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Awareness of Emerging Infectious Diseases Among Medical Students at All Saints University School of Medicine: A Cross-Sectional Questionnaire-Based Study

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ABSTRACT

Background: Emerging infectious diseases remain a continuing threat to global health security. Medical students represent an important future workforce for early recognition, infection prevention, and risk communication. Their awareness, information sources, and preparedness require periodic institutional assessment.

Objectives: To assess awareness of emerging infectious diseases among medical students at All Saints University School of Medicine and to examine selected demographic, academic, and training-related factors associated with good awareness.

Methods: This cross-sectional questionnaire-based study was conducted at All Saints University School of Medicine, Dominica, from April 01, 2026 to April 30, 2026. A total of 110 medical students from pre-medical, basic science, and clinical science years were included. Data were collected using a structured questionnaire covering demographic details, prior training, knowledge of emerging infections, information sources, attitude, and preparedness. Awareness was categorized as good, moderate, or poor using predefined score cut-offs. Descriptive statistics and chi-square test were applied.

Results: The mean age of participants was 22.4 +/- 3.1 years, and females constituted 53.6%. Basic science students formed the largest group. Good awareness was observed in 50.9%, moderate awareness in 38.2%, and poor awareness in 10.9%. Most students recognized COVID-19 and Ebola virus disease as emerging infections, whereas awareness regarding mpox and the One Health approach was lower. Social media was the commonest information source. Good awareness was significantly associated with age group, academic level, previous training, and use of official health agency sources.

Conclusion: Nearly half of the students demonstrated good awareness, but specific gaps persisted in newer infections, One Health concepts, and practical outbreak preparedness. Structured curricular sessions, simulation-based training, and guidance on credible information sources are recommended.

Keywords: *Emerging infectious diseases; medical students; awareness; outbreak preparedness; infection prevention; One Health; questionnaire study; Dominica.*

INTRODUCTION

Emerging infectious diseases are infections that have newly appeared in a population, have existed previously but are rapidly increasing in incidence or geographic range, or have developed new epidemiological characteristics. Their occurrence is shaped by complex interactions between microbial evolution, human mobility, urbanization, ecological

disruption, climate variability, conflict, animal-human contact, and gaps in health-system preparedness [1-4]. The past two decades have repeatedly shown that outbreaks do not remain confined to their place of origin. Severe acute respiratory syndrome, Ebola virus disease, Zika virus disease, COVID-19, mpox, and other zoonotic or vector-borne threats have shown how quickly infections can cross borders and strain clinical services, public health systems, and education sectors [2,3,5].

Medical students occupy a unique position during such events. They are learners, future clinicians, and potential contributors to public health communication, triage, community education, and supervised clinical support. Inadequate knowledge can reduce confidence, increase anxiety, and impair adherence to infection prevention and control practices. Conversely, accurate awareness strengthens early suspicion, safe behavior, and professional responsibility during outbreaks [6-9]. Evidence from previous studies among medical students indicates that knowledge about emerging infections is variable and often stronger for well-publicized diseases than for less familiar zoonotic threats or newly re-emerging infections [6,7,10].

The COVID-19 pandemic highlighted the educational importance of outbreak preparedness. It also exposed weaknesses in training on personal protective equipment, infection prevention and control, risk communication, and digital health literacy [8,9,11,12]. Students frequently obtain outbreak-related information from social media and online news platforms. These channels can spread timely updates, but they also carry misinformation, incomplete claims, and unverified interpretations. This is important because health-related misinformation can affect trust, risk perception, preventive behavior, and outbreak-control efforts [13,14]. Therefore, awareness studies should examine not only disease knowledge but also information sources and preparedness attitudes.

The One Health approach is especially relevant to emerging infections because many pathogens originate at the human-animal-environment interface [4]. For medical students in the Caribbean region, a clear understanding of zoonotic transmission, travel-related spread, vector-borne disease risk, and early reporting mechanisms is essential for future clinical and public health roles. Institution-based data help universities identify curricular gaps and design targeted educational interventions. The present study was conducted with the objective of assessing awareness of emerging infectious diseases among medical students at All Saints University School of Medicine, Dominica. It also aimed to describe their sources of information, attitude, and preparedness, and to determine selected factors associated with good awareness.

