

Enterovirus Surveillance in Thailand

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1

Country	Characteristics
Vietnam	<ol style="list-style-type: none"> 1. Seroprevalence of EV-A71 infections: 55% 2. 1,500,000 newborns/year 3. Ongoing vaccine development 4. Member of ASEAN
Malaysia	<ol style="list-style-type: none"> 1. Seroprevalence of EV-A71 infections: 60% 2. 500,000 newborns/year 3. Ongoing vaccine development 4. Member of ASEAN and PIC/S
Cambodia	<ol style="list-style-type: none"> 1. Seroprevalence of EV-A71 infections: 88.8% 2. 400,000 newborns/year 3. Member of ASEAN
Thailand	<ol style="list-style-type: none"> 1. Seroprevalence of infections: CV-A (31.2%), EV-A71 (9.1%) 2. 765,600 newborns/year 3. Member of ASEAN and PIC/S

ASEAN: Association of Southeast Asian Nations

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

2

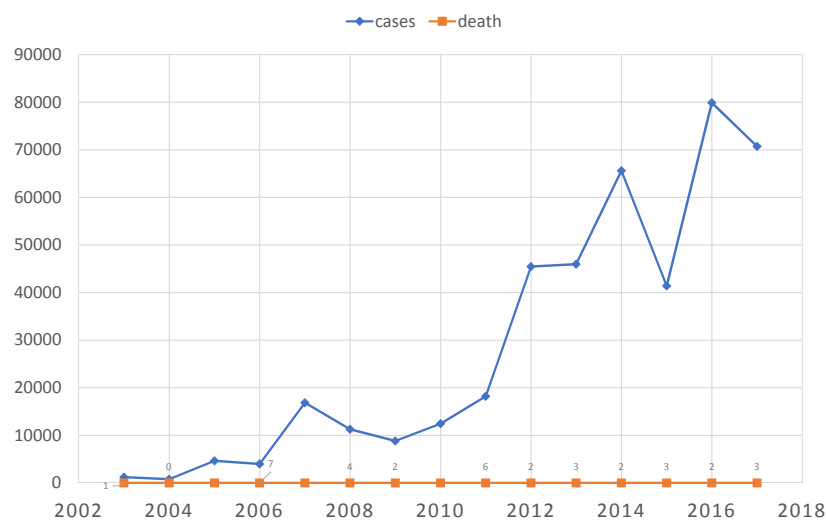
2

Websites

- **Hand, foot and mouth disease (HFMD)**
 - [Bureau of Epidemiology, Department of Disease Control](#)
 - <http://www.boe.moph.go.th/boedb/surdata/disease.php?ds=71> (Th)
- **Data: 2003 – 2018 presence**
- **ICD-10: B08.4 Enteroviral vesicular stomatitis with exanthem**

