The History of Medan Pathological Laboratory in 1906-1942

Budi Agustono[1], Wara Sinuhaji[1], Junaidi[2], and Kiki Maulana Affandi[1]
[1]*Department of History, Universitas Sumatra Utara, Medan, Indonesia*
[2]*Department of History, University of Gadjah Mada, Yogyakarta, Indonesia*

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Abstract: Plantation industrialization in East Sumatera had made both various profit and problems to the stakeholders. The increasing of population as the effect of industrialization, at the early of 20th century, not only made a changes to the economy and politics but also to the health issues. Various diseases began to infect people in this area. Those diseases were caused by climate, environment and unhealthy lifestyle. In overcoming the problem, in 1906, the private plantation initiated the establishment of a research institution about tropical diseases in Medan. The research institution was called as Medan Pathological Laboratory. During its development, it was able to solve the problem regarding to the diseases which infected people in the plantation belt such as cholera, dysentery, beriberi, and malaria. The doctors and experts discovered the correlation between the cause of diseases and lifestyle in plantations and environmental conditions in East Sumatera. In the period of development, this colonial health institution had decreased the number of mortality and overcome various epidemics and diseases in East Sumatera.

1 INTRODUCTION

Health issue is a serious matter as well as the population development in a particular area. In East Sumatera, health issue is not a priority; at least until the plantation industrialization entered this region in 1860. The very rapid progress of plantation industrialization in East Sumatera could be said as "*bagaikan gula yang dikerubungi semut"* which this metaphor illustrates that many people from another region came to this region to seek for life, besides of course the natives and the plantation labors. This condition, of course, gave big impact to the number of populations in East Sumatera. Besides that, the environment also changed the effect of drastically expanding plantation area. At the end of 19th century, the change of demography and environment which was very drastic giving impact to health issue which was experienced by people in this region.

One of the health policies which could be considered as big impact to health issue in this region, or even in the Dutch East Indies was the establishment of Pathological Laboratory in Medan (Donath, 1945). The policy of laboratory establishment was the initiation of plantation entrepreneur which then helped by colonial government in its development. Generally, the existence of this laboratory had given important impact to health issue in East Sumatera. This research is aimed to explain the history of pathological laboratory in Medan and also the role and impact within the scope of health in this area. Before that, there will be an explanation about plantation industrialization which is considered as the major factor of health issue in this area.

2 RESEARCH METHODS

This research usages historical method, consists of four stages, nanely heuristic, critics, interpretatin and historiography. Heuristic is used for documents collection, such as documents and goverment official reports as a primary sources. Magazine like Medical Journal of the Dutch-Indies as an object of research as secondery sources. After data collection require verification, inter and extern critics for data findings. Therefore, data is interpreted so that narrated in historiography.

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3 EAST SUMATRA IN THE 19TH CENTURY UNTIL THE EARLY 20TH CENTURY

In colonial era, East Sumatera developed along with plantation industrialization. The starting point of that development was initiated by an entrepreneur from Netherlands, J. Nienhuys. In the beginning of plantation period, in 1860s-1890s, the expansion had a concern on the cultivation of tobacco commodities. From several sources of colonial, it is stated that in the early period, most of regions in East coast of Sumatera were tobacco-planted. Lately, after studies were conducted, it was found that areas which produced tobacco with high quality are between of *Wampu* river and *Ular* river (Pelzer, 1985).

In East Sumatera, the expansion of foreign capital was represented in the form of plantation companies. The first plantation company was NV. Deli Maatschappij which was established in 1869 (Cremer, 1919; Pelzer, 1985). The other plantation companies which were established, they are NV.Tabak Arendsburg Maatschappij in 1875, NV.Deli Batavia Maatschappij in 1877, and NV.Senembah Maatschappij in 1889. Those companies were the parent of some *onderneming* (plantation). In its development, there were 15 *onderneming* in 1873, then increased to 86 *onderneming* in 1884, and then got increasing to 169 *onderneming* in 1891. By the end of 1891 to 1892, a world economy crisis occurred which caused decreasing level *onderneming* in East Sumatera. In 1904, there were 114 *onderneming.* In 1914 that were 101 *onderneming* and in 1930 there were 72 *onderneming* (Jaarverslag ..... 1914, 1915).

