1 The Call for a Language of Public Health
Philanthropic Foundations, Bacteriologists, and Health Administrators

> Our age is marked by two tendencies, the democratic and the scientific. In Dr. Welch and his work we find an expression of the best in both tendencies. He not only represents the spirit of pure science but constantly sees and seizes opportunities to direct its results into the service of human kind.[1]

On April 8, 1930, United States President Herbert Hoover delivered a speech to 1,600 guests at the Memorial Continental Hall in Washington, DC, which had served as the venue for the Washington Naval Conference nine years previously. The occasion was the eightieth birthday celebration of the pathologist and founder of the Johns Hopkins University School of Public Health (JHSPH), William Welch. Hoover praised Welch for his contributions to science and democracy: the two guiding spirits of the time. Hoover's speech also conveyed the key principles of public health work in the interwar United States: public health experts were to advance science and apply their discoveries to achieving progress for all humanity.

Welch's birthday celebration vividly encapsulated the interwar, American public health milieu, which contributed to the standardization of statistics at the international level in three important ways. First, the event brought together key stakeholders in American public health work: government workers, representatives of philanthropic foundations, and public health researchers. Specifically, the United States government was represented at the event by Hoover and Hugh Cumming, the surgeon general of the United States Public Health Service (USPHS). Key players from philanthropic foundations were involved in organizing the celebration, including John D. Rockefeller, Jr., the patron of the Rockefellers' philanthropic enterprises; Simon Flexner, the first director of the Rockefeller Institute for Medical Research; and Albert Milbank, president of the Milbank

[1] "Committee on the Celebration of the Eightieth Birthday of Doctor William Henry Welch," *The Eightieth Birthday of William Henry Welch: The Addresses Delivered* (New York: Milbank Memorial Fund, 1930), 25.

Memorial Fund. The event's organizers also included important names in public health research: C. E. A. Winslow of Yale University and Sir Arthur Newsholme, the former principal officer of the United Kingdom Local Government Board and a visiting professor at the JHSPH, to name just two.[2] These three strands of power – the United States government, philanthropic foundations, and public health researchers – orchestrated American public health work during the interwar years and, as the following chapters will show, played a salient role in institutionalizing statistical practices in public health at the international level.

Second, the event featured a transnational network for public health. Welch's birthday celebration was not a purely American affair, despite the prominent role of American stakeholders in this network. Local events were held in health organizations and medical institutes across the world, including the League of Nations Health Organization (LNHO) in Geneva, the Pasteur Institute in Paris, the London School of Hygiene and Tropical Medicine, and the Peking Union Medical College (PUMC) in Beijing. In Tokyo, a meeting was even organized to listen to the live radio broadcast of the celebration.[3] Composed of different branches of public health work, the same transnational network laid the foundation for international standards in public health statistics and strove to implement initiatives to establish them.

Lastly, and perhaps most essentially, the main organizer and sponsor of the celebration was the Milbank Memorial Fund, a general-purpose philanthropic foundation specializing in social work and public health.[4] Just as the Milbank Memorial Fund played an essential role in turning Welch's birthday celebration into an international public health event, many public health initiatives both within and outside the United States became a reality through the financial support of American philanthropic foundations. These foundations underwrote public health campaigns and recruited experts who ended up spreading American-style public health work to other parts of the world.[5]

[2] Ibid., 39.

[3] Ibid., 19, 36.

[4] Researchers use the term "general-purpose philanthropic foundation" to refer to foundations able to amend their programs according to changing needs without being bound by a deceased donor's will. (See, e.g.: Daniel M. Fox, "Foundations and Health: Innovation, Marginalization, and Relevance since 1900," in *American Foundations: Roles and Contributions*, eds. Helmut K. Anheier and David C. Hammack [Washington, DC: Brookings Institution Press, 2010]; Olivier Zunz, *Philanthropy in America: A History* [Princeton, NJ: Princeton University Press, 2014].)

[5] On the transnational nature of philanthropic foundations, see, e.g.: Thomas David and Ludovic Tournès, "Introduction. Les philanthropies: un objet d'histoire transnationale," *Monde(s)*, no. 6.2 (2014): 7–22.

The aforementioned actors, and the partnerships they formed, paved the way for the international public health statistical practices that are this book's focus. Before delving into specific themes within those practices, this chapter provides a detailed overview of the zeitgeist and key actors that led to the dependence on statistics in public health. Rooted in the Progressive Era (1896–1916) in the United States, philanthropic foundations, bacteriologists, and Chinese-born experts trained in North America – with their respective priorities and capacities – came to contribute to promoting (and sometimes implementing) statistics in public health projects at the international level.

