

A CROSS-SECTIONAL NATIONWIDE SURVEY

Physicians' perceptions of working in mass vaccination sites during COVID-19 pandemic

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ABSTRACT

BACKGROUND: This survey was aimed to obtain the characteristics of physicians operating in mass vaccination sites (MVS), emphasizing their motivation to work there.

METHOD: We conducted a nationwide cross-sectional internet-based survey involving physicians operating in MVS during the COVID-19 pandemic. The questionnaire comprised demographic characteristics and questions regarding the perception of physicians working in MVS.

RESULTS: In total, 140 questionnaire responses were analysed. There were 98 female (70 %) and 42 male (30 %) physicians. Fifty-five were residents (39.3 %), and 85 were attending physicians (60.7 %). As the main motivation for participating in MVS, residents (43.6 %) reported a financial benefit, while moral responsibility was more common in attending physicians (50.6 %), ($p < 0.0001$). Regarding the will to work in MVS in the future, 78.6 % of the physicians responded positively, regardless of their sex, age, and role (all $p > 0.05$). Physician burnout was more prevalent (32 %) in those study participants, who worked in MVS as part of their work duty. 48 % of these physicians expressed no willingness to work in MVS in the future. All the respondents, who reported the professional experience as their main motivation to work in MVS expressed their will to work in MVS again.

CONCLUSIONS: The financial aspect was the most important motivational factor among residents, while moral responsibility was decisive for the attending physicians. Physicians, who participated in MVS as a work duty presented both the most prevalent self-perceived burnout syndrome (32 %) and the hesitancy (48 %) to work in MVS again in the future (Tab. 4, Ref. 15). Text in PDF www.elis.sk

KEY WORDS: mass vaccination site, COVID-19; healthcare workers, vaccination, SARS-CoV-2, coronavirus.

Introduction

In China, a severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) outbreak began in late December 2019, evolving in just a few months into a pandemic (1). The global strategy to control the pandemic focused on developing and evaluating safe and effective vaccines for COVID-19 infection. On 21 December 2020, the European Medicines Agency (EMA) approved Pfizer-BioNTech as the first vaccine against SARS-CoV-2 for use in the European Union (2). Soon thereafter, other types of vaccines have been registered and delivered. To achieve a rapid vaccination administration to a substantial population cohort, the capacity of conventional health care sites (e.g., community and primary care

Tab. 1. Demographic data of the study participants.

Total sample (n = 140)	Number	Percentage (%)
Gender		
Females	98	70.0
Males	42	30.0
Age		
≤ 35	66	47.1
36 – 45	24	17.1
46 – 55	22	15.7
56 – 65	20	14.3
≥ 65	8	5.7
Occupation		
General Practice	17	12.1
Pediatrics	30	21.4
Surgery	22	15.7
Rehabilitation	11	7.9
Internal medicine	28	20.0
Anaesthetist	14	10.0
Non-clinical specialization	8	5.7
Other	10	7.1
Education		
Resident	55	39.3
Attending	85	60.7
Experience in mobile hospital		
No	132	94.3
Yes	8	5.7

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Tab. 2. Detected data of the study participants in total cohort and subgroups (role, sex, and age).

