

# VIRAL ETIOLOGY OF ACUTE FEBRILE DISEASES FROM ARCHIVED SPECIMENS COLLECTED BETWEEN 2012 TO 2017 IN INDONESIA

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Emerging Virus Research Unit  
Eijkman Institute for Molecular Biology, Indonesia



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# EIKMAN INSTITUTE FOR MOLECULAR BIOLOGY

Research Institute under auspicious of ministry of Research and Technology and Higher Education



## SCIENCE AT THE EIKMAN INSTITUTE

### HUMAN GENOME DIVERSITY AND DISEASES

- Diversity of Indonesian population
- Red blood cell disorders: Thalassaemia
- Mitochondria and lifestyle-related diseases

### INFECTIOUS DISEASES

- Malaria
- Hepatitis
- Dengue
- **Emerging virus**
- Bacteria

### GENETIC BIODIVERSITY

- Wild-life animal population genetics
- Marine microbes
- Genetic diversity of anopheles mosquitos

# BACKGROUND

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- ❑ Acute febrile illness (AFI) viral infections occur worldwide and are one of the major global burdens of diseases.
- ❑ Might have similar clinical presentation, and the fever can be potentially fatal if the aetiology is not recognized and appropriately treated early.
- ❑ Indonesia has been identified as a high-risk area of emerging viruses,
- ❑ Viral etiology responsible for AFI in Indonesia is obscure and poorly understood.

# STUDY OBJECTIVES

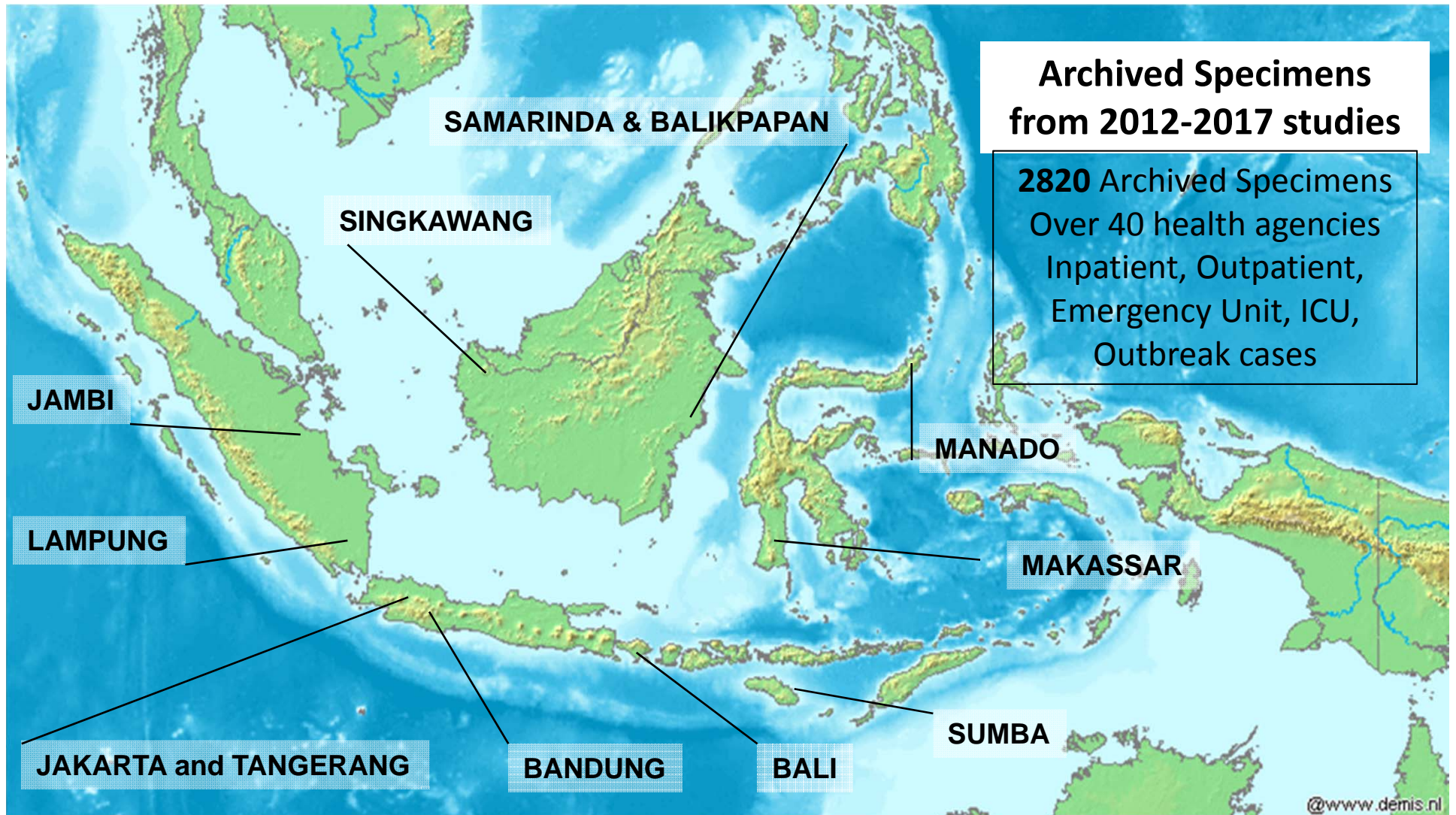
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comprehensive information on viral agents causing  
AFI of unknown origin (UFO) in humans

