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Medicine, health, and development in Indonesia

On August 17, 1945, two days after Japan capitulated, Sukarno and Mohammad Hatta, Indonesia's first president and vice-president, declared Indonesia's independence. At that time, several physicians had been discussing plans for the organization of medical education, healthcare, and public health in the newly independent nation, which were suffused with ideas about development, modernization, and the role of science and medicine in achieving both. Similar ideals had already been formulated by Indonesian intellectuals before the turn of the twentieth century; they soon became central in the philosophy of the Indonesian nationalist movement. Because the Netherlands refused to recognize Indonesia's independence and sent military troops to recover its former colonies, the realization of these plans had to wait for four and a half years. After the transfer of sovereignty from the Netherlands to the Republic of Indonesia on 27 December 1949, physicians faced the daunting task of establishing medical education, and rebuilding and expanding healthcare institutions, guided by the conviction that the population's health was essential for the nation's development.[1]

In this article, we analyze how Indonesian conceptions of development were related to ideas about health during four periods, following conventional demarcations in Indonesian historiography. We relate these conceptions to fundamental demographic changes, changing challenges and health outcomes, and changes in the provision of healthcare. We commence with the notions of development articulated by Indonesian physicians and other intellectuals during colonial times, from the 1880s to the end of the Japanese occupation (1942–1945) and the war of independence (1945–1949). Before 1949, Indonesian physicians debated the various interrelationships between medicine, health, and develop-

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1 Our discussion of notions of development is inspired by Ariel Heryanto's seminal essay *Language of Development and Development of Language: The Case of Indonesia* (Canberra: Research School of Pacific and Asian Studies, Australian National University, 1995). See also Ariel Heryanto and Nancy Lutz, "The Development of 'Development,'" *Indonesia*, no. 46 (1988): 1–24. Although the Indonesian words for development distinguished here were at times used interchangeably; we distinguish them here for clarity and analytical purposes.

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ment; articulated health policies but were hardly able to implement these. After independence, this changed. During the Sukarno era (1950–1965), which constitutes the second period to be discussed, physicians developed plans on the organization of healthcare, which they could only implement to a limited degree because of political instability and economic problems. Through the expansion of healthcare provision and the introduction of antibiotics, mortality rates related to infectious diseases declined and life expectancy rose.

In November 1965, general Suharto seized power during a bloody coup, inaugurating the New Order [*Orde Baru*], also named the Development Order, which focused on industrialization, economic reconstruction, and reforming agricultural production. During the Suharto era (1965–1998), the third period analyzed in this article, the number of medical schools increased, community health centers were established all over the country, and vertical health initiatives targeting malaria and smallpox were implemented. Indonesia's standard of living, overall welfare, and health outcomes increased significantly. Finally, after the end of Suharto's dictatorial rule in 1998, the fourth period covered in this article, the rhetoric around development receded. Although the introduction of universal health insurance in 2014 made healthcare much more accessible, Indonesia faces a variety of health challenges for which the healthcare system is ill prepared. While life expectancy continues to increase, noncommunicable and chronic health problems, including mental health issues, became more prevalent amid the still common infectious diseases, indicating that Indonesia is currently passing through the epidemiological transition, facing multiple burdens of disease.

Indonesian physicians in colonial times

From 1851 until 1924, physicians were the only Indonesians who had received any scientific training. That year, a Technical School was established in Bandung, which primarily focused on engineering; it provided instruction in scientific methods as well. A very small number of Indonesians received training in medicine, biology, and engineering outside the colonies, mostly in the Netherlands. Consequently, the number of Indonesians who had received any scientific instruction during the colonial period remained very small, although the influence of this small group was nonetheless significant. In colonial times, Indonesian physicians and medical students were enthralled by the promises of modern science and medicine to improve living conditions in the Indies, thereby realizing progress and development. During the 1880s, Indonesians who had received Western education—doctors, teachers, clerks, and junior officials employed by

the colonial state and Dutch businesses—started discussing science, progress, and the promises of modernity or *kemajuan* (progress, development) in the burgeoning vernacular press. *Kemajuan* is a concept rich in meaning: it suggests possibilities for increasing one's social status, but also of attaining "educational progress, enlightenment, civilization, modernization, and success in life."[2] The small group of Indonesians conversant with these ideas valued Western-style education, mastery of the Dutch language, technological innovation, and the new printed mass media highly.

During the nineteenth century, the colonial medical service was operated by the military and primarily provided medical care to soldiers, officers, and colonial officials. Indonesians only received medical attention when their afflictions potentially affected the European inhabitants of the colonies. The extensive smallpox vaccination campaigns, which commenced during the first part of the nineteenth century, constituted one of the few health initiatives undertaken by the Dutch colonial administration that had some effect for Indonesians, at least on Java.[3] In the 1870s, the indigenous population started to be of interest to European physicians, as several tobacco plantations in the Deli area around Medan (North Sumatra) introduced medical services to safeguard the health of their work force, which consisted of coolies or indentured workers.[4] Most of them had been recruited in China or on Java, which was relatively expensive. Plantation managers hoped to maximize the productivity of their workforce and expected that health measures would result in overall savings and increased profits. Public health measures were introduced, and hospitals and a medical laboratory established. The research evaluating their combined effect demonstrated significant gains in health status, life expectancy, and productivity of the workforce.[5] After 1880, several missionary organizations started to provide medical care to Indonesians, but their coverage was patchy at best.

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2 Ahmat B. Adam, *The Vernacular Press and the Emergence of Modern Indonesian Consciousness* (Ithaca, NY: SEAP, 1995), 80.

3 Peter Boomgaard, "Smallpox, Vaccination, and the Pax Neerlandica, Indonesia, 1550–1930," *Bijdragen tot de Taal-, Land- en Volkenkunde* 159, no. 4 (2003): 590–617. See also Peter Boomgaard, "The Development of Colonial Healthcare in Java: An Exploratory Introduction," *Bijdragen tot de Taal-, Land- en Volkenkunde* 149, no. 1 (1997): 77–93.

4 The conditions at the plantations in the Deli area were abysmal and abuses of laborers were rife. See Ann Laura Stoler, *Capitalism and Confrontation in Sumatra's Plantation Belt, 1870–1979* (Ann Arbor, MI: University of Michigan Press, 1985); Jan Breman, *Taming the Coolie Beast: Plantation Society and the Colonial Order in Southeast Asia* (Delhi and New York: Oxford University Press, 1989).

5 W. Schüffner and W.A. Kuenen, "Die Gesundheitlichen Verhältnisse des Arbeiterstandes der Senembah-Gesellschaft auf Sumatra während der Jahre 1897 bis 1907: Ein Beitrag zu dem Prob-

In 1901, the Dutch parliament adopted the so-called Ethical Policy to guide colonial governance. According to its principles, the Netherlands recognized the responsibility to foster the further development of its colonies towards eventual independence instead of merely viewing them as sources of profit.[6] During the first part of the twentieth century, economic, religious, and ethical imperatives demanded safeguarding and improving the health of Indonesians. Medical education had commenced in Batavia in 1851 on a very modest scale at the local military hospital. In 1902, the Batavia medical college (School for the Education of Native Physicians; *School ter Opleiding van Inlandsche Artsen*; STOVIA) moved to new, purpose-built quarters, which were funded by three leading (and exceedingly wealthy) plantation owners from the Deli area, who were convinced that the Dutch East Indies needed more, and more affordable, physicians.[7]

At the turn of the twentieth century, developments within medicine had inspired increased optimism about its potential efficacy. In the 1870s, the bacteriological revolution led by Louis Pasteur and Robert Koch had revolutionized medical research, medical care, and public health; it also had started to influence routine hygienic practices. Around 1900, the parasitological revolution provided significant new insights into various tropical diseases. This revolution was inspired by the work of Ronald Ross, who had identified mosquitoes as the primary vector of disease transmission in malaria.[8] At the same time, X-Ray machines became available in the colonies and the possibilities of aseptic surgery expanded. In combination, these developments increased the optimism of physicians in the efficacy of modern medicine. They also increased public confidence in the ability of medicine to maintain the health of both European settlers and Indonesian laborers in the colonies.

