Dengue in the Tropics- The Guyana situation

Dr. Shazeema Shaw

Infectious Disease Specialist

Objectives

- Overview of Dengue infection
- Review the global dengue statistics
- Highlight the current dengue situation in Guyana
- Outline updated testing algorithm
- Review updated management guidelines
- Importance of surveillance for a better national response

Dengue

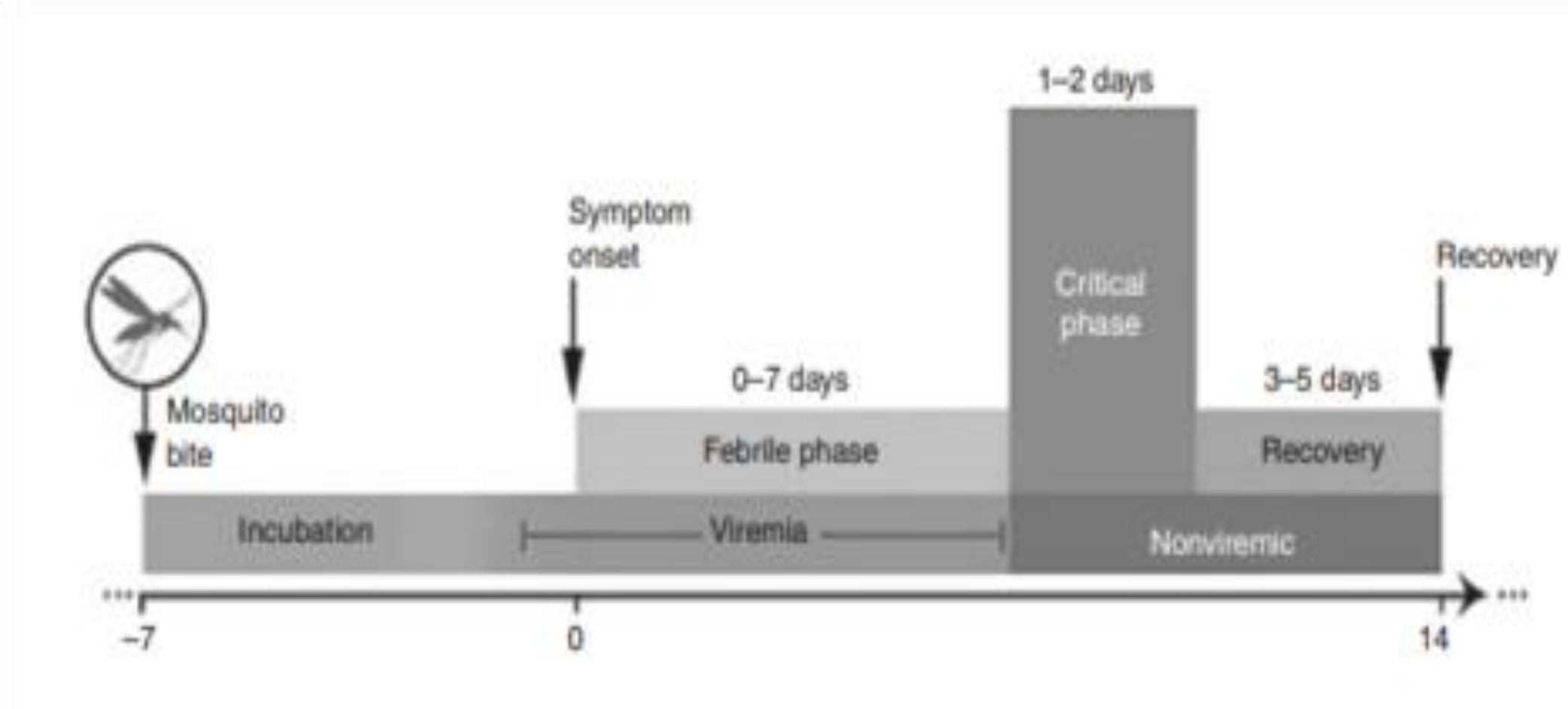
- Dengue viral infection (DVI) is a debilitating arthropod-borne disease
- Transmitted by the aedes aegypti mosquito.

Fun Fact

Only the female mosquitoes need a blood meal to reproduce hence only the females bite while the males use nectar from flowers

- Single positive stranded RNA virus from the family: Flaviviridae, genus Flavivirus
- There are four related but antigenically distinct serotypes of dengue virus designated as DENV-1, DENV-2, DENV-3, and DENV-4
- The first infection by one serotype produces lifelong, serotype specific immunity but not lasting protection against infection by another serotype.

Clinical Course Of Dengue



Febrile Phase

- Typical duration for this phase ranges from 0 to 7 days and biphasic fever can occur
- Monitoring of defervescence (may occur between 3 and 8 days of illness) and warning signs is crucial to identify progression to critical phase
- This phase is often accompanied by onset of high temperature accompanied by severe headache, retro-orbital pain, myalgia, arthralgia, transient macular or maculopapular rash, facial flushing or erythema, injected oropharynx, nausea, vomiting, anorexia, and minor hemorrhagic manifestations such as petechia, ecchymosis, purpura, epistaxis, gum bleeding, hematuria, vaginal and gastrointestinal bleeding, or positive tourniquet test.
- The liver may be large or tender after few days of fever.

- Leucopenia, mild to moderate thrombocytopenia, hyponatremia, and elevated aspartate aminotransferase and alanine aminotransferase (ALT) can occur during this phase

- Febrile phase may cause several complications such as dehydration, hyponatremia, seizures in young children (due to fever), and neurological manifestations (encephalitis and aseptic meningitis)

Critical Phase

- Typically starts around the time of defervescence; however, it may begin early among patients who are febrile on the third day of onset of fever and lasts about 24–48 h.
- During the febrile to afebrile transition, patients without increased capillary permeability improve and do not go through the critical phase.
- On the other hand, patients with increased capillary permeability may manifest with the warning signs, primarily due to plasma leakage.
- Onset of critical phase can be identified by rapid decline in platelet (PLT) count with a concomitant rise in hematocrit (HCT) and presence of warning signs.
- Moreover, patients may develop leucopenia up to 24 h before platelet drop is recognized.
- The presence of warning signs indicates the beginning of critical phase.

