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Perception of the Congolese population on Covid-19 vaccination: cross-sectional survey of online

Abstract

COVID-19 vaccines will become available in Democratic Republic of Congo soon. Understanding communities' responses to the forthcoming COVID-19 vaccines is important. We was conducted an analytical cross-sectional study online in 26 provinces of the Democratic Republic of Congo during the period from January to March 2021. A total of 11971 responses were included; mean age of respondents was 35.1±10.4 years; 79.4% were males; 90.5% had university school education and 55.4% has a high socioeconomic level. A frequency of poor perception of covid-19 vaccination is 75.6%. In a multivariable regression model, age between 46-55 years, 36-45 years and 26-35 years (aOR=1.54, CI: 1.27-1.87, aOR=1.70 CI: 1.35-2.13 and aOR =3.40, CI: 2.78–4.17, respectively), None profession and liberal profession (aOR=1.75, CI: 1.49-3.34 and aOR=2.52, CI: 1.89-3.34, respectively), moderate and low socioeconomic level (aOR=3.06, CI: 2.64-3.56 and aOR=5.89, CI: 4.11-8.38, respectively), Low and very low risk of infection with COVID-19 (aOR=1.67, CI: 1.07-1.97 and OR=2.66, CI: 1.36-3.04, respectively; Moderate, low and very low risk of getting sick if you are infected (aOR=1.49, CI: 2.08-2.98, aOR=2.97 CI: 2.45-3.59 and aOR=3.89, CI: 3.11-4.82, respectively) were associated with a poor perception COVID-19 vaccination. In conclusion, the frequency of misperception in the Congolese population is high. It is associated with the poor perception of the disease and the socio-demographic characteristics of individuals.

Keywords: COVID-19, perception, covid-19 vaccination, determinants

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Introduction

Since the start of the pandemic, several surveys have been conducted in the population of world and in the Democratic Republic of Congo (DRC) to know the intention of people to receive a vaccine or not against the 2019 coronavirus disease (COVID-19).[1,2] The analysis of its surveys, although they target a fairly homogeneous group of the population (older adults aged eighteen years), nevertheless provides useful information regarding the attitudes of the Congolese population towards vaccines against COVID-19.[3,4] The acceptability of this vaccination in certain groups of the population who might be targeted first.[5] Overall, we note that a majority of Congolese express the intention to receive a vaccine against COVID-19.[6] We observed, however, a downward trend in favorable intentions in a more diminished environment. The fear of side effects and the poor perceived effectiveness of vaccines are the main reasons for not intending to be vaccinated against COVID-19 as reported in several studies carried out around the world.[7–15] A number of participants spoke of the futilities of vaccination in the face of the pandemic.[3] To induce motivations for resorting to vaccination, the personal protection conferred by a vaccine against COVID-19 is cited in certain studies.[12–15] In the same vein, studies showing the perception of COVID-19 vaccination in the DRC have not yet been carried out. We considered that Covid-19 could be perceived as a social fact unrelated to the medical causes and that the effectiveness of the vaccine was often questioned because it does not necessarily meet the expectations of population in terms of health. This study, therefore wants to show how the Congolese perceive vaccination against COVID-19 on the one hand and on the other hand to research the socio-demographic factors associated with the poor perception of vaccination against covid-19.

Materials and methods

Study setting and design

An analytical cross-sectional study was conducted online in 26 provinces of the DRC during the period from January to March 2021. The study population consisted of the inhabitants of the DRC. Anyone who was at least 18 years old and freely agreed in writing or orally to participate in the study was included. Congolese living abroad or people with a known mental disorder were not included in these surveys. Respondents who did not answer two-thirds of the

questionnaire questions during the survey were excluded from the study. Systematic probability sampling-The sample size is calculated from Fisher's formula: $n \geq \frac{Z^2 * (p) * (1-p)}{d^2}$ where n=Sample size, z=1.96 (confidence coefficient), p=previous prevalence, d=0.05 (margin of error or range of imprecision reflecting the degree of absolute precision desired). Because of the probable non-responding subjects, 10% of the number calculated at the height should be added. We have been estimated that the frequency of poor perception about COVID-19 vaccination is 50%, as mentioned in the literature, in the absence of a prevalence of such a documented in the country. The sample size thus calculated was $n \geq \frac{1.96^2 * 0.50 * 0.50}{(0.05)^2}$ =384. By including the 10% of non-respondents, we obtained 422 people to question. Assuming that 422 people must answer the questionnaire in each province, the sample was multiplied by 26, which gives a size of 10,972 people.