In colonial times, a modest number of Indonesians received instruction at Dutch university medical schools; most of them were trained at the medical colleges in Batavia (today: Jakarta) and Surabaya, both of which had a practical or

lem der Assanierung großer Kulturunternehmungen in den Tropen," *Zeitschrift für Hygiene und Infektionskrankheiten* 64 (1909): 167–257.

6 Robert Cribb, "Development Policy in the Early 20th Century," in *Development and Social Welfare: Indonesia's Experiences under the New Order*, ed. Jan- Paul Dirkse, Frans Hüsken, and Mario Rutten (Leiden: KITLV Press, 1993), 225–245.

7 Liesbeth Hesselink, *Healers on the Colonial Market: Native Doctors and Midwives in the Dutch East Indies* (Leiden: KITLV Press, 2011), 167.

8 Laurence Monnais and Hans Pols, "Health and Disease in the Colonies: Medicine in the Age of Empire," in *The Routledge History of Western Empires*, ed. Robert Aldrich and Kirsten McKenzie (New York: Routledge, 2014), 270–284.

professional curriculum.[9] The degrees awarded by these colleges were considered inferior to those from European university medical schools, which were academic in nature and primarily provided training in conducting medical research. Because of their practical training, Indonesian physicians earned much less than their European colleagues, and generally occupied subordinate and less desirable positions in the colonial medical service. Indonesian physicians were acutely aware of their inferior status and earnings, which fueled the desire for equality with European physicians with respect to education, income, and placement. They consequently emphasized the emancipatory aspects of developmental ideas and envisaged themselves as participants in cosmopolitan scientific and medical communities, which they believed valued education, training, and skills regardless of race and ethnic background. In 1909, they founded the Association of Native Physicians (*Vereeniging van Inlandsche Artsen*; later: Association of Indies Physicians; *Vereeniging van Indische Artsen*) to improve their professional position and emancipate themselves with respect to their European colleagues.[10]

In 1927, the Batavia Medical School [*Geneeskundige Hoogeschool*], which awarded degrees equivalent to those awarded by Dutch university-affiliated medical schools, commenced operations. The same year, the Batavia medical college (STOVIA) no longer accepted new students and offered enrolled students the opportunity to transfer to the new institution. Indonesian physicians had long advocated the establishment of a fully-fledged medical school in the Indies, which would enable them to attain the same medical degrees as their European colleagues. Unfortunately, the Batavia Medical School did not offer bursaries and the tuition fees were too high for most Indonesians. Most students were Dutch, Indo-European, or Chinese Indonesian.[11]

In the 1930s, the Rockefeller Foundation, at times with reluctant cooperation from the Dutch East Indies Public Health Service, initiated several demonstration projects in rural hygiene in an impoverished rural area in Java.[12] The Foun-

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9 The Batavia medical college was founded in 1851 as the Dokter Djawa School (School for Javanese Physicians). In 1901 it was renamed School for the Education of Native Physicians [School tot Opleiding van Inlandsche Artsen; STOVIA]; in 1913, it was renamed again as the School for the Education of Indies Physicians [School tot Opleiding van Indische Artsen; the acronym remained STOVIA]. The medical college in Surabaya was named the Dutch Indies Physicians School [Nederlandsch-Indische Artsen School; NIAS]. For a history see Liesbeth Hesselink, *Healers on the Colonial Market*.

10 Hans Pols, *Nurturing Indonesia: Medicine and Decolonisation in the Dutch East Indies* (Cambridge: Cambridge University Press, 2018), 102–115.

11 Pols, *Nurturing Indonesia*, 139–141.

12 The program is described in J.L. Hydrick, *Intensive Rural Hygiene Work and Public Health Education of the Public Health Service of Netherlands India* (Batavia: Author, 1937). See also Pols,

dation's officers were guided by the idea that health was a necessary condition for economic development.[13] They established several small clinics providing basic medical assistance, primarily focusing on maternal and child health. They also encouraged Indonesians to build latrines and change health behaviors through elaborate public health education projects that focused on hookworm and malaria.[14] These projects were of little interest to Dutch physicians, who preferred to work in the large urban centers in well-equipped modern hospitals while maintaining lucrative private practices on the side. Many of their Indonesian colleagues, however, were interested in these projects because they demonstrated how basic healthcare could be provided to the vast majority of Indonesians. Abdul Rasyid, a member of the colonial parliament throughout the 1930s and, in 1939, the newly elected president of the renamed Association of Indonesian Physicians, was impressed by these projects, which inspired him to articulate his ideas about "medical nationalism."[15] He argued that medical care should no longer rely on expensive and technologically-intensive hospital-based care, but focus instead on increasing the number of low-cost clinics providing basic medical care as well as on enlisting the population in hygienic efforts through intensive public health education.

In colonial times, the activism of Indonesian physicians initially focused on protesting the dualistic organization of the Dutch East Indies Health Service, which relegated them to secondary and subordinate positions. In the 1930s, they embraced Rasyid's medical nationalism and started contemplating how medical care could benefit all Indonesians. They also established contact with indigenous physicians in other Asian countries, which assisted them in formulat-

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Nurturing Indonesia, 138–60; Eric Andrew Stein, "Colonial Theatres of Proof: Representation and Laughter in 1930s Rockefeller Foundation Hygiene Cinema in Java," *Health and History* 8, no. 2 (2006): 14–44; Eric Andrew Stein, "Hygiene and Decolonization: The Rockefeller Foundation and Indonesian Nationalism, 1933–1958," in *Science, Public Health, and the State in Modern Asia*, ed. Liping Bu, Darwin H. Stapleton, and Ka-Che Yip (New York, 2012), 51–70.

13 John Farley, *To Cast out Disease: A History of the International Health Division of the Rockefeller Foundation (1913–1951)* (New York: Oxford University Press, 2004).

14 These programs, and the philosophy that inspired them, were presented to the world at the Intergovernmental Conference on Far-Eastern Countries on Rural Medicine, which was held at Bandung in 1937. According to several historians of medicine, the ideas presented there prefigured those presented at the 1978 Alma Ata conference on primary healthcare. See Theodore M. Brown and Elizabeth Fee, "The Bandoeng Conference of 1937: A Milestone in Health and Development," *American Journal of Public Health* 98, no. 1 (2008): 40–43.

15 Pols, *Nurturing Indonesia*, 148–153.

ing alternatives to the organization of medical care in the Indies.[16] When they were seeking to emancipate themselves and when they were advocating horizontal, community-based health initiatives, they were guided by ideas of *kemajuan* or development, emphasizing different strands—emancipation, access to medical care—within the complex set of ideas encompassed within that concept. Despite their involvement in colonial politics and their explicit ideas about the organization about medical care, Indonesian physicians were hardly able to implement their ideas.