The Progressive Era and Philanthropic Foundations

The golden age of general-purpose philanthropic foundations lasted from the 1890s to the early 1930s.[6] This started with the Progressive Era: the economic boom at the turn of the twentieth century had created a growing class of nouveau riche but had worsened living conditions for the poor. It was also a time when the United States federal government was slow to formulate social policies, and it was left to such foundations to fill the void by implementing innovative social and public health programs.[7]

As Olivier Zunz indicates, the golden age began in 1893 with the passing of a New York State law, known as the Tilden Act, permitting the establishment of general-purpose foundations in which trustees were allowed to redefine and alter donors' plans to meet current social needs. Soon after, general-purpose philanthropic foundations began to thrive in the United States.[8] They tackled issues ranging from public health to social work, competing with the faith-based organizations to which their founders had once entrusted the lion's share of their donations.[9] The foundations reached the height of their influence in 1922, when

[6] Despite minor disagreements regarding the end of the golden age of American philanthropic foundations due to interests in different programs, researchers specializing in the history of such foundations tend to start their accounts in the 1890s, with the 1930s marking the moment when the foundations largely retired from American socioeconomic policy-making. (See, e.g.: Steven Wheatley, "The Partnerships of Foundations and Research Universities," in *American Foundations: Roles and Contributions*, 74; Fox, "Foundations and Health," 121; Inderjeet Parmar, *Foundations of the American Century: The Ford, Carnegie, and Rockefeller Foundations in the Rise of American Power* [New York: Columbia University Press, 2012], 3.)

[7] Fox, "Foundations and Health." For general accounts on public health development during the Progressive Era, see, e.g.: Paul Starr, *The Social Transformation of American Medicine* (New York: Basic Books, 1982); George Rosen, *A History of Public Health* (Baltimore, MD: Johns Hopkins University Press, 2015).

[8] Zunz, *Philanthropy in America*, 16.

[9] Ian Tyrrell, *Reforming the World: The Creation of America's Moral Empire* (Princeton, NJ: Princeton University Press, 2010), 227–9.

Hoover – then secretary of commerce – implemented his "compound republic" policy, through which the United States federal government sought to systematically integrate philanthropic foundations' programs into the government's social policies.[10] Hoover's defeat in the 1932 presidential election put an end to the golden age of philanthropic foundations. The New Deal of his successor, Franklin D. Roosevelt, created a more powerful federal government that took charge of social policies in the aftermath of the Great Depression.[11] With the federal government taking on the central role in socioeconomic policy-making in areas ranging from social work to public health, philanthropic foundations gradually stopped directly implementing campaigns on American soil and instead intensified their activities in foreign countries.[12]

Before philanthropic foundations began to lose prominence, starting in 1930, their financial support had been the foundation of American public health activities and research. Specifically, the two main philanthropic foundations investing in public health – the Rockefeller Foundation and the Milbank Memorial Fund – carried out health campaigns while also providing support to local health authorities, universities, and research institutes. Not only did the philanthropic foundations provide financial resources to these entities, they also exchanged technical advice, fieldwork training, political backing, and data that reinforced each other's programs. Both the Rockefeller Foundation and the Milbank Memorial Fund extended this modus operandi to foreign countries. By working with foreign governments and establishing research institutes, universities, and public health campaigns, they influenced the methods that local authorities used in their public health programs.

The transnational network described above, comprised of public and private stakeholders and fueled by American philanthropic funding, led statistical practices gradually to filter into public health research and policies in various parts of the world. But how did these actors come to focus on numbers in their public health programs? The Rockefeller Foundation's ideas about and dependence on numbers can be traced back to its founding years and were visible in its management culture. Established in 1913 by John D. Rockefeller, the Foundation sought to "promote

[10] Zunz, *Philanthropy in America*, 104; Fox, "Foundations and Health," 121.

[11] In historiographies of American philanthropic foundations, researchers have shown how the foundations' roles changed before World War II. See, e.g.: Judith Sealander, *Private Wealth and Public Life: Foundation Philanthropy and the Reshaping of American Social Policy from the Progressive Era to the New Deal* (Baltimore, MD: Johns Hopkins University Press, 1997); Fox, "Foundations and Health"; Zunz, *Philanthropy in America*.

[12] Parmar, *Foundations of the American Century*, 3.

the well-being of mankind throughout the world."[13] Frederick Gates, Rockefeller's right-hand man in business affairs, was also his adviser on philanthropic matters. Besides Gates, many of Rockefeller's business partners were also involved in managing the Foundation. The fact that Rockefeller hired professional managers in the 1920s is yet another sign of the businesslike mindset that reigned within the Foundation.[14]