The data was collected from a questionnaire designed using a Gmail link which should be sent to a correspondent by WhatsApp whose number we had. Whoever receives it should send it to other people he knows and so on. The questionnaire was put online and could be taught by anyone in the DRC, the links and the QR-code allowing access to the survey were distributed to correspondents by WhatsApp of the people who made part of the participants therefore relied mainly on the "snowball" effect after validation of consent, access to the questionnaire did not require identification and the responses were completely anonymous. The principal investigator was responsible for the data collected via a confidentiality email. The variables of interest were made up of the socio-demographic and economic characteristics of the respondents, including: sex, age, marital status, religion, level of education, family composition, socioeconomic level of households, and monthly income were considered. Then the variables specific to vaccination (knowledge and perception of vaccines, past experiences and behaviors on the vaccine, knowledge and assessment of risks related to COVID-19and acceptance of the COVID-19 vaccination). The poor perception was defined in any individual who considered that the COVID-19 vaccination was as an excuse to exterminate the African population, as a badge to bring the population to join the lodge. It is also defined as does not actually work to prevent COVID-19 and to be able to be infected by COVID-19 by getting vaccinated.

Data processing and analyses

The data collected was then transferred to SPSS for Windows version 21 for processing and analysis. Categorical variables were presented as absolute and relative frequency, quantitative variables were summarized by measures of central tendency and dispersion. The mean and its standard deviation were reported for variables with a normal distribution. Comparison of proportions was performed using Pearson's Chi-square or Fischer's exact test. Student's t test made it possible to compare the means. The factors determining the poor perception of the covid-19 vaccination were examined in a bivariate model and were included in the logistic regression models when they were associated with the dependent variable in multivariate analysis. Variables not contributing significantly (P≥0.05) were gradually excluded to obtain the final models. The calculated adjusted ORs were used to estimate the degree of association between the dependent variables and the independent variables. The p-value <0.05 was the threshold of statistical significance.

Ethical considerations

The study protocol was approved by the National Health Ethics Committee of the DRC under Approval No.239/CNES/BN/PMMF/2021. Data were collected online anonymously and were only available to study investigators using passwords.

Results

Perception on the vaccine

This figure indicates a frequency of 75.6% of the misperception on vaccination against covid-19 in the Congolese population (Figure 1).

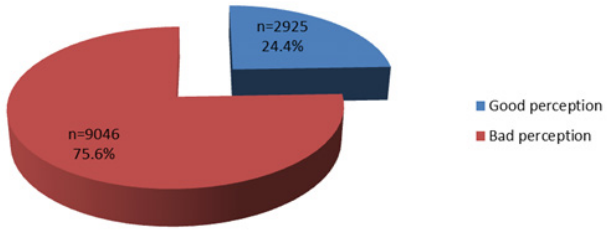

Figure 1 Frequency of poor and good perception of covid-19.

Different types of perception on the COVID-19-Vaccination

In the Congolese population, 66.5% fear that the COVID-19 vaccine does not really work to prevent COVID-19, 49.9% fear that after vaccination, they will get infected with COVID-19, 49.7% fear that the COVID-19 vaccine is being used as an excuse to exterminate the African population and 43.2% perceive the covid-19 vaccine to be used as a badge to bring the population to join the lodge (Figure 2). The mean age of the respondents was 35.1±10.4 years, it is significantly lower among those with poor perception of the vaccine (p<0.001). Men were more numerous sex ratio of 3M/ 1F, the majority were of higher or university level (90.7%), civil servant in 39.3%, low socioeconomic level in 25.8% and high in 55.4%, Catholic religion (41.9%), married in 41.9% and living in Kinshasa in 65.2%. the comparison of the socio-demographic characteristics of respondents with good perception and bad perception were statistically different (p <0.05) (Table 1). This table indicates that knowledge about routine vaccines, about the risks of transmission of covid-19 were significantly higher among respondents with a good perception than those with a poor perception (p <0.05) (Table 2).

