



## **Summative Learning Project (SLP)**

Assessing Facility Readiness for Timely Diagnosis, Management, and Prevention of Dengue Transmission within Savar Upazila Health Complex in Dhaka, Bangladesh: A Mixed-Methods Study

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## **Abstract**

### **Introduction**

*Dengue, a viral infection, is rapidly increasing globally. It constitutes a serious public and economic threat, especially in resource-constraint countries like Bangladesh. The weaknesses in healthcare systems in these countries result in poor preparedness for diagnosis, management, and prevention of dengue.*

### **Method**

*This mixed-methods study assessed the readiness of Savar Upazila Health Complex, Dhaka, Bangladesh, to manage dengue cases effectively. Quantitative data were obtained through an observational checklist, while qualitative information was derived from 11 Key Informant interviews with healthcare professionals. The study evaluated the essential components of prevention and management: infrastructure, logistics, operational processes, and community engagement in the fight against dengue fever.*

### **Findings**

*The facility showed some promise to readiness, as basics like mosquito nets and institutional treatment were available. However, critical gaps were identified in the availability of diagnostic tools, trained personnel, and infection control measures. Notably, challenges in waste management were significant, including inadequate biomedical waste disposal within the facility and the accumulation of general garbage around the hospital premises. These issues and insufficient ventilation increase the risk of mosquito breeding and dengue transmission. Despite some community awareness efforts, the lack of educational materials and poor coordination limited the effectiveness of preventive initiatives.*

### **Conclusion**

*Savar Upazila Health Complex's readiness for dengue management illustrates some major strengths and critical weaknesses. It is vital to ensure that different structural factors such as inadequate health workforce, limited availability of diagnostic tools, and beds are addressed to efficiently increase the facility's readiness to manage dengue cases. Strengthening the community education program is also required to reduce the disease burden and prevent future outbreaks.*

**Keywords:** *dengue management, facility readiness, healthcare infrastructure, mixed-methods study, community engagement*

## A. Introduction

Dengue is the world's most rapidly spreading viral disease, which spreads to humans through mosquitos. It has become a serious global health issue (WHO, 2023c). The World Health Organization (WHO) places dengue among the ten highest global health threats (WHO, 2023b). Dengue is present in over 125 nations, with yearly infection cases 400 million and mortality cases 40,000 (Hossain et al., 2023). Asia represents 70% of the global dengue burden (WHO, 2023b). The disease is highly prevalent in the tropical and subtropical regions of Southeast and South Asia (WHO, 2023c). While global data highlights the widespread impact of dengue, this study specifically addresses the challenges faced by a healthcare facility in Savar, Bangladesh, a region severely affected by dengue outbreaks.

Low and middle-income countries (LMICs) with high population density, inadequate health care services, and unplanned rapid urbanization experience a higher dengue burden than developed countries (Gubler, 2011). Dengue imposes a significant economic and health burden on low- and middle-income countries, especially in Southeast Asia and Latin America. Between 1990 and 2017, global dengue incidence surged dramatically, with cases rising from 23 million to 105 million (Zeng et al., 2021). Over half of the estimated dengue infections, 31,245,000 out of 56,879,000 occurred in South Asia between 1990 and 2019 (Du et al., 2021; Yang, 2021).

In 2023, Bangladesh and Thailand reported more dengue cases than in 2022. By November 2023, Bangladesh saw a significant surge, with cases reaching 308,167 compared to 62,382 for the entire year of 2022. Thailand also experienced a 300% increase, with cases rising from 46,678 in 2022 to 136,655 by November 22, 2023 (Department of Disease Control, 2023). During this period, dengue-related deaths in Bangladesh climbed from 281 Case Fatality Rate (CFR) 0.45% to 1,598 (CFR 0.52%), and in Thailand from 34 (CFR 0.07%) to 147 (CFR 0.11%) (Department of Disease Control, 2023). In other affected countries, the CFR varied from 0.04% in Nepal to 0.72% in Indonesia (WHO, 2023a).

Bangladesh, a nation located in the South Asian region with a population above 165 million, first experienced the presence of dengue hemorrhagic fever in 2000 (Bonna et al., 2023). Since then, the country has witnessed several major dengue outbreaks due to environmental, socio-economic, behavioural, and climate change-related factors. In 2023, the Bangladesh Ministry of Health and Family Welfare (MoHFW) reported 69,483 laboratory-confirmed dengue cases and 327 associated deaths, with a CFR of 0.47% (WHO, 2023c). Of these, 63% of cases and 62% of deaths were reported in July 2023 (WHO, 2023c).

The dengue outbreak in 2023 had a lasting impact on the health system of Bangladesh (Reza et al., 2024). The recent dengue outbreak in Bangladesh has severely strained healthcare resources, with limited supplies and hospital bed shortages. If appropriate preventative measures are not implemented, the fragile healthcare systems, the inability to cope with the outbreaks, and the lack of knowledge about dengue infection in the communities may result in health calamities (Hossain et al., 2023).

This included straining health facilities' capacity to deliver care to the patients. Rapid deployment of medical personnel and supply of drugs were required to cope with the surge of dengue cases. There was also a critical shortage of infusions, especially intravenous saline solutions, in both public and private hospitals and pharmacies, which caused a hike in price by as much as five times regular pricing (ACAPS, 2023). To exacerbate matters, the bed-to-population ratio in public hospitals was only 0.32 per 1000 population in the year 2020, which is far lower than the 3.5 beds per 1000 population recommended by the World Health Organization, with private hospitals performing slightly better with 0.54 beds per 1000 population ratio (ACAPS, 2023). According to the *Health Bulletin 2023* from the Ministry of Health and Family Welfare, Government of the People's Republic of Bangladesh, the country had a total of 71,100 hospital beds in the public sector as of December 2023, with an average of one hospital bed for every 2,405 people (MOHFW, 2024).

The insufficient supply of necessary dengue test kits, especially antigen tests that help detect the illness in its early stage, affected disease identification in many hospitals and diagnostic centres. The Directorate General of Health Services (DGHS), a wing of the Ministry of Health and Family Welfare, usually distributes such kits to all the public hospitals in the country. However, surplus stocks were unavailable due to the high cases during the outbreak in 2023 (ACAPS, 2023). Hence, hospitals were advised to procure the kits independently from the suppliers (ACAPS, 2023). Also, lots of test requests were received, which resulted in extreme delays in report turnaround time at the government's pathology laboratories, which, in turn, hindered effective management and control of the situation (ACAPS, 2023).

Dengue patients often need saline solutions through injection. At the same time, healthcare centres require more dengue test kits, blood bags, platelet kits, trained healthcare professionals, and dedicated beds to cater to patients suffering from the disease. The outbreak most often affects low-income households, as their living conditions, including overcrowded housing, poor sanitation, and limited access to healthcare services, create environments conducive to mosquito breeding and hinder timely medical intervention, thus increasing the demand for public healthcare support (ACAPS, 2023).

A preparedness plan is necessary to prevent dengue outbreaks. The goal of preparedness action planning is to enhance partner engagement, strengthen capacity building, and improve infrastructure while facilitating operational linkages to foster a well-organized and effective level of response (Bagahizel & Elkhatim, 2023). Consequently, in places where there is a recurring incidence of dengue, the emphasis should be on the ability to detect and manage outbreaks. At the same time, in areas that do not have such a problem, attention is directed to individual cases, factors associated with them, or alarming signs (Bagahizel & Elkhatim, 2023).

Low levels of preparedness in hospitals and health systems can lead to high mortality among dengue patients. Earlier studies suggest that many hospitals do not have the essential components that would help manage dengue patients effectively, such as diagnostic equipment, management protocols, and skilled staff (Mustafa et al., 2023; Saleh et al., 2021). Other factors contributing to fatality in dengue include age greater than 40 years, the presence of specific comorbidities such as diabetes and hypertension, and signs including altered level of consciousness and reflex abnormalities (Karunakaran et al., 2014; Mallhi et al., 2017).

Prolonged hospitalizations are frequently associated with dengue hemorrhagic fever, increased alkaline phosphatase levels, prolonged prothrombin time, and organ failure (Mallhi et al., 2017). Dengue mortality cannot be reduced without increasing case management capabilities by utilizing healthcare human resources, establishing services to facilitate diagnosis, and enhancing disease and vector control programs (Mustafa et al., 2023; Saleh et al., 2021). Most importantly, specialized care units should have plans and measures in place to quickly identify high-risk patients for appropriate interventions and management (Mallhi et al., 2017).

This study examines the readiness of the Savar Upazila Health Complex in Dhaka, Bangladesh, to manage dengue cases and prevent transmission within the facility efficiently. Dhaka, with its dense population of approximately 21 million people (BBS, 2022), frequently faces high dengue incidence rates, reporting over 15,000 cases annually during peak seasons, which poses significant challenges in managing the high volume of patients each year (DGHS, 2023).

While a considerable amount of work has been done regarding the epidemiology and transmissibility of dengue fever, scant information exists on the facility-level preparedness to manage the disease and prevent transmission within the facility. Most studies have concentrated on the burden of the disease, its treatment, and prevention at high levels, such as countries and regions. Nonetheless, there is a limited inquiry into implementing control measures against dengue in health care facilities and regions, the malady of concern, especially

in areas of high population density like Narayanganj, and what barriers they face.

Gaining insight into facility readiness is essential for improving dengue management and prevention strategies and health outcomes in the regions where dengue is endemic. Understanding the constraints faced by the Savar Upazila Health Complex (UHC) would offer lessons for improving the healthcare system and its efficiencies. The research findings could help policymakers and healthcare practitioners shape appropriate clinical and public health programs, manage resources effectively, and eventually lower the burden of dengue morbidity and mortality in Bangladesh.

## **B. Research Question**

What is the current status of the infrastructural, logistical, and operational readiness of Savar Upazila Health Complex to handle dengue cases effectively and prevent transmission of the dengue virus within the facility?

