



## Short communication

## COVID-19 vaccine acceptance in older Syrian refugees: Preliminary findings from an ongoing study

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## ABSTRACT

This study assesses COVID-19 vaccine intentions among a sample of older Syrian refugee beneficiaries of a humanitarian organization in Lebanon, and explores factors associated with vaccine refusal. The findings are part of an ongoing rotating 4-wave panel study. The sample was limited to participants from the first panel who completed a phone interview between January-February 2021. Out of 1,037 beneficiaries, almost a third (29%) reported no intention to vaccinate. Reasons for refusal were: newness of the vaccine (35%); preference to maintain precaution measures (21%); belief that the COVID-19 vaccine is not essential (21%); and other (23%). COVID-19 vaccine refusal was significantly associated with perceptions regarding vaccine safety (OR: 5.97; 95% CI: 4.03–8.84) and effectiveness (OR: 6.80; 95% CI: 4.44–10.42) but did not differ by age, presence of chronic conditions, self-reported adherence to COVID-19 measures, and perceptions of susceptibility to and severity of COVID-19. Addressing vaccine hesitancy among Syrian refugees in Lebanon necessitates disseminating accurate, accessible, and culturally appropriate information about vaccine safety and effectiveness.

### 1. Introduction

Achieving COVID-19 herd immunity worldwide demands the implementation of equitable vaccination campaigns and overcoming multiple resource constraints such as accessibility to the vaccine, logistical capacities, and vaccine hesitancy (Chevallier et al., 2021; Schwarzingler et al., 2021). Existing studies on COVID-19 vaccine hesitancy have focused on adults from the general population and healthcare workers (Sallam, 2021), with little evidence published on the perceptions of immigrants and refugees. As displaced populations are disproportionately affected by COVID-19 due to the syndemic effects of health and social vulnerabilities (Thomas and Osterholm, 2021), including them in national vaccination campaigns is paramount.

The Arab region, which hosts one of the largest refugee populations worldwide, reports very low COVID-19 vaccine acceptance rates (Sallam, 2021), with studies published shortly following vaccine rollout reporting that only 28.4% of adults in Jordan and 44% in Lebanon expressed willingness to get vaccinated (Sallam et al., 2021; Wouters

et al., 2021).

Lebanon launched its COVID-19 vaccination campaign on February 14, 2021 pledging for an inclusive and equitable vaccination strategy. The national plan initially prioritised vaccinating healthcare workers, older people above age 65, and those aged 55–64 years with comorbidities (Ministry of Public Health, 2021). The two main vaccines provided by the Ministry of Public Health for free to the abovementioned priority social groups are Pfizer Biontech and AstraZeneca, although other vaccines were purchased by various labor sectors (i.e., banks and hospitality venues). Between February and August 2021, 2,365,852 doses of the COVID-19 vaccine were administered; yet, only 1.9% were given to Syrians (Ministry of Public Health, 2021), highlighting stark inequities in vaccine access. Registration to receive the COVID-19 vaccine on the national platform among Syrians was also low with only 5% of total registered people being of Syrian nationality (Ministry of Public Health, 2021).

There are 865,000 registered Syrian refugees in Lebanon, a country with a total population of 6 million (UNHCR) (UNHCR, 2021). To

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achieve herd immunity and protect those who are most at risk of severe COVID-19 infection, it is critical that all Syrians residing in Lebanon receive the vaccine and especially older adults with co-morbidities. Understanding the factors associated with vaccine acceptance and refusal is key for public health planning to achieve this aim. Thus, this study assessed COVID-19 vaccine intentions among a sample of older Syrian refugees ( $\geq 50$  years of age) in Lebanon, and explored factors related with vaccine refusal.

## 2. Materials and methods

The findings come from an ongoing rotating 4-wave panel study aiming to track the vulnerability of older Syrian refugees residing in Lebanon to COVID-19 and their adherence to public health measures. The sampling frame for the study was a beneficiary household list of the Norwegian Refugee Council, an international humanitarian organization operating in Lebanon, with at least one adult aged 50 years or older. Data for the study were collected through phone interviews. The study sample size is 3,838; however, the findings presented here are limited to a sample of 1,037 from the first panel who were interviewed between January 21, 2021 and February 22, 2021, around the time Lebanon received its first batch of the COVID-19 vaccine in mid-February 2021.

This study was granted approval by the Social and Behavioral Sciences Institutional Research Board at the American University of Beirut. Participants voluntarily agreed to participate in the study following oral consent and had the right to refuse or withdraw participation at any time without affecting their access to benefits.

