

# Knowledge, attitudes, perceptions and factors associated with mpox vaccine hesitancy among university students in Sierra Leone: a cross-sectional study

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## Research Article

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# Abstract

## Background

Mpox remains a public health concern, particularly in settings where access to reliable health information, vaccination and health services may be limited. University students are an important population for mpox prevention because of their social interactions and potential influence on health behaviours. This study assessed knowledge, attitudes and perceptions of mpox and examined factors associated with reported mpox vaccine hesitancy among students in Sierra Leone.

## Methods

A cross-sectional study was conducted among 422 students from three constituent colleges of the University of Sierra Leone between January and June 2026. Data were collected using a structured questionnaire assessing knowledge, attitudes, perceptions and vaccination intention. Vaccine hesitancy was defined as reporting that the participant would not take an mpox vaccine if it were available. Univariable and multivariable binary logistic regression were performed to identify factors associated with reported hesitancy, with crude and adjusted odds ratios (CORs and AORs) and 95% confidence intervals (CIs) reported.

## Results

Of 422 participants, 287 (68.0%) reported willingness to receive an mpox vaccine, while 135 (32.0%) were classified as hesitant. Good knowledge was observed in 332 (78.7%) participants, while 174 (41.2%) had a positive attitude and 249 (59.0%) had a positive perception. In multivariable analysis, good knowledge was associated with lower odds of reported hesitancy (AOR 0.203, 95% CI 0.116–0.356;  $p < 0.001$ ), as was positive perception (AOR 0.562, 95% CI 0.328–0.962;  $p = 0.036$ ). Compared with FBC students, hesitancy was lower among students from COMAHS (AOR 0.093, 95% CI 0.032–0.266;  $p < 0.001$ ) and IPAM (AOR 0.508, 95% CI 0.293–0.882;  $p = 0.016$ ). Students in Years 1–2 and 3–4 had lower odds of hesitancy than those in Year 5+ (AOR 0.344, 95% CI 0.120–0.984;  $p = 0.047$  and AOR 0.228, 95% CI 0.082–0.632;  $p = 0.005$ , respectively). Positive attitude was not independently associated with hesitancy (AOR 0.952, 95% CI 0.549–1.651;  $p = 0.860$ ).

## Conclusions

Although two-thirds of students expressed willingness to receive an mpox vaccine, reported hesitancy remained substantial. Knowledge and perception were independently associated with hesitancy, while differences across colleges and levels of study suggest an important role for educational context. Mpox preparedness should therefore combine targeted risk communication with trusted healthcare-

professional engagement and affordable, convenient access to vaccination. Because vaccination intention was assessed hypothetically, these findings indicate potential demand rather than actual vaccine uptake.

## 1. Introduction

Mpox is a zoonotic viral disease caused by monkeypox virus, an orthopoxvirus transmitted through close contact with infected people or animals and through contaminated materials. After decades of being recognised primarily in parts of Central and West Africa, mpox gained renewed international attention following the global outbreak that began in 2022. The scale of that outbreak prompted the World Health Organization (WHO) to declare a Public Health Emergency of International Concern and reinforced the importance of surveillance, risk communication, prevention and access to appropriate care (1–5). Although the intensity of the global emergency has changed, mpox remains a public health concern, particularly in settings where surveillance, vaccination and access to health services are constrained (3–5).

Effective mpox prevention depends partly on whether people understand transmission, recognise clinical manifestations and know how infection can be prevented (6). This is relevant in university settings, where students interact frequently in classrooms, accommodation, transport and social environments. Evidence from university and medical-student populations has shown substantial variation in knowledge, with gaps reported in transmission, symptoms, prevention, disease severity and vaccine-related information (7–10). Thus, university attendance alone does not ensure adequate understanding of mpox (11–12).

Knowledge may also influence vaccination decision-making. Studies among university students and other populations have reported associations between mpox knowledge, risk perception, vaccine confidence and willingness to vaccinate, although the strength and direction of these relationships vary across settings (13–19). Global and student-specific systematic reviews likewise show substantial heterogeneity in mpox vaccine acceptance, underscoring the importance of context, perceived risk, confidence and access (20–22).

This issue is particularly relevant in Sierra Leone. The country reported a confirmed mpox case in January 2025, following earlier documented cases, including the 2017 Pujehun outbreak (23, 24). Local evidence remains limited. A recent study among Njala University students documented variation in mpox-related knowledge, attitudes and preventive practices, but did not directly examine vaccine decision-making (25). Evidence therefore remains limited on the combined relationship between knowledge, attitudes, perceptions and vaccine hesitancy among students across the University of Sierra Leone, including both health-related and non-health-related programmes.

Generating such evidence is important for developing context-specific risk communication and vaccination strategies. University students are not only potential recipients of vaccination but may also influence health information and behaviours within their families and communities. Understanding which

knowledge gaps, perceptions and contextual factors accompany hesitancy can help identify groups that may require more targeted communication and access interventions.

Accordingly, this study assessed knowledge, attitudes and perceptions of mpox and examined factors associated with mpox vaccine hesitancy among students at the University of Sierra Leone. The study specifically sought to describe students' knowledge, attitudes and perceptions; estimate the proportion willing and unwilling to receive an mpox vaccine if available; and identify factors independently associated with vaccine hesitancy.

## **2. Methods**

### **2.1 Study design**

A cross-sectional study was conducted from 1 January to 30 June 2026 among students at three constituent colleges of the University of Sierra Leone (USL). Data were collected using a structured, self-administered questionnaire. The study was reported in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidance (26).

### **2.2 Study setting**

The study was conducted at Fourah Bay College (FBC), the Institute of Public Administration and Management (IPAM), and the College of Medicine and Allied Health Sciences (COMAHS), the three constituent colleges represented in the study. FBC provides programmes across arts, social sciences, law, natural and applied sciences and related fields; IPAM focuses primarily on business, public administration, information technology and management; and COMAHS provides training in medicine, pharmacy, nursing and other health-related disciplines. The inclusion of these colleges allowed comparison of students with predominantly health-related versus non-health-related educational backgrounds.

Fourah Bay College (FBC) is a constituent college of USL with a broad range of undergraduate and postgraduate programmes, including arts, social sciences, law, natural and applied sciences and related disciplines.

The College of Medicine and Allied Health Sciences (COMAHS) is a constituent college of USL focused on the education and training of health professionals, including doctors, pharmacists, nurses and other allied health professionals.

The Institute of Public Administration and Management (IPAM) is a constituent college of USL with programmes centred on business, public administration, information technology, management and related fields.

### **2.3 Study Population**

The study population comprised students enrolled at Fourah Bay College (FBC), the Institute of Public Administration and Management (IPAM), and the College of Medicine and Allied Health Sciences (COMAHS). The sample included students from both health-related and non-health-related programmes, allowing comparison of knowledge, attitudes, perceptions, and reported vaccine hesitancy across different educational settings, although it was not designed to be representative of all students enrolled at the university. Students were eligible to participate if they were aged 18 years or older, could understand English, provided informed consent, and agreed to participate voluntarily. Students younger than 18 years and those unable to complete the questionnaire were excluded from the study.

## 2.4 Sample size determination

The minimum sample size was calculated using Fisher's formula for a single population proportion:  $n = \frac{Z^2 pq}{d^2}$ . Assuming a 95% confidence level ( $Z = 1.96$ ), a prevalence of 50% ( $p = 0.50$ ),  $q = 0.50$  and a 5% margin of error ( $d = 0.05$ ), the minimum sample size was 384. An additional 10% was allowed for non-response or incomplete questionnaires, resulting in a target sample of 422 students (27).