specimens archived from previous studies submitted to the Emerging  
Virus Research Unit (EVRU), Eijkman Institute Indonesia  
during the period of 2012-2017

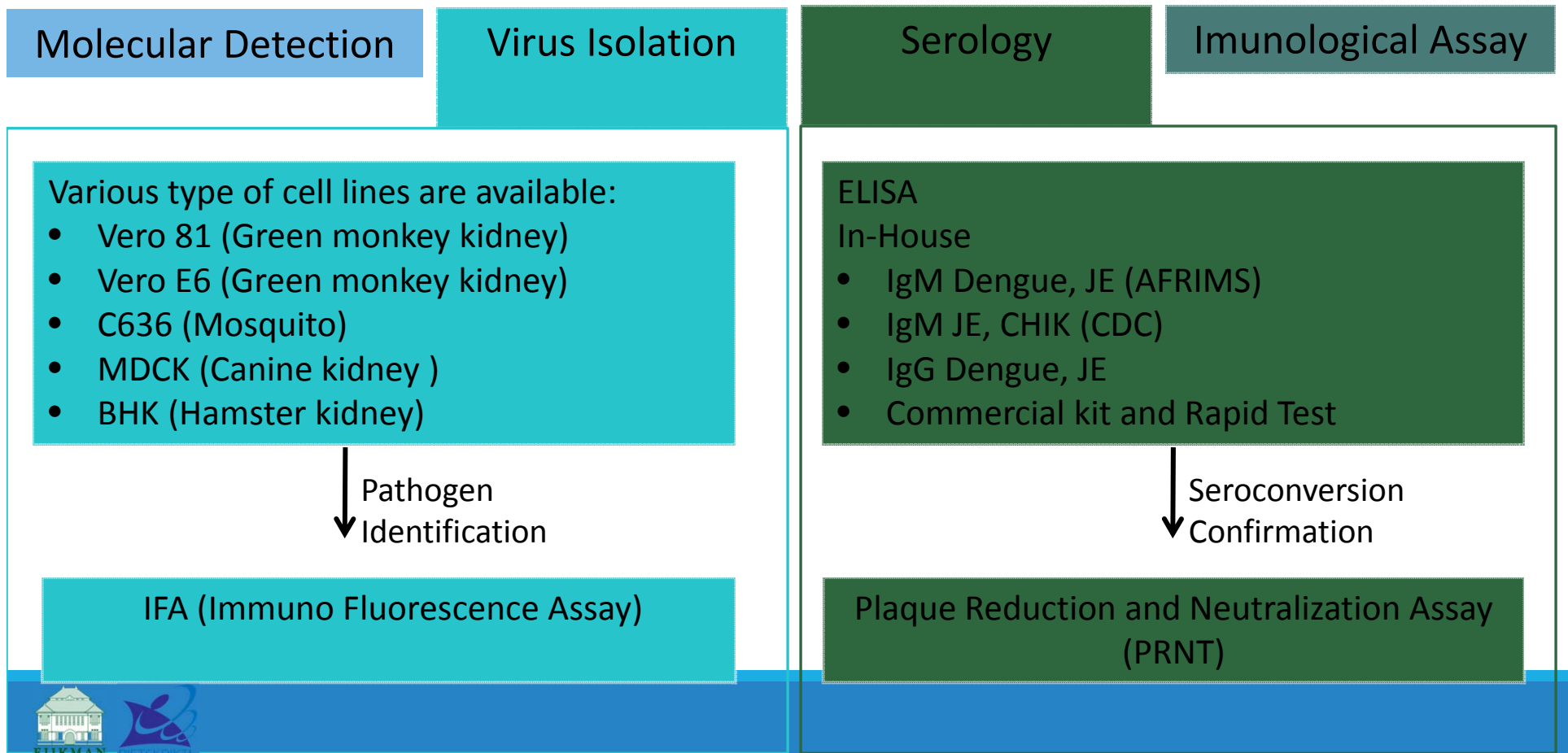
# METHODS- STUDY SITES

\_Retrospective Cryo-preserved specimens\_



