國家衛生研究院
National Health Research Institutes

Asia-Pacific Network for Enterovirus Surveillance (APNES)

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WPRO webpage

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Purpose

- The purposes of APNES focus on the applications and issues surrounding the epidemiology, virology, monitoring and vaccine development of Enterovirus in the Asia-Pacific region

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Country	Characteristics
Cambodia	1. Seroprevalence of EV-A71 neutralizing antibody: 92% 2. 400,000 newborns/year 3. Member of ASEAN
Malaysia	1. Seroprevalence of EV-A71 neutralizing antibody: 60% 2. 500,000 newborns/year 3. Ongoing vaccine development 4. Member of ASEAN and PIC/S
Taiwan	1. Seroprevalence of EV-A71 neutralizing antibody: 56-58% 2. 200,000 newborns/year 3. Ongoing vaccine development
Thailand	1. Seroprevalence of neutralizing antibody: CV-A (31.2%), EV-A71 (9.1%) 2. 765,600 newborns/year 3. Member of ASEAN and PIC/S
Vietnam	1. Seroprevalence of EV-A71 neutralizing antibody: 56-58% 2. 1,558,600 newborns/year 3. Ongoing vaccine development 4. Member of ASEAN
Philippines	1. Detection rate: EV-D68 (0.23%) 2. 1,700,618 newborns/year 3. Member of ASEAN

ASEAN: Association of Southeast Asian Nations

PIC/S: Pharmaceutical Inspection Convention and Pharmaceutical Inspection Co-operation Scheme

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APNES members (since 2017)

1. Cambodia: Pasteur Institute
2. Malaysia: University of Malaya, Kuala Lumpur
3. Malaysia: University of Malaysia, Sarawak
4. Taiwan: National Health Research Institutes
5. Vietnam: Pasteur Institute, HCMC
6. Vietnam: Children Hospital No. 1, HCMC
7. Thailand: Chulalongkorn University, Faculty of Medicine
8. Member Recruitment Goal 2019: Research Institute for Tropical Medicine in the Philippines

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APNES activities 2019

Date	Nation	Institutions
March	Vietnam	The Children's Hospital No. 1 of Ho Chi Minh City (CH1), Pasteur Institute of Ho Chi Minh City (PI-HCMC)
March	Philippines	Research Institute for Tropical Medicine (RITM), Department of Health
April	Taiwan	Bio-medical meeting in Taiwan
May	Taiwan	Symposium meeting of WHO/NIBSC International standard EV71 inactivated vaccine

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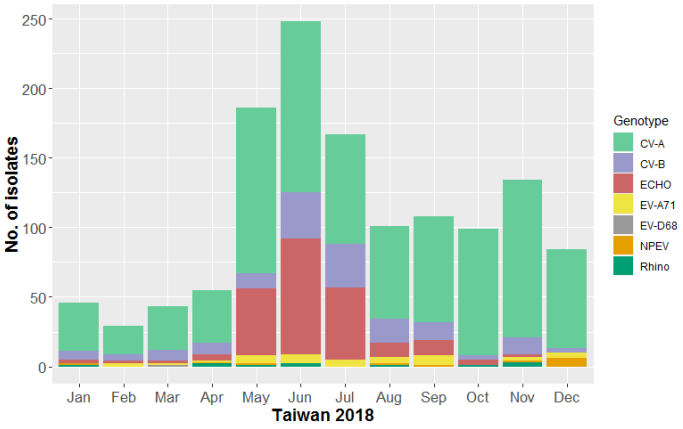
EV surveillance report 2018 - Taiwan



Data from: Taiwan CDC

- 1300 enterovirus isolates
- 36 with severe complications
- Among the severe cases:
  - 12 (33.3%) ECHO11
  - 8 (22.2%) EV-A71
  - CV-A4, CV-A9, CV-A10, CV-A16, CV-B1, CV-B2, CV-B3, CV-B5 and EV-D68
  - 8 deaths reported- 7 were related to ECHO11.

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Achievements in 2017 and 2018

- Discussed detection technologies of enterovirus with some organizations in other countries
- Establishing EV71 vaccine reference antigens and rapid serotyping of enteroviruses
- NHRI 2017 International Workshop on Enterovirus Surveillance and Vaccine Development

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http://enterovirus.nhri.org.tw/

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Demographics of the Philippines

- The 0-14 years age group represents 33.8% and those aged 65 years and above comprises only 4.4%
- 1,700,618 newborns/year
- Tuberculosis is among the leading causes of morbidity and mortality
- Coxsackievirus (CV) B, ECHO6, ECHO11, ECHO13 and D68 were the frequent isolates.