In a multivariable regression model, age between 46-55 years, 36-45 years and 26-35 years (aOR=1.54, CI: 1.27-1.87, aOR =1.70 CI: 1.35-2.13 and aOR=3.40, CI: 2.78–4.17, respectively), None profession and liberal profession (aOR=1.75, CI: 1.49-3.34 and aOR=2.52, CI: 1.89-3.34, respectively), moderate and low socioeconomic level (aOR=3.06, CI: 2.64-3.56 and aOR =5.89, CI: 4.11-8.38, respectively), Low and very low risk of infection with covid-19 (OR=1.67, CI: 1.07-1.97 and OR=2.66, CI: 1.36-3.04, respectively; Moderate, low and very low risk of getting sick if you are infected (aOR=1.49, CI: 2.08-2.98, aOR=2.97 CI: 2.45-3.59 and aOR =3.89, CI: 3.11-4.82, respectively) were associated with a poor perception covid-19 vaccination (Table 3).

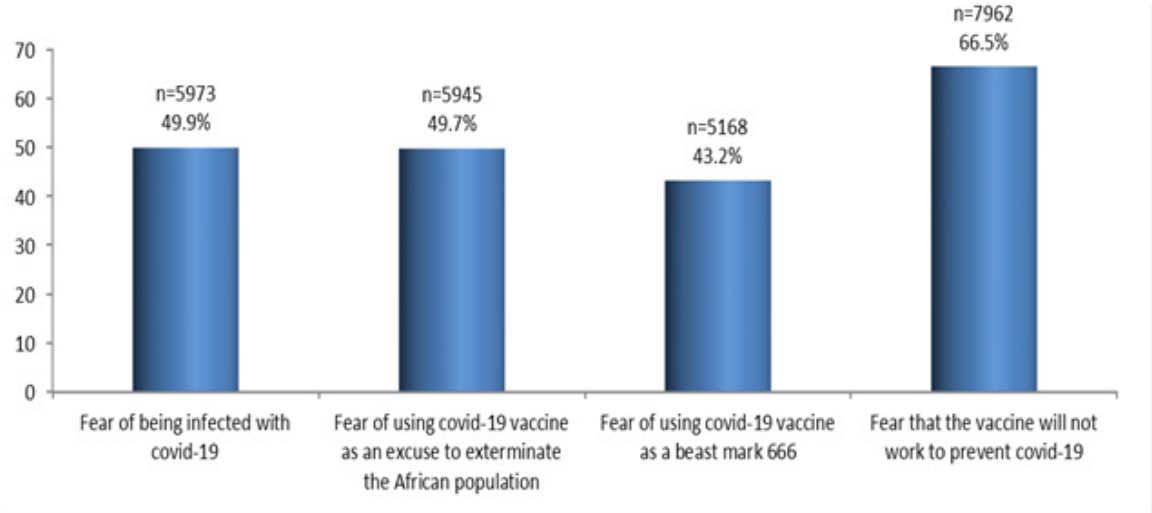

Figure 2 Different types of perception of the vaccine against covid-19 by the Congolese population.

Table 1 Sociodemographic characteristics of the study population and perception

Variables	Over all n=11971 (%)	Good perception n=2925 (%)	Poor perception n=9046 (%)	p
Age	35.1±10.4	36.6±12.7	34.6±9.4	<0.001
≤25 years	2306(19.3)	569(19.5)	1737(19.2)	
26-35 years	4930(41.2)	1217(41.6)	3713(41.0)	
36-45 years	2924(24.4)	527(18.0)	2397(26.5)	
46-55 years	1196(10.0)	306(10.5)	890(9.8)	
>55 years	615(5.1)	306(10.5)	309(3.4)	
Sex				<0.001
Male	9502(79.4)	2516(86.0)	6286(77.2)	
Female	2469(20.6)	409(14.0)	2060(22.8)	
Education level				0.036
None and Primairy	603(5.0)	122(4.2)	481(5.3)	
Secondary	514(4.3)	134(4.6)	380(4.2)	
University	10854(90.7)	2669(91.2)	8185(90.5)	
Profession				<0.001
None	1167(9.7)	240(8.2)	927(10.2)	
Official	4706(39.3)	1162(39.7)	3544(39.2)	
Liberal	3952(33.0)	872(29.8)	3080(34.0)	
Student	2146(17.9)	651(22.3)	1495(16.5)	
Socioeconomic level				<0.001
Low	3087(25.8)	480(16.4)	2607(28.8)	
Moderate	2247(18.8)	480(16.4)	1767(19.5)	
High	6637(55.4)	1965(67.2)	4672(51.6)	
Religion				<0.001