The Japanese occupation (1942–1945) and the Indonesian war of independence (1945–1950)

The Japanese occupation, during which the Indonesian archipelago became part of the Japanese colonial empire, led to significant changes in medical research, medical education, and the organization of health care. Batavia's Medical School was renamed *Ika Daigaku* [Japanese: medical school] and came under the leadership of a Japanese dean and a small number of Japanese professors.[17] Several leading Indonesian physicians were appointed to key positions in the medical school, the health service, and various public health initiatives. Through the intervention of the Japanese, the emancipation of Indonesian physicians was realized to a much greater extent than had been possible under Dutch rule. All European physicians (except German ones) were interned and relieved of their official functions. Because the Japanese had outlawed the Dutch language, medical teaching had to be conducted in Indonesian (Malay), which at that time was rapidly developing. Indonesian physicians established a committee to determine Indonesian counterparts for Dutch and Latin medical terms.[18] They viewed devel-

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16 Sunil S. Amrith, *Decolonizing International Health: India and Southeast Asia, 1930–1965* (Houndmills, Basingstoke, Hampshire: Palgrave Macmillan, 2006).

17 Soejono Martosewojo, "Risalah Pembentukan Djakarta Ika Dai Gaku," in *125 Tahun Pendidikan Dokter di Indonesia 1851–1976*, ed. M.A. Hanafia, Bahder Djohan, and Surono (Jakarta: FKUI, 1976), 33–34; T. Karimoeddin, "Pendidikan Dokter Jaman Pendudukan Jepang (Ika Dai Gaku)," in Hanafia, Djohan, and Surono, *125 Tahun Pendidikan Dokter di Indonesia*, 26–32.

18 Achmad Ramali was associated with this committee. The results were published as Ahmad Ramali and K. St. Pamoentjak, *Kamus Kedoktoran: Arti dan Keterangan Istilah* (Djakarta: Djambatan, 1953). The most recent edition is Ahmad Ramali, K. St. Pamoentjak, and Hendra T. Laksman, *Kamus Kedoktoran: Arti dan Keterangan Istilah*, 25th ed. (Djakarta: Djambatan, 2003). See also Leo Suryadinata and Hock Guan Lee, eds., *Language, Nation and Development in Southeast Asia* (Singapore: Institute of Southeast Asian Studies, 2007).

oping a suitable vernacular medical language as central to their efforts to create an Indonesian medical profession.

The Japanese physicians stationed in Indonesia introduced their Indonesian colleagues to Japanese conceptions of public health, which were, in turn, derived from German approaches which had been incorporated into Japanese medical thinking.[19] According to Japanese physicians, medicine and public health were essential tools for nation building; their ideas reinforced Rasyid's medical nationalism.[20] In a speech to Indonesia's physicians in 1944, Sukarno, who served various roles within the Japanese military administration to maintain and enhance the loyalty of the Indonesian population to the Japanese regime, emphasized that their work was not limited to "*treating the sick*, but also looking after and taking care of the Indonesian people so that they become a very healthy and physically strong nation (*rakyat sehat dan kuat*)." During the 1950s, the phrase "healthy people, strong nation (*rakyat sehat, negara kuat*)" became one of the main slogans of public health initiatives.[21] The Japanese established neighborhood associations across Indonesia as a conduit for political propaganda and public health education; they also intended to establish clinics in each. These neighborhood associations were later used for the same purposes by the Suharto regime; they still exist today.

Soon after Japan's capitulation and the declaration of Indonesia's independence, the Dutch started to send troops to reclaim their former colonies. In 1949, anticipating the end of the Dutch colonial empire, the Dutch scientific elite in Indonesia celebrated their scientific accomplishments.[22] Despite their pride in their accomplishments in the Indies, the Dutch colonial administration had hardly provided any form of education to most Indonesians. In 1942, over 90 percent of Indonesians were illiterate and there were a mere 500 Indonesian physicians, only about 30 of whom had academic qualifications.

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19 Hoi-eun Kim, *Doctors of Empire: Medical and Cultural Encounters between Imperial Germany and Meiji Japan* (Toronto: University of Toronto Press, 2014).

20 Pols, *Nurturing Indonesia*, 161–182.

21 Emphasis in original. Quoted in Pols, *Nurturing Indonesia*, 167.

22 W.H. van Helsdingen, *Daar Wèrd Wat Groots Verricht: Nederlandsch-Indië in de Twintigste Eeuw* (Amsterdam: Elsevier, 1941); Pieter Honig and Frans Verdoorn, *Science and Scientists in the Netherlands Indies* (New York: Board for the Netherlands Indies, Surinam and Curaçao, 1945). For medicine see the series of articles in the journal *Quarterly Journal of Tropical Medicine and Hygiene* in 1949.

According to Peter Boomgaard, the population of Southeast Asia hardly grew during the eighteenth century.[23] During the nineteenth century, population size and life expectancy were slowly increasing. During the last decades of the nineteenth century, life expectancy was around 30 years, a figure significantly depressed because of high infant mortality rates. During the 1870s, the biological standard of living as measured by human body size declined as a consequence of famine and epidemics, and only recovered slowly during the following three decades. Average heights increased from the turn of the twentieth century, a trend that accelerated after World War II.[24] Even though the Dutch colonial administration had been proud of its health initiatives, health expenditures were minimal and colonial health initiatives only had a very limited effect on the life expectancy of Indonesians. Not surprisingly, conditions during the Japanese occupation and the war of independence adversely affected health. After 1950, because of better sanitation, increasing standards of living, easier access to healthcare, and the availability of antibiotics, a rapid decline of mortality related to infectious disease took place, leading to a fundamental demographic transition.[25]

Health and medicine in Indonesia after 1950

After the transfer of sovereignty on 27 December 1949, the political, social, and economic environment for medical care, medical education, and public health changed dramatically. The Indonesian government aimed to transform colonial institutions for higher education into institutions educating professionals to staff its bureaucracy, schools, and businesses.[26] In the 1950s, Indonesians faced the daunting task of establishing government institutions and a national infrastructure during a period of economic instability and political unrest.

23 Peter Boomgaard, "The Demographic History of Southeast Asia in the Twentieth Century," in *Histories of Health in Southeast Asia: Perspectives on the Long Twentieth Century*, ed. Tim Harper and Sunil S. Amrith (Bloomington, IN: Indiana University Press, 2014), 87–98.
24 Jörg Baten, Mojgan Stegl, and Pierre van der Eng, "The Biological Standard of Living and Body Height in Colonial and Post-Colonial Indonesia, 1770–2000," *Journal of Bioeconomics* 15, no. 2 (2012): 103–122.
25 See the essays in Tim Harper and Sunil S. Amrith, eds., *Histories of Health in Southeast Asia: Perspectives on the Long Twentieth Century* (Bloomington, IN: Indiana University Press, 2014).
26 Despite this, some critics have argued that too many elements from colonial times have been retained. See, for example, Denys Lombard, *Nusa Jawa, Silang Budaya: Kajian Sejarah Terpadu*, trans. Winarsih Partaningrat Arifin, Rahayu S. Hidayat, and Nini Hidayati Yusuf, vol. 1, *Batas-batas Pembaratan* (Jakarta: Gramedia, 1990), 121–124.

Ideas about development during the Sukarno era (1950–1965) resembled those formulated during colonial times: modernization was seen as the main goal, experts and administrators were seen as essential, and (foreign) experts were highly valued. At this time, the primary concept associated with development was *perkembangan* (root word: *kembang*, flower), which has organic connotations of growth, flowering, and flourishing, and implies participation, mutual cooperation, and being strong and self-reliant.[27] Education, especially at the primary level, was considered of utmost importance.[28] To realize a flourishing nation, Indonesian politicians were convinced that vast numbers of teachers, engineers, lawyers, doctors, and other professionals were needed.