Intention to vaccinate against COVID-19 was assessed using the following question: "If a safe and effective vaccine for COVID-19 became available, free, would you take it?" (Yes, No, Don't know, Refuse to answer). Using unadjusted logistic regression analyses, we examined the association between vaccine refusal and five constellations of factors: 1. Socio-demographics; 2. Presence of chronic illness; 3. General perceptions of vaccine safety and effectiveness; 4. Adherence to COVID-19 measures; 5. Perceptions of susceptibility to and severity of COVID-19.

## 3. Results

The majority of the sample (66%) reported an intention to receive the COVID-19 vaccine if it is safe and free; almost one third (28.8%) reported no intention to vaccinate and 5.2% didn't know or refused to answer. Among those who reported no intention to vaccinate, the reasons provided were: newness of the vaccine and wanting to wait to know more (35%); preference to maintain public health precautions (21%); belief that the vaccine is not essential (21%); and other reasons (23%) including worry about the side effects of the vaccine, interactions with other medications, and lack of trust in the system.

The findings in [Table 1](#) demonstrate that COVID-19 vaccine acceptance was not associated with sex, age, or education; however, the odds of refusal were statistically significantly higher among refugees living outside informal tented settlements (ITSs) compared to those inside ITSs. Those in the 70 + age category and those reporting chronic conditions did not significantly differ from younger participants or those without chronic conditions in their vaccine acceptance. This finding has important implications given that these are the two most at risk groups of COVID-19 severe illness and mortality ([Zhou et al., 2020](#)). Perceptions of vaccine safety and effectiveness were significantly associated with vaccine acceptance; for example, those who disagreed with the statement that vaccines are safe were six times more likely to report refusal to vaccinate compared to those who agreed with the statement. Finally, self-reported adherence to COVID-19 public health measures and perceptions of susceptibility to and severity of COVID-19 were not associated with vaccine acceptance.

## 4. Discussion

The majority of older Syrian refugees reported the intention to receive the COVID-19 vaccine; however, a third reported refusing to receive it citing such reasons as the newness of the vaccine, the belief that it is not essential, or preference to continue to follow COVID-19 precautions. Surprisingly, older age, and presence of chronic conditions were not associated with COVID-19 vaccine acceptance, nor were self-reported adherence to COVID-19 measures and perceptions of susceptibility to and severity of COVID-19. On the other hand, the factors associated with vaccine refusal included perceptions surrounding the safety and effectiveness of vaccines and residing outside ITSs.

In the context of Lebanon, our findings show that Syrians tended to have a higher reported intention to receive the vaccine than the Lebanese population as revealed in recent studies. For example, findings from a cross-sectional survey of a small, non-representative sample of Lebanese adults and an online survey of 1,185 Lebanese participants reported COVID-19 intention at 21% and 46%, respectively ([Al Halabi et al., 2021](#); [Abou-Arrej et al., 2021](#)). Vaccine intention was also low among populations in other Arab countries such as Kuwait (23.6%), Jordan (28.4%), and Saudi Arabia (31.8%) ([Sallam et al., 2021](#)). Older adults and refugees were underrepresented in these studies, which may explain the lower reported intentions in comparison to what we found among older Syrian refugees in Lebanon.

COVID-19 vaccine refusal was higher among Syrians living outside ITSs compared to those living inside. This may be explained by the fact that most humanitarian programming focuses on refugees inside settlements that have clear geographic boundaries as they are easier to locate. As such, Syrian refugees inside ITSs may have received more information about the benefits of vaccination compared to refugees who are difficult to reach outside ITSs. This highlights the need to focus efforts on reaching the "hard-to-reach" refugees who are geographically dispersed in urban and rural settings. Moreover, unlike other studies that found age and education to predict vaccine refusal/acceptance ([Sallam, 2021](#); [Sallam et al., 2021](#); [Abou-Arrej et al., 2021](#)), these two important sociodemographic factors did not show an association in our study. This might be explained by the lack of variability in age and education level in this disadvantaged refugee population as only 12% of the study sample were 70 years of age or older and the majority reported low education.

