

# Taming the Zoonosis in Tropic: Rise of Rabies (*hondsdotheid*) as an Endemic Disease and Its Containment in Colonial Indonesia, 1870s-1930s

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**Abstract:** Rabies, or canine madness, is one of the most frequent zoonotic diseases, mainly through the bite of a dog. The disease presumably had been in existence long before the coming of Europeans, as raising a dog and other rabid animals had been a strong tradition among indigenous people. Yet, it was only in the mid19th Century, with the establishment of colonial administration, that rabies began to be recorded, and then only at the end of the Century did the colonial government perceive it as a dangerous disease, especially in Java. This study seeks to investigate why rabies became a public health issue only later at the end of the 19th Century. What factors influenced the rise of this disease, how did local people perceive it, and what was the colonial government's response to this disease? This paper argues that rabies was an endemic disease before the colonial authorities acknowledged it and that it continued until the end of the colonial period, based on colonial publications and other pertinent sources, mainly newspapers. The limited records and belated development and introduction of medical science became contributing factors to the tardiness of government responses in resolving this endemic disease. Rabies remained a threatening public issue after Indonesia became independent.

**Abstrak:** Rabies, atau penyakit anjing gila, merupakan salah satu penyakit zoonosis yang paling sering terjadi, terutama melalui gigitan anjing. Penyakit ini mungkin sudah ada jauh sebelum kedatangan bangsa Eropa, karena memelihara anjing dan hewan lain yang terkena rabies merupakan tradisi yang kuat di kalangan penduduk asli. Namun, baru pada pertengahan abad ke-19, dengan berdirinya pemerintahan kolonial, rabies mulai tercatat, dan baru pada akhir abad tersebut pemerintah kolonial menganggapnya sebagai penyakit berbahaya, terutama di Jawa. Penelitian ini berupaya menyelidiki mengapa rabies baru menjadi masalah kesehatan masyarakat pada akhir abad ke-19. Faktor-faktor apa yang memengaruhi munculnya penyakit ini, bagaimana masyarakat setempat melihatnya, dan apa tanggapan pemerintah kolonial terhadap penyakit ini? Tulisan ini berpendapat bahwa rabies merupakan penyakit endemik sebelum pemerintah kolonial mengakuinya dan penyakit ini terus berlanjut hingga akhir masa kolonial, berdasarkan publikasi kolonial dan sumber-sumber terkait lainnya, terutama surat kabar. Keterbatasan data dan keterlambatan pengembangan serta pengenalan ilmu kedokteran menjadi faktor yang menyebabkan lambatnya respons pemerintah dalam mengatasi penyakit endemik ini. Rabies tetap menjadi masalah publik yang mengancam setelah Indonesia merdeka.

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## INTRODUCTION

In a report published in 2007, the World Health Organization (WHO) declared rabies an endemic disease in many countries. This disease is caused by a kind of virus (*rhabdovirus*) that lives in rabid animals' saliva, especially dogs, cats, and monkeys. It is transmitted into humans' bodies through the bite of those animals. The virus attacks the peripheral nervous system and slowly spreads to reach the central nervous system, creating serious and deadly consequences. If it affects the human body, the normal impact is a *hydrophobia* symptom, namely the phobia of water to the extent that the sufferer will be afraid of water, avoiding it, including drinking and causing acute dehydration that can be fatal to the human immune system (World Health Organization, 2007, p. 5). In modern-day Indonesia, rabies is widely known as *penyakit anjing gila*, which etymologically means "mad dog disease", referring to its main causal factor, the bite of a dog, which is often regarded as an unexpected thing due to the special position of the dog as the closest domesticated animal to human life (*Bahaya Penyakit Rabies*, 2019).

In the same report, WHO unveils that rabies is the world's tenth mortality cause due to infection of the human body. This is especially true among poor people in third-world nations; nevertheless, the exact incident caused by this ailment has yet to be determined. Around the world, 99 percent of rabies-related deaths were reported in third-world nations, with over half of the cases affecting children under the age of 15 (World Health Organization, 2007, p. 13). In 2005, WHO received several reports disclosing the fact that there were 60,000 deaths every year caused by this disease, mainly in Asia and Africa. WHO's own investigation finds out that in India, only 20,000 deaths are reported annually meanwhile, in China, since May 2006, rabies has been reported as the main cause of death due to infection, taking the life of 3,293 in 2006, 27% higher than the previous year (Knobel et al., 2005). These facts confirm that developing countries, including Indonesia, are until now the epicenter of rabies. Yet, WHO views these countries, as well as developed countries, as paying little attention to this disease, so this world organization has called rabies "the most neglected public health issue" until now (World Health Organization, 2007).

The neglect of rabies and its consequences does not appear to be limited to medical and public health research. It can also be found in the study of social science and humanities, such as medical history. Neil Pemberton and Michael Worboys argue

that research about the history of rabies in a global context is still relatively limited and has little attention from historians, despite the disease having been known since antiquity and its cultural significance is recognizable – particularly when it is concerned with the dog's position in human life (Pemberton & Worboys, 2007). Studies on rabies and its history, according to these scholars, can lead to a better understanding of the following four aspects: (1) the relation between medical science/human health with veterinary science/animal health; (2) the interaction of knowledge among professionals and non-professional/popular concerning (infectious) diseases; (3) the role of government/state in controlling the spread of infectious diseases through animals; (4) the changing position of dog and its domestication and ownership system in society. In essence, the study of the history of rabies, according to these scholars, can offer a better understanding of the rise of medicine and human health science related to animal health. It can also provide a better understanding of the rise of the state and surveillance institute of human and animal health, and the changing position of the dog in human life, which altogether become part and parcel of the rise of modern society and the modern world (Pemberton & Worboys, 2007, pp. 5–8).

