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Factors Associated with Covid-19 Vaccine Uptake and Dropout Rate Among Men in Kabuyanda Town Council-Isingiro District

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ABSTRACT:

Introduction: COVID-19 (Corona Virus) is an emerging respiratory disease caused by the highly contagious Novel virus referred to as Severe Acute Respiratory Syndrome Coronavirus. Immunization is the most recommended effective strategy for primary prevention of the illness (WHO 2020) however COVID-19 vaccine uptake is low at 40% in Uganda far below the national target of 95%. The study assessed factors associated with COVID-19 vaccine uptake and dropout rate among men in Kabuyanda Town Council.

Methods: It was community cross sectional study, a total of 406 men aged 18years and above were enrolled in the study, sampled and interviewed at house hold in January to April 2024, semi- structured questionnaires were administered to collect quantitative data, which was analyzed using STATA software. Binary logistic regression was performed to assess factors associated with COVID-19 vaccine uptake and dropout rate, the association between outcome variable was tested using Pearson's Chi-Square (x^2) and odds ratio, p-value ≤ 0.05 was considered significant

Results: COVID-19 vaccine uptake in Kabuyanda Town council is low, (45.47% vs 95%) compared to the national target as previously reported (https://uniph.go.ug). Independent factors were Age between 33-45 years (OR 3.31 (1.24 - 8.85) p-value (0.017) and 45and above (OR 12.28 (4.58 - 32.98) p-value (0.000), level of income (60.000-200,000) (OR 2.27 (1.30-3.94) p-value 0.004 , briefs on "whether one can get COVID-19 if not vaccinated" majority men Disagreed (OR 5.82 (1.57-21.52) p-value (0.008), perceptions "of whether one can develop complications and die after getting an injection of COVID-19 Vaccine, men who agreed (OR 0.21(0.04-0.97) P-value (0.0047)

Conclusion: COVID-19 vaccine uptake among men is low. Therefore there is need to intensify health education on the benefits of COVID -19 Vaccines in communities to counteract myths, rumors about the disease and the vaccine, create immunization outreaches in rural areas to immunize those in 3km and beyond, engage men in high paying projects to raise monthly earnings and carry out more studies about COVID-19 vaccine uptake to strengthen these findings

Keywords: COVID-19, Vaccine Uptake, Immunization, Vaccination

Introduction

COVID-19 (Corona Virus) is an emerging respiratory disease caused by the highly contagious Novel virus referred to as Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV-2) with high case

fatality rate. Immunization is the most recommended effective strategy for primary prevention of the illness (WHO 2020)

Globally by November, 2022, about 640,370,260 cases had been reported with a subsequent death of about 6.6 million people. (*COVID Live - Coronavirus Statistics – World meter, 2022)* with 70.6% of the world population having received one dose of COVID-19 vaccine for protection

While in sub Saharan Africa 20% of the populations were fully vaccinated with Covid-19 vaccine with poor dynamics of vaccine acceptance among men (Philip. Et al 2023) (https//blogs. World bank.org)

In Uganda Covid-19 vaccine uptake coverage was at 63% with 42% females compared to 21% males fully vaccinated, including Isingiro district and Kabuyanda Town Council (https://uniph.go.ug) COVID-19 vaccination was launched in March 2021 in Uganda, vaccines were made available with an eligibility criteria of people aged 18 years and above, elderly, Diabetic patients, people with Cardiovascular diseases and people living with HIV/AIDS, were a precedence in the program

Kabuyanda Town Council situated in Isingiro district of western Uganda, is made up of four wards namely Central, Northern Kisyoro, and Iryango with 25 village cells, has one HCIV and two HC11s (Not for profit) which offer health services to the population, immunization department is headed by registered health professionals serving a population of 22100 (Men 10829 (49%) Women 11271 (51%) of 3.5% annual growth rate (UBOS 2020) projections