During the Cold War, the United States, the Soviet Union, and, later, China commenced offering developmental assistance to newly independent nations to gain their political allegiance.[29] President Sukarno eagerly accepted such offers but also played donors off against each other to maintain the country's independence. Indonesia opposed free trade, the abolition of tariffs, and free rein for international corporations, all of which were promoted by the United States. Instead, Sukarno aimed to make Indonesia self-sufficient with respect to food (in particular rice), natural resources, and technical expertise.[30] The goal of self-sufficiency was central to the Asian-African Conference that Indonesia hosted at Bandung in April 1955; delegates argued that newly independent nations should retain control over their natural resources and build up local expertise in exploiting them, which would reduce their dependence on the developed world. The Bandung conference aimed to foster an alliance between recently decolonized countries by forming a third, independent voice in international affairs.[31] Health and medicine were seen as essential in the newly independent country because they could help foster a healthy, strong, and vigorous population which could

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27 For a discussion of different Indonesian conceptions of development, see Heryanto, *Language of Development*.

28 Suzanne Moon, *Technology and Technical Idealism: A History of Development in the Netherlands East Indies* (Leiden: CNWS, 2007).

29 Sara Lorenzini, *Global Development: A Cold War History* (Princeton, NJ: Princeton University Press, 2019).

30 Bradley R. Simpson, *Economists with Guns: Authoritarian Development and US–Indonesian Relations, 1960–1968* (Stanford, CA: Stanford University Press, 2008), 13–36. For food and agriculture, see Suzanne Moon, "Takeoff or Self-Sufficiency: Ideologies of Development in Indonesia, 1957–1961," *Technology and Culture* 39, no. 2 (1998): 187–213.

31 Christopher J. Lee, *Making a World after Empire: The Bandung Moment and its Political Afterlives* (Athens, OH: Ohio University Press, 2010). See also Seng Tan and Amitav Acharya, eds., *Bandung Revisited: The Legacy of the 1955 Asian-African Conference for International Order* (Singapore: NUS Press, 2008).

play its part in realizing these developmental ideals. Medical research that could contribute to realize these goals—such as research into nutrition—was generously funded.[32]

Resurrecting colonial institutions for higher education (in particular medical education) and medical care as well as making them suitable for the newly independent nation was challenging.[33] In 1951, the Ministry of Education and Culture established a program for higher education and set out the parameters for scientific research.[34] First, the needs and demands of the state took precedence over those of pure research—or, as it was expressed in the Ministry's words, research and higher education needed to develop in harmony with the state. Second, to stimulate the development of the Indonesian scientific community, universities and research institutions had to give priority to Indonesians when hiring staff. Promising future academics received scholarships for advanced study abroad. Third, the Dutch language was outlawed while Indonesian was preferred; although English was tolerated, few Indonesians spoke it. Finally, instead of graduating small numbers of highly qualified academic researchers, as had been the aim of Dutch medical schools and the Batavia Medical School, Indonesian universities were instructed to graduate large numbers of teachers, physicians, engineers, and lawyers, as there was a dire shortage of all these professionals.

In the early 1950s, Indonesian physicians formulated plans to reform medical education. Until then, medical education had been based on the academic "free study" model which the Batavia Medical School had introduced in 1927. Medical education was primarily oriented towards inculcating academic skills, students worked at their own pace, and examinations were held only once a

32 Vivek Neelakantan, *Science, Public Health and Nation-Building in Soekarno-Era Indonesia* (Newcastle upon Tyne: Cambridge Scholars, 2017), 49–51. At this time, Poorwo Soedarmo was the leading medical researcher on nutrition. For his autobiography see: Poorwo Soedarmo, *Gizi dan Saya* (Jakarta: Fakultas Kedoktoran Universitas Indonesia, 1995).

33 For a report on the success of Indonesianizing the University of Indonesia see Willard A. Hanna, "From Universiteit to Universitas: The 'Indonesiatization' of a Dutch University," *American Universities Field Staff Reports, Southeast Asia Series* 4, no. 17 (1956): 1–17.

34 See R. Thomas Murray, *A Chronicle of Indonesian Higher Education: The First Half Century, 1920–1970* (Singapore: Chopmen Enterprises, 1973), 40–172; William K. Cummings and Salman Kasenda, "The Origins of Modern Indonesian Higher Education," in *From Dependence to Autonomy: The Development of Asian Universities*, ed. Philip G. Altbach and Viswanathan Selvaratnam (Dordrecht: Kluwer, 1989), 143–166; R.M. Koentjaraningrat and Harsja W. Bachtiar, "Higher Education in the Social Sciences in Indonesia," in *The Social Sciences in Indonesia*, ed. R.M. Koentjaraningrat (Jakarta: LIPI, 1975), 1–42; Bachtiar Rifai and Koesnadi Hardjasoemantri, *Perguruan Tinggi di Indonesia* (Jakarta: Departemen Perguruan Tinggi dan Ilmu Pengetahuan, 1965).

year. Consequently, only a small number of highly qualified medical researchers graduated each year. To meet the country's urgent need for more physicians, instructors associated with the Faculty of Medicine at the University of Indonesia decided to reform medical education following the American model, which was known as "guided study."[35] Medical education became cohort-based, attendance at lectures and practical classes compulsory, and examinations were held regularly. In 1952, the University of Indonesia entered into an agreement with the University of California at San Francisco (UCSF) to develop and implement a new medical curriculum. American lecturers spent several months a year in Jakarta while Indonesian medical staff travelled to the United States for advanced instruction. The number of medical graduates steadily increased in the early 1960s.[36] During the 1950s, several new medical schools were established. In the decade after independence, Indonesian physicians relinquished ideals of conducting research to advance knowledge and made medical education more practical in nature, embracing models of medical education that they had firmly opposed during colonial times.

In the early 1950s, officials at Indonesia's Ministry of Health developed plans for a comprehensive healthcare system for the entire country in which community health clinics played a central role. Most of these plans were formulated by Johannes Leimena, who was Minister of Health from 1947 until 1953 and from 1955 to 1959. According to Leimena, providing healthcare was part of the "larger project to reconstruct the whole nation," which meant it had to be considered from a holistic perspective: "work in the field of health can only be of value if also progress is made in fields of economy, social security and education."[37] Leimena presented the "Bandung plan," named after the city where it

35 Vivek Neelakantan, *Science, Public Health and Nation-Building*, 142–55. See also Francis Scott Smyth, "University of California Medical Science Teaching in Indonesia," *Journal of Medical Education* 32, no. 5 (1957): 344–349; Francis Scott Smyth, "Health and Medicine in Indonesia," *Journal of Medical Education* 38, no. 8 (1963): 693–696; John S. Wellington, "Medical Science and Technology," in *Indonesia: Resource and Their Technological Development*, ed. Howard M. Beers (Lexington, KT: University Press of Kentucky, 1970), 165–173. See also Willard A. Hanna, "A Binational Project in Medical Education," *American Universities Field Staff, Southeast Asia Series* 4, no. 19 (1956): 1–10.

36 During the 1950s, there was an extreme shortage of physicians in Indonesia. In 1957, for example, there were 1,450 physicians, which is roughly equal to one physician for every 55,000 persons. See Willard A. Hanna, "No Place for Hypochondriacs: Medical Services in Indonesia," *American Universities Field Staff Reports, Southeast Asia Series* 5, no. 5 (1957): 1–5.