Nowadays, scientists have given more serious attention to rabies and its related problems. Some studies have shed light on this contagious disease's social, cultural, and medical dimensions. John Douglas Blaisdell, for example, wrote a Ph.D. thesis about rabies in the 18<sup>th</sup> century in the United Kingdom and North America (Blaisdell, 1995), while Bert Hansen published a lengthy article about the reactions of American society in welcoming the first medical invention to handle rabies in French in 1885 (Hansen, 1998, pp. 374–418). Then Lance Sittert and Sandra Swart coo-edited a book that investigated the history of dogs in South Africa (Sittert and Swart, 2008), in which a chapter written by Lance van Sittert discusses specifically the rabies pandemic in the country in 1893 (van Sittert, 2008, pp. 111–143). Another book by Eric T. Jenning examines the local government's efforts to solve the rabies epidemic in colonial Madagascar from 1899 to 1910 (Jennings, 2009, pp. 263–282). Jessica Wang presented her research on the same issue but in a different location, namely, in New York, the United States of America, during the period 1830–1920 (Wang, 2009). Karen Brown contributes another look at the rabies pandemic in South Africa (Karen, 2011), while Bill Wasik and Monica Murphy wrote a popular historical study about the cultural history

of rabies all over the world (Wasik & Murphy, 2012).

Similarly, the evolution in the international academic world and historical studies on rabies in Indonesia are still rare, despite Indonesian historians' growing interest in medical history research. Perhaps the work of Budi Gustaman is the most recent historical study about rabies in Indonesia (Gustaman, 2020). In his article, Gustaman focuses on the issue of animal welfare, particularly dogs, which were thought to be the carriers of rabies and hence became the main target of killing in the campaign to eradicate rabies in the Netherlands Indies. Nevertheless, he provides historical information about the development of rabies as an endemic disease since the end of the 19th century. The absence of historical studies on rabies in Indonesia is surprising, given the abundance of colonial writings on the subject and the fact that rabies is still a current and relevant concern in Indonesia. Some colonial publications on rabies are the works of J. Groneman (Groneman, 1906), Ch. W.F. Winkel (Winkel, 1918), and Felix Ortt (Ortt, 1927). In addition, the colonial government also published a handbook on rabies containing the ordinance or regulation concerning rabies in 1916 (Departement van Binnenlandsch Bestuur, 1916). These documents demonstrate that rabies was seen as a significant disease in the Netherlands Indies and that the government and colonial officials paid close attention to it and made concerted measures to combat it.

Considering the shortcomings of historical studies about rabies in Indonesia, this paper seeks to fill the gap by examining rabies as a public health issue in Java and government efforts to overcome it in the late colonial period. The main question to be answered is why and in what way rabies "emerged" as a public health issue in Java and how the colonial government solved the problem. The following follow-up questions will supplement this: When did rabies initially appear and was identified in the Netherlands Indies? How threatening was the disease to society? How did the local population perceive it and what kind of medication did they have to cure it? How and since when was rabies considered a public health issue? What kind of measures or policies were adopted by the colonial government? And how did medical knowledge and medication for rabies develop and help the government in handling the rabies pandemic in Java and the Indies as a whole?

## **METHOD**

This paper applies extensive documentary research

perusing a variety of historical sources to answer those research questions, primarily colonial archives collected from the National Archive of Indonesia (ANRI), colonial government official publications, and contemporaneous newspapers, both were accessed from an online database of Leiden University and digital collection of the Dutch National Library ([www.delpher.nl](http://www.delpher.nl)). The collected data is analyzed through in-depth reading and inter-textual comparison and then interpreted with the help of modern literature. As for analytical framework, this paper follows the argument of Pemberton & Worboys (2007), who suggest that a rabies study should cover four aspects: first, it will discuss the history of rabies as a public health issue in the world and especially in the Indies; and the position of dogs and other rabid animals after the outbreak of the disease. Then, it continues with the discussion of colonial government policies in handling the disease, including the way they developed and expand the medical knowledge and medical facilities related to the disease care, in distributing information and public education about the disease, and establishing a surveillance and control system of dogs and other rabid animals that potentially could generate contagion of this disease in society. A reflective conclusion will end the paper's discussion.

## **ORIGINS AND EARLY HISTORY OF RABIES**

In the literature, it was mentioned that rabies is one of the oldest diseases that infect humans and animals at once, and its history can be traced back to early human civilization. In his classic and famous work, "Iliad," Homer has mentioned the rabies phenomenon when he describes the story of Sirius, Orion's favorite pet, who was seen to have caused negative impact on people living around it. The mad dog scenario that erupted across the Mediterranean, Egypt, and Rome was then attributed to Sirius. Yet, it was Democritus who became the first person to make a written description of rabies around 500 BC. This step was followed up by Roman writers and physicians, including Aristoteles, Plutarch, Xenophon, and many more. Since the beginning of the Christian Era, there has been major growth in rabies publications, particularly in places under Roman Empire, particularly in Greece and Creta, where rabies was more common than in earlier eras (Steele, 1975, pp. 2–3).

Until the Middle Age, according to James H. Steel, most rabies cases were casuistical in nature triggered by the bite of a mad dog, fox, wild dog, and bear. The rabies epidemic was first recorded in Franconia in 1271 when an invasion of foxes to ru-

ral and urban areas in the region caused 30 people to die. In 1500, Spain was also hit by an explosion of rabies. In 1586 a similar explosion of rabies cases also took place in Austria, Hungary, and Turkey. Paris and other parts of Western Europe were also affected by a large-scale rabies plague in 1604. Britain gained its turn in the 1700s when rabies hit the country badly throughout the period 1734–1735. During those years, it was reported that London had a significant health problem due to the wild, insane dogs that roamed the city's streets. As a response, the municipal government of London issued an order to capture all dogs found in the streets of London within one month and banish them. For each of the captured and banished dogs, the government provided a financial reward to attract attention and stimulate the participation of the city dwellers (Steele, 1975, pp. 6–7).