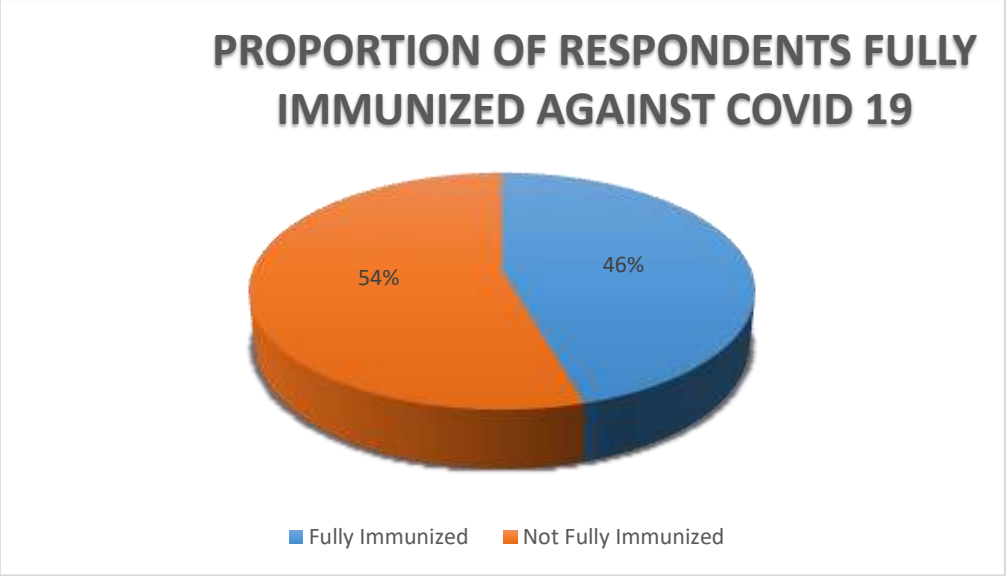
COVID-19 vaccine uptake remained low in many parts of Uganda at approximately 40 % for dose one, and 27.1% for dose two (COVID-19 tracker) (Katumba.C Petience N etal (2023), factors responsible had not been clearly defined. Therefore the study established factors associated with COVID-19 vaccine uptake among men in Kabuyanda Town Council-Isingiro District

MATERIALS AND METHODS

The principal investigator got approval from Cavendish University-Uganda and Uganda National Council of Science and technology (NCST) to identify factors associated with COVID-19 vaccine uptake among men in Kabuyanda Town Council, through face to face interview of men aged 18 -75 years at household level. A cross sectional study was done using quantitative data collection methods, 406 Men aged between 18-75 years were interviewed using semi-structured questionnaires, administered on simple random sampling at house hold. Sample Size was determined by $n= Z^2 PQ/e^2$ formula used by Kish and Leslie (1965). Where, n = Sample size, Z = Critical value of normal distribution at the required confidence level 1.96 (the statistic corresponding to 95% Confidence interval). p = Sample proportion (Estimated prevalence of the problem under study) obtained from literature of previous studies. Q=100%-P or (1-P) = 40% (Coverage of COVID-19 Vaccine in Kabuyanda Town Council) e = Margin of error taken as 5% which the investigator was likely to accommodate

RESULTS

406 men of 18years to 75years were enrolled into the study. Majority 317(78.08%) were Married, 256(88.42%) were Protestants, 229 (21.43%) and 87(21.43%) had attained primary and secondary education respectively, 256 (63.79%) and 87(26.35%) were peasants and self-employed while the majority earned between 10,000 -50,000= (63.79%) and 60,000-200,000= (30.54%) monthly The level of Covid-19 vaccine Uptake in Kabuyanda Town Council was estimated by the proportion of Men who received Covid-19 vaccine during immunization period , Majority of them received one dose 221(54.43%) while 185 (45.57%) received two doses as shown in the figure below



Individual factors associated with COVID-19 vaccine uptake at bivariate analysis were age, men aged between 33-45 years (OR 3.36 (1.58-7.15) and 45and above (OR 12.20 (5.88-25.28) were more likely to utilize the vaccination program than men aged 18-25 years and 26-32 years, in addition, men who were married (OR 4.10 (2.15-7.82) and separated (OR 5.29 (1.90-14.74) were more likely to utilize services compared to the unmarried individuals, occupation (OR 0.25 (0.09-0.67) and level of income (OR 2.83 (1.82-4.40) were also associated individual factor to COVID-19 Vaccine uptake

