Dengue

By: Dr. Maria Nicolette Mariano-Alabado
Outline

• Background
• Epidemiology
• Etiologic agent
• Mode of transmission
• Clinical signs/symptoms
• Supportive management
• Prevention & Control
Background

• Dengue is the fastest spreading vector-borne disease in the world endemic in 100 countries.
• Dengue virus has four serotypes (DENV1, DENV2, DENV3 and DENV4).
• First infection with one of the four serotypes usually is non-severe or asymptomatic, while second infection with one of other serotypes may cause severe dengue.
• Dengue has no treatment but the disease can be early managed.
• The five year average cases of dengue is 185,008; five year average deaths is 732; and five year average Case Fatality Rate is 0.39 (2012-2016 data).
Epidemiology

• Dengue is the most rapidly spreading mosquito-borne viral disease in the world.

• In the last 50 years, incidence has increased 30-fold with increasing geographic expansion to new countries and, in the present decade, from urban to rural settings.

• An estimated 50 million dengue infections occur annually and approximately 2.5 billion people live in dengue endemic countries.

• Some 1.8 billion (more than 70%) of the population at risk for dengue worldwide live in member states of the WHO South-East Asia Region and Western Pacific Region, which bear nearly 75% of the current global disease burden due to dengue.
Figure 1.1 Countries/areas at risk of dengue transmission, 2008

The contour lines of the January and July isotherms indicate the potential geographical limits of the northern and southern hemispheres for year-round survival of Aedes aegypti, the principal mosquito vector of dengue viruses.

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines or maps represent approximate border lines for which there may not yet be final agreement.

Data Source: World Health Organization Map
Production: Public Health Information and Geographic Information Systems (GIS) World Health Organization

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Figure 1.2 Average annual number of dengue fever (DF) and dengue haemorrhagic fever (DHF) cases reported to WHO, and of countries reporting dengue, 1955–2007.
Highlights

- 371,717 dengue cases, including 1,407 deaths, reported from 1 January to 19 October 2019: 106% higher than in 2018.
- 5,927 newly reported dengue cases and 20 deaths between 13 and 19 October, decreased from 6,561 cases in the preceding week, and 23% lower than in the same epidemiological week in 2018.
- Weekly Case Fatality Rate (CFR) of 0.34% in epidemiological week 42 (13-19 October 2019) is lower than in same period in 2018 (0.52%). Accumulative CFR of 0.38% is also lower than in 2018 (0.51%)
- A National Dengue Epidemic was declared on 6 August 2019.
- 12 out of 17 regions exceed either the alert or the epidemic threshold
Current Situation

Between 1 January and 19 October 2019, 371,717 dengue cases including 1,407 deaths were reported through the DOH routine surveillance system, with a CFR of 0.38%.

Since the beginning of the outbreak, children aged 5-9 years have consistently been the most affected age group among dengue cases (23%) and deaths (38%). Similarly, the majority of dengue cases are consistently male (56%), and the majority of dengue deaths are female (54%).

Between 13 and 19 October, 5,927 cases and 20 deaths were reported, compared to 6,561 cases and 14 deaths in the preceding week, and 23% lower than in 2018. Similarly, the weekly CFR of 0.34% in epidemiological week 42 is lower than in the same time period in 2018 (0.52%) (Figure 2).

Please note that weekly cases are subject to change after inclusion of delayed reports.
Figure 3: Annual total dengue cases and deaths in the Philippines 2008-2019*

* Until 19 October 2019
A total of 271,480 Dengue cases were reported nationwide from January 1 to August 31. This is 95% higher compared to the same period last year (85,981). Figure 1 shows weekly data of reported dengue cases in 2019 compared to alert and epidemic thresholds.
Table 1. Reported Dengue Cases by Region
Philippines, January 1 – August 31, 2019 vs January 1 – August 31, 2018