Formula:

$$n = \frac{Z^2 \times p \times q}{d^2}$$

Where:

- $n$  = minimum required sample size
- $Z = 1.96$  (95% confidence level)
- $p = 0.50$  (assumed prevalence in the absence of prior local data)
- $q = 1 - p = 0.50$
- $d = 0.05$  (margin of error)

Calculation:

$$n = \frac{(1.96)^2 \times 0.5 \times 0.5}{(0.05)^2}$$

$$n = \frac{3.84 \times 0.25}{0.0025}$$

$$n = \frac{0.96}{0.0025}$$

$$n = 384$$

To account for possible non-response or incomplete questionnaires, a 10% allowance was added. The final target sample was 422 students.

$$\text{Non-response adjustment} = 384 \times 10\% = 38$$

Final sample size = 384 + 38 = **422 students**

## 2.4.1 Sample allocation across colleges

The target sample of 422 was proportionally allocated across the three colleges according to the reported student populations from the previous year. The planned allocation was 226 students from FBC, 127 from IPAM and 69 from COMAHS. Proportional allocation was used only to distribute the target sample across the three colleges; recruitment of individual participants within each college was non-probability-based, using convenience sampling supplemented by snowball referral.

- FBC = 9,930
- IPAM = 5,585
- COMAHS = 3,035

The enrolment figures were obtained from the respective college administrations and represented the reported student populations for the preceding academic year.

The resulting allocation is presented in Table 1.

Table 1  
Sample Size Distribution across Universities

| University | Estimated Population of Universities the previous year | Sample allocation (n = 422)                      |
|------------|--------------------------------------------------------|--------------------------------------------------|
| FBC        | 9,930                                                  | $\frac{9,930}{18,550} \times 422 = 226$ students |
| IPAM       | 5,585                                                  | $\frac{5,585}{18,550} \times 422 = 127$ students |
| COMAHS     | 3,035                                                  | $\frac{3,035}{18,550} \times 422 = 69$ students  |
| Total      | 18,550                                                 | 422 students                                     |

### Source

The target sample of 422 was proportionally allocated across the three colleges according to the reported student populations from the previous year.

## 2.5 Data collection tool and procedure

Data were collected using a structured questionnaire adapted and developed from previously published studies assessing mpox-related knowledge, attitudes, perceptions, and vaccination intention among university students. The questionnaire was informed by the studies of Doan et al. (2024), Lounis et al. (2024), and Kumar et al. (2023), and was adapted to the context of university students in Sierra Leone,

provided as Supplementary File 1 (9, 13, 15). It was administered through a combination of paper-based questionnaires and electronic completion, with data subsequently entered or captured using Google Forms. Participants were recruited using convenience sampling supplemented by snowball recruitment. Trained data collectors approached eligible students on campus and in classrooms during scheduled breaks.

The analytical questionnaire comprised six domains:

1. 1. Socio-demographic characteristics: age, gender, level of study, college, place of residence and monthly family income.
2. 2. Previous exposure to mpox information and vaccination history: prior awareness of mpox, exposure to university-provided mpox information or lectures, and history of COVID-19 and seasonal influenza vaccination.
3. 3. Knowledge of mpox: 16 closed-ended items covering disease characteristics, transmission, clinical manifestations, prevention, severity and treatment or prophylaxis. Responses were recorded as true, false or not sure. Correct responses received one point and incorrect or not-sure responses received zero, producing a total score from 0 to 16. Scores of  $\geq 8$  ( $\geq 50\%$ ) were classified as good knowledge and scores below 8 as poor knowledge. This 50% threshold is consistent with previous mpox knowledge studies that classified participants scoring at least half of the maximum obtainable score as having good or adequate knowledge (28, 29).
4. 4. Attitudes towards mpox vaccination: 7 items assessed attitudes towards mpox vaccination, including perceived vaccine effectiveness and safety, willingness to vaccinate, willingness to encourage others to vaccinate, willingness to pay, trust in health authorities, and related views. Items were scored on a five-point Likert scale, with negatively worded items reverse scored. A total score of  $\geq 75\%$  of the maximum obtainable score was classified as a positive attitude and a score below 75% as a negative attitude. This threshold follows the modified Bloom's cut-off point, under which respondents scoring at least 75% of the maximum obtainable score on a domain are classified as positive and those scoring below it as negative; the same modified threshold has been applied in previous knowledge, attitude and practice surveys (30).
5. 5. Perceptions of mpox: 10 statements assessed perceived severity, susceptibility, potential effects on academic activities and support for mpox prevention as a national priority. Items were scored on a five-point Likert scale, with reverse scoring applied where required. A total score of  $\geq 75\%$  of the maximum obtainable score was classified as a positive perception and a score below 75% as a negative perception, applying the same modified Bloom's cut-off point used for the attitude domain (30). The stricter threshold used for attitude and perception than for knowledge was prespecified, on the basis that endorsement of a favourable position on a Likert scale represents a lower bar than a correct response to a factual item.
6. 6. Vaccine acceptance and hesitancy: the primary outcome was measured by the question, "If the mpox vaccine were available to you, would you take it?" A "No" response was classified as vaccine hesitancy and a "Yes" response as acceptance. Because the item asked participants to consider a vaccine that was not in fact available to them, the outcome measured self-reported vaccination

intention rather than observed vaccination behaviour, and is referred to throughout as reported vaccine hesitancy. This operational definition reflects the established concept of vaccine hesitancy as delay in acceptance or refusal of vaccination despite availability (31). Additional yes/no items assessed perceived vaccine safety and effectiveness and potential barriers or facilitators, including cost, healthcare-professional recommendation and on-campus accessibility. These supplementary items were analysed descriptively.

A pilot survey involving 21 students from the participating colleges was conducted to assess clarity and internal consistency before the main survey. Reported Cronbach's alpha coefficients were 0.825 for knowledge, 0.879 for attitude and 0.915 for perception. A coefficient of 0.760 was obtained for the supplementary multi-item set covering perceived vaccine safety and effectiveness and potential barriers and facilitators; this coefficient applies to that supplementary item set and not to the single-item primary outcome, for which internal consistency cannot be calculated. Cronbach's alpha was used to assess internal consistency of the multi-item constructs only, consistent with established guidance on questionnaire reliability assessment (32).

Data collection was conducted by trained data collectors. Most participants completed a paper-based questionnaire, which was subsequently entered into Google Forms, while others completed the questionnaire electronically. Participation was voluntary and responses were collected without personal identifiers.

## **2.6 Data analysis**

Data were analysed using IBM SPSS Statistics version 27. Categorical variables were summarised using frequencies and percentages, while continuous variables were summarised using means and standard deviations. Knowledge, attitude and perception scores were calculated according to the prespecified scoring criteria and categorised as good/poor knowledge, positive/negative attitude, and positive/negative perception, respectively. Binary logistic regression was used to identify factors associated with mpox vaccine hesitancy. The dependent variable was coded as 0 for vaccine acceptance ("Yes") and 1 for vaccine hesitancy ("No"). Crude odds ratios (CORs) and 95% confidence intervals (CIs) were estimated in univariable analyses. Variables were then entered simultaneously into a multivariable logistic regression model to obtain adjusted odds ratios (AORs) and 95% CIs. The model included age, gender, university affiliation, area of residence, monthly family income, level of study, knowledge, attitude and perception. Statistical significance was set at  $p \leq 0.05$ . Model fit was assessed using the Hosmer-Lemeshow goodness-of-fit test. Given the cross-sectional design, odds ratios were interpreted as measures of association rather than causation.

## **3. Results**

### **3.1 Socio-demographic characteristics**

A total of 422 students participated. The largest age group was 21–25 years (187, 44.3%), followed by 18–20 years (131, 31.0%) and  $\geq 26$  years (104, 24.6%). There were 224 (53.1%) male and 198 (46.9%) female participants. FBC contributed 226 (53.6%) participants, IPAM 127 (30.1%) and COMAHS 69 (16.4%). Monthly family income was  $<LE1,000$  for 126 (29.9%),  $LE1,001–3,000$  for 115 (27.3%),  $LE3,001–5,000$  for 71 (16.8%) and  $>LE5,000$  for 110 (26.1%) participants (Table 2).