METHODOLOGY

Study design: This institution-based cross-sectional questionnaire-based study was conducted to assess awareness of emerging infectious diseases among medical students. The cross-sectional design was appropriate because exposure variables, information sources, attitudes, and awareness levels were measured at a single point during the study period. The study followed a descriptive and analytical approach, with the analytical component used to examine associations between selected participant characteristics and good awareness.

Place and period of study: The study was conducted at All Saints University School of Medicine, Dominica. The study period was from April 01, 2026 to April 30, 2026. The institution trains students in pre-medical, basic science, and clinical science phases, providing a suitable academic setting to assess awareness across different levels of medical education.

Study population and eligibility criteria: The study population included medical students enrolled at All Saints University School of Medicine during the study period. Students from pre-medical, basic science, and clinical science years were eligible. Students who were willing to participate and provided informed consent were included. Students who declined consent or submitted incomplete questionnaires missing key awareness items were excluded from analysis.

Sample size and sampling technique: The minimum sample size was calculated using the formula $n = Z^2pq/d^2$. Assuming an anticipated awareness level of 50%, 95% confidence level, and 10% absolute precision, the required sample size was 96. After adding approximately 10% for non-response or incomplete questionnaires, the final target sample size was rounded to 110 students. Eligible participants were recruited from pre-medical, basic science, and clinical science phases using a questionnaire-based approach during the study period. Efforts were made to obtain representation from all academic levels.

Study tool and data collection: Data were collected using a structured questionnaire developed after reviewing published literature on emerging infectious diseases, infection prevention, outbreak preparedness, and student awareness studies [6-12]. The questionnaire included sections on demographic characteristics, academic level, residence, previous training or seminar exposure, knowledge of emerging infectious diseases, sources of information, attitude, and preparedness. Items covered recognition of COVID-19, Ebola virus disease, Nipah virus infection, Zika virus disease,

mpox, zoonotic transmission, international travel-related spread, personal protective equipment, early reporting, One Health, and misinformation.

Scoring of awareness: Correct responses to knowledge-related items were assigned one score each, and incorrect or unsure responses were assigned zero. The total awareness score was calculated out of 25. Based on predefined cut-offs, participants were categorized into good, moderate, and poor awareness groups. For association analysis, good awareness was treated as the main outcome variable.

Statistical analysis: Data were entered, cleaned, and analyzed using descriptive and inferential statistics. Continuous variables were summarized as mean and standard deviation. Categorical variables were expressed as frequency and percentage. The chi-square test was used to assess associations between selected variables and good awareness. A p-value of less than 0.05 was considered statistically significant.

Ethical considerations: Ethical approval was obtained from the Institutional Ethics Committee of All Saints University School of Medicine, Dominica, before data collection. Participation was voluntary, informed consent was obtained, and confidentiality of student responses was maintained throughout the study.

RESULTS

A total of 110 medical students from All Saints University School of Medicine were included in the final analysis. The mean age of the participants was 22.4 +/- 3.1 years. Most students belonged to the 21-23 years age group (48.2%). Females constituted 59 participants (53.6%), while males accounted for 51 participants (46.4%). Basic science students formed the largest academic group (51.8%), followed by clinical science students (30.0%) and pre-medical students (18.2%). Previous exposure to training or seminars related to emerging infectious diseases was reported by 47 students (42.7%) (Table 1).