<table>
<thead>
<tr>
<th>Region</th>
<th>2019</th>
<th></th>
<th>2018</th>
<th></th>
<th>% Change of Reported Cases</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Cases</td>
<td>Deaths</td>
<td>Cases</td>
<td>Deaths</td>
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<tr>
<td>PHILIPPINES</td>
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<td>1,107</td>
<td>127,478</td>
<td>655</td>
<td>113</td>
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<tr>
<td>I</td>
<td>10,892</td>
<td>25</td>
<td>9,988</td>
<td>38</td>
<td>9</td>
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<tr>
<td>II</td>
<td>10,982</td>
<td>59</td>
<td>6,701</td>
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<td>64</td>
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<tr>
<td>III</td>
<td>19,088</td>
<td>55</td>
<td>19,307</td>
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<td>1</td>
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<tr>
<td>IVA-CALABARZON</td>
<td>39,810</td>
<td>124</td>
<td>16,005</td>
<td>92</td>
<td>149</td>
</tr>
<tr>
<td>IV-B MIMAROPA</td>
<td>7,272</td>
<td>19</td>
<td>4,781</td>
<td>36</td>
<td>53</td>
</tr>
<tr>
<td>V</td>
<td>6,976</td>
<td>52</td>
<td>2,033</td>
<td>23</td>
<td>243</td>
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<tr>
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<td>45,345</td>
<td>201</td>
<td>9,551</td>
<td>67</td>
<td>375</td>
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<tr>
<td>VII</td>
<td>16,338</td>
<td>97</td>
<td>7,584</td>
<td>39</td>
<td>115</td>
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<tr>
<td>VIII</td>
<td>18,107</td>
<td>52</td>
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<tr>
<td>IX</td>
<td>18,505</td>
<td>94</td>
<td>3,493</td>
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<tr>
<td>X</td>
<td>19,925</td>
<td>76</td>
<td>11,223</td>
<td>71</td>
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</tr>
<tr>
<td>XI</td>
<td>5,975</td>
<td>31</td>
<td>3,371</td>
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<tr>
<td>XII</td>
<td>16,956</td>
<td>67</td>
<td>5,383</td>
<td>26</td>
<td>215</td>
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<td>3,456</td>
<td>26</td>
<td>1,601</td>
<td>18</td>
<td>116</td>
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<td>17</td>
<td>4,332</td>
<td>7</td>
<td>22</td>
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<td>Caraga</td>
<td>8,445</td>
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<td>3,450</td>
<td>13</td>
<td>145</td>
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<tr>
<td>NCR</td>
<td>18,136</td>
<td>93</td>
<td>14,476</td>
<td>77</td>
<td>25</td>
</tr>
</tbody>
</table>

Table 1 shows that majority of the cases were from the following regions: Region VI (45,436 or 17%), Region IV-A (39,810 or 15%), Region X (19,925 or 7%), Region III (19,088 or 7%) and NCR (18,136 or 7%).

The regions with the highest percent increase in the number of reported cases for this year compared to last year were: Region IX (430%), Region VI (375%), Region VIII (329%), Region V (243%), and Region XII (215%).

Profile of Cases

Age of suspect cases ranged from less than 1 month to 100 years (median age of 12 years). Majority of the cases (142,190 or 52%) were male. Most of the cases belonged to the 5-9 years age group (61,530 or 23%) (Figure 3).

Figure 3. Reported Dengue Cases by Age Group and Sex (N=271,480)
Philippines, January 1 – August 31, 2019
The predominant serotype from January 1 to August 31 is DENV3 (481 cases or 67%) followed by DENV 1 (122 cases or 17%), DENV 2 (97 cases or 14%), DENV 4 (11 cases or 2%) and mixed serotype (3 case or 0.4%). Majority of the confirmed Dengue cases were from the following regions: Region IVA (127 or 18%), Region IX (105 or 15%), Region II (97 or 14%), and Region XI (73 or 10%) (Table 2).

Table 2. Confirmed Dengue Cases by Region and Serotype (n=714)
Philippines, January 1 – August 31, 2019