Variables	Category	Immunization Status		S. Error	CD-OR(95%CL	P-value
Age		0-n (%)	1-n (%)			
	18-25	56 (25.34)	11 (5.95)		1.0	1.0
	26-32	52 (23.53)	16 (8.65)	0.684	1.57 (0.67-3.69)	0.304
	33-45	65 (29.41)	43 (23.24)	1.293	3.36 (1.58-7.15)	0.002*
	45&above	48 (21.72)	115 (62.16)	4.536	12.20 (5.88-25.28)	0.000**
Marital Status						
	Not married	53 (23.98)	13 (7.03)		1.0	
	Married	158 (71.49)	159 (85.95)	1.351	4.10 (2.15-7.82)	0.000**
	Separated	10 (4.52)	13 (7.03)	2.768	5.29 (1.90-14.74)	0.001*
Religion						
	Catholics	58 (26.24)	45 (24.32)		1.0	1.0
	Protestants	140 (63.35)	116 (62.70)	0.251	1.06 (0.67-1.69)	0.780
	Islam	6 (2.71)	4 (2.16)	0.580	0.86 (0.22-3.22)	0.822
	Adventists	9 (4.07)	11(5.95)	0.774	1.57 (0.60-4.12)	0.355
	Pentecostal	8 (3.62)	9 (4.86)	0.761	1.45 (0.52-4.057)	0.479
Education						

Level						
	Did not go to school	34 (15.38)	37 (20.00)		1.0	1.0
	Primary	131(59.28)	98 (52.97)	0.187	0.68 (0.40-1.17)	0.169
	Secondary	50 (22.62)	37 (20.00)	0.218	0.68 (0.36-1.27)	0.231
	Tertiary	6 (2.71)	13 (7.03)	1.090	1.99 (0.68-5.82)	0.209
Occupation						
	Peasant	141 (63.80)	118 (63.78)		1.0	1.0
	Self Employed	53 (23.98)	54 (29.19)	0.280	1.21 (0.78-1.91)	0.393
	Government Employee	3 (1.36)	8 (4.32)	2.193	3.13 (0.83-12.28)	0.092
	Others	24 (10.86)	5 (2.70)	0.126	0.25 (0.09-0.67)	0.006*
Level of income						
	10,000-50,000=	164 (74.21)	95 (51.35)		1.0	1.0
	60,000-200,000=	47 (21.27)	77 (41.62)	0.637	2.82 (1.82-4.40)	0.000**
	200,000-500,000=	10 (4.52)	13 (7.03)	0.987	2.24 (0.94-5.31)	0.066
Have you ever suffered from COVID-19						
	Yes	7 (3.17)	14 (7.57)	0.189	0.39 (0.15-1.01)	0.053
	No	214 (96.83)	171 (92.43)	0.925	2.00(0.81-4.96)	0.134

Key: * Statistically significant ** highly statistically significant

Health System factors associated with COVID-19 vaccine uptake at bivariate analysis were Distance (OR 0.47 (0.23-0.95), men who lived in 3-5km were less likely to take up COVID-19 vaccine compared to men who lived in 1km to the vaccination Centre.

Variables	**Category**	**Immunization Status**		**S. Error**	**CD-OR(95%CL**	**P-value**
		0-n (%)	1-n (%)			
Are you aware of where you received covid-19 vaccine						
	Yes	215 (97.29)	178 (96.22)	0.796	1.41(0.47-4.26)	0.544

	No	6 (2.71)	7 (3.78)	0.083	0.83(0.68-1.00)	0.062
Approximate Distance from home to COVI9-19 vaccination center						
	<1Km	17 (7.69)	25 (13.51)		1.0	1.0
	2-3Km	129 (58.37)	108 (58.38)	0.193	0.56 (0.29-1.10)	0.098
	3-5Km	75 (33.94)	50 (27.03)	0.171	0.47 (0.23-0.95)	0.038*
Means of transport used to vaccination Centre						
	Foot	124 (56.11)	90 (48.65)		1.0	1.0
	Boda Boda	54 (24.43)	61 (32.97)	0.361	1.56 (0.98-2.45)	0.057
	Vehicle	42 (19.00)	34 (18.38)	0.291	1.08 (0.64-1.84)	0.749
Waiting time to get services of COVID-19						
	1hour	17 (7.69)	14 (7.57)		1.0	1.0
	2-3hours	107 (48.42)	77 (41.62)	0.341	0.87(0.40-1.88)	0.730
	3-4hours	74 (33.48)	65 (35.14)	0.425	1.06(0.48-2.33)	0.872
	4-5hours	17 (7.69)	22 (11.89)	0.761	1.57(0.60-4.05)	0.351
	>5hours	6 (2.71)	7 (3.78)	0.939	1.41(0.38-5.10)	0.599
How many vaccinators were involved during vaccination						
	Two vaccinators	20 (9.05)	14(7.57)		1.0	1.0
	Three vaccinators	128 (57.92)	79(42.70)	0.332	0.88 (0.42-1.84)	0.738
	Four vaccinators	73 (33.03)	91(49.19)	0.687	1.80 (0.85-3.80)	0.124