WHO & UN; (Apostol et al, 2012), (Imamura et al, 2011)

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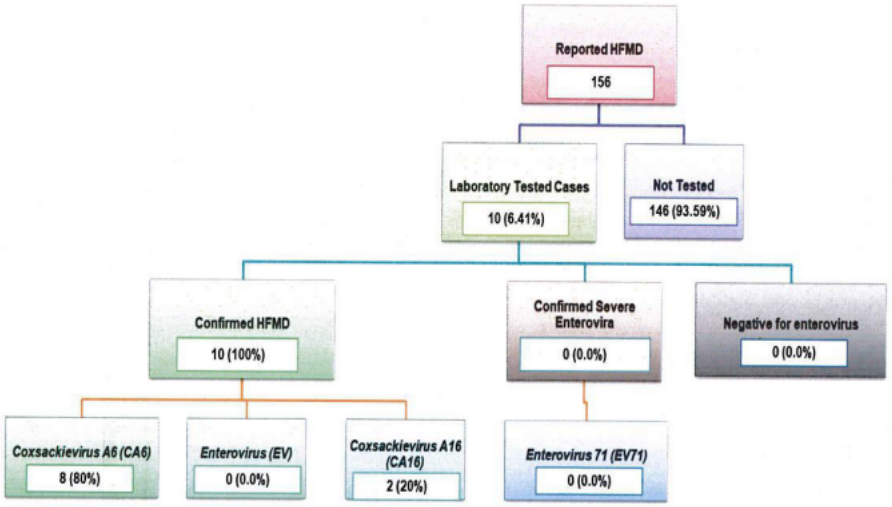
Fig. 3 Classification of Reported Hand,Foot and Mouth Disease Cases, Philippines, as of January 1-March 3, 2018 (N=156)



doh.gov.ph

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EV in the Philippines 2012 -2019

Result	2012	2013	2014	2015	2016	2017	2018	2019	Total
ENTEROVIRUS RNA DETECTED	**864**	**310**	**120**	**302**	**89**	**547**	**192**	**44**	**2468**
EV-71 RNA DETECTED	35	11	4	1	6	5	0	0	62
CA 6 RNA DETECTED	140	98	86	229	66	482	104	38	1243
CA 16 RNA DETECTED	34	29	13	39	8	5	40	1	169
UNTYPED ENTEROVIRUS	51	24	17	33	9	55	48	5	242
ENTEROVIRUS NEGATIVE	**269**	**109**	**42**	**146**	**47**	**176**	**123**	**30**	**942**
NOT TESTED	**82**	**12**	**15**	**6**	**14**	**24**	**24**	**3**	**180**
Total	**611**	**283**	**177**	**454**	**150**	**747**	**339**	**77**	**2838**
Total Tested	**1133**	**419**	**162**	**448**	**136**	**723**	**315**	**74**	**3410**
Sampling	226	152							

Result	2012	2013	2014	2015	2016	2017	2018	2019
ENTEROVIRUS RNA DETECTED	**76.3%**	**74.0%**	**74.1%**	**67.4%**	**65.4%**	**75.7%**	**61.0%**	**59.5%**
EV-71 RNA DETECTED	4.1%	3.5%	3.3%	0.3%	6.7%	0.9%	0.0%	0.0%
CA 6 RNA DETECTED	61.9%	43.4%	71.7%	75.8%	74.2%	88.1%	54.2%	86.4%
CA 16 RNA DETECTED	22.4%	19.1%	10.8%	12.9%	9.0%	0.9%	20.8%	2.3%
UNTYPED ENTEROVIRUS	22.6%	15.8%	14.2%	10.9%	10.1%	10.1%	25.0%	11.4%
ENTEROVIRUS NEGATIVE	**23.7%**	**26.0%**	**25.9%**	**32.6%**	**34.6%**	**24.3%**	**39.0%**	**40.5%**
NOT TESTED	**82**	**12**	**15**	**6**	**14**	**24**	**24**	**3**
Total	**1215**	**431**	**177**	**454**	**150**	**747**	**339**	**77**
Total Tested (denominator)	**1133**	**419**	**162**	**448**	**136**	**723**	**315**	**74**

Source from:
Dr. Lea Necitas G. Apostol at RITM

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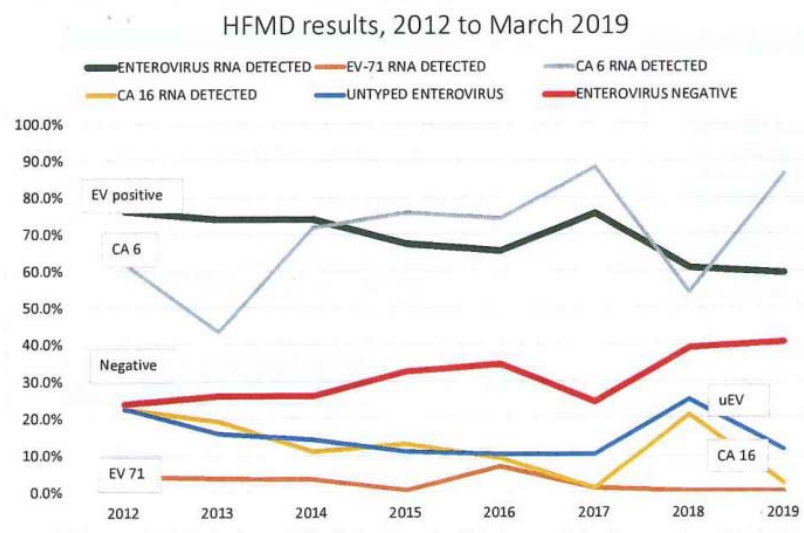

Total sequenced	
EV 71	27
CA 6	113
CA 16	111
uEV	8

Source from:
Dr. Lea Necitas G. Apostol at RITM

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