- Clinical fluid accumulation (ascites, pleural effusion)
- Liver enlargement > 2 cm
- Severe abdominal pain or tenderness
- Persistent vomiting (at least 3 episodes/24 h)
- Mucosal bleed
- Lethargy or restlessness
- Sometimes rapid decline in PLT count with concurrent increase hematocrit in (HCT) is also considered warning sign

- Pleural effusion and ascites are mostly clinically detectable after IVF therapy only, unless plasma leakage is significant.

- In addition to the plasma leakage, hemorrhagic manifestations such as easy bruising and bleeding at venipuncture sites occur frequently

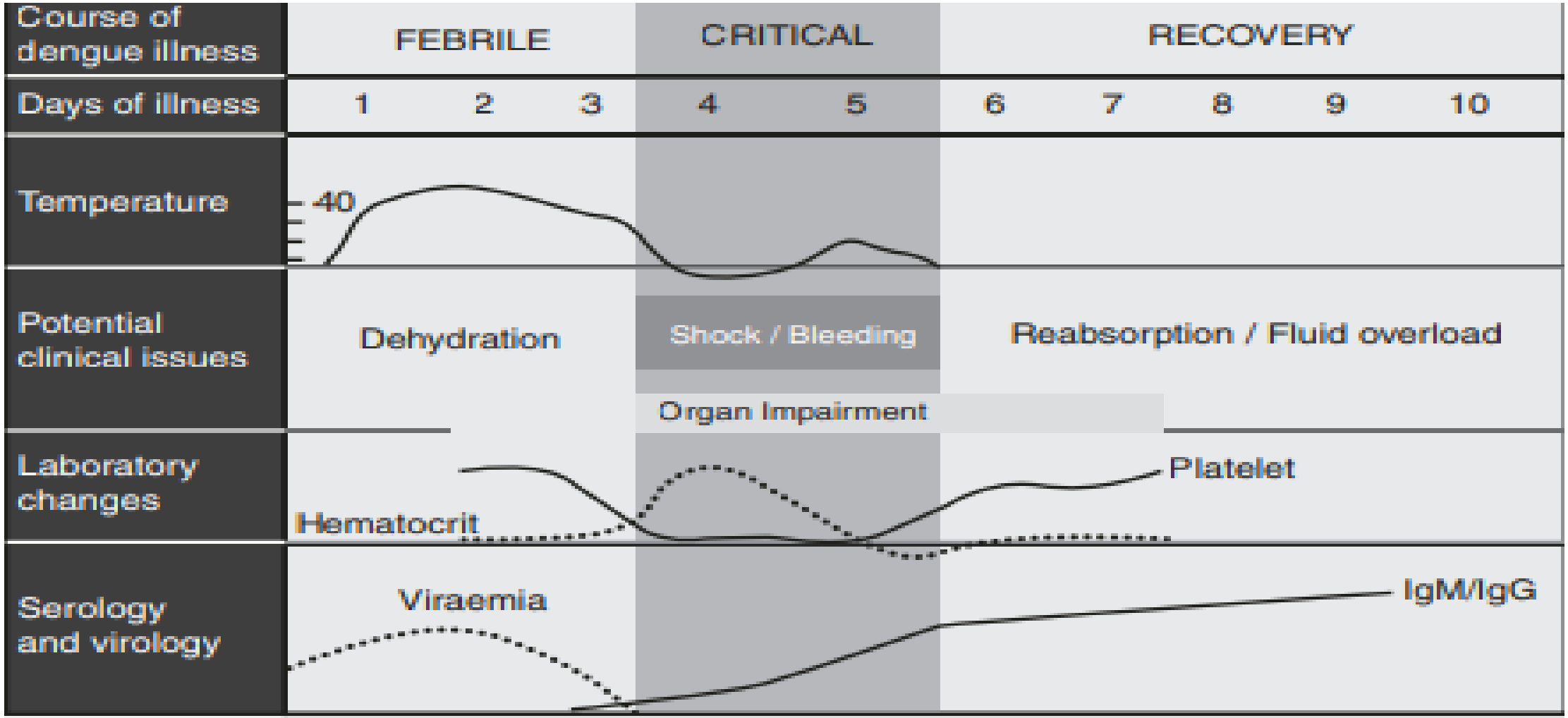
Question

Do you think dengue is a problem and can kill someone?

