



Prevalence and Behavioral and Social Drivers of Measles-Rubella Vaccine Uptake Among Caregivers of Children During a Measles Outbreak, Kyegegwa District, January–April 2026

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Summary

Background: Behavioral and social factors play a critical role in shaping caregivers' decisions regarding childhood immunization. On March 20, 2026 in Kyegegwa District declared a measles outbreak when six children tested positive for IgM for measles. Among six laboratory-confirmed cases, three occurred in children who had never received the Measles-Rubella vaccine, while two cases had received only a single dose of the MR vaccine. We assessed behavioral and social drivers of measles-rubella (MR) vaccine uptake among caregivers of measles case-patients in Kyegegwa District, January–April, 2026.

Methods: We conducted a mixed-methods cross-sectional survey among caregivers of children aged 9-59 months in Kyegegwa District. Caregivers of case children were selected using simple random sampling from a line list as a sampling frame while caregivers of controls were systematically selected from household lists from the same neighborhood as case caregivers. Caregivers were interviewed using a structured questionnaire based on the World Health Organization Behavioral and Social Drivers of Vaccination framework. Measles-Rubella vaccine uptake (≥ 1 dose) was assessed, with predictors identified. Prevalence ratios were calculated using modified Poisson regression and quantitative data analyzed thematically.

Results: In total, 259 respondents participated in the study. Overall, prevalence of Measles-Rubella uptake was 82.24%. More than half of caregivers (53.7%) were between the ages of 25-39 years. The uptake of Measles-Rubella vaccines was associated with having had a health worker recommend vaccinating the child [aOR] 3.9; 95% [CI]: 1.5–10.4), perceived easy access to vaccination services (aOR 3.3; 95% CI: 1.1–9.8) and history of personally taking the child for vaccination (aOR 4.4; 95% CI: 1.6–12.3). Qualitative findings indicated that caregivers' trust in health workers, reminders from Village Health Teams, and convenient community outreach sessions were important enablers of vaccination. Some caregivers reported missed opportunities when they arrived late or vaccination services.

Conclusion: Measles-Rubella vaccine uptake was driven by caregiver agency, health worker recommendations, and localized convenience. To close remaining immunity



gaps, public health strategies must address systemic missed opportunities by offering flexible outreach hours and empowering community health teams with targeted tracking.

Background

Measles remains one of the most contagious vaccine preventable diseases (VPD) and continues to pose a public health threat in many low- and middle-income countries despite the availability of a safe and effective vaccine[1]. Globally, sustained efforts led by the World Health Organization and partners have significantly reduced measles morbidity and mortality through routine immunization and supplementary campaigns from 145 to 49 cases per 1 million population from 2000 to 2018[2].

In Uganda, the introduction of the second dose of measles–rubella (MR) vaccine into the routine immunization schedule marked an important step toward eliminating both diseases[3,4]. However, a measles outbreak declared on March 20, 2026 in Kyegegwa District highlighted important immunization challenges. Among six laboratory-confirmed cases, three occurred in children who had never received the MR vaccine, while two cases had received only a single dose of the MR vaccine, instead of the recommended two doses. This pattern suggests a dual burden of missed access to immunization services and incomplete vaccination, pointing to both demand and supply side barriers within the health system.

Vaccination uptake is influenced by more than the availability of vaccines. The WHO Behavioral and Social Drivers of Vaccination framework identifies four domains that may influence uptake: thoughts and feelings about vaccination, social processes, motivation to vaccinate, and practical issues such as accessibility and service quality[5,6]. Caregivers may value childhood vaccination but still encounter barriers such as limited knowledge of the vaccination schedule, long distances to vaccination sites, inconvenient service-delivery arrangements, missed opportunities at health facilities, and inconsistent reminders or recommendations from health workers[6]. Understanding these factors is essential for designing locally appropriate interventions. We assessed behavioral and social drivers associated with MR vaccine uptake among caregivers of children in selected measles-affected sub-counties of Kyegegwa District between January and April, 2026.

Methods

We conducted a mixed methods cross-sectional study among caregivers of children in Kasule and Rwentuuha sub-counties, Kyegegwa District, Uganda. Respondents were caregivers of children aged 9-59 months residing in Kyegegwa District during between January–April 2026. Caregiver were defined as adults who were primarily responsible for an eligible child and able to report vaccination history. The primary outcome was the uptake of age-appropriate MR vaccine dose, defined as receipt of at least one dose of the MR vaccine in a child at 9 months and second of MR vaccine at 18 months. Explanatory variables were grouped according to the four domains of the Behavioral and Social drivers of Vaccination framework[7].