The Rockefeller Foundation's trust in statistics was also related to its emphasis on using science to improve the well-being of humanity. Science was central to decision-making from day one of the Foundation's public health work. Before the Foundation was even established, Rockefeller had donated to the hookworm control campaign in the American South in 1909, blazing the trail for the establishment of the Foundation's International Health Board (IHB). Rockefeller supported the hookworm campaign because of scientific advances that had made it possible to identify hookworm ova using a microscope and to invent new treatments.[15] From the early days of the IHB, the Foundation endorsed various ways of collecting and using statistics that were closely related to its commitment to science. In the 1910s, the Foundation underwrote the JHSPH, including its statistics department, to promote science-based public health. In the 1920s, under the direction of former United States army officer Frederick Russell, the IHB collected vital and health statistics linked to scientific research; the idea took hold not just at the IHB headquarters in New York but also in its public health fieldwork in Europe, the Americas, and Asia.[16] In 1926, the IHB recruited JHSPH-trained Persis Putnam to be its first statistician. Putnam assessed vital statistics from fieldwork reports using mathematical statistical analysis. Through Putnam, statistical analysis came to be integrated into the IHB's management.[17]

The Milbank Memorial Fund linked statistics to business management in a manner similar to the Rockefeller Foundation. Albert Milbank, the Fund's president from 1922, was also head of the Borden Company, the leading producer of condensed milk at the time. Milbank transformed the Fund from a purely grant-giving organization into one that carried out its own public health programs. He managed the Fund as he would a business: one prominent proof being that, on its twenty-fifth anniversary,

[13] The Rockefeller Foundation, "The Rockefeller Foundation Annual Report 1913–1914," 1914, 7, www.rockefellerfoundation.org/wp-content/uploads/Annual-Report-1913-1914-1.pdf.

[14] Anne-Emanuelle Birn, *Marriage of Convenience: Rockefeller International Health and Revolutionary Mexico* (Rochester, NY: University of Rochester Press, 2006), 22.

[15] Ibid., 17–18.

[16] On Frederick Russell's policies while working for the IHB (which became the International Health Division in 1927), see: John Farley, *To Cast Out Disease: A History of the International Health Division of the Rockefeller Foundation* (Oxford: Oxford University Press, 2004).

[17] I will elaborate on Persis Putnam's statistical practices in Chapter 2.

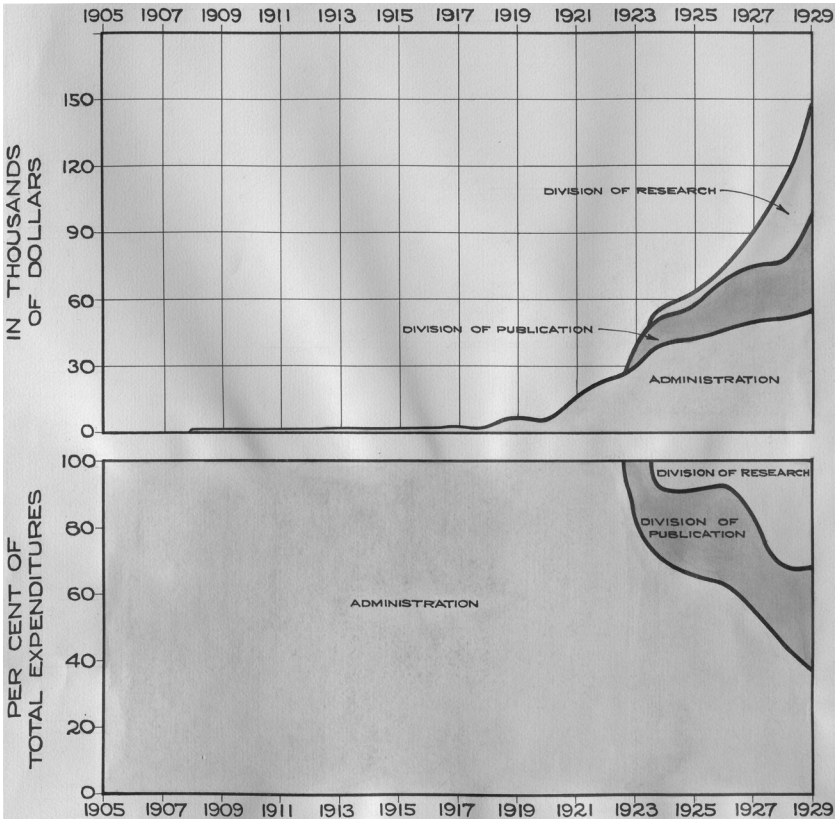

Figure 1.1 Comparative expenditures for administration, research, and publication (1905–1929).
Milbank Memorial Fund, "Twenty-Five Years of Philanthropy," 1930, 1–2, IV/32/2 Historical records, twenty-fifth anniversary: charts and tables, Milbank Memorial Fund Archives, University of Yale. Courtesy of Milbank Memorial Fund Records (MS 845). Manuscripts and Archives, Yale University Library.

the Fund published its finance and expenditure records dating back to 1905 (in full color), claiming the publication would be useful for other, younger organizations in administrating a general-purpose foundation.[18] Figure 1.1 is an example of how the expenditure report was presented, illustrating how the Fund's spending on administration grew along with the research and publication expenditure categories that emerged in 1923.

