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Mass Psychogenic Illness in a School during a Human Papillomavirus Vaccination Campaign, Bangladesh, 2024

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Abstract

Mass psychogenic illness (MPI) poses a public health threat due to rapid spread, diagnostic difficulty, and potential to undermine public trust. Effective prevention and response require recognition of social and psychological risk factors with clear communication, education, and preparedness. On 30 Oct 2024, two students at a school in Gobindaganj, Bangladesh, developed symptoms such as shortness of breath, abdominal cramps, and body aches shortly after receiving the human papillomavirus (HPV) vaccine. Within hours, 17 more reported similar symptoms. This investigation describes the outbreak by person, place, and time, documents the response by health authorities and hospital staff, and outlines measures taken to maintain confidence in HPV vaccine safety. Health officials reviewed hospital records, interviewed students, teachers, vaccinators, and health officials, and evaluated vaccine storage and cold chain integrity. Among 80 vaccinated students, 19 developed symptoms, resulting in an attack rate of 24%. Five students were hospitalized, three had hypokalemia linked to hyperventilation. All fully recovered within 24 hours. No evidence was found of vaccine quality issues, cold chain failures, immunization errors, infectious causes, or environmental exposures. The symptom pattern, rapid spread, absence of an organic cause, and presence of psychological stressors led to classification of the event as MPI. Management focused on symptomatic care, reassurance about vaccine safety, and real-time public and media communication. Authorities also addressed vaccine misinformation through press briefings, community outreach, and engagement with religious leaders. This incident highlights the need to integrate MPI preparedness into immunization campaign planning to ensure rapid containment and sustained public trust.

Keywords: mass psychogenic illness, Bangladesh, vaccination, HPV, AEFI

Introduction

Mass psychogenic illness (MPI), also known as mass hysteria, mass sociogenic illness, or epidemic hysteria, is a phenomenon characterized by the rapid spread of symptoms within a socially connected group, in the absence of an identifiable physical or environmental cause.[1] As a primarily psychological and social phenomenon, MPI underscores the complex interplay between individual stress responses and group dynamics, often arising in high-stress or close-knit environments such as schools, workplaces, and religious or military settings.[2] MPI outbreaks are frequently associated with heightened anxiety about environmental, chemical, or infectious threats, reflecting evolving societal stressors and the influence of social networks.

MPI outbreaks predominantly affect socially cohesive groups, with women and younger individuals, particularly in school settings, more susceptible. Common triggers include psychological stress, fear, and rumor, which, when amplified by interpersonal and media communication, can result in the rapid propagation of symptoms such as shortness of breath, dizziness, fainting, nausea, and headaches. While the symptoms are transient and typically resolve with reassurance and environmental or psychological intervention, for public health authorities, the condition poses significant challenges, such as misdiagnosis, stigmatization, and unnecessary resource utilization.

MPI outbreaks are sporadic and typically short-lived, but their disruptive impact on communities and public health systems can be significant. Outbreaks have

been documented globally across diverse cultural and socioeconomic contexts, with notable events such as a conversion disorder among students in New York, rashes at several schools in Sri Lanka, and neurological complaints at a girls' school in Australia.[3–5] Several unpublished outbreaks that occurred in Bangladesh during recent vaccine campaigns include schools in Borhanuddin (68 students), Kaliganj (40 students), Potuakhali (12 students), Lakshmipur (17 students), Rajshahi (7 students), Chittagong (21 students) and Rangpur (3 students).

An 18-day human papillomavirus (HPV) school vaccination campaign in seven divisions of Bangladesh was initiated on 24 Oct 2024 by the Ministry of Health and Family Welfare, Bangladesh, supported by United Nations Children's Fund (UNICEF), the Global Alliance for Vaccines and Immunization (GAVI), and the World Health Organization (WHO). On 30 Oct 2024, the local health authority of Gobindaganj was notified that students at a rural school experienced rapid onset of severe shortness of breath, abdominal cramps, and body aches after the HPV vaccination. This outbreak may be classified as an adverse event following immunization (AEFI) during a mass HPV vaccination campaign. We describe the outbreak in terms of person, place and time, document the role local health authorities and hospital staff played in managing the event, and outline steps taken to ensure the public maintains confidence in the safety of the HPV vaccine.