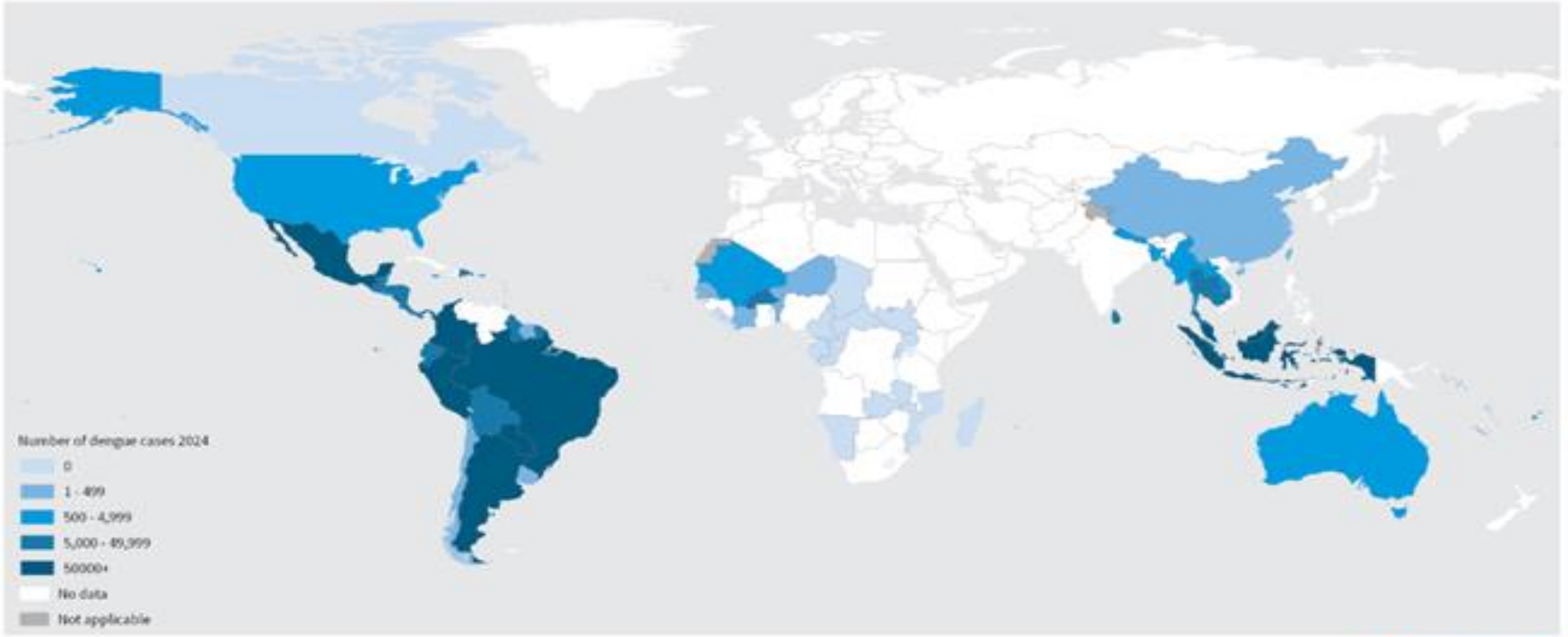
- Yes
- No

Recovery Phase

- If the patient survives critical phase, a gradual reabsorption of extravascular fluid in the next 48–72 h occurs.
- However, recovery depends on the severity of illness and treatments provided during febrile and critical phase


Course of dengue illness
FEBRILE
CRITICAL
RECOVERY
Days of illness
1
2
3
4
5
6
7
8
9
10
Temperature
40
Potential clinical issues
Dehydration
Shock / Bleeding
Reabsorption / Fluid overload
Organ Impairment
Laboratory changes
Hematocrit
Platelet
Serology and virology
Viraemia
IgM/IgG

Global Dengue Statistics



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Data Source: WHO
Map Production: World Health Emergencies
Map Date: 28 May 2024

0 1,500 3,000 KM

World Health Organization

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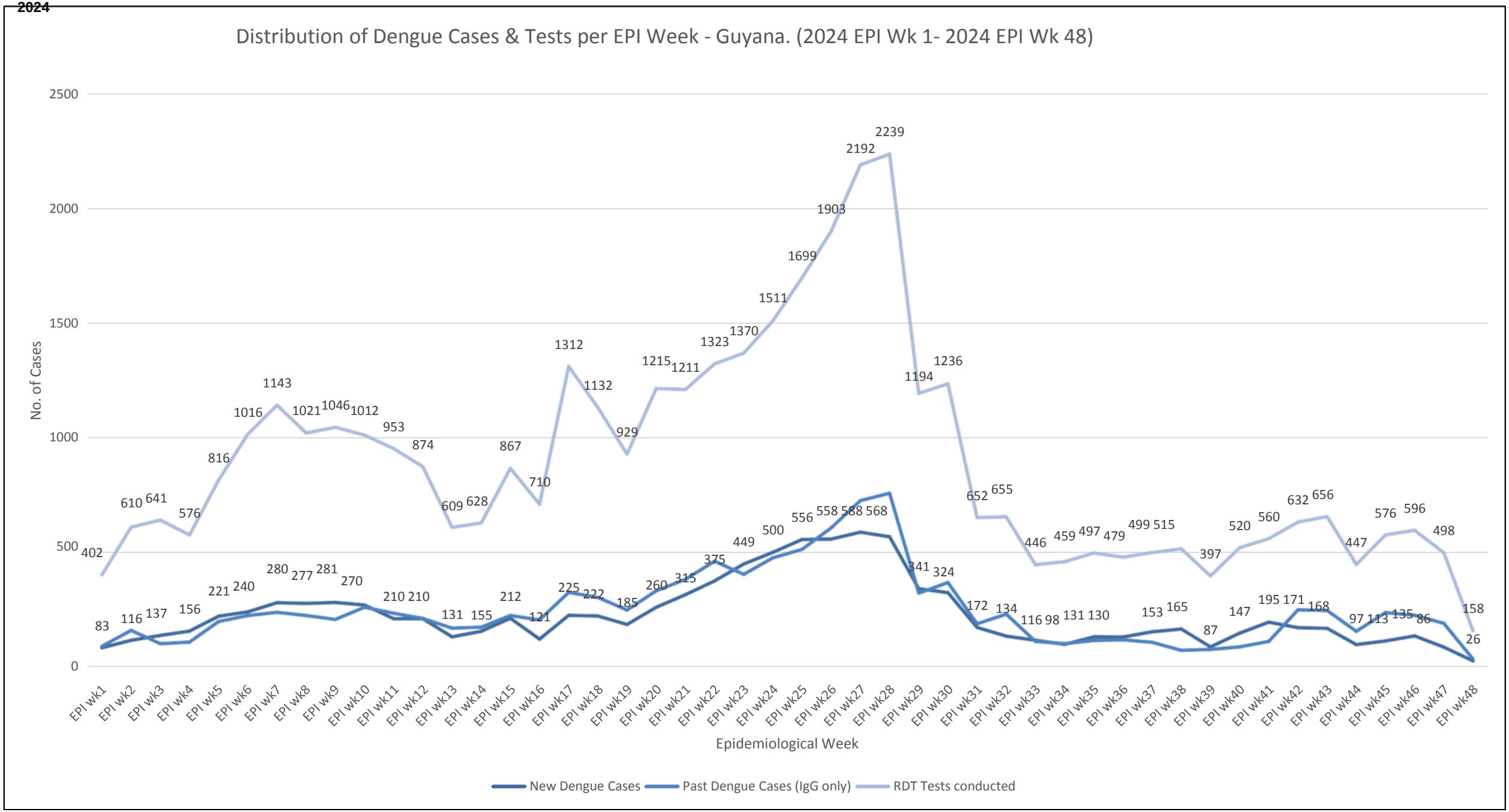
- As of 30 April 2024, over 7.6 million dengue cases have been reported to WHO in 2024
- Including 3.4 million confirmed cases, over 16 000 severe cases, and over 3000 deaths.
- While a substantial increase in dengue cases has been reported globally in the last five years, this increase has been particularly pronounced in the Region of the Americas
- Where the number of cases has already exceeded seven million by the end of April 2024, surpassing the annual high of 4.6 million cases in 2023.

