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Risk as a Technology of Care: Public Health, Private Insurance, and Medical Sociality

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This Honors thesis, entitled *Technologies of Abstraction: The Disembodiment of American Medicine,* is the culmination of an interdisciplinary major meant to investigate medicine and the body historically, sociologically, and philosophically. Each chapter focuses on the integration of a particular technology into medicine, and traces the way in which the meanings of the technology and the priorities of medicine worked mutually to articulate the dimensions of care. Each of these technologies assumed particular institutional forms in the context of prevailing understandings of the ontology of the body, the place of the physician in society, the identity of stakeholders in the organization of medicine, and the relationship between disease and health. Chapter One focuses on the x-ray's early life, at the end of the 19th century, as a potent representation of industrial and scientific medicine, as well as of the irrelevance of patient self-knowledge. It tracks the use of the x-ray in authorizing biomedicine as the only legitimate philosophy of care, while noting the discrepancy between the machine's symbolic power and any firm understanding of the way that it actually worked. Chapter Two centers the mid-century debut of antidepressants onto a medical landscape that increasingly understood both disease and cure in the language of chemistry. The understanding of the body as a set of chemical processes provided an organizing principle for doctors, researchers, and pharmaceutical companies to coordinate their activity, as well as laid the groundwork for the proliferation of bureaucracies that were needed to produce, regulate, and deliver medicine. The third chapter carries on with the themes of abstraction, individualization, and bureaucratization to discuss risk, a technology that has come to characterize 21st century healthcare through the predominance of both chronic disease and the insurance practices that set the terms for health maintenance. As the threat of infectious disease waned over the 20th century, the conflation of two kinds of risk – disease risk and financial risk – came to structure medicine according to the logic of privatization. As medical sociality was no longer visible through contagion, the preponderance of for-profit insurers worked to displace matters of medicine from the public to the private. This disjunction between medicine and politics continues to obscure the roots of chronic disease in social and environmental conditions, and leaves political bodies lacking the grounds to address acute crises of infectious disease.

> Artificial epidemics...are attributes of society, products of a false culture or of a culture that is not available to all classes. These are indicators of defects produced by political and social organization, and therefore affect predominately those classes that do not participate in the advantages of the culture.
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> Rudolf Virchow, 1848

Introduction: Diagnosis and (un)certainty

Medical diagnostic categories are attempts to order the human experience of "complexity and impurity" into representations that enable therapeutic intervention (Löwy, 2011, p. 300). They make uncertainty manageable. Over the course of the 20th century in the United States, diagnostic and therapeutic frameworks came to be negotiated in an increasingly large, bureaucratic, and business-oriented space. By the 21st century, the uncertainty of living in a body – one that is necessarily susceptible to internal breakdown and external injury – had become mediated by notions of health and disease that were inaccessible to the patient. Medical epistemologies were abstracted from the singular interaction between doctor and patient, and negotiated between the interests of general practitioners, specialists, researchers, device and drug manufacturers, and hospital administrators.

In this complex space of health and sickness, there was a dramatic shift in the object of concern for healthcare providers. The threat of infectious disease waned, and diagnoses of chronic diseases proliferated. The institutional structure of American healthcare evolved in response to an increasing prevalence of chronic illnesses which, while often framed as epidemics, challenged 19th-century models of understanding and managing sickness. Chronic disease developed from a complex set of non-bacterial, non-viral factors related to diet, lifestyle, environmental exposures, and more. This epistemological shift in relation to disease causation re-made disease as the balance of risk factors that characterized any one individual. Healthcare, configured in the language of risk, oriented the individual in a locus of probabilities that certain detrimental health outcomes might occur.

The prevalence of chronic disease in the United States challenged existing frameworks for understanding health and sickness. Causal explanations based on specifiable, sinister molecules were insufficient to address a kind of sickness that was characterized not by acute harm, but by a degeneration that paralleled the natural process of aging. The successful use of targeted therapies to prevent and treat infectious disease made biochemical explanations authoritative, but chronic diseases called for a more holistic understanding of the determinants of health. In challenging established etiological paradigms, chronic diseases had the capacity to cause a radical reconceptualization of the meaning of illness, to situate health outcomes in a web of biological, social, psychological, political, economic, and environmental conditions.

