stated vaccine preference).

In this representation however, given that the stated time each individual is willing to spend (indirect cost), and the amount of money the individual is willing to spend to get the vaccine (direct cost) are both under the control of the individual decision maker, they are necessarily endogenous determinants of vaccine decision outcome. This implicitly means bidirectional relationships would prevail between these two determinants on the one hand, and the vaccine decision outcome on the other hand. Such bidirectional relationships (endogeneity) would have to be taken into account in any statistical modeling of the vaccine decision outcome.

The data collected based on this conceptual framework, through the online questionnaire (see survey link in the attached supplementary material) include the socio-economic and demographic characteristics of the participants (see table 1 below); the personal and peer influences on individual perceived COVID-19 vaccine utility (see table 2 below); the contextual influences on individual perceived COVID-19 vaccine utility (see table 3 below); the vaccine specific influences on individual perceived COVID-19 vaccine utility (see table 4 below); and finally the vaccine decision outcome variable, along with the two endogenous vaccine decision determinants (see table 5 below).

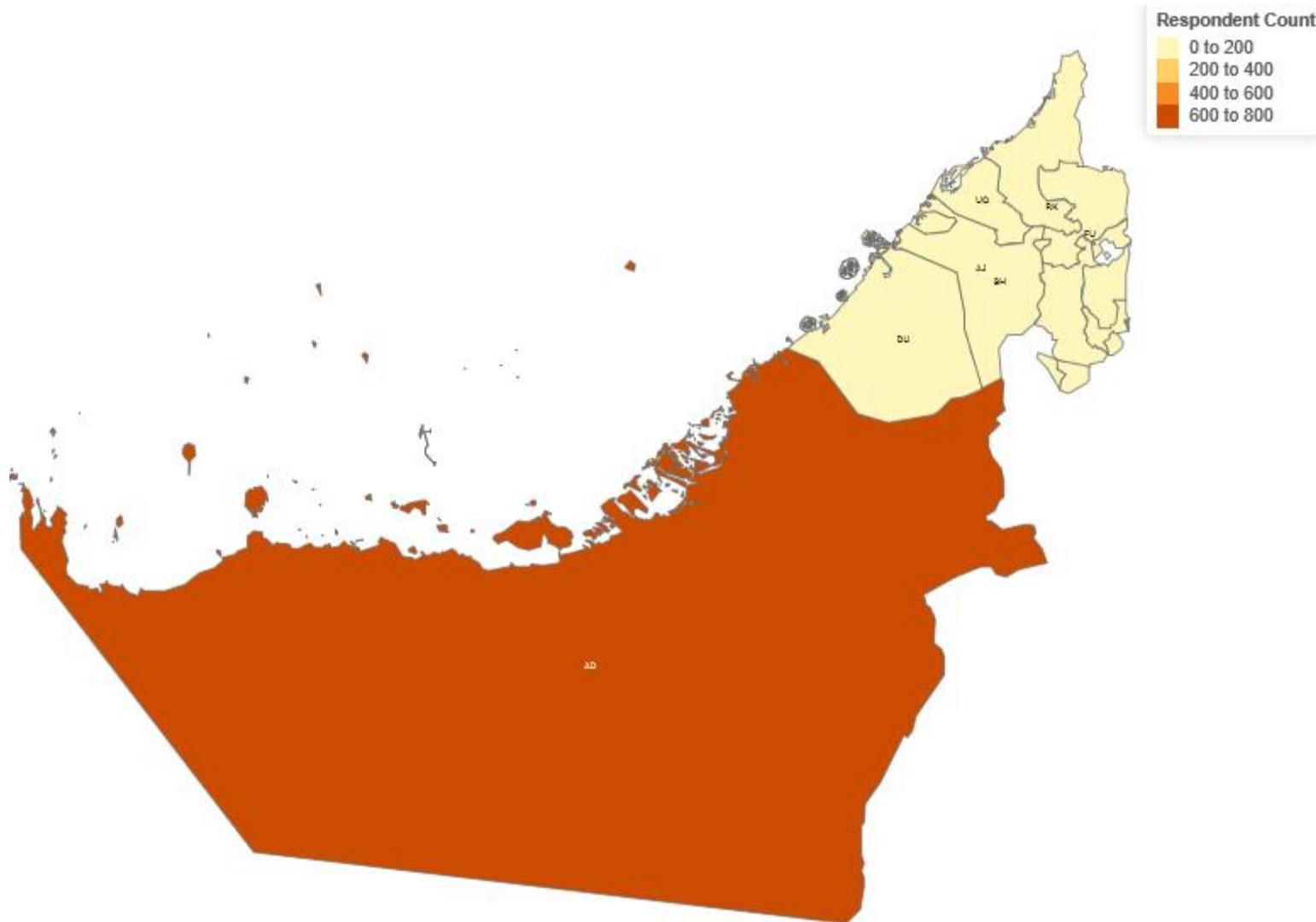


Figure1: Spatial (geographical) coverage and individual count of the Data Collection

