

# Individual Factors Associated with Uptake of Covid Vaccine Among Matatu Crew in Meru Matatu Stage, Meru County, Kenya

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**Abstract** The uptake of COVID-19 vaccines is an essential aspect towards enabling effective control on the spread of the virus. It is important that matatu crew, together with the vulnerable groups should receive vaccination to lower the incidence and disease transmission rate. In the Covid 19 vaccination campaign this group has been greatly sidelined. The study is aimed at determining individual factors that predict uptake of the Corona Virus 19 vaccine amongst the Matatu crew in Meru matatu stage. The study population was Matatu crew in Meru matatu stage. Sampling size determination was done using the Fischer's formula. The sampling technique was systematic among the drivers, touts and conductors in Meru Matatu stage, while purposive selection was done among the key informants. The study used of questionnaire for quantitative and for qualitative data collection an interview guide was used. Data analysis from the self-administered questionnaire was analyzed quantitatively using descriptive statistics like frequencies and proportions. Chi-square analysis was used to capture associations amongst the categorical variables. Further, statistical significance was placed at  $p < 0.05$ . Qualitative data was analyzed through the use of thematic analysis. Results were presented in tables, pie charts and bar graphs for ease of understanding. The study found a low uptake of Covid 19 vaccine among the Matatu operators. Individual characteristics such age ( $\chi^2=11.94$ ,  $\alpha=0.008$ ), duty ( $\chi^2=99.98$ ,  $\alpha=0.00$ ) marital status ( $\chi^2=35.891$ ,  $\alpha=0.00$ ), education level ( $\chi^2=32.39$ ,  $\alpha=0.00$ ), gender ( $\chi^2=9.021$ ,  $\alpha=0.002$ ) were significantly associated with low COVID 19 uptake among the Matatu Crew operators. The study concluded that there was low uptake of Covid -19 vaccine among the Matatu crew in Meru and this was affected mostly by the individual characters of the crew. From the findings, the study recommended that the county health team should involve and train the Sacco official to deliver the Covid 19 vaccine. Further research should be done to determine other social mechanisms of improving Vaccine uptake and reducing misinformation towards emergency vaccines.

**Keywords** Matatu crew, Predictors, Vaccination, Vaccine uptake

## 1. Introduction

The recently experienced global pandemic caused by Coronavirus disease 2019 (COVID-19) which is largely spread via respiratory droplets has resulted in a sudden substantial rise in hospitalizations for pneumonia related symptoms and/or with multiple organ failure (Pan *et al.*, 2020). Of great concern is the fact that the disease can be transmitted by both asymptomatic and symptomatic carriers. It takes approximately one week for symptoms to show, within which the asymptomatic person will still be infectious. Commonly, the symptoms are mimic common cold and flu, with most patients presenting with shortness of breath, dry cough and fever (Cheng *et al.*, 2021).

COVID-19 was first reported in Wuhan, China from a

group of patients presenting with pneumonia of unknown etiology at the close of 2019 (Pan *et al.*, 2020). It then spread all over the world within a short time. In as much as some of the people who contract the COVID-19 disease only experience mild or moderate symptoms and thereafter recover with ordinary common cold treatment, some become seriously ill and require specialized medical attention with critical hospitalization (Cheng *et al.*, 2021).

Natural immunity can be acquired from getting the virus that causes COVID-19 and this may give some protection. However, the risk that comes with severe illness, strain on the healthcare system and deaths associated with COVID-19 dwarf benefits of natural immunity (WHO, 2021). COVID-19 vaccination is therefore necessary to help in creating an antibody response without this risk of severe disease. Currently, more than one hundred vaccines are being investigated and several of them are already authorized by medical agencies. The infection rates of COVID-19 cases highlights the need to ensure increased levels of vaccination to limit the spread of the disease (Mant *et al.*, 2021).

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Despite multiple vaccines that have been introduced to help halt the occurrence of these conditions there is still a high extent of Corona Virus vaccine hesitancy from the public (Tavolacci et al., 2021). This is highly likely to impair all the efforts directed towards limiting this trend (Tavolacci et al., 2021). According to WHO (2019) vaccine hesitancy ranks in the top ten threats in the world as irrespective of the availability of vaccines, such trends limit the capability of dealing with vaccine-preventable illnesses.

## 2. Research Objective

The study sought to determine the individual factors associated with the uptake of COVID vaccine among Matatu crew in Meru Matatu stage.