<table>
<thead>
<tr>
<th>Region</th>
<th>Dengue 1</th>
<th>Dengue 2</th>
<th>Dengue 3</th>
<th>Dengue 4</th>
<th>Mixed Serotype</th>
<th>Total</th>
</tr>
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<tbody>
<tr>
<td>PHILIPPINES</td>
<td>122</td>
<td>97</td>
<td>481</td>
<td>11</td>
<td>3</td>
<td>714</td>
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<td>I</td>
<td>9</td>
<td>12</td>
<td>28</td>
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<td>50</td>
</tr>
<tr>
<td>II</td>
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<td>2</td>
<td>94</td>
<td>1</td>
<td>0</td>
<td>97</td>
</tr>
<tr>
<td>III</td>
<td>25</td>
<td>14</td>
<td>25</td>
<td>1</td>
<td>0</td>
<td>65</td>
</tr>
<tr>
<td>IV-A CALABARZON</td>
<td>20</td>
<td>6</td>
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<td>1</td>
<td>2</td>
<td>127</td>
</tr>
<tr>
<td>IV-B MIMAROPA</td>
<td>0</td>
<td>0</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>13</td>
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<tr>
<td>V</td>
<td>2</td>
<td>1</td>
<td>8</td>
<td>1</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td>VI</td>
<td>0</td>
<td>1</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>VII</td>
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<td>0</td>
<td>14</td>
</tr>
<tr>
<td>VIII</td>
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<td>7</td>
<td>0</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
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<td>22</td>
<td>76</td>
<td>3</td>
<td>0</td>
<td>105</td>
</tr>
<tr>
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<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>XI</td>
<td>37</td>
<td>16</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>74</td>
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<td>XII</td>
<td>4</td>
<td>5</td>
<td>28</td>
<td>2</td>
<td>0</td>
<td>39</td>
</tr>
<tr>
<td>BARMMM</td>
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<td>4</td>
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<td>0</td>
<td>0</td>
<td>19</td>
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<tr>
<td>CAR</td>
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<td>3</td>
<td>14</td>
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<td>0</td>
<td>12</td>
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<tr>
<td>NCR</td>
<td>5</td>
<td>2</td>
<td>35</td>
<td>1</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Profile of Reported Dengue Deaths

Figure 6. Reported Dengue Deaths by Age Group and Sex (n=1,107)
Philippines, January 1 – August 31, 2019

Table 3. Top Provinces/Cities with Highest Reported Dengue Deaths (n=1,107)
Philippines January 1 – August 31, 2019

<table>
<thead>
<tr>
<th>Province</th>
<th>Deaths</th>
<th>% among Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iloilo</td>
<td>84</td>
<td>8</td>
</tr>
<tr>
<td>Negros Occidental</td>
<td>60</td>
<td>5</td>
</tr>
<tr>
<td>Cebu</td>
<td>56</td>
<td>5</td>
</tr>
<tr>
<td>Zamboanga Del Sur</td>
<td>50</td>
<td>5</td>
</tr>
<tr>
<td>Cavite</td>
<td>43</td>
<td>4</td>
</tr>
</tbody>
</table>

Etiologic Agent

• The various serotypes of the dengue virus are transmitted to humans through the bites of infected *Aedes* mosquitoes, principally *Aedes aegypti*.

• The immature stages are found in water-filled habitats, mostly in artificial containers closely associated with human dwellings and often indoors.

• Dengue outbreaks have also been attributed to *Aedes albopictus*. 

WHO. Dengue: guidelines for diagnosis, treatment, prevention and control. 2009
Transmission of the Dengue Virus

- Dengue virus circulating in the blood of humans is ingested by female mosquitoes during feeding.
- The virus then infects the mosquito mid-gut and subsequently spreads systemically over a period of 8-12 days.
- The virus can be transmitted to other humans during subsequent probing or feeding.
- Thereafter the mosquito remains infective for the rest of its life.

WHO. Dengue: guidelines for diagnosis, treatment, prevention and control. 2009
Clinical Signs and Symptoms

- Sudden onset of high fever which may last from 2 to 7 days.
- Joint and muscle pain and pain behind the eyes
- Weakness
- Skin rashes
- Nosebleeding when fever starts to subside
- Abdominal pain
- Vomiting of coffee-colored matter
- Dark-colored stools
- Difficulty of breathing
Know the 7 Symptoms of Dengue

- Fever
- Vomiting
- Muscle & joint pain
- Diarrhea
- Skin rash
- Headache
- Bleeding nose & gums

Consult a nearby health facility immediately if you have these symptoms, or if you feel unwell.
What to do if with symptoms of Dengue?