In 1957, the Commission on Chronic Illness, a joint endeavor by the American Medical Association, American Hospital Association, American Public Health Association, and American Welfare Association, published its general report at the conclusion of its seven-year program. The commission outlined its philosophy of controlling chronic disease by promoting health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." They identified "components of healthful living" that included "nutrition, mental hygiene, adequate housing, moderate and well balanced personal habits, useful and productive role in society, general education, healthy working environment, recreation, and personality." They then elaborated four general areas at which to intervene in health care delivery for chronic illnesses: nutrition, mental hygiene, housing, and economic security (Yamashita, 1992, pp. 99).

But while rising rates of chronic diseases expanded etiology to include elements of the social world, an intersecting epistemological shift in the business of healthcare ultimately reified individual behavior as causative of disease. The conceptual shift in diagnosis and disease management accompanied the rise to prominence of the knowledge and accounting practices structured by private insurance. Behavioral risk became conceptually and materially entangled with actuarial logics that implicitly set the terms for the distribution of care. The increasing influence of private health insurance subjected patients' health risks to processes of economization that were driven by firms' own financial motives. Particularly towards the end of the century, private interest replaced public good in paradigms of health. Without the visible threat of infectious disease and the corresponding necessity of strict control of populations, public health officials lost much of their authority. Although they called for a broad socio-political-environmental understanding of the determinants of chronic disease, individuals increasingly saw their health as a private matter. Private health insurance was thereby able to take the place of public health departments in setting the terms for health governance. They relied on actuarial calculations to manufacture patient risk pools, abstracting individuals' healthcare decisions from their political environments as they reconfigured health outcomes along the lines of consumer choice.

The destabilization of the infectious disease paradigm represented an opportunity to think through both theories of disease causation and positive projects to promote health apart from targeting individual diseases. However, the space of possibility was narrowed by the reassertion that more information about the body's interior would inevitably produce results – an individualism that was implicit in the form of governmentality produced by private health insurers. These firms made individuals responsible for evaluating their own health on the basis of their location in an actuarial cohort that was inaccessible to them. In the process, they disallowed alternative modes of sociality that might have articulated possibilities for intervening in health at a structural level.

Infectious Disease and Public Health Authority

By the middle of the 20th century, the chief healthcare concern for the United States had shifted from infectious to chronic diseases. Public health campaigns had been largely successful in decreasing mortality from cholera, dysentery, tuberculosis, typhoid fever, influenza, yellow fever, and malaria. Most of the decreased mortality can be attributed to sanitation and hygiene improvements that occurred near the end of the 19th century, and were implicit in urban planning that sought to ameliorate the problems of overcrowding (Bollyky, 2018; “Achievements in Public Health,” 1999). By 1900, 40 out of the 45 U.S. states had established health departments to enact projects such as chlorination of the water supply to decrease the prevalence of waterborne diseases. By the 1950s, state and local efforts had expanded to include sewage disposal, food safety, and public education about hygienic practices. However, the successes of governments in virtually eradicating diseases including diphtheria, tetanus, poliomyelitis, smallpox, measles, mumps, rubella, and type b meningitis were attributed to strategic vaccination campaigns and therapeutic innovations. Antibiotics and screening campaigns, such as those to detect tuberculosis through mobile x-ray clinics, advertised the potential for technological innovations to identify and target specific causes of diseases. Therefore, important structural changes at the level of social and environmental health were eclipsed by the symbolic power of sophisticated technologies to intervene at the molecular level of life.