Citation: Nkodila AN, Lukanu PN, Mbendi CN et al. Perception of the Congolese population on Covid-19 vaccination : cross sectional survey of online. *Int J Vaccines Vaccination.* 2021;6(1):12–19. DOI: 10.15406/ijvv.2021.06.00110

Table Continued

Variables	Over all n=11971 (%)	Good perception n=2925 (%)	Poor perception n=9046 (%)	p
Catholic	5015(41.9)	1400(47.9)	3615(40.0)	
Protestante	3090(25.8)	871(29.8)	2219(24.5)	
Revival church	3761(31.4)	654(22.4)	3107(34.3)	
Black church	105(0.9)	0(0.0)	105(1.2)	
Marital status				<0.001
Marrid	5017(41.9)	1142(39.0)	3875(42.8)	
Single	6594(55.1)	1783(61.0)	4811(53.2)	
Divorced	360(3.0)	0(0.0)	360(4.0)	
Region				<0.001
Kinshasa	7800(65.2)	1749(59.8)	6051(66.9)	
Haut Katanga	1933(16.1)	834(28.5)	1099(12.1)	
Haut Uélé	240(2.0)	0(0.0)	240(2.7)	
Kasai	326(2.7)	0(0.0)	326(3.6)	
Kongo Central	465(3.9)	240(8.2)	225(2.5)	
Kwango	344(2.9)	0(0.0)	344(3.8)	
Kwilu	345(2.9)	0(0.0)	345(3.8)	
Lomami	104(0.9)	0(0.0)	104(1.1)	
Nord Kivu	414(3.5)	102(3.5)	312(3.4)	

Table 2 Knowledge, perception of the disease, and perception of vaccination

Variables	Over all n=11971(%)	Good perception n=2925 (%)	Poor perception n=9046 (%)	p
Understanding how vaccines work	9895(82.7)	2701(92.3)	7194(79.5)	<0.001
Know the routine vaccination	1285(94.3)	2925(100.0)	8360(92.4)	<0.001
Know the vaccines recommended for adults	10745(89.8)	2085(95.9)	7940(87.8)	<0.001
Vaccines can prevent infectious diseases				<0.001
Strongly disagree	825(6.9)	240(8.2)	585(6.5)	
Disagree	895(7.5)	120(4.1)	775(8.6)	
Indifferent	1150(9.6)	0(0.0)	1150(12.7)	
I agree	6947(58.0)	1507(51.5)	5440(60.1)	
Strongly agree	2154(18.0)	1058(36.2)	1096(12.1)	
Important for everyone to get vaccinated				<0.001
Strongly disagree	1690(14.1)	0(0.0)	1690(18.7)	
Disagree	2731(22.8)	360(12.3)	2371(26.2)	
Indifferent	1619(13.5)	105(3.6)	1514(16.7)	
I agree	3971(33.2)	1489(50.9)	2482(27.4)	
Strongly agree	1960(16.4)	971(33.2)	989(10.9)	
I believe my community is better protected against COVID				<0.001
Strongly disagree	1913(16.0)	120(4.1)	1793(19.8)	
Disagree	3216(26.9)	360(12.3)	2856(31.6)	

