

DIPHTHERIA OUTBREAK IN INDONESIA : A THREE-YEAR REPORT

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Background

Indonesia is a big country with 240 millions people. It has around 17 thousands islands and 34 provinces. Since 2011 Indonesia suffered from diphtheria outbreak, especially in East Java Province, the second largest province – regarding the population – in the country. There are at least 35 millions people live in East Java.

The increasing number of diphtheria patients was detected initially in 2005, in Bangkalan district. Despite all efforts from the specific district and the province, the diphtheria patients could not be stopped. In 1999, there was a major changes in sociopolitical condition in Indonesia. The president and his regime stepped down after 32 years ruling the country. This major changes gave consequences in most aspects of life, including immunization and other health related programs. Few years after, the responsibility of some major programs like immunization were transferred to the districts, instead of in the hand of the Ministry of Health.^{1,2,3}

The schedule of diphtheria vaccine in Indonesia consists of 7 times of vaccination. Three times will be given in the first year and then followed by boosters at 18 month, 4-5 years, and the last two at the elementary school. All districts run the same schedule, however, the geographical condition, the local infra structures, and the quality of the head of the districts will play major roles. Many areas in Indonesia had low coverage of basic immunization.^{2,3} The aim of this study was to analyze the three year surveillance of diphtheria outbreak in East Java Indonesia

Methods

This report was based on surveillance data collected at East Java Provincial Health Office from all 38 districts since January 2011 until December 2013. The data sources were the district hospitals, provincial hospitals, the local health officers, the family of the patients, and the contacts. The collected data were

identity (like name, sex, age), the demographical data (such as address, the parents, and the close contacts), and also the surroundings (houses and the environment). We also recorded the immunization history, clinical features (based on the history and physical examinations), the treatment, and all additional laboratory data if available. Microbiology data was based on the specimen from throat and nasal swab. The specimen was sent to 1 of 2 main laboratories in Surabaya and Malang. Usually the report would be made on weekly basis but in some certain areas where cases were detected, the report from the district would be made on daily basis. All reports were collected at East Java Provincial Health Office. This data was also sent to Jakarta (The Ministry) on the same day or couple days after.

Results

From 2011, there were 2226 cases in total, reported from 38 districts (100%). The highest annual number in the history was recorded in 2012 with 955 clinical cases. Among those cases in three years, female (51.7%) slightly outnumbered male. The patients were mostly below 15 years old (1226; 56.42%), however the trend for the last few years showed the increasing number of adults. Based on the immunization status, in 2012 the percentage of unimmunized patients, partially immunized, and completely immunized by age were 39%, 49.3%, and 11.7%, respectively. From three years data, the complete immunization by age group were 14.2%. In 2012, from 827 specimens, 88 (10.6%) yielded toxigenic *C. diphtheriae* (WHO standard method). Figure 1 describes the overall incidence by year in East Java from 2000 until 2013. Figure 2 shows the age distribution of the patients and figure 3 shows the immunization status of the diphtheria patients. Figure 4 shows the distribution of the *Corynebacterium diphtheriae* by districts in East Java Province.

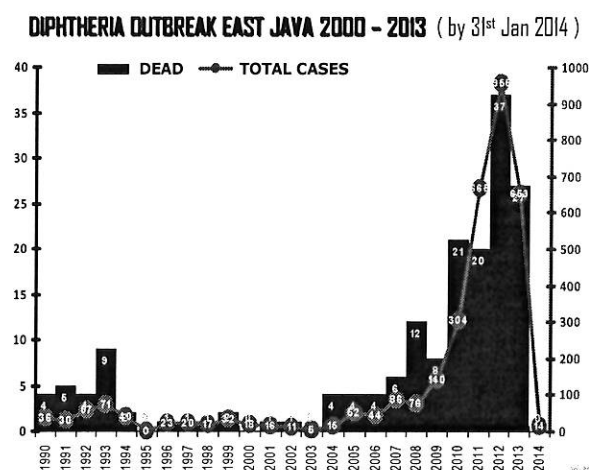


Figure 1. The diphtheria incidence in East Java from 2000 until 2013

AGE DISTRIBUTION OF DIPHTHERIA PATIENTS DURING THE OUTBREAK – EAST JAVA 2005 – 2013

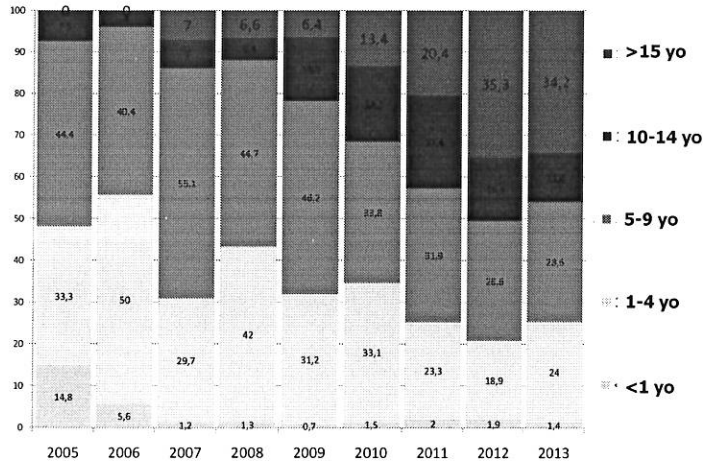
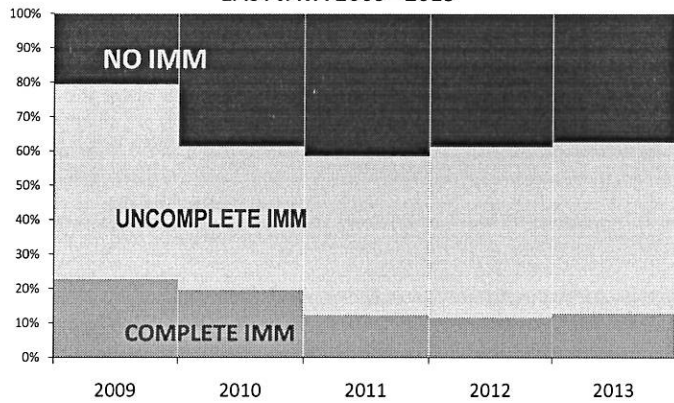