[18] Milbank Memorial Fund, "Twenty-Five Years of Philanthropy," 1930, 1–2, IV/32/2 Historical records, twenty-fifth anniversary: charts and tables, Milbank Memorial Fund Archives, University of Yale.

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The way the Milbank Memorial Fund collected statistics from its programs is closely related to the American social survey movement. John Kingsbury, the chief executive of the Fund from 1922, was a passionate collector of statistics in the early stage of his career. In 1911, when Kingsbury was the general director of the New York Association for Improving the Condition of the Poor (AICP),[19] he contributed statistical data on its beneficiaries to a report by the Russell Sage Foundation entitled "Wage Earner's Illness," which indicated that illness caused poverty and bolstered support for the campaign for compulsory health insurance, as advocated for by the American Association for Labor Legislation.[20] Kingsbury also worked with Paul Kellogg (1879–1958), the leader of the Pittsburgh Survey from 1910 to 1914, who drafted policy propositions on the living wage, hours of work, and so on for the 1912 Republican Convention.[21] Kellogg reformed the magazine *Charities and the Commons* and supplied information to American charity workers in the journal *Survey*, which underscored the importance of surveys in charity work and marked the peak of the social survey movement.[22] It is therefore unsurprising that Kingsbury, too, emphasized the role of surveys in public health work while overseeing the Milbank Memorial Fund. His ideas about surveys prompted the Fund to collect and share vital and health statistics before and after carrying out public health programs. As I will show in Chapter 4, Kingsbury endorsed health demonstration in New York State that included the collection of statistics on the cost of health services. He also hired Edgar Sydenstricker, a former health statistician at the LNHO and the USPHS, to oversee the collection of statistics from the Milbank health demonstrations.

Influenced by the traditions of scientific health research and social surveys, respectively, the leaderships of the Rockefeller Foundation and the Milbank Memorial Fund were convinced that numbers were a reliable medium for communicating public health conditions. It is worth noting that the two organizations were in constant contact at the highest level, as well as on the ground. John D. Rockefeller, Jr., and Albert Milbank

[19] "Kingsbury C.V.," n.d., II/24/15 Kingsbury, John A. Speeches 1937–1938, 1956, Milbank Memorial Fund Archives, University of Yale.

[20] The Russell Sage Foundation report compiled the AICP's data with that of the United Hebrew Charities. The report was never published, however. (Beatrix Hoffman, *The Wages of Sickness: The Politics of Health Insurance in Progressive America* [Chapel Hill, NC: University of North Carolina Press, 2001], 36–7, 191.)

[21] Shelton Stromquist, *Reinventing "The People": The Progressive Movement, the Class Problem, and the Origins of Modern Liberalism* (Urbana and Chicago, IL: University of Illinois Press, 2006), 100.

[22] Ibid., 100–1.

had been classmates at the Tony Cutler School.[23] When the Milbank Memorial Fund lacked funding for its health demonstration project in China owing to the economic depression, Rockefeller began funding the project at Milbank's request.[24] The Rockefeller Foundation's officers also sought advice from the Milbank Memorial Fund on a regular basis regarding nutrition and tuberculosis control.[25]

Both organizations worked in foreign terrain – be it geographically or socioeconomically – and depended on numbers to communicate local situations to their headquarters and the research institutes that they financed. Between the two of them, they funded three initiatives that improved the reliability of statistics and techniques for interpreting them. The Rockefeller Foundation financed a public health school (the JHSPH) and an intergovernmental organization (the LNHO's epidemiological intelligence service). The former legitimatized the use of mathematical statistics for analyzing vital and health statistics in academia, while the latter standardized vital and health statistics collection and dissemination among public administrations. The Milbank Memorial Fund, with its considerably smaller budget, devised health demonstrations in New York State through which it financed local public health administrations, in collaboration with local governments, to test their financial feasibility. The Milbank demonstrations established the essential role of statistical practices in health policy-making through a number of publications that described the results.

Although the above three initiatives had different priorities and were independent of one another, the experts who contributed to their design and implementation were in contact and had very similar career paths. Examining their profiles can help us grasp the context that led to the development of the international health statistical system.

Bacteriologists and Their Ventures into Public Health

Both the Rockefeller Foundation and the Milbank Memorial Fund sought guidance from public health researchers when designing their initiatives. Three medical doctors, who had also trained in bacteriological

[23] Ron Chernow, *Titan: The Life of John D. Rockefeller, Sr.* (New York: Knopf Doubleday Publishing Group, 2007), 232.

[24] John D. Rockefeller Jr., "To Albert Milbank," November 30, 1932, Family/Cultural Interests/E/11/114, Rockefeller Archive Center.