Total sample (n = 140)	Sex				Age (years)						Role		
	Total, n (%)	Males	Females	p	≤ 35	36-45	46-55	56-65	≥ 65	p	Resident	Attending	p
Work in more MVS													
No	110 (78.6)	32 (76.2)	78 (79.6)	0.653	54 (81.8)	21 (87.5)	19 (86.4)	13 (65.0)	3 (37.5)	0.014	48 (87.3)	62 (72.9)	0.044
Yes	30 (21.4)	10 (23.8)	20 (20.4)		12 (18.2)	3 (12.5)	3 (13.6)	7 (35.0)	5 (62.5)		7 (12.7)	23 (27.1)	
Number of shifts in MVS													
0 - 1	73 (52.1)	21 (50)	52 (53.1)	0.143	31 (47.0)	17 (70.8)	15 (68.2)	8 (40.0)	2 (25.0)	0.109	27 (49.1)	46 (54.1)	0.969
2	48 (34.3)	16 (38.1)	32 (32.7)		25 (37.9)	6 (25.0)	4 (18.2)	10 (50.0)	3 (37.5)		20 (36.4)	28 (32.9)	
3	12 (8.6)	1 (2.4)	11 (11.2)		6 (9.1)	0	1 (4.5)	2 (10.0)	3 (37.5)		5 (9.1)	7 (8.2)	
4	3 (2.1)	1 (2.4)	2 (2.0)		1 (1.5)	1 (4.2)	1 (4.5)	0	0		1 (1.8)	2 (2.4)	
5	4 (2.9)	3 (7.1)	1 (1.0)		3 (4.5)	0	1 (4.5)	0	0		2 (3.6)	2 (2.4)	
Shift preference													
Morning shift	49 (35.0)	10 (23.8)	39 (39.8)	0.106	20 (30.3)	10 (41.7)	5 (22.7)	9 (45.0)	5 (62.5)	0.030	18 (32.7)	31 (36.5)	0.327
Evening shift	35 (25.0)	10 (23.8)	25 (25.5)		13 (19.7)	9 (37.5)	10 (45.5)	2 (10.0)	1 (12.5)		11 (20.0)	24 (28.2)	
Full day shift	56 (40.0)	22 (52.4)	34 (34.7)		33 (50.0)	5 (20.8)	7 (31.8)	9 (45.0)	2 (25.0)		26 (47.3)	30 (35.3)	
Clarity of instructions about vaccination													
No	108 (77.1)	30 (71.4)	78 (79.6)	0.292	48 (72.7)	18 (75.0)	19 (86.4)	16 (80.0)	7 (87.5)	0.657	40 (72.7)	68 (80.0)	0.317
Yes	32 (22.9)	12 (28.6)	20 (20.4)		18 (27.3)	6 (25.0)	3 (13.6)	4 (20.0)	1 (12.5)		15 (27.3)	17 (20.0)	
Postvaccination patient education													
Always	82 (58.6)	19 (45.2)	63 (64.3)	0.110	43 (65.2)	12 (50.0)	11(50.0)	12 (60.0)	4 (50.0)	0.486	40 (72.7)	42 (49.4)	0.024
Sometimes	50 (35.7)	20 (47.6)	30 (30.6)		19 (28.8)	9 (37.5)	11(50.0)	7 (35.0)	5 (50.0)		13 (23.6)	37 (43.5)	
Never	8 (5.7)	3 (7.1)	5 (5.1)		4 (6.1)	3 (12.5)	0	1 (5.0)	0		2 (3.6)	6 (7.1)	
Professional satisfaction													
No	68 (48.6)	22 (52.4)	46 (46.9)	0.639	35 (53.0)	12 (50.0)	10 (45.5)	8 (40.0)	3 (37.5)	0.543	28 (50.9)	40 (47.1)	0.883
Don't know	15 (10.7)	3 (7.1)	12 (12.2)		5 (7.6)	5 (20.8)	3 (13.6)	2 (10.0)	0		6 (10.9)	9 (10.6)	
Yes	57 (40.7)	17 (40.5)	40 (40.8)		26 (39.4)	7 (29.2)	9 (40.9)	10 (50.0)	5 (62.5)		21 (38.2)	36 (42.4)	
Work MVS is for me													
Rest	83 (59.3)	27 (64.3)	56 (57.1)	0.286	41 (62.1)	13 (54.2)	12 (54.5)	13 (65.0)	4 (50.0)	0.920	33 (60.0)	50 (58.8)	0.911
Stress	20 (14.3)	3 (7.1)	17 (17.3)		9 (13.6)	3 (12.5)	3 (13.6)	4 (20.0)	1 (12.5)		7 (12.7)	13 (15.3)	
Don't know	37 (26.4)	12 (28.6)	25 (25.5)		16 (24.2)	8 (33.3)	7 (31.8)	3 (15.0)	3 (37.5)		15 (27.3)	22 (25.9)	
Quality of sleep after shift													
Better	23 (16.4)	9 (21.4)	14 (14.3)	0.213	12 (18.2)	3 (12.5)	3 (13.6)	3 (15.0)	2 (25.0)	0.046	8 (14.5)	15 (17.6)	0.036
Don't know	79 (56.4)	19 (45.2)	60 (61.2)		43 (65.2)	12 (50.0)	15 (68.2)	6 (30.0)	3 (37.5)		38 (69.1)	41 (48.2)	
Worse	38 (27.1)	14 (33.3)	24 (24.5)		11 (16.7)	9 (37.5)	4 (18.2)	11 (55.0)	2 (25.0)		9 (16.4)	29 (34.1)	
Motivation for participation in MVS													
Financial benefit	52 (37.1)	17 (40.5)	35 (35.7)	0.541	28 (42.4)	9 (37.5)	4 (18.2)	9 (45.0)	2 (25.0)	0.000	24 (43.6)	28 (32.9)	0.000
Moral responsibility	51 (36.4)	15 (35.7)	36 (36.7)		10 (15.2)	12 (50.0)	14 (63.6)	10 (50.0)	5 (62.5)		8 (14.5)	43 (50.6)	
Work duty	25 (17.9)	5 (11.9)	20 (20.4)		22 (33.3)	1 (4.2)	1 (4.5)	1 (5.0)	0		19 (34.5)	6 (7.1)	
Professional growth	12 (8.6)	5 (11.9)	7 (7.1)		6 (9.1)	2 (8.3)	3 (13.6)	0	1 (12.5)		4 (7.3)	8 (9.4)	
Burn out from participation in MVS													
No	114 (81.4)	35 (83.3)	79 (80.6)	0.704	55 (83.3)	19 (79.2)	21 (95.5)	13 (65.0)	6 (75.0)	0.142	47 (85.5)	67 (78.8)	0.324
Yes	26 (18.6)	7 (16.7)	19 (19.4)		11 (16.7)	5 (20.8)	1 (4.5)	7 (35.0)	2 (25.0)		8 (14.5)	18 (21.2)	
Will to work in MVS in the future													
No	30 (21.4)	8 (19.0)	22 (22.4)	0.653	16 (24.2)	4 (16.7)	5 (22.7)	4 (20.0)	1 (12.5)	0.901	11 (20.0)	19 (22.4)	0.740
Yes	110 (78.6)	34 (81.0)	76 (77.6)		50 (75.8)	20 (83.3)	17 (77.3)	16(80.0)	7 (87.5)		44 (80.0)	66 (77.6)	