Table 2  
Socio-demographic characteristics of students in the university of sierra leone (USL)  
2025/26

| Variable                                  | Category           | Frequency (n = 422) | Percent (%) |
|-------------------------------------------|--------------------|---------------------|-------------|
| Age (years)                               | 18–20              | 131                 | 31.0        |
|                                           | 21–25              | 187                 | 44.3        |
|                                           | $\geq 26$          | 104                 | 24.6        |
| Gender                                    | Male               | 224                 | 53.1        |
|                                           | Female             | 198                 | 46.9        |
| University                                | COMAHS             | 69                  | 16.4        |
|                                           | IPAM               | 127                 | 30.1        |
|                                           | FBC                | 226                 | 53.6        |
| Programme/Course                          | Health-related     | 72                  | 17.1        |
|                                           | Non-health-related | 350                 | 82.9        |
| Monthly Family Income                     | $< LE1,000$        | 126                 | 29.9        |
|                                           | $LE1,000–3,000$    | 115                 | 27.3        |
|                                           | $LE3,001–5,000$    | 71                  | 16.8        |
|                                           | $> LE5,000$        | 110                 | 26.1        |
| <b>Note:</b> LE = Sierra Leonean currency |                    |                     |             |

## 3.2 Previous exposure to mpox information and vaccination history

Most participants had heard of mpox before the survey (390, 92.4%), whereas 32 (7.6%) had not. About half reported that their university had provided information or lectures on mpox (210, 49.8%). Previous COVID-19 vaccination was reported by 113 (26.8%) participants, while 309 (73.2%) reported no COVID-19 vaccination. Seasonal influenza vaccination was reported by 71 (16.8%) participants (Table 3).

Table 3

Previous exposure to mpox information and vaccination history among students in USL 2025/26

| Variable                                                                  | Yes n (%)     | No n (%)      |
|---------------------------------------------------------------------------|---------------|---------------|
| Before this survey, had you heard about monkeypox (Mpox)?                 | 390<br>(92.4) | 32 (7.6)      |
| Has your university ever provided any information or lectures about Mpox? | 210<br>(49.8) | 212<br>(50.2) |
| Have you received a COVID-19 vaccine?                                     | 113<br>(26.8) | 309<br>(73.2) |
| Have you ever received a seasonal flu vaccine?                            | 71 (16.8)     | 351<br>(83.2) |

### 3.3 Knowledge of mpox

Overall, 332 (78.7%) participants had good knowledge and 90 (21.3%) had poor knowledge (Fig. 1). The highest proportions of correct responses concerned recognition of mpox as a public health concern in Sierra Leone (335, 79.4%), its characteristic symptoms (335, 79.4%), transmission through close physical contact (320, 75.8%) and transmission through contaminated materials (309, 73.2%). Uncertainty was greatest for the item concerning the usual case-fatality rate, for which 168 (39.8%) respondents selected “not sure” (Table 4).

Table 4  
Knowledge of mpox and mpox vaccination among students in USL 2025/26

| Statement                                                                                                | True n (%) | False n (%) | Not Sure n(%) | Mean $\pm$ SD   |
|----------------------------------------------------------------------------------------------------------|------------|-------------|---------------|-----------------|
| Mpox is not a newly discovered viral disease                                                             | 229 (54.3) | 123 (29.1)  | 70 (16.6)     | 1.62 $\pm$ 0.75 |
| Mpox circulates only among primates, including humans                                                    | 272 (64.5) | 87 (20.6)   | 63 (14.9)     | 1.50 $\pm$ 0.74 |
| Mpox usually presents with more than simple flu-like symptoms                                            | 287 (68.0) | 52 (12.3)   | 83 (19.7)     | 1.52 $\pm$ 0.80 |
| There is currently no specific antiviral drug approved for mpox                                          | 201 (47.6) | 120 (28.4)  | 101 (23.9)    | 1.76 $\pm$ 0.81 |
| People who previously received smallpox vaccination may need additional protection against Mpox          | 219 (51.9) | 100 (23.7)  | 103 (24.4)    | 1.73 $\pm$ 0.83 |
| Mpox infection has a high rate of systemic complications                                                 | 268 (63.5) | 66 (15.6)   | 88 (20.9)     | 1.57 $\pm$ 0.81 |
| Mpox rash typically appears in a synchronous pattern                                                     | 233 (55.2) | 99 (23.5)   | 90 (21.3)     | 1.66 $\pm$ 0.81 |
| Mpox virus can survive for several days on contaminated surfaces                                         | 241 (57.3) | 72 (17.1)   | 108 (25.6)    | 1.68 $\pm$ 0.85 |
| The usual case fatality rate of of mpox ranges between 1% and 10%                                        | 169 (40.0) | 85 (20.1)   | 168 (39.8)    | 2.00 $\pm$ 0.90 |
| Mpox can spread through close physical contact with an infected person rash or body fluids               | 320 (75.8) | 52 (12.3)   | 50 (11.8)     | 1.36 $\pm$ 0.68 |
| Mpox can be spread by sharing bedding or towels with an infected person                                  | 309 (73.2) | 64 (15.2)   | 49 (11.6)     | 1.38 $\pm$ 0.69 |
| Mpox is only sexually transmitted infection (STI)                                                        | 96 (22.7)  | 254 (60.2)  | 72 (17.1)     | 1.94 $\pm$ 0.63 |
| Standard preventive measures like hand hygiene and using mask can reduce the spread of Mpox              | 301 (71.3) | 65 (15.4)   | 56 (13.3)     | 1.42 $\pm$ 0.71 |
| In sierra Leone mpox is considered a disease of public health concern                                    | 335 (79.4) | 41 (9.7)    | 46 (10.9)     | 1.32 $\pm$ 0.66 |
| Most people who get mpox experience a fever and a distinctive skin rash                                  | 335 (79.4) | 42 (10.0)   | 45 (10.7)     | 1.31 $\pm$ 0.66 |
| Mpox can sometimes cause severe illness and complications, especially in people with weak immune systems | 320 (75.8) | 34 (8.1)    | 68 (16.1)     | 1.40 $\pm$ 0.75 |

### 3.4 Attitudes towards mpox vaccination

Overall, 174 (41.2%) participants had a positive attitude towards Mpox vaccination (Fig. 2). Most participants agreed or strongly agreed that vaccination is effective in preventing Mpox 304 (72.0%) and that getting vaccinated is a responsible decision for students 251 (59.5%). Similarly, 238 (56.4%) agreed or strongly agreed that the benefits of vaccination outweigh its risks, while 240 (56.9%) would encourage friends or family to receive the vaccine. Willingness to pay for an Mpox vaccine if it was not free was comparatively lower 147 (34.8%). Item-level responses are presented in Table 5.