Methods

We conducted a descriptive study to identify epidemiological characteristics of the outbreak and actions taken by local health organizations. This consisted of interviewing vaccinated students, health staffs that treated them, their parents, and school and health officials who assisted with the response, and assessing the vaccine cold chain.

Since the Bangladesh Ministry of Health and Family Welfare does not have a definition for MPI, we used the expanded program on immunization (EPI), Bangladesh, definition as follows: (a) two or more people experiencing the same type of symptoms without an identifiable physical cause and little or no laboratory evidence of disease; (b) a rapid spread of illness symptoms occurring within a socially connected group; (c) event triggered by psychological stressors such as fear of illness, rumors, or perceived threats; and (d) symptoms typically resolving when the underlying psychological stress is addressed, or the group dynamics change.[6]

In Bangladesh, the WHO office uses the AEFI surveillance system definitions for all vaccines introduced by the government.[7] For this event to be classified as a reportable AEFI, at least one of the following conditions must be met: (a) vaccine product-related reaction; (b) vaccine quality defect-related reaction; (c) immunization error-related reaction; (d) immunization triggered stress response; or (e) coincidental event.

The Bangladesh EPI defines a non-serious adverse event as one in which individuals experience any of the following symptoms: fever, nausea, nodule at vaccination site, muscle pain, redness, swelling or joint pain on and around the site of injection, seizure with or without fever, headache, anaphylaxis, abscess, rash, cough, joint pain, unstoppable bleeding in the site of injection, unconsciousness, or fainting.[8] A serious adverse event is a death, deformity, an overnight hospital stay exceeding 24 hours, community concern, more than two people with the same symptoms, any congenital deformity, or other serious health-related event.

We defined a case as a student who had a serious adverse event within 24 hours after receiving the HPV vaccination at the school on 30 Oct 2024. Our analysis focused on students with a serious AEFI only.

To describe the actions taken during the event, the local health officials reviewed medical records of the students treated at the hospital, interviewed them and their guardians, and conducted laboratory investigations including complete blood count, serum electrolytes, serum creatinine, and electrocardiograph. Interviews and group sessions were conducted among the following groups:

Vaccinators: information obtained included the time that the students received the vaccine, the time they started vaccination, whether the cold chain was maintained, type and use of vaccine carrier, and disease history of the student.

Medical technologist: we asked about the maintenance of the cold chain, time of storage and state of the vaccine when stored, and the time and state of the vaccine before sending to vaccinators.

Teachers: we asked about the students' past medical illnesses and history of AEFI.

Treated students: we obtained medical history, whether breakfast was eaten in the morning, any similar history, and any other potential causal factors behind the illness.

Students not treated and guardians: we obtained history of illness of the students affected, and any other history related to this incident.

To describe the actions on maintaining vaccine confidence and safety, the authors examined the cold

chain management at the district and sub-district level by interviewing the vaccinators and EPI medical technologist responsible for the storage of vaccines, the upper authority regarding vaccines responsible for cold chain management, and the WHO surveillance and immunization officer. We also checked freezer temperature logs, whether the ice pack used for the vaccines were frozen, the proper use of the freeze-free vaccine carrier used as recommended by WHO for this campaign, and the vaccine vial monitors and expiration dates.

To describe the actions taken to determine the role of hospital staff in managing the incident, we interviewed the vaccinators and EPI and hospital staff (doctors, nurses, consultants, and emergency attendants).

To describe actions taken to determine the role health authorities played in managing this event, we interviewed the vaccinators, EPI medical technologists, hospital authorities, and administrative authorities of the EPI program.

Verbal consent was obtained from the student's parents or guardians and assent from the students. The EPI programme officers also gave their verbal consent to conduct the investigation. To maintain confidentiality, personal identifiers were not collected, and interviews were conducted in private rooms.