37 J. Leimena, *The Upbuilding of Public Health in Indonesia* (Jakarta: Ministery of Public Health, 1950), 9, 18; this is the English version of J. Leimena, *Membangun Kesehatan Rakjat* (Jakarta:

was first implemented, as the blueprint for the organization of national health care.[38] According to this plan, healthcare should be delivered at four levels, starting with hospital care in urban centers, auxiliary hospitals in the regions, primary care clinics in the districts, and mobile health posts in small villages. Primary care clinics or community health centers were the first port of call for those seeking medical attention; conditions that could not be treated there were referred to auxiliary hospitals or main hospitals. This emphasis on community clinics revived the ideals of the Rockefeller Foundation and Abdul Rasyid's medical nationalism. Leimena aimed to integrate public health initiatives, public health education, and preventive and curative care at all four levels. In a decision that proved to be very unpopular among physicians and medical students, recent medical graduates were required to work in remote areas for a period of three years before they received permits to establish private practice, which were (and continue to be) financially much more rewarding than working in the public healthcare system.[39] This requirement was opposed by the Indonesian Medical Association (*Ikatan Dokter Indonesia*; IDI), which was primarily focused on improving the status and working conditions of Indonesian physicians.

According to Leimena, malaria was Indonesia's most significant public health challenge. In 1955, the World Health Organization announced its Global Malaria Eradication Program, which relied almost exclusively on spraying DDT to eradicate the mosquitoes that transmit malaria.[40] This program promised to stimulate agricultural development and foster a more productive labor force. The program was also an example of the new, vertical, and technology-intensive programs that the WHO advocated during the second part of the twentieth century. These programs relied primarily on technology and expert intervention to target specific diseases and were not concerned with local participation or public health education. In Indonesia, the program commenced in 1958 and continued in an episodic manner for the next 20 years. In the late 1960s, when the toxicity of DDT became widely known and the mosquitoes that transfer malaria developed resistance to DDT, the program was discontinued. Smallpox remained a major problem in post-independence Indonesia. Although Dutch physicians

Noordhoff-Kolff, 1952). This booklet covered the 1937 Bandung conference and the Rockefeller Foundation program extensively.

38 Leimena, *Upbuilding of Public Health*, 26–43. For a discussion see Neelakantan, *Science, Public Health and Nation-Building*, 67–91.

39 Neelakantan, *Science, Public Health and Nation-Building*, 29–66.

40 Randall M. Packard, "Malaria Dreams: Postwar Visions of Health and Development in the Third World," *Medical Anthropology* 17, no. 3 (1997): 279–296. For developments in Indonesia see Neelakantan, *Science, Public Health and Nation-Building*, 92–141.

had started vaccination campaigns in the early nineteenth century, the disease was still widely prevalent in the 1960s. However, the WHO launched an Intensified Smallpox Eradication Program in 1966 and the disease was finally eradicated in the country in 1974.[41]

Until 1965, both horizontal health initiatives, such as the establishment of community health centers, and vertical initiatives, such as malaria eradication programs, were implemented in Indonesia. Both were justified by referring to ideals of development, as both promised to realize a healthier nation. Because of continuing political instability, the occurrence of various local insurrections, and severe economic problems fueling hyperinflation, most health initiatives could not be realized. During the Sukarno era, many ideas and plans were formulated, which could only be implemented later. Despite this, life expectancy rose from 39.77 years to 49.33 years, a significant increase over a 15-year period.[42] This increase was mainly caused by increases in the standard of living and the availability of antibiotics.

Health and development under Suharto (1965–1989)

In November 1965, General Suharto seized power in a bloody coup that was followed by anti-Communist massacres across the country during which over one million people were killed. Indonesia re-established ties with the United States, the World Bank, the International Monetary Fund, and the United Nations. Because of its strong anti-communist stance, the Suharto regime gained the trust of the American government; during the 1970s, Indonesia received the second-highest distribution of foreign aid in aggregate terms, after India.[43] Suharto's military dictatorship was characterized by a strong centralized government that forcefully pursued *pembangunan* (development, a phrase derived from engineering indicating constructing or erecting buildings) that focused on economic liberalization, industrialization, and agricultural reform.[44] Suharto employed a group of economists who were trained in the United States, nicknamed the "Ber-

41 Vivek Neelakantan, "Eradicating Smallpox in Indonesia: The Archipelagic Challenge," *Health and History* 12, no. 1 (2010): 61–87.
42 Data obtained from the website of the World Bank. See https://data.worldbank.org/indicator/SP.DYN.LE00.IN?locations=ID, accessed 1 July 2021.
43 Bradley R. Simpson, *Economists with Guns*; Hal Hill, *Indonesia's New Order: The Dynamics of Socio- Economic Transformation* (Sydney: Allen & Unwin, 2004).
44 Heryanto, *Language of Development*.

Figure 1: Poster on the eradication of malaria and dengue fever, with strong militaristic overtones. The text reads: "Break the chain of transmission of dengue fever and malaria! The mosquito is our enemy! Kill! Destroy!" Published by the Department of Defence and Security, Commando Operation Mosquito I. Poster from the 1970s. From the collection on Indonesian health of Hans Pols.

keley mafia" or the "technocrats," to reform the economy following American ideas.[45] Obstacles to foreign investment were removed and the country started to export primary resources in great quantities. During Suharto's reign, the Indonesian economy grew significantly and inflation came under control. The average *per capita* income increased from US$65.05 in 1968 to US$1,137.41 in 1996 at current prices.[46] Between 1965 and 1998, life expectancy rose from 48.7 to 66.6 years; infant mortality declined from 131 to 44.7 per 1,000 births. Suharto became known as Father Development [*Bapak Pembangunan*]; his regime, named the *New Order* [*Orde Baru*] or the *Orde Pembangunan*, was characterized by a complex combination of economic development, corruption, patronage networks, repression, and random state-sanctioned violence.[47] By aligning itself with the West, the Indonesian economy boomed. It abandoned ideals of self-sufficiency and exported large amounts of primary resources (mostly crude oil), which bolstered its economy.

Medical education and medical care improved significantly during Suharto's New Order.[48] Several new medical schools as well as numerous community health centers [*Pusat Kesehatan Masyarakat* or *Puskesmas*] were established (today, there are close to 10,000). Besides providing healthcare, these health centers commenced public health education and community outreach programs in the 1980s in the form of monthly village meetings; villages were visited in rotation [*Posyandu: Pos Pelayanan Terpadu* or integrated service post]. At these monthly visits, nurses, village midwives, or community health workers (popularly named *kader kesehatan* or health volunteers[49]) weighed children, provided advice to pregnant women, dispensed nutritional information, and administered vaccinations. In this way, basic medical care and health promotion was provided to the inhabitants of even the smallest villages. Politicians hoped that these community health centers would maintain and improve the health of the population,

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45 Michael E. Latham, *The Right Kind of Revolution: Modernization, Development, and U.S. Foreign Policy from the Cold War to the Present* (Cornell, NY: Cornell University Press, 2010); Simpson, *Economists with Guns*.

46 Data provided by the World Bank. See "GDP per capita (current US$)" Indonesia," https://data.worldbank.org/indicator/NY.GDP.PCAP.KD?locations=ID, accessed 29 September 2021.

47 See Hal Hill, *Hal Hill, Indonesia's New Order.*

48 Wasisto Broto, Thomas Suroso, Rushdy Hoesein, and Abdul Syukur, *Sejarah Pembangunan Kesehatan Indonesia 1973–2009* (Jakarta: Kementrian Kesehatan Republik Indonesia, 2009).