Similar to other studies ([Schwarzinger et al., 2021](#); [Sallam, 2021](#); [Abou-Arrej et al., 2021](#); [Fisher et al., 2020](#)), ours showed that lack of trust, limited knowledge about the vaccine, and negative perceptions around vaccine effectiveness were associated with higher vaccine refusal. Refusal of new vaccines has been found to further exacerbate in settings of low trust such as that of Lebanon, a country witnessing deep political and economic crises. Vaccine refusal varies with time, context, and the nature of the vaccine itself, and the phenomenon was shown to be attributed to Complacency, Convenience and Confidence, also known as the "3Cs" model involving individual, contextual, and vaccine-related factors ([WHO, 2014](#)). It has been suggested that perceptions around risks versus complacency, affordability, and convenience (availability of and accessibility to vaccines) contribute to explaining vaccine intention and acceptance. On the other hand, mistrust in vaccines' safety and effectiveness, as well as a more generalized mistrust of the pharmaceutical industry, government, and healthcare providers predict vaccine refusal ([WHO, 2014](#)). Hence, an understanding of all of these factors is a necessary component of the design of vaccination plans and health promotion and communication strategies.

## 5. Strengths and limitations

The data used in the present analysis come from the first of a three panel study and may have lacked statistical power to detect sex and age differences in vaccine refusal. Specifically, we did not have enough statistical power to carry out meaningful analysis on the vaccine

**Table 1**  
Key characteristics, beliefs, knowledge and medical history and their associations with COVID-19 vaccine acceptance.

	Total (n = 1037)	Acceptance of COVID-19 vaccine (n = 684 (66.0%))	Refusal of COVID-19 vaccine (n = 299 (28.8%))	Undecided (n = 54 (5.2%))	Refusal of COVID-19 vaccine <sup>a</sup> OR (95% CI)
	n (%)	n (%)	n (%)	n (%)	
<i>Socio- Demographics</i>					
<i>Age (years)</i>					
50–59	629 (60.7)	420 (66.8)	184 (29.2)	25 (4.0)	1
60–69	282 (27.2)	184 (65.2)	77 (27.3)	21 (7.5)	0.96 (0.70–1.31)
70+	126 (12.2)	80 (63.5)	38 (30.2)	8 (6.3)	1.08 (0.71–1.66)
<i>Sex</i>					
Male	579 (55.8)	394 (68.1)	157 (27.1)	28 (4.8)	1
Female	458 (44.2)	290 (63.3)	142 (31.0)	26 (5.7)	1.23 (0.94–1.61)
<i>Residence</i>					
Inside informal tented settlements (ITS)	402 (38.8)	283 (70.4)	102(25.4)	17 (4.2)	1
Outside ITS	635 (61.2)	401 (63.2)	197 (31.0)	37 (5.8)	<b>1.36 (1.03–1.81)</b>
<i>Education</i>					
Never attended school	479 (46.4)	317 (66.2)	129 (26.9)	33 (6.9)	1
Attended school	554 (53.6)	364 (65.7)	169 (30.5)	21 (3.8)	1.14 (0.87–1.50)
<i>Health</i>					
<i>Chronic conditions</i>					
None	277 (27.8)	182 (65.7)	80 (28.9)	15 (5.4)	1
At least one	718 (72.2)	472 (65.7)	207 (28.8)	39 (5.4)	1.00 (0.73–1.36)
<i>Hypertension</i>					
No	601 (60.6)	394 (65.5)	173 (28.8)	34 (5.7)	1
Yes	390 (39.4)	258 (66.2)	112 (28.7)	20 (5.1)	0.99 (0.74–1.31)
<i>Diabetes</i>					
No	771 (77.6)	513 (66.5)	220 (28.5)	38 (4.9)	1
Yes	222 (22.4)	140 (63.1)	66 (29.7)	16 (7.2)	1.10 (0.79–1.53)
<i>Vaccination Perceptions</i>					
<i>I think vaccines are safe</i>					
Agree	670 (64.6)	504 (75.2)	144 (21.5)	22 (3.3)	1
Neither agree nor disagree or Don't know	211 (20.4)	129 (61.1)	68 (32.2)	14 (6.6)	<b>1.84 (1.30–2.61)</b>
Disagree	156 (15.0)	51 (32.7)	87 (55.8)	18 (11.5)	<b>5.97 (4.03–8.84)</b>
<i>I think vaccines are effective</i>					
Agree	680 (65.6)	510 (75.0)	148 (21.8)	22 (3.2)	1
Neither agree nor disagree or Don't know	226 (21.8)	145 (59.7)	74 (32.7)	17 (7.5)	<b>1.89 (1.35–2.65)</b>
Disagree	131 (12.6)	39 (29.8)	77 (58.8)	15 (11.4)	<b>6.80 (4.44–10.42)</b>
<i>COVID-19 Adherence Measures</i>					
<i>Attended social events</i>					
No	934 (94.0)	613 (65.6)	269 (28.8)	52 (5.6)	1
Yes	60 (6.0)	40 (66.7)	18 (30.0)	2 (3.3)	1.02 (0.58–1.82)
<i>Mainly stayed at home except for essential purchasing</i>					
No	197 (19.8)	127 (64.5)	60 (30.4)	10 (5.1)	1
Yes	798 (80.2)	527 (66.0)	227 (28.5)	44 (5.5)	0.91 (0.65–1.29)
<i>Received visitors at home</i>					
No	675 (67.8)	436 (64.6)	197 (29.2)	42 (6.2)	1
Yes	320 (32.2)	218 (68.1)	90 (28.1)	12 (3.8)	0.91 (0.68–1.23)
<i>Worn a mask</i>					
No		88 (68.8)	36 (28.1)	4 (3.1)	1