The rabies phenomenon continued to spread in Europe and other parts of the world. Throughout the 19<sup>th</sup> century, rabies had become a common problem in the entire European continent, notably in French, Germany, Britain, and the Netherlands. Similar situations were also found outside Europe, where many European travellers and settlers were concentrated. In 1819, for example, the Canadian city of Ottawa had an increase in rabies cases. In 1835, there were also reports of rabies outbreaks in Chile, which were followed by the spread of rabies to other parts of Latin America. In Asia, rabies cases were first in Hong Kong in 1857, then in Canton in 1860, and continued to spread to Beijing and Shanghai in the following years. In 1858, rabies had reached the African continent, spreading on a large scale in Algeria. This forced the French colonial government to take a radical approach by banishing all dogs that were considered to be containers of the disease. In 1860, it was recorded that rabies had infected the local population in North America, taking an increasing number of lives (Steele, 1975, p. 81).

The fast spread of rabies over the world drew scholarly attention from a variety of fields. Throughout the 18th and 19th centuries, rabies became the focus of discussion and scientific research among medical observers and practitioners, who tried to understand its nature and find its medication and medical treatment. According to John Douglas Blaisdell (Blaisdell, 1995, pp. 4–5), the central theme of discussion about rabies is related to the fact that proper diagnosis of this disease was considered almost impossible. The rabies diagnosis in that period was based on two theories; (1) all biting dogs are mad dogs, and (2) whoever got bitten

by the mad dog will get a rabies infection, even though the symptoms appear years after the infection. The issue is that rabies diagnoses have always been made purely based on symptoms that arise after a bite, leading to unclear and extremely subjective processes. Meanwhile, humans and animals share many diseases that could produce symptoms similar to those of rabies. Shortly speaking, an accurate diagnosis of rabies in this period could only be achieved when the infected people were dying or dead, so through a postmortem analysis or autopsy.

That reality has stimulated many physicians and medical experts to find a more robust and precise diagnosis method for rabies to improve the existing therapy and medical treatment. One of them is Louis Pasteur, a French medical scientist, who was widely recognized as the inventor of the proper diagnosis method for rabies at the end of the 19th century. Pasteur presented his first discovery and innovation in 1881, following a series of medical experiments. After multiple revisions, the complete form of that innovation was submitted to the French Scientific Academy in 1885. One year later, Pasteur reported the result of his treatment method to 350 rabies patients. The result showed that there was only one single patient proved to have been infected with rabies after three weeks of the bite. Based on this finding, Pasteur persuaded the French Scientific Commission to establish a center for the antirabies vaccine. The institution that was named later after his name, Pasteur Institute, provided treatment and produced rabies vaccine not only for French but also for non-French people who needed it (Robbins, 2001; Steele, 1975, pp. 21–22). In a short period, the Pasteur Institute grew fast and established branches practically everywhere in the world, including in the colonies, where it became a hub for academic study on rabies and other microbial, parasitic diseases. In the Netherlands Indies, The Pasteur Institute was established in 1893 in Weltevreden with complete support from the Netherlands Indies government. The institute was planned to function as a laboratory for pathological anatomy and bacteriology (*laboratorium van pathologische anatomie en bacteriologie*), with a main task to overcome the rabies pandemic. Early discussion about the plan to establish this institute had been reported in local newspapers, such as in *Java Bode*, on October 10, 1893.

#### **RABIES AS A PUBLIC HEALTH ISSUE IN JAVA**

From the discussion above, Europeans have known rabies, including its sources, symptoms, and effects that might appear on human bodies. This also ap-

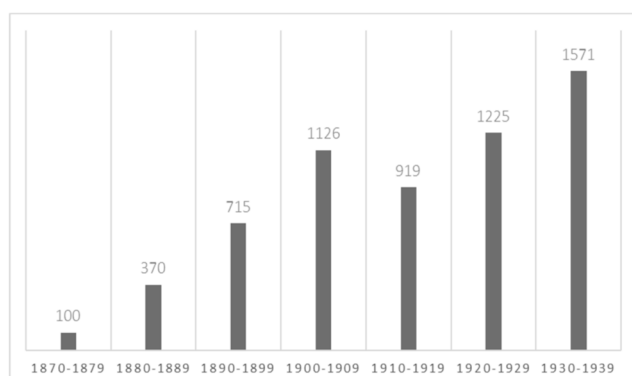
plies to the Dutch, who have been familiar with this disease since 1822 when it hit the country on a large scale (Looff, 1903, pp. 3–4).<sup>2</sup> Therefore, theoretically, they brought their knowledge and information about rabies to their colony, the Netherlands Indies. Moreover, local populations have a long tradition of domesticating dogs and other rabid animals, long before the coming of Europeans, which makes them prone to getting a rabies infection. According to Peter Boomgaard, the habit to domesticate dogs was found almost everywhere in the archipelago, among aristocrats or elite circles or common people, who used dogs mainly for hunting and guarding cattle or fields (Boomgaard, 1997, pp. 194–202; Raffles, 2008, p. 21). Thomas S. Raffles explains in his classic work that dogs were not only the most popular domesticated animal in Java but also a wild animal for other ethnic groups. The number of wild dogs was much bigger than the domesticated ones. This includes what local people called *Asu Wawar*, *Asu Ajag*, and *Asu Kikik*. Yet, it is still need to ascertain whether those domesticated dogs or the wild one that became the cause of rabies in that period of time. In addition, rabies threats in the archipelago could also emerge from wild animals that inhabit forests or jungles around there.