## 3. Methodology

The approach that was used in this study is a cross sectional descriptive research design. Additionally, a mixed research design was used to allow collection, analyzing and integration of qualitative as well as quantitative research (Ngechu, 2004). The study was done in Meru town which is in the eastern side of Kenya. The study population of this study were the Matatu crew in Meru Matatu stage. All Saccos (18) within the Meru stage were sampled. At any given time, the Meru stage can accommodate 400 Matatus with matatus taking an average 30 minutes to load/offload. On average the stage is usually at 80% capacity according to the head stage manager. The population of this study were 18 Sacco office clerks (1 per sacco), 18 touts (1 per sacco), 36 loaders and 2560 drivers or conductors(1 respondent from each Matatu) for the duration of data collection (4hours\*2\*320). The inclusion criteria for drivers and conductors who were at the Meru Matatu stage on the day of data collection, and bearing Sacco identification badges. This is shown in the table below.

**Table 1.** Study Population

Sacco clerks	Touts	Loaders	Conductors /drivers
18	18	36	2560

Source: Meru matatu stage Management

Meru County is sampled purposefully; all 18 Saccos that have applied for slots in Meru Matatu stage were sampled. 1 clerk, 1 tout and two loaders from each Sacco were sampled making a total of 72 respondents. For quantitative data, Systematic random sampling was used to select matatu drivers and conductors, where in every 6<sup>th</sup> Matatu (2560 matatus) one respondent was selected as a respondent. Where there were cases of more than one respondents eligible in a Matatu ie where Matatu has both driver and conductor, only one of them was selected. Purposive sampling was preferred to pick county staff working at the

stage for in-depth interviewing.

This study used the Fisher *et al.*, (1998) to compute sample size

$$n = \frac{Z^2 pq}{d^2} \frac{Z^2 pq}{d^2}$$

Where:

n = sample size desired

Z = the Standard normal deviation (1.96, or a confidence interval of 95%

p = the estimated proportion with the characteristic of interest (placed at 40% for this study)

q = 1-p

and

d = is the desired degree of accuracy. This is set at 0.05.

$$\frac{1.96^2 \times 0.40(1.0 - 0.4)}{0.05^2}$$

$$= 368.6$$

$$\approx 369$$

A 10% Sample size adjustment was applied to take care of non-response and incomplete questionnaires

$$110\% (369) = 406$$

In order to accord every eligible respondent equal probability of selection, Simple Random Sampling technique was used. Procedure proportionate to size or stratification was also applied as shown in the table 2 below

**Table 2.** Proportionate Sampling

Designation	Total	Determination of Sample	K <sup>th</sup>
Sacco clerks	18	18/2632×406=3	18/3= 6th
touts	18	18/2632×406=3	18/3= 6th
loaders	36	36/2632×406=6	36/6=6th
Drivers/ conductors	2560	2560/2632×406=394	2560/394=6th
<b>Total</b>	<b>2632</b>	<b>406</b>	<b>406</b>

Source: primary data, 2022

Systematic Random Sampling procedure was used where every 6<sup>th</sup> matatu entering the stage was sampled, and driver/conductor served with a questionnaire until the desired sample size was achieved.

Confirmation of questionnaire completeness and accuracy was done at the point of data collection. To help figure out the characteristic of all the variables, descriptive analysis was applied to describe respondents' sampling structure as well as basic characteristics. Chi-Square and cross tabulation table was used to cluster various parameters. A 95% confidence interval and therefore a 0.05 p-value was used in this study as the statistical significance standard.

## 4. Results

The total number of participants distributed according to the various termini they were working from.

**Table 3.** Distribution of Operators Per Termini

N=388		
Sacco name	n	%
Chuka ungwana	10	2.6
Digital	27	7.0
Inana	20	5.2
Kibantu	18	4.6
Mark one	18	4.6
Meiso	37	9.5
Mekina	30	7.7
Menya	35	9.0
Meru luxury	11	2.8
Meru Nissan	17	4.4
Meru shuttle	28	7.2
Millenium	13	3.4
Mitunguu	27	7.0
Nyamena	25	6.4
Prestige	21	5.4
Raha	28	7.2
Ungwana	23	5.9

The table below shows the ages of the transport operators. From the results majority (50.5%) of them were between 31-40 years. Meaning majority of the respondents are middle aged individuals. In terms of duties most of the workers were drivers (57.7%) that is about 223 of them. The rest were single. In terms of educational levels most of them were secondary school graduates who were 47.2%. In spite of that, 36.1% (140) were tertiary school graduates. This means that most of the operators are well educated.