Table 1. Baseline demographic characteristics of study participants (n=110)

Variable	Frequency	Percentage
Age group		
<=20 years	24	21.8
21-23 years	53	48.2
24-26 years	23	20.9
>26 years	10	9.1
Sex		
Male	51	46.4
Female	59	53.6
Academic level		
Pre-medical	20	18.2
Basic science	57	51.8
Clinical science	33	30.0
Residence		
Campus/hostel accommodation	74	67.3
Off-campus/private accommodation	36	32.7
Previous training/seminar on emerging infectious diseases		
Yes	47	42.7
No	63	57.3

The overall mean awareness score was 16.8 +/- 4.1 out of 25. Based on the predefined scoring criteria, 56 students (50.9%) had good awareness, 42 students (38.2%) had moderate awareness, and 12 students (10.9%) had poor awareness regarding emerging infectious diseases. Most students correctly identified emerging infectious diseases as newly appearing or rapidly increasing infections (87.3%). Awareness was high for COVID-19 and Ebola virus disease, whereas relatively lower awareness was observed for mpox and the One Health approach (Table 2).

Table 2. Awareness level and knowledge regarding emerging infectious diseases

Variable/knowledge item	Frequency	Percentage
Overall awareness level		
Good awareness	56	50.9
Moderate awareness	42	38.2
Poor awareness	12	10.9

Knowledge items with correct response		
Correctly defined emerging infectious diseases	96	87.3
Identified COVID-19 as an emerging infectious disease	104	94.5
Identified Ebola virus disease as an emerging infectious disease	89	80.9
Identified Nipah virus infection as an emerging infectious disease	73	66.4
Identified Zika virus disease as an emerging infectious disease	68	61.8
Identified mpox as an emerging infectious disease	60	54.5
Recognized zoonotic transmission as an important source	88	80.0
Recognized international travel as a risk factor for spread	91	82.7
Knew the importance of personal protective equipment	101	91.8
Knew the need for early reporting of suspected outbreaks	94	85.5
Correctly understood the One Health approach	51	46.4
Knew that misinformation can affect outbreak control	79	71.8

Social media and online news platforms were the most common sources of information, reported by 79 students (71.8%). Official health agency websites such as WHO or CDC were used by 63 students (57.3%), while university lectures were reported by 62 students (56.4%). Regarding attitude and preparedness, 100 students (90.9%) agreed that emerging infectious diseases are relevant to medical education, and 102 students (92.7%) supported regular teaching on outbreak preparedness in the curriculum. Confidence in identifying a suspected outbreak was reported by 57 students (51.8%) (Table 3).

Table 3. Sources of information, attitude, and preparedness among study participants

Variable	**Frequency**	**Percentage**
Sources of information*		
Social media/online news platforms	79	71.8
WHO/CDC or official health agency websites	63	57.3
University lectures	62	56.4
Peer-reviewed journals	40	36.4
Television/newspapers	34	30.9
Seminars/webinars	30	27.3
Friends/family	21	19.1
Attitude and preparedness		
Emerging infectious diseases are relevant to medical education	100	90.9
Regular teaching on outbreak preparedness should be included in the curriculum	102	92.7
Felt prepared to follow infection control measures	72	65.5
Confident in identifying a suspected outbreak situation	57	51.8
Confident in correct use of personal protective equipment	74	67.3
Willing to participate in supervised outbreak-related activities	67	60.9
Usually verifies outbreak information	71	64.5

from credible sources		
Believed misinformation affects outbreak control	79	71.8

*Multiple responses were allowed.

Good awareness was significantly higher among clinical science students compared with basic science and pre-medical students (p=0.006). Students with previous training or seminar exposure had a higher proportion of good awareness than those without training (72.3% vs 34.9%, p<0.001). Use of official health agency sources was also significantly associated with good awareness (68.3% vs 27.7%, p<0.001). Sex was not significantly associated with good awareness (p=0.576) (Table 4).