Statistically significant values are marked in bold. MVS – mass vaccination site

clinics) was not sufficient. In this case, a hybrid strategy involving both conventional health care and mass vaccination sites has been proven fundamental (3). A mass vaccination center is a place for high-volume and high-speed vaccinations during infectious epidemic crises (4). They were established over a temporary period to increase the percentage of the vaccinated population in a short time and settled in non-traditional settings, large indoor (e.g., shopping malls, exhibition halls), and outdoor (e.g., squares, parking lots, stadiums) spaces. The mass vaccination center requires the participation of various healthcare professionals, support staff, and logistic support (5). Before vaccine administration, each patient undergoes a health and safety screening, including a pre-

vaccination questionnaire/interview. A physician usually performs this examination at the vaccination site, providing on-site medical care to identify and manage adverse reactions. These physicians represent various medical specialties. Some of them volunteer to work in mass vaccination centers, and others are on work duty. The role of these physicians is essential, and understanding their characteristics (e.g., motivation, self-perceived burnout syndrome, age, and specialty distribution) is essential to guide future policy and provide high-quality health services. This study was aimed to obtain the basic characteristics of the physicians employed at mass vaccination sites (MVS), highlighting their motivation to work there.

Tab. 3. Detected data of the study participants in subgroups (motivation for participation in MVS and will work in MVS in the future).