We asked caretakers of both case-patients and control-persons about their thinking and feeling about vaccines, peer norms, practical issues and motivation factors that



influence the uptake of Measles-Rubella vaccine. The vaccination status was obtained by checking the child vaccination. For parents that did not have child vaccination cards, correctly pointing to the left upper arm vaccination site was considered an indicator for Measles-Rubella vaccination. Caregiver of case children were selected using simple random sampling using random numbers generated from excel from a line list as a sampling frame. Controls were systematically selected from household lists. Controls were selected from the same village and within the same age category.

This outbreak investigation was in response to a public health emergency. The Ministry of Health (MoH) gave permission to investigate this outbreak. In agreement with the International Guidelines for Ethical Review of Epidemiological Studies by the Council for International Organizations of Medical Sciences (1991) and the Office of the Associate Director for Science, US CDC/Uganda, it was determined that this activity was not human subject research. Informed consent was obtained from caregivers prior to data collection.

Results

Participant characteristics and Measles-Rubella vaccination status

A total of 259 caregivers participated in the survey. The prevalence of Measles-Rubella vaccine uptake 82.24% (213/259) among respondents. Most caregivers were aged 25–39 years 53.7% (139/259) and had attained primary education 59.5% (154/259) as shown in Table 1.

Thoughts and feelings about vaccination

Overall, 251/259 (96.9%) considered childhood vaccines safe, 96.1% (249/259) considered vaccines important for their children's health, and 96.9% (251/259) reported trust in health workers who provided vaccination services. However, knowledge of the recommended MR vaccination schedule was limited: only 19.3% (50/259) caregivers correctly identified the number of MR vaccine doses required for full protection.

Table 1: Characteristics of caregivers and selected behavioral and social drivers of Measles-Rubella vaccination Kyegegwa, January – April 2026

Characteristic	Category	n=259	%
Caregiver characteristics			
Age category (years)	<25	44	17.0
	25–39	139	53.7
	≥40	76	29.3
Education level	No formal education	59	22.8
	Primary	154	59.5
	Secondary	39	15.1
	Tertiary or university	7	2.7
MR vaccination status among children assessed			



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Receipt of at least one MR vaccine dose*	Yes	213	82.24
	No	46	17.76
Thoughts and feelings			
Perceived childhood vaccines as safe	Yes	251	96.9
Perceived childhood vaccines as important	Yes	249	96.1
Trusted health workers who provide vaccination	Yes	251	96.9
Correctly identified the recommended number of MR doses	Yes	50	19.3
Motivation			
Wanted child to receive all routine vaccines	Yes	242	93.4
Social processes			
Reported recommendation from religious leader	Yes	244	94.2
Reported recommendation from family member	Yes	231	89.2
Reported recommendation from community leader	Yes	250	96.5
Reported recommendation from health worker	Yes	229	88.4
Received reminder that child was due for vaccination	Yes	134	51.7
Practical issues			
Distance to nearest government or PNFP health facility	<1 km	11	4.2
	1–5 km	145	56.0
	>5 km	103	39.8
Reported easy access to vaccination services	Yes	234	90.3
Incurred costs while seeking vaccination services	Yes	70	27.0
Satisfied with vaccination services	Yes	247	95.4
Knew where to obtain vaccination services	Yes	255	98.5
Personally, took child for vaccination	Yes	235	90.7
Reported ever being turned away from vaccination	Yes	26	10.0

Motivation and social processes

Most caregivers 93.4% (242/259) wanted their children to receive all vaccines included in the national immunization schedule including the 2 doses of the MR vaccine. More than a third 88.4% (229/259) of caregivers reported receiving a recommendation from a health worker, 89.2% (231/259) from a family member, 94.2% (244/259) from a religious leader, and 96.5% (250/259) from a community leader. Approximately half of caregivers 51.7% (134/259) reported receiving reminders that their children were due for vaccinations.

Practical issues affecting access to vaccination services

Most caregivers 90.3% (234/259) reported that vaccination services were easy to access, and 95.4% (247/259) were satisfied with the services received. However,



27.0% (70/259) reported incurring costs while seeking vaccination services, and 10.0% (26/259) reported that they had previously been turned away from a vaccination site. Almost all caregivers 98.5% (255/259) knew where to obtain vaccination services (Table 1).

Factors associated with Uptake of Measles-Rubella vaccine among caregivers of children during a measles outbreak, Kyegegwa District, January-April 2026

In the multivariable analysis (Table 2), caregivers who reported receiving a health-worker recommendation to vaccinate had higher odds of Measles-Rubella vaccine uptake by their children compared to caregivers who did not report receiving such a recommendation (aOR 3.90; 95% CI: 1.45–10.42). Caregivers who reported that vaccination services were easy to access also had higher odds of having their children vaccinated with the MR vaccine compared to caregivers who reported difficulty accessing services (aOR 3.30; 95% CI: 1.12–9.79). Caregivers who reported personally taking their children for vaccination were also more likely to take their children for MR vaccination (aOR 4.40; 95% CI: 1.56–12.30). Because this measure is closely related to the outcome, it should be interpreted cautiously as a proximal indicator of caregiver engagement rather than as an independent causal determinant. Other variables included in the adjusted model were not statistically associated with MR vaccination.