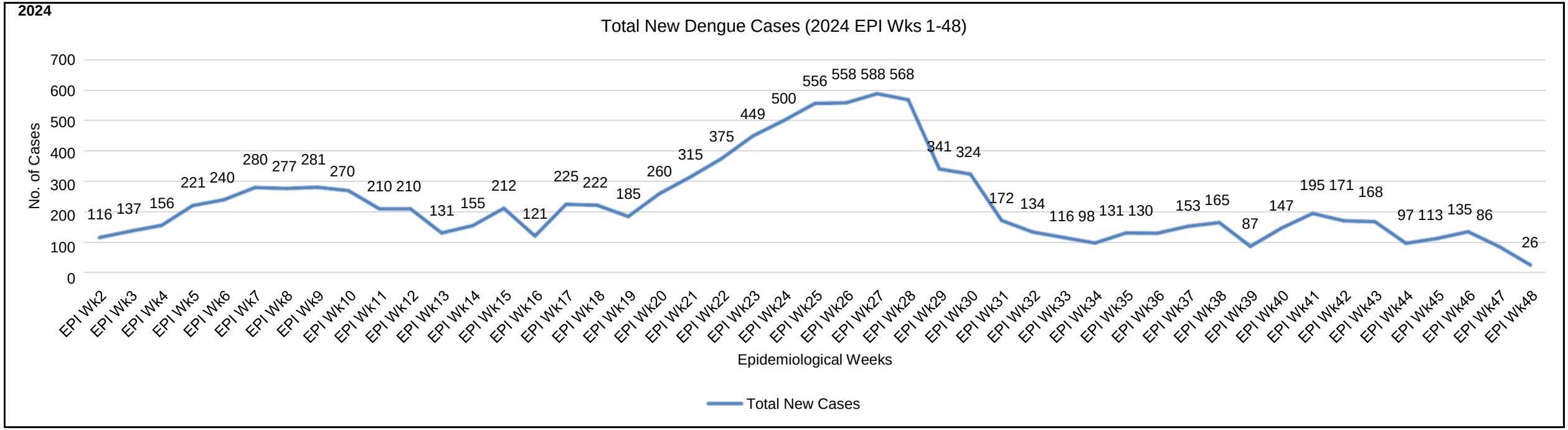
DENGUE EPIDEMIOLOGICAL UPDATE – 27 NOVEMBER 2024

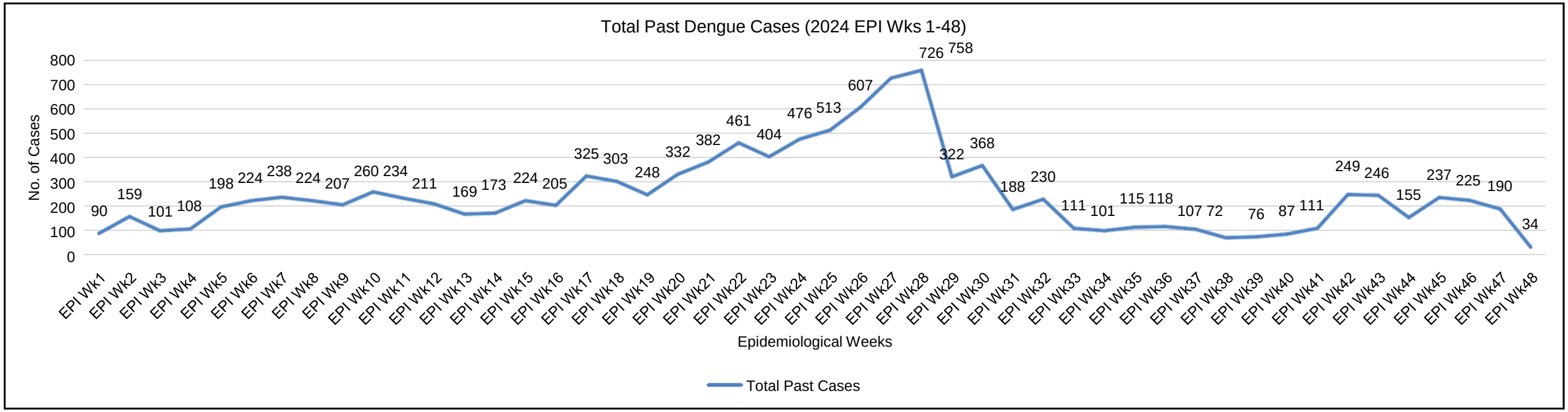
VARIABLE	TOTAL EPI WEEK 48 (24-30 NOV)	TOTAL PER YEAR (2024)
NEW DENGUE CASES	26	10891
PAST DENGUE CASES (IGG ONLY)	34	11903
RDT TESTS CONDUCTED	158	42435
HOSPITALIZED CASES	0	1123
POSITIVITY RATE	16%	26%
DENGUE DEATHS	0	7
CASE FATALITY	0	0.06%