Total sample (n = 140)	Motivation for participation in MVS					Will to work in MVS in the future		
	Financial	Moral	Work duty	Experience	p	No	Yes	p
Gender								
Male	17 (32.7)	15 (29.4)	5 (20.0)	5 (41.7)	0.541	8 (26.7)	34 (30.9)	0.653
Female	35 (67.3)	36 (70.6)	20 (80.0)	7 (58.3)		22 (73.3)	76 (69.1)	
Age								
≤ 35	28 (53.8)	10 (19.6)	22 (88.0)	6 (50.0)	0.000	16 (53.3)	50 (45.5)	0.901
36–45	9 (17.3)	12 (23.5)	1 (4.0)	2 (16.7)		4 (13.3)	20 (18.2)	
46–55	4 (7.7)	14 (27.5)	1 (4.0)	3 (25.0)		5 (16.7)	17 (15.5)	
56–65	9 (17.3)	10 (19.6)	1 (4.0)	0		4 (13.3)	16 (14.5)	
≥ 65	2 (3.8)	5 (9.8)	0	1 (8.3)		1 (3.3)	7 (6.4)	
Role								
Resident	24 (46.2)	8 (15.7)	19 (76.0)	4 (33.3)	0.000	11 (36.7)	44 (40)	0.740
Attending	28 (53.8)	43 (84.3)	6 (24.0)	8 (66.7)		19 (63.3)	66 (60)	
Occupation								
General Practice	9 (17.3)	4 (7.8)	3 (12.0)	1 (8.3)	0.417	2 (6.7)	15 (13.6)	0.062
Pediatrics	7 (13.5)	8 (15.7)	12 (48.0)	3 (25.0)		12 (40.0)	18 (16.4)	
Surgery	8 (15.4)	11 (21.6)	2 (8.0)	1 (8.3)		5 (16.7)	17 (15.5)	
Rehabilitation	5 (9.6)	4 (7.8)	1 (4.0)	1 (8.3)		2 (6.7)	9 (8.2)	
Internal medicine	8 (15.4)	12 (23.5)	4 (16.0)	4 (33.3)		2 (6.7)	26 (23.6)	
Anaesthetist	7 (13.5)	5 (9.8)	1 (4.0)	1 (8.3)		2 (6.7)	12 (10.9)	
Non-clinical specialization	3 (5.8)	4 (7.8)	1 (4.0)	0		1 (3.3)	7 (6.4)	
Other	5 (9.6)	3 (5.9)	1 (4.0)	1 (8.3)		4 (13.3)	6 (5.5)	
Professional satisfaction with work								
No	32 (61.5)	17 (33.3)	17 (68.0)	2 (16.7)	0.004	25 (83.3)	43 (39.1)	0.000
Don't know	3 (5.8)	8 (15.7)	3 (12.0)	1 (8.3)		2 (6.7)	13 (11.8)	
Yes	17 (32.7)	26 (51.0)	5 (20.0)	9 (75.0)		3 (10.0)	54 (49.1)	
Quality of sleep after shift								
Better	9 (17.3)	11 (21.6)	1 (4.0)	2 (16.7)	0.006	3 (10.0)	20 (18.2)	0.559
Don't know	20 (38.5)	31 (60.8)	19 (76.0)	9 (75.0)		18 (60.0)	61 (55.5)	
Worse	23 (44.2)	19 (17.6)	5 (20.0)	1 (8.3)		9 (30.0)	29 (26.4)	
Burn out from participation in MVS								
No	39 (75.0)	46 (90.2)	17 (68.0)	12 (100.0)	0.021	18 (60.0)	96 (87.3)	0.001
Yes	13 (25.0)	5 (9.8)	8 (32.0)	0		12 (40.0)	14 (12.7)	
Will to work in MVS in the future								
No	9 (17.3)	9 (17.6)	12 (48.0)	0	0.002			
Yes	43 (82.7)	42 (82.4)	13 (52.0)	12 (100.0)				

Statistically significant values are marked in bold. MVS ≤ mass vaccination site

Methods

Study design

This study is a nationwide questionnaire-based cross-sectional Internet survey. The authors of this research designed a set of 21 questions to investigate the physicians' perceptions of their experience with MVS. The questionnaire also included items to collect basic demographic data and professional experience. Additionally, specific information on sleep quality and burnout syndrome was also collected. The study period was from August 1 to September 1, 2021.

Study participants

An anonymous online survey was developed and sent by email to MVS coordinators through the Czech Republic with the request of their distribution between the physicians working in MVS under their supervision. Physicians, who worked in MVS, who voluntarily decided to participate in the survey and accessed it through an online link on the dedicated platform, received the invitation by email. Unfinished questionnaires were excluded from the analysis.

Ethical issues

Participation/denial of the study did not pose any risk and was voluntary. All the study volunteers were informed about the study on the first page of the questionnaire, and filling it in was considered as consent with participation in the study. The work described was carried out in accordance with The Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans. This study was approved by the Ethics Committee of the General Teaching Hospital in Prague (174/21 S-IV), and authorized by the institutions, where it was performed.

Statistical analysis

The Statistical Package for Social Sciences (SPSS), version 25 (SPSS Inc., Chicago, Illinois, USA), was used for data analysis. Descriptive variables are presented as numbers and percentages. The chi-square independence test was performed to assess the difference in the distribution of categorical variables between multiple groups. Statistical significance was considered as the p-value of less than 0.05.