Key: * Statistically Significant ** highly statistically significant

Community factors associated with the COVID-19 vaccine uptake at bivariate analysis revealed that "knowledge about availability of COVID-19 vaccine and where to get vaccinated from" were associated with COVID-19 vaccine Uptake, Men who disagreed (OR 0.24 (0.09-065)) and strongly disagreed (OR

0.15 (0.02-0.91) were less likely to utilize the vaccination services because they didn't know its availability and where to get it

In addition "whether one can get COVID-19 if not vaccinated" was associated with COVID-19 Vaccine uptake , majority of respondents were Neutral (OR 2.22 (1.14-4.34) and others disagreed (OR 3.56 (1.25-10.13) compared to men who strongly agree and were more likely to utilize services

Variables	Category	Immunization Status		S.Error	CD-OR(95%CL	P.value
		0-n (%)	1-n (%)			
COVID-19 vaccine availability and where to get vaccinated from.						
	Strongly Agree	8 (3.62)	15 (8.11)		1.0	1.0
	Agree	144 (65.16)	135 (72.97)	0.22	0.50 (0.20-1.21)	0.127
	Neutral	4 (1.81)	6 (3.24)	0.62	0.80 (0.17-3.68)	0.775
	Disagree	58 (26.24)	27 (14.59)	0.12	0.24 (0.09-065)	0.005*
	Strongly Disagree	7 (3.17)	2 (1.08)	0.13	0.15 (0.02-0.91)	0.039*
When one is not vaccinated can he/she easily contract COVID-19?						
	Strongly Agree	55 (24.89)	36 (19.46)		1.0	1.0
	Agree	136 (61.54)	100 (54.05)	0.28	1.12 (0.68-1.83)	0.644
	Neutral	24 (10.86)	35 (18.92)	0.75	2.22 (1.14-4.34)	0.019*
	Disagree	6 (2.71)	13 (7.03)	1.89	3.56 (1.25-10.13)	0.017*
One is given an injection of COVID-19 vaccine; he/she can easily develop complications and die?						

	Strongly Agree	5 (2.26)	8 (4.32)		1.0	1.0
	Agree	47 (21.27)	51(27.57)	0.41	0.67 (0.20-2.21)	0.521
	Neutral	92 (41.63)	88 (47.57)	0.35	0.59 (0.18-1.89)	0.383
	Disagree	59 (26.70)	31(16.76)	0.20	0.32 (0.09-1.08)	0.069
	Strongly Disagree	18 (8.14)	7 (3.78)	0.17	0.24 (0.05-1.00)	0.051

Key: * Statistically significant ** highly statistically significant

Multivariate analysis, assessed interaction of different factors to obtain adjusted Odds Ratio of associated factors with COVID-19 Vaccine Uptake at Individual level, Health system level and Community level, which found that Age in the two categories was a factor associated with COVID-19 vaccine uptake in Kabuyanda Town Council**,** hence statistically significant, because men aged between 33-45 years (OR 3.31 (1.24 - 8.85) were three times more likely to take up the COVID-19 vaccination program than those aged below and men aged 45and above (OR 12.28 (4.58 - 32.98) were twelve times more likely to utilize vaccination services than those men aged 18-25 years and 26-32 years respectively showing that COVID-19 vaccine uptake increased with age

In addition, level of income 60,000-200,000= (OR 2.27 (1.30-3.94)) was statistically significant thus associated with COVID-19 vaccine uptake in Kabuyanda Town council , the middle class monthly earners were two times more likely to utilize the vaccination program than those who earned below and above this category

Community factors on "whether one can get COVID-19 if not vaccinated" majority men Disagreed (OR 5.82 (1.57-21.52) were six times more likely to get vaccinated than those who strongly agree to the contrary hence associated with COVID-19 Vaccine uptake

While on the perceptions "of whether one can develop complications and die after getting an injection of COVID-19 Vaccine, majority of men agreed (OR 0.21(0.04-0.97) hence were less likely to get vaccinated, and others who disagreed (OR 0.10 (0.02-047) were also less likely to utilize the services as well as those who strongly disagreed (OR 0.08 (0.01-0.47) indicating information gap within communities to counteract myths and rumors about COVID-19 Vaccines