# STUDY ALGORITHM..1 of 2

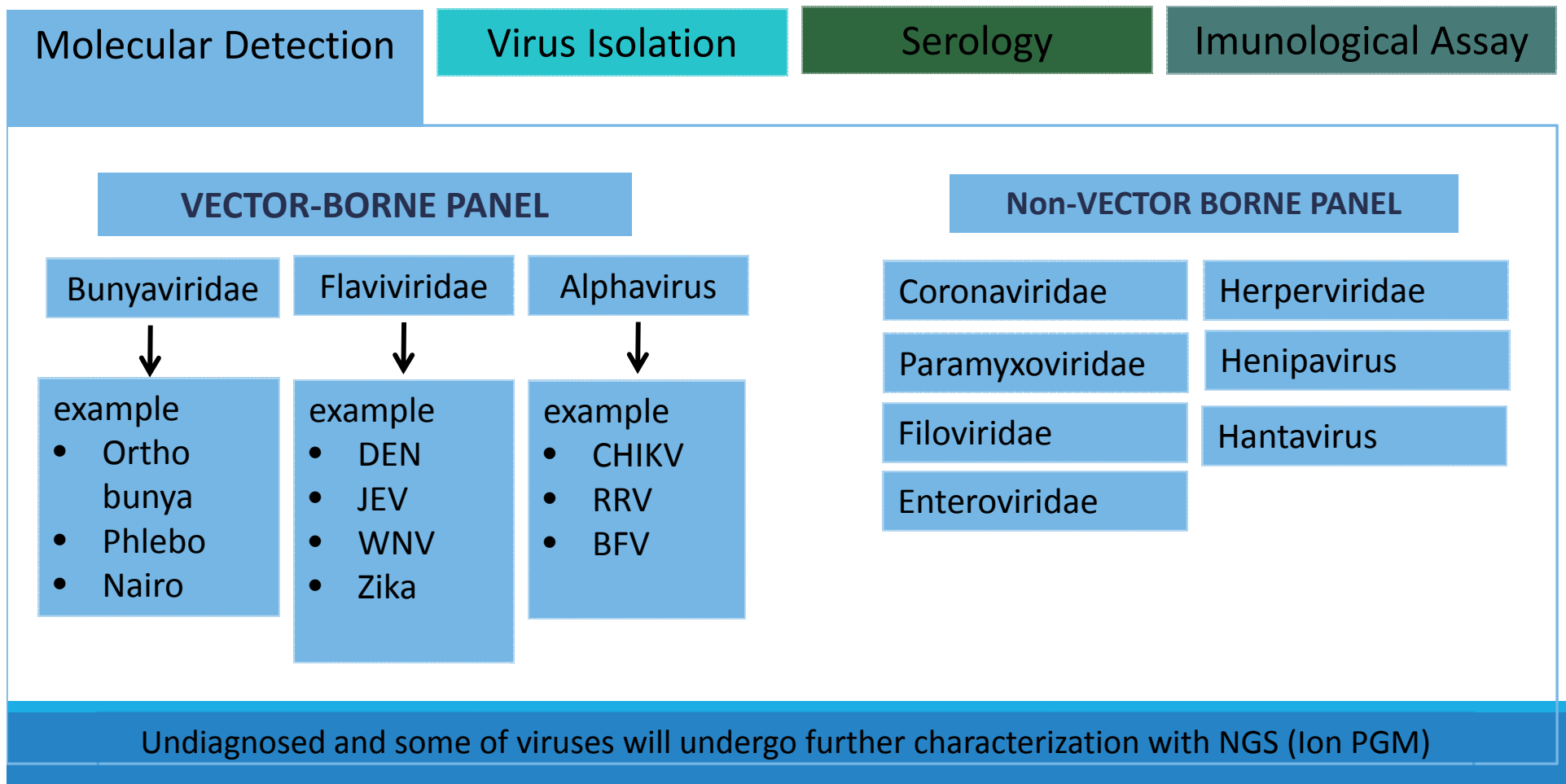
- ❑ Virus isolation
- ❑ Serology
- ❑ Molecular Characterization



# STUDY ALGORITHM.. 2 of 2

In paralel with Virus Isolation

Molecular Panel: RT-PCR Assay testing 9 virus panels (family level)