Early information about the existence of rabies in the Netherlands Indies is very limited, and it was only detected much later when newspapers began to appear in the country. Citing the work of Wiggers, Budi Gustaman, for example, argues that symptoms of rabies infection were found for the first time in the case of a Javanese colonial soldier who was bitten by a dog in February 1891 (Gustaman, 2020, p. 360). This was followed by a case of a child bitten by a dog in Palimanan Cirebon in 1894, which had more obvious rabies signs. It seems Gustaman bases his information on the publication of the Pasteur Instituut, which was assigned to handle the rabies patients and started its function officially in the 1890s. A survey in the database of colonial newspapers, [www.delpher.nl](http://www.delpher.nl), which the National Library of the Netherlands developed, shows that rabies cases have already been reported in colonial newspapers since the 1850s. For example, *De Oostpost*, edition of March 23, 1853 contains news about the spread of rabies plague (*plaag hondsdoelheid*) on a large scale in Manado, Northern Celebes caused by dogs bite. The plague was considered different from that happening in Europe, where rabies attacked not only humans but also cattle that were bitten by dogs. The news did not mention human casualties from the plague, but it mentions that hundreds of dogs in

Manado were killed as they were considered the main cause of the plague. “Soerabaija, Den 23sten Maart,” 1853. A similar news was also published by *De Java Bode*, edition of 30-3-1853. For information, newspapers began to publish in Java in the VOC (*Vereenigde Oost-Indische Compagnie*) period, namely in 1718 when the VOC established a “state printing agency” for its official publication. Diantaranya adalah *De Bataviaasche Nouvelles*, *Bataviaasche Koloniale Courant*, *Gouvernementsbladen*, and many more. By then, private newspapers flourished in several cities in Java and outside Java (Hoogewerf, 1990, pp. 22, 26–27).

The death case from rabies in Java was found in the reportage of *de locomotief*, a Semarang-based private newspaper dated May 7, 1866. The incident occurred in Mojokerto toward the end of April 1866, when a nine-year-old girl was bitten by her dog while they were playing together. The girl’s wound was healed, but after 33 days, she suffered from *hydrophobia* or rabies symptoms and then died (*De Locomotief*, 7-05-1866). A couple months later, another rabies death was reported in Pasuruan on September 12, 1868, this time a Chinese woman, Lien Tjie, who was bitten by a wild dog, *anjing kampung*, three months before and then suffered rabies symptoms before she died (*Bataviaasch Handelsblad*, 19-09-1868). According to Budi Gustaman, the term *anjing kampung* was often used to refer to dogs that were held and domesticated by indigenous people, and most of the dogs were Indian pariah or Balinese mongrel kinds. Unlike dogs domesticated by Europeans, which were often expensive, clean, and in good care, those *anjing kampung* were viewed as dirtier, more aggressive, and hence more probable as a container of rabies virus to humans (Gustaman, 2020, p. 359). The case and news about rabies deaths were reported and circulated by other newspapers that appeared at the same time in various cities in Java and Sumatra becoming public knowledge and in the long run gradually forging a public concern and anxiety about this disease.

The rabies death cases became a regular feature in the newspaper’s reportage in the later period. Quantitatively, the number of newspaper articles concerning rabies and related issues in the Netherlands Indies increased progressively from the 1870s up until the last decade of the colonial period. It must be underlined here that not all those newspaper articles contain information about the rabies pandemic. Many of them were indeed informing rabies cases from all over the Netherlands Indies and abroad, but the remaining articles re-



**Figure 1.** Newspaper articles concerning rabies in the Netherlands Indies, 1870–1939 (Source: Extracted and developed from [www.delpher.nl](http://www.delpher.nl))

ported discussions or scientific forums or the newest research findings concerning rabies, the government's plan related to rabies, medical advertisements, short stories, and many more. Due to the lack of data and statistics about rabies infections, the increasing number of newspaper articles concerning rabies can be used to indicate the rise of rabies cases in the Netherlands Indies, as reported by the local newspapers. However, one thing for sure is that the increase in newspaper reportage about rabies means strengthening discourse and public concern about the danger of rabies as a transmissible disease in the Netherlands Indies. Figure 1 presents the development of rabies reportage from the 1870s until the 1930s, which shows the last decades of 1930s as the highest period due likely to the increasing number of rabies cases but also the rise of public concern and media coverage over the disease.

Other evidence of the increasing public attention on rabies can also be seen from the rise of opinion articles in the newspapers that provide evaluative and critical assessments or summaries of a scientific article regarding rabies and “scientific” works and pamphlets written by physicians, medical experts, and public health observers concerning rabies condition and development in the Netherlands Indies. An example of the first type of publication is a long article titled “*Hondsdolheid Rabies Canina Hydrophobia Lyssa*,” by an anonymous writer and published as a series of articles in three editions of *Bataviaasch Nieuwsblad*, a leading newspaper led by P.A. Daum on September 12, 13, and 14, 1887. These pages go into detail about the characteristics of rabies, the symptoms, its progression in Europe, and scientific research on rabies and its treatment approaches around the world.

An example of the first publication is a long article titled “*Hondsdolheid Rabies Canina Hydrophobia Lyssa*”, written anonymously and published

as a series in three consecutive editions of Batavia-based newspaper led by P.A. Daum, *Bataviaasch Nieuwsblad* from September 12 to September 14, 1887. The article discusses at length the characteristics of rabies, its symptoms, its transmission in Europe, and information about scientific research and medical treatment of rabies in different parts of the world (“*Hondsdolheid Rabies Canina Hydrophobia Lyssa*,” 1887). It appears that the article was produced to inform the public about rabies and how to treat it medically. Interestingly, not long after it, another anonymous article was published at *Java Bode*, which contains slightly contrasting information from the previous articles. The article criticizes the ways the government and the police handled the rabies pandemic by slaughtering or permitting “the killing” of 3000 dogs suspected of the virus container (“*Beleid van Politie En Hondenmoord*,” 1887).

Meanwhile, a pamphlet about rabies published to respond to the rise of rabies endemic is exemplified by the work of Dr. J. Groneman, a medical practitioner in Batavia, titled *Noodwang Tegen 't Hondengevaar* (emergency of the dog's threat). As implied by the title, the author describes the danger of rabies disease caused by a mad dog bite, which, at the time of its publication at the end of the 19th century and early 20th century, was already at an emergency level. According to Groneman, rabies cases increased significantly from time to time to the extent that they showed endemic characteristics, and hence, a serious medical strategy was needed to handle them. Most of the rabies infection cases were found in Java and Sumatra, where 95% were caused by dog bites, and the rest were by the bites of monkeys, horses, cats, and other live stocks. Groneman also suggested all animal lovers give proper health care to their pets, as it happened that even friendly and tamed pets could attack and bite their owners and people around them. Groneman expected that a government tax on dogs (*hondenbelasting*) could enhance that kind of awareness, while at the same time, the Pasteur Instituut could provide service to many more rabies patients (Groneman, 1906).