**Table 4.** Socio economic characteristics of the operators

		Frequency	%
Age	21 - 30	65	16.8
	31 - 40	196	50.5
	41 - 50	103	26.5
	51 - 60	24	6.2
Marital status	Divorced	11	2.8
	Married	319	82.2
	Single	58	14.9
Duty	Clerk	63	16.2
	Conductor	63	16.2
	Driver	223	57.5
	Loader	10	2.6
level of education	Tout	29	7.5
	College/University	140	36.1
	No formal education	9	2.3
	Primary	56	14.4
	Secondary	183	47.2

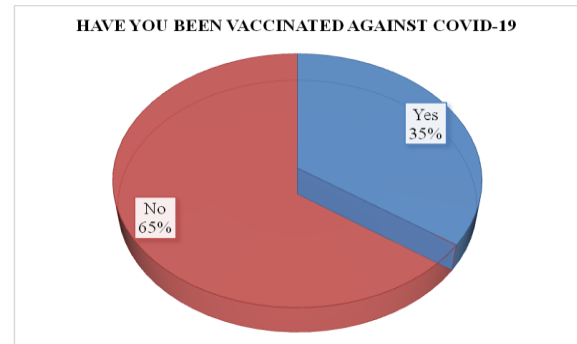
### Vaccination against COVID -19

The figure below shows the percentage of those who have been vaccinated against COVID-19 vaccinated. From the above figure, it shows that the number of those not vaccinated are more at 65%. This indicates that majority of

the operators had not accepted the vaccine.

*“A few of the Matatu operators have agreed to be vaccinated”. (Health official).*

*“The Matatu operators don’t even want to see those people who come to give the vaccine to them”. (Matatu stage official/manager).*

**Figure 1.** Vaccination Against Covid-19

This low vaccine was also confirmed by the health official who was interviewed. The official opines that only a few of the Matatu crew has agreed to be vaccinated.

### Individual Factors Associated with Uptake of Covid -19

From the results, majority of the respondents were between the ages of 31-40 years (more than half -50.5%) of the respondents. Meaning most of the operators are young active adults. In terms of factors that were associated with Coving -19 vaccine among the Matatu operators, age, gender, marital status, and duty and the station all had a significant association with low COVID vaccine uptake. This was contrary to an earlier finding from a study which revealed that those who took past influenza vaccine were likely to take the COVID-19 vaccine (Fan *et al.*, 2021). Further, Khalis *et al.* (2021) revealed that people who showed greater information on the COVID-19 vaccine information showed higher likelihood of accepting the vaccine. Mo *et al.* (2021) also revealed that individual factors are critical in determining the uptake of the vaccine.

Vaccine uptake is connected with a number of socio-demographic characteristics that impact the capacity to achieve total management of the illness. According to a research done by Graupensperger *et al.* (2021), individuals exhibited strong intentions to get the COVID-19 vaccinations when they believed it to be crucial. However, the research found that younger persons were less likely to get immunized because they did not perceive themselves to be at risk for serious illness.

The operators also gave various reasons why they do not like to be vaccinated. The reasons included, that it does not provide protection which was said by majority of the respondents, fear to be transmitted with the virus, fear that they would die and also fear of side effects. These factors are more of anxiety and are not supported by facts. Bullock, Lane and Shults (2022) in their study for vaccine hesitancy also found anxiety rather than familiarity with vaccines as the main reason behind vaccine hesitancy.

**Table 5.** Individual Factors associated with uptake of COVID -19

Individual characteristics	Vaccination against Covid 19?		Chi-Square	df	P value	
	No	Yes				
Age	21 - 30	24	41	11.94	3	.008
	31 - 40	53	143			
	41 - 50	47	56			
	51 - 60	11	13			
Gender	Female	32	30	9.201	1	.002
	Male	103	223			
Marital status	Divorced	0	11	35.891	2	.000
	Married	96	223			
	Single	39	19			
Duty	Clerk	28	35	99.98	4	.000
	Conductor	25	38			
	Driver	43	180			
	Loader	10	0			
	Tout	29	0			
level of education	College/University	37	103			
	No formal education	9	0	32.39	3	.000
	Primary	31	25			
	Secondary	58	125			

## 5. Conclusions and Recommendations

According to the findings of the research, there was a poor uptake of the Covid 19 vaccination among the matatu drivers. Individual variables such as age ( $2 = 11.94, =0.008$ ), duty ( $2 = 99.98, =0.00$ ), married status ( $2 = 35.891, =0.00$ ), education level ( $2 = 32.39, =0.00$ ), and gender ( $2 = 9.021, =0.002$ ) were significantly linked with poor COVID 19 uptake among the Matatu Crew operators. The study concluded that Individual characteristics such age, duty, marital status were associated with low COVID 19 uptake among the operators and therefore recommended that further research should be done to determine other social mechanisms of improving Vaccine uptake and reducing misinformation towards emergency vaccines.

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