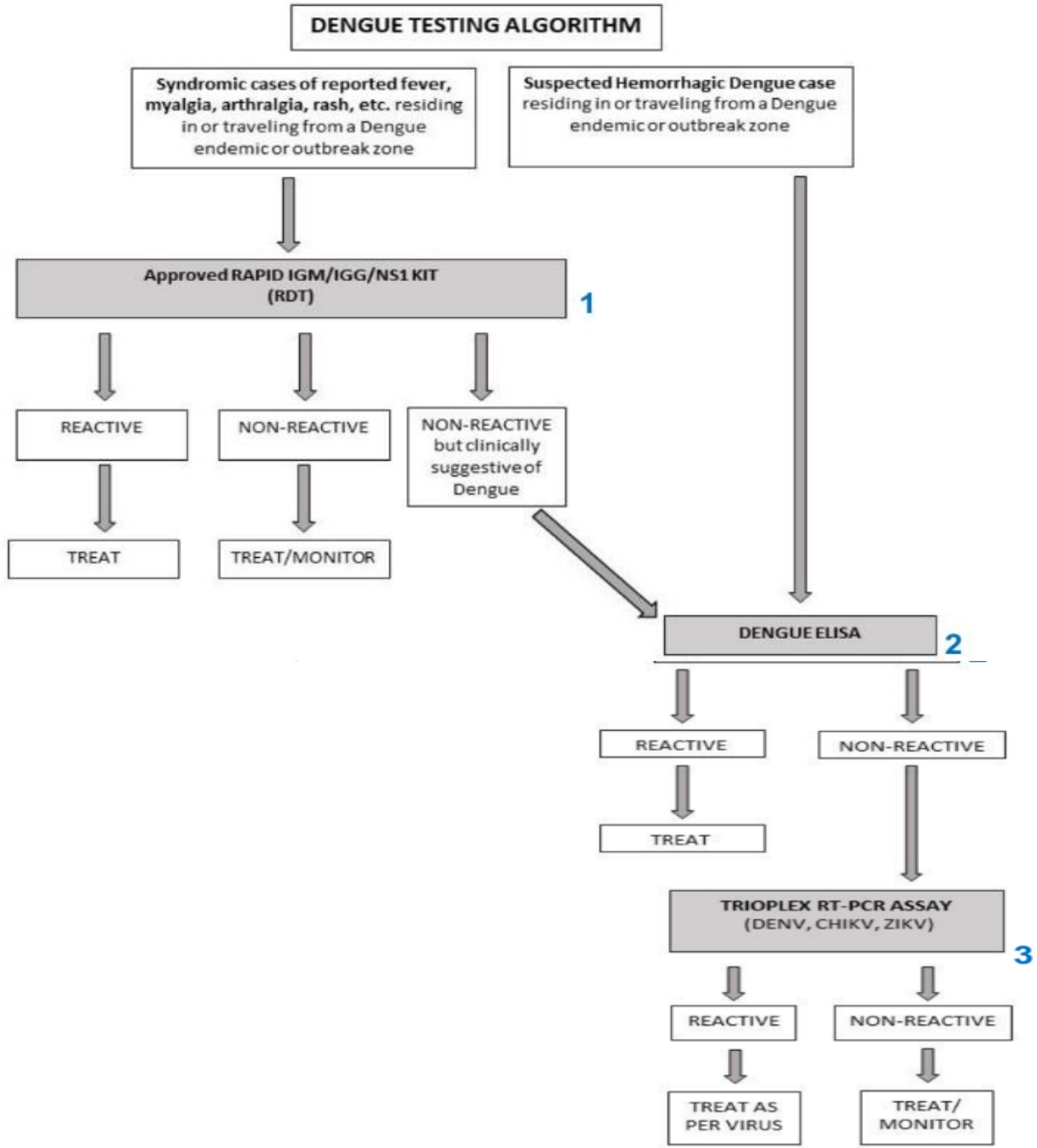
ADMINISTRATIVE REGION	HOTSPOTS (17-30 NOV)	NO. OF NEW CASES (17-30 NOV)
REGION 1	HOTSPOT NOT STATED	
REGION 2	AIRY HALL, BOUNTY HALL, CHARITY, COLUMBIA, RED LOCK	1
REGION 3	VREED-EN-HOOP	1
REGION 4	DIAMOND	2
REGION 5	BUSHLOT	3
REGION 6	HOTSPOT NOT STATED	9
REGION 7	HOTSPOT NOT STATED	3
REGION 8	PARAMAKATOI	6
REGION 9	LETHEM	3
REGION 10	CANVAS CITY, CHRISTENBURG, WISROC, WISMAR	1


Distribution of Dengue Cases & Tests per EPI Week - Guyana. (2024 EPI Wk 1- 2024 EPI Wk 48)
No. of Cases
Epidemiological Week
New Dengue Cases
Past Dengue Cases (IgG only)
RDT Tests conducted