Note: Abu Dabi [AD: 796 (71.78%)]; Dubai [DU: 129 (11.63%)]; Sharjah [SH: 80 (7.21%)]; Ras Al Khaimah [RH: 13 (1.17%)]; Ajman [AJ: 50 (4.51%)]; Fujairah [FU: 34 (3.07%)]; Umm al Quwain [UQ: 7 (0.63%)].

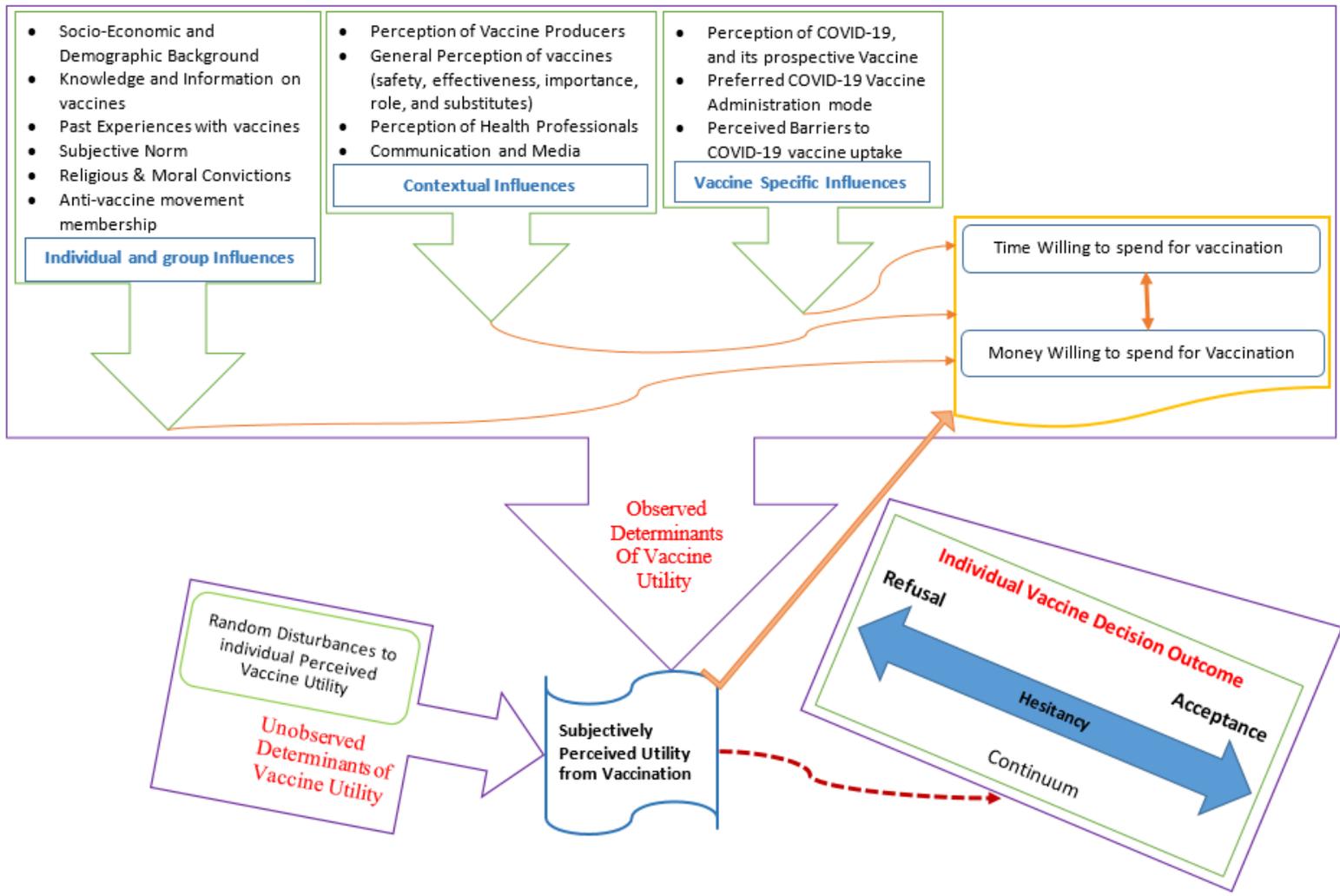


Figure2: Random Utility Based Conceptual Framework for Individual’s decision making about Covid-19 vaccination.