Results

Describing the Event

On 30 Oct 2024, during the HPV vaccination campaign conducted by the Bangladesh EPI, the local health authority of Gobindaganj Sub-district of Bangladesh was notified that several girls from a rural school became ill just after receiving the HPV vaccine. The school contained 750 students, ranging from kindergarten to tenth grade, of which 120 (16%) were female. As this vaccination campaign was for 10–14-year-old girls only, the target population for HPV vaccination in this school was female students, of which there were 80 in this age bracket. The school assembly starts at 08:00 AM and usually ends at around 08:30 AM. Some students travel from afar and many arrive without having eaten breakfast. The school has no cafeteria and there are no shops selling food near the school.

Vaccinations began at 09:00 AM and within 10:00 AM total 80 female students were vaccinated in that school. One of the first girls to be vaccinated developed rapid onset severe shortness of breath, abdominal cramps, and body aches approximately one hour post-vaccination. Soon afterwards another girl developed the same symptoms. Since the vaccinators thought that these symptoms were due to the vaccine, they contacted a local pharmacist, who agreed that the symptoms were due to the vaccine. The vaccinators then contacted the AEFI focal person for this campaign in the subdistrict, who then advised the vaccinators to bring the students to the hospital.

After witnessing the first two students become symptomatic, 17 other students had a rapid onset of severe shortness of breath, abdominal cramps, and body aches after receiving the vaccine (Figure 1). The median age of the symptomatic students was 13 years (range 10–14 years). All were immediately transported to hospital. Five later reported that, on the previous day, they were afraid to be vaccinated, and did not have a good sleep that night. Eight girls reported that they often fell down at the assembly, even without vaccination or medicine, as they often skipped breakfast.

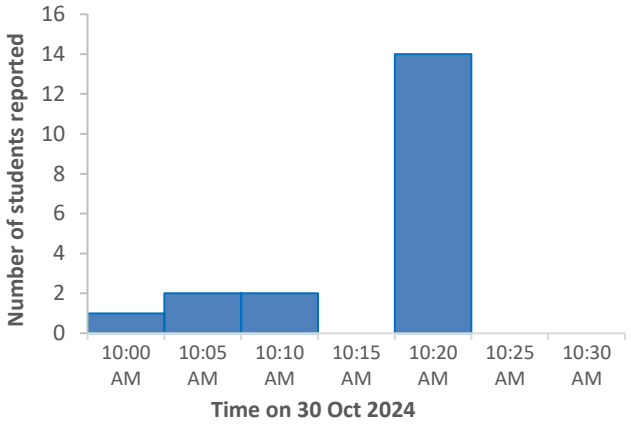

Figure 1. Symptom onset dates of a mass psychogenic illness among students in a village school, Gobindaganj, Bangladesh 2024

Upon arrival at the hospital, the students were treated symptomatically and given oxygen for hyperventilation and paracetamol for body aches (Table 1). Two agitated girls were given diazepam. Five girls had carpopedal spasms: three girls had hypokalemia, all had normal serum calcium levels and no changes in heart rate/rhythm on electrocardiogram. When many girls with similar symptoms were treated at the hospital, hysteria or mass psychogenic illness was suspected because similar events occurred in the country during the immunization campaign.

Table 1. Treatment provided to students at the hospital, Gobindaganj, Bangladesh, 2024

Treatment	Number of students	Percent
Low flow oxygen (0.5 L/min)	19	100
Paracetamol	9	47
Muscle relaxant	2	11
Antihistamine	11	58
Oral potassium	3	16

The most common symptoms were shortness of breath, headache, and body ache (Table 2). Thirteen students were treated and released within one hour of admission, one was hospitalized for one day, and five were hospitalized for three days. All students recovered without any complications. This outbreak was considered a serious AEFI because more than two people that were vaccinated were affected from the same locality at the same time, and more than two people were admitted to hospital for at least 24 hours. Infectious diseases, respiratory illness, foodborne or vector-borne illnesses, chemical exposures, neurological disorders, psychiatric conditions, and environmental toxins were systematically were ruled out through rigorous clinical evaluation, laboratory testing, and environmental assessments.