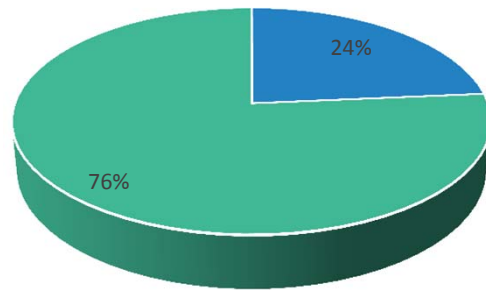
# Viral Etiology of Archived specimens (2012 to 2017)

2112 eligible samples



17.8 % (n=379) cases confirmed as viral infection

(Serum, CSF (Cerebrospinal fluid), and respiratory specimens)



■ children  
n= 501

■ adult  
n= 1621

- West Nile
- Herpes 6B
- Epstein Barr
- Cytomegalo
- Herpes Simplex 1
- HIV
- Coxsackie A6
- Coxsackie A1
- Coxsackie B3
- Entero 71
- Rhino
- Measles
- Boca
- H1N1 Pandemic 2009
- Human Corona OC43
- Human Adeno
- Zika
- Neurotropic Den
- Chik

Most common endemic and emerging viruses discovered were chikungunya, cytomegalovirus, measles, and enteroviruses

Emerging viruses such as zika, west nile and enterovirus 71 were also documented

First reported cases in Indonesia of numerous emerging viruses  
by the Emerging Virus Research Unit at the Eijkman Institute for molecular Biology

**CDC** Centers for Disease Control and Prevention  
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**EMERGING INFECTIOUS DISEASES™** ISSN: 1088-2620

Volume 22, Number 5—May 2016

Letter

Isolation of **Zika Virus** from Febrile Patient, Indonesia

*Am. J. Trop. Med. Hyg.*, 90(2), 2014, pp. 260–262  
doi:10.4269/ajtmh.13-0445  
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Short Report: **West Nile Virus** Documented in Indonesia from Acute Febrile Illness Specimens

Khin Saw Aye Myint,\* Herman Kosasih, I. Made Artika, Aditya Perkasa, Mita Puspita, Chairin Nisa Ma'roef, Ungke Antonjaya, Jeremy P. Ledermann, Ann M. Powers, and Bakti Alisjahbana

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Contents lists available at ScienceDirect

**ELSEVIER** International Journal of Infectious Diseases  
journal homepage: [www.elsevier.com/locate/ijid](http://www.elsevier.com/locate/ijid)

Short Communication

Occurrence of **measles genotype D8** during a 2014 outbreak in Banjarmasin, South Kalimantan, Indonesia

Edi Hartoyo<sup>a,b</sup>, Ageng Wiyatno<sup>c</sup>, Ungke Anton Jaya<sup>c,d</sup>, Chairin Nisa Ma'roef<sup>c</sup>, Corina Monagin<sup>c</sup>, Khin Saw Myint<sup>c</sup>, Dodi Safari<sup>c,\*</sup>

**JIDC** | THE JOURNAL OF INFECTION IN DEVELOPING COUNTRIES

Brief Original Article

Detection and identification of **coxsackievirus B3** from sera of an Indonesian patient with undifferentiated febrile illness

Ageng Wiyatno<sup>1</sup>, Ungke Antonjaya<sup>2</sup>, Chairin Nisa Ma'roef<sup>1</sup>, Silvita Fitri Riswari<sup>3</sup>, Hofiya Djauhari<sup>3</sup>, I Made Artika<sup>1,4</sup>, Corina Monagin<sup>5</sup>, Bradley S Schneider<sup>5</sup>, Khin Saw Myint<sup>1</sup>, Bakti Alisjahbana<sup>3,6</sup>, Dodi Safari<sup>1</sup>, Herman Kosasih<sup>3</sup>

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# LIMITATION

What we Learned for the past 5 years

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Successful detection depends on:

1. Time frame of specimen collection (early stage)
2. cold chain maintenance

# CONCLUSION

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- The compiled data provides relevant information on the endemic and emerging viruses in Indonesia from 2012 to 2017.
- Importance of gold standard assays like virus isolation in addition to the molecular screening and deep sequencing as a useful tool for virus characterization.

It is essential conduct further investigation on remaining unknown cases to better understand the distribution of this infection and its potential public health problems.

# ...and many, contributors to this work!



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- Dodi Safari
- I Made Artika
- Tedjo Sasmono
- Din Syafruddin
- Ageng Wiyatno
- Adewantari Aghni
- Araniy Fadhillah
- Frilasita Aisyah Yudhaputri
- Rama Dhenni
- Tina Kusumaningrum
- Ungke Anton Jaya
- Aditya Perkasa



# Thank You