Even when they harnessed the power of antibiotics, vaccination, and new screening methods, public health efforts to eradicate disease depended on strong state police power. Public health responses to epidemics included compulsory population-based measures such as mandatory inoculation for smallpox and forced isolation of tubercular patients (Galva et al., 2005). These campaigns relied on a rhetoric that configured the biological causes of infectious disease as alien invaders of a bounded population. Individual molecular entities were enemies attempting to invade a community whose borders were, by necessity, clearly delineated. Significantly, campaigns against diseases such as tuberculosis and venereal diseases in the years before and during World War II often drew on wartime rhetoric to mobilize public support for protecting the nation’s health. The individual’s protection from harmful agents depended on the surveillance and protection of the community as a whole, and this reality justified strong police power on the part of state health organizations. The doctrine regarding police power as an expression of civil authority, or the state’s ability to regulate non-criminal behavior, was firmly recognized as necessary for the health of the population (Galva et al., 2005, p. 21). There was, therefore, a strong communitarian justification for the state's use of biological and epidemiological advances to control infectious diseases.

The replacement of infectious diseases by chronic diseases as a public health priority towards the middle of the century challenged the authority of state power over public health matters. This was, in part, due to new models of disease causation that were necessary to make sense of increasing rates of cardiovascular disease, diabetes, hypertension, and cancer. These chronic conditions could not be explained by traditional epidemiological models, which were largely influenced by Louis Pasteur's principles of microbiological germ theory and Robert Koch's causative principles. Koch's postulates provided a framework for drawing one-to-one relationships between microorganisms and diseases. They specified that the organism must 1) be found in all cases of the disease, 2) be isolated from patients and grown in culture, and 3) produce the disease anew when inoculated into animals (Parascandola, 2011, p. 245). These laboratory-based activities could draw powerful connections between a single cause and a single effect, but they broke down in the face of chronic diseases that had no clear infectious origin.

In the place of direct cause-and-effect claims, epidemiologists adopted probabilistic methods influenced by developments in quantum physics, ecology, and the social sciences. These disciplines had expressed doubt that complex physical, biological, or human phenomena could be explained by single observable causes. But epidemiologists embraced theories of multiple causation not only for their scientific rigor; they harnessed them because they were pragmatic. The growing association of cigarette smoking with lung cancer in the 1950s and 1960s is an example. Although researchers could not rigorously demonstrate that smoking was the single cause of lung cancer, they could demonstrate a probable correlation between the two. A complete picture of cancer causation was lacking, but public health departments could justify anti-smoking campaigns to operationalize messaging around the only cause that they could identify and target (Parascandola, 2011).

Public health workers often made individual behavior the target of their campaigns, urging the public to stop smoking, or to regularly visit their doctor to be screened for various cancers. Although the model of public health that predominated in the second half of the 20th century, referred to variously as "modern" or "risk factor" epidemiology, emphasized social and environmental factors in addition to biological ones, public health rhetoric was individualizing in articulating behavior modification as the way to ameliorate disease. At the same time, general acquiescence to compulsory public health measures declined. In the late 1950s, the ideologies of individual rights and freedom arose responses to the Vietnam War, the civil rights movement, and the rise of second-wave feminism. These priorities were reflected in a number of decisions made by the Warren Court that emphasized individual rights over civil police power. These decisions weakened the power of the state to impose quarantine, conduct contact testing, and limit access to places identified as foci of contagion (Galva et al., 2005, p. 22). From the 1960s onwards, health matters were removed from the domain of public concern and relocated within the discourse of consumer choice and behavior. Actions to prevent illness would be measured against private freedoms, and medical decisions would be framed in terms of patient autonomy.

Public health officials and medical researchers declared that there was an "unseen plague" or epidemic of chronic health conditions, and that as many as half of all Americans could be sick without knowing it (Yamashita, 1992, p. 64). But although the language of infectious disease control was co-opted for this new and invisible threat, the public health concern with chronic disease prescribed a very different set of actions and responses, and with it a new logic of sociality. Cancer was pervasive – by the 1930s it was estimated that one in four Americans would develop a cancer at some point in their lives – but it often could not be seen ("A Battle on Cancer," 1928). Unlike those affected by outbreaks of infectious disease, the population of cancer patients was not geographically bound. It took active and sophisticated searching on the part of public health authorities to locate cancer patients. This idea of an invisible killer justified widespread campaigns to encourage Americans to regularly visit their doctors for various screening tests. But individual diagnoses were made within the confines of the doctor-patient encounter, and this myopic focus made the community of other cancer patients invisible. Although there was a cancer "epidemic," decisions about testing and treatment were ultimately contingent on the individual's compliance with recommended screening protocols. Individual health regimens and outcomes were abstracted from communal trends in disease.