Variables	Category	Immunization Status		S. Error	CD-OR(95%CL	P-value
		0-n (%)	1-n (%)			
Age						
	18-25	56 (25.34)	11 (5.95)			1.0
	26-32	52 (23.53)	16 (8.65)	0.83	1.63 (0.60-4.45)	0.335
	33-45	65 (29.41)	43 (23.24)	1.66	3.31 (1.24-8.85)	0.017*
	45&above	48 (21.72)	115	6.17	12.28 (4.58-	0.000**

			(62.16)		32.98)	
Marital Status						
	Not married	53 (23.98)	13 (7.03)			1.0
	Married	158 (71.49)	159 (85.95)	0.65	1.37 (0.53-3.51)	0.508
	Separated	10 (4.52)	13 (7.03)	1.06	1.51(0.38-5.96)	0.549
Education Level						
	Did not go to school	34 (15.38)	37 (20.00)			1.0
	Primary	131(59.28)	98 (52.97)	0.34	1.01 (0.52-1.98)	0.957
	Secondary	50 (22.62)	37 (20.00)	0.53	1.26 (0.55-2.88)	0.572
	Tertiary	6 (2.71)	13 (7.03)	1.31	1.87 (0.47-7.43)	0.369
Occupation						
	Peasant	141 (63.80)	118 (63.78)			1.0
	Self Employed	53 (23.98)	54 (29.19)	0.21	0.72 (0.39-1.29)	0.276
	Government Employee	3 (1.36)	8 (4.32)	2.65	3.05 (0.55-16.73)	0.197
	Others	24 (10.86)	5 (2.70)	0.74	1.06 (0.27-4.19)	0.927
Level of income						
	10,000-50,000=	164 (74.21)	95 (51.35)			1.0
	60,000-200,000=	47 (21.27)	77 (41.62)	0.63	2.27 (1.30-3.94)	0.004*
	200,000-500,000=	10 (4.52)	13 (7.03)	0.66	1.16 (0.37-3.57)	0.793
Approximate Distance from home to COVID-19 vaccination center						
	<1Km	17 (7.69)	25 (13.51)			1.0
	2-3Km	129 (58.37)	108 (58.38)	0.22	0.53 (0.23-1.21)	0.132
	3-5Km	75 (33.94)	50 (27.03)	0.24	0.54 (0.22-1.32)	0.180

When one is not vaccinated can he/she easily contract COVID-19?						
	Strongly Agree	55 (24.89)	36 (19.46)			1.0
	Agree	136 (61.54)	100 (54.05)	0.27	0.88 (0.47-1.64)	0.688
	Neutral	24 (10.86)	35 (18.92)	0.68	1.61 (0.70-3.69)	0.261
	Disagree	6 (2.71)	13 (7.03)	3.88	5.82 (1.57-21.52)	0.008*
	Strongly Disagree	0 (0.00)	1 (0.54)	-		-
One is given an injection of COVID-19 vaccine; he/she can easily develop complications and die?						
	Strongly Agree	5 (2.26)	8 (4.32)			1.0
	Agree	47 (21.27)	51(27.57)	0.16	0.21 (0.04-0.97)	0.047*
	Neutral	92 (41.63)	88 (47.57)	0.21	0.29 (0.06-1.24)	0.095
	Disagree	59 (26.70)	31(16.76)	0.07	0.10 (0.02-0.47)	0.004*
	Strongly Disagree	18 (8.14)	7 (3.78)	0.07	0.08(0.01-0.47)	0.005*

DISCUSSIONS

Covid-19 vaccine Uptake in Kabuyanda Town Council is very low (45.57%) Compared to the recommended 95% national target, this observation has been made by several other studies in Africa and Uganda in particular (Galanis, Vraka et al. 2021) (Muhindo, Okoboi et al. 2022) attributed it to Age , fear of the type of COVID-19 vaccine, history of SARS-CoV-2 infections, information gap, missed opportunities, distance to the vaccination center and time taken to receive the COVID-19 Vaccine (Kyakuwa, Kimbugwe et al. 2024) which has resulted into the occurrence of COVID-19 cases in some parts of Uganda and other surrounding areas, with severe attacks of corona virus and subsequent deaths of many victims at time. Therefore there is need to create awareness among the population on the benefits of the COVID-19 vaccine to quickly reduce this trend and eliminate the virus within population of Kabuyanda Town Council , Isingiro District and Uganda in general

The study identified Age as having a remarkable influence on COVID-19 vaccine uptake among individuals in the Kabuyanda Town Council, this observation has been previously cited by (Ndejjo, Chen et al. 2023) and (Kyakuwa, Abaasa et al. 2024) especially on individuals who were middle aged

and elderly, in the study, the COVID-19 vaccine uptake increased with age in utilizing the vaccination program, probably because they had chronic illnesses like diabetes and hypertension or for fear of deaths and leaving their families.