Note: The framework combines the (bio) technology acceptance model with the vaccine skepticism framework, and Random Utility Theory. It suggests that observed determinants of vaccine utility combines with unobserved determinants to influence individual subjectively perceived utility from vaccination; this latter in turn identify the chosen position by the individual on the vaccine outcome continuum (Stated vaccine preference)

Experimental Design, Materials, and Methods

Our study relied on a cross-sectional design to collect stated preferences data on a prospective COVID-19 vaccine in the UAE. The survey was designed using Google Forms platform and delivered to respondents using a snowball sampling strategy. The questionnaire was developed in bilingual (Arabic and English) format, and self-administered voluntarily to participants across all seven emirates of the UAE (i.e. Abu Dhabi, Dubai, Sharjah, Ras Al Khaimah, Ajman, Fujairah, Umm al Quwain). Initially, the study investigators shared the survey link through email to their primary contacts (aged 18 and above) living in the UAE, followed by social media dispatch predominantly through WhatsApp and Microsoft Teams (MsTeams) channels. The primary respondents were requested to roll out the survey further after completion, by sharing the link with their own contacts living in the studied region. The survey run for a month covering the period of July 4th to August 4th 2020, garnering responses from a total of 1109 participants.

The menu of survey questions was framed based on the WHO's SAGE working group on immunization developed matrix of vaccine determinants, which was itself informed by a systematic review of peer reviewed and grey literature, and by the expertise of the working group [2]. This latter framework was expended with respondents' socio-economic and demographic background information, along with their stated willingness to travel for, and willingness to pay for the Covid-19 vaccine once available. Descriptive statistics were conducted to generate summary tables for study variables. All data treatments and analyses were performed using the R statistical software [21], and the final data set available in the Mendeley repository [22]. Table (1) below summarizes respondents' socio-economic and demographic characteristics; Table (2) on the other hand depicts personal and peer influences on respondents' perceived COVID-19 vaccine utility, while table (3) conveys the contextual influences, and table (4) describes vaccine specific influences on respondents' perceived COVID-19 vaccine utility.

Table 1: Socio-economic and demographic characteristics of the participants (n=1109)

variables	Description	Freq (n)	%
AGE	Respondent age category in years		
	1- [18 to 25]	143	12.89
	2- [26 to 35]	310	27.95
	3- [36 to 45]	437	39.40
	4- [45 and over]	219	19.75
Gender	Respondent gender		
	0- Male	309	27.86
	1- Female	800	72.14
MariStat	Marital status		
	1- Married	860	77.55
	2- Separated/divorced/Widowed	59	05.32
	3- Single	190	17.13
Nationality	Respondent nationality		
	0- Emirates	246	22.18
	1- Non-Emirates	863	77.82
ResidenCity	City of Residence (One of 7 as shown in figure 1)		
Education	Level of education		
	0- None	43	03.88
	1- High School	113	10.19
	2- Diploma	125	11.27
	3- Graduate	655	59.06
	4- Postgraduate	173	15.60
Occupation	Respondent sector of occupation		
	1- Not working	388	34.99
	2- Semi government	81	07.30
	3- Government	250	22.54
	4- Private	331	29.85
	5- Self-employed	59	05.32
IncomeMonthly	Monthly Income (1USD = 3.6725 AED)		
	0- None	149	13.44
	1- less than 10,000 EAD	344	31.02
	2- less than 20,000 EAD	275	24.80
	3- less than 30,000 EAD	184	16.59
4- Above 30,000 EAD	157	14.16	

Table 2: Personal and Peer Influences on individual perceived COVID-19 vaccine utility (N =1109)