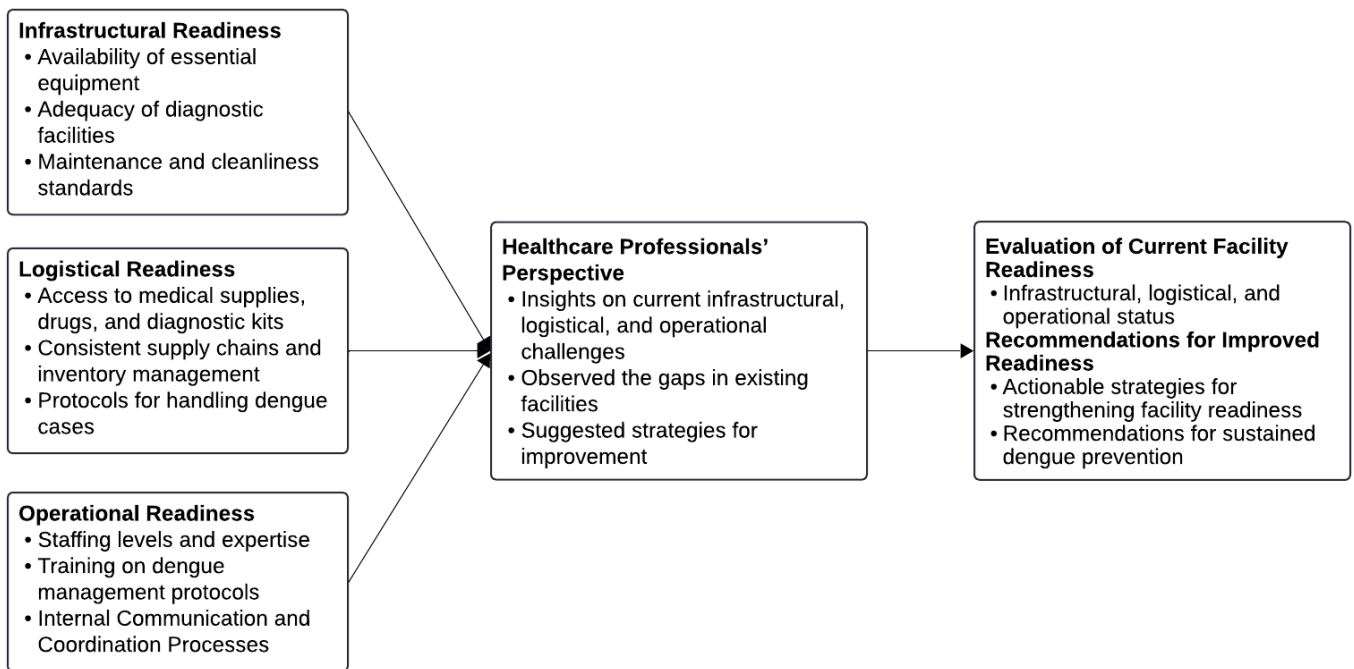
## **C. General Objectives**

This study aims to assess the readiness of Savar Upazila Health Complex to manage dengue cases efficiently and prevent dengue transmission within the facility.

## **D. Specific Objectives**

- a) To evaluate the current state of facility readiness for dengue management and prevention of dengue virus transmission at the Savar Upazila Health Complex, Dhaka, Bangladesh.
- b) To explore healthcare professionals' perspectives on infrastructural, logistical, and operational challenges to deliver appropriate dengue management care and implement dengue prevention strategies at the Savar Health Complex, Dhaka, Bangladesh.
- c) To provide recommendations for enhancing facility readiness to improve dengue prevention at the Savar Health Complex, Dhaka, Bangladesh.

## E. Conceptual Framework



*Conceptual Framework of the Study*

## F. Operational Definitions of Concepts

| Concepts                             | Operational Definition                                                                                                                                                                                                                                          |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Facility Readiness                   | The ability of a health facility to carry out effective dengue management strategies such as appropriate infrastructure, resources, and trained personnel (PAHO, 2016; WHO, 2015).                                                                              |
| Infrastructural Factors              | The parameters concern the physical structure, the equipment provided, and the sanitation standards imposed at the health complex, which are required to control dengue (WHO, 2012a).                                                                           |
| Logistical Factors                   | Factors related to the availability of resources (medicines, screening tests, diagnostic tests, laboratory tests, bed nets, etc.), transportation, and movement have implications for dengue control measures (Raafat et al., 2019; Wilder-Smith et al., 2018). |
| Operational Factors                  | Factors about the education of the personnel, the establishment of protocol, and observance of dengue control measures in the health centre (Erlanger et al., 2008).                                                                                            |
| Healthcare Professional Perspectives | Healthcare professionals' perspectives and opinions on the dimensions of facilities' readiness to implement dengue preventive measures (Selvarajoo et al., 2020).                                                                                               |
| Dengue Prevention                    | Developing and implementing interventions, such as health and education promotion aimed at patients, environmental modifications aimed at controlling the breeding of disease                                                                                   |

|  |                                                                               |
|--|-------------------------------------------------------------------------------|
|  | vectors, and the supply of appropriate products and services (Nutbeam, 2000). |
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## **G. Methodology**

### **a) Study Design**

This study followed a concurrent mixed-method design that encompassed qualitative and quantitative approaches to assess Savar UHC's preparedness for dengue management and control. Quantitative data provided measurable insights into infrastructure and resource availability, while qualitative interviews captured the lived experiences and challenges faced by healthcare professionals, offering depth and context to the findings.

For the quantitative part, we used an observational checklist to assess the condition of healthcare facilities. This checklist included items including the supply of necessary drugs, the number of dengue beds available, access to dengue laboratory facilities, infection control practices, and staff trained to manage such cases. The qualitative component comprised 11 Key Informant Interviews (KIIs) with healthcare professionals. Participants for the KIIs were deliberately chosen based on their roles and experience in dengue management, ensuring diverse perspectives from medical officers, nurses, and administrative staff. Through these interviews, we explored the infrastructural (such as availability of beds), logistical (such as availability of medicine), and operational challenges (such as lack of trained healthcare service providers) challenges affecting the implementation of efficient dengue management and prevention strategies. Qualitative and quantitative data were triangulated to provide a comprehensive understanding of facility readiness. Observational checklist results highlighted infrastructural and logistical gaps, while KIIs provided context through healthcare professionals' lived experiences.

### **b) Study Site**

The Savar Upazila Health Complex is government-owned and located in Savar Upazila, around 24 km northwest of Dhaka City in Bangladesh. The peri-urban complex serves the citizens of the upazila and is instrumental in addressing public health challenges, including treating dengue fever, which is rampant in the area.

The Savar Upazila Health Complex was classified as an Upazila Health Complex, managed by the public sector, and catered to a population of approximately 1,951,804 individuals in the surrounding area. The facility provided both inpatient and outpatient services, offering diagnosis and treatment for various health conditions, including dengue

fever.

**c) Study Population**

The study population in this research were healthcare professionals (doctors and nurses) and staff at the Savar Upazila Health Complex, Dhaka, Bangladesh, focusing on their insights, knowledge, and experiences with facility readiness for dengue management and prevention of dengue transmission within the facility.

**d) Inclusion and Exclusion Criteria for Selecting Participants**

The study participants included healthcare professionals involved in managing dengue cases and prevention activities and were willing to participate in the research and provide informed consent. The exclusion criteria are health professionals or staff not directly involved in dengue management and prevention initiatives.

**e) Sampling Technique**

A convenience sampling method was used to select healthcare professionals and staff with direct experience or link to dengue management and prevention. This approach enhanced the relevance and depth of the insights gathered by focusing on those most familiar with the health facility's challenges and readiness.

**H. Data Collection Procedure**

**a) Sample**

A total of 11 healthcare professionals were recruited as study participants. The number of interviews depended on the number of eligible participants available and agreed to participate in the research.

**b) Pre-testing**

A rigorous training session for the Field Research Assistants (FRAs) was organized to inform them about the study project and to demonstrate the FRAs on how to conduct interviews appropriately. After the training session, field research assistants (FRAs) were assigned to different zones within the Upazila Health Complex for data collection. The trained assistants were given instructions on how to ensure reliability and consistency in conducting the interviews.

We pre-tested the tools in Rupganj Upazila Health Complex, a government-owned healthcare facility in the Narayanganj District, Dhaka, Bangladesh, which served a population of approximately 631,950, including rural and peri-urban communities. The facility provided various health services, including maternal and child health care and emergency services. After pre-testing, we made some modifications to the observation checklist and KII guidelines according to the experience.

Data were collected using an observational checklist and an open-ended interview guideline covering infrastructural adequacy, resource availability, operational procedures for dengue management and prevention within the facility, and community awareness. The observational checklist was developed following the Service Availability and Readiness Assessment (SARA) tool developed by WHO and the National Guideline for Clinical Management of Dengue in Bangladesh. The observational checklist assessed the availability of key infrastructures, human resources, and operational procedures relative to the facility's conditions, supply levels, staff, training, and protocols for managing dengue. These were adapted from standard facility operational checklists to cater to the requirements for managing dengue.

The analysis for this study involved an evaluation of the readiness of the Savar Upazila Health Complex to manage dengue disease through an observational checklist covering seven areas: infrastructural, supplies and medical equipment, training of personnel, diagnostic capacity, patient monitoring, and community outreach. Each area included specific questions, and the results were classified according to two dimensions: availability ("Yes" or "No") and adequacy ("Yes" or "No"). The researchers systematically evaluated the presence and adequacy of essential domains such as infrastructural facilities, medical supplies, trained personnel, diagnostic tools, patient monitoring equipment, and outreach initiatives to the community. Hence, this approach was systematic for a comprehensive understanding of preparedness by identifying those components that were available and adequate as well as areas that would require improvement.