49 Health volunteers continue to be an essential part of health care provision in Indonesia. See Ralalicia Limato et al., "What Factors Do Make Quality Improvement Work in Primary Health Care? Experiences of Maternal Health Quality Improvement Teams in Three Puskesmas in Indonesia," *PLoS ONE* 14, no. 12 (2019): e0226804, accesed 10 May 2021, https://doi.org/10.1371/journal.pone.0226804.

which would increase the quality of the human resources available for industrialization. These community health centers did not always live up to expectations, in particular because local politicians came to see them as a source of income by charging fees for the medications which had been provided free of charge by the Ministry of Health, which left fewer funds for healthcare purposes.[50] In 1978, at the International Conference on Primary Healthcare, held at Alma Ata, in the Soviet Socialist Republic of Kazakhstan, the Indonesian delegation presented overviews of several of the initiatives that they had undertaken.[51] At this conference, horizontal health initiatives in addition to vaccinations were lauded as the best way to achieve "health for all" by the year 2000.

American developmental aid was contingent on the implementation of family planning programs across Indonesia. Physicians associated with the World Health Organization had become increasingly concerned with the threat of imminent overpopulation, in particular in developing nations.[52] During colonial times, Indonesian physician Marie Thomas had started advocating for family planning. During the Sukarno era, most Indonesian politicians and physicians were opposed to family planning, despite the advocacy of leading physician Julie Sulianto Saroso.[53] Sukarno was convinced that large numbers of Indonesians were needed to develop the nation; many Muslim leaders were afraid that making contraception available would promote immorality. In December 1967, Suharto signed the World Leaders' Declaration on Population and subsequently managed to convince most Muslim political groups to endorse his plans by assuring them that contraception would only be made available to married couples. The following year, the National Family Planning Co-ordinating Board,

50 Januar Achmad, *Hollow Development: The Politics of Health in Soeharto's Indonesia* (Canberra, ACT: Australian National University Press, 1999).

51 WHO and UNICEF, *Primary Health Care: Report of the International Conference on Primary Health Care, Alma Ata, USSR, 6–12 September 1978* (Geneva: World Health Organization, 1978). For a significant Indonesian contribution see Gunawan Nugroho, "A Community Development Approach to Raising Health Standards in Central Java, Indonesia," in *Health by the People*, ed. Kenneth W. Newell (Geneva: World Health Organization, 1975), 91–111. For Alma Ata see also Marcos Cueto, "The Origins of Primary Health Care and Selective Primary Care," *American Journal of Public Health* 94, no. 11 (2004): 1864–1874.

52 See Paul R. Ehrlich, *The Population Bomb* (New York: Ballantine Books, 1968). See also Matthew James Connelly, *Fatal Misconception: The Struggle to Control World Population* (Cambridge, MA: Belknap Press of Harvard University Press, 2008). For Indonesia see *People, Population, and Policy in Indonesia*, ed. Terence H. Hull (Jakarta Equinox, 2005).

53 Uswatul Chabibah, "Kegigihan Julie Sulianti Saroso Mengangkat Derajat Kesehatan Rakyat," *Tirto.id* (29 April 2021), accessed 9 May 2021, https://tirto.id/kegigihan-julie-sulianti-saroso-mengangkat-derajat-kesehatan-rakyat-gd92.

Figure 2: Poster promoting infant health services, used in and around Yogyakarta, used before 1972. The text reads: “For the welfare of the nation’s hope, doctors and midwives are always ready.” From the collection on Indonesian health of Hans Pols

which reported directly to Suharto, was established.[54] This organization was highly successful and was often praised in international circles. It established hundreds of clinics throughout Indonesia with financial assistance from USAID and the United Nations Population Fund (UNPFA, which awarded Suharto its population award in 1989). The Board's motto was: "Two children [is] enough [*dua anak cukup*]." In addition to relying on physicians, midwives, and nurses, the Board also relied on large numbers of volunteers, particularly the leaders of village organizations. Between 1965 and 1997, the reported fertility rate in Indonesia declined from 5.612 to 2.579 per woman, or about 53 percent.[55]

Under Suharto, the health of Indonesians improved dramatically following substantial rises in the standard of living and impressive increases in the country's health infrastructure. From 1965 to 2000, life expectancy rose from 49.629 years to 65.772 years.[56] From 1950 on, the incidence of communicable disease dropped significantly, but it remained relatively high as compared to high income countries. Near the end of Suharto's presidency, the prevalence of noncommunicable diseases started to increase. Even though maternal and child mortality decreased, they remained high in comparison to other Southeast Asian nations. Health inequality, including the unequal distribution of physicians, other health professionals, and health infrastructure remained a formidable challenge.[57]

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54 Firman Lubis, "History and Structure of the National Family Planning Program," in *Two Is Enough: Family Planning in Indonesia under the New Order, 1968–1998*, ed. Firman Lubis and Anke Nienhof (Leiden: KITLV Press, 2003), 31–55. See also Terence H. Hull, "The Political Framework for Family Planning in Indonesia: Three Decades of Development," in the same volume, 57–81.

55 Based on figures provided by the World Bank. See World Bank, "Fertility Rate, Total (Births per Woman): Indonesia," accessed 1 July 2021, https://data.worldbank.org/indicator/SP.DYN.TFRT.IN?locations=ID.

56 Data obtained from the website of the World Bank. See World Bank, "Life Expectancy at Birth, Total (Years): Indonesia," accessed 1 July 2021, https://data.worldbank.org/indicator/SP.DYN.LE00.IN?end=2019&locations=ID&start=1960&view=chart.

57 Lorraine Corner and Y. Rahardjo, "New Directions in Health Policy in Indonesia: The Need for a Demand-Oriented Perspective," in *Health and Development in Southeast Asia*, ed. Paul Cohen and John Purcall (Canberra, ACT: Australian Development Studies Network, Australian National University, 1995), 77–103; Achmad, *Hollow Development*.

Figure 3: Poster promoting family planning from the Suharto era, but from before 1972. The text reads: “Mothers are now able to space pregnancies for the sake of her own health. Get involved in family planning.” Issued by the National Association for Family Planning. From the collection on Indonesian health of Hans Pols

Health and medicine after the fall of Suharto (1998–present)

Suharto was able to hold on to power through severe repression and steadfast support from the military, police, and secret services. In 1997, the Asian monetary crisis commenced with severely adverse consequences for the Indonesian economy. In a matter of months, the Indonesian rupiah lost 80 percent of its value, businesses and banks collapsed, the economy shrank by more than 10 percent, unemployment rose significantly, living standards declined, and poverty increased.[58] Demonstrations were held with increasing frequency and Suharto's position became untenable; he resigned on 21 May 1998. His vice-president, B.J. [Bacharuddin Jusuf] Habibie, took his place for a mere 17 months to allow elections to be organized. Despite the short duration of his presidency, Habibie significantly shaped modern Indonesia by initiating a far-reaching program of political decentralization, which delegated most decision-making powers from the central government to the regencies (districts). He also abolished media censorship, liberalized the press, instituted economic reforms (particularly in the banking sector), and allowed political parties to organize and participate in elections.

By profession, Habibie was an airplane engineer; he had received his training in Germany and the Netherlands in the 1950s. He subscribed to Suharto's developmental ideals and was recruited by him in 1974 to guide Indonesia's industrial development; four years later he became Minister of Research and Technology. Habibie aimed to transform Indonesia from an agricultural to a modern society through industrialization. He stimulated state-owned enterprises to build ships, aircraft, communication technology, and military equipment.[59] His technological and industrial idealism came under criticism for tending to focus on realizing "mega-projects" that would never be economically viable while only benefitting a few insiders. In 1992, Habibie revived Batavia's Eijkman

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58 World Bank, "The World Bank on the Social Impact of the Indonesian Crisis," *Population and Development Review* 24, no. 3 (1998): 664–666.