Table 2. Symptoms of students during a mass psychogenic illness event, Gobindaganj, Bangladesh, 2024

Symptom	Number of students	Percent
Shortness of breath	19	100
Headache	7	37
Body ache	3	16
Hand pain	2	11
Itchiness	1	5
Abdominal cramp	1	5

Attack Rate

Overall, 19 students (24%) reported adverse effects following HPV vaccination. The attack rate was relatively low for ages 10–12 years and increased from age 13 onward (Table 3). The number of ill students was highest in the 13-year-old age group (nine students), followed by the 14-year-old group (six students). Although the number of cases in the 15-year-old age group was low (two students), the attack rate was high (33%). The attack rate increased with grade and was highest in grade 9 (33%) (Table 4). Attack rates were lower in grade 5 (17%) and 8 (25%).

Table 3. Attack rates of a mass psychogenic illness among students by age, Gobindaganj, Bangladesh, 2024

Age (years)	Number of ill students	Number of students	Attack rate (%)
10	1	11	9
11	0	0	0
12	1	10	10
13	9	34	26
14	6	19	32
15	2	6	33
Total	**19**	**80**	**24**

Table 4. Attack rates of a mass psychogenic illness among students by school class, Gobindaganj, Bangladesh 2024

Grade	Number of ill students	Number of students	Attack rate (%)
5	2	12	17
6	6	27	22
7	6	25	24
8	1	4	25
9	4	12	33
Total	**19**	**80**	**24**

Vaccine Cold Chain Assessment

The HPV vaccine cold chain was assessed by the EPI medical technologist, the local authority responsible for cold chain management, and the WHO surveillance and immunization officer. They noted that the average temperature of the freezer containing the HPV vaccine was +4.5 °C (range: +3.0 to +5.5 °C) for the seven days before the incident date. Also, the ice packs used for the vaccines were not frozen properly due to a mechanical malfunction of the refrigerator that day; therefore, a freeze-free vaccine carrier was used during the campaign. However, monitored vaccine vials were in a usable state, intact, and the vaccine had not expired.

Local Health Authorities and Hospital Staff Managing the Event

Before this outbreak, local authorities prepared for an AEFI because of previous reports of MPIs occurring in HPV immunization campaigns in the country. The hospital prepared two rooms to receive students in case any developed an adverse event, and vaccinators were trained to recognize these adverse events and report them to the disease control medical officer. Staff also prepared emergency kits containing injectable adrenalin, paracetamol tablets, antihistamines, syringes, and cotton.

Local health authorities were surprised that 19 students developed adverse events. Local volunteers directed the teachers, parents, and press to a separate room from the students. A medical consultant who examined students at the hospital initially excluded an anaphylaxis reaction and suspected an acute exacerbation of a respiratory illness. While the first two students were examined and treated, more students who developed similar symptoms were being transported to the hospital. Because the symptoms were similar, physicians suspected a cluster of MPI and initiated steps to rule out other causes. The hospital authorities engaged one team of local volunteers to counsel the teachers and guardians that the adverse events were not due to the vaccine.

To identify additional cases, teachers contacted guardians to check for symptoms among students that were vaccinated and not hospitalized; however, no more students reported any symptoms.

Managing the Event

Dealing with reporters

Hospital staff and local authorities were confident that the adverse events experienced by the students were not due to the vaccine. They were confident because the HPV vaccine was piloted in 2016 in Gazipur and in 2023 in Dhaka Division where no serious AEFI was reported.