Results

At the beginning of this study analysis, we excluded seven questionnaires that were considered incomplete. Subsequently, we analysed the responses of 140 questionnaire respondents (30.0 % men and 70.0 % females). Detailed socio-demographic data and distribution by medical specialty are reported in the Table 1. Data on personal experience of physicians working in MVS with respect to age, sex, and role are presented in the Table 2. Operating in more than one MVS was more frequent among attending physicians, particularly among those over 65 years of age ($p=0.014$), compared to residents ($p=0.044$). Self-perceived sleep quality following a shift in MVS was worse in attending physicians, particularly in those aged 56 to 65 years ($p=0.046$), compared to residents ($p=0.036$). As the main motivation for participating in MVS, residents (43.6 %) reported primarily a financial benefit, while a moral responsibility was more common in attending physicians (50.6 %), ($p<0.0001$). Regarding the desire to work in MVS in the future, 78.6 % of the physicians responded positively, regardless of their sex, age, and role (all $p>0.05$). Physician burnout was more prevalent (32 %) in those study participants, who worked in MVS as part of their work duty. 48 % of these physicians expressed no willingness to work in MVS in the future. All the respondents, who reported the professional experience as their main motivation to work in MVS expressed their will to work in MVS again. Table 3 presents the analysis of motivation to work in MVS and the will to work in MVS in the future with respect to socio-demographic data and selected work-related outcomes (e.g., physician burnout, quality of sleep, professional satisfaction). Among the physicians, who expressed their desire to work in MVS in the future, most were employed in one single MVS ($p=0.026$) and did not report burnout ($p=0.001$). On the other hand, 83.3 % of physicians, who do not want to work in MVS in the future reported no professional satisfaction ($p<0.0001$). Table 4 presents the general subjective impression of physicians about the appearance of side effects and reactions after vaccination and how the patients understand the pre-vaccination questionnaire.

Discussion

This cross-sectional survey was aimed to determine the motivation of the physicians to work in MVS and to explore if they would be in favour of working there again in the future, if for some reasons needed (e.g., in case of a new SARS-CoV-2 mutation or another epidemic situation). Additionally, data on self-perceived physician burnout, professional satisfaction, and sleep quality were also collected and analyzed. This is believed to be the first study to investigate the working environment in the MVS during COVID-19 pandemic from the physician's perspective. In the present study, 43.6 % of the residents reported a financial benefit, followed by work duty (34.5 %) as the primary motivating factor for participating in MVS. However, moral responsibility (50.6 %), followed by financial benefit (32.9 %), was reported as the primary motivation of the attending physicians. On the other hand, professional experience/growth with a frequency of 7.3 % among residents and 9.4 % among attending physicians was the least common on

Tab. 4. Physician reported postvaccination side effects/reactions in MVS – tentative judgement.

Total sample (n = 140)	Number	Percentage (%)
Average number of patients/hour		
≤ 50	68	48.6
50–100	62	44.3
≥ 100	10	7.1
Questionnaire misunderstanding by patients		
No	70	50.0
Yes	70	50.0
Any reaction after vaccination		
≥ 50 % of patients	52	37.1
≤ 50 % of patients	39	27.9
≤ 20 % of patients	32	22.9
≤ 1 % or never	17	12.1
Immediate/early reaction		
Precollapse	85	60.7
Anaphylaxis	2	1.4
None	53	37.9
Delayed reaction		
Pain	128	91.4
Fever	56	40.0
Skin redness	21	15.0
Fatigue	81	57.9
Upper limb oedema	14	10.0
Swollen lymph nodes	11	7.9
None	3	2.1