A New Kind of Risk: Actuaries and the Technology of Certainty

Chronic disease was understood as being engendered by a heterogeneous set of factors, and thereby challenged the ontology of illness as caused by a single agent. However, the treatment of chronic disease did not correspond to this complexity. Although public health organizations increasingly identified social, economic, and environmental influences on healthcare outcomes, insurance companies reified individual behavior and, increasingly, genetics, as causative of disease. In 1965 medical professionals internationally had outlined notions of a "new public health," one premised not only on identifying disease but on "the more sophisticated concept of positive health" (Yamashita, 1992, p. 125). Doctors and public health officials had begun to recognize the limits of screening campaigns that collected more information about pathology but could not deliver treatments in response to this data. It seemed that "knowing about the disease" would not always help the patient, and they identified external factors – security and safety in the natural and built environment – as important places to intervene for the sake of health (Yamashita, 1992, p. 126).

But although public health programs espoused the need to look toward contextual drivers of disease, their power to actually produce health in the population was decreasing. Instead, insurance companies, and the pharmaceutical therapies that they helped to standardize, structured and provisioned care according to measurements about individuals. They helped to define the era of chronic diseases according to an actuarial logic that necessitated a proliferation of statistical information about their patient populations. They helped to define chronic diseases themselves according to measurements and risk assessments of individuals, a paradigm that prescribed targeted interventions but neglected to outline a truly positive conception of health.

The advent of insurance as a way to achieve security for a whole population was conditional on mathematical tools that used data about populations to calculate the likelihood of given events occurring in the future. Actuaries turned an infinite set of qualities about people into measurable predictions about desirable and undesirable events. In doing so, they delimited a space for *risk* apart from *uncertainty* as an innate condition of life. Frank Knight, one of the founders of the Chicago School of Economics, articulated the difference between risk and uncertainty as such: "Risk is a combination of hazards and is measured by probability; uncertainty is measured by a degree of belief. Risk is a state of the world: uncertainty a state of the mind" (Knights & Vurdubakis, 2014, p. 730). In delineating salient causal conditions through measurement, actuarial practices "designate an objective reality which disciplined knowledge can open up to prediction and control" (Knights & Vurdubakis, 2014, p. 730). In its ability to "reconstruct" and "rearrange" certain aspects of the observable world in accordance with laws of prediction, insurance is part of a deep history that renders the world increasingly knowable through precise measurement.

The discipline of statistics is predicated on the conceit that, with more, and more perfect, information, a scientist with the appropriate training can discern patterns and regularities out of "what appear[s] to be the chaos of mass phenomena." Jakob Bernoulli, a prominent 17th century mathematician and contributor to the field of probability, noted that "everything in the world occurs for definite reasons and in definite conformity with law." Even if events appeared to be accidental, this was only for lack of complete knowledge about the world. The mathematician was licensed to "assume a certain necessity" in the order of things (Knights & Vurdubakis, 2014, p. 738). Every occurrence was to be interpreted according to its place in a universe of probability. The growth of insurance in Europe in the 17th and 18th centuries involved a "re-definition of misfortune in terms of an impersonal chance rather than in terms of an alternative theory of agency, such as witchcraft, personalized malevolence, or God's punishment for sin" (Knights & Vurdubakis, 2014, p. 735). The discourse of probability enabled a measurable understanding of events as individuals were dislodged from their given places in cosmological narratives and social configurations. The construction of statistical tables established the regularity of certain events, while the calculation of probabilities based on measurements of individuals implanted the individual in a locus of quantifiable occurrences.