The development of plantation industrialization caused changes in East Sumatera. One of the changes was demography. The original inhabitants of this region comprised of Malay, Karonese, and Simalungunese, which was in the growth becoming minority group. And the migrant population covered European, Eastern foreigner (Chinese, India and Arabian) and the natives or Indonesian ethnics such as Javanese, Minangnese, Mandailingnese and others (Loderichs, 1997). This alteration happened as the consequence of migration owing to plantation industrialization which grew rapidly at the early of 20th century. Mostly, the migrants to East Sumatera would work as a labor in plantation. The first labor that migrated to East Sumatera in the end of 19th was Chinese labor, then followed by Javanese labor that became majority community at the early of 20th century until this time.

Besides the diverse ethnic groups that inhabited East Sumatera, the quantity of people also increased significantly. According to prediction data from Thee Kian Wie in 1850s, East Sumatera had been inhabited by 150.000 people. In 1890, the number of citizens in this area rose drastically, that was 285.000 people. The increasing factor caused by the entry of Chinese labours to plantation in East Sumatera. Entering the 20th century, the number of populations in East Sumatera gradually increased. Based on the data obtained, in 1905, population in East Sumatera was recorded as many as 568.417 people, in 1913 (773.106 people), in 1920 (1.197.554), and according to the census which was conducted in 1930 stated that the number of population in this region was 1.693.200 people (Wie, 1977).

Plantation industrialization in East Sumatera had caused several transformations or changes. Besides the demography aspect, there was an environmental change, where the area of East coast in Sumatera which was a *"jungle"* changed to be *"cultuurgebied"* which had very high economic value. The expansion of plantation area and the large increasing number of migrants had caused "bad effect" to East Sumatera condition. One of the bad effects was related to health issue that will be explained in the next discussion (Kouwenaar, 1936).

4 HEALTH

The higher number of populations in one region would give impact to all aspects in life, not only in economic, political and cultural aspect but also in health and environmental aspect. The large increasing number of populations is considered as supporting factor of the emergence of various epidemics. Moreover, the conversion of forest into plantation also caused change on environmental condition. The change of environment quite influenced the spreading of epidemic in one region. In East Sumatera, for instance, before the plantation industrialization, there was no literature found clarifying that there were epidemics in this area. Therefore, the discussion in this article is focused on the changes and health dynamics in East Sumatera during the colonial era by Netherlands.

One of the contributors to the high number of epidemics and death rates in East Sumatera was the condition of labors-plantation's life and environment. Many cases of unidentified epidemics occurred at the end of 19th century until the early of 20th. The most common epidemics were tropical diseases. The hygienic issue in working area was the main cause of spreading epidemics. The diseases caused by dirty environment and poor sanitation were cholera, dysentery, typhus, and malaria. Poor quality of environment and sanitation was the

consequence of unsuitable labors' residence at plantation era during pioneering time, so it caused many infectious diseases and became an epidemic at the end of 19th century (Kouwenaar, 1936). Another factor was tropical climate which was unusual for Chinese labors and vulnerable body condition to disease also accelerated the spreading of epidemics among plantation labors.

In 1891, cholera appeared an epidemic causing high death rate in East Sumatera cholera. The source was from Chinese labors that entered East Sumatera massively (Snijders, 1921). Besides cholera, the disease that spread in East Sumatera at the end of 20th century was beriberi. This disease attacked labors in plantation because of bad condition of food and nutrition. This situation happened a lot in the early of plantation opening, so the spreading of disease became faster. This situation was also generated by many companies that were not aware to labors' health issue since they were only focused on getting high profit specifically from a plantation organized personally (Donath, 1945). The next epidemic occurred in East Sumatera and even in the Dutch East Indies' region was commonly influenza pandemic. In East Sumatera, influenza pandemic had generated the death of population about 2.027 people (Vervoort, 1921).

In addition to epidemic, the tropical climate in East Sumatera actually could cause the diseases which did not find in this area previously. Those diseases were dysentery, typhus, hookworm *(ankylostomiasis)*, malaria plague, smallpox, pneumonia, tuberculosis, fever, meningitis, and leprosy (Kouwenaar, 1936). Several diseases were not only generated by unhealthy and unhygienic environment, but also poor residence and dietary habit could produce dysentery, typhus, malaria, hookworm, and plague (Schuffner, 1914).