DENGUE EPIDEMIOLOGICAL UPDATE – 27 NOVEMBER 2024



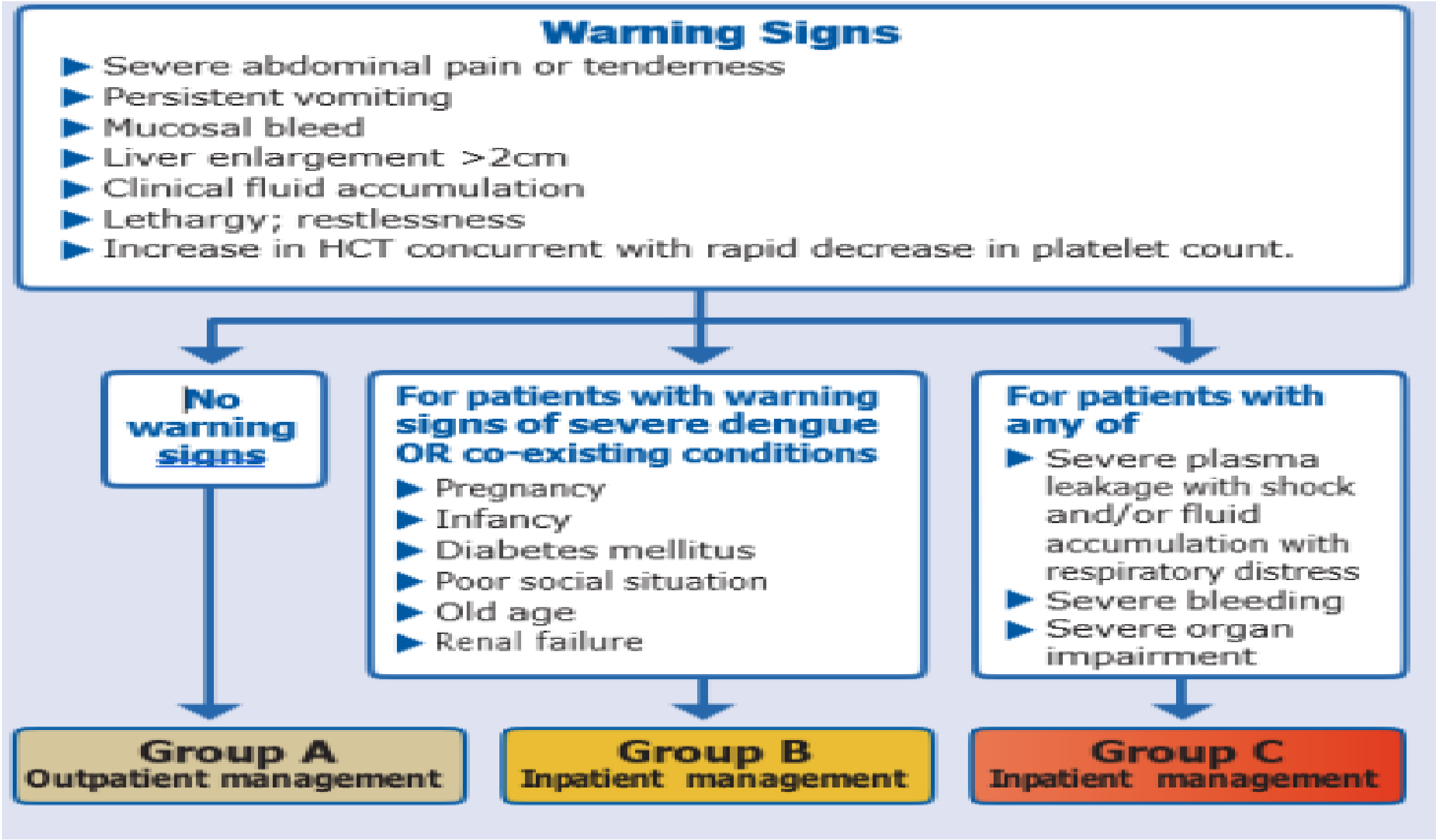



DENGUE TESTING ALGORITHM
Syndromic cases of reported fever, myalgia, arthralgia, rash, etc. residing in or traveling from a Dengue endemic or outbreak zone
Suspected Hemorrhagic Dengue case residing in or traveling from a Dengue endemic or outbreak zone
Approved RAPID IGM/IGG/NS1 KIT (RDT)
1
REACTIVE
NON-REACTIVE
NON-REACTIVE but clinically suggestive of Dengue
TREAT
TREAT/MONITOR
DENGUE ELISA
2
REACTIVE
NON-REACTIVE
TREAT
TRIOPLEX RT-PCR ASSAY (DENV, CHIKV, ZIKV)
3
REACTIVE
NON-REACTIVE
TREAT AS PER VIRUS
TREAT/ MONITOR