[25] Paul Weindling, "American Foundations and the Internationalizing of Public Health," in *Shifting Boundaries of Public Health: Europe in the Twentieth Century*, eds. Susan Gross Solomon, Lion Murard, and Patrick Zylberman, Rochester Studies in Medical History (Rochester, NY: University of Rochester Press, 2008), 69–70.

laboratory research methods, acted as statesmen of science and were sought out by the philanthropic foundations in order to secure scientific credentials for their actions. These were William Welch (1850–1934), Hermann Biggs (1859–1923), and Ludwik Rajchman (1881–1965), who would become the principal advocates of the three statistical initiatives discussed in the following chapters.

Welch and Biggs had almost identical early career trajectories. Born in the mid-nineteenth century, they were part of the first generation of physicians to convert to germ theory and related laboratory methods when the theory began to gain traction at the end of the century. Welch and Biggs both began their medical careers at Bellevue Hospital Medical College in New York City, in the 1870s and 1880s, respectively. Welch then embarked on a two-year tour of Europe, during which he worked with Julius Cohnheim in Breslau (current-day Wrocław, Poland), and through him became acquainted with Robert Koch.[26] Afterwards, Welch returned to Bellevue to teach pathology and contributed to the establishing the United States' first pathology laboratory.

Welch's lectures were greatly admired by his students, including a young Hermann Biggs, and Welch's laboratory demonstration of Koch's experiment inspired Biggs' passion for bacteriology.[27] Just like his mentor, Biggs departed for Europe to apprentice under renowned bacteriologists, including Robert Koch in Berlin and Louis Pasteur in Paris. In 1884, a year after Biggs' departure for Europe, Welch himself took a second European tour in search of inspiration for his design of a medical college and laboratory at Johns Hopkins University. 1884 was also when Robert Koch isolated the pathogen responsible for cholera. Welch and Biggs' European experiences meant that they were steeped in bacteriological laboratory methods focused on isolating pathogens in pure culture in the era when that trend reached its climax.[28]

Upon returning home, Welch and Biggs imported European laboratory training into the American public health system. Welch became a professor of pathology at Johns Hopkins and the first pathologist-in-chief of its hospital five years later; Biggs took over the Carnegie Laboratory at Bellevue, and convinced the New York City government to enlarge its municipal diagnostic laboratory (which also produced vaccines) at the

[26] David Riesman, "William Henry Welch, Scientist and Humanist," *The Scientific Monthly* 41, no. 3 (1935): 253.

[27] Simon Flexner and James Thomas Flexner, *William Henry Welch and the Heroic Age of American Medicine* (New York: The Viking Press, 1941), 119; Richard Adler, *Robert Koch and American Bacteriology* (Jefferson, NC: McFarland, 2016), 145.

[28] For more detail on Welch's training during his second visit to Europe, see: Adler, *Robert Koch and American Bacteriology*, 145–9.

end of the nineteenth century, with Biggs at the helm.[29] Biggs spent the rest of his career in New York public health administrations: he served as the first general medical officer of the Health Department of the City of New York in 1902, and as the New York State Commissioner of Health in 1914.[30]

The final effort of both men's careers was the promotion of statistical practices in public health in the 1910s. Biggs was in his fifties and Welch in his sixties, and both were well established in research. Their emphasis on statistical collection can be understood as an effort to apply laboratory methods to the social world. Theodore Porter's work is useful for grasping Welch and Biggs' reasons for supporting statistics: Porter draws a parallel between laboratory science and quantification, pointing out that statistics put the messy reality of the social world into a purified form and represented social reality while being suited to laboratory-like manipulations.[31] As the collection and calculation of statistics had traits in common with laboratory research, it is not surprising that Welch and Biggs became strong advocates for statistical practices in public health, though neither of them would have considered himself a statistician.

Welch and Biggs' voices were amplified by their close relationship with the philanthropic foundations. Both were, in one way or another, associated with the Carnegie Laboratory at Bellevue, and both had served on the board of directors of the Rockefeller Institute for Medical Research since its establishment in 1901,[32] making them a natural choice for the foundations to consult when designing their programs. When Welch submitted his design for the Johns Hopkins School of Public Health and its statistics department, he was a professor of pathology at Johns Hopkins and was frequently called upon by the Foundation to advise its IHB and China Medical Board. He also visited China on a Rockefeller mission in 1915 and participated in designing the PUMC.[33] Biggs was the general medical officer of the New York Public Health Board, and had spearheaded a variety of public health activities in New York, including the Framingham health demonstration launched in 1916. With the Milbank Memorial Fund's financial support, the demonstration aimed to lower the number of tuberculosis cases in the Massachusetts town