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Table Continued

Variables	Over all n=11971(%)	Good perception n=2925 (%)	Poor perception n=9046 (%)	p
Indifferent	2087(17.4)	209(7.1)	1878(20.8)	
I agree	3679(30.7)	1586(54.2)	2093(23.1)	
Strongly agree	1076(9.0)	650(22.2)	426(4.7)	
I believe most people tolerate vaccination very well.				<0.001
Strongly disagree	2066(17.3)	120(4.1)	1946(21.5)	
Disagree	4084(34.1)	425(14.5)	3659(40.4)	
Indifferent	1465(12.2)	314(10.7)	1151(12.7)	
I agree	4029(33.7)	1841(62.9)	2188(24.2)	
Strongly agree	327(2.7)	225(7.7)	102(1.1)	
I believe the risks of vaccination are only the benefits				<0.001
Strongly disagree	1602(13.4)	0(0.0)	1602(17.7)	
Disagree	2562(21.4)	769(26.3)	1793(19.8)	
Indifferent	2623(21.9)	411(14.1)	2212(24.5)	
I agree	4564(38.1)	1437(49.1)	3127(34.6)	
Strongly agree	620(5.2)	308(10.5)	312(3.4)	
I know someone has contracted a vaccine preventable disease	4930(41.2)	1720(58.8)	3210(35.5)	<0.001
Knowing someone with covid-19	8297(69.3)	2016(68.9)	6281(69.4)	0.309
I believe my risk of being infected with COVID-19 is				0.001
Very low	3913(32.7)	555(19.0)	3358(37.1)	
Low	3254(27.2)	888(30.4)	2366(26.2)	
Moderate	2505(20.9)	632(21.6)	1873(20.7)	
High	2299(19.2)	850(29.1)	1449(16.0)	
I believe my risk of getting very sick if I am infected				0.001
Very low	4463(37.3)	672(23.0)	3791(41.9)	
Low	3739(31.2)	959(32.8)	2780(30.7)	
Moderate	2317(19.4)	666(22.8)	1651(18.3)	
High	1452(12.1)	628(21.5)	824(9.1)	

Table 3 Determinants of poor perception about covid-19 vaccination

Variables	p	Unadjusted OR (95%CI)	p	Adjusted OR (95%CI)
Age				
>55 years		Ref		Ref
46-55 years	0.001	3.02 (2.51-3.64)	0.031	1.54 (1.27-1.87)
36-45 years	0.001	3.02 (2.55-3.58)	0.039	1.70 (1.35-2.13)
26-35 years	<0.001	4.50 (3.75-5.41)	<0.001	3.40 (2.78-4.17)
≤25 years	0.011	2.88 (2.35-3.53)	0.22	1.33 (0.42-1.70)
Sex				
Male		Ref		Ref
Female	<0.001	1.81 (1.62-2.04)	0.059	1.82 (0.59-2.07)

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Table Continued

Variables	p	Unadjusted OR (95%CI)	p	Adjusted OR (95%CI)
Education level				
University		Ref		
Secondary	0.015	1.27 (1.05-1.58)	0.112	1.62-0.42-1.85)
Primary	0.447	0.93 (0.76-1.13)	0.239	1.24 (0.59-1.45)
Profession				
Official	<0.001	Ref		Ref
None	<0.001	1.68 (1.42-1.99)	0.001	1.75 (1.49-3.34)
Student	0.25	1.33 (0.19-1.49)	0.111	1.22 (0.47-1.43)
Libéral	0.001	1.54 (1.37-1.73)	0.001	2.52 (1.89-3.34)
Socio-économic level				
High		Ref		Ref
Moderate	0.001	1.55 (1.38-1.74)	0.001	3.06 (2.64-3.56)
Low	0.001	2.28 (2.05-2.55)	<0.001	5.89 (4.11-8.38)
Risk of infection with covid-19				
High		Ref		Ref
Moderate	0.001	1.56 (1.39-1.75)	0.12	1.24 (0.49-1.47)
Low	0.001	1.74 (1.54-1.96)	0.005	1.67 (1.07-1.97)
Very low	<0.001	3.55 (3.14-4.02)	0.001	2.66 (1.36-3.04)
Risk of getting sick if you are infected				
High		Ref		Ref
Moderate	0.001	1.89 (1.65-2.17)	<0.001	2.49 (2.08-2.98
Low	0.001	2.21 (1.95-2.51)	0.001	2.97 (2.45-3.59)
Very low	<0.001	4.30 (3.77-4.91)	0.002	3.89 (3.11-4.82))