Question

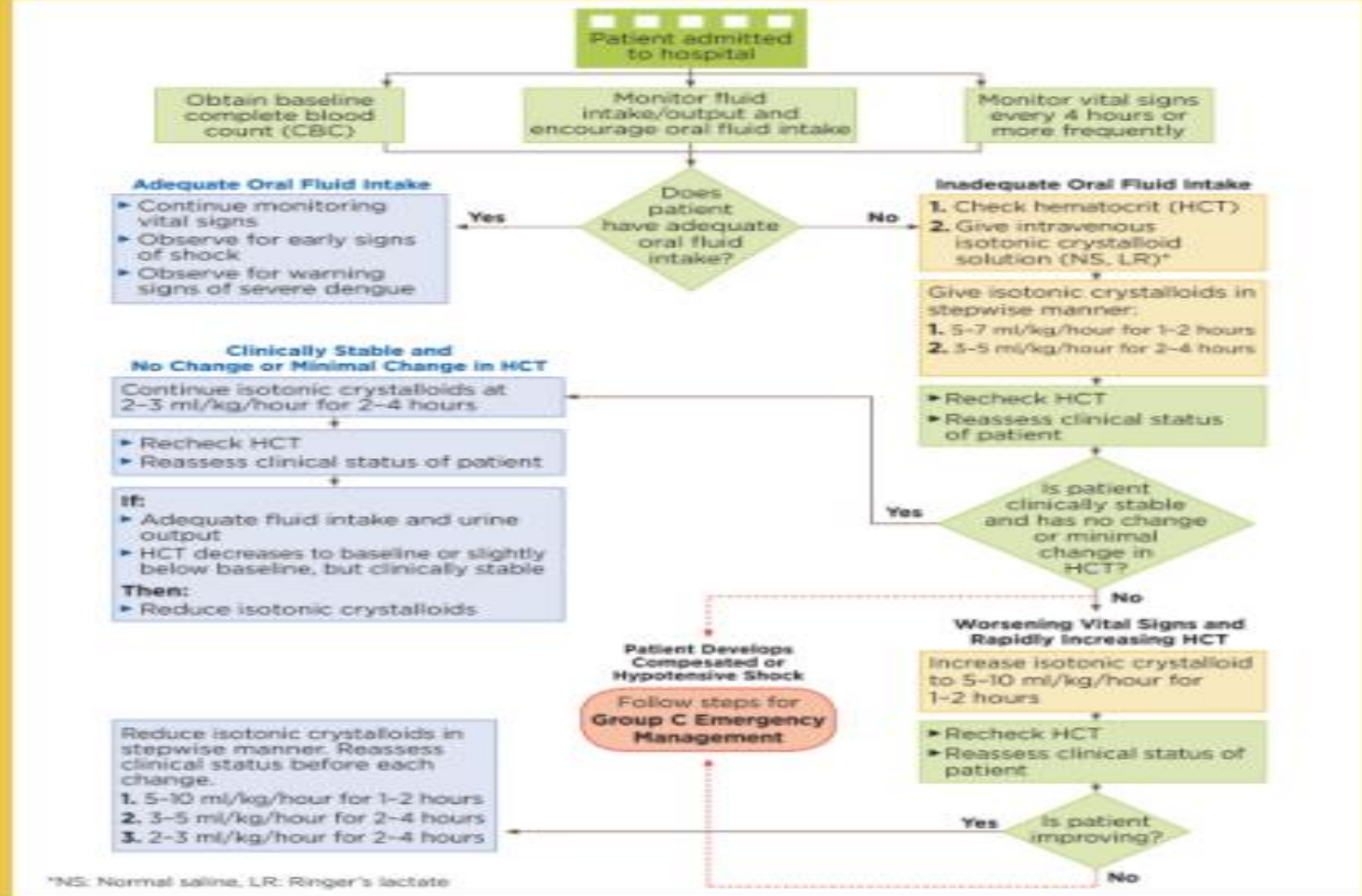
What would you do if someone test positive for dengue and is having intermittent bleeding from the gums?

- Send them home
- Explain that they should go to the hospital
- Tell them it's their choice


Warning Signs
Severe abdominal pain or tenderness
Persistent vomiting
Mucosal bleed
Liver enlargement >2cm
Clinical fluid accumulation
Lethargy; restlessness
Increase in HCT concurrent with rapid decrease in platelet count.
No warning signs
For patients with warning signs of severe dengue OR co-existing conditions
Pregnancy
Infancy
Diabetes mellitus
Poor social situation
Old age
Renal failure
For patients with any of
Severe plasma leakage with shock and/or fluid accumulation with respiratory distress
Severe bleeding
Severe organ impairment
Group A
Outpatient management
Group B
Inpatient management
Group C
Inpatient management

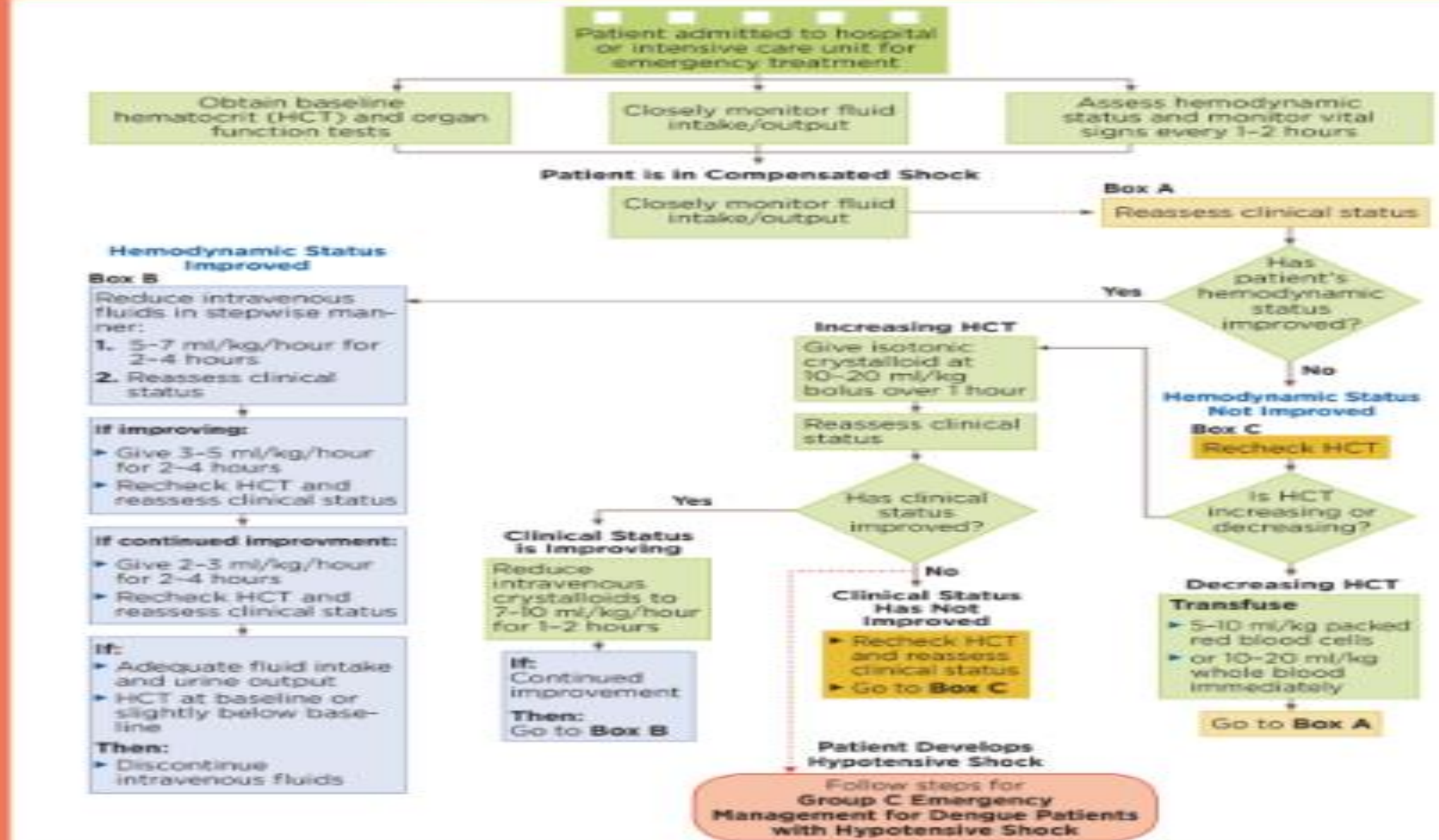
Group B — Inpatient Management for Dengue Patients with

Warning Signs

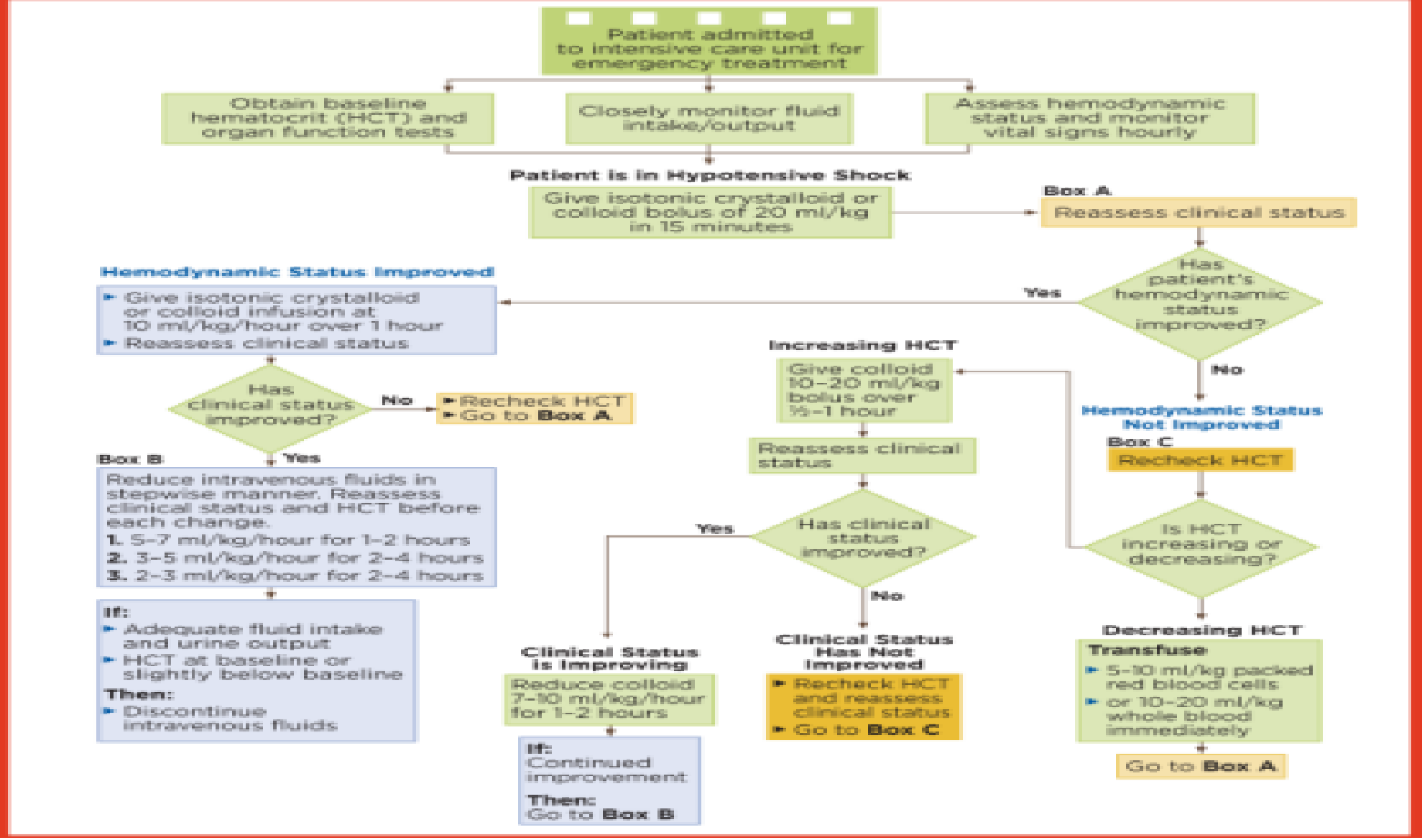


Group C — Emergency Management for Dengue Patients with

Compensated Shock



Group C — Emergency Management for Dengue Patients with Hypotensive Shock



Key Management Considerations

- Hydration, rest and Panadol as outpatient
- No NSAIDS !!!
- Inpatient; early IVF resuscitation
- No PLT transfusion only if Plt less than 10000 and or active bleeding
- NO antimicrobials unless high clinical suspicion and or confirmatory infection present
- Dengue is a virus …keep in mind

Importance of Surveillance

- Early detection of changes in disease pattern
- True reflection of the problem at hand
- Appropriate preparation and action to curb the problem and control the disease

THANK YOU