Epidemics and the disease spreading in East Sumatera had been the source of high death rate at the turn of the 19th century to the 20th century. According to Kouwenaar, a doctor who was on duty in plantation, the factors generating the diseases and epidemics was the expansion of plantation area, specifically the forest and it caused environmental changes which had "bad effect" than before. Another factor was demography change through massive labors recruitment and natives' migration from other areas arriving to this region to seek life. Those situations had produced a considerable increase in demographics, therefore; it impacted on the change of health quality (Kouwenaar, 1936). Based on those two factors, two issues were obtained namely hygienic and sanitation issue which were crucial health issues at the 20th century.

In responding to the health issues in East Sumatera, the plantation companies and government did various endeavors in maintaining people's health. One of the endeavors was by upgrading the healthy facility in this area. Then, this effort was realized by constructing several hospitals and placing medical team or doctors in that hospital. In its progress, there were an increasing number of hospitals and on-duty doctors. In 1910, there were 22 hospitals and 23 doctors and in 1930, there were 47 hospital and 53 doctors on duty (Kouwenaar, 1936).

According to W.A. Kuenen's, a doctor in plantation, states that health maintenance is mainly addressed to labors in plantation. This was because the labors' conditions were very apprehensive. The amount of labor in plantation was 120.000 people in 1900s. The cost incurred by plantation entrepreneur for the maintenance of labors were about f. 7,- to f. 9,- for every year. According to the calculation then the incurred average cost for labors' health maintenance in plantation f. 960.000,- per year (Kuenen, 1910).

Hygien and sanitation issues in East Sumatera are included as one part of health issue that quite consumed Netherlands' attention at the end of 19th century until the early of 20th century. For that reason, several policies and regulations were made by government in collaboration with plantation entrepreneurs to overcome that issue by constructing hospitals' facility and providing the doctors and other medical teams. Moreover, there was a policy made in order to overcome health issue in East Sumatera i.e. establishing an institution or research institution to conduct studies, as the place of disease study and topical health issue in the Dutch East Indies situated and centred in Medan – as the heart of plantation area – since the location was in Medan then that institution was labeled as Medan Pathological Laboratory.

5 PATHOLOGICAL LABORATORIES

Entering the 20th century, the development of health issue increased more and more in East Sumatera. The health issue was not only as a burden for government but also for plantation entrepreneurs. In the previous discussion, it had been elaborated that the various factors affecting health issue were a massive migration, a worse environmental change, hygien and sanitation issue in East Sumatera. For responding and solving those numerous problems, then, in 1906, health institution was established namely Medan Pathology Laboratory.

This institution was initiated by two functionary plantation entrepreneurs those are Van Vollenhoven,

the chief of Deli Administrator Maatschappij and C.W. Janssen, the director of Senembah Matschappij Company and Medan Tabak Matschappij (Alkema, 1929). At the time of its establishment, this institution was led by a doctor, who was on duty in a plantation company namely Senembah Maatschappij. The doctor is dr. W.A. Kuenen. He is the one who put the principles of institution and policy direction of this laboratory. In addition, he also contributed much in a study about tropical disease which infected many labors in plantation (AVROS, No. 358). Along with W.A.P. Schuffner, they discovered the correlation between the environmental condition and the cause of a disease or epidemic. Some previous researches and policies were made by them then followed by other plantation companies (Schoute, 1934). On the other hand, they also had decreased the level of labors' death in Senembah Maatschappij plantation from 136 death cases of every 1.000 labors in 1891 and it became 10 death cases of every 1.000 labors in 1906. They applied several policies and regulations such as maintenance of hygiene in barrack and labors' residence, concerning on nutritious and adequate food, and treating a sick labor with good facilities and infrastructures such as hospital and clinic in plantation (Schuffner and Kuenen, 1910).

Pathological laboratory had aim to spread widely and give information about public sanitation issue in East Sumatera. Besides, the propaganda of health and hygienic life style was shared. That laboratory was functioned to help doctors or medical experts conducting research in this laboratory. In addition, this laboratory also provided help to the doctors in conducting a research. Therefore, this laboratory would have qualified doctors in bacteriology and serology. There were several activities done in this laboratory such as prophylaxis vaccination (disease prevention), treatment therapies and preparation of diagnosis of disease cases (AVROS, No. 358).