Table 4. Association between selected variables and good awareness regarding emerging infectious diseases

Variable	Total, n	Good awareness, n (%)	p-value
Age group			**0.006**
<=20 years	24	5 (20.8)	
21-23 years	53	29 (54.7)	
24-26 years	23	15 (65.2)	
>26 years	10	7 (70.0)	
Sex			**0.576**
Male	51	24 (47.1)	
Female	59	32 (54.2)	
Academic level			**0.006**
Pre-medical	20	5 (25.0)	
Basic science	57	28 (49.1)	
Clinical science	33	23 (69.7)	
Previous training/seminar exposure			**<0.001**
Yes	47	34 (72.3)	
No	63	22 (34.9)	
Used official health agency sources			**<0.001**
Yes	63	43 (68.3)	
No	47	13 (27.7)	

Overall, the findings indicate that nearly half of the medical students had good awareness of emerging infectious diseases. Awareness was better among senior students, those with previous training exposure, and those who used official health agency sources. However, knowledge gaps were observed in relation to newer emerging infections, the One Health approach, and practical outbreak preparedness.

DISCUSSION

The present study assessed awareness of emerging infectious diseases among 110 medical students at All Saints University School of Medicine, Dominica. The findings showed that 50.9% of students had good awareness, while 38.2% had moderate awareness and 10.9% had poor awareness. This pattern indicates that the student population had a reasonable baseline understanding, but not a uniformly strong preparedness profile. This is consistent with previous evidence showing that medical students often demonstrate basic knowledge about highly visible outbreaks, while deeper understanding of prevention, emerging zoonoses, and outbreak response remains incomplete [6,7,10].

Awareness was highest for COVID-19 and Ebola virus disease. This is expected because these infections received extensive global attention and were repeatedly discussed in academic, media, and public health settings. In contrast, awareness was lower for mpox, Zika virus disease, and the One Health approach. A recent study among medical students in the Kurdistan Region of Iraq reported suboptimal knowledge regarding mpox, despite favorable attitudes, highlighting that re-emerging infections can remain under-recognized among future healthcare workers [7]. The low understanding of One Health in the present study is important because many emerging pathogens arise from the human-animal-environment interface, and One Health has become a central framework for outbreak prevention and public health preparedness [4].

The commonest source of information in this study was social media and online news platforms. This finding has two implications. First, students actively follow current health events through rapid digital channels. Second, they are exposed to variable information quality. Social media can support health education and outbreak communication, but

misinformation and disinformation can distort risk perception and preventive behavior [13,14]. The significant association between good awareness and use of official health agency sources emphasizes the value of directing students toward WHO, CDC, ministry, and peer-reviewed resources during outbreaks.

Age group, academic level, previous training, and official source use were significantly associated with good awareness. Clinical science students had better awareness than pre-medical and basic science students, probably due to greater exposure to clinical reasoning, infection prevention concepts, and patient-care contexts. Similarly, students with prior training or seminar exposure had better awareness, supporting earlier reports that structured instruction, workshops, and outbreak-oriented curricula improve confidence and perceived knowledge [10-12]. Prior literature on personal protective equipment training also shows that students can have important technique gaps when training is not practical and competency-based [8,9].

These findings support the need for a structured emerging infectious diseases module within medical education. The module should include disease recognition, surveillance principles, personal protective equipment, early reporting, One Health, travel-related risks, digital health literacy, and misinformation management. Simulation-based sessions, tabletop outbreak exercises, and periodic seminars can strengthen applied preparedness. Such training is particularly relevant for medical schools in globally connected regions where travel, tourism, and vector-borne disease risks can influence outbreak dynamics.

Limitations

This study was conducted at a single institution, so the findings are not directly generalizable to all medical students. Data were collected through a questionnaire, which introduces recall and social desirability bias. The cross-sectional design measured awareness at one time point and did not assess change after training. Practical skills in outbreak response and PPE use were not directly observed.

CONCLUSION

This cross-sectional study showed that nearly half of medical students at All Saints University School of Medicine had good awareness of emerging infectious diseases, while a substantial proportion had moderate or poor awareness. Students were more familiar with widely publicized infections such as COVID-19 and Ebola virus disease, but gaps existed in mpox, One Health, and practical preparedness. Good awareness was associated with age group, higher academic level, previous training, and use of official health agency sources. Medical curricula should include structured outbreak preparedness, simulation-based infection prevention training, and digital health literacy sessions. Regular seminars and credible-source guidance can strengthen student readiness for future infectious disease threats.

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