variables	Description	Freq (n)	%
	Knowledge and Information on vaccines		
KnowVaccine	Can you tell me what a vaccine is?		
	0- No	478	43.10
	1- Yes	631	56.90
InfoSrcVaccens	Whom do you turn to for your information on vaccines?		
	Others	88	07.94
	Family OR relative	32	02.89
	A Friend	22	01.98
	A health worker	505	45.54
	The internet	462	41.66
EnouInfVacSafty	Do you feel you get enough information on vaccines and their safety?		
	0- No	650	58.61
	1- Yes	459	41.39
	Past Experiences with vaccines		
EverNOTvaccin	Have you ever decided to not get a vaccination for yourself?		
	0- No	834	75.20
	1- Yes	275	24.80
Any1BadReactVac	Do you know anyone who has had a bad reaction to a vaccine?		
	0- No	876	78.99
	1- Yes	233	21.01
PastNegExpVacDisrag	Do you remember any events in the past that would discourage you from getting the Covid-19 vaccine?		
	0- No	899	81.06
	1- Yes	210	18.94
SatisfHlthProfAnsImu	How satisfied are you with your health professional/health worker's answers to your questions related to immunization?		
	0- Not at all	105	09.47
	1- A little	177	15.96
	2- A moderate amount	490	44.18
	3- Quite a bit	337	30.39

Table 2: Personal and Peer Influences on individual perceived COVID-19 vaccine utility (Continue)

variables	Description	Freq (n)	%
	Subjective Norm		
ImportnCoVacEvery1	How important do you think it is for everyone to get the COVID-19 vaccine once available?		
	0- Not at all	113	10.19
	1- A little	99	08.93
	2- A moderate amount	232	20.92
	3- Quite a bit	665	59.96
CoVaccCmplsry	Do you think COVID-19 vaccination should be compulsory or not, once available?		
	0- No	410	36.97
	1- Yes	699	63.03
	Religious and Moral Convictions		
NoVaccRelgCult	Do you know anyone who does not take a vaccine because of religious or cultural reasons?		
	0- No	984	88.73
	1- Yes	124	11.27
RiskngHlth	Do you think they are risking their health or the health of their family by not taking the vaccine?		
	0- No	384	34.63
	1- Yes	724	65.37
ImpMenVaccWom	Do you think it is more important for men to get vaccinated than women?		
	0- No	954	86.02
	1- Yes	155	13.98
	Anti-vaccine movement Membership		
AntiVaxxer	Do you identify as an anti-vaxxer?		
	0- No	900	81.15
	1- Yes	209	18.85

Table 3: Contextual influences on individual perceived COVID-19 vaccine utility (N =1109)

Variables	Description	Freq (n)	%
Perception of Vaccine Producers			
BeleiVacPrdcersIntrstHlth	Do you believe that vaccine producers are interested in your health?		
	0- No	371	33.45
	1- Yes	738	66.55
TrustVaccProdSafeEffectVac	Do you trust vaccine producers to provide safe and effective vaccines?		
	0- No	410	36.97
	1- Yes	699	63.03
General Perception of vaccines			
PercVaccSaftyGenrl	How much do you think the following characteristics apply to vaccines in general? “Safe”		
	0- Not at all	107	09.65
	1- A little	161	14.52
	2- A moderate amount	574	51.76
	3- Quite a bit	267	24.08
PercVaccEffGenrl	How much do you think the following characteristics apply to vaccines in general? “Effective”		
	0- Not at all	109	09.83
	1- A little	166	14.97
	2- A moderate amount	532	47.97
	3- Quite a bit	302	27.23
PercVaccImportncGenrl	How much do you think the following characteristics apply to vaccines in general? “Important”		
	0- Not at all	110	09.92
	1- A little	121	10.91
	2- A moderate amount	399	35.98
	3- Quite a bit	479	43.19
VacImunSysTrengh	Do you think vaccines strengthen the immune system?		
	0- No	327	29.49
	1- Yes	782	70.51
AltrnPrevMesur	Do you believe that there are other (better) ways to prevent diseases which can currently be prevented by a vaccine?		
	0- No	417	37.60
	1- Yes	682	62.40

Table 3: Contextual influences on individual perceived COVID-19 vaccine utility (Continue)

Variables	Description	Freq (n)	%
	Perception of Health Professionals		
TurstVacAdvHlthProf	Do you trust the vaccine advice your health care provider gives you?		
	0- Not at all	115	10.37
	1- A little	170	15.33
	2- A moderate amount	441	39.77
	3- Quite a bit	383	34.54
	Communication and Media		
InfoSrceCov	What is the most common information source you turn to, for information on COVID-19?		
	Others	32	02.89
	Government website	373	33.63
	News blogs	53	04.78
	News papers	42	03.79
	Radio	11	00.99
	Television	114	10.28
	The internet in general	484	43.64