The qualitative section involved conducting KIIs with healthcare professionals using open-ended questions to gather in-depth information. The topics covered include healthcare professionals' views, perspectives, and experiences on current dengue preventive measures in place, challenges faced in the operations of the facilities, and the adequacy of resources and their infrastructure.

### **c) Data Analysis**

#### **1) Quantitative Analysis**

The quantitative data from an observational checklist was analyzed using Stata for descriptive analysis. The findings were presented in paragraphs and tables.

## **2) Qualitative Analysis**

The qualitative information gathered from the research participants was transcribed, categorized, and subjected to an iterative process of theme analysis. After a careful inspection, codes were developed and manually added after the transcripts were read several times. These codes were used to group similar data. The next step involved comparing these groups to identify patterns and emerging themes. Finally, the analysis concluded the significant challenges health facilities face in implementing effective dengue prevention measures, and the findings were verified for accuracy. Qualitative and quantitative results were triangulated. The qualitative results enhanced the quantitative results and gave a clearer picture of the healthcare facility scenario.

## **H. Ethical Consideration**

The ethical considerations in this study included obtaining informed consent from participants before their involvement in the study, ensuring they understood the purpose, procedures, and voluntary nature of the research, ensuring confidentiality and anonymity of participants' personal information, and adhering to ethical guidelines for research involving human subjects, as specified by the institutional review board of BRAC JPGSPH.

We obtained ethical approval for the research from the Institutional Review Board (IRB) of BRAC JPGSPH, BRAC University. This required preparing a detailed research proposal that describes the study objectives, methods, and ethical issues for review and putting it on hold until data collection is over. The IRB protocol number was MPH-2024-001.

## **I. Findings**

Table 1 shows the characteristics of the KII participants. The key informants were health workers, an administrative officer, and support staff with different roles, experiences, and professional qualifications in terms of higher education. The key informants were between 27 and 58 years old, and their qualifications ranged from high school to postgraduate degrees.

**Table 1 Characteristics of Informants of KII**

| ID     | Age | Gender | Education                                                   |
|--------|-----|--------|-------------------------------------------------------------|
| KII 1  | 44  | Male   | Fellowship of the College of Physicians and Surgeons (FCPS) |
| KII 2  | 40  | Male   | Bachelor of Medicine and Surgery (MBBS)                     |
| KII 3  | 30  | Male   | Higher Secondary Education (HSC)                            |
| KII 4  | 57  | Male   | Master of Science                                           |
| KII 5  | 27  | Female | Diploma in Nursing                                          |
| KII 6  | 52  | Female | Diploma in Nursing                                          |
| KII 7  | 52  | Female | Diploma in Nursing, Diploma in Midwifery                    |
| KII 8  | 58  | Female | Diploma in Nursing                                          |
| KII 9  | 43  | Male   | MBBS                                                        |
| KII 10 | 57  | Male   | Bachelor Degree                                             |
| KII 11 | 42  | Male   | MBBS                                                        |

### 1) Facility Infrastructure

According to the observation checklist findings, 6 of the 14 items (42.86%) under the “Facility Infrastructure” domain were adequately available in the Savar UHC. These included a designated dengue treatment area, water and sanitation facilities with functional toilets (latrines) for patient use, electricity from any source, overnight/inpatient beds for dengue patients, a functioning computer within the facility, and access to email or the internet. Among the essential facilities, separate male and female toilets were available in the dengue corner ward, and these were confirmed to be sufficient and well-maintained. For instance, the medical officer stated,

*‘Yes, there are enough. The toilets that are available are sufficient.’*

*(Medical officer, KII 1).*

This statement indicated that the hospital had adequate toilets to meet its requirements and that there were no immediate concerns regarding sanitation facilities.

Another healthcare professional also mentioned that the facility has enough toilets,

*"We have five on the female side and five on the male side."*

*(Senior Staff Nurse, KII 6)*

This statement confirmed that the hospital had five toilets on both the female and male sides, indicating a balanced distribution of sanitation resources.

The toilets were also clean enough.

*"The toilets are cleaned daily, three to four times."*

*(Office Assistant, KII 3).*

This statement highlighted that the toilets were cleaned three to four times daily, ensuring a regular maintenance schedule for sanitation.

Key informant interviews and observations identified significant clinical and non-clinical waste management gaps at Savar UHC. While efforts to maintain cleanliness were noted, the lack of proper segregation and disposal mechanisms posed challenges. For instance, sharp containers and biohazard bags for clinical waste were insufficient, and general waste disposal systems were inadequate, increasing the risk of cross-contamination and infection. A key informant (Statistician, KII 4) highlighted broader waste management challenges in the surrounding area:

*By deficiency, I mean that in some streets, there is excessive garbage. Due to the current social situation, since the ward commissioners are not present. If the ward commissioners were here, they would occasionally clean. A pile of garbage is accumulating at a street corner not far from here. A few days ago, they tried to clean it with a backhoe, but it's still there."*

*(Statistician. KII 4).*

Waste management in the area was inadequate, with excessive garbage accumulating on some streets. The unavailability of ward commissioners has worsened the situation, as whatever little cleaning efforts can still be done occasionally using hired hands is now unavailable. With all due attempts to effectively remove waste piles with a backhoe, the leftover heaps still attest to the need for more sustained and better waste management practices. To address these issues, the facility requires adequate waste bins, sharp containers, and regular training programs for staff on waste segregation and disposal practices.

The other issue was ventilation system. One of the health professionals said the ventilation system within the UHC was inadequate.

*"The ventilation system is not proper. This issue can occur during nursing care, particularly in situations where adequate airflow is needed, although it doesn't happen all the time."*

*(Senior Staff Nurse, KII 6).*

The ventilation system in the facility was inadequate, creating occasional issues during nursing care. Although not a constant problem, its intermittent occurrence highlighted a need for improvements to ensure a consistently safe and comfortable environment for both patients and staff.

These infrastructural gaps, such as inadequate ventilation and lack of mosquito prevention measures, directly contribute to higher risks of dengue transmission within the facility, compounding the burden on both patients and staff. One nurse shared,

*"There is no system here for the outside air to come in. We don't have much greenery or bushes around us, it's quite clean and tidy. But we can't open the windows. The door can only be opened a little. The ventilation system is not that good."*

*(Senior Staff Nurse, KII 8).*

These quotations highlighted the lack of proper airflow due to closed windows and limited door openings, which hamper the circulation of fresh air. Despite the clean environment, the absence of adequate ventilation creates discomfort and potential challenges during nursing care.

The Senior Staff Nurse interviewed described the challenges faced by the hospital due to its small size, inadequate drainage, and lack of mosquito prevention measures, especially during outbreaks.

*"The hospital building is small, with insufficient space for the number of patients during outbreaks. Poor drainage systems in the surrounding areas and a lack of mosquito prevention measures further complicate the situation. A larger building with dedicated wards and mosquito prevention systems would greatly improve care quality."*

*(Senior Staff Nurse. KII 5).*

This quotation highlights the inadequate space in the hospital building, which becomes a significant challenge during patient surges, especially during outbreaks. The poor drainage system and lack of mosquito prevention measures exacerbate the situation, increasing the risk of infections and discomfort. The senior staff nurse emphasized that a larger building with dedicated wards and proper mosquito control would significantly enhance the quality of care, providing a more suitable environment for patients and healthcare providers.

The Senior Staff Nurse highlighted the severe impact of inadequate mosquito control in the hospital, which has led to dengue infections among staff and their families, further affecting patient care.

*"I was infected with dengue a while ago, and one of our nurses was also infected. Additionally, the husband of another nurse and the family of another nurse, who live in this residential quarter, were infected as well. The drainage system is poor, and stagnant water in toilets and discarded coconut shells creates breeding grounds for*

*mosquitoes. Many staff members have been infected, and when they take leave, it affects patient care."*

*(Senior Staff Nurse, KII 5).*

This quotation highlighted the lack of mosquito control measures, which contributed to the spread of dengue infections among staff and their families. The poor drainage system and stagnant water in the hospital created breeding grounds for mosquitoes, increasing the risk of infection. The resulting staff illnesses led to absences, further impacting patient care and creating a cycle of challenges for the hospital's operations.

## **2) Supplies and Equipment**

A total of 11 out of 21 items (52.4%) under the supplies and equipment domain were adequately available in Savar UHC. These included necessary medications for dengue treatment, mosquito repellents, diagnostic tools, intravenous infusion kits, and oxygen therapy equipment. However, there had been stock-outs of dengue RDT kits, hematocrit, platelet count, and CBC testing supplies in the past four weeks. Additionally, items like clean running water, disposable gloves, pedal bins with liners, and disposable syringes were available. One key informant mentioned that medicines such as paracetamol and saline were available,

*"Yes, they are available. We provide paracetamol and saline. If, in rare cases, there's a shortage, we ask patients to buy them from outside, but there's no supply shortage here now. At present, we have enough."*

*(Senior Staff Nurse, KII 8).*

This statement indicated that paracetamol and saline were readily available and that there were no current supply shortages. In rare shortages, patients were asked to purchase these medicines outside the facility.

Although Saline and paracetamol are adequately available when it comes to NS1 test kits, sufficient stock is not available:

*"Actually, at the moment, we have a shortage of the NS1 test kits. However, we usually have them available. Due to the sudden increase in the number of patients, we are facing a temporary shortage of kits. But this service is generally available to us."*

*(Medical officer KII 1).*

This statement revealed a temporary shortage of NS1 test kits due to a sudden patient increase. However, the test kits were typically available, and the shortage was unusual.

Another medical officer said there was a shortage of medication due to the high patient volume:

*"Since Savar is a densely populated area, we receive 1000 to 1500 patients daily, similar to a district hospital. Because of this, we are not able to provide enough medications to the patients. If 10 are required, we can only provide 6."*

*(Medical Officer. KII 2).*

The medical officer mentioned that due to Savar's dense population and high patient volume, they could not provide enough medications, often falling short of the required amount.