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Table 1 (continued)

	Total (n = 1037)	Acceptance of COVID-19 vaccine (n = 684 (66.0%))	Refusal of COVID-19 vaccine (n = 299 (28.8%))	Undecided (n = 54 (5.2%))	Refusal of COVID-19 vaccine <sup>a</sup> OR (95% CI)
	n (%)	n (%)	n (%)	n (%)	
Yes	128 (12.9) 866 (87.1)	566 (65.4)	250 (28.8)	50 (5.8)	1.08 (0.71–1.64)
<i>COVID-19 Perceived severity</i>					
<i>COVID-19 is a serious infection that is spreading across the world</i>					
True	965 (95.9)	642 (66.5)	275 (28.5)	48 (5.0)	1
False	41 (4.1)	24 (58.5)	15 (36.6)	2 (4.9)	1.46 (0.75–2.82)
<i>COVID-19 Perceived susceptibility</i>					
No	228 (23.5)	140 (61.4)	75 (32.9)	13 (5.7)	1
Yes	741 (76.5)	496 (66.9)	206 (27.8)	39 (5.3)	0.77 (0.56–1.07)

<sup>a</sup> The unadjusted ORs are for refusal of COVID-19 vaccine versus acceptance; the “undecided” were excluded from logistic regression analyses.

heistant group, which is a unique group that can be swayed towards vaccine acceptance. In addition, data collection occurred prior to the commencement of the vaccination program in January and February 2021 in Lebanon and therefore it is possible that vaccination intentions have changed since then. Despite these limitations, this study was relatively large compared to others completed in Lebanon and provides insight to tailoring the vaccination rollout amongst Syrian refugees.

## 6. Conclusion

These preliminary findings highlight important directions towards enhancing vaccine acceptance among Syrian refugees in Lebanon to reach herd immunity, reduce rates of severe infections, and ensure that Syrian refugees, who make up a significant proportion of the resident population in the country, are not left behind. Although vaccine acceptance among Syrian refugees in our sample was higher than that of the general adult population in Lebanon, refugees may face particular challenges in vaccine registration and access. In Lebanon, where Syrian refugees experience security, mobility, and healthcare access barriers, humanitarian organisations ought to consider delivery of immunization services to older refugees inside and outside ITSSs. Practical approaches include disseminating accurate, accessible, and culturally appropriate information about vaccine safety and effectiveness. Importantly, these public health information campaigns must tackle the unprecedented surge of misinformation ‘infodemic’ about COVID-19 vaccines (Makhoul et al., 2021); consider the integration of “3Cs” model of vaccine hesitancy; and work with community leaders, organisations and other key influencers to improve confidence, re-establish trust and address possible determinants influencing vaccine acceptability among Syrian refugees.

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## CRediT authorship contribution statement

**Noura Salibi:** Investigation, Data curation, Formal analysis, Project administration, Writing – original draft. **Sawsan Abdulrahim:** Conceptualization, Investigation, Supervision, Funding acquisition, Project administration, Methodology, Writing – original draft. **Maria El Haddad:** Investigation, Data curation, Validation, Project administration. **Stephanie Bassil:** Conceptualization, Funding acquisition, Resources. **Zeina El Khoury:** Conceptualization, Funding acquisition, Resources. **Hala Ghattas:** Conceptualization, Supervision, Investigation, Project administration, Methodology, Funding acquisition, Writing – review & editing. **Stephen J. McCall:** Conceptualization, Investigation, Data curation, Supervision, Funding acquisition, Methodology, Project administration, Writing – original draft.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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