Discussion

Inscribed in Pastorium logic, vaccination against covid-19 underlines a separation between modern and scientific knowledge; and local and lay knowledge. From a WHO and public health perspective, vaccination against covid-19 is a safe and cost-effective way to effectively combat covid-19 and the incidence of mortality associated with it. Aiming at the eradication of covid-19, the objectives and principles of vaccination are based on a global vision in the population. For public health, vaccination is an essential component of human rights and a responsibility of the population, making mass campaigns legitimate. People find it difficult to adhere to these principles because they go beyond the idea of contributing to the health of the population. The principles defended during vaccinations against covid-19 may even be in opposition to the expectations of the population. The logical conflicts lie in the perception of the covid-19 vaccine[16] conveyed by the altruistic aspect of the vaccination acts. In this study, the population feared vaccination against covid-19 as a mean of reducing the African population (50%). Furthermore the rumors around the COVID-19 vaccination notably used as a badge to bring the population to join the lodge (43%), as a means of introducing covid-19 into the population (50%) and as a means that will not go not act to reduce contamination (67%). This conception of introducing or contaminating the population is due to the circulation of the virus. According to the Congolese population, COVID-19 is a disease imported from outside. By vaccinating the population, they are still infecting COVID-19. Instead of protecting themselves, the population will fall sicker.

Like modern medicine, the population's knowledge of covid-19 constitutes an important collection of advice and measures to be taken, based on the experiences of healthcare professionals. This study has shown that vaccination against covid-19 does not meet the expectations of the population in terms of prevention because it relies above all on other objectives such as eradication, which constitutes a long-term action, which the population cannot therefore perceive directly. Vaccination must above all meet a need for "optimal healing"[17] requiring the interaction of local knowledge and the characteristics of the population to be vaccinated. It is fitting to underline in this study the importance of awareness and information in the eyes of the population to be vaccinated, and to reassure them about the effects of vaccines and dispel rumors. However, the messages disseminated to the population through social networks and stories do not seem to contribute to the knowledge of the population about the covid-19

vaccine. It is therefore important to improve the information systems concerning vaccination against covid-19. This task falls primarily to community workers who are in-charge of mass immunizations should provide insight about benefits of vaccination.[18,19]

The search for health care of the population depends essentially on the perception of its importance.[20] Several factors explain the poor perception of the vaccine against covid-19. With regard to this misperception, the related factors were mainly the young age of the population, the lack of profession and the liberal profession, the socioeconomic level of the population and the misperception of covid-19 itself. All of these factors are certainly related to the lack of adequate information about the covid-19 vaccine. Several studies have shown that belonging to a high socioeconomic level is associated with a good perception of the Covid-19 vaccine.[21–29] Older people have a good conception of the fact that they are more exposed to the disease and therefore they are more aware of perceiving vaccination as a lifesaving age.[22] Surprisingly the unemployed and self-employed people are likely to perceive the wrong way for receiving the covid-19 vaccine. This is a problem because since the majority of them have a low socioeconomic level, think that the disease does not exist, they are not exposed. They are therefore the vector of disease transmission. A study carried out in Canada has shown that the poor dissemination and lack of information of the population about this vaccine are the factors linked to this poor perception.[28]

Certain limitations must be recognized in this study. First, our respondents are not representative of the general population in each province where the survey was conducted. Only people with an Internet connection were able to participate in the study. As the level of education of our workers was higher than that of the general population, we speculate that the reluctance of the general population to immunize may even be greater. Self-reports can lead to recall bias and influence our results. The cross-sectional nature of this investigation precludes us from drawing causal inferences.

Conclusion

The regression model revealed that there was an association between socio-demographic factors, perception of covid-19 disease, and the poor perception of the COVID-19 vaccination. It clearly emerges from the important results for a poor perception on the existence and the risk of contamination of the COVID-19 as well as to eradicate this bad perception. The health authorities should concentrate on the aspects related to the disease. This could be especially important in encouraging COVID-19 vaccination uptake in the later stages of the epidemic, as people are not likely to be well informed about the disease, and have bad conceptions. The elimination these misunderstandings and concerns will likely increase the intention to be vaccinated for the next campaign the DRC would organize.

Author's contributions

All authors contributed to data analysis, drafting or revising the article, have agreed on the journal to which the article will be submitted, gave final approval of the version to be published, and agree to be accountable for all aspects of the work.

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Conflits of interest

The authors declare no conflict of interest.

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