The most important development in the expansion of the rabies danger discourse is the emergence of a concrete Netherlands Indies government response toward the rabies issue. It can be seen at least from two related policies that the government issued in the early 1890s, namely, the introduction of government regulation of rabies handling known as *hondsdolheid-ordinance* on July 9, 1890, and the establishment of Pasteur Instituut in 1895. These

policies show the colonial government's seriousness in responding to the spread of rabies infection in the Netherlands Indies. The policies could also be seen as proof that the colonial government had recognized rabies as an endemic disease that endangered public health. *Hondsdolheid-ordonantie* of 1890, which was revised in 1915, contains the ban of importing dogs, cats, and apes from regions affected by rabies plague and the import regulations of the animals from outside the Netherlands Indies. It also contains the provisions for handling dog, cat and apes infected with rabies – to be killed by authoritative officers and the corpse to be buried minimum at a half meter underground and the quarantine requirements for people or animals infected by rabies bites and the decision to set director of agriculture, industry, and trade like the one responsible for the enactment of these regulations (Nassy, 1918, pp. 24–25).

Meanwhile, Pasteur Institute was established in 1893, but the government officially opened it in 1895 with a decree, *Besluit 16 July 1895 No. 15* and *Staatsblad 1895 No. 148*. Article 1 of the decree stipulates that the Institute was officially located in Weltevreden, Batavia with the main task to give medical treatment to rabies patients (*Bijblad Op Het Staatsblad van Nederlandsch-Indie 1897. Deel XXXI, 1897, pp. 388–390*). In addition, the center was expected to research to find a cure for rabies or a new vaccine. For that purpose, the government provided routine yet limited financial support for the institute and sent its director to Paris to the headquarter of the Pasteur Instituut to study rabies treatment methods developed by Dr. Pasteur himself and the technology they used for pathological and microbiology research. Despite having difficulties in the early years of its development, the institute implemented its functions successfully, especially in providing medical care and treatment for rabies patients from various areas in Java and outside Java. The following section will discuss the achievements of this institute in detail.

## COLONIAL GOVERNMENT'S ANTIRABIES MEASURES

The Netherlands Indies government began to show its serious attention to handling the endemic plague of rabies in the early 1890s. Broadly, the Dutch colonial government introduced three main policies in measuring rabies endemic, namely, (1) establishing health facilities and institutions for rabies patients; (2) developing preventive systems and mechanisms to avert the spread of rabies; (3) organizing public education programs on the danger of rabies.

## Establishing health facility and institution

As mentioned in the previous section, the most important policy that the colonial government introduced to overcome the rabies plague was the establishment of the Pasteur Institute, a research institution that functioned as a pathological anatomy and bacteriological laboratory (*laboratorium van pathologische anatomie en bacteriologie*) to produce various vaccines (*parc vaccinogen*) and at the same time functioned as a clinic that provided medical treatment for rabies patients. The Pasteur Institute became a leading institution in combating the rabies plague. It became an indispensable pillar of public health service in the Netherlands India, especially in supporting various vaccination programs, after it was officially established in 1895 through the government *Besluit Juli 16, 1895, No.15* and *Staatsblad 1895 No. 148*. Initially, the institute was housed in Weltevreden, Batavia. However, it was later relocated to a new, larger facility in Bandung.

In the early years of its establishment, the Institute was led by Eilert de Haan as director and had a limited number of modest equipment that restricted its service and operation. Nevertheless, the institute managed to produce inoculation as a remedy to cure the infection of mad dog virus (*hydrophobia*), which is suffered by rabies patients. The inoculation was made using an innovative procedure invented by Louis Pasteur at the Pasteur Institute in Paris and used by Batavia's Pasteur Institute workers who had been dispatched to Paris to examine it previously. Thus, Batavia's Pasteur Instituut was able to provide medical services to rabies patients soon after its opening. In the tenth year of its annual report, the Pasteur Institute claims that 1905, it had already provided medical treatment to 574 rabies patients. The patients con-



**Figure 2.** The office of Pasteur Institute in Weltevreden in 1920 (Source: Digital collection of Leiden University Library, No. KITLV A1350. Retrieved from <https://digitalcollections.universiteitleiden.nl/view/item/768033>, on 12 October 2021.



**Figure 3.** The new building of Pasteur Institute in Bandung around 1931 (Source: Digital collection of Leiden University No. KITLV 5035. Retrieved from <https://digitalcollections.universiteitleiden.nl/view/item/790278>, on 12 October 2021.)

sisted of 210 Europeans and 364 local populations who came from Batavia, Priangan, and Surakarta residencies. Additionally, there were also patients from Aceh, Padang, Sumatra's East Coast, Bangka and Billiton, South Sulawesi, Manado, Ambon, and Seram. Of these patients, 14 patients, 3 Europeans and 11 local people from Gorontalo, Bandung, Bondowoso, Malang, and Tangerang were dead. Based on that data, the report categorizes rabies as a worrying endemic disease in the Netherlands Indies, which required prompt and serious strategy from the government to handle it ("Het Instituut Pasteur in 1905," 1906).

The capability and capacity of the Pasteur Institute in producing antirabies inoculation (*prophylactic inoculation*) increased along with the expansion of better laboratory equipment after Di-

rector A.H. Nijland M.D. took over the institute management in 1908. Pasteur Instituut managed to manufacture hundreds of antirabies inoculations per year under Nijland's direction. Unlike the previous period, the inoculations were no longer produced through the Pasteur method but using a different method developed by Dr. Hogenes—an internal expert of the institute, which was preferable to local physicians working in the institute. Besides producing antirabies vaccine serum to cure patients who suffered from a dog bite, the Pasteur Institute under Nijland directorship also produced various kinds of vaccines for typhoid, cholera, therapeutic, antidiphtheritic serum, antitetanic, antidiphtheritic, and snake-poison antidote. All the products were produced by the Pasteur Institute independently without the help of any institutions from outside the Netherlands Indies (Flu, 1926, pp. 33–35).

