

## Review Article

# Indonesian strategy in reducing *Aedes aegypti* diseases in ASEAN economic community era

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### ABSTRACT

Indonesia is one of the countries that has a very strategic role in the ASEAN region. The state of readiness of Indonesia in ASEAN Economic Community (AEC) 2015 will involve all elements of the society due to very large population. Economically, Indonesia should be able to compete with ASEAN countries, and human resources should also be prepared. On the other hand, shifts and movements of the people between countries will be increased, this could be a threat for the country. However, those who are ready with the human resources, it might be a positive value, otherwise, it might be a weakness for unprepared countries. AEC era is not only economic power that should be concerned, but also health problems that should be a priority. Nowadays, the *Aedes aegypti* cases are still high in Indonesia. This paper aims to describe the strategies to reduce the disease, which also be a focus of government.

**Keywords:** ASEAN Economic Community, *Aedes aegypti*

### INTRODUCTION

The main concept of the ASEAN Economic Community (AEC) is to create ASEAN as a single market and production-based unity, which there is a free low on goods, services, factors of production, investment and capital as well as the elimination of tariffs for trade between countries of ASEAN. AEC is expected to reduce poverty and economic disparities between the member countries through a number of mutually beneficial cooperation.<sup>1</sup> The presence of the AEC could help the powerlessness of ASEAN countries in the global competition of the world economy by establishing a single market based in Southeast Asia.<sup>2</sup>

In the era of AEC, the shift of people from one country to another will be very open and free.<sup>2</sup> In terms of health, it will have a great impact because people are susceptible to the disease that will be easily infected. Moreover, Indonesia is still facing a high variety of diseases such

as *Aedes aegypti*, the solution of this disease should be serious and involve many parties.

On the other side, one of health problems in Indonesia until now is Dengue, which the number of patients is progressively increased as well as its virus distribution.<sup>3</sup> This disease is found in almost all parts of the world, especially in the tropical and subtropical countries, as both endemic and epidemic disease,<sup>4</sup> and the dengue virus is the cause of *Aedes aegypti* disease.

*Aedes aegypti* disease by the dengue virus will be into the circulation of humans through the bite of mosquitoes of the genus of *Aedes*,<sup>5</sup> for instance, *Aedes aegypti* or *Aedes albopictus*. This disease can occur throughout the year and affect all age groups. However, it is associated with the environment and people behavior.<sup>6</sup> Therefore, to control and manage the environment and change the people behavior are needed.

The control of *Aedes aegypti* disease is a series of preventing and controlling activities to break the chain of disease transmission by *Aedes aegypti* mosquitoes and ways to eradicate *Aedes aegypti* mosquito larvae.<sup>7</sup> However, there are two kind of activities need to be implemented, namely 1) The prevention of *Aedes aegypti*, which is a series of actions taken before any case of *Aedes aegypti* occurred, and 2) Eradication when *Aedes aegypti* already occurred. This paper aimed to discuss about the prevention strategies to reducing *Aedes aegypti* in Indonesia.

## METHODS

Secondary data analysis from literature review was conducted in this study, whis is from database such as Conopus, DOAJ, Google Scholar, and also from grey

literatures from the report of Ministry of Health Indonesia, Indonesian Public Health Assosiation (IPHA), Statistic of Indonesia, and others sources.

## RESULTS AND DISCUSIONS

### Population of Indonesia

Indonesia consists of 33 provinces with a very diverse population distribution among the provinces with the other provinces. From the Table 1, it could be seen that Jawa Barat Province is the highest population of 43.053.732 and the province of Papua Barat is a province with the less population, 7.604.22. However, year by year, Indonesia population increased gradually, from 119.208 229 population in 1971, to 237.641 326 population in 2010.