[29] John Duffy, *The Sanitarians: A History of American Public Health* (Urbana, IL: University of Illinois Press, 1992), 195.
[30] "Hermann M. Biggs," *Science* 58, no. 1508 (1923): 413–14.
[31] Porter, *Trust in Numbers*, 16–21.
[32] Darwin H. Stapleton, *Creating a Tradition of Biomedical Research: Contributions to the History of the Rockefeller University* (New York: Rockefeller University Press, 2004), 20.
[33] Flexner and Flexner, *William Henry Welch*, 402.

of Framingham.[34] These prior collaborations gave Welch's and Biggs' suggestions on statistical initiatives considerable weight with the philanthropic foundations. Notably, Welch and Biggs were also associated with each other's initiatives via the philanthropic foundations that funded them. Welch sat on the advisory board of the Milbank Memorial Fund, which funded the New York State demonstrations supported by Biggs; and Biggs participated in the Rockefeller Foundation's conferences on designing a new school of public health, a conference that paved the way for Welch's proposed school at Johns Hopkins.[35]

On the other side of Atlantic, the bacteriologist Ludwik Rajchman – the main instigator of the LNHO's use of statistics – had a career that took a rather different trajectory. Rajchman was born, decades after Welch and Biggs, into a family of intellectuals in Russian-controlled Warsaw in 1881. When Rajchman began his medical education at the Jagiellonian University in Krakow, bacteriology was already well established across Europe. His teacher, Odo Bujwid, was a student of Louis Pasteur and Robert Koch. When Rajchman was released from prison after his involvement in the Polish Revolution of 1905, Bujwid organized his exile in Paris at the Pasteur Institute. Rajchman stayed in Paris until 1910, when he was hired as a bacteriologist by the Royal Institute of Public Health in London. When Poland gained independence in 1918, Rajchman returned to his home country and convinced the newly established government to establish an epidemiological institute, later known as the National Institute of Hygiene. Rajchman and his institute were instrumental in containing the typhus epidemic that was raging in Russia and Eastern Europe following World War I. He became known to the Rockefeller Foundation, which was active in the provision of medical relief in Eastern Europe. Rajchman's leading role in responding to that crisis eventually led him to be named the first director of the LNHO in 1921. His first mission for the League, before becoming director, was to form international partnerships to combat typhus in Eastern Europe.[36]

As the first director of the LNHO, Rajchman was in charge of designing the organization, and he created the statistical service with the express aim of gaining financial support from the Rockefeller IHB. Like Welch and Biggs, Rajchman was an established bacteriologist and no

[34] Donald B. Armstrong, "The Framingham Health Tuberculosis Demonstration," *American Journal of Public Health* 7, no. 3 (1917): 318–22.

[35] Rockefeller Foundation, "Conference on Training for Public Health Service by Rockefeller Foundation – Committee on Institute of Hygiene," October 16, 1914, RF/1.1/200/184/2214, Rockefeller Archive Center.

[36] Marta Aleksandra Balinska, "Ludwik Rajchman (1881–1965): Médecin polonais et citoyen du monde," *La Revue du Praticien* 55, no.4 (2005): 458–61.

stranger to the Rockefeller Foundation. What distinguished Rajchman from Welch and Biggs was his rhetoric regarding the role of statistics. Rajchman, working as he did at the helm of an international health organization, emphasized the fact that statistics could serve as the basis for international collaboration, rather than focusing on advancing scientific research.[37]

Welch, Biggs, and Rajchman were neither the first nor the only individuals to use statistics to tackle public health crises, but they planted the seeds for initiatives that eventually institutionalized statistical practices within public health at the international level. Apart from their generational and geographical differences, the three researchers' careers had several traits in common: Their apprenticeships were transnational; they all received bacteriological laboratory training; and they were all known to the philanthropic foundations for their medical research before they sought to integrate statistical practices into public health. Their prior experience motivated and empowered them – with the support of philanthropic foundations – to venture into statistical initiatives for public health, which would have a profound impact in several regions of the world over the following years.

Missionaries' Sons, Born in China and Trained in North America

To achieve their ambition of carrying out public health work that transcended national borders, the philanthropic foundations and their bacteriologist partners relied on experts with knowledge of both public health and local contexts. In China, missionaries' sons who had been born and raised in the country fit perfectly into this highly niche profile. Edgar Sydenstricker (1881–1936) and John B. Grant (1890–1962) were two notable examples. Their childhoods in China gave them knowledge of the country, while their university training in North America (Sydenstricker in the United States, and Grant in Canada and the United States) meant that their public health expertise was aligned with the needs of the foundations and bacteriologists. They were thus entrusted to lead the Chinese end of the circuits through which statistical initiatives crossed continents. Specifically, Sydenstricker was recruited by the LNHO in Geneva to design the epidemiological intelligence service, with earmarked funding from the Rockefeller Foundation. Upon returning to the United States, he was then associated with the Milbank Memorial

[37] See Chapter 3 for more information on Rajchman's attempts to secure IHB funding.