According to J.G. Nassy, from 1903 to 1916, the Pasteur Institute of Weltevreden provided medical treatment to a total of 7,904 patients, which consisted of 2,476 Europeans and 5,426 local people (Nassy, 1918, p. 35). It was estimated that 139 patients died as a result of this figure. All rabies patients who could show proof of low income would be eligible for a discount or treatment fee waiver. The complete data of the patients are presented in Table 1.

Equipped only with a modest medical infrastructure, the early year's operation of Pasteur Institute managed to provide medical treatment to many rabies patients coming from different parts of the archipelago. Data in Table 1 shows that rabies

**Table 1.** Rabies patients under medical treatment of the Pasteur Institute Weltevreden, 1903–1916

Year	Europeans	Local People	Local People from Java	Local People from outside Java	Dead Patients
1903	97	225	164	61	11
1904	228	364	284	80	17
1905	217	330	253	77	11
1906	147	325	260	65	12
1907	132	275	221	54	10
1908	135	321	282	39	8
1909	173	410	333	77	5
1910	144	404	342	62	5
1911	179	337	285	52	3
1912	135	362	290	72	7
1913	228	470	409	61	12
1914	260	627	550	77	12
1915	291	616	503	113	17
1916	110	362	288	74	10
Total	2476	5428	4464	964	140

Source: Nassy, 1918, p. 35



plagues afflicted Europeans as well as local populations, with almost equal scale and the ratio of infections annually. According to Nassy's calculation, the number of European patients in ratio to the total European was  $2\frac{1}{4}$  more in comparison with the ratio of "native" patients to their total population, which was 400 times more than the Europeans. This suggests, according to Nassy, that rabies infection was more dangerous to Europeans than to the local population, even though the number of deaths caused by rabies among these two groups of individuals was significantly different, 3 Europeans compared to 139 locals. Moreover, the majority of those passing rabies patients originated from outside Java, so they had to undergo a long trip to reach the Pasteur Institute, and often, it was too late to get medical treatment. This shows that geographical barriers and transportation matter how rabies patients get immediate medical treatment in this institute (Nassy, 1918, p. 36).

Nassy seemed to believe that local people with rabies illnesses who came to the Pasteur Institute for medical treatment represented the entire archipelago's local population. Yet, the data in Table 1 clearly shows that most rabies patients from both European and local people originated from Java, and only a few were from outside Java. The problems of transportation, financial capacity, and access to health and medical facilities were determining factors that influenced how those rabies patients could arrive at the Pasteur Institute. The local population had a more limited restriction in comparison with Europeans or Chinese to reach and access the antirabies medical service, which was provided at that period only in Bandung and Weltevreden, in the Pasteur Instituut. As a result, the number of rabies-infected people in the local population was very certainly significantly higher than the statistics in Table 1. One of the types of evidence is the circulated letter issued by the Head Inspector of the public health office (*Hoofdinspecteur, Chef van den Burgerlijken Geneeskundigen Dienst*), De Vogel, on June 15, 1917 to all head districts (*hoofden van gewestelijk bestuur*) containing instruction to send all of their people suspected to have been infected rabies to the Pasteur Institute to get medical treatment. The Pasteur Institute's director ordered the circulation letter, expressing his concern over the rising number of passing rabies patients who were either too late or did not receive medical treatment at all (*Bijblad Op Het Staatsblad van Nederlandsch Indie Deel LIII No. 8747-8938*, 1918, pp. 89-90).

The circulation letter seemed to have a real

impact. The official report of the Pasteur Institute in 1920 reveals that the number of rabies patients in that year increased remarkably. It is reported that 1,255 people had come to consult and check their condition, whereas, in 1917, the number of patients who came to the institute was merely 742 people. Of these 1255 patients, 367 were declared to have mild rabies symptoms. They needed no intensive care or treatment, while the remaining 888 patients, 402 Europeans and 486 local population, were declared as having more serious rabies symptoms and in need of intensive medical treatment. Out of 888 patients, 38 were allowed to return home after enduring monitoring and moderate treatment, followed by another 94 patients (64 Europeans and 30 local populations) because their last laboratory check confirmed they were free of rabies. Thus, the total number of patients needing full medical treatment was 756, consisting of 315 Europeans and 441 local populations. The majority of them, 683 patients, originated from Java (with a composition of 302 Europeans and 336 locals), and the remaining 118 patients (13 Europeans and 105 locals) originated from outside Java. The same report also mentions that most of the patients, 744 people, were infected with rabies because of dog bites (374 dogs), four patients were infected from monkey bites (2 monkeys), and one patient was infected from the bite of a horse. Of all those patients, nine patients were reported dead at the end of treatment (Anonymous, 1920, pp. 585-587).

Five years later, the 1925 annual report of Pasteur Institute reveals that the number of rabies patients that were taken care of in this institute decreased slightly. It was recorded that 1008 patients came for consultation, and 730 had to undergo further examination, consisting of 200 Europeans and 530 local people. After going through an early screening process, 25 European patients and 42 local patients were declared free from rabies and could return home. The remaining 175 European patients and 485 local patients had to undergo medical treatment. Most of these patients originated from Java, consisting of 121 Europeans and 299 local people, many of them from Priangan with 193 patients and Batavia with 85 patients. The remaining 155 cases came from areas other than Java, with the majority hailing from Manado (57 patients) and Sulawesi and the adjacent islands (43 patients). Of the entire patients mentioned above, six patients were reported dead (Anonymous, 1920, pp. 363-370).