1. Seek doctor’s advice immediately
2. Get tested for dengue even when there is no alarming symptom
3. Focus more on children, pregnant women and elderly people
4. Take extra precautions if having already contracted the disease before
Dengue Disease Case Classification

**DENGUE ± WARNING SIGNS**

- **Probable dengue**
  - live in /travel to dengue endemic area.
  - Fever and 2 of the following criteria:
    - Nausea, vomiting
    - Rash
    - Aches and pains
    - Tourniquet test positive
    - Leukopenia
    - Any warning sign

- **Laboratory-confirmed dengue**
  - (important when no sign of plasma leakage)

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

- **with warning signs**

- **without**

**SEVERE DENGUE**

1. Severe plasma leakage
2. Severe haemorrhage
3. Severe organ impairment

**CRITERIA FOR DENGUE ± WARNING SIGNS**

**CRITERIA FOR SEVERE DENGUE**

- Severe plasma leakage leading to:
  - Shock (DSS)
  - Fluid accumulation with respiratory distress

- **Severe bleeding**
  - as evaluated by clinician

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

*requiring strict observation and medical intervention*
Management

Group A: Patients who may be sent home

These are patients who are able to:

• Tolerate adequate volumes of oral fluids
• Pass urine every 6 hours
• Do not have any of the warning signs particularly when the fever subsides
• Have stable hematocrit

https://www.doh.gov.ph/Health-Advisory/Dengue
Management

Group B: Patient who should be referred for in-hospital management

Patients shall be referred immediately to in-hospital management if they have the following conditions:

- Warning signs
- Without warning signs but with co-existing conditions that may make dengue or its management more complicated
- Social circumstances such as living alone or living far from health facility or without a reliable means of transportation.
- The referring facility has no capability to manage dengue with warning signs and/or severe dengue.

https://www.doh.gov.ph/Health-Advisory/Dengue
Management

Group C: Patient with severe dengue requiring emergency treatment and urgent referral

These are patients with severe dengue who require emergency treatment and urgent referral because they are in the critical phase of the disease and have the following:

- Severe plasma leakage leading to dengue shock and/or fluid accumulation with respiratory distress;
- Severe hemorrhages;
- Severe organ impairment (hepatic damage, renal impairment, cardiomyopathy, encephalopathy or encephalitis)
- Patients in Group C shall be immediately referred and admitted in the hospital **within 24 hours**.
Prevention and Control

Seek & Destroy Breeding Places
Secure Self-Protection
Seek early consultation
Support spraying to prevent impending outbreak
Health Advisory
DENGUE

Mag 4S Laban sa Dengue

SEARCH and DESTROY
Para di mapupunan ng butig at parahugan ng likod:
- Pasaan ang tubig at liki lihi ang flower vase at ibina sa karaniwang pagiging
- Tanggap ng burol sa burol ang mga butas sa paligid ng inyong bahay.
- Takpan ang mga limba, diin o iba pang matagal na ngutang nga tubig.
- Mga tubong sa buhang o mga guling sa inyong paligid.
- Itaob ang mga bote, lata at iba pang maaring patugunan ng butig
tagaputol ng lamok.
- Linisin at taasin ang tubig sa pagiging lamok.

SELF-PROTECTION MEASURES
- Insan ang maling kasagutan ang di matading makapal ng lamok.
- Masahol din gumumit ng mosquito repellent sa araw.

SEEK EARLY CONSULTATION
- Kung may lagal na ng 2 araw at may kasahorn sa balot, puno sa
- Para sa kalusugan. 

SAY NO TO DISCRIMINATE FOGGING
- Yes to fogging only during outbreaks.

Pag-iwas at pagsugpo:
- Magpakonsulta sa doktor kung may lagnat na ng 2-7 araw.
- Magsuot ng mahahabang kasuotan upang hindi madaling makagat ng lamok.
- Maaari din gumamit ng insect repellent.
- Itaob ang mga bote, lata at iba pang maaring mapapigunan ng tubig at panggitunan ng mga lamok.
- Linisin at takpan ang mga dram at iba pang imbakan ng tubig.

DOH Galing
PARA sa KALUSUGAN!
Kumonsulta agad sa pinakamalapit na health facility kapag nilaghat o nakaramdam ng alinman sa mga sintomas ng dengue.
THANK YOU