59 Sulfikar Amir, *The Technological State in Indonesia: The Co-Constitution of High Technology and Authoritarian Politics* (London: Routledge, 2012); Sulfikar Amir, "Nationalist Rhetoric and Technological Development: The Indonesian Aircraft Industry in the New Order Regime," *Technology in Society* 29, no. 3 (2007): 283–293; Sulfikar Amir, "Symbolic Power in a Technocratic Regime: The Reign of BJ Habibie in New Order Indonesia," *Sojourn: Journal of Social Issues in Southeast Asia* 22, no. 1 (2007): 83–106; Suzanne Moon, "Justice, Geography, and Steel: Technology and National Identity in Indonesian Industrialization," *OSIRIS* 24 (2009): 253–277.

Institute as the Eijkman Institute for Molecular Biology (*Lembaga Biologi Molekuler Eijkman*), thus honoring its first director, Christiaan Eijkman, who had conducted research on the causes of beriberi in the late nineteenth century, explaining it as a nutritional deficiency. In 1929, Eijkman had been awarded the Nobel Prize for Physiology or Medicine for this research. Habibie recruited Professor Sangkot Marzuki, a well-known Indonesian biomedical scientist then working at Monash University in Australia, as director.[60] The Eijkman Institute played a key role in advancing biomedical science in Indonesia. Through DNA analysis, its researchers were able to identify the perpetrators of the bombing of the Australian Embassy in Jakarta in 2004.[61] It also played a central role in investigating the COVID-19 pandemic.[62] Unfortunately, because of its recent integration in Indonesia's science super-agency BRIN (*Badan Riset dan Inovasi Nasional*; Indonesia Agency of Research and Innovation), it has lost its independence and is now more subject to political interference.[63]

The effects of Habibie's decentralization program have not always been uniformly positive for healthcare provision. Although health budgets have increased significantly since 1998, most of these have been allocated to curative medical interventions; spending on health promotion, monitoring and evaluation, and public health initiatives have decreased. Moreover, health services have become fragmented, disparities between regions have increased, and family planning services have declined. Many regencies, the basic area of organization in Indonesia below the provinces, lack the capacity to plan, manage, and provide health services adequately. Local healthcare delivery generally lacks transparency. Critics have recommended increases in spending by the central government with concomitant accountability and the allocation of funds for environmental and

60 Jeffrey Jervis, "Reviving a Nobel Past in Indonesia," *Science* 279, no. 5356 (6 March 1998): 1482.

61 Herawati Sudoyo et al., "DNA Analysis in Perpetrator Identification of Terrorism-Related Disaster: Suicide Bombing of the Australian Embassy in Jakarta 2004," *Forensic Science International: Genetics* 2, no. 3 (2008): 231–237.

62 Ardila Syakriah, "Indonesia Targets Local COVID-19 Strain in Eijkman-led 2022 Vaccine Initiative," *Jakarta Post*, 5 May 2020, accessed 15 September 2021, https://www.thejakartapost.com/news/2020/05/05/indonesia-targets-local-covid-19-strain-in-eijkman-led-2022-vaccine-initiative.html; Sandra Perrett, "Australia and Indonesia to Partner on COVID-19 Research," *CSIRO Media Releases and Statements*, 14 July 2020, accessed 15 September 2021, https://www.csiro.au/en/news/news-releases/2020/australia-and-indonesia-to-partner-on-covid-19-research.

63 Dynah Rochmyaningsih, "'Superagency' May Further Politicize Indonesian Research," *Science* 372, no. 6541 (30 April 2021): 449; Dyna Rochmyaningsih, "Indonesia's Research Reform Triggers Layoffs and Protests," *Science* 275, no. 6577 (12 January 2022): 131–132.

preventive health.[64] In 2015, just after the end of Susilo Bambang Yudoyono's presidency (2004–2014), Indonesia inaugurated universal health insurance (*Jaminan Kesehatan Nasional*; JKN) to ensure equity in access to healthcare services. It continues to be an important program but faces both administrative and financial challenges, including significant budget shortfalls.[65]

From 1999 to 2019, Indonesia's GDP rose at a high rate of around 5.6 % per annum. During the same period, its poverty rate halved to 9.78 %. Average per capita income rose from US$830 (just after the Asian monetary crisis) to US $4,196. Although Indonesia's Gini index rose from 31.1 to 39.5, indicating that economic inequality had increased, health conditions continued to improve overall.[66] Life expectancy increased by 5.77 years to 71.7 years. The neonatal mortality rate declined from 23.6 to 12.4 deaths per thousand live births between 1999 and 2019 and the maternal mortality rate declined from 2.72 to 1.77 deaths per thousand live births between 2000 and 2017.[67] However, despite these improvements, both neonatal mortality and maternal mortality remained high in comparison with other south-east Asian countries and middle-income countries. These relatively high rates are associated with delayed referrals from community health centers to hospitals and limited referral transportation. Moreover, basic

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64 Stein Kristiansen and Purwo Santoso, "Surviving Decentralisation?: Impacts of Regional Autonomy on Health Service Provision in Indonesia," *Health Policy* 77, no. 3 (2006): 247–259, https://www.sciencedirect.com/science/article/pii/S0168851005001806; Abdullah Asnawi and Johannes Stoelwinder, "Decentralization and Health Resource Allocation: A Case Study at the District Level in Indonesia," *Health Care Quarterly* 9, no. 4 (2007): 5–16; Trisya Rakmawati, Reece Hinchcliff, and Jerico Franciscus Pardosi, "District-Level Impacts of Health System Decentralization in Indonesia: A Systematic Review," *The International Journal of Health Planning and Management* 24, no. 2 (2019): e1026–e53; Aderia Rintani and Adik Wibowo, "Health Sector Decentralization and Its Implication to Health Services in Indonesia," *Jurnal Ilmu Kesehatan Masyarakat* 10, no. 1 (2019): 1–14.

65 Rina Agustina et al., "Universal Health Coverage in Indonesia: Concept, Progress, and Challenges," *The Lancet* 393 (19 December 2019): 75–102.

66 The data in the following paragraphs are derived from Nafsiah Mboi et al., "On the Road to Universal Health Care in Indonesia, 1990–2016: A Systematic Analysis for the Global Burden of Disease Study 2016," *The Lancet* 392, no. 10147 (18 August 2018): 581–591. Some additional data have been obtained through the website of the World Bank. I have not included data from 2020 and 2021 because they reflect the influence of the COVID-19 pandemic and are therefore not illustrative of long-term trends.

67 For the neo-natal mortality rate see: "Indonesia: Mortality Rate, Neonatal (per 1,000 Live Births), *KNOEMA*, https://knoema.com/atlas/Indonesia/Neonatal-mortality-rate, accessed 15 September 2021; for the maternal mortality rate see: "Indonesia: Maternal Mortality Rate (Deaths/100,000 Live Births), KNOEMA, https://knoema.com/atlas/Indonesia/Maternal-mortality-ratio, accessed 15 September 2021.

emergency obstetrical and neonatal care centers are not available in all districts; where they are available, they rarely offer services 24 hours a day. In 2019, stunting in children under five years, a key measure of childhood malnutrition, was 27.7 %, the fifth-highest rate in the world. Stunting is primarily a problem in poorer families.[68] Unfortunately, several programs to address this problem have thus far not been successful.