Fund's New York and Ding Xian (Ting Hsien) health demonstrations.[38] Grant, for his part, was sent to China by the Rockefeller Foundation to serve as professor of pathology at the PUMC, where he would carry out a series of activities that laid the foundation for public health statistics in China.[39] As executive officers, Grant and Sydenstricker were both pioneers of health statistics collection in China, a country separated from the North Atlantic sphere by vast cultural and political differences.

Though they were involved in different initiatives and worked with different foundations, Sydenstricker and Grant's family backgrounds were surprisingly similar. Sydenstricker's father, Absalom Sydenstricker, was an American Presbyterian missionary stationed in Shanghai, where Edgar Sydenstricker was born in 1881. Nine years later, John Grant was born into a Canadian missionary family based in Ningbo, some 200 kilometers south of Shanghai. The men's family backgrounds explain their long-standing interest in public health in China in two ways. First, having grown up in missionary families, they were steeped in charitable culture, which in part explains why both undertook studies and careers that had a humanitarian dimension. In 1896, the fifteen-year-old Sydenstricker went to West Virginia to study sociology and economics at Washington and Lee University;[40] some fifteen years later, Grant began his studies in Nova Scotia and later studied medicine at the University of Michigan.[41] Their childhoods also inspired their professional interest in China at different stages of their careers. As will be discussed in the following chapters, Sydenstricker brought the Milbank Memorial Fund's attention to China in the late 1920s. And Grant spent eighteen years in China representing the Rockefeller Foundation in the construction of a public health system there before the Foundation transferred him to India in 1937 due to the outbreak of the Second Sino-Japanese War.[42]

With specializations in the social sciences and medicine, respectively, Sydenstricker and Grant were trained to approach public health issues from different angles. Sydenstricker applied a social-science perspective:

[38] These two initiatives will be discussed in Chapters 3 and 4, respectively.

[39] Grant and his contribution to vital and health statistics in China will be presented in greater detail in Chapter 2.

[40] Dorothy G. Wiehl, "Edgar Sydenstricker: A Memoir," in *The Challenge of Facts: Selected Public Health Papers of Edgar Sydenstricker*, eds. Richard V. Kasius (New York: Prodist, 1974), 4.

[41] Liping Bu and Elizabeth Fee, "John B. Grant International Statesman of Public Health," *American Journal of Public Health* 98, no. 4 (2008): 628.

[42] Li Lu and Zhang Daqing, "Lan Ansheng de gongxian: Zhongguo gonggong weisheng jingyan zai yindu de zhuanyi" [John Black Grant's Contribution: Chinese Public Health Experiences' Transplant in India], *Yixue yu Zhexue [Medicine & Philosophy]* 36, no. 9A (2015): 81–4.

He began his career by conducting social surveys on the wages, working conditions, and standards of living of industrial workers for the United States Immigration Commission. His venture into public health started in 1915, when he joined the USPHS and was appointed assistant to surgeon Benjamin S. Warren for a study on health insurance administration in European countries. He was subsequently transferred to South Carolina to work with Joseph Goldberger, also of the USPHS, on his epidemiological study of pellagra, which sought to ascertain the relationship between dietary, economic, and sanitary factors.[43] In contrast to Sydenstricker, Grant received more orthodox training for a public health expert: though originally trained in medicine, he began his career in public health after being recruited by the Rockefeller IHB in 1918. The IHB first sent Grant to Puerto Rico to work on hookworm control and later paid for his studies in public health at Johns Hopkins University in the early 1920s. Grant's work in China reflected the nature of his training and focused on adapting public health research and administration to the Chinese context.

Unlike the bacteriologists mentioned above, Sydenstricker and Grant did not come to focus on statistical practices only at the end of their careers; rather, their entire careers were intertwined with public health statistics. In the early 1920s, both men were associated with statistical initiatives by philanthropic foundations and designed programs that led to the professionalization of public health statisticians.[44] As I will demonstrate in the following chapters, Sydenstricker's work with the LNHO – aimed at institutionalizing the role of statisticians within national health authorities – was launched in 1922 with Rockefeller funding. Grant's plan for a public health school at the PUMC – where special attention was given to the training of statisticians – was endorsed by the Rockefeller Foundation in 1924.

Both men's influence in public health statistics extended beyond 1925. Following his work at the LNHO, Sydenstricker returned to the United States and continued conducting statistical research for the USPHS and the Milbank Memorial Fund. The latter would send Sydenstricker to China to run a health demonstration. Sydenstricker also became the director of the statistical section of the American Public

[43] Willford I. King, "Edgar Sydenstricker," *Journal of the American Statistical Association* 31, no. 194 (1936): 411–14.

[44] Sydenstricker was an author of two articles describing the role of statisticians in public health administrations: E. W. Kopf et al., "Educational and Professional Standards for Vital Statisticians," *American Journal of Public Health* 15, no. 6 (1925): 518–20; Edgar Sydenstricker, "The Statistician's Place in Public Health Work," *Journal of the American Statistical Association* 23, no. 162 (1928b): 115.