Official data from the Pasteur Institute concerning the treatment of rabies patients after 1925

was not found. However, data from 1915, 1920, and 1925 show that the number of rabies patients seen at the Pasteur Institute grew and remained consistent at over 750 yearly. On the one hand, rabies became an ongoing public health issue in the Netherlands Indies as an endemic threat until the end of the colonial period (but continued in the postcolonial period). Alternatively, the establishment of the Pasteur Institute was highly instrumental and significant for the colonial government and society in general in coping with rabies endemic. However, the government's decision to plot this institute as the only health facility to provide medical treatment for rabies patients resulted in a centralized rabies eradication program that was imbalanced and unable to reach the population of patients living far away from this facility, particularly those outside Java.

### Developing a preventive system and mechanism

In addition to the curative steps of establishing special medical facilities to solve rabies disease, the colonial government also launched preventive policies to minimize and reduce any possible circumstances that could lead to the spreading of rabies disease. Because most patients were infected with rabies from a dog bite, the preventive policies included reducing the population of dogs and developing a controlling and checking system concerning the domestication of dogs. For that purpose, the Dutch colonial government issued at least two related steps: 1) issued a special ordinance concerning rabies and circulated it in the form of a pamphlet under the title *Hondsdolheid-Ordonnantie* ("Ordonansi Penyakit Gila-Anding"), and 2) introducing *hondenbelasting* or tax on the dog.

The *Hondsdolheid-Ordonnantie* was issued in 1915 through *Staatsblad* 1915 No. 302. This regulation was revised and added several times before it was cancelled and replaced by *Hondsdolheid-Ordonnantie* (Ordonansi Penyakit Gila-Andjng 1926), which was based on *Staatsblad* 1926 No. 451. The following paragraphs discuss some important regulations from the two ordinances above. *First*, to reduce the dog population and to prevent the increasing number of "wild" dogs, Article 1 of the ordinance forbade any efforts to import dogs, cats, and apes without written permission from the appointed authority, namely, the director of agriculture, industry, and trade service (*Landbouw, Nijverheid en Handel Dienst*) (Departement van Binnenlandsch-Bestuur, 1919, pp. 9–23). Meanwhile, any export of the previously mentioned animals from outside the Netherlands Indies must go through

medical examination, quarantine, and customs police in the following ports: Tanjung Priok, Cirebon, Pekalongan, Semarang, Surabaya, Belawan-Deli, Sabang, Padang, and Makassar. The owners of the exported animals had to pay the examination check and the quarantine process amounted to 2,5 guilders per animal (*Voorschriften Ter Bestrijding van Hondsdolheid. Handleiding Ten Dienste van de Indlandsche Bestuursambtenaren Op Java En Madoera*, No. 21/L.N.H., 1929, pp. 25–42).

Another important provision concerns the steps to take if the imported animal shows rabies symptoms. The provision is regulated in detail in articles 7 to 13. In principle, if the imported animals display rabies symptoms during the quarantine procedure, the owner must write a report to the authorities, particularly the government's veterinarian, the quarantine officer, and the local government's head, within 24 hours. The suspected rabies animal then must be tied and locked up to keep it in control, but if those steps put the officer in danger, then the owner is requested to kill the animal. Suppose the government's veterinarian can ensure that the animals (dog, cat, and ape) have rabies infection. In that case, the animal must be killed immediately and burned down by the police or other officers who were approved by the police. If the animal corpse cannot be burned, it can also be buried in a hole at least one meter deep. The owner of a rabies-infected animal can propose clemency for his animal but his proposal has to be approved by experts and the head of local government no later than five days, and if it is granted, then the rabies-infected animals have to be locked up for four months (Departement van Binnenlandsch-Bestuur, 1919, pp. 25–28; *Voorschriften Ter Bestrijding van Hondsdolheid. Handleiding Ten Dienste van de Indlandsche Bestuursambtenaren Op Java En Madoera*, No. 21/L.N.H., 1929, pp. 43–48).

Closely related to the *Hondsdolheid-Ordonnantie* is the colonial government policy to introduce tax (on) dogs (*hondenbelasting*). The dog tax was enacted much earlier, namely through *Staatsblad* 1906 No. 283. The stipulation was that everyone who has a dog as a pet must register his dog ownership and then pay one guilder per dog annually. This tax was one of the urban taxes and its levy was related to the decentralization policy. Most of the taxpayers of the dog tax were Europeans who often took dogs as their family pets. In 1914, this tax collected 20,500-guilder revenue. About the Antirabies Ordinance, the dog tax functioned as a government mechanism to control the population of dogs and the legality of their ownership. By paying this

tax, every dog owner gained not only legal recognition but also a guarantee of his dog's hygienic and healthy condition. As evidence of his ownership, the owner must put an "identity necklace" on his dog, whose form and pattern were already regulated by the government. So, it would be easy for the officers to recognize and differentiate it from wild dogs, which were often considered more vulnerable as rabies carriers (*Voorschriften Ter Bestrijding van Hondsdolheid. Handleiding Ten Dienste van de Indlandsche Bestuursambtenaren Op Java En Madoera*, No. 21/L.N.H., 1929, pp. 56–57).

In practice, this *Hondsdolheid-Ordonnantie* of 1926 intensified the killing of dogs and other rabies carrier animals that had been practiced previously in several regions. That happens primarily to wild dogs or is considered to be the one, including "anjing kampung" (rural dogs), often domesticated by local populations. However, the provisions set by the 1926 Ordinance concerning the treatment of rabies-infected dogs, such as locked up, tied, and shot until burned down, were perceived as too cruel (animalistic). A group of activists united as *Nederlandsch Indische Vereeniging Bescherming van Dieren* or NIVBD (Organization of Animal Protection of the Netherlands Indies) protested the provisions that they thought were cruel. As an alternative, they offered a way to kill dogs without hurting them and respected the "animalistic values." Aside from suggesting the use of machete to slaughter dogs, NIVBD offered the use of coal gas as a method to end the life of rabies-infected dogs. The method was considered as not hurting the dog too much because they would faint first after breathing in the gas for 15–20 seconds before finally dying. However, it cannot be ascertained to what extent this NIVBD's plea was accepted or not by the Netherlands Indies government. According to Budi Gustaman, NIVBD abandoned this method, due to the high operational cost of the instrument, its expensive maintenance, difficult service for any damage, and vulnerability to malfunction because of the humid tropical weather (Gustaman, 2019, p. 363). This also has to do with the establishment of *different asyl* (animal asylum) and *different hospitals* (animal clinic/hospital), such as in Bandung, Batavia, and Semarang, where the rabies-infected dogs were collected, quarantined, rehabilitated, and, if necessary, killed in much "softer" ways.