By the 20th century, public authorities had applied statistical methods to understanding health. A 1928 article in the *Los Angeles Times* entitled "Life and Death Chances Figured by Scientists" celebrated that the "Public Health Service Reduces Toll of Disease and Accident to Charted Certainty." The writer, Dr. Hugh. S. Cumming, Surgeon-General of the United States Public Health Service, compared figures "dug from mountains of mathematics" by scientists at the Service to the odds that help gamblers increase their yield, heralding the ease with which the public could now make decisions about life and death. He wrote that officials could now obtain answers, on behalf of the healthcare-consuming public, to questions such as "How many more years should I be good for after January 1? What sickness, if any, do I run the most chance of falling victim to during the coming year? What are the odds in favor of my surviving an illness?...[and] What are the odds of my not dying, considering my age?" in the form of "what might be called a health horoscope." It was now possible to apprehend information about future risks based on a detailed landscape of data about survival under predictable conditions. Public health officials navigated this statistical topography when they alerted people to their potential risks of contracting infectious diseases, as well as diseases of the respiratory system, nervous system, eyes and ears, circulatory system, digestive system, and kidneys. Individuals were thereby situated in a cosmology of numerical assessments, as medical systems made the statistical tracking of disease the authoritative way to manage and make sense of health. Dr. Cumming articulated the explanatory power of probability when he wrote that "Astrologers make prophecies from the positions of the planets [and] The modern epidemiologist depends upon sound and proved natural laws" (Cumming, 1928). The statistical modeling of disease extracted, from numerical data, landmarks that oriented individuals between life and death.

Insurance and Governmentality

The actuarial calculations of life events created risks, events that were immanently predictable, out of what would have otherwise been uncertainties. Much has been written about governments' adoption of this technocratic process as constituting a particular form of state power over individuals (Knights & Vurdubakis, 2014; Collier, 2014; McDonnel & O'Donovan, 2009). Insurance was part of a broader development in which the state used scientist methods to increase its instrumental knowledge of the population. This form of governmentality rendered the population an "economic and moral resource," enforcing narrowly defined norms of responsibility, security, and citizenship (Knights & Vurdubakis, 2014, p.

736). It assigned each individual a place in the collective by calculating probabilities of risk, and produced order by measuring certain qualities of individuals against each other. This process was both individualizing and homogenizing, as it made it possible "to measure gaps, to render the differences useful by fitting them to one another" (Knights & Vurdubakis, 2014, p. 733). Insurance enabled the state to use actuarial practices to delimit normality on its own terms. Actuaries made risk-backed finances the measure of individuals, using economic calculus to rectify disruptions due to chance occurrences and restore security.

This line of critique elucidates the flattening of life into measurable entities that allows technocrats to enforce certain modes of sociality. However, it is insufficient to understand the landscape of health insurance in the United States. The critique of state power assumes a "pessimistic functionalism: an apparatus…programmed to accomplish certain purposes no matter what, when, or where" (Bourdieu & Wacquant, 1992, p. 102). This centralized apparatus does not exist in the United States, as it has continually failed to pass national healthcare legislation that would place all citizens within one risk pool. Rather, health coverage is dispersed between multitudinous private corporations, producing obscured social groupings that are governed by less visible technologies of power.

The movement from infectious to chronic disease, and the accompanying removal of health governance from politics to economics, took place within a broader trend of rationalization through insurance. The example of the federal government's incorporation of flood insurance demonstrates the ideological shift in which public security is submitted individualizing market forces through the actuarial calculation of risks. After a series of earthquakes and hurricanes hit Alaska, the Pacific Northwest, the Midwest, and the South in the years of 1964 and 1965, the federal government passed the 1965 Flood Act, which allocated funding to strengthen protection against floods and provide relief to individuals who had suffered damages (Collier, 2014). The act was unprecedented in the scale at which it protected individuals, but it also altered the relationship of individuals to government provisions. Flood policy allowed the federal government to economize the effects of chance flooding, "forg[ing] new articulations and accommodations between political government and processes of rationalization" (Collier, 2014, p. 273). Their approach was to instantiate a program of risk-rated federal flood insurance that charged home and business owners a premium for building in flood-prone areas. This system replaced earlier security measures in which technical experts assessed the costs and benefits of constructing dams and levees, and made decisions based on the balance as it related to the relevant population. Under risk-rated insurance, individuals themselves were made to perform calculations of risk according to statistical likelihoods set out by actuarial processes.