Table 5  
Attitudes towards Mpox vaccination among students at USL, 2025/26

| Statement                                                                                                                                                               | SA n (%)   | A n (%)    | N n (%)    | D n (%)   | SD n (%)  | Mean $\pm$ SD   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|------------|-----------|-----------|-----------------|
| I believe vaccination is an effective way to prevent Mpox infection                                                                                                     | 124 (29.4) | 180 (42.7) | 67 (15.9)  | 20 (4.7)  | 31 (7.3)  | 3.82 $\pm$ 1.13 |
| I trust vaccines recommended by health authorities in Sierra Leone                                                                                                      | 59 (14.0)  | 150 (35.5) | 135 (32.0) | 40 (9.5)  | 38 (9.0)  | 3.36 $\pm$ 1.11 |
| I believe the benefits of Mpox vaccination outweigh the risks                                                                                                           | 71 (16.8)  | 167 (39.6) | 113 (26.8) | 41 (9.7)  | 30 (7.1)  | 3.49 $\pm$ 1.10 |
| I would encourage friends/family to receive the vaccine                                                                                                                 | 78 (18.5)  | 162 (38.4) | 115 (27.3) | 44 (10.4) | 23 (5.5)  | 3.54 $\pm$ 1.08 |
| I am confident in the safety of Mpox vaccines                                                                                                                           | 69 (16.4)  | 151 (35.8) | 122 (28.9) | 51 (12.1) | 29 (6.9)  | 3.43 $\pm$ 1.11 |
| I am willing to pay for an Mpox vaccine if it is not free                                                                                                               | 44 (10.4)  | 103 (24.4) | 115 (27.3) | 93 (22.0) | 67 (15.9) | 2.91 $\pm$ 1.23 |
| Getting vaccinated against Mpox is a responsible decision for students                                                                                                  | 97 (23.0)  | 154 (36.5) | 91 (21.6)  | 54 (12.8) | 26 (6.2)  | 3.57 $\pm$ 1.15 |
| <b>Note:</b> SA = strongly agree; A = agree; N = neutral; D = disagree; SD = strongly disagree. Responses were scored from 1 (strongly disagree) to 5 (strongly agree). |            |            |            |           |           |                 |

### 3.5 Perceptions of mpox and vaccination

Overall, 249 (59.0%) participants had a positive perception of Mpox and its prevention (Fig. 3). Most participants agreed or strongly agreed that Mpox is a serious disease that can cause severe health problems, 314 (74.4%), and that it poses a real public health threat in Sierra Leone, 300 (71.1%). Similarly, 285 (67.5%) perceived university students to be at risk of infection, while 283 (67.1%) believed that Mpox could become more widespread without vaccination. The strongest endorsement was for making Mpox prevention a national health priority, 309 (73.2%). In contrast, perceived personal vulnerability was comparatively lower, with 180 (42.7%) agreeing or strongly agreeing that they felt personally vulnerable to Mpox infection. Item-level responses are presented in Table 6.

Table 6  
Perceptions of Mpox and its prevention among students at USL, 2025/26

| Statement                                                                                                                                                               | SA n (%)   | A n (%)    | N n (%)    | D n (%)   | SD n (%)  | Mean $\pm$ SD   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------------|------------|-----------|-----------|-----------------|
| Mpox is a serious disease that can cause severe health problems                                                                                                         | 157 (37.2) | 157 (37.2) | 55 (13.0)  | 27 (6.4)  | 26 (6.2)  | 3.93 $\pm$ 1.14 |
| Mpox poses a real public health threat in Sierra Leone                                                                                                                  | 141 (33.4) | 159 (37.7) | 67 (15.9)  | 34 (8.1)  | 21 (5.0)  | 3.86 $\pm$ 1.12 |
| University students are at risk of contracting Mpox                                                                                                                     | 94 (22.3)  | 191 (45.3) | 83 (19.7)  | 39 (9.2)  | 15 (3.6)  | 3.73 $\pm$ 1.02 |
| Mpox infection could disrupt my academic activities                                                                                                                     | 116 (27.5) | 161 (38.2) | 70 (16.6)  | 52 (12.3) | 23 (5.5)  | 3.70 $\pm$ 1.16 |
| I am worried about the spread of Mpox in my community                                                                                                                   | 96 (22.7)  | 172 (40.8) | 85 (20.1)  | 42 (10.0) | 27 (6.4)  | 3.64 $\pm$ 1.13 |
| Without vaccination, Mpox could become more widespread                                                                                                                  | 123 (29.1) | 160 (37.9) | 80 (19.0)  | 38 (9.0)  | 21 (5.0)  | 3.77 $\pm$ 1.11 |
| I believe Mpox can be prevented through vaccination                                                                                                                     | 99 (23.5)  | 182 (43.1) | 86 (20.4)  | 32 (7.6)  | 23 (5.5)  | 3.72 $\pm$ 1.07 |
| I believe misinformation contributes to fear about the Mpox vaccines                                                                                                    | 129 (30.6) | 174 (41.2) | 64 (15.2)  | 29 (6.9)  | 26 (6.2)  | 3.83 $\pm$ 1.12 |
| I feel personally vulnerable to Mpox infection                                                                                                                          | 47 (11.1)  | 133 (31.5) | 121 (28.7) | 77 (18.2) | 44 (10.4) | 3.15 $\pm$ 1.16 |
| Preventing Mpox should be a national health priority                                                                                                                    | 175 (41.5) | 134 (31.8) | 57 (13.5)  | 27 (6.4)  | 29 (6.9)  | 3.95 $\pm$ 1.19 |
| <b>Note:</b> SA = strongly agree; A = agree; N = neutral; D = disagree; SD = strongly disagree. Responses were scored from 1 (strongly disagree) to 5 (strongly agree). |            |            |            |           |           |                 |

### 3.6 Mpox vaccine acceptance and hesitancy

Overall, 287 (68.0%) participants indicated that they would take an mpox vaccine if it were available, while 135 (32.0%) were classified as hesitant. Most respondents considered the vaccine effective (288, 68.2%) and safe (275, 65.2%). A healthcare professional's recommendation was the most frequently reported facilitator of uptake (330, 78.2%), followed by easy access on campus (230, 54.5%). Conversely, 246 (58.3%) reported that vaccine cost could prevent them from accepting vaccination (Table 7).

Table 7  
Mpox vaccine acceptance and hesitancy among students at USL, 2025/26

| Statement                                                                                 | Yes n (%)     | No n (%)      |
|-------------------------------------------------------------------------------------------|---------------|---------------|
| If the mpox vaccine were available to you, would you take it?                             | 287<br>(68.0) | 135<br>(32.0) |
| Do you believe the mpox vaccine is safe?                                                  | 275<br>(65.2) | 147<br>(34.8) |
| Do you believe the mpox vaccine is effective in preventing mpox?                          | 288<br>(68.2) | 134<br>(31.8) |
| Would the cost of the vaccine prevent you from taking it?                                 | 246<br>(58.3) | 176<br>(41.7) |
| Would you be more likely to take the vaccine if recommended by a healthcare professional? | 330<br>(78.2) | 92 (21.8)     |
| Would you be more willing to take the vaccine if it were easily accessible on campus?     | 230<br>(54.5) | 193<br>(45.5) |

### 3.7 Factors associated with mpox vaccine hesitancy

In multivariable analysis, university affiliation, level of study, knowledge and perception were independently associated with mpox vaccine hesitancy. Compared with students from FBC, students from COMAHS had substantially lower odds of hesitancy (AOR 0.093, 95% CI 0.032–0.266;  $p < 0.001$ ), as did those from IPAM (AOR 0.508, 95% CI 0.293–0.882;  $p = 0.016$ ). Good knowledge was associated with lower odds of hesitancy compared with poor knowledge (AOR 0.203, 95% CI 0.116–0.356;  $p < 0.001$ ). Students in Years 1–2 and 3–4 also had lower odds of hesitancy than those in Year 5+ (AOR 0.344, 95% CI 0.120–0.984;  $p = 0.047$  and AOR 0.228, 95% CI 0.082–0.632;  $p = 0.005$ , respectively). Positive perception was associated with lower odds of hesitancy (AOR 0.562, 95% CI 0.328–0.962;  $p = 0.036$ ), whereas positive attitude was not independently associated with hesitancy (AOR 0.952, 95% CI 0.549–1.651;  $p = 0.860$ ). Table 8.