### Organizing public education on rabies danger

Another preventive policy issued by the government of the Netherlands Indies was to provide "public education" for society on the danger of ra-

bies, especially from public health and medical points of view. The policy was implemented by publishing pamphlet books with information about rabies and its symptoms. These books were published in cooperation with the *Volkslectuur* or Balai Pustaka, the government agency that has a program to publish and provide reading materials for the local population. One of the examples of this publication is the book "Andjing Gila" (Mad Dogs) written by Moedaka, which was translated into Malay language and summarized by A. Prawira Soeganda and published by Balai Pustaka in 1919. This 20 more-page book explains rabies disease, its symptoms, and its incubation period, suggested steps to reduce the risk caused by this disease, and technical guidance to register with the Pasteur Institute (Moeldaka, 1919).

The second book is the work of A. Tuyter, a physician, titled "Peladjaran Kesehatan" (Lesson about Health). As the title indicates, the book guides the readers on how to have a healthy life by maintaining their bodies and environmental hygiene. Yet, the book also discusses various tropical diseases that recurrently emerge in the Netherlands Indies. Rabies is among the diseases mentioned in one of the book's chapters, although relatively brief. However, it already provides sufficient introductory information about the disease for students and public readers interested in health issues in this colony (Tuyter, 1930). Another book published for a similar purpose is *Dari Hal Gila Andjing* (It's About Mad Dog), which Amir translated from the original version in Dutch to the Malay Language. One thing that makes the book different is that its content is taken mainly from the *Hondsdolheid-Ordonnantie* 1915 and the revised version of 1916 (B.G.D., 1919).

Apart from publishing the reading books for public education, the Netherlands Indies' government also published all related regulations concerning the handling of rabies, which included the *Hondsdolheid-Ordonnantie* 1916 and *Hondsdolheid-Ordonnantie* 1926, in the format of two languages, Dutch and Malays (Indonesia). These publications were created as handbooks for regional government officials to encourage their participation in the two laws' efforts to combat rabies endemic. Of course, the public also read the books as educational materials to increase their knowledge about rabies. As part of government policy, public education through these publications not only became a supplement but also, in the longer term, could strengthen the Netherlands Indies government's policies to eradicate rabies endemic from this country.

## CONCLUSION

From the entire discussion, rabies was one of the contagious diseases that greatly affected the public health condition of the Netherlands Indies population. Even though early information about this disease only emerged in colonial newspapers around the mid-19th century, as historical reality, rabies could have been there in Nusantara a long time before. This has to do with the fact that the population in many parts of the archipelago had a long tradition of domesticating dogs, cats, apes, and even tigers for various purposes in their daily life. Therefore, rabies disease could have emerged and been known among locals, but it was, of course, a new conception from Western science and medicine. The Dutch colonial ruler established the rabies notion as part of their endeavor to pacify the archipelago, where they finally discovered different diseases and environmental risks that may imperil their lives at any time.

It is quite surprising that the Dutch colonial government did not immediately apply their knowledge about rabies in their colony. Rabies had been spreading in Europe since a much earlier period, and medical science there had developed a cure for the disease. It was only at the end of the 19th century that rabies became a public concern in the colony, and it was considered a serious public health issue showing endemic characteristics that needed an immediate response. The Dutch colonial government took curative and preventive policies and measures simultaneously. The curative measures were adopted by establishing a special medical facility to treat the rabies-infected population. The facility was known as the Pasteur Institute, and it was named after Louis Pasteur, the world's first creator of the rabies vaccine. While giving medical treatment for rabies patients, the institute also conducted microbiology research and produced new vaccines as remedies for other acute diseases, such as typhus, cholera, tuberculosis, pests, and others. Since its opening in 1895, the institute had been flooded by rabies patients from all over the archipelago.

In tandem with curative policies, the Dutch colonial government also developed preventive strategies to overcome rabies endemic in the Netherlands Indies. Among the measures taken was issuing a special regulation concerning the eradication of rabies, stipulating the Pasteur Institute as the main referential institute for rabies medical treatment. In addition, the Dutch colonial government enacted strict regulations concerning trading, transporting, and exchanging such rabies-prone animals

as dogs, cats, and apes. The colonial government also applied a stiff procedure and mechanism to supervise, examine, and eliminate rabies-infected animals. Concerning dogs, the most popular domestic pet, a special tax was introduced to provide a legal basis for ownership status, control mechanism, and supervision of its hygiene. With such a structured mechanism, the dog population could be controlled, and the owners were forced to take care of the cleanliness and health of their pets. The dog population could be managed with an organized method, and owners would be required to care for their pets' hygiene and health. Lastly, the colonial government also launched public education in society by publishing books about rabies's dangers.

All in all, until the end of the colonial period, the combination of those preventive and curative steps and strategies could not entirely successfully eradicate rabies as an endemic disease in the Netherlands Indies. Yet, establishing medical facilities could provide medical treatment for hundreds to thousands of patients annually. This was a perfect sign that public awareness of the significance of receiving medical treatment for rabies infection had substantially improved, as had public understanding of the disease, owing to implementing a dog tax and publications about the disease. On an individual level, people became aware of the cautious way of caring for their pets.

However, the paper leaves important questions unanswered, namely, how is the cultural understanding of Indonesian people about rabies and to what extent the Dutch colonial government's preventive and curative policies change the perception of the local population on the established tradition to take dogs, cats, and other animals as domesticated pets, as well as reduce the number of rabies infection cases in the country. Those questions can be used as a starting point for further research.

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