Health Association, and throughout his career sought to demonstrate the correlation between health and social factors – such as economic status, income, and sanitary conditions – up until his premature death in 1936.[45] As for Grant, he became a public health administration guru in China, with his students occupying key positions within Chinese public health administrations and research institutes even after 1945. Grant's influence also extended to other parts of the world after World War II. He was associated with United States President Harry Truman's administration, advised the World Health Organization, and consulted with several national governments on their health administration design. He also taught public health at the University of Puerto Rico until his death in 1962.[46]

It should be noted that Sydenstricker and Grant knew each other and consulted one another while working on their respective programs. The most significant encounter came in the late 1920s, when Sydenstricker arrived in China as Milbank's representative in charge of designing the health statistical system for the rural reconstruction programs in Ding Xian. At Grant's advice, he placed the Ding Xian program in the hands of Grant's former students at the PUMC.[47]

The life stories of Sydenstricker and Grant support historian Ian Tyrrall's argument that continuities existed between missionary societies and philanthropic foundations.[48] Tyrrall asserts that philanthropic foundations gradually replaced missionary societies as the major players in the American moral empire, but Sydenstricker and Grant's trajectories show that this replacement happened not only at the organizational level but also at the individual level. The sons of missionaries with cultural knowledge and humanitarian concerns attributable to their childhood in China and higher education in North America, they became the executors of American philanthropic foundations' plans to promote public health statistics on an international scale.

Confluence and Networks

The life trajectories of the bacteriologists and health administrators introduced above represent two directions of migration. On the one hand, starting in the 1870s, American bacteriologists traveled to Europe for laboratory training and then returned to the United States to develop

[45] Wiehl, "Edgar Sydenstricker: A Memoir."
[46] Bu and Fee, "John B. Grant International Statesman of Public Health."
[47] See Chapter 4.
[48] Tyrrell, *Reforming the World*, 228–9.

their own laboratories. On the other, the sons of North American missionaries grew up in China and returned to North America for higher education, where they became acquainted with, and were later hired by, philanthropic foundations. New York was the meeting point for these two trajectories: it was where affluent American philanthropic foundations were headquartered and where experts with various skill sets were recruited to carry out the foundations' plans to improve health conditions and further crystallize statistical collection for public health at the international level.

The experts involved in the three interwar circuits of transfer for statistical practices covered in this book were aware of one another's initiatives and even collaborated in some cases. For example, Raymond Pearl, the first biostatistics professor at the JHSPH, recommended that Edgar Sydenstricker become the first director of the LNHO's epidemiological intelligence service.[49] Pearl was also part of the LNHO's study groups. Sydenstricker and his associates at the LNHO provided statistical services to the Milbank health demonstrations upon returning to the United States, and Sydenstricker's Milbank-funded research on the impact of depression on morbidity and malnutrition was published in the LNHO's bulletin.[50] This off-and-on collaboration is demonstrative of how the circulation of a given statistical practice was not self-contained; rather, different circuits interacted with one another.

This loosely organized collaborative network was not without its opponents. Major Greenwood and Raymond Pearl, both pupils of Karl Pearson (a leading founder of mathematical statistics), privately shared bitter criticisms of initiatives aimed at inserting statistics into public health. Although Greenwood and Pearl also made salient contributions to those same initiatives on several occasions, the duo complained to each other that such initiatives were a waste of money and energy because they tackled only the superficial manipulation of statistical techniques, thus diverging from the mathematical statistical research in which Greenwood and Pearl had been trained under Pearson.[51] Such criticisms make it evident that the circulation of statistical practices was not always straightforward and was challenged at various points. The challenges are revelatory of the ways in which some types of statistical thinking and practices were "lost in translation" when transferred to China from the North Atlantic sphere of influence. As I will detail later, North Atlantic experts and their

[49] Wickliffe Rose, "To Rajchman," July 18, 1922, 12b/26117/21836/R839/1923, League of Nations Archives.

[50] Borowy, *Coming to Terms with World Health*, 367–8.

[51] Major Greenwood, "To Raymond Pearl," August 5, 1923, Greenwood, Major (2) 1923/i, Raymond Pearl Papers, American Philosophical Society. I will also detail their criticisms in Chapter 2.

Chinese partners had to adapt their priorities when confronted with the Chinese context.

In the following chapters, I will further detail how the call for a language of public health was responded to and implemented through my analysis of the circulation of statistical practices among a network of experts composed of philanthropists, researchers, and administrators. This network spanned continents and laid the foundation for an international health statistical system from the 1910s to the 1960s. The network grew as more specialists were recruited to carry out statistical work, and some early initiatives trained new cohorts of health experts in statistical practices.