The medical officer also mentioned that sometimes they could not perform the test:

*"As I said, sometimes we cannot perform tests here and have to send patients out for testing."*

*(Medical Officer. KII 2).*

The medical officer noted that sometimes tests could not be performed on-site requiring patients to be sent elsewhere.

One Office Assistant mentioned that while IV fluids were continuously received, the availability of kits was inconsistent:

*"No, we continuously receive IV fluids. The kits are not always available."*

*(Office Assistant, KII 3).*

This statement indicated that IV fluids were consistently available, but diagnostic kits faced occasional shortages.

The Senior Staff Nurse highlighted the challenges faced by patients due to the unavailability of affordable in-house diagnostic testing facilities, particularly for those with financial constraints:

*"Yes, there are problems. Patients need to be sent outside for diagnostic tests. Many poor patients cannot afford it. Tests can be done here at much lower costs than in private clinics. "Now, sending patients outside for tests is both physically challenging and financially burdensome."*

*(Senior Staff Nurse. KII 6).*

This statement revealed that patients sometimes needed to be sent outside for tests, which created financial and physical challenges, especially for poor patients. The availability of lower-cost in-house testing facilities could help alleviate this burden.

### 3) Health Personnel and Training

According to the observation checklist findings, only 2 out of 17 items (11.76%) under the “health personnel and training” domain were adequately available in the Savar UHC. These included the ability of providers in the facility to diagnose dengue and prescribe treatment for dengue. However, 6 out of 17 items (35.29%) were available but inadequate. These included the availability of generalist (non-specialist) medical doctors, specialist medical doctors, nurses, non-physician clinicians/paramedical professionals, other support staff, and guidelines on standard precautions for infection prevention, all specific to dengue care.

More than half of the required resources in the facility were either unavailable or inadequate. Interviews with health professionals also highlighted gaps, such as a lack of training in dengue protocols. Out of the nine health professionals interviewed, four admitted to never having received any training on dengue management and prevention techniques

One senior medical officer identified a key challenge in managing dengue disease as insufficient staff knowledge and orientation:

*"The main challenge is related to orientation, there's a lack of knowledge and orientation regarding the disease."*

*(Medical officer. KII 11).*

This statement revealed that the primary issue was a lack of knowledge and proper orientation about the disease, which hindered effective management.

Another healthcare professional mentioned the challenges faced due to a severe shortage of health workers in Savar Upazila, impacting service delivery.

*"Yes, there are challenges here. The area of Savar Upazila is 282 square kilometers, with a population of over 1.95 million. For every 6,000 people, there is only one health worker. By this calculation, I would need around 325 health workers. However, I currently have only 51 workers. With just 51 workers, it is never possible to perform enough tasks. Still, our workers make considerable efforts. Where we used to visit monthly, we now go every two months. This creates a lot of difficulty for the workers"*  
*(Health professional KII 10).*

This statement highlighted the significant shortage of health workers in Savar Upazila, with only 51 workers available to serve a population of over 1.95 million. The limited staff forced a reduction in service visits, increasing the difficulty for workers to meet the area's healthcare

needs.

The Office Assistant discussed challenges in following guidelines due to resource shortages:

*"It is not always possible to follow the guidelines. Often, many resources are not available, which creates problems."*

*(Office Assistant. KII 3)*

This statement highlighted that the unavailability of resources often prevented the proper implementation of guidelines, leading to operational difficulties.

Another key informant mentioned that efforts were made to follow national guidelines, despite difficulties:

*"They try to follow the national guidelines. Although they may not do it perfectly, they still make an effort."*

*(Administrative officer KII 4).*

This statement emphasized that while the guidelines were not always followed perfectly, there was still a consistent effort to adhere to them.

The informant further mentioned that staff faced challenges due to a shortage of essential equipment, including masks and special uniforms for dengue

*"No, the challenge for the staff is that there is a shortage of items like masks or other necessary equipment. For dengue, we haven't been supplied with any special uniforms, so they have to manage on their own."*

*(Administrative officer, KII 4).*

This statement highlighted the difficulty staff encountered due to the lack of necessary supplies, forcing them to manage without specialized uniforms or sufficient protective gear.

Another key informant shared challenges regarding staff shortages and workload. Significant challenges arose from staff shortages, which impacted patient care and service delivery:

*"This is a 50-bed hospital, and the staff allocation is based on that capacity. However, the patient load sometimes exceeds 100 beds, leading to staff shortages. With maternity services, male and female wards, diarrhea management, and child care services, the limited nursing staff often struggles to manage. We have 5–6 nurses in the morning and 2–3 in the afternoon, which is insufficient."*

*(Senior Staff Nurse, KII 5).*

This statement highlighted that the hospital struggled with insufficient nursing staff due to a patient load beyond its capacity. The limited staff, especially during afternoon shifts, made managing the range of services difficult.

#### 4) Diagnostic Capacity

The diagnostic capacity of the facility was assessed based on its ability to perform essential tests for dengue diagnosis. While some critical diagnostic tools were available, such as the Complete Blood Count (CBC) and systems for monitoring hematocrit and platelet counts, other important resources, like NS1 antigen tests and IgM/IgG rapid tests, were found to be inadequate or unavailable. Additionally, there was limited access to further laboratory testing or established referral arrangements.

**Table 2 Diagnostic Capacity**

| <b>Essential</b>                                                                                                                                                              | <b>Category</b>                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| Ability to perform Complete Blood Count (CBC) (e.g., presence of CBC machine, testing logs, or observation of tests being conducted).                                         | Available and adequate         |
| Availability and capacity for NS1 antigen this month                                                                                                                          | Not available and not adequate |
| Availability of other diagnostic tools for dengue (e.g., IgM/IgG rapid tests, hematocrit testing, or related equipment).                                                      | Not available and not adequate |
| Clinical symptoms used for diagnosis (e.g., visible diagnostic protocols or guidelines)                                                                                       | Available and adequate         |
| System in place for regular monitoring of hematocrit and platelet count (e.g., protocols, equipment, or logs for tracking hematocrit and platelet levels in dengue patients). | Available and adequate         |
| Access to further laboratory testing or established referral arrangements.                                                                                                    | Not available and not adequate |

The evaluation of diagnostic capacity has also pointed out the strengths and significant gaps in the facility's capability to diagnose and monitor cases of suspected dengue. The strengths include CBC, clinical symptom-based diagnosis per the national protocol or guidelines, and systems for hematocrit and platelet monitoring in cases. All these demonstrate very basic preparedness in diagnosing and managing cases of dengue.

However, this is counterbalanced by significant gaps, such as missing NS1 antigen tests, rapid tests for IgM/IgG, and hematocrit tests. Such limitations could severely affect the facility's ability to confirm and manage dengue cases accurately, thus necessitating the remediation of such weaknesses to elevate total diagnostic capacity. This facility faced

challenges due to a shortage of dengue test kits; the health professionals and staff highlighted the challenge of inadequate dengue testing.

The office assistant mentioned that there were no significant obstacles except for the occasional unavailability of NS1 and antigen kits.

*"No, there are no obstacles. The only issue is that the kits for NS1 and Antigen are sometimes unavailable."*

*(Office Assistant. KII 3).*

Operational processes appear efficient, but occasional shortages of NS1 and antigen kits point to supply chain gaps, highlighting the need for improved resource management to ensure uninterrupted diagnostic services.

One medical officer also mentioned that the main challenge currently faced by the facility is the lack of dengue test kits, despite high public expectations for affordable services:

*"While providing services, we currently don't have any dengue test kits available. Since this is a government facility, people have high expectations that they will be able to access diagnostic tests here even with financial constraints. At the moment, the main limitation we face is the lack of test kits."*

*(Medical officer, KII 11)*

This statement highlighted that the absence of dengue test kits was a significant limitation, especially given the public's high expectations for accessible diagnostics at a government facility.

One Senior Staff Nurse emphasized that there was a continued shortage of test kits:

*"As I mentioned earlier, there are not enough kits."*

*(Senior Staff Nurse. KII 6).*

This statement highlighted the ongoing issue of insufficient test kits, which hindered providing adequate care.

## **5) Patient Monitoring and Record-Keeping**

The patient monitoring and record-keeping assessment discussed how well the facility could monitor and manage dengue patients. Though some elements existed in terms of monitoring the vital signs and hydration status, as well as the documentation of dengue cases, overall, the adequacy of such systems was found to be insufficient. In addition, the facility lacked isolation spaces for dengue patients when required.

**Tabel 3 Patient Monitoring and Record-Keeping**

| <b>Essential</b>                                                           | <b>Category</b>                |
|----------------------------------------------------------------------------|--------------------------------|
| System for regular monitoring of patient vital signs and hydration status. | Available and adequate         |
| Documentation system for tracking dengue cases and outcomes.               | Available and not adequate     |
| Designated space for isolating dengue patients when necessary.             | Not available and not adequate |

Appraising patient monitoring and record-keeping systems indicates significant inadequacies in facility readiness for managing dengue cases. There are systems for regularly monitoring patients' vital signs and hydration status and recording systems on confirmed outcomes, but these systems do not function satisfactorily. Such inadequacies are likely to limit the facility's capacity for continuous and accurate monitoring, which is vital in-patient care and outcome evaluation.

Moreover, there is no available space that can be used for isolating the dengue patients when the need arises, which creates a risk of disease transmission and puts infection control at risk. The above findings indicate the necessity for improvements in patient monitoring, documentation systems, and infrastructure towards comprehensive care and control of dengue cases. The systems for monitoring patient vital signs and hydration status are in place using specific forms. For dengue cases outcomes are tracked manually in books, and there is no designated isolation space for dengue patients.

The junior consultant of pediatrics mentioned that the health facility in Savar had sufficient resources, including a system for regularly monitoring patients' vital signs and hydration status.