Table 8  
Factors associated with Mpox vaccine hesitancy among university students at the University of Sierra Leone, 2025/26

| Variable              | Category           | COR (95% CI)        | p-value           | AOR (95% CI)        | p-value           |
|-----------------------|--------------------|---------------------|-------------------|---------------------|-------------------|
| Age                   | 18–20 years        | 0.912 (0.522–1.593) | 0.746             | 0.514 (0.254–1.039) | 0.064             |
|                       | 21–25 years        | 1.093 (0.655–1.825) | 0.733             | 1.082 (0.593–1.971) | 0.798             |
|                       | ≥ 26 years         | Reference           | -                 | Reference           | -                 |
| Gender                | Male               | 1.015 (0.674–1.529) | 0.943             | 0.628 (0.386–1.021) | 0.061             |
|                       | Female             | Reference           | -                 | Reference           | -                 |
| University            | COMAHS             | 0.147 (0.061–0.353) | <b>&lt; 0.001</b> | 0.093 (0.032–0.266) | <b>&lt; 0.001</b> |
|                       | IPAM               | 0.708 (0.447–1.121) | 0.141             | 0.508 (0.293–0.882) | <b>0.016</b>      |
|                       | FBC                | Reference           | -                 | Reference           | -                 |
| Residence             | Western Area Urban | 0.840 (0.558–1.266) | 0.405             | 0.841 (0.527–1.342) | 0.468             |
|                       | Western Area Rural | Reference           | -                 | Reference           | -                 |
| Monthly family income | <Le1,000           | 0.943 (0.551–1.613) | 0.831             | 0.698 (0.379–1.283) | 0.247             |
|                       | Le1,001–3,000      | 0.559 (0.312–0.999) | 0.050             | 0.415 (0.211–0.815) | <b>0.011</b>      |
|                       | Le3,001–5,000      | 1.052 (0.565–1.957) | 0.873             | 0.712 (0.351–1.442) | 0.345             |
|                       | >Le5,000           | Reference           | -                 | Reference           | -                 |
| Level of study        | Year 1–2           | 0.740 (0.349–1.571) | 0.434             | 0.344 (0.120–0.984) | 0.047             |
|                       | Year 3–4           | 0.508 (0.238–1.082) | 0.079             | 0.228 (0.082–0.632) | <b>0.005</b>      |
|                       | Year 5+            | Reference           | -                 | Reference           | -                 |
| Knowledge             | Good knowledge     | 0.229 (0.141–0.373) | <b>&lt; 0.001</b> | 0.203 (0.116–0.356) | <b>&lt; 0.001</b> |
|                       | Poor knowledge     | Reference           | -                 | Reference           | -                 |

| Variable   | Category            | COR (95% CI)        | p-value           | AOR (95% CI)        | p-value      |
|------------|---------------------|---------------------|-------------------|---------------------|--------------|
| Attitude   | Positive attitude   | 0.584 (0.380–0.896) | <b>0.014</b>      | 0.952 (0.549–1.651) | 0.860        |
|            | Negative attitude   | Reference           | -                 | Reference           | -            |
| Perception | Positive perception | 0.434 (0.286–0.659) | <b>&lt; 0.001</b> | 0.562 (0.328–0.962) | <b>0.036</b> |
|            | Negative perception | Reference           | -                 | Reference           | -            |

### Model statistics

$\chi^2(14) = 90.982$ ,  $p < 0.001$ ; Nagelkerke  $R^2 = 0.271$ ; Hosmer-Lemeshow  $\chi^2(8) = 11.139$ ,  $p = 0.194$ ; overall classification accuracy = 73.5%.

### Note

Outcome coding was Yes = 0 (vaccine acceptance) and No = 1 (vaccine hesitancy). Therefore,  $AOR > 1$  indicates higher odds of hesitancy, whereas  $AOR < 1$  indicates lower odds of hesitancy. The model was adjusted simultaneously for all variables listed. For categorical variables, the stated reference category was used. COR = crude odds ratio; AOR = adjusted odds ratio; CI = confidence interval, LE= Sierra Leonean currency.

## 4. Discussion

This study set out to understand how students at the University of Sierra Leone think about mpox and about the prospect of being vaccinated against it, at a point when empirical evidence from West Africa remains sparse. Four observations frame everything that follows. Roughly two in three students said they would accept an mpox vaccine, leaving close to a third who would not, so acceptance was moderate to high but not uniform. Factual knowledge was widespread, yet favourable attitudes towards vaccination were considerably less common, and fewer than half of students felt personally vulnerable to infection. After adjustment, the characteristics that remained associated with reported hesitancy were what students knew about the disease, how they perceived it, which constituent college they attended and how far they had progressed through their programme. Attitude, which appeared influential in unadjusted analysis, no longer contributed once these factors were taken into account.

Taken together, the pattern points to a particular kind of hesitancy. Students in this sample were not, for the most part, rejecting vaccination on principle; the large majority who considered an mpox vaccine safe and effective argues against that reading. The hesitant minority was distinguished by a weaker grasp of what mpox does and a weaker sense that it could happen to them. This pattern could reflect a different situation from entrenched vaccine refusal, although the cross-sectional design does not allow

the direction of these relationships to be established. The central message of the analysis is therefore that knowledge and perception remained independently associated with reported hesitancy after adjustment whereas attitude did not, and that differences across colleges point to the potential importance of educational and institutional context.

The level of willingness observed here sits within the range reported internationally and somewhat above the available pooled estimates. A recent systematic review and meta-analysis of student populations reported pooled acceptance of 58.6%, and a 2026 African systematic review and meta-analysis reported pooled acceptance of 54.97% (20, 22). Both pooled values should be treated as orientation rather than benchmark, because heterogeneity in each was extreme ( $I^2 = 100\%$  and  $I^2 = 97.8\%$ , respectively), which means the pooled figures summarise widely dispersed underlying estimates rather than a stable central value. The African synthesis also aggregates general populations, healthcare workers and medical students drawn from countries at very different points in their mpox response. On this basis it would be inaccurate to claim that acceptance in the present sample was definitively higher than elsewhere; the more defensible reading is that it falls within the reported international range while lying somewhat above the pooled estimates, which suggests that latent demand is unlikely to be the first constraint on coverage in this population.

That reading needs an important qualification. What was measured here was stated willingness to accept a vaccine that was not in fact available, and willingness of this kind should not be interpreted as evidence that students would actually receive an mpox vaccine were one offered to them. The distance between intention and behaviour is well documented on this continent: the same African synthesis that reported pooled acceptance of around 55% found actual uptake substantially lower (22), and a global review reported a comparable acceptance–uptake gap across key populations (21). For programme planning, the practical implication is that the willing majority observed here should be treated as a ceiling on achievable coverage rather than a forecast of it. Supply, eligibility criteria, cost, waiting time and the perceived immediacy of the threat will each erode that ceiling once a vaccine actually arrives.

Knowledge was the strongest independent correlate of reported hesitancy in this study. Participants with good mpox knowledge had substantially lower odds of reporting vaccine hesitancy than those with poor knowledge, and this association persisted after accounting for college, year of study, income, attitude and perception. It should be read as an association rather than as a causal effect. The direction of the association is more informative than its magnitude. It may indicate that a substantial share of the hesitancy reported here is informational in character rather than ideological, which would be a comparatively tractable form of hesitancy. This interpretation should be treated as provisional: the design cannot establish whether limited knowledge contributes to hesitancy, whether students already disinclined to vaccinate are less likely to acquire accurate information, or whether both relationships operate together. The finding is consistent with the broader African evidence, in which greater mpox knowledge has been identified among the factors associated with vaccine acceptance (22), and with reports among university students in China linking mpox knowledge to willingness to vaccinate (16).

None of this evidence establishes that raising knowledge would in itself lower hesitancy, and the present data cannot support such a claim.

The composition of the knowledge gap is more revealing than the overall score. Students were confident about the things that circulate readily in public messaging: that mpox is a concern in Sierra Leone, that it causes fever and a distinctive rash, that it spreads through close physical contact and through shared bedding or towels. They were far less certain about how dangerous the disease actually is. The item on case fatality attracted the largest share of “not sure” responses of any in the instrument, and roughly a quarter were unsure whether prior smallpox vaccination confers adequate protection. Comparable unevenness across knowledge domains has been described among students in Algeria (13) and in multi-country samples of medical students (8). The distinction matters because recognising a disease is not the same as being able to weigh it. A student who can name mpox but cannot judge its severity has no basis on which to decide whether a vaccine is worth taking.