Table 2: Factors associated with Measles-Rubella vaccination among children during a measles outbreak, Kyegegwa District, January –May 2026

Characteristic	Reference category	cOR (95% CI)	aOR (95% CI)	p-value
Age <25 years	25–39 years	0.59 (0.22–1.58)	0.70 (0.22–1.20)	0.450
Age ≥40 years	25–39 years	0.34 (0.16–0.72)	0.50 (0.19–1.09)	0.080
Perceived vaccines as safe	No	3.47 (0.80–15.14)	3.10 (0.40–24.41)	0.280
Trusted health workers	No	3.47 (0.80–15.14)	1.60 (0.22–11.18)	0.660
Received health-worker recommendation	No	5.72 (2.50–13.07)	3.90 (1.45–10.42)	0.007
Received vaccination-due reminder	No	1.98 (0.99–3.97)	1.10 (0.49–2.49)	0.820
Reported easy access to vaccination services	No	6.79 (2.82–16.35)	3.30 (1.12–9.79)	0.031
Satisfied with vaccination services	No	2.93 (0.84–10.24)	0.90 (0.17–5.62)	0.990
Personally, took child for vaccination	No	7.39 (3.03–18.04)	4.40 (1.56–12.30)	0.005
Reported ever being turned away	No	0.45 (0.17–1.15)	0.60 (0.18–1.70)	0.300

cOR: crude odds ratio; aOR: adjusted odds ratio; CI: confidence interval.



Qualitative findings

The qualitative findings supported the quantitative results. Caregivers described trust in health workers, reminders from Village Health Teams (VHTs), and convenient community outreach sessions as important enablers of vaccination. Some caregivers also reported missed opportunities when caregivers arrived late or vaccination services were no longer available

Table 3: Illustrative qualitative findings related to Measles-Rubella vaccination in Kyegegwa District, January–May2026.

Theme	Summary	Illustrative quotation
Health-worker and VHT reminders	Caregivers described reminders from VHTs and health workers as prompts to attend outreach vaccination sessions.	<i>“Our VHT always passes around ... informing us that vaccination of children is the next day, so we should take our children there for vaccination.”</i>
Convenient outreach services	Community outreach sessions reduced travel time and made vaccination easier to access.	<i>“The vaccinators are near our home, at the mango tree in the trading center ... by midday I am back home with my children vaccinated.”</i>
Missed opportunities	Some caregivers described being turned away when they arrived after vaccination activities had closed.	<i>“Some friends of mine were turned away because they ... arrived late.”</i>

Discussion

Using the WHO Behavioral and Social Drivers framework, this study found that MR vaccine uptake among children in Kyegegwa District was associated with healthcare-worker recommendation, ease of access to vaccination services, and caregivers personally taking their children for vaccination. These findings highlight the importance of social influence and practical factors in caregivers' vaccination decisions.[8,9]

Healthcare-worker recommendation was associated with increased MR vaccine uptake. Healthcare workers and Village Health Teams are trusted sources of vaccination information and play an important role in mobilizing caregivers, particularly in communities served through outreach services[10].

Easy access to vaccination services was also associated with uptake, consistent with studies showing that proximity to vaccination services improves childhood vaccination[11,12] . In Kyegegwa, community outreach sessions may have reduced distance-related barriers by bringing vaccination services closer to caregivers.

Children whose caregivers personally took them for vaccination were also more likely to receive MR vaccine. Direct interaction with healthcare workers may provide caregivers



with information on vaccine benefits and subsequent vaccination dates, supporting completion of the vaccination schedule[9].

Study limitations: Vaccination status was based on caregiver recall when vaccination cards were unavailable, which may have introduced recall or misclassification bias.

Conclusion: During the January–May 2026 measles outbreak in Kyegegwa District, healthcare-worker recommendation, easy access to vaccination services, and caregivers personally taking children for vaccination were associated with increased MR vaccine uptake. The district should strengthen healthcare-worker and Village Health Team communication, maintain accessible and predictable outreach services, provide vaccination reminders, and reinforce caregiver education on the two-dose MR vaccination schedule

Author's contributions: CMB conceptualized the study, led data collection and analysis and drafted the manuscript. GT, MN, LA, AA, NR, WA, NP, RK, EN supported data collection and cleaning. RM, KB, YN, AA provided technical input during study design and data interpretation. All the authors read and approved the bulletin.

Declaration of interest: The authors declare no conflict of interest

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