Pathological laboratory is a medium to conduct research and to diagnose various tropical diseases existed in East Sumatera plantation at the end of 19th century. The research in it was done in order to find the cause of a disease, the correlation between symptoms and the environment with the epidemics of disease in one region specifically plantation (Volker, 1928). In its development, this institution improved gradually. The improvement could be seen from the number of conducted researches was 1.311 in 1910, and the highest improvement occurred in 1930 become 30.372, but it got downtrend in 1934 which became 28.553 (Kouwenaar, 1936).

In the early stage of operation of this laboratory, all administrative activities were entirely supported by the company of Deli Maatschappij, Senembah Maatschappij and Medan Tabak Maatschappij. Gradually, along with the development, there were many plantation companies, private plantations, and plantation hospitals turned to be the members of this laboratory. The contribution of the members was to give donation or membership fee every month. In the period of 1909-1920, it was recorded that 45 plantation companies were the members of Medan pathological laboratory (AVROS, No. 358).

The number of members progressively increased particularly from rubber plantation companies. Each member donated fund to this laboratory. The calculation of contribution was based on the large number of labors in each plantation. The plantation which was the member of institution was obliged to pay contribution fee of f. 0.50 for each labor per month (Wolff, 1930). Except the contribution fee, there was a contribution from Netherlands colonial government. In 1918, Netherlands colonial government issued a policy to assist operational cost for the institution by giving f. 500 every month (AVROS, No. 358). The next stage, operational budget escalated every year. And then, the management and distribution of the operational budget of the institution was controlled by governmental health institution namely BGD *(Burgerlijken Geneeskundige Dienst)* (Alkema, 1929).

On 1st November 1920, there was a transfer and collaboration occurred between laboratory institution and plantation entrepreneur association i.e. DPV (Deli Planters Vereeniging) and AVROS (Algemeene Vereeniging Rubberplanters ter Oostkust van Sumatra). This transfer was continued even though the plantation condition was less profitable in recent years. By this transfer, it caused a change in the formation of the institution's management, so the policy issued also changed (AVROS, No. 358).

In the organizational structure of the institution, it incorporated the board of directors which was in 1921 consisting of 2 representatives from DPV, 2 representatives from AVROS, and 1 person was the director of laboratory institution. Moreover, the institutional structure comprised of the director, the vice director, laboratory doctor, assistant of bacteriology and serology department, and the secretary. Besides the organizational hierarchy which mostly consisted of Europeans, there were also staffs and employees from the natives positioned as foreman, laboratory staffs, assistants, attendants, office clerks, photographer and drivers (AVROS, No. 358).

The first director was dr. W.A. Kuenen who was on duty in the period of 1906-1916. During his era, the organizational structure and institute's duty were assisted by vice director dr. J.J. van Loghem starting from 1908 to 1909 and then dr. H. Vervoort in

starting from 1913 to 1914. The assistant of bacteriology and serology department was held by J.v.d. Bosch (1909-1912) and P. de Haan (1915). Meanwhile, the doctors who conducted researches in the laboratory were dr. J.J. van Loghem (1909), dr. H. Vervoort (1910, 1913-1916), dr. N.H. Swellengrebel (1912), dr. M. Bluml and the plantation doctors were dr. N.H.v.d. Heyden (1913), E.P. Snijders (1914-1921), a plantation doctor namely dr. E.v.d. Velden (1915), dr. I.W. Holm, a plantation doctor namely dr. A. Klett, and three government native doctors were dr. Abdul Mochtar, dr. Andu, dan dr. Moh. Sjaaf (1916) (AVROS, No. 358).

After dr. W.A. Kuenen, the next director of laboratory was held by dr. H. Vervoort in 1916-1921. Then, the vice director position was held by dr. E.P. Snijders in 1920-1921 and the assistant of bacteriology and serology department was held by dr. P. de Haan (1917-1921), and the doctors working and conducting researches in laboratory were dr. R.V. Vollenhoven, dr. O. Imhoff, dr. P.P. Leendertz, and two government native doctors namely dr. Sitanala and dr. Raden Pratomo (1918), and four plantation doctors namely dr. G.W. Pott Holstede, dr. K. Surbek, dr. E.R. Luyken Roskott, and dr. J. Feilzer (1919) (AVROS, No. 358).