*"Overall, what we have now can be considered sufficient."*

*(Junior Consultant, Pediatric. KII 1)*

This statement reflected a sense of satisfaction with the existing methods for patient monitoring, suggesting that the consultant believed the current practices were adequate for managing dengue patients. However, it also implied no immediate urgency to further improve or innovate these systems.

The statistician also mentioned that the system for regularly monitoring patients' vital signs and hydration status was generally sufficient and faced no significant challenges:

*"No, these are generally sufficient."*

*(Statistician, KII 4)*

This response suggested that the statistician viewed the current monitoring methods as

adequate for dengue patient care. The brief statement conveyed confidence in the effectiveness of the existing system.

## 6) Infection Control and Waste Management

The evaluation of infection control and waste management focused on the facility's abilities in the prevention and management of infection, especially concerning dengue. Certain infection control practices with the use of mosquito nets in respect of patients did exist, but these were few and far between. Most significantly, the facility had inadequate disposal systems for biomedical waste, inadequate hand hygiene stations, and minimal control of mosquito breeding sites around the facility.

**Tabel 4 Infection Control and Waste Management**

| Essential                                                                                  | Category                   |
|--------------------------------------------------------------------------------------------|----------------------------|
| Implementation of infection control measures, including use of mosquito nets for patients. | Available and adequate     |
| Proper disposal system for biomedical waste.                                               | Available and not adequate |
| Functional hand hygiene stations with adequate supplies.                                   | Available and not adequate |
| Regular inspection and control of mosquito breeding sites around the facility.             | Available and not adequate |

The good things about Savar UHC were the adequate availability and effectiveness of Mosquito Nets. One key informant mentioned that adequate mosquito nets were provided to every dengue patient and were effective:

*"Yes. Nets are provided to every dengue patient. It's adequate. Nets are okay and effective."* (Medical officer, KII 1). The provision of sufficient mosquito nets ensured effective protection for dengue patients, helping to reduce the risk of further mosquito-borne transmission.

The key informant further mentioned that the hospital was mosquito-prone due to surrounding bushes, ditches, drains, and improper waste disposal, including coconut shells:

*"The entire hospital is mosquito-prone. There are various bushes, ditches, and drains around it. People are throwing garbage in different places, including coconut shells. These factors are putting everyone at risk"*

*(Medical officer, KII 1)*

The environmental factors around the hospital, such as stagnant water and waste, contributed to a higher risk of mosquito breeding, putting both patients and staff at risk of mosquito-borne diseases.

Another key informant who was also a medical officer emphasized that while the hospital maintains cleanliness, mosquitoes are a widespread issue, and controlling outdoor environments falls under the authority of external management:

*"There are no specific areas. We always maintain cleanliness. The place is cleaned almost every day. Mosquitoes are everywhere. The most important thing is that we focus on the hospital. We cannot control what is outside; that's an authority issue."*

*(Medical Officer. KII 2)*

Despite efforts to maintain cleanliness within the hospital, the external environment contributed to the persistent mosquito presence, highlighting the need for broader authority intervention to address the issue.

The Office Assistant emphasized that cleaning external areas, such as homes, jungles, and waste like coconut husks, could help prevent dengue:

*"Cleaning outside the facility is more important. If areas like homes, jungles, coconut husks, and chip packets were cleaned by volunteers, it could help prevent dengue."*

*(Office Assistant. KII 3).*

Addressing the cleanliness of surrounding areas through volunteer efforts could significantly reduce mosquito breeding sites, helping to prevent dengue outbreaks.

## **7) Community Awareness and Outreach**

The assessment of community awareness and outreach programming flagged accomplishments and improvement opportunities. There was good evidence of collaboration between the facility and local health authorities concerning vector control measures. The facility had maintained records of awareness programs or community outreach, showing a commitment to stakeholder involvement in dengue prevention efforts by the community.

The availability of educational materials for patients on dengue prevention was deficient but present, limiting the facility's ability to inform and empower patients to adopt preventive measures effectively. Field staff conducted community campaigns for dengue prevention, and the facility collaborated directly with the community and sometimes with local health authorities for vector control.

**Tabel 5 Community Awareness and Outreach**

| Essential                                                                     | Category                   |
|-------------------------------------------------------------------------------|----------------------------|
| Availability of educational materials on dengue prevention for patients.      | Available and not adequate |
| Record of community outreach or awareness programs conducted by the facility. | Available and adequate     |
| Collaboration with local health authorities on vector control measures.       | Available and adequate     |

One key informant who was a senior medical doctor mentioned that around 200 staff members at the field level were regularly oriented about dengue and worked in their respective wards to raise awareness among the public:

*"At the field level, we have around 200 staff members who are regularly oriented about dengue. They work in their respective wards or facilities to build awareness among service recipients and the general public in the surrounding areas."*

*(Medical officer, KII 11).*

The officer emphasized the efforts made to educate both service recipients and the surrounding community about dengue, with a dedicated team of staff focused on awareness-building at the grassroots level.

One health inspector explained that while they and other community health workers played roles in identifying and referring patients with symptoms, their involvement ended after referral, with the facility management handling treatment,

*"When we say we engage with the community, we, the health inspectors, assistant health inspectors, and others working in the community. Our work might differ in type, but we all play a role. Whenever we enter a village, if we find someone with symptoms like fever, vomiting, or diarrhea, we refer that patient here. After referring, the management provides the necessary services based on the tests and examinations. The management take care of the patient, and once the patient arrives at the hospital, we just keep track to see whether the patient is improving or needs to transfer elsewhere. That's all! We don't have any role in the treatment management"*

*(Health Inspector. KII 10).*

The health inspector highlighted the referral-based nature of their work, where community health workers primarily identify and direct patients to the hospital, leaving treatment management to the hospital staff. This approach underscores a collaborative effort between community and hospital services.

One medical officer emphasized that community awareness is crucial in combating dengue. Despite efforts to educate individuals, many remain unaware of preventive measures like using mosquito nets and managing stagnant water, making it difficult to address the issue:

*"Community awareness is the most important. Because if everyone becomes aware, we can see that many people are affected by dengue. For example, a person in my neighboring house had dengue; they don't use a mosquito net, and when I suggest they use one, they get upset. I tell them to hang a mosquito net. People often don't realize that they or their family members could get affected, or that they should take care of their neighbors. Also, water got stagnant in various places, which needs to be eliminated; this requires social awareness. People need to be trained on these issues through different media. If people are not aware, fighting against dengue becomes very difficult."*

*(Junior Consultant, Pediatric. KII 1).*

The medical officer stressed the importance of increasing community awareness to prevent dengue. The lack of awareness about simple preventive actions, such as using mosquito nets and proper water management, poses a challenge in controlling dengue, highlighting the need for more widespread education and training.

Another key informant who was a senior medical doctor mentioned that field workers of the Savar UHC conduct door-to-door interpersonal communication (IPC) and used media, including their Facebook page, to engage the community and spread awareness:

*"Our field workers conduct IPC (interpersonal communication), go door-to-door, and we engage with the community through media, including our Facebook page, to spread awareness."*

*(Medical officer, KII 9).*

The medical officer highlighted the use of field workers for direct communication and media platforms, including Facebook, to effectively engage with the community and raise awareness about dengue prevention.

The collaboration between the health facility and local health authorities, particularly for vector control measures, was an essential aspect of the community outreach efforts. According to the Junior Consultant, Paediatric, the facility worked closely with community clinics at the union and ward levels, where health workers referred suspected dengue patients. Advocacy

meetings with local representatives and community members, including schools, were also regularly conducted to ensure coordinated efforts in dengue prevention:

*"By being involved with the community, we already have community clinics at the union and ward levels. We have health workers there, and they are referring patients who they suspect might have dengue. We also have advocacy meetings with local representatives and people from different levels of society from time to time. Therefore, we work in coordination with the community, especially with schools."*

*(Junior Consultant, Paediatric. KII 1)*

Additionally, the Senior Staff Nurse mentioned that although the Upazila authorities sometimes provided mosquito repellent, the impact of mosquitoes in the area was minimal. Despite this, one challenge remained: the reluctance of many patients to use the mosquito nets provided to them, which hindered the effectiveness of vector control efforts:

*"Sometimes, the upazila authorities come and provide mosquito repellent. There aren't many mosquitoes, and their impact isn't that significant. However, patients often don't use the mosquito nets. Even when they are provided, many don't use them, especially the regular patients."*

*(Senior Staff Nurse, KII 8)*

These quotations underscore the importance of both community involvement and local authority support in vector control measures. While the efforts to provide mosquito repellents and raise awareness are in place, adherence to preventive measures, such as using mosquito nets, remains a significant barrier.

## **J. Discussion**

The study assessed the facilities of Savar Upazila Health Complex in managing dengue cases and preventing transmission within the health complex. The study showed how well-equipped Savar Upazila Health Complex is in terms of the delivery of healthcare facilities for effective management of dengue prevention. The study was done using the quantitative data along with the qualitative insights in order to analyse the crucial features that suggested the availability of important resources; infrastructural and logistical support; operational efficiency; challenges faced by healthcare professional. It has provided the base to understand readiness by identifying strengths, gaps, improvement needs in the area's context to strengthen the strategy of dengue control.

This study has revealed severe shortages in infrastructure, resources, and personnel with which the health facility in Savar Upazila is constrained, inhibiting effective management and prevention of dengue. These deficiencies are not independent but rather contained in the folds of bigger systemic issues within the infrastructure of healthcare and management of vector-borne diseases in less resourceful settings. Major findings demonstrate impressive strengths and major weaknesses indicative of the systemic challenges of healthcare infrastructure vis-a-vis such resource-limited nations. Following is a detailed synthesis of findings, actionable recommendations, and evidence from the existing literature.