Ten to twenty reporters came to the hospital to cover this event. To answer their questions, the spokesperson for the hospital gave a press conference and stated that all students were examined, the symptoms were probably not due to the vaccine, and that other diagnoses were ruled out. The spokesman asked the reporters not to disturb the hospital staff as they needed to manage the patients smoothly. The next day, reporters were shown videos from the Directorate General of Health Services on the safety of HPV vaccination and were requested not to spread unfounded rumors to the public. The hospital physician provided updates of the hospitalized students to the reporters every 12 hours. The hospital authorities shared pictures on hospital web page and the public could see that the students were recovering, and that their illnesses were not serious.

Rumors

On social media, there were some posts claiming that vaccines were not allowed under Islamic law, made women infertile, and stopped girls from menstruating. The Directorate General of Health Services posted video messages on social media to address these rumors. The EPI office shared a video of girls who were vaccinated at Gazipur on 2016 and were later married. They shared the vaccine manufacturer documents that verified the endorsement of the vaccine by religious leaders. They also shared the video and comments of the Chairperson of the National AEFI committee and comments of several pediatricians and gynecologists. The Islamic Foundation engaged the national and local religious leaders to share this message to the public that the HPV vaccine was allowed under Islamic law and was safe.

Increasing public confidence in vaccination

During the press conference, reporters were informed that the cold chain for the HPV vaccines in Gobindaganj was maintained properly. Freeze-free vaccine carriers were used, and vaccines were checked for expiration dates and vaccine vial monitors were intact. Mass media was used to show the positive effects of HPV vaccination and videos of renown gynecological consultants were shared on social media.

Discussion

This mass psychogenic illness outbreak during a school-based vaccination campaign in Bangladesh illustrates a well-recognized pattern of psychosomatic events in group settings. In this event, students had an acute episode of dizziness, fainting, nausea, headaches, hyperventilation, and non-specific neurological symptoms, hallmarks of a previous MPI described in the literature.[2] Consistent with known MPI transmission patterns, symptoms appeared to spread through observation and suggestion rather than direct contact.[9] Environmental and psychological triggers, such as witnessing peers faint or hearing distressing rumors, likely played a role in symptom amplification.

As with any cluster of unexplained symptoms, a broad differential diagnosis was considered. Infectious diseases, respiratory illnesses, foodborne or vector-borne illnesses, chemical exposures, neurological disorders, psychiatric conditions, and environmental toxins were systematically ruled out through rigorous clinical evaluation, laboratory testing, and environmental assessments. This thorough process was crucial to avoid unnecessary interventions and to correctly identify the outbreak's psychogenic origin.

Adolescents, particularly females, are disproportionately affected by an MPI, especially in structured environments such as schools and workplaces.[1,10] Sociocultural influences, including greater tendencies toward somatization and different societal expectations regarding health reporting, may partly explain this gender disparity.[1] In this case, the combination of an organized school setting, strong peer networks, and anxiousness regarding introduction of a new vaccine, likely facilitated the propagation of symptoms. An additional factor was that several students had not eaten breakfast prior to receiving the vaccine in the morning. Weakness due to hunger or dehydration can predispose individuals to fainting or dizziness, contributing to the onset of symptoms and potentially intensifying the collective response. The range of temperatures that the vaccine was stored in the week before the cold chain inspection and on the second day of the event was +3.0 to +5.5°C and was within the recommended temperature range of +2.0 to +8.0°C. Consequently, the vaccine was stored at the recommended temperatures and was unlikely to be linked to the MPI. The attack rate was relatively low among students aged 10–12 years and increased from

age 13 onward. Similarly, students in lower grades had relatively lower attack rates than students in higher grades. This suggests that older students may be at higher risk, possibly due to behavioral factors, environmental exposures, biological susceptibility, or onset of puberty.