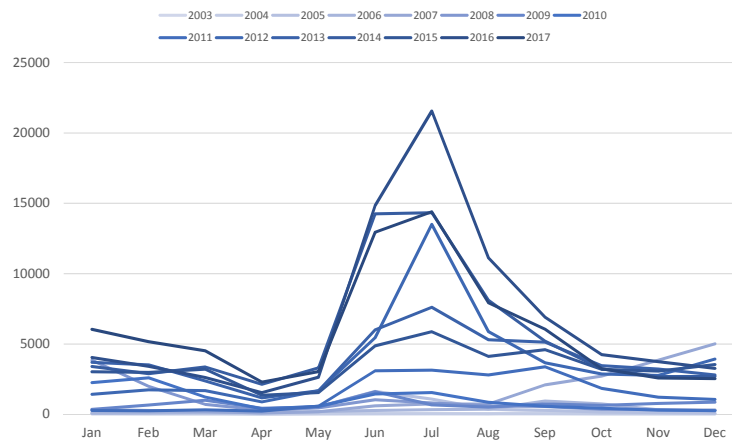
3

2000 – 2017 Yearly HFMD



4

2001 – 2017 Monthly HFMD



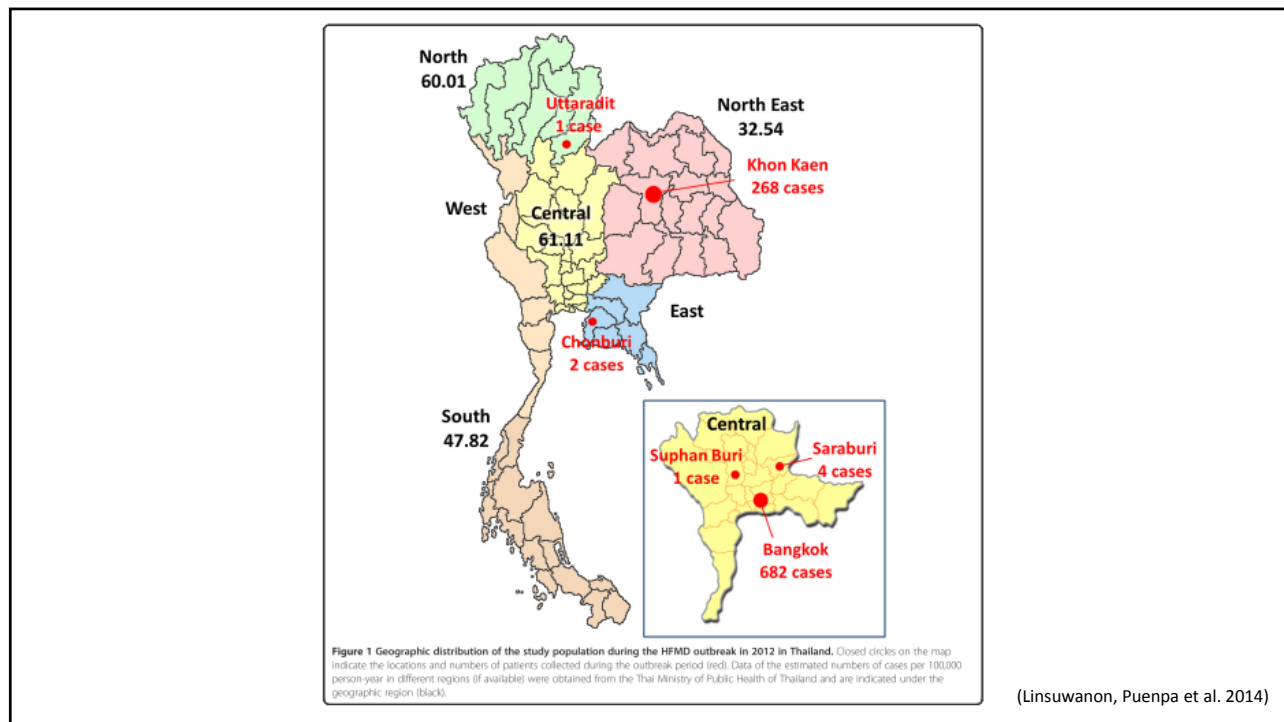
5

2018 HFMD

- 1 January 2018 - 15 May 2018, a total of 11672 cases were reported from 77 provinces. There were 0 deaths.
- The highest proportion of cases by age group: 1 years old (27.78%); 2 years old (22.53%); 3 years old (16.85%)

http://www.boe.moph.go.th/boedb/surdata/506wk/y61/en/d71_1361_en.pdf

6



7

Case definitions

- Herpangina (HA): Having well-characterized vesicular enanthem, oral ulcers on the anterior tonsil pillars, soft palate, buccal mucosa, or uvula.
- HFMD: Oral ulcers mainly on the buccal mucosa and tongue, accompanied by typical vesicular rashes most commonly on the extensor surfaces of the hands, feet, knees, and/or buttock.
- A severe case was defined as having HFMD or HA and accompanied by the occurrence of at least one of the following complications: aseptic meningitis, myocarditis, encephalitis, pulmonary edema, hemorrhage, acute flaccid paralysis, and cardiopulmonary collapse

8

Virus characterization of HFMD (2008 – 2013)

Table 1 Demographic and clinical data associated with different enterovirus genotypes

	HFMD	HA	HFMD/HA	All
No of case	795 (67.3%)	197 (16.7%)	190 (16.1%)	1182
No of sample	833 (67.3%)	202 (16.4%)	202 (16.4%)	1237
Age range (median)	4d to 54y (2.4y)	3 m to 16y (2.6y)	1 m to 50y (3y)	4d to 54y (2.5y)
Mean age \pm SD	3.4y \pm 4.8y	3.4y \pm 3.0y	5.1y \pm 8.3y	3.6y \pm 5.0y
Sex ratio (F:M)	1:1.4	1:1.1	1:1.2	1:1.3
Virology: EV71	66 (8.3%)	2 (1%)	40 (21.1%)	108 (9.1%)
CV-A16	65 (8.2%)	2 (1%)	35 (18.4%)	102 (8.6%)
Other CV-A	217 (27.3%)	22 (11.2%)	28 (14.7%)	267 (22.6%)
Pan-EV	131 (16.5%)	88 (44.7%)	10 (5.3%)	229 (19.4%)
Negative	316 (39.7%)	83 (42.1%)	77 (40.5%)	476 (40.3%)

HFMD, Hand, foot, and mouth disease; HA, Herpangina; EV71, Human enterovirus 71; CV-A, Coxsackievirus species A; Pan-EV, Pan-enterovirus; y, year old; m, month old.

(Linsuwanon, Puenpa et al. 2014)

9

9

Year	Sample	Sample size/disease	Age	%	Reference
2014 – 2016	Specimens	1049 Patients with HFMD		CV-A6: 32.9% CV-A16: 11.6%	(Puenpa, Suwannakarn et al. 2017)
2010 – 2016	Fecal samples	1310 HFMD patients with no diarrhea	1 – 66y	EV-A: 92.6% CV-A6: 54.8%	(Chansaenroj, Tuanthap et al. 2017)
2010 – 2014	Fecal samples	1266 at Chiang Mai Patients with acute gastroenteritis	< 12y	EV: 5.8% EV-C96: 12.3%	(Kumthip, Khamrin et al. 2017)
2011 – 2013	Specimens	11 at Lopburi Patients with HFMD	<15y	CV-A16: 44.5% EV-A71: 29.6%	(Owatanapanich, Wutthanarungsan et al. 2016)
2013	Specimens	203	16d - 50y	EV-A71: 30% CV-A8: 26% CV-A16: 21%	(Mauleekoonphairoj, Puenpa et al. 2015)
2008 – 2013	Specimens	1182 Patients with HFMD or HA	4d - 54y	EV-A71: 9.1% CV-A: 31.2%	(Linsuwanon, Puenpa et al. 2014)
2012	Specimens	704 Patients with HFMD or HA	1m - 54y	CV-A6: 33.5% CV-A16: 9.4% EV-A71: 8.8%	(Puenpa, Mauleekoonphairoj et al. 2014)
2010 – 2011	Specimens	6266 Children	6m - 10y	EV: 41.5%	(Taylor, Lopez et al. 2017)
2008 – 2011	Resp samples	121 at Bangkok		EV: 43% EV-A71	(Zhou, Fernandez et al. 2016)
2006 – 2011	Resp samples	1810 Patients with resp illnesses	< 15y	EV-D68: 1.4%	(Linsuwanon, Puenpa et al. 2012)
2008 – 2009	Specimens	48	4m - 26y	EV-A71: 47.9% CA-16: 8.3%	(Chatproedprai, Theanboonlers et al. 2010)

10

Summary

- HFMD occurred endemically during 2008-2017. CV-A6, CV-A16, and EV-A71 were the three most commonly identified EV associated with HFMD.
- EV-71 had a high prevalence in 2008-2009 and has been identified with a higher frequency since 2012. Co-circulation between different EV-71 genotypes was observed during the outbreaks.
- Surveillance of epidemiology and monitoring of disease severity should be continued

11

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12