The health facility showed some level of readiness, like the installation of basic medicines, namely paracetamol and normal saline and distribution of mosquito nets to patients. However, the persistent shortages of NS1 antigen test kits as well as other diagnostic tools displayed glaring gaps in diagnostic capacity. This deficiency is delaying early detection and hence, inhibiting effective management, especially during outbreaks. Timely intervention and care require permanency in the supply chain concerning the diagnostic tools (Mustafa et al., 2023; Schneller & Abdulsalam, 2022).

There was a lot of infrastructure challenge. Poor ventilation and drainage systems promote mosquito breeding, and in turn, increase the probability of dengue transmission. Further poor waste management, included inadequate disposal systems for biomedical wastes, aggravates the environmental hazards. The results are supported by earlier researches emphasizing environmental contributions in vector control and in preparedness by health facilities (Buhler et al., 2019; Ferronato & Torretta, 2019; Onen et al., 2023). Improving these facilities by upgrading ventilation and drainage systems will thus promote effective dengue prevention intervention in the long run.

Another constraint was human resource limitation. The facility's limited workforce cannot cope with the demands of over 1.95 million people, leading to patient care and service delivery disruptions. The trained healthcare professional shortage also compromises the effectiveness of the health facility in implementing dengue management protocols. There is a need for ongoing training sessions on updated guidelines in dengue management. These sessions would serve to improve the capabilities of staff members. Training programs have improved healthcare outcomes in similar low-resource settings (Aung et al., 2023; Ho et al., 2023).

This step is significant but far from sufficient. Awareness programs should be complemented with meaningful activities by organizing educational materials and empowering the community, making them practice preventive behaviours like using mosquito nets and

eliminating stagnant water sources. Previous studies by Ouédraogo et al. (2018) and Hossain et al. (2024) discuss how the community can do the best in these prevention efforts. Online methods of communication generate extra mileage for educational activities and mobilize participation (Hossain et al., 2023; Ouédraogo et al., 2018).

The existing operations will be supplemented by incorporating these recommendations. Short-term priorities comprise ensuring an unbroken supply of diagnostic kits and protective equipment (WHO, 2012b). In the medium term, training for staff should be complemented with community outreach programs (Sri-Pathmanathan et al., 2023). Long-term options must underscore injection into infrastructure improvements, including capable drainage systems and special dengue units. Also, relevance to local authorities for waste management and vector control would substantiate a lot for preventive actions. To summarize, Savar Upazila Health Complex shows foundational readiness for dengue management, but security problems due to weak infrastructure, human resources, and operational management hinder efficient delivery. Addressing these challenges through integrated interventions will not only add value to facility readiness towards dengue outbreaks but also to resilience within the larger healthcare system, all made within resource-poor contexts.

This study has some limitations. It focused on one healthcare facility, so the findings may not apply to other areas. The data relied on self-reported information, which might include biases. Environmental observations were limited to the hospital surroundings, missing broader factors. Future studies should cover more facilities and include larger samples to better understand dengue management challenges.

## **K. Conclusion**

The readiness of the Savar Upazila Health Complex to manage dengue cases demonstrates foundational strengths but is hindered by systemic gaps in infrastructure, resources, and human capacity. While basic tools like mosquito nets and saline are available, the lack of diagnostic kits, inadequate ventilation, and poor waste management highlight areas needing urgent improvement. Regular training for healthcare professionals, infrastructural enhancements, and active community engagement are necessary to build a resilient healthcare system. Lessons from this study can inform interventions in other resource-limited, dengue-endemic settings, ensuring better preparedness and response to future outbreaks.

## **Recommendation**

In the short term, ensure uninterrupted supply chains for diagnostic kits, protective equipment, and essential medicines. Medium-term priorities include regular training programs for healthcare professionals to enhance their capacity to implement updated dengue

management protocols effectively. In the long term, infrastructural upgrades, such as improved drainage systems, better ventilation, and dedicated dengue care units, must be implemented. Collaborating with local authorities for waste management and mosquito control is critical to support these efforts. Additionally, community engagement should be strengthened through digital platforms and accessible educational campaigns to promote dengue prevention behaviors.

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## Annex

### 1) Annex 1 - Observational Checklist



Inspiring Excellence

#### Observation Checklist of Facility Readiness for Upazila Health Complex

BRAC James P Grant School of Public Health, Dhaka, Bangladesh

PI: Yosi Duwita Arinda

FOR USE BY OBSERVER ONLY

|                 |      |
|-----------------|------|
| Date (mm/dd/yy) | Time |
|                 |      |

| General information about the health facility |                                                            |                                                                                  |
|-----------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------|
| 1                                             | Name of facility                                           |                                                                                  |
| 2                                             | Location of facility                                       |                                                                                  |
| 3                                             | Region / Province                                          |                                                                                  |
| 4                                             | District                                                   |                                                                                  |
| 5                                             | Type of facility                                           |                                                                                  |
| 6                                             | Managing Authority                                         |                                                                                  |
| 7                                             | Urban / Rural                                              |                                                                                  |
| 8                                             | The population is covered by this facility in the area.    | (Specify number or estimate):                                                    |
| 10                                            | Outpatient or Inpatient                                    |                                                                                  |
| 11                                            | Does this facility offer diagnosis or treatment of dengue? |                                                                                  |
| 12                                            | How many days per week is the facility open?               | 1. 7 days a week<br>2. 6 days a week<br>3. 5 days a week<br>99. Others (Specify) |
| 13                                            | Facility functioning hours (average hours open per day).   | 4 hours or less<br>5 to 8 hours<br>9 to 16 hours<br>17 to 23 hours<br>24 hours   |

| No                             | Dengue Prevention Facility Readiness Essentials                                                                                                                                                                                                                                                                           | Available | Adequate | Notes/Comments             |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------|----------------------------|
| <b>Facility Infrastructure</b> |                                                                                                                                                                                                                                                                                                                           |           |          |                            |
| 1                              | Presence of a designated dengue treatment area.                                                                                                                                                                                                                                                                           |           |          |                            |
| 2                              | Adequate ventilation and lighting in treatment areas.                                                                                                                                                                                                                                                                     |           |          |                            |
| 3                              | Availability of water and sanitation facilities, including functional toilet (latrine) for patient use.                                                                                                                                                                                                                   |           |          |                            |
| 4                              | Availability of electricity from any source (e.g., electricity grid, generator, solar, or other), including for stand-alone devices (e.g., EPI cold chain).                                                                                                                                                               |           |          |                            |
| 5                              | Functional mosquito-proof barriers (e.g., window screens)                                                                                                                                                                                                                                                                 |           |          |                            |
| 6                              | Cleanliness and absence of stagnant water around the facility                                                                                                                                                                                                                                                             |           |          |                            |
| 7                              | Availability of sufficient handwashing facilities for both staff and patients                                                                                                                                                                                                                                             |           |          |                            |
| 8                              | Covered garbage bins in key areas.                                                                                                                                                                                                                                                                                        |           |          |                            |
| 9                              | Availability of overnight/inpatient beds available for dengue patients (adults and children)                                                                                                                                                                                                                              |           |          | (Specify number):<br>_____ |
| 10                             | The facility supports the availability of a functioning cellular telephone or a private cellular phone.                                                                                                                                                                                                                   |           |          |                            |
| 11                             | Availability and functioning short-wave radio for radio calls                                                                                                                                                                                                                                                             |           |          |                            |
| 12                             | This facility has a functioning computer                                                                                                                                                                                                                                                                                  |           |          |                            |
| 13                             | There is access to email or internet within the facility today                                                                                                                                                                                                                                                            |           |          |                            |
| 14                             | Availability of functional ambulance or emergency transportation.                                                                                                                                                                                                                                                         |           |          |                            |
| <b>Supplies and Equipment</b>  |                                                                                                                                                                                                                                                                                                                           |           |          |                            |
| 15                             | Stock of necessary medications for dengue treatment (e.g., Paracetamol, IV fluids, or other relevant drugs).                                                                                                                                                                                                              |           |          |                            |
| 16                             | Availability of mosquito repellents and protective equipment.                                                                                                                                                                                                                                                             |           |          |                            |
| 17                             | Availability and functioning equipment for reusable item sterilization (e.g., <b>electric autoclave</b> (pressure & wet heat), non-electric autoclave, electric dry heat sterilizer, electric boiler or steamer (no pressure), non-electric pot with cover for boiling/steam, and heat source for non-electric equipment) |           |          |                            |
| 18                             | Diagnostic tools (e.g., blood pressure cuffs, materials for tourniquet test).                                                                                                                                                                                                                                             |           |          |                            |
| 19                             | Laboratory supplies for dengue testing (e.g., NS1 antigen test kits, CBC machines).                                                                                                                                                                                                                                       |           |          |                            |
| 20                             | There has been a stock-out of dengue RDT kits (e.g., NS1 antigen test kits, IgM/IgG rapid tests, or other related RDT kits), hematocrit, platelet count, or CBC testing supplies in the past 4 weeks.                                                                                                                     |           |          |                            |