These observations have a bearing on what university health education in this setting might contain. Awareness-raising, in the conventional sense of ensuring students have heard of mpox, appears already to have largely succeeded here. The observed deficit lies in severity, prognosis, the limits of pre-existing immunity and what vaccination does and does not prevent, which is the content on which a reasoned vaccination decision would be expected to depend. Educational materials aimed at this population could reasonably be reoriented towards that content rather than towards basic disease recognition, although the present data cannot establish whether doing so would alter vaccination intention.

Perception was independently associated with reported hesitancy, and the item-level pattern indicates where that association may originate. Students overwhelmingly endorsed mpox as a serious disease, as a genuine threat to Sierra Leone and as a national prevention priority. Yet fewer than half agreed that they themselves were personally vulnerable, and personal vulnerability attracted the lowest mean score of any perception item. The gap between “this is dangerous for the country” and “this could happen to me” is the central behavioural observation of this study. That perception retained an independent association with reported hesitancy after adjustment for knowledge, attitude, college, level of study and socio-demographic characteristics gives it particular weight, since it indicates that the association is not simply a restatement of what students know. Perceived risk and perceived severity may influence vaccination intention, and higher risk perception is likewise identified among the factors associated with acceptance in the African meta-analysis (22). This should not be read as demonstrating a causal pathway from perceived susceptibility to willingness, which a cross-sectional design cannot establish.

A gap of this kind is consistent with what established models of health behaviour would anticipate, in which perceived severity in the absence of perceived susceptibility is less often accompanied by protective behaviour, because the threat, however real, may be regarded as somebody else’s problem. Evidence from university students in Kazakhstan points the same way: there, willingness to vaccinate tracked perceptions of danger and of national threat more closely than factual knowledge did (33), and risk perception recurs as a determinant of acceptance across African studies (22). In the present sample

the two constructs appear to operate in tandem, with knowledge supplying the reasons and perceived susceptibility supplying the motive.

For intervention design, these associations suggest a different target. The instinctive response is to concentrate effort on the vaccine-refusing minority, but the larger group who accept that mpox is serious while placing themselves outside its reach may warrant greater attention. These students did not report opposition to vaccination; rather, they did not report perceiving it as personally relevant. Reaching them may require communication that is specific about exposure the crowded lecture theatre, the shared hostel room, shared bedding and towels, the informal transport most students use daily rather than communication that escalates alarm about the disease in the abstract. Given that severity was already widely recognised in this sample, further emphasis on severity alone appears unlikely to address the observed gap, whereas concrete, locally recognisable transmission scenarios may be better suited to it. This proposition follows from the pattern of responses reported here and from the association between risk perception and acceptance described in the wider literature (22, 33); it has not been tested in this population.

Positive attitude was associated with lower odds of hesitancy in the crude analysis but was no longer associated with the outcome after adjustment. Attitude should therefore not be described as an independent determinant of reported hesitancy in this sample. The attenuation itself is analytically informative: it suggests that the crude relationship may partly overlap with knowledge, perception and other participant characteristics, so that the association observed before adjustment was carried in part by variables that travel with attitude rather than by attitude alone. Had the analysis stopped at bivariate associations, the study would have identified attitude as a priority intervention target; the adjusted model does not support that conclusion.

Supplementary analyses reinforced the point. Perception was associated with attitude, whereas knowledge was not independently associated with attitude once perception was accounted for. Knowledge, attitude and perception are therefore not interchangeable proxies for a single underlying construct, despite the convention of reporting them together as “KAP”. They behave as related but separable dimensions of vaccine decision-making, and the practical consequence is that interventions targeting general vaccine sentiment may leave mpox-specific hesitancy untouched. For research, this argues for keeping these dimensions analytically distinct, and for supplementing composite KAP scores with validated multidimensional hesitancy instruments in future work in this region (31).

Students at COMAHS were substantially less likely to report hesitancy than students at Fourah Bay College, with IPAM students falling between the two, and these associations persisted after adjustment for knowledge, attitude, perception and socio-demographic characteristics. The ordering is unsurprising in itself, since COMAHS trains health professionals; the notable feature is that the association remained after knowledge was accounted for. The observed differences by university may reflect differences in educational exposure, health-related training, access to health information, or institutional context. Such explanations cannot be established from this cross-sectional study, in which none of these factors was

measured directly, and attending a health-professional programme should not be described as causing greater acceptance. Associations between academic discipline and mpox-related knowledge or vaccination responses have been reported elsewhere (16, 19).

College affiliation should therefore be read as a marker for an information environment rather than as a cause of lower hesitancy in its own right. It stands in for curriculum content, peer norms, access to health professionals and habits of source appraisal that this study did not measure directly. The programmatic reading is clear enough. Non-health faculties, which accounted for the large majority of this sample and of the university's enrolment, are where mpox vaccination communication is most needed and least likely to occur spontaneously. A uniform, campus-wide message would under-serve exactly the students who need it most. Practical options include integrating brief mpox content into general studies and orientation programmes at FBC and IPAM, and training COMAHS students as peer educators across the other colleges an approach that borrows the credibility of health-professional training without requiring health professionals to be present everywhere.

Students in earlier years were less likely to be hesitant than those in Year 5 and above. This runs against the intuition that longer exposure to higher education produces greater vaccine confidence, and it should be interpreted with restraint: the Year 5 + group was small, the corresponding confidence intervals were wide, and the finding may reflect differences in discipline, age or accumulated experience rather than progression through a degree. It is nonetheless a signal worth pursuing, since senior students often influence junior peers. Larger studies with more granular measures of academic discipline and health-information exposure would be needed before this observation could support any targeting decision.

The supplementary items exposed a set of constraints sitting outside the knowledge–perception axis altogether. A clear majority of students said that cost could stop them accepting an mpox vaccine, while more than three-quarters said a healthcare professional's recommendation would make them more likely to accept it, and over half said convenient on-campus availability would. Willingness, in other words, is conditional. These responses speak to convenience and confidence rather than complacency, and they identify the components of hesitancy most directly amenable to policy.

Three implications follow. First, any mpox vaccination offer to this population should be free at the point of use; a cost barrier reported by most students would neutralise much of the goodwill this study documents. Second, delivery should be brought to campus through student health services, faculty-based clinics or scheduled campus vaccination days rather than requiring students to seek it out. Third, since the recommendation of a health professional was the most frequently reported facilitator in this sample, vaccination counselling could be built into routine student health encounters rather than left to mass communication. These supplementary items were analysed descriptively and were not compared statistically, so their relative ranking should be read as a description of how often each was endorsed rather than as evidence of differing effect. The prominence of this item is consistent with the wider emphasis on trusted messengers and confidence in health authorities, which are among the factors associated with mpox vaccine acceptance in the African literature (22). The purpose of such counselling

is not persuasion. It is to give students an accurate account of benefits, limitations, eligibility and safety on which they can base their own decision. The African evidence points in the same direction, indicating that closing the gap between acceptance and uptake requires attention to access as much as to demand (22).

Almost all students had heard of mpox, but only about half reported that their university had ever provided information or lectures on it. Awareness is therefore arriving largely through channels the university does not control, and in a context where students themselves identified misinformation as a driver of vaccine fear, that is a vulnerability rather than a reassurance. The task for universities and for public health authorities is not to make students aware of mpox; it is to ensure that what reaches them is accurate and decision-relevant. Establishing that communication before an outbreak, while attention is low and anxiety manageable, is considerably easier than attempting it during one. University health services, the Ministry of Health and academic institutions could reasonably treat the current inter-epidemic period as the window for that work.

Several questions follow directly from these results. The most important is whether stated willingness survives contact with a real vaccination offer; a prospective study following students from intention through to documented vaccination would settle a question this design cannot. Others include the mechanism behind the college effect, which would benefit from qualitative enquiry into how health-professional training shapes vaccination norms; the unexpected finding among senior students, which needs a larger sample to confirm or dismiss; and the relative performance of susceptibility-focused against severity-focused communication, which could be tested experimentally in this setting at modest cost.