After 1950, a demographic transition took place in Indonesia (and the rest of Asia), as life expectancy increased and mortality decreased because of increasing standards of living, better sanitation, easier access to healthcare facilities, and the availability of medications, in particular antibiotics.[69] Nevertheless, mortality related to communicable diseases remains significant, in particular because of malaria, tuberculosis, pneumonia, and diarrheal disease. Malaria is still endemic in many areas and causes around 40,000 deaths a year, predominantly among children, who are also affected by pneumonia and diarrheal disease. Indonesia has the second-highest tuberculosis burden in the world; every year around 1,000,000 new cases are recorded. Indonesia currently has the fastest increase of individuals with HIV in Southeast Asia (current prevalence: 0.4 %). Emergent infectious diseases such as dengue fever, Zika virus, and avian influenza are persistent threats.[70]

Although the contribution of communicable diseases to overall mortality has declined over the past 70 years, Indonesia's disease burden associated with non-communicable diseases has risen significantly after 1990, indicating that the country is passing through the epidemiological transition.[71] From 1997 to 2016, obesity rates have risen from around 10 % to 21 %. From 2005 to 2018, the number of individuals with diabetes increased by 63 %. The incidence of stroke increased 46 % between 2007 and 2013; the rate in 2019 was 12.1 strokes per 1,000 individuals, which accounts for about 15 % of total deaths. DALYs (Disabil-

68 Ty Beal et al., "A Review of Child Stunting Determinants in Indonesia," *Maternal & Child Nutrition* 14, no. 4 (2018): e12617, https://doi.org/10.1111/mcn.12617.

69 Harper and Amrith, eds. *Histories of Health in Southeast Asia*.

70 See, for example, Julio Frenk, and Octavio Gómez-Dantés, "The Triple Burden: Disease in Developing Nations," *Harvard International Review* (September 2011): 36–40; and Nila F. Moeloek, "Indonesia National Health Policy in the Transition of Disease Burden and Health Insurance Coverage," *Medical Journal of Indonesia* 26, no. 1 (2017): 3–6. At the time this invited editorial appeared, Moeloek was Indonesia's Minister of Health.

71 Antonio Dans et al., "The Rise of Chronic Non-Communicable Diseases in Southeast Asia: Time for Action," *The Lancet* 337 (2011): 680–689; Preet K. Dhillon et al., "Status of Epidemiology in the WHO South-East Asia Region: Burden of Disease, Determinants of Health and Epidemiological Research, Workforce and Training Capacity," *International Journal of Epidemiology* 41, no. 3 (2012): 847–860.

ity Adjusted Life Years) related to cerebrovascular disease and ischemic heart disease have increased significantly over the past 30 years (55.4 % and 57.3 %, respectively). Smoking is a well-known risk factor for several chronic diseases. Around 65 % of Indonesian men smoke every day; among women, this percentage is much lower. Indonesia still has not signed the WHO Framework Convention on Tobacco Control, partly because of the economic significance of tobacco taxes and the political influence of the tobacco industry.[72]

The combined disease burden associated with communicable and noncommunicable diseases poses distinct challenges to Indonesia's healthcare services.[73] The global COVID-19 pandemic has hit Indonesia very hard, partly because of the inept and delayed reactions by the Ministry of Health during 2020, and partly because Indonesian president Joko Widodo and his government consistently prioritize economic growth over health. During the first and second waves, Java's hospitals were overwhelmed and mortality rates were high, although it remains difficult to estimate prevalence and mortality rates because of insufficient testing.[74] During the first 10 months of 2020, there was an excess mortality rate of 61 %, which corresponds to 16,118 deaths.[75] The tally for 2021 is expected to be much higher.

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72 Putu Ayu Swandewi Astuti, Mary Assunta, and Becky Freeman, "Why Is Tobacco Control Progress in Indonesia Stalled? A Qualitative Analysis of Interviews with Tobacco Control Experts," *BMC Public Health* 20 (2020): article 527.

73 Peter Heywood and Terence H. Hull, "Dealing with Difficult Diseases: Renovating Primary Health Care to Deal with Chronic Conditions in Indonesia," in *Health Transitions and the Double Disease Burden in Asia and the Pacific: Histories of Responses to Non-Communicable and Communicable Diseases*, ed. Milton J. Lewis and Kerrie L. MacPherson (New York: Routledge, 2013), 216–229. See also, for example, Dhillon et al., "Status of Epidemiology in the WHO South-East Asia Region."

74 See, for example, Stanley White, "Indonesia's COVID-19 Situation Nears 'Catastrophe': Red Cross," *Jakarta Post* (29 June 2021), accessed 29 June 2021, https://www.thejakartapost.com/news/2021/06/29/indonesias-covid-19-situation-nears-catastrophe-red-cross.html; Nur Janti and Yerica Lai, "Java's Health System Paralized," *Jakarta Post* (5 July 2021), accessed 5 July 2021, https://www.thejakartapost.com/paper/2021/07/04/javas-health-system-paralyzed.html; Gemma Holliani Cahya, "Covid Surge Pushes Indonesia's Health System to the Brink," *The Guardian* (8 July 2021), accessed 8 July 2021, https://www.theguardian.com/global-development/2021/jul/08/covid-surge-pushes-indonesias-health-system-to-the-brink.

75 Iqbal R.F. Elyazar et al., "Excess Mortality During the First Ten Months of COVID-19 Epidemic at Jakarta, Indonesia," *MedRxiv: The Preprint Server for Health Sciences* (14 December 2020), accessed 8 July 2021, https://doi.org/https://doi.org/10.1101/2020.12.14.20248159.

Conclusion

From the 1880s until today, Indonesian intellectuals have articulated multi-faceted and subtly changing ideas on progress, development, and modernization which continue to play a central role in Indonesian social, political, and medical thought. According to Indonesian physicians, health constituted a significant condition for progress and social development, making medicine a significant tool of nation building. At times, they focused on professional advancement; at other times, on optimal forms of healthcare delivery; at still other times, they proposed and implemented public health measures. At specific junctures in Indonesia's history, physicians and policymakers advocated top-down health initiatives; at other times, they favored community-based programs; at still other times, a combination of both. Indonesian politicians have generally focused on economic and industrial development, which, they hoped, would lead to increased standards of living and, thereby, better health outcomes. Although ideas on development inspired various initiatives in medical care and public health, their influence on health outcomes has been rather limited. In colonial times, medical care benefiting Indonesians was too limited to influence health outcomes. After the 1950s, increases in living standards were far more significant, while during the past 40 years nutrition and an increasingly sedentary lifestyle have led to an increase in noncommunicable diseases.

During the Dutch colonial era, the Japanese military occupation (1942–1945), and the war of independence (1945–1949), Indonesian physicians were not able to develop and implement substantial health initiatives, but they became acquainted with ideas on public health and the organization of medical care. During the Sukarno era (1950–1965), leading physicians primarily focused on reforming and expanding medical education to counteract the shortage of physicians in the country. They developed plans for the organization of medical care, of which establishing community health centers all over the country was central. Because of political instability and economic problems, these ideas were only partly realized. Despite that, life expectancy rose and mortality rates because of infectious diseases declined because of increasing standards of living and the availability of antibiotics. Under Suharto (1965–1998), industrialization and economic liberalism resulted in a steady increase in the standard of living. Life expectancy rose dramatically while infant and maternal mortality rates declined.

During the past 20 years, the significance of noncommunicable diseases on mortality and quality of life has increased significantly. Indonesia, like other countries in Southeast Asia, is currently facing a double burden of disease

through a combination of communicable diseases (common and newly emerging) and non-communicable diseases. To address this multi-faceted challenge adequately, a robust healthcare system, a comprehensive and well-administered health insurance system, preventive initiatives, and a strong capacity in medical science are required. As elsewhere, Indonesia's healthcare system is ill prepared to deal with the increasing importance on non-communicable diseases, as they result from poor nutrition and an increasingly sedentary lifestyle.

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