**Table 1: Population of Indonesia by Province 1971, 1980, 1990, 1995 , 2000 and 2010<sup>8</sup>.**

Provinces	Populations					
	1971	1980	1990	1995	2000	2010
Aceh	2008595	2611271	3416156	3847583	3930905	4494410
Sumatera Utara	6621831	8360894	10256027	11114667	11649655	12982204
Sumatera Barat	2793196	3406816	4000207	4323170	4248931	4846909
Riau	1641545	2168535	3303976	3900534	4957627	5538367
Jambi	1006084	1445994	2020568	2369959	2413846	3092265
Sumatera Selatan	3440573	4629801	6313074	7207545	6899675	7450394
Bengkulu	519316	768064	1179122	1409117	1567432	1715518
Lampung	2777008	4624785	6017573	6657759	6741439	7608405
Kepulauan Bangka Belitung	-	-	-	-	900197	1223296
Kepulauan Riau	-	-	-	-	-	1679163
Dki Jakarta	4579303	6503449	8259266	9112652	8389443	9607787
Jawa Barat	21623529	27453525	35384352	39206787	35729537	43053732
Jawa Tengah	21877136	25372889	28520643	29653266	31228940	32382657
Di Yogyakarta	2489360	2750813	2913054	2916779	3122268	3457491
Jawa Timur	25516999	29188852	32503991	33844002	34783640	37476757
Banten	-	-	-	-	8098780	10632166
Bali	2120322	2469930	2777811	2895649	3151162	3890757
Nusa Tenggara Barat	2203465	2724664	3369649	3645713	4009261	4500212
Nusa Tenggara Timur	2295287	2737166	3268644	3577472	3952279	4683827
Kalimantan Barat	2019936	2486068	3229153	3635730	4034198	4395983
Kalimantan Tengah	701936	954353	1396486	1627453	1857000	2212089
Kalimantan Selatan	1699105	2064649	2597572	2893477	2985240	3626616
Kalimantan Timur	733797	1218016	1876663	2314183	2455120	3553143
Sulawesi Utara	1718543	2115384	2478119	2649093	2012098	2270596
Sulawesi Tengah	913662	1289635	1711327	1938071	2218435	2635009
Sulawesi Selatan	5180576	6062212	6981646	7558368	8059627	8034776
Sulawesi Tenggara	714120	942302	1349619	1586917	1821284	2232586
Gorontalo	-	-	-	-	835044	1040164
Sulawesi Barat	-	-	-	-	-	1158651
Maluku	1089565	1411006	1857790	2086516	1205539	1533506
Maluku Utara	-	-	-	-	785059	1038087
Papua Barat	-	-	-	-	-	760422
Papua	923440	1173875	1648708	1942627	2220934	2833381
Indonesia	119.208.229	147.490.298	179.378.946	194.754.808	206.264.595	237.641.326

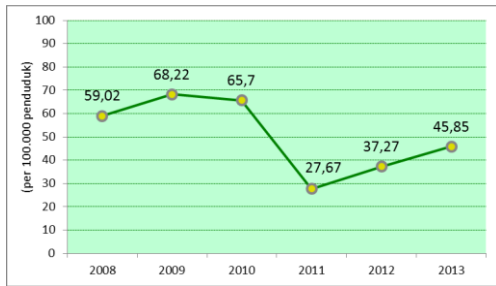
Note: Including non permanent resident (homeless people, sailor, boat people and remote area community).

Source: 1971, 1980, 1990, 2000 Population Census, and 1995 Intercensal Population Census

**Table 2: Distribution of Dengue fever in ASEAN Country.**

Country	Dengue fever apparent and cases (Million) <sup>10</sup>
Brunei Darussalam	12.732
Cambodia	0.4
Indonesia	7.6
Lao PDR	0.1
Myanmar	1
Philippines	3.1
Singapore	0.2
Thailand	1.9
Vietnam	2.6

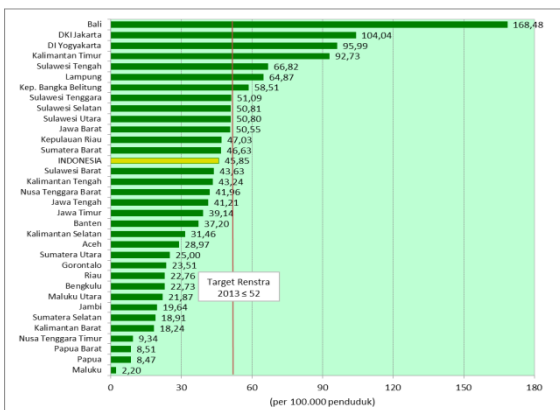
**Conditions of Aedes aegypti Disease in Indonesia<sup>9</sup>**



**Figure 1: Condition of Aedes aegypti in Indonesia by years.**

In 2013, the number of patients of *Aedes aegypti* were reported approximately 112 511 cases with 871 deaths of people (Incidence Rate/morbidity which was 45.85 per 100,000 population and CFR/mortality of 0.77%). It was higher when compared to the in 2012, which approximately 90,245 cases with IR 37.27. Meanwhile, the target of Strategic Plan of the Ministry of Health for morbidity *Aedes aegypti* in 2013 is  $\leq 52$  per 100,000 population. Hence, Indonesia has thus reached the target of the Strategic Plan in 2013.

**Cases Aedes aegypti in Indonesia by Provinces<sup>9</sup>**



**Figure 2: Cases Aedes aegypti in Indonesia by province.**

In line with this, there were 26 provinces (78.8%) that achieved the morbidity of *Aedes aegypti* in 2013 (see Figure 2). The high Incidence Rate (IR) was in Bali, which about 168, 48 cases, while in DKI Jakarta was around 104.04 cases, and DI Yogyakarta was only 95.99 per 100,000 population. On the other hand, death due to *Aedes aegypti* was categorized as high if Case Fatality Rate (CFR) > 2%, and in 2013, there were three provinces having a high CFR includes Jambi, Bangka Belitung Islands, and East Nusa Tenggara. Therefore, these three provinces still need to improve the quality of health services as well as quality and quantity of health human resources in hospitals and health centers (doctors, nurses, and others), and improve the facilities, particularly the supporting diagnostics and treatment.