Marital status was also associated with COVID-19Vaccine Uptake as previously cited by (Slivesteri, Ssali et al. 2023), men who were married utilized the vaccination program more than the unmarried, may be because of the responsibility they have as bread winners which could be lost when they are sick

Level of income was also individual factor associated with COVID-19 Vaccine uptake which correlates with earlier findings of (Kabagenyi, Wasswa et al. 2022) and(Backhaus 2023), middle income earners utilized the vaccination program more than the lower and higher income earners probably because they easily meet health demands towards vaccine uptake than those who earn little, which calls for strengthening ways and means of raising household income to meet health demands for utilizing COVID-19 vaccines in Kabuyanda Town Council

Distance to the vaccination Centre was a health system factor associated with COVI-19 vaccine uptake because men who lived in distance of 3km and above were less likely to take up the vaccination program than those in 1km to the vaccination Centre, this correlates with previous studies of (Kyakuwa, Atuhairwe et al. 2022 and (Kyakuwa, Kimbugwe et al. 2024) where distance ranges were statistically significant at the utilisation of COVID-19 Services , which calls for creation of many outreaches into communities for easy COVID-19 vaccine Uptake in Kabuyanda Town Council

“Knowledge about availability of COVID-19 vaccine and where to get vaccinated from” were Community factors associated with COVID-19 vaccine uptake in a study area, men who disagreed on the availability were less likely to get vaccinated and “on whether one can get COVID-19 if not vaccinated was also community factor because men who knew that they can get corona virus, if not vaccinated were three times more likely to utilize the COVID-19 vaccination program than those disagreed

Other community factor associated with COVID-19 vaccine uptake was on the perception “of whether one can develop complications and die” after getting COVID-19 vaccine injection, majority men who agreed were less likely to get vaccinated as previously cited by (Kabagenyi, Wasswa et al. 2022) and (Kyakuwa, Kimbugwe et al. 2024) indicating information gap on myths , rumours about COVID-19 vaccine, which calls for mass sensitisation of communities about COVID-19 Vaccines

CONCLUSIONS

The study identified factors to effective COVID-19 vaccine uptake and made the following conclusions,

- The level of COVID-19 vaccine uptake in Kabuyanda Town council–Isingiro district of Western Uganda is below the national target (45.47% vs 95%) therefore COVID-19 uptake is low as previously reported (https://uniph.go.ug)
- Men aged between thirty three and forty five together with those aged forty six and above utilized the vaccination of COVID-19 services than those aged thirty two and below
- Men who were married utilized COVID-19 vaccination services than unmarried men
- Men who had monthly income between sixty thousand and two hundred thousand shillings utilized the COVID-19 vaccination services than those who earned less
- Men who lived 3km and above did not utilize COVID-19 vaccination services as those within 1Km to the vaccination center

- Men who did not know availability of the COVID-19 vaccine and where to get it were less likely to take up the COVID-19 vaccine program than those who knew
- Men who knew that they can get corona virus when not vaccinated, where three times involved in the vaccination services than those who disagreed
- Men who perceived that, when you get an injection you develop complications and die did not utilize the vaccination services, however to combat COVID-19 infections, immunization against corona virus remains the most effective strategy worldwide (Kabagenyi, Wasswa et al. 2022) therefore addressing factors indentified in the study will improve COVID-19 vaccine Uptake in Kabuyanda Town Council so as to hit 95% national target
- Health Centre managers strengthen health education programs with focus on the benefits of COVID-19 vaccines at health Centre and during outreaches to foster proper communication between community members
- Sensitize families to strengthen ways and means of raising household income to meet health demands for utilizing COVID-19 vaccines in Kabuyanda Town Council
- Health center management create many outreaches to communities for easy COVID-19 vaccine Uptake in Kabuyanda Town Council
- Politicians embrace Mass sensitization on radios ,churches and mosques to bridge the information gap about myths and rumors on COVID-19 vaccines
- The researcher recommends for larger studies to strengthen the findings since immunization seeking behavior continue to be influenced by many factors overtime

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