MVS – mass vaccination site

average. According to dualistic motivation theory, financial, moral motivation, and work duty can be considered extrinsic motivating factors (6). Because intrinsic and extrinsic motivating factors can interact, improving the environment toward a better professional growth (e.g., providing clear vaccination guidelines, educational activities, and participation in scientific research) could increase the number of physicians, who would like to work in MVS in the future. We consider it noteworthy to investigate further if the responding physicians would work in MVS again in the future if needed. Regarding the question, if respondents expressed their will to participate in MVSs in the future, 20 % of the residents and 22.4 % of the attending physicians responded negatively, regardless of their sex, age, and role. When further analysing this question, our results showed that 40 % of the physicians with self-reported physician burnout responded negatively. Physician burnout was more prevalent (32 %) in those study participants, who worked in MVS as part of their work duty. Notably, 48 % of those physicians expressed their will not to work in MVS in the future. In contrast, all the respondents, who reported the professional experience as their main motivation to work in MVS expressed their will to work in MVS again. Considering our results, it seems that physician burnout is an important predictor of the will to continue working in MVS. Several studies showed a prevalence of physician burnout between 25–60 % across a broad spectrum of medical specialties (7). The 2012 study found that 47 % of 7288 physicians had experienced burnout syndrome, which exceeded its prevalence in the general population (8). Our results showing a burnout prevalence of 18.6 % should be judged with caution because they relate only to temporary, short-term employment. Furthermore, our study

did not show an increased incidence of work-related stress, as reported by physicians working in MVS. Only a few studies investigated physician burnout and mental distress related to short-term employment. Our results appear to be in line with the survey by Ager et al. that described a lower proportion of participants, who presented symptoms of post-traumatic stress disorder among aid workers in northern Uganda than would be expected (9). This is also supported by another study that reported an improvement in burnout scores among short-term medical mission workers (mostly physicians and nurses) in South America (10). When analyzing our results further in the group of attending physicians, employment in more MVSs was more common than in the residents. This was predominantly manifested in the age group over 65 years of age. We can speculate that this observation resulted from their retirement or semiretirement, thus allowing better time flexibility for these physicians. When speaking of the quality of sleep self-perceived by attending physicians after the change in MVS, 55 % of those surveyed between 56 and 65 years of age reported sleep disturbances, therefore, more than other age groups. This observation is in line with a higher prevalence of insomnia in the older population (11). On the other hand, among those physicians over 65 years of age, sleep disturbance was observed in only 25 %. This fact may again be related to the retirement or semiretirement of these respondents. Interestingly, with regard to post-vaccination patient education, only 49.4 % of attending physicians responded that they provided these instructions ‘always’ compared to 72.7 % positive answers of residents. This face-to-face education intervention on vaccination and the post-vaccination regime was generally found to be insufficient, although it can improve patients’ comfort and decrease a vaccine hesitancy (12, 13). On the other hand, 77.1 % of the participants in this study reported a general ambiguity in the vaccination recommendations/guidelines. Providing clear and concise recommendations on vaccination contraindications, time interval between doses or since COVID-19 infection, the relevance of antibody level, post-vaccination regime, etc. may improve the confidence of vaccinators and thus compliance with providing patient education intervention. It is important to note that a significant percentage of physicians and healthcare workers could suffer from psychological distress and general issues related to the COVID-19 pandemic (14, 15). However, this cross-sectional survey showed that only 18.7 % of the physicians reported burnout from working in MVS. On the other hand, professional satisfaction was low (40.7 %). We retain that the role of physicians involved in mass vaccination is crucial, and their psychological characteristics (e.g., motivation, self-perceived burnout syndrome) should be carefully monitored to guarantee high-quality health services. Among the limitations, the authors admit that there is a lack of validated instruments to assess physician burnout, sleep quality, and professional satisfaction. Furthermore, an extrapolation of our results to conditions in other countries should be taken with caution. We have also collected data on physician-reported post-vaccination side effects/reactions, as shown in Table 4. Importantly, this represents tentative and retrospective data. Therefore, this table should only be considered as perceived by a physician. As such, arriving at strong conclusions can be misleading.

Conclusions

When speaking about the participation of the physicians in MVS during the COVID-19 pandemic, we may conclude that a financial aspect was the most important motivational factor among the residents. At the same time, moral responsibility was crucial for attending physicians. Furthermore, our first and preliminary results imply a poor professional satisfaction of these physicians, although most of them (78.6 %) expressed their desire to work as vaccinators again in the future, if necessary. We found that physicians, who participated in MVS as a work duty presented with the most prevalent self-perceived burnout syndrome. In this group, only 52 % of the respondents expressed their desire to work in MVS again in the future. Thus, future research is warranted to investigate better the real motivation of physicians working in mass vaccination centers, make the working environment more attractive, and identify the most appropriate physicians to counteract the COVID-19 (or other infectious diseases) epidemic.

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