Nationally, the target of morbidity *Aedes aegypti* is 53 per 100,000 population or less. Until 2013, the morbidity *Aedes aegypti* in Indonesia was recorded around 45.85 per 100,000 population. It means the number has reached the target set, while the mortality *Aedes aegypti* was also decreased, from 41.30% in 1968 to 0.77% by 2013, based on CFR.

**Dengue Fever Apparent Cases in ASEAN Country**

Despite having morbidity and mortality of *Aedes aegypti*, Dengue fever cases in the ASEAN region are also spread out evenly. Indonesia is the highest country having 7.6 million cases in distribution, while Brunei Darussalam is the lowest country in distribution, which is only 12.732 thousands cases. Therefore, Indonesian government need to do a great effort in reducing dengue fever, especially *Aedes aegypti* that a main cause of dengue fever.

**The Role of Civil Society**

*Aedes aegypti* is a public health problem that is difficult to overcome. Disease prevention and eradication of *Aedes aegypti* is a shared responsibility between the government and society.<sup>11</sup> Duties and responsibilities of the government in efforts to eradicate the disease *Aedes aegypti* include making policy and strategic plan *Aedes aegypti* disease prevention, eradication developing technology, develop guidelines eradication, provide training and technical assistance, conduct counseling and health promotion and community mobilization.<sup>12</sup>

Eradication program of *Aedes aegypti* vector actually emphasis on the cleaning of Aedes mosquito larvae,<sup>5</sup> this requires the involvement of all levels of society in order the eradication program could be longer and more sustainable. The Awareness Model in society can be more effective if being implemented by health provider in society, especially in districts and subdistricts. This program focuses on the process of increasing knowledge and awareness of the public about the importance of healthy living. The knowledge will include the information about *Aedes aegypti* breeding places, such as

in the shelters of clean water or the tub of raining water, water storage tanks, flower vases, cans or plastic bag former, on the top floor of the open building, house gutters, bamboo fences, fruit peel rind like rambutan, coconut shells, old tires, and all forms of containers that can hold water.<sup>4</sup>

However, many factors cause of the disease such as environment, behavior of society, health services and heredity. But, there are many things underlie the difficulty of eradicating *Aedes aegypti* in Indonesia, including lack of knowledge and awareness of society to behave in a healthy life and pay attention to the environment, particularly the environment of mosquito breeding sites.<sup>6</sup> This is due to lack of community involvement in tackling the issue of *Aedes aegypti* and dissemination of government to the public about how to eradicate the *Aedes aegypti* and prevention appropriate and in accordance with the state of the surrounding environment.

#### ***The role of public health professional organizations***

In Indonesia, there is Jumantik Child that other countries might not have. It is primary school pupils were selected to be trained to understand the basics of dengue prevention, to share knowledge about environment to friends and family and do activities to eradicate mosquito e in school and home. Through this Jumantik Child action, children are trained to no longer be a victim of dengue fever but able to become agents of change and inspiration for the environment.<sup>13</sup> Therefore, mosquito eradication activities are conducted by society and government regularly and continuously to prevent dengue fever by eradicating the mosquito to mosquito larvae<sup>14</sup> either by chemical means, biological way (to keep the fish eating larvae or bacteria), or by physical activities consisting of activities draining, shut down, bury.<sup>15</sup>

#### ***The role of government.***

The government has four pillars of the strategy in reducing *Aedes aegypti*. *First*, strengthen the observation of the case and vector, which is supported by adequate laboratory; *Second*, strengthen the management of patients in hospitals, health centers and clinics; *Third*, improve vector control efforts in an integrated manner; *Fourth*, strengthen partnerships with various parties in the prevention and control of *Aedes aegypti* disease. However, in order to support the implementation of the government strategy, quality development of human resources are needed to reduce *Aedes aegypti*.

In line with this, the scope of eradicating *Aedes aegypti* in Indonesia include *Aedes aegypti* Epidemiology, Surveillance *Aedes aegypti* case, Surveillance and Control of Vectors *Aedes aegypti*, *Aedes aegypti* Case Management, Research Epidemiology, Prevention Focus and Countermeasures outbreaks *Aedes aegypti*, Operating Equipment and Materials *Aedes aegypti* Vector Control,

Planning Supervision<sup>16</sup> and Control of *Aedes aegypti*, Health Promotion In Control *Aedes aegypti*.

## **CONCLUSIONS**

*Aegypti Aedes* control is not only the role of government, but also all elements of government of Indonesia as the strategy in reducing cases of *Aedes aegypti* in Indonesia. Community and health professional organizations also should be involved, which will decrease *Aedes aegypti* case in Indonesia. In the era of the AEC, all must work together to address this disease.

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