Several limitations qualify these findings. The cross-sectional design precludes any statement about temporal ordering, so the associations reported here should not be read causally; the data cannot distinguish whether better knowledge reduces hesitancy or whether students already receptive to vaccination are more inclined to seek out accurate information. Recruitment relied on convenience sampling supplemented by snowball referral, which may have introduced selection bias and limits generalisability beyond the participating colleges. The outcome captured hypothetical willingness under an assumed offer rather than observed vaccination behaviour, so the findings describe reported intention and should not be read as evidence of vaccination behaviour. Because recruitment was non-probability-based, the sample is not representative of the University of Sierra Leone student population as a whole. All responses were self-reported and are therefore susceptible to recall and social-desirability bias. Finally, some subgroup estimates, particularly those involving students in Year 5 and above, rested on small numbers and carry correspondingly wide uncertainty. These constraints should be borne in mind when extending the findings to the wider student body or to other populations in Sierra Leone.

Against these limitations, the study contributes evidence that has not previously been available for this setting. It examines vaccine hesitancy across health-related and non-health-related university environments rather than confining the analysis to medical students, and it moves beyond describing

knowledge and attitudes to identify which factors remain associated with hesitancy when considered simultaneously. The model showed acceptable calibration on the Hosmer–Lemeshow test and accounted for a meaningful, though clearly incomplete, share of the variation in the outcome a reminder that determinants not captured here, including trust in institutions, social norms and exposure to misinformation, warrant direct measurement in future work.

## 5. Conclusion

Most students at the University of Sierra Leone indicated that they would accept an mpox vaccine, but a substantial minority indicated that they would not, and that minority was distinguished less by who they were than by what they understood and what they believed about their own risk. Reported hesitancy was not associated with any single demographic characteristic. It was associated with knowledge of the disease, perceived susceptibility to it, and the educational environment in which students learn, with those in health-professional training and in the earlier years of study more often expressing willingness than their peers. General approval of vaccines, by contrast, offered no independent purchase on willingness once these factors were considered.

The study provides the first evidence from Sierra Leone on self-reported mpox vaccine intention spanning both health-related and non-health-related university settings, and it moves beyond descriptive reporting of knowledge and attitudes to establish which factors retain an independent association with hesitancy when examined together. In doing so it separates three constructs that are routinely bundled as a single measure, showing that knowledge and perception carry independent weight while general vaccine attitude does not. That separation has practical consequences for how hesitancy is measured and addressed in comparable West African settings.

For practice and policy, the findings argue for building mpox preparedness before a vaccine arrives rather than after. Universities should move beyond general awareness messaging towards content that addresses disease severity, personal exposure risk and what vaccination actually achieves, and should concentrate that effort in non-health faculties, where hesitancy was highest. Health authorities planning an eventual vaccination offer should make it free at the point of use, deliver it on campus, and route it through health professionals, whose recommendation was the most frequently reported facilitator in this sample. Interventions will be most productive if they focus not on the small group who reject vaccination outright, but on the larger group who accept that mpox is dangerous while assuming it will not reach them.

Because willingness was measured hypothetically, these findings describe potential demand rather than future coverage. Prospective work tracking students from stated intention through to documented vaccination is needed to establish how much of the goodwill observed here would translate into protection.

## Declarations

**Author contributions:** Conceptualisation: MK, PBJ and NMK. Data acquisition: MK, NMK, and PBJ. Methodology: PBJ, MK and NMK. Formal analysis and data analysis: NMK, ENS, ASVK and MK. Visualisation: NMK and PBJ. Writing, review and editing: NMK, MK, ENS, ASVK, PBJ and DMK. All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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**Ethics approval and consent to participate:** Ethical approval was obtained from the Institutional Review Board of the College of Medicine and Allied Health Sciences, under the number (COMAHS/IRB/062-2026). The study was conducted in accordance with the Declaration of Helsinki and relevant institutional ethical requirements. Participation was voluntary, informed consent was obtained electronically from all participants, and confidentiality and anonymity were maintained throughout the study.

**Clinical trial number:** not applicable.

**Data availability:** The datasets generated and analysed during the current study are available from the corresponding author on reasonable request.

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Figures

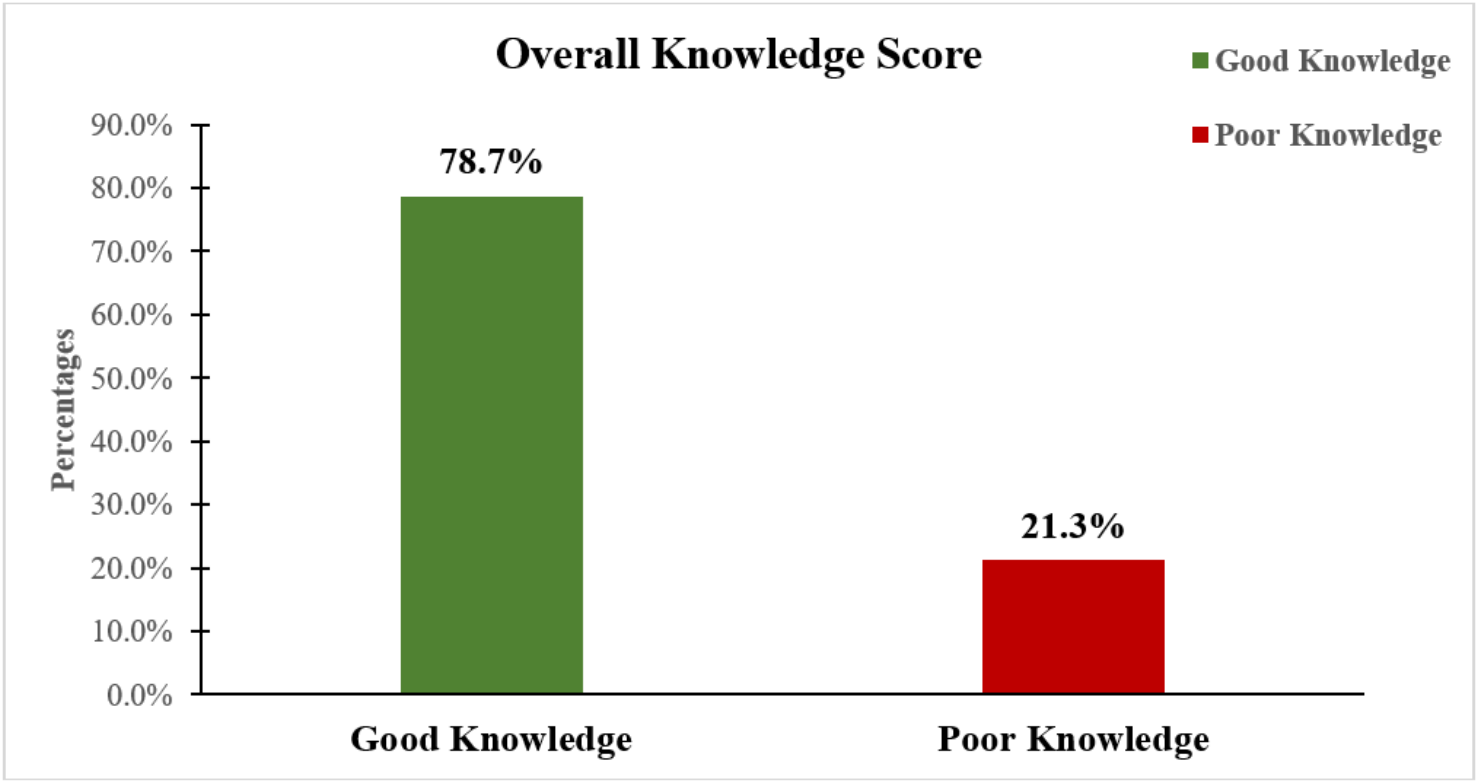


Figure 1

Overall knowledge level of mpox and mpox vaccination among students at USL 2025/26