The broader context in Bangladesh is also important. Previous MPI outbreaks associated with HPV vaccinations reveal the power of public perception and rumor in shaping responses to health interventions. Misinformation, often magnified by traditional and social media, can catalyze anxiety and symptom spread, complicating outbreak management.[11]

The response by local health authorities and healthcare providers was crucial in managing this outbreak. A rapid epidemiological investigation, the immediate ruling out of environmental and infectious hazards, and clear, transparent communication helped to prevent an escalation of the situation. Hospital teams played a vital role by triaging students, providing symptomatic treatment, and their reassurances minimized the reinforcement of symptoms and prevented unnecessary medical treatment. Such strategies are aligned with best practices for managing MPI outbreaks.[12] Importantly, when an MPI outbreak occurs during a vaccination campaign, it can seriously threaten public confidence in immunization efforts. Recognizing this risk, public health officials swiftly communicated findings to the community, engaged trusted healthcare workers to disseminate timely and accurate information, and emphasized the safety and importance of the HPV vaccine. Educational outreach and psychological support helped contain misinformation and regained public trust in vaccinations.

Although MPI outbreaks are often self-limited, they can produce significant public health and social consequences. Beyond the immediate health concerns, outbreaks can disrupt educational systems, strain healthcare resources, and cause vaccine hesitancy. Moreover, sensationalized media coverage can exacerbate the situation by perpetuating fear and misunderstanding.[1,13]

Epilogue

An MPI outbreak at a school in Boalkhali, Chattogram, on 29 Oct 2025, almost one year after the current outbreak, reaffirmed that swift medical evaluation on-site, psychological support, and transparent communication are crucial in limiting the spread of MPI outbreaks and maintaining public trust during an immunization campaign. That particular outbreak occurred during a countrywide typhoid vaccination campaign targeting 50 million children in Bangladesh. Twenty students developed pain, fainting, dizziness, and weakness shortly after vaccination. Drawing on lessons from the outbreak at the school in Gobindaganj Sub-district, the affected students were not transported to a hospital but moved to a separate room and treated on-site. A medical consultant and three physicians were sent to the school to evaluate, treat, and counsel the affected students. The students were monitored for three hours and released to their guardians when their symptoms subsided. To reassure others, local health officials visited the classrooms and explained that the symptoms were not caused by the vaccine. A total of 800 students received the typhoid conjugate vaccine that day, including 150 vaccinations administered after the MPI event.

Limitations

As this was a descriptive study, we were unable to identify risk or preventive factors or test hypotheses. Interviews were conducted only on ill students, with no comparison group. Therefore, an analytical study, such as case-control study, could not be conducted. Although we were confident of the sequence of events, their duration was subject to recall bias and therefore may be approximations.

Recommendations

Effective management requires rapid assessment, transparent communication, and reassurance to affected communities. Public health authorities must engage efficient and hardworking managers, trusted messengers, counter misinformation, and emphasize the safety and importance of vaccines during vaccination campaigns. Preventive strategies such as stress management, education, and media cooperation are essential to maintaining good vaccination coverage and public trust during and after MPI events. Epidemiologists should consider conducting analytical studies, such as case-control studies, to test hypotheses and identify risk factors.

Conclusion

Though medically benign, an MPI outbreak can cause significant disruptions such as school closures, absenteeism, stigma, and persistent anxiety in communities. When they occur during immunization campaigns, vaccine confidence may be undermined, contribute to misinformation, and lead to increased vaccine hesitancy. Public fear, especially if amplified by sensational media coverage, can reduce vaccination uptake and compromise public health goals. The coordinated, multidisciplinary response to the MPI outbreak during the vaccination campaign in Bangladesh

highlights the necessity of early interventions, public reassurance, and open communication. Viewing an MPI outbreak as a legitimate public health phenomenon is crucial for ensuring community resilience and maintaining trust in vital public health interventions such as vaccination programs.

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Author Contributions

Jafrin Jahed Jiti: Investigation, methodology, writing—original draft. **Shahabuddin Manik:** Writing—review & editing. **Alden Henderson:** Supervision, writing—review & editing.

Ethical Approval

Ethical approval was exempt because this was a response to an acute health event.

Informed Consent

Verbal informed consent was obtained before interviews were conducted.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

None.

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Declaration of Generative AI and AI-assisted Technologies in the Writing Process

No AI was used to analyze the data or write the manuscript.

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