In the work and research sharing, those were coordinated entirely by director as the person in charge of the institution. But, in 1916, there were some working adjustments implemented by the institution such as the activity of bacteriology department, anatomical pathology, and the supervision of chemical analysis were responsible to dr. E.P. Snijders, while serology department activity, vaccination preparation, and cleanliness were responsible to the director of institute was dr. H. Vervoort (AVROS, No. 358).

In addition to these internal activities done by personnel of pathological laboratory institution, the staffs or doctors conducting research in the laboratory also did external activity such as representing various activities i.e. conducting researches, attending health congress, eradicating the diseases and others. Some other activities took place in 1909, the vice director, dr. J.J. van Loghem represented the institution to attend Bombay Health Congress in India. In 1913, the director of institute, dr. W.A. Kuenen gave a lecture about health issue and handling of amoebic dysentery disease representing Medical Community in the Dutch East Indies in Far East Tropical Health Associations Congress which was held in Saigon. In 1915, dr. Vervoort along with the director of the Public Works Department *Gemeente* Medan, J. Hogervoorst conducted a working visit to Singapore and the State Government of the Malay peninsula to conduct a study about waste disposal and incineration issue and also some other issues such as urban hygiene and sanitation issue. In the same year, the director of institute, dr. W.A. Kuenen a conducted an official trip to conduct a study about health to Java Island. Health issue which was studied by him was plague epidemic issue in Java Island (AVROS, No. 358).

In the early of 1919, dr. Vervoort was assigned by the head of Public Health Service Inspectorate to do a further research and study about the improvement of houses, barracks, warehouses, and settlements to Java Island. This thing was done after considering the causes and risks of plague epidemics which were most in that environment. In addition, he also got specific order from entrepreneurs association in Deli related to this issue by visiting and doing further investigation in the plantation office and labors' houses. This policy was in line with the reorganization of health and sanitation management throughout the plantation region (AVROS, No. 358).

In November 1919, dr. Vervoort conducted an investigation to Java Island through the command of the ADEK *(Algemeen Delisch Emigratie Kantoor)* board of director or Deli General Immigration Office. In his visit, dr. Vervoort was assigned to ensure that the cause of disease and high number of mortality due to influenza amongst the immigrant labors in Java and to identify the steps to improve the health condition of labors in plantation. The step done was to re-examine the labors recruited by DPV and AVROS in Medan. It is coordinated with the ship's doctor and the doctor at the gathering place of labors (Hong) in Deli (AVROS, No. 358). This step was also applied as a precaution to avoid the spreading of influenza epidemics widely.

Pathological laboratory institution improved rapidly from time to time, it could be seen from the number of this institute's members. In 1929, the number of members had reached 414 plantations with 327.200 employees. The details of members were 93 members from DPV, 278 members from AVROS, and 43 members from other organizations. At that time, the operational cost also reached f. 175.232,58. The total of operational budget already included the contribution fee or subsidy from Netherlands colonial government which reached f. 12.000 (Wolff, 1930).

6 CONCLUSIONS

Medan Pathological Laboratory established in 1906 was an influential health research institution concerning on health issue specifically in East Sumatera. The establishment of this institution was

initiated by plantation company especially NV. Deli Maatschappij, NV. Senembah Maatschappij, and NV. Medan Tabak Maatschappij. The purpose of this institution was to be a medium of place to conduct research and to diagnose various tropical diseases existing in the plantation of East Sumatera at the end of 19th century. The research was aimed to find the cause of a disease, the correlation between the symptoms and environment, and the spreading of epidemics in a region particularly in plantation area. Besides that, this institution also shared propaganda of health and hygiene life style. This institution was aimed to provide assistance to doctors or health experts who conducted a study in this laboratory. This institution had qualified doctors in conducting a research related to serology and bacteriology.

During its development, Medan Pathological Laboratory had conducted some researches and discovery related to disease and health issues in East Sumatera. The cause and the correlation of what makes the disease such as cholera, beriberi, influenza, and etc. had been discovered. Centred in Medan, pathological laboratory had several facilities such as research room, library, and houses for labors. The members of this laboratory were mostly plantation companies which provided major contribution to the operation of this laboratory.

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