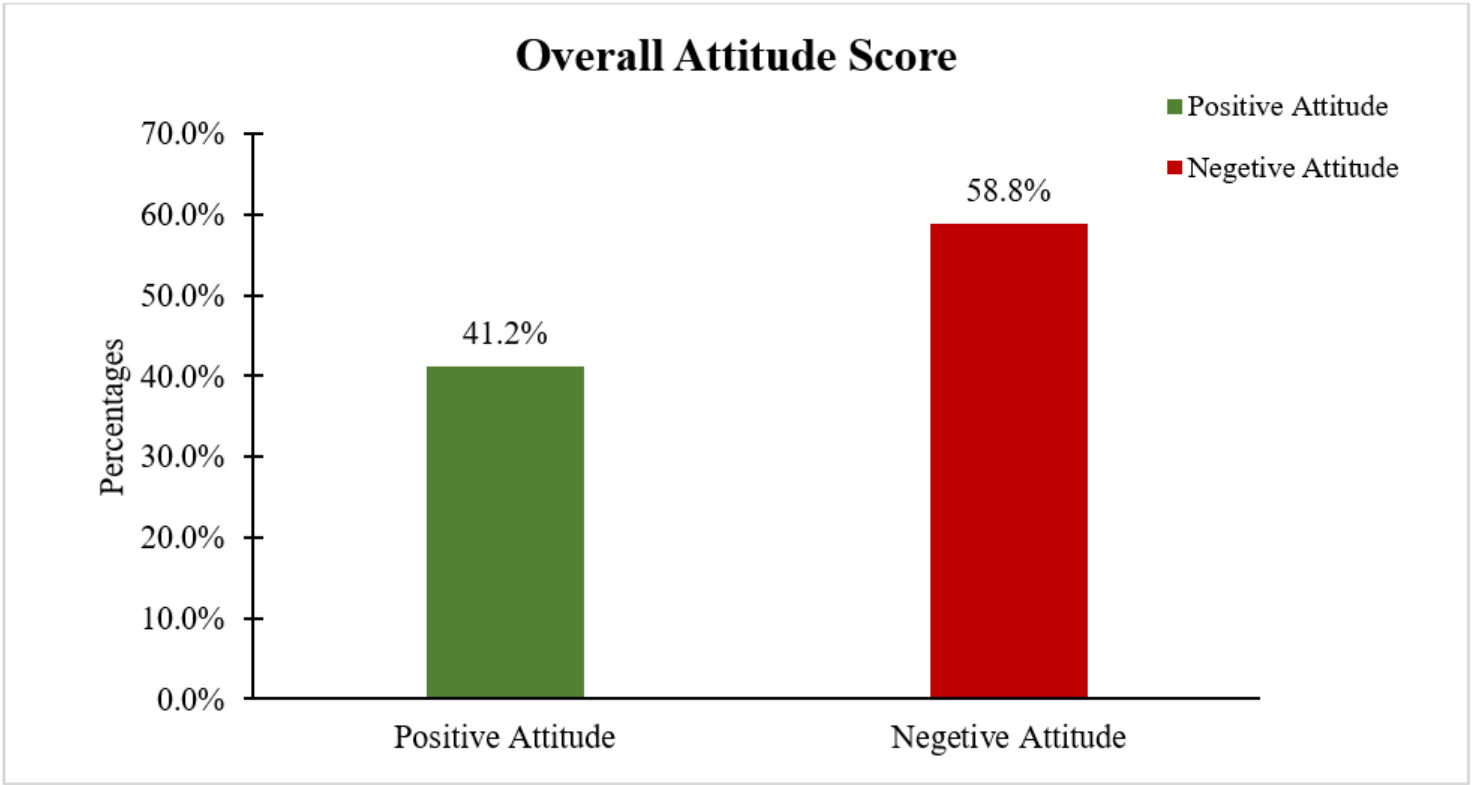


Figure 2

Overall attitude towards mpox vaccination among students at USL 2025/26

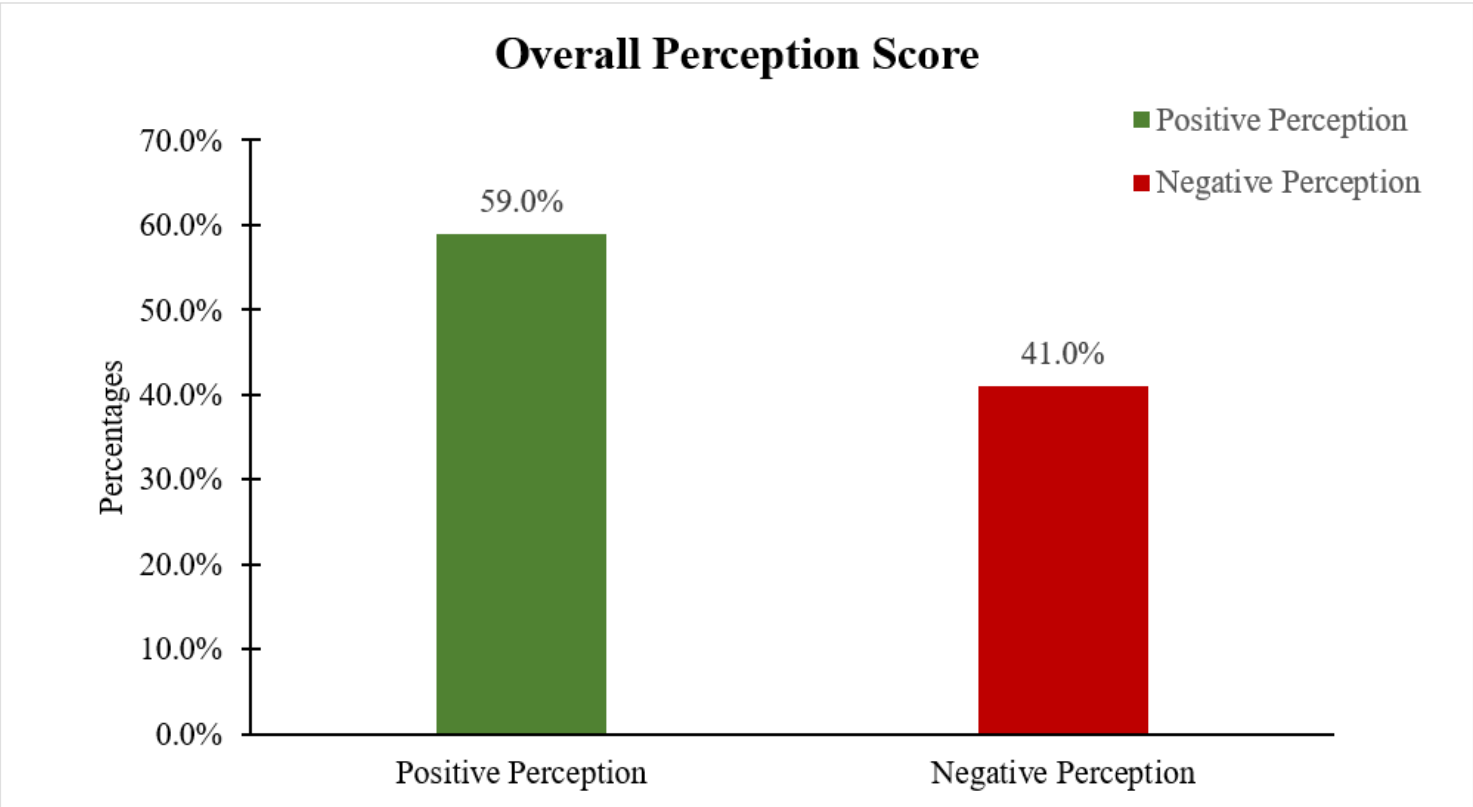


Figure 3

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [SupplementaryFile1Questionnaire.pdf](#)