|                                      |                                                                                                                                                                                                                                           |  |  |                            |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|----------------------------|
| 21                                   | Availability of blood products or established referral system for blood transfusions.                                                                                                                                                     |  |  |                            |
| 22                                   | Vector control supplies (e.g., insecticide-treated <b>bed nets</b> , larvicides).                                                                                                                                                         |  |  |                            |
| 23                                   | Dengue rapid diagnostic test kits with a valid expiration date available in stock at the facility today.                                                                                                                                  |  |  |                            |
| 24                                   | Availability of a blood pressure apparatus (e.g., digital or manual sphygmomanometer with stethoscope).                                                                                                                                   |  |  |                            |
| 25                                   | Availability of intravenous infusion kits                                                                                                                                                                                                 |  |  |                            |
| 26                                   | Availability of oxygen concentrators, <b>oxygen cylinders</b> , central oxygen supply, flowmeter for oxygen therapy (with humidification), and oxygen delivery apparatus (key connecting tubes and mask/nasal prongs) available.          |  |  |                            |
| 27                                   | Availability of clean running water available (e.g., piped, <b>bucket with tap</b> , or pour pitcher).                                                                                                                                    |  |  |                            |
| 28                                   | Availability of hand-washing soap or liquid soap available.                                                                                                                                                                               |  |  |                            |
| 29                                   | Availability of alcohol-based hand rub available.                                                                                                                                                                                         |  |  |                            |
| 30                                   | Availability of disposable latex gloves available.                                                                                                                                                                                        |  |  |                            |
| 31                                   | Availability of a waste receptacle (pedal bin) with a lid and plastic bin liner.                                                                                                                                                          |  |  |                            |
| 32                                   | Availability of a sharp's container (safety box) available.                                                                                                                                                                               |  |  |                            |
| 33                                   | Availability of environmental disinfectant (e.g., chlorine, alcohol) available.                                                                                                                                                           |  |  |                            |
| 34                                   | Availability of disposable syringes with disposable needles available.                                                                                                                                                                    |  |  |                            |
| 35                                   | Availability of auto-disable syringes available.                                                                                                                                                                                          |  |  |                            |
| <b>Health Personnel and Training</b> |                                                                                                                                                                                                                                           |  |  |                            |
| 36                                   | Availability of generalist (non-specialist) medical doctors assigned to dengue ward or dengue-specific care.                                                                                                                              |  |  | (Specify number):<br>_____ |
| 37                                   | Availability of specialist medical doctors assigned to dengue ward or dengue-specific care.                                                                                                                                               |  |  | (Specify number):<br>_____ |
| 38                                   | Availability of nurses assigned to dengue ward or dengue-specific care.                                                                                                                                                                   |  |  | (Specify number):<br>_____ |
| 39                                   | Availability of non-physician clinicians/paramedical professionals (physician assistants, medical assistants, laboratory technicians, pharmacists, emergency medical technicians (EMTs)) assigned to dengue ward or dengue-specific care. |  |  | (Specify number):<br>_____ |
| 40                                   | Availability of other support staff (e.g., aides, cleaners) assigned to dengue care.                                                                                                                                                      |  |  | (Specify number):<br>_____ |
| 41                                   | On-call or standby staff for emergency dengue case management.                                                                                                                                                                            |  |  |                            |
| 42                                   | Adequate number of trained healthcare providers for dengue care.                                                                                                                                                                          |  |  | (Specify number):<br>_____ |

|                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |                            |
|-----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|----------------------------|
| 43                                            | Staff trained on current dengue management, including treatment protocols, vector control, and the use of RDTs and other diagnostic methods.                                                                                                                                                                                                                                                                                   |  |  | (Specify number):<br>_____ |
| 44                                            | Providers of dengue services have received training in dengue diagnosis with RDTs in the last two years.                                                                                                                                                                                                                                                                                                                       |  |  |                            |
| 45                                            | Staff awareness on use of personal protective equipment.                                                                                                                                                                                                                                                                                                                                                                       |  |  |                            |
| 46                                            | Training records on dengue prevention and vector control methods (e.g., certificate training)                                                                                                                                                                                                                                                                                                                                  |  |  |                            |
| 47                                            | National guidelines for the diagnosis and treatment of dengue are available in this facility today.                                                                                                                                                                                                                                                                                                                            |  |  |                            |
| 48                                            | Availability of a dedicated team for dengue case management.                                                                                                                                                                                                                                                                                                                                                                   |  |  |                            |
| 49                                            | This facility provides intermittent preventive treatment for dengue                                                                                                                                                                                                                                                                                                                                                            |  |  |                            |
| 50                                            | Providers in this facility diagnose dengue.                                                                                                                                                                                                                                                                                                                                                                                    |  |  |                            |
| 51                                            | Providers in this facility prescribe treatment for dengue.                                                                                                                                                                                                                                                                                                                                                                     |  |  |                            |
| 52                                            | This facility has guidelines on standard precautions for infection prevention                                                                                                                                                                                                                                                                                                                                                  |  |  |                            |
| <b>Diagnostic Capacity</b>                    |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |                            |
| 53                                            | Ability to perform Complete Blood Count (CBC) (e.g., presence of CBC machine, testing logs, or observation of tests being conducted).<br>(Note: Testing logs refer to written or digital records documenting CBC tests, including patient details and test results. Observation of tests being conducted means directly seeing CBC tests being performed or witnessing the use of CBC machines and equipment in the facility). |  |  |                            |
| 54                                            | Availability and capacity for NS1 antigen                                                                                                                                                                                                                                                                                                                                                                                      |  |  |                            |
| 55                                            | Availability of other diagnostic tools for dengue (e.g., IgM/IgG rapid tests, hematocrit testing, or related equipment).                                                                                                                                                                                                                                                                                                       |  |  |                            |
| 56                                            | Clinical symptoms used for diagnosis (e.g., visible diagnostic protocols or guidelines)                                                                                                                                                                                                                                                                                                                                        |  |  |                            |
| 57                                            | System in place for regular monitoring of hematocrit and platelet count (e.g., protocols, equipment, or logs for tracking hematocrit and platelet levels in dengue patients).                                                                                                                                                                                                                                                  |  |  |                            |
| 58                                            | Access to further laboratory testing or established referral arrangements.                                                                                                                                                                                                                                                                                                                                                     |  |  |                            |
| <b>Patient Monitoring and Record-Keeping</b>  |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |                            |
| 59                                            | System for regular monitoring of patient vital signs and hydration status.                                                                                                                                                                                                                                                                                                                                                     |  |  |                            |
| 60                                            | Documentation system for tracking dengue cases and outcomes.                                                                                                                                                                                                                                                                                                                                                                   |  |  |                            |
| 61                                            | Designated space for isolating dengue patients when necessary.                                                                                                                                                                                                                                                                                                                                                                 |  |  |                            |
| <b>Infection Control and Waste Management</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |                            |

|                                         |                                                                                            |  |  |  |
|-----------------------------------------|--------------------------------------------------------------------------------------------|--|--|--|
| 62                                      | Implementation of infection control measures, including use of mosquito nets for patients. |  |  |  |
| 63                                      | Proper disposal system for biomedical waste.                                               |  |  |  |
| 64                                      | Functional hand hygiene stations with adequate supplies.                                   |  |  |  |
| 65                                      | Regular inspection and control of mosquito breeding sites around the facility.             |  |  |  |
| <b>Community Awareness and Outreach</b> |                                                                                            |  |  |  |
| 66                                      | Availability of educational materials on dengue prevention for patients.                   |  |  |  |
| 67                                      | Record of community outreach or awareness programs conducted by the facility.              |  |  |  |
| 68                                      | Collaboration with local health authorities on vector control measures.                    |  |  |  |

## 2) Annex 2 - Guideline of Key Informant Interview (KII)



**BRAC** SCHOOL OF  
JAMES P GRANT PUBLIC HEALTH



Inspiring Excellence

**Collecting feedback from healthcare professionals in Upazila Health Complex**  
BRAC James P Grant School of Public Health, BRAC University, Dhaka, Bangladesh  
PI: Yosi Duwita Arinda

### Key Informant Interview Guideline (KII) for Healthcare Professionals and Staff

#### Facility Readiness

##### A. Infrastructure and Sanitation

- In your opinion, what are the main infrastructural challenges (e.g., ventilation, mosquito-proofing) affecting dengue prevention at this facility?  
Probe:
  - How does the ventilation system affect patient and staff safety in dengue areas?
  - Are there areas more prone to mosquito issues? How do they impact dengue control?
  - How effective are the mosquito-proofing measures in preventing mosquito access?
- How would you rate the facility's cleanliness and mosquito control measures?  
Probe:
  - How often is the facility cleaned, and is it effective in preventing mosquitoes?
  - What mosquito control methods are used?
  - In your opinion, is it effective?
  - Are there any gaps in mosquito control that could increase dengue risk?
- How many toilets are available in this facility, specifically for dengue patients?  
Probe:
  - How often are these toilets cleaned in a day or week?
  - Are there any challenges in maintaining sanitation in these areas?

4. Are bed nets provided in this facility for dengue patients?

Probe:

- 1) If yes, how are they used, and are they effective in preventing mosquito bites?
- 2) Are there sufficient bed nets for all dengue patients in need?

## **B. Supplies and Equipment**

1. Are there any challenges in maintaining essential dengue prevention supplies (e.g., IV fluids and diagnostic kits)?

Probe:

- 1) Are there any difficulties in keeping essential supplies like IV fluids or diagnostic kits available?
- 2) Do you face any stock outs or supply shortages issues?
- 3) How do you think that affects dengue care and prevention?
2. How reliable are laboratory diagnostic tools (e.g., NS1 antigen tests, CBC machines) for detecting dengue?

Probe:

- 1) Do you think the NS1 antigen tests and other diagnostic tools are accurately detecting dengue?
- 2) Are there any issues with the functionality or reliability of the CBC machines in diagnosing dengue?

## **C. Health Personnel and Training**

1. Did you receive any training on dengue management and prevention protocols?

Probe:

- 1) What kind of training do you receive? and when?
- 2) Do you think the training was effective?
- 3) In your opinion, how confident are staff in applying dengue management protocols during patient care?
- 4) Are there any gaps in staff training on dengue prevention measures?
2. What challenges exist in ensuring staff adherence to infection control practices?

Probe:

- 1) What factors make it difficult for staff to follow infection control guidelines consistently?
  - 2) Are any specific barriers (e.g., resources, time) hindering staff adherence to infection control practices?
  3. Do staff in this facility follow the national guidelines for dengue management?
- Probe:
- 1) What challenges do staff face in adhering to these guidelines?
  - 2) Are there any gaps or areas in the guidelines that are difficult to implement?