Figure 2. Age distribution of diphtheria patients in East Java 2005 - 2013

DISTRIBUTION OF IMMUNIZATION STATUS – DIPHTHERIA OUTBREAK EAST JAVA 2009– 2013



NOTE :
 Complete Imm : Complete by age, with written document
 Uncomplete Imm : not complete by age, no written document
 No Immunization : Never received immunization

Figure 3. Immunization status of diphtheria patients in East Java 2009 - 2013

During this outbreak, several efforts have already been done, i.e.:

- Limiting the cases - Controlling the morbidity and mortality (*short term*)
 - Early detection and referral system
 - Case and contact management
- Limiting the transmission and new cases(*short term*)
 - Epidemiology investigation
 - Outbreak Response Immunization: 3 rounds in certain areas

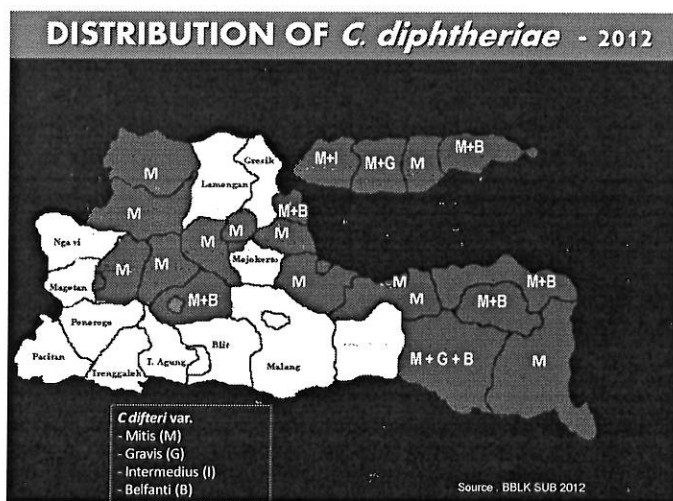


Figure 4. Distribution of Corynebacterium diphtheriae by districts in East Java 2012

Discussion

Diphtheria is one of the most deadliest disease, especially in the pre-vaccine era. This disease was known since the era of Hipocrates (5 AD). In 1900s the fatality rate can reach as high as 50%. The high number of cases was reduced gradually after the discovery of diphtheria vaccine in the 1920s by Gaston Ramon.^{4,5}

The most severe outbreak of diphtheria was recorded in 1990-1998 in Russia and the surrounding countries. The breakdown of that country made many health programs uncontrollable, especially in the poor parts. The change of immunization program, the quality of the vaccine, and the low quality of the house and surroundings in many parts of those countries contributed significantly to the outbreak. Russia got tremendous supports from many developed countries and, certainly, WHO and other health organization all over the world.^{6,7}

Data from The Ministry of Health of Indonesia showed the coverage of the basic immunization, including diphtheria was actually not bad. Many provinces could reach more than 90%, despite the question

about the data accuracy. We assumed the coverage on the district level were actually much worse than the provinces.²

In every outbreak of the diphtheria the main cause was the low level of immunity. The best way to get the immunity was by immunization. Low coverage means many people were not protected and the outbreak would follow.^{6,7}

The official announcement of outbreak in East Java was made by the governor on November 10, 2011. Since then, the activity of reporting increased and make the peak number in 2012. Not all of the province were suffered from this outbreak. The deadliest damage were found on the horse-shoe area. This includes Madura Island and all districts on the northern parts of East Java. This picture also happened previously in relation with other outbreak such as poliomyelitis.⁸

During the Russian outbreak, most patients were adult.^{6,7} In East Java, the majority of patients were under 15 year-old. Until today there is no official program for adult diphtheria immunization in Indonesia, except the suggestion for health care workers to repeat the diphtheria vaccination regularly. The government through the ministry and the province tried their best to stop the outbreak, however, the number of cases are still high. We need more time and better plan to stop the crisis.

Conclusion

Since 2011, there was a diphtheria outbreak in East Java Indonesia. The highest number of patient was recorded in 2012. Most of the patients were unimmunized or partially immunized. The positivity rate of microbiology culture was low. Despite many actions in affected area, until this year the outbreak cannot be stopped.

Keywords : *diphtheriae outbreak, East Java Indonesia, surveillance*

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