Finally, table (5) below provides three key vaccine outcome variables: (i) the vaccine preference outcome (with varying degree of acceptances), (ii) the opportunity cost outcome (amount of time willing to spend for the vaccine), and (iii) the direct cost outcome (amount of money willing to spend for the vaccine). The first outcome characterizes the individual's chosen position in the vaccine preference continuum, and is indicated by the answer to the question "How willing are you to get the covid-19 vaccine, once discovered?", with the alternatives defined as "vaccine refusal" if chosen option is (0-not at all); "vaccine hesitant" if chosen option is (1-a little; or 2-Moderate amount); "vaccine acceptant" if chosen option is (3- quite a bit). As the stated opportunity cost of vaccination the second outcome variable captures the time the individual is willing to spend to get the vaccine, and is the answer to the question "What is the maximum amount of time you would be able and willing to spend to get the covid-19 vaccine, once discovered?", with 6 ordered outcomes (0- None; 1- less than 30 minutes; 2- 30 to 60 minutes; 3- 60 to 90 minutes; 4- 90 to 120 minutes; 5- over 120 minutes). On the other hand, the stated direct financial cost of vaccination as the third outcome variable is the answer to the question "What is the maximum amount (in dirham), that you would be willing to pay for the covid-19 vaccine, once discovered?". It has 7 potential choices options (0- 0 AED; 1- less than 100 AED; 2- 100 to 200 AED; 3- 200 to 300 AED; 4- 300 to 400 AED; 5- 400 to 500 AED; 6- over 500 AED).

Table 4: Vaccine Specific Influences on individual perceived COVID-19 vaccine utility (N =1109)

Variables	Description	Freq (n)	%	
Perception of COVID-19, and its prospective Vaccine				
SeriousCovDises	How serious do you believe the COVID-19 disease is?			
	0- Not at all	40	03.61	
	1- A little	84	07.57	
	2- A moderate amount	336	30.30	
ImportnCoVacc	How important do you believe the COVID-19 vaccine is?			
	0- Not at all	106	09.56	
	1- A little	88	07.94	
	2- A moderate amount	244	22.00	
ConcernCoVacc	How concerned are you about the COVID-19 vaccine?			
	0- Not at all	100	09.02	
	1- A little	160	14.43	
	2- A moderate amount	394	35.53	
	3- Quite a bit	455	41.03	
	Preferred COVID-19 Vaccine Administration mode			
	CoVaccPrefAdmnMod	What would be your preferred mode of administration, of the COVID-19 vaccine, once found?		
		None	239	21.55
Orally		310	27.95	
Injected		488	44.00	
	Nasal spray	72	06.49	
	Perceived Barriers to COVID-19 Vaccine uptake			
	FinCostCoVaccPrevGet	Would the financial cost of the COVID-19 vaccine prevent you from getting it, if it was not provided for free?		
		0- No	532	47.97
	1- Yes	577	52.03	
	TravelOver1HrCoVacc	If you have to spend more than one hour in travel time to get your COVID-19 vaccine, would you consider it important enough to travel for it?		
0- No		366	33.00	
	1- Yes	743	67.00	
	TravelDiffEmirCoVacc	Will you be willing to travel to a different Emirate to get your COVID-19 vaccine, if it was not available in your emirate of residence?		
0- No		403	36.34	
	1- Yes	706	63.66	

Table 5: Vaccine Outcome Variables (N =1109)

Variables	Description	Freq (n)	%
WTGCoVacc	How willing are you to get the COVID-19 vaccine, once discovered?		
	0- Not at all	279	25.16
	1- A little	229	20.65
	2- A moderate amount	356	32.10
	3- Quite a bit	245	22.09
MaxTimWillgSpndCoVacc	What is the maximum amount of time you would be willing to spend to get the COVID-19 vaccine, once discovered?		
	0- None	63	05.68
	1-]0 to 30 min[	512	46.17
	2- [30 to 60 min[	95	08.57
	3- [60 to 90 min[	57	05.14
	4- [90 to 120 min[	242	21.82
MaxWTPCoVacc	What is the maximum amount of money (in dirham) you would be willing to pay for the COVID-19 vaccine, once discovered?		
	0- 0 AED	284	25.61
	1-]0 to 100 AED[	444	40.04
	2- [100 to 200 AED[	146	13.17
	3- [200 to 300 AED[	87	07.84
	4- [300 to 400 AED[	31	02.80
	5- [400 to 500 AED[	51	04.60
6- [500 AED and over[	66	05.95	

Declaration of Competing Interest

The research project did not receive financial support from any institutions. The authors declare that they have no known competing financial interests or personal relationships that have, or could be perceived to have, influenced the work reported in this article.

Ethics Statement

Data collection was conducted according to the Declaration of Helsinki. Respondents' participation was completely consensual, anonymous, and voluntary.

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