## **D. Diagnostic and Treatment Capacity**

1. What barriers limit this facility's ability to conduct dengue diagnostics (e.g., CBC, NS1 antigen tests)?

Probe:

- 1) Are there any issues with access to necessary diagnostic tools for dengue testing?
  - 2) How do delays in getting diagnostic results affect dengue care?
  2. Are there improvements needed in patient monitoring, such as hydration tracking?
- Probe:
- 1) Are current patient monitoring methods, like hydration tracking, sufficient for dengue patients?
  - 2) What challenges do you face in monitoring dengue patients' hydration levels?

### **E. Community Engagement and Awareness**

1. How does the facility engage the community in dengue prevention?
2. What challenges do you face in outreach for dengue prevention in the community?  
Probe:
  - 1) What strategies are used to involve the community in dengue prevention activities?
  - 2) What kind of community awareness initiatives are taken by UHC?
  - 3) What challenges or barriers do you face in contacting the community for dengue prevention?
3. What role does community awareness play in dengue prevention, and how can it be improved?  
Probe:
  - 1) In your opinion, how important is community awareness in reducing dengue cases in the area?
  - 2) In your opinion, what actions can be taken to improve community awareness about dengue prevention?

### **F. Facilities Readiness**

1. How sufficient are the current resources (e.g., staff, equipment) for the facility to handle a dengue outbreak effectively?  
Probe:
    - 1) Is there enough staff and equipment to manage many dengue cases during an outbreak?
    - 2) How do you manage the shortage of staff?
    - 3) How do you manage the shortage of equipment?
    - 4) What resource shortages do you face that could affect your ability to handle a dengue outbreak?
  2. What improvements are needed in the facility's emergency preparedness for dengue or similar outbreaks?  
Probe:
    - 1) What areas of emergency preparedness need strengthening to handle dengue outbreaks more effectively?
    - 2) Are there specific measures that could be improved to prepare the facility for a dengue outbreak better?
- 

### **3) Annex 3 - Information Sheet (Bangla Version)**

#### **তথ্যপত্র**

#### **ভূমিকা:**

আপনাকে শুভেচ্ছা। আমার নাম ইয়োসি দুইতা আরিন্দা। আমি ব্র্যাক জেমস পি গ্র্যান্ট স্কুল অব পাবলিক হেলথ, ব্র্যাক ইউনিভার্সিটি, ঢাকা, বাংলাদেশ থেকে এসেছি। আমরা একটি গবেষণা পরিচালনা করছি যা ডেঙ্গু নির্ণয় এবং নিয়ন্ত্রণে স্বাস্থ্যকেন্দ্রের প্রস্তুতি মূল্যায়নের উপর ভিত্তি করে।

#### **গবেষণার উদ্দেশ্য:**

সাভার উপজেলা স্বাস্থ্য কমপ্লেক্স ডেঙ্গু রোগের কার্যকর ব্যবস্থাপনা এবং স্বাস্থ্যকেন্দ্রের মধ্যে ডেঙ্গু সংক্রমণ প্রতিরোধে কতটা প্রস্তুত, তা যাচাই করা।

#### **অংশগ্রহণের কারণ:**

আপনার অংশগ্রহণ গুরুত্বপূর্ণ কারণ এটি স্বাস্থ্যকেন্দ্রের বর্তমান প্রস্তুতি সম্পর্কে মূল্যবান

ধারণা প্রদান করবে। এটি ডেঙ্গু রোগ ব্যবস্থাপনার উন্নয়নে এবং প্রাদুর্ভাবপূর্ণ এলাকায় সেবার মান বাড়াতে সহায়ক হবে।

#### **প্রক্রিয়া:**

আপনি যদি অংশগ্রহণে সহমত হন, আমরা প্রায় ৬০ মিনিটের একটি সাক্ষাৎকার নেব। সাক্ষাৎকারে আপনার অভিজ্ঞতা এবং ডেঙ্গু ব্যবস্থাপনা নিয়ে মতামত জানতে চাইব, যার মধ্যে থাকবে অবকাঠামো, লোকবল, এবং চ্যালেঞ্জগুলো। সঠিক তথ্য নিশ্চিত করার জন্য সাক্ষাৎকারটি অডিও রেকর্ড করা হতে পারে। প্রয়োজনে ছবি তোলাও হতে পারে।

#### **অংশগ্রহণের উপকারিতা:**

এই গবেষণায় অংশগ্রহণের মাধ্যমে সরাসরি কোনো উপকার পাওয়া যাবে না। তবে, আপনার মতামত ভবিষ্যতে ডেঙ্গু প্রতিরোধ এবং ব্যবস্থাপনার কৌশল উন্নত করতে সাহায্য করবে, যা রোগীদের এবং সমাজের জন্য উপকারী হবে।

#### **ঝুঁকি:**

এই গবেষণায় কোনো শারীরিক বা মানসিক ঝুঁকি নেই। তবে, কিছু প্রশ্ন আপনাকে সংবেদনশীল মনে হতে পারে। অস্বস্তিকর মনে হলে আপনি যেকোনো প্রশ্ন এড়িয়ে যেতে বা সাক্ষাৎকার যেকোনো সময় বন্ধ করতে পারেন।

#### **গোপনীয়তা এবং অজ্ঞাতনামা:**

আপনার সমস্ত তথ্য গোপন রাখা হবে। আপনার ব্যক্তিগত তথ্য গবেষণা দলের বাইরে কারও সঙ্গে ভাগ করা হবে না। তথ্য নিরাপদে সংরক্ষণ করা হবে, এবং গবেষণা থেকে প্রকাশিত কোনো প্রতিবেদনে আপনার বা অন্য অংশগ্রহণকারীদের নাম উল্লেখ করা হবে না।

#### **অংশগ্রহণের ধরন:**

অংশগ্রহণ সম্পূর্ণ স্বেচ্ছামূলক, এবং আপনি যেকোনো সময় কোনো প্রভাব ছাড়াই অংশগ্রহণ বন্ধ করতে পারেন। যদি আপনি অংশগ্রহণ না করার বা অংশগ্রহণ বন্ধ করার সিদ্ধান্ত নেন, তাহলে আপনার সেবার মান বা স্বাস্থ্যকেন্দ্রের সঙ্গে আপনার সম্পর্কের ওপর কোনো নেতিবাচক প্রভাব পড়বে না।

#### **যোগাযোগের তথ্য:**

এই গবেষণা নিয়ে যদি আপনার কোনো প্রশ্ন বা উদ্বেগ থাকে, তাহলে ইয়োসি দুইতা আরিন্দার সঙ্গে যোগাযোগ করতে পারেন:

- ফোন: +৮৮০ ১৪ ০৮৪৯ ২০৮৫
- ইমেইল: [yosi.duwita.arinda@g.bracu.ac.bd](mailto:yosi.duwita.arinda@g.bracu.ac.bd)

ন্যায়সংগত বিষয় নিয়ে কোনো প্রশ্ন থাকলে, ইনস্টিটিউশনাল রিভিউ বোর্ডের সঙ্গে যোগাযোগ করতে পারেন:

- ফোন: +৮০১৯৯৩৩৭৯৫১২
- ইমেইল: [irb-jpgsph@bracu.ac.bd](mailto:irb-jpgsph@bracu.ac.bd)

আপনার অংশগ্রহণের জন্য ধন্যবাদ।

#### 4) Annex 4 - Consent Form (Bangla Version)

### সম্মতি ফর্ম

#### গবেষণা প্রকল্পের শিরোনাম:

সাভার উপজেলা স্বাস্থ্য কমপ্লেক্স, ঢাকা, বাংলাদেশে ডেঙ্গু সংক্রমণের সময়মতো নির্ণয়, ব্যবস্থাপনা এবং প্রতিরোধে স্বাস্থ্যকেন্দ্রের প্রস্তুতি মূল্যায়ন: একটি মিশ্র গবেষণা পদ্ধতি।

#### উত্তরদাতার সম্মতির বিবৃতি:

আমি অংশগ্রহণকারী তথ্যপত্রটি পড়েছি বা এটি আমাকে পড়ে শোনানো হয়েছে। আমি প্রদত্ত তথ্য সম্পর্কে যেকোনো প্রশ্ন করার সুযোগ পেয়েছি এবং আমার সমস্ত প্রশ্নের সন্তোষজনক উত্তর পেয়েছি। আমি বুঝতে পেরেছি যে আমার সম্পর্কে সংগ্রহ করা তথ্য গোপন রাখা হবে। যদিও এই গবেষণার ফলাফল জনসাধারণের কাছে প্রকাশ করা হতে পারে, আমার ব্যক্তিগত তথ্য ভাগ করা হবে না। আমি এটাও বুঝতে পেরেছি যে এই গবেষণায় আমার অংশগ্রহণ সম্পূর্ণ স্বৈচ্ছামূলক, এবং আমি যেকোনো সময় গবেষণা থেকে অংশগ্রহণ বন্ধ করতে পারি, যার জন্য আমার ওপর কোনো নেতিবাচক প্রভাব পড়বে না।

অতএব, আমি স্বৈচ্ছায় এই গবেষণায় অংশগ্রহণ করতে সম্মতি দিচ্ছি : **হ্যাঁ** **না**

আমি সাক্ষাৎকার রেকর্ড করার জন্য সম্মতি দিচ্ছি : **হ্যাঁ** **না**

আমি, স্বাক্ষরকারী, নিশ্চিত করছি যে আমি গবেষণার উদ্দেশ্য এবং প্রক্রিয়া বুঝতে পেরেছি এবং স্বৈচ্ছায় অংশগ্রহণে সম্মতি দিচ্ছি।

#### সাক্ষাৎকার গ্রহণকারীর নাম:

স্বাক্ষর:

তারিখ:

উত্তরদাতার নাম:

উত্তরদাতার স্বাক্ষর/আঙ্গুলের ছাপ:

তারিখ: