PSRH – Dengue fever

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Shaping Fiji's Health

Fiji Dengue Fever SITREP Volume 02,2017

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Surveillance ,FCCDC , MOHMS, Fiji

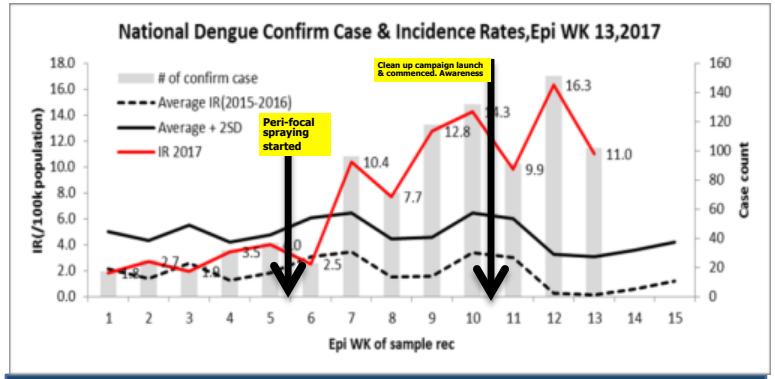
Overview

- The Dengue trend from Jan 01 to April 04 implies a continued increase in incidence rate despite the best efforts of the division to control the situation.
- Since the launch of the 4 weeks clean up campaign on 04 communities have been mobilized to dispose of their rubbish with the recent larval surveys generally indicating a reduction in the mosquito Breteaux Index.
- The laboratories around the country including the PH laboratory at Mataika House has been inundated with laboratory requests and is attempting to cope with the influx of requests.
- The interventions conducted following the National Fight the Bite campaigns include divisional and subdivisional clean up programs, peri focal spraying and awareness activities.

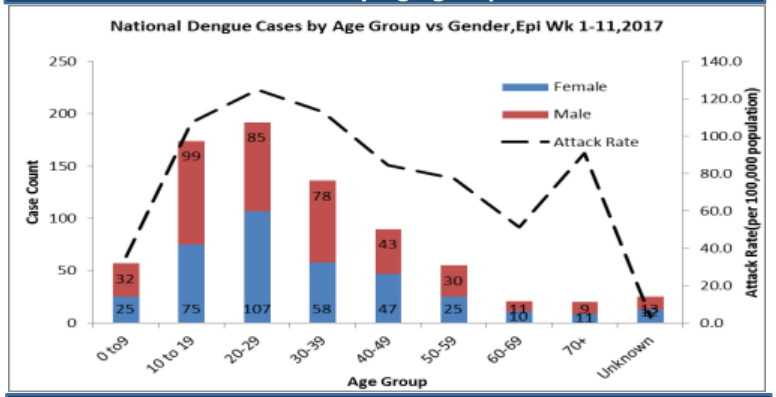
Dengue Surveillance

- The Early Warning DLI clinical syndrome has recorded 474 cases in Epiweek 13 as compared to 419 cases reported in Epi week 12, an increase of 55 cases.
- There are a total of 913 laboratory confirmed positive cases of dengue reported from Jan 01 to April 02 as compared to 278 cases for the same period last year.
- There is an average of 6 hospital admissions weekly with an average length of stay of 4 days being reported from CWMH with one reported dengue fatality from CWMH ICU in April this year.
- The trend in graph 1 depicts a steady increase above the average IR and 2 SD average IR from Epi week 6 to epiweeks 13.
- The trend in graph 2 depicts an increase in dengue cases reported in the 10-39 years age group, with more females being reported in the 10-29 years age group.

National Trend



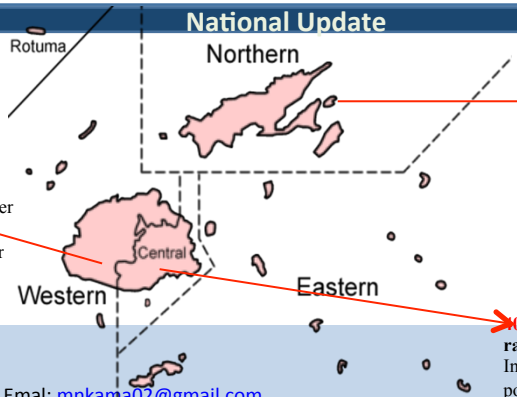
Cases by Age group



Lab Testing

- Dengue rapid testing is being conducted in the Divisional and Sub divisional hospitals.
- Reference dengue IgM ELISA testing and PCR is done at Public Health lab in Mataika House.
- A total of 16 samples from January to March this year was sent to ILM with the official report of Dengue serotype 2 in circulation.
- Currently a batch of dengue samples will be sent for serotyping.
- PH lab at Mataika house has been inundated with test requests for dengue and currently we have 1233 samples remaining to be tested from Epiweek 13 –16.

National Update



389 confirmed cases(positivity rate=26 %)
Incidence rate (2017) = 106.4 per 100,000 population
Incidence rate (2016) = 25.2 per 100,000 population

124 confirmed cases(positivity rate=5.87 %)
Incidence rate (2017) = 91.7 per 100,000 population
Incidence rate (2016) = 99.1 per 100,000 population

400 confirmed cases(positivity rate=38.6%)
Incidence rate (2017) = 104.2 per 100,000 population
Incidence rate (2016) = 13.5 per 100,000 population

Interventions

- **Clinical Interventions:**

The Dengue case definition wall charts, information sheets and Management guidelines (algorithms and pocket guides) have been distributed to the 4 divisions and all subdivisions hospitals around the country.

- **Public Health Interventions:**

Mosquito control involving peri focal chemical spraying against mosquitoes at high risk sites is ongoing and complements the clean-up campaigns
Risk communication messages on dengue fever have been scaled up and Interpersonal communication against dengue at the field level has also been intensified.
Inter-sectoral collaboration work on dengue control is ongoing

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2017 CWMH Antenatal dengue cases

Month	AVI			Confirmed dengue			comments
	IT	IF	O	IT	IF	O	
January	9	15	0	0	2	0	1 DHF
February	3	13	1	2	2		2DHF
March	10	4		4	4		2DHF
April	21	10		4	4		3DHF

Case

- 21 year old Primigravida Itaukei female at 40 weeks referred from health centre with pre-labour rupture of membranes and fever
- History of Presenting Compliant – unwell for 3 days .Initially had runny nose and cough then developed fever and body pains, severe joint pains.

- She noticed water running down her thighs 24 hours ago and ever since has soaked 3 pads with clear liquor. She denied any labour pains and fetal movements are normal.
- Due to the prolonged ruptured membrane she was referred for induction of labour with a suspicion of chorioamnionitis due to the spiking temperatures.
- Review of system - Nil urinary or bowel symptoms
- No significant obstetric and gyane history.

- She booked at 8 weeks. A+ve, VDRL, TPHA, Hbsag ,HIV negative.
- Low risk ANC
- At booking Hb 12 plt 253,000

- 2am.day 1-On Arrival to prep room, patient seen by O&G intern and discussed with senior registrar on call.
- Pulse -110 T-39 Bp 100/60
- CTG – fetal tachycardia.

- On examination she had no icterus, JVP normal, normal heart sounds, nil murmur, Longitudinal lie, cephalic presentation, non tender uterus.
- Speculum exam – pooling of clear liqour, nil foul smell, and cervix closed on inspection.

- Assessment – Acute viral Illness – clinically not chorioamnionitis. Rule out dengue, leptospriosis.

- On exam – non tender uterus, draining clear liquor. Nil bruises on extremities
- Bloods – HB -11.3 pcv 42 MCV -80 plt – 33,000
- Normal eGFr
-
- Assessment – clinically Dengue fever with complication – DSS/DHF
- Plan – IVF -500mls bolus, IDC to monitor urine output, Maintenance crystalloids 3L/24hrs
- Case co-managed with medical team.
- Family conference arranged on need for maternal stabilisation prior to delivery.

- Day 3 - Patient still spiking temperature – Hb 10.3 pcv 38 plts 18,000.
- Patient was transfused 4 plts and 4ffp.
- Early morning noted patient to have blood stained vaginal discharge. She was taken for 1st stage monitoring.
- Vaginal exam – 3cm dilated cx 1cm long , soft ,draining blood stained liquor.
-
- Team discussion on need for transfusion to optimise PLTs 6hours prior to delivery. However team consensus was to avoid transfusion unless bleeding manifestation.

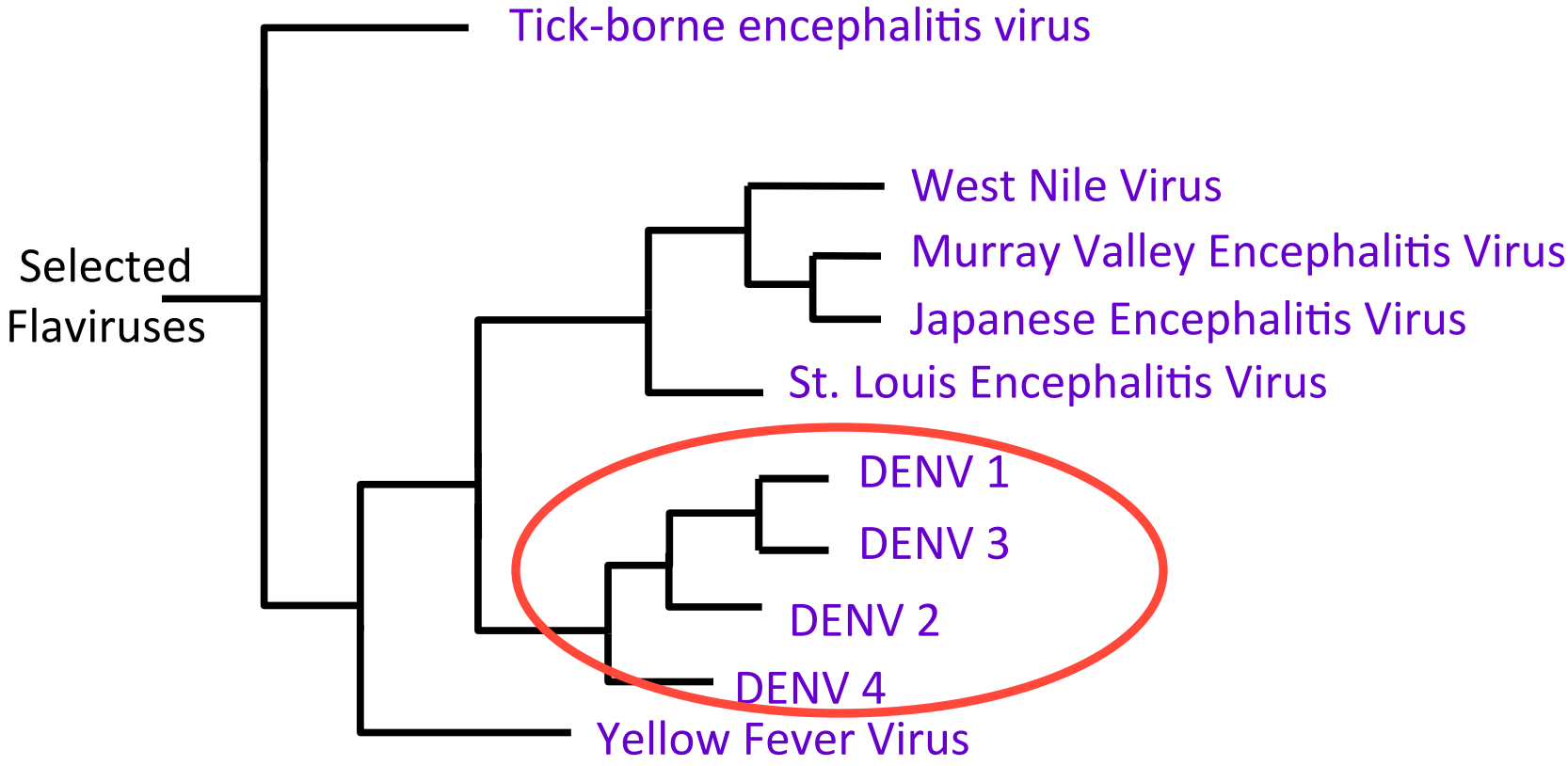
- 11am – patient was passing moderate meconium. Pt planned for EMCS.
- Hb -11.3 plts – 12,000.
- Issue – maternal stability was a key concern.
-
- However cesar was done under GA with no additional blood products transfused.
- Intra - op – 800mls blood loss.
- Uterus contracted – b-lynch not applied.
- PR misoprostol 800mcg for ongoing tone and 40 unit's oxytocin in 1 litre normal saline.
- Post op- noted bleeding from skin incision site.
- Baby well, managed by paeds.
- Mum transferred to ICU for intensive monitoring.
- Ongoing family conference.

- 6 hours post op
- Patient well.
- Pulse -120 BP -120/80 urine output 100mls/hr.
- Patient transfused 2PRBC 2plts 2ffp as pt had bleed 2oomls in paru after peri-toilet.
-
- 12 hours post op
- Vitals remained same.
- Uterus contracted. Lochia minimal. Dressing dry.
- Patient on soft diet. Visited by husband and other family.
- Bloods –Hb 9 g/dl plts – 22,000 coags –pt 12/12 PTTK 26 / 58
-
- 24 hours post –op patients vitals remained stable.

- 30 hours post partum
- Patients linen changed 3 x , fully soaked with blood. Bulky uterus. Managed with uterotonics.
- Patient continued to bleed – hb 6 g/dl plts 50,000 despite transfusing 6 PRBC 4FFP 4plts 4 cryoprecipitate.
- Patient given 1 gram transnemic acid over 10 minutes.
-
- Patient continued to bleed .
-
- Massive transfusion protocol initiated and planned for an emergency hysterectomy at 2am.
- Hysterectomy done – EBL -300mls intra op with 300 mls hemoperitonium. No pelvic or abdominal hematoma.
- Drain put in POD.
- Closed in layers tightly.
- Patient resuscitated in ICU.
- Received a total of 55 blood products by day 4.
- On day 4 – wound dry,Hb 10 plts 60,000.
- Patient recovered 2 weeks

Dengue Virus (DENV)

- Single stranded RNA viruses
- Members of Flavivirus family



Dengue Virus

- Four serotypes (really species): DENV-1, -2, -3, -4
  - All cause full spectrum of disease
  - Infection confers lifelong serotype-specific immunity
    - Short-term cross-immunity
- Genetic variation within serotypes
  - Some genetic variants thought to be more virulent
- Dengue virus causes an acute febrile illness (called *dengue*)

Dengue in the Pacific*

- First reported before the 1950's in American Samoa, Cook Islands, Fiji, French Polynesia, Guam, Kiribati, New Caledonia, PNG, Solomon Islands, Tonga, Tuvalu and Vanuatu
- Between 1950 & 1970, 2 major outbreaks were reported in FP in 1964 and 1969
- Dengue activity in PICTS increased in the 1970's [DEN 2; 1974-1976 – DEN 1
- 1980's DEN 4 was prevalent; 1990's DEN 3
- 2000-2004 DEN 1

*Singh et.al https://www.spc.int/phs/pphsn/Publications/PHDSurveillance/Surveillance-pages111-119.pdf

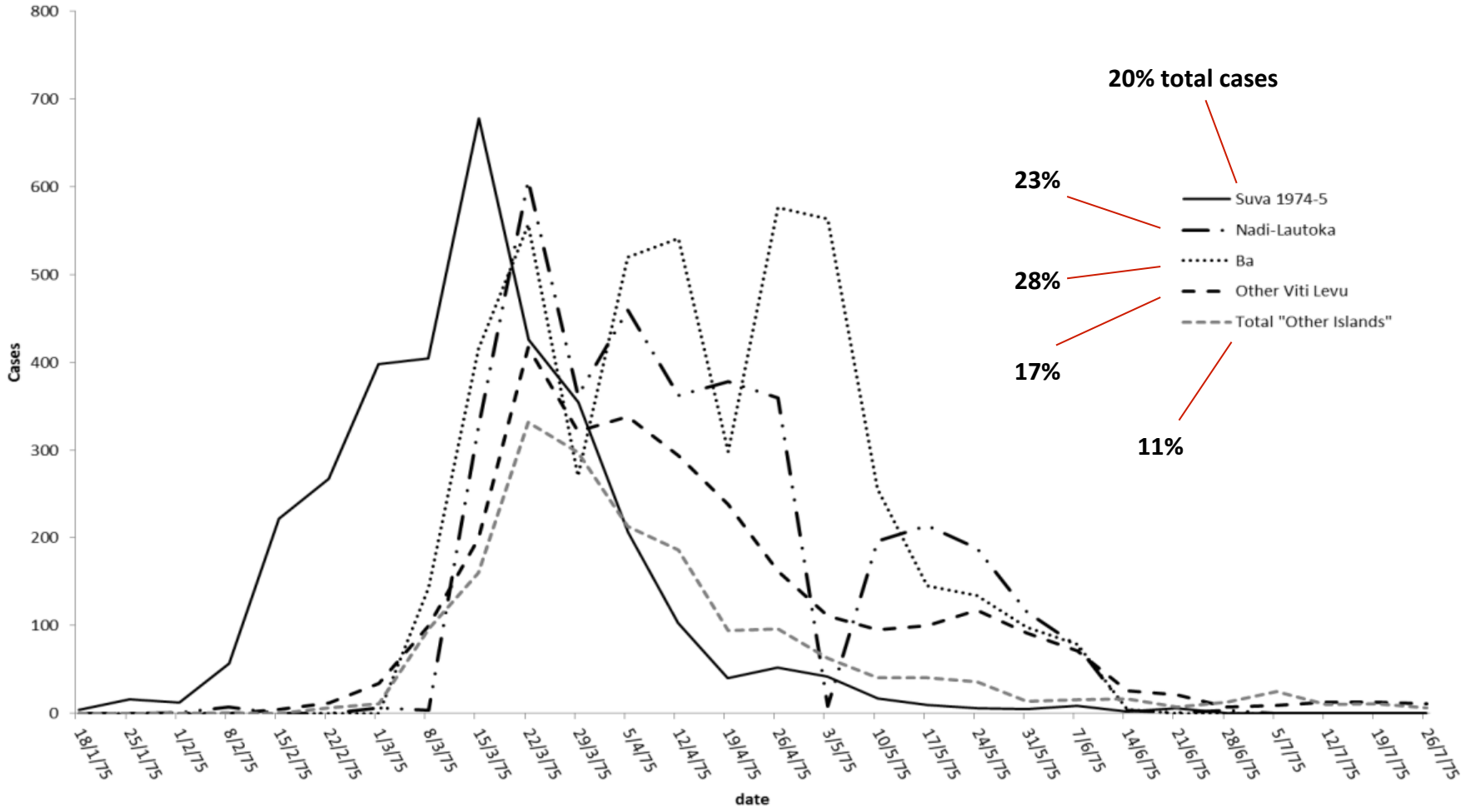
Dengue in Fiji*

- Dengue has a seasonal trend normally increases or outbreaks are noted from end of January to end of May. There have been outbreaks that have lasted longer than this seasonality and presented after this period.

- Reportable by law – the Public Health Act Cap.111 under the Notifiable Diseases Schedule

- NNDSS is a passive surveillance system and should guide prevention and control, however, there is poor reporting by clinicians leading to a failure of the surveillance in this outbreak

1975 dengue outbreak – Fiji (n=16,203)



Transmission of Dengue Virus

- *Aedes aegypti* is most common dengue vector, but also other Aedes species (6 in Fiji)
  - Lives around human habitation; rests in dark areas
  - Primarily a daytime feeder; bites indoors
  - Lays eggs preferentially in artificial, water-holding containers; also empty coconut shells, etc

Breeding sites: plants, pools, water-filled buckets, used tires, empty oil drums, water storage containers etc.

Other Routes of Transmission

- Transmission of dengue documented via receipt of blood products (RBC transfusion)[2,3,4]
- Dengue virus can be transmitted from mother to the fetus *in utero* or to neonate at birth*
- Rates of vertical transmission vary and may depend on severity of maternal infection*

[2] Chuang et al. Review of dengue fever cases in Hong Kong during 1998 to 2005. Hong Kong Med J 2008;14:170-177.
[3] Tambyah et al.Dengue hemorrhagic fever transmitted by blood transfusion. N Engl J Med 2008;359:1526-1527.
[4] Mohammed, H. et al. Dengue Virus in Blood Donations, Puerto Rico, 2005. Transfusion 2008; 48:1348-1354.
* Pouliot S.H., et. al. Maternal dengue and pregnancy outcomes: a systematic review. Obstetr Gynecol Survey 2010.

Vertical transmission

- Newborn baby can develop symptoms immediately after birth or up to 1-2 weeks later
- Most cases have fever plus thrombocytopenia and hepatomegaly.
  - Hemorrhagic manifestation: 50%
  - Pleural effusion and/or rash: 25%
- Both cesarean and natural birth

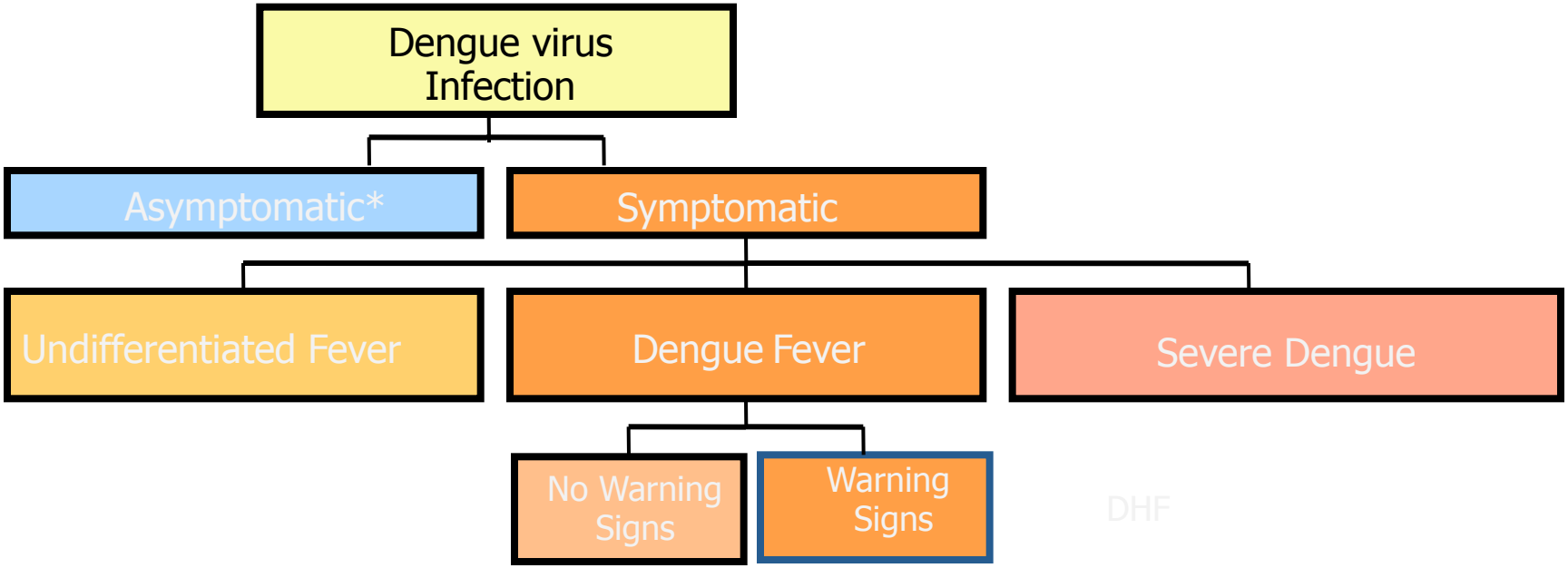
* Pouliot S.H., et. al. Maternal dengue and pregnancy outcomes: a systematic review. Obstetr Gynecol Survey 2010.

Case Definition*

- An acute febrile illness of 2-7 days duration with 2 or more of the following:
  - ✓Headache
  - ✓Retro-orbital pain
  - ✓Myalgia
  - ✓Arthralgia
  - ✓Rash
  - ✓Hemorrhagic manifestations

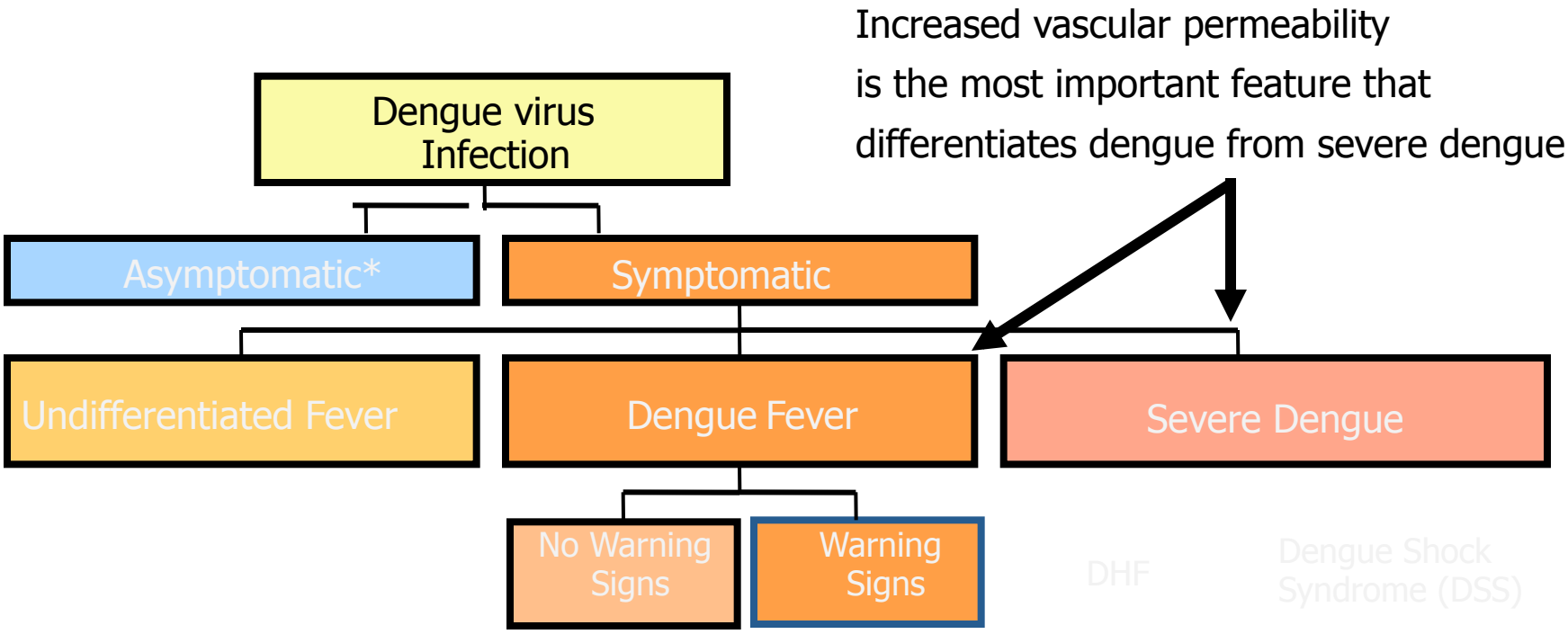
* case definition adapted from Fiji CD Surveillance and Outbreak guidelines

Dengue – Clinical Spectrum



*Modified from Rodriguez L et al. Am J Trop Med Hyg 1995; 52(6):496; Endy TP et al. Am J Epid 2002; 156:40, Burke DS et al. Am J Trop Med Hyg 1988; 38:172

Dengue – Clinical Spectrum



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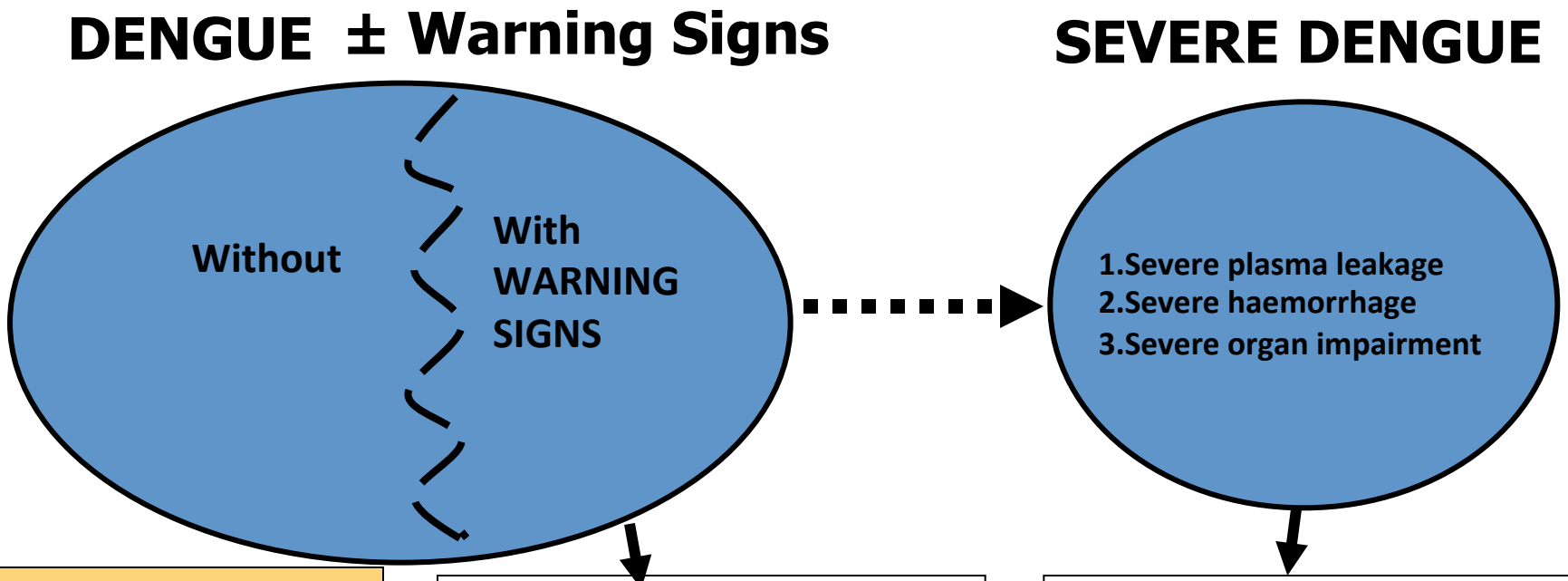
Dengue – Clinical Spectrum

- **Asymptomatic dengue**
  - **Up to 53-89% of all infections in some studies**
- **Symptomatic dengue**
  - **Classic dengue fever (DF) defined as fever plus 2 of:**
    - Aches pains
    - Nausea, vomiting
    - Rash
    - Tourniquet test +ve
    - Leucopenia
    - Any warning sign
  - Any warning sign
    - Persistent vomiting
    - Abdominal pain
    - Lethargy
    - Mucosal bleed
    - Liver enlargement
    - Clinical fluid accumulation
    - Hi HCT + Low PLT

Revised Dengue Classification



Suspected **Dengue**
ever and 2 of the following criteria:
- Aches pains
- Nausea, vomiting
- Rash
- Aches and pains
- Tourniquet test +ve
- Leucopenia
- Any warning sign

Warning Signs*
- Abdominal pain or tenderness
- Persistent vomiting
- Clinical fluid accumulation
- Mucosal bleed
- Lethargy; restlessness
- Liver enlargement >2cm
- *Laboratory:* Increase in HCT concurrent with rapid decrease in platelet count

1. Severe plasma leakage leading to
- Shock. Fluid accumulation with respiratory distress

2. Severe bleeding
as evaluated by clinician

3. Severe organ involvement
- *Liver:* AST or ALT>=1000
- *CNS:* Impaired consciousness
- *Heart and other organs*

Clinical Course of Dengue

- After a 2 week incubation period, the illness begins abruptly and will be followed by 3 phases:
  - Febrile phase
  - Critical phase
  - Recovery phase

Febrile Phase

- Fever last 2 – 7 days
- Around the time of defervescence, patients can either improve or deteriorate.
- Monitoring for defervescence & warning signs are crucial to recognise progression to critical phase.

* Defined as when body temperature drops to less than 38.0°C, and remains below this level.

Critical Phase

Onset of critical phase usually can be identified by:

- Defervescence
- Drop in platelet count with rise in hematocrit

Warning Signs

- Severe abdominal pain
- Persistent vomiting
- Clinical fluid accumulation (ascites, pleural effusion)
- Mucosal bleed
- Lethargy; restlessness
- Liver enlargement >2cm

Critical Phase

- May deteriorate to severe dengue during this phase[1]
- Warning signs are result of plasma leakage due to vascular permeability
- Clinically significant plasma leakage usually lasts 24 to 48 hours from time of defervescence [1,2]
- Must monitor carefully for resolution of plasma leak and start of recovery phase to avoid fluid overload[1]

[1]Dengue guidelines for diagnosis, treatment, prevention and control. 3rd edition. Geneva; WHO. 2009.

[2]Farrar J , in Dengue :Tropical Medicine: Science and Practice (Halstead S, ed.), Imperial College Press, 2008.

Recovery Phase

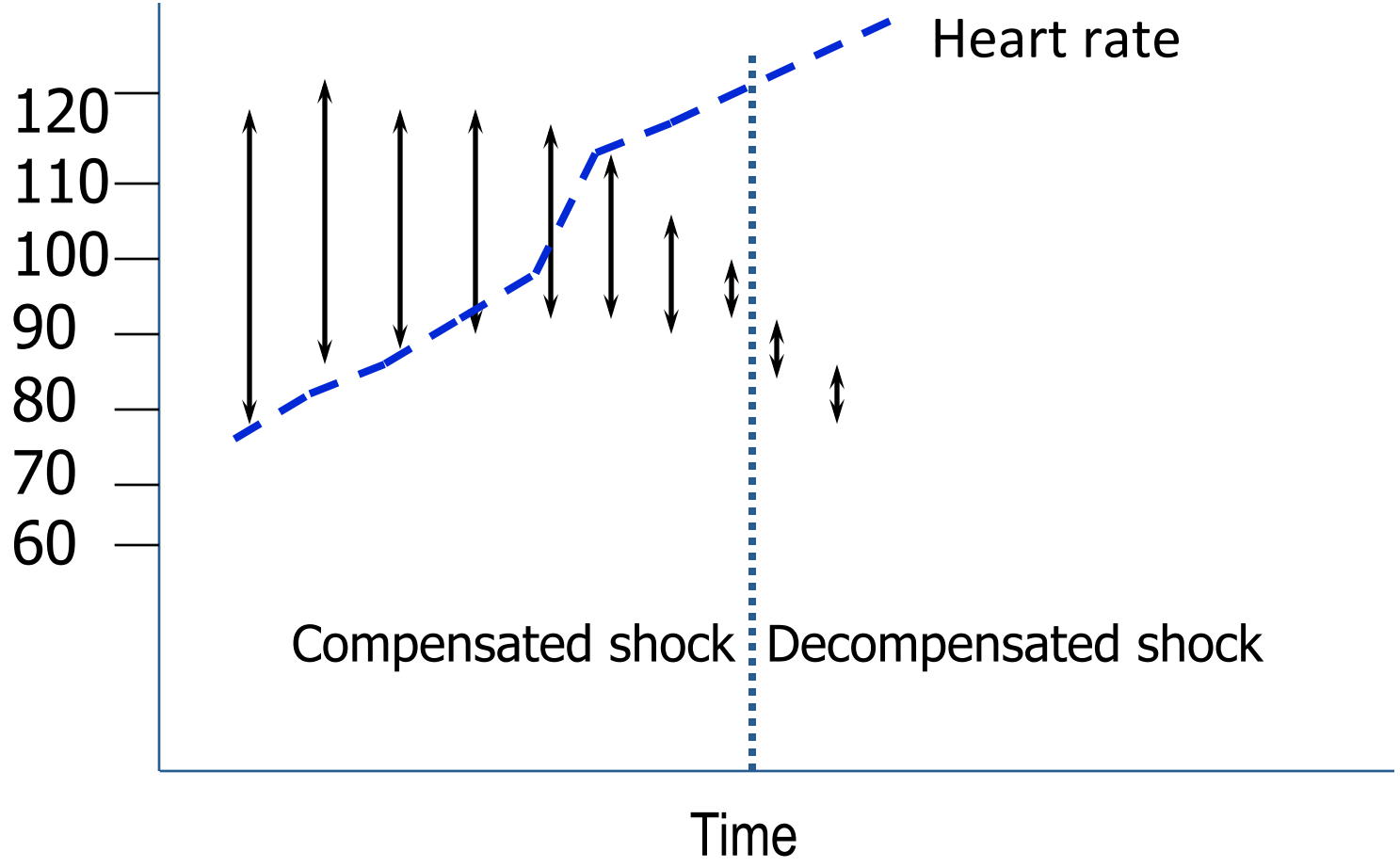
- Gradual re-absorption of extravascular fluid takes place in 48–72 hours.
- General well being improves, hemodynamic status stabilises and diuresis ensues.
- Laboratory
  - HCT stabilises or may decrease due to dilutional effect
  - WBC usually starts to rise soon after defervescence.
  - Recovery of platelet count is typically later than WBC.

Causes of Death in Dengue

- Unrecognized disease
- Unrecognized shock or prolonged shock
- Unrecognized occult hemorrhage
- Fluid overload

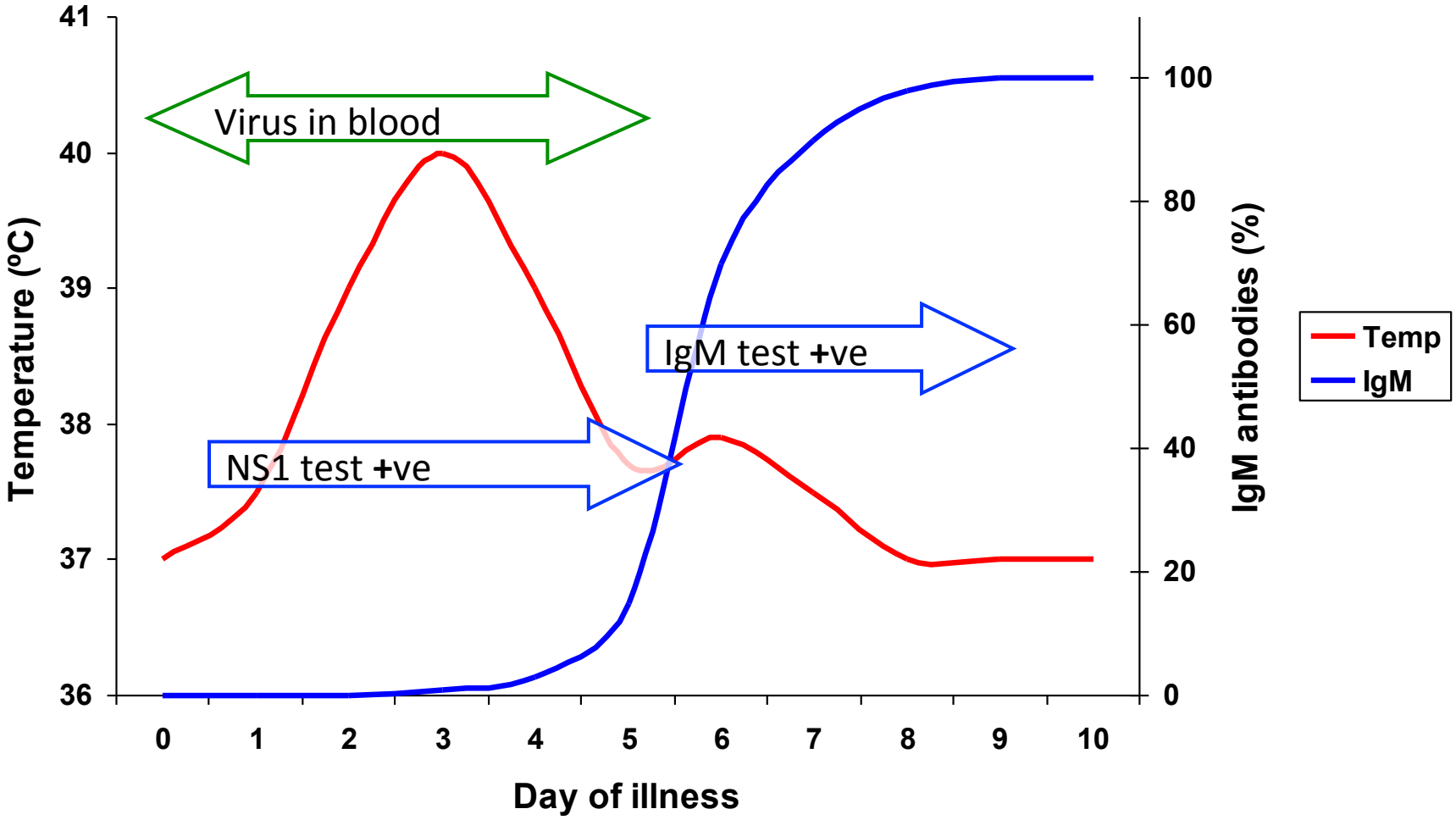
Blood Pressure, Pulse Pressure, Heart Rate In Hypovolemic Shock

Important to identify early signs of shock including narrowing pulse pressure with rising diastolic, delayed capillary refill and tachycardia in absence of fever



Lucy Lum Slide

Primary dengue infection



Specimen Diagnosis

- **Positive:**
  - NS1 [Day 1 – day 5]
  - IgM antibody

- **Dengue DuoCassette – IgM / IgG**
  - IgM from Day 5 onwards (upto 2 weeks)
  - IgG – prolonged

- **Negative:**
  - No NS1 or IgM antibody


Demonstrating the RDT

- **Specimen testing at WHO CC in Brisbane**

Dengue in pregnancy

- Clinical manifestation , treatment and outcome similar to non-pregnant women
- Misdiagnosis/delay – similar clinical and laboratory features with more common obstetric emergencies and infections

- ***IMPACT*** –

*Vertical transmission

*Increased morbidity during labour – critical phase

*PET , Preterm labour, lbwt ,Ceasarian delivery

Dengue in pregnancy

Challenges:

- Recognition of dengue and plasma leakage
- Monitoring and management
- severe disease
- Neonatal complication

- Management of delivery in critical phase
- Preparation of blood products
- Avoiding trauma , complete placenta
- PPH care

Dengue in pregnancy

Management of significant bleeding —

- Gastrointestinal bleeding, epistaxis, or menorrhagia in patients with DHF (and occasionally in patients with dengue fever) can be severe enough to require blood transfusion.

- Significant internal bleeding should be suspected in patients with signs of intravascular hypovolemia without elevation of hematocrit.

- In these circumstances, blood replacement should be performed with 5mL/kg of packed red blood cells (or 10 mL/kg whole blood).

- Factors that contribute to bleeding include thrombocytopenia due to decreased platelet

- In severe cases, frank disseminated intravascular coagulation.

- Platelet transfusions have not been shown to be effective at preventing or controlling hemorrhage but may be warranted in patients with severe thrombocytopenia

- OTHERS

1. NSAIDs
2. IV FLUIDs – Normal Saline 0.9%
3. Transfusion Trigger
4. Obstetric Indication for Operative delivery
5. TOP

THANK YOU - QUESTIONS ?