This burden of choice shifted political philosophical questions about tradeoffs between security and cost-effectiveness for a community to the realm of consumer choice for the individual. It remade the uncertainty of natural disasters into probabilistic calculations of risk that the policy purchaser was meant to take as authoritative. Whereas New Deal economics posited that "flood works had significant public goods characteristics and would therefore be underprovided by private markets," 1960s legislation placed the responsibility for protection on the consumer. The technologies that connected citizens to security were re-formed in relation to the statistical wrangling of uncertainty in terms of risk. This legislation enforced "a new moral economy of disaster" predicated on the assumption that individuals should understand and act upon their specific probability of encountering future calamity (Collier, 2014, pp. 275-276). In the past, federal relief programs understood natural disasters as "acts of god," and treated those affected as unfortunate victims (Friedrich Hayek cited in Collier, 2014, pp. 275). Risk-rated insurance made floods into "a different kind of event," one liable to prediction on the basis of observable patterns, and thereby embedded in the rational agent's calculations about their own security (Collier, 2014, pp.275).

By relegating decisions about flood security to individual financial choices, the federal government reconceptualized its role in provisioning for the future. It cast off its responsibility to guarantee protection for all citizens from unpredictable events and facilitated access to protection only for individuals who performed the appropriate statistical calculus. This movement mirrored the federal government's relinquishing of responsibility for communal health concerns, and the private health insurance industry's re-shaping of health security according to calculations of individual risk. The passing over of public health policy into private health insurance wrangled uncertainty about the ontology of chronic diseases into statistical evaluative frameworks that used information about individuals to hedge financial risk. By the time chronic disease became a salient public health concern, epidemiologists had expanded their notions of disease causality to include non-biological, non-specific entities, including social and environmental conditions that are not within the purview of individual control. The actuarial practices of health insurers, however, necessitated more precise information about individuals with which to make coverage decisions. Risk-rating based on medical informatics and behavior enabled them to economize their coverage as they marketed a model of disease prevention that relied on the patient-consumer's adherence to pragmatic behavioral modifications.

Screening and Responsibility

As personal behavior became the most clearly discernable risk factor associated with chronic illness, people were encouraged to regularly visit specialists to undergo screening for cancer risk. Screening was not meant to replace diagnosis; rather it was designed to encourage 'higher-risk' people to take a more active role in bringing up health concerns to their physicians (Yamashita, 1992). The Commission on Chronic Illness, first convened after World War II by the American Hospital Association in partnership with other American professional healthcare organizations, as well as the World Health Organization, a Senate subcommittee on chronic diseases, and multiple reports by the American Medical Association on "Planning for the Chronically Ill," all emphasized prevention as the best strategy to avoid the widespread occurrence of late-stage cancers. By the 1950s, the philosophy of "multiphasic screening" had been proposed as a way to efficiently administer multiple tests within one visit to the specialist (Yamashita, 1992, p.72). By the 1970s, the number of diagnostic tests had proliferated, and the American Cancer Society began to recommend more frequent regular testing of asymptomatic individuals ("History of ACS Recommendations").

This strategy embraced the WHO's 1968 recommendation, for infectious disease management, that authorities use measures to "discover those among the apparently well who are in fact suffering from disease." The WHO viewed screening as the most "admirable method" of combating communicable disease, as it allowed "steps to be taken to prevent [the ill] from being a danger to their neighbors" (Yamashita, 1991, p. 1). Medical associations adopted the rhetoric of contagion surrounding communicable diseases as they elaborated the applicability of screening to combat chronic conditions as well. However, the detection of chronic disease did not stipulate that authorities intervene in public matters. Rather than use positive test results to find other positive cases, isolate the infected, or ameliorate conditions of overcrowding, they limited their recommendations to modifications of health behaviors. Often, screening was conducted on the assumption that more information was better, even when there was no available treatment for what was found.

In 1967, Jerry E. Bishop, a staff reporter for The *Wall Street Journal,* visited a facility that administered more than 30 of the different screening tests that would come to constitute a yearly check-up. The writer was investigating the multiphasic screening that would proliferate under a proposed bill entitled the Adult Health Protection Act, or "Preventicare." Senator Williams proposed the bill under the premise that "We can and must believe that a great nation, in an age of technological marvels, can enter an age of health maintenance, rather than relying almost solely on health repair" (U.S. Senate Subcommittee, 1966). Heard in the Senate Subcommittee on Aging, the bill proposed that a slew of free, voluntary health tests be made available to every citizen over the age of fifty. Senator Williams argued that Medicare was limited in that it only accounted for treatment, and only for those over the age of 65. The understanding of chronic illness as a set of slow-burning diseases necessitated earlier detection, meaning that people needed to be screened at a younger age. The facility that Bishop visited, the Life Extension Institute in Manhattan, was a private organization that offered two-hour $40 (about $307 in today's dollars) checkups for people under forty, and four-hour $85 (about $650) checkups for people over forty. He was asked to fill out comprehensive medical history paperwork that informed the doctor about his food, exercise, and smoking habits, and then was shepherded between diagnostic machines that were meant to detect lung tumors, glaucoma, stomach ulcers, colon polyps, dental diseases, hernias, cardiac rhythms, and more. Bishop himself had little access to the information generated by these machines. The institute forbid all patients from seeing the electrocardiogram tracing for fear that they would "misunderstand the machine's capabilities and become alarmed about meaningless aberrations," although they sent the tracing to patients' family doctors. Bishop was told that his tests all appeared normal, admonished to cut down on the two packs of cigarettes he smoked daily, and sent on his way. In hindsight, Bishop realized that he forgot to ask the doctor about a note on his x-ray report that identified a gastrointestinal abnormality of "one inconstant spasm in the antral end of the stomach and bulb" (Bishop, 1967). The doctor did not follow up with him about this finding.

As shown by Bishop's visit to the Life Extension Institute, individuals were made aware of sophisticated technologies that could inform them of their risk of developing disease later in life. But, as the visit also shows, patients themselves were not privy to the interpretations of data gathered by these technologies. Rather, they were encouraged to take responsibility for prevention by modifying their behavior – usually in regard to smoking cessation, which was arguably the only clear and actionable way to control a known carcinogen. Preventive medicine assumed an ideology of care that was legitimated by sophisticated technology but ultimately premised on pragmatic associations between controllable behavior and future risk of illness. Doctors embraced screening campaigns that had been successful in rooting out infectious diseases, appropriating rhetorical strategies premised on the specialist's ability to discover hidden physical causes of disease and applying them to chronic diseases with multiple complex and unknown causes. As the doctor took x-rays of Bishop's chest, he noted that "he [doesn't] see much tuberculosis anymore," but that "lung tumors [were] showing up more frequently" (Bishop, 1967).

But although the technology and the rhetoric were transposed from infectious to chronic diseases, the response indicated by the detection of chronic threats inside the patient's body was different. Public health departments, for lack of both scientific knowledge and popular support, could not make strong population-based interventions. There was no cure for chronic diseases – a reality that led to increased doubt over the necessity and ethics of frequent screening in subsequent decades. The only intervention was to maintain a lifestyle that might prevent future ruinous health outcomes. Americans were bombarded with information campaigns alerting them to their accountability for preventing health catastrophe by smoking, eating, and exercising in the correct way.

Private Health Insurance and Invisible Communities

The ideology of health maintenance as an individual responsibility was implicit in the proliferation of private and employer-based insurance schemes in the 1970s and 1980s. These decades saw a movement away from social insurance plans that were proposed, and defeated, periodically from the early 1900s. The Wagner-Murray-Dingell Bill of 1943 was the most expansive proposition for national health insurance. It was conceived as an expansion of the New Deal social security system that was enacted in 1935 and was meant to provide government-financed coverage to all working people and their dependents, although it excluded the unemployed, who were required to seek charity care at public hospitals or fund their care through state welfare programs (Bodenheimer & Grumbach, 1995). The bill was defeated by the American Medical Association, which asserted that national health insurance would threaten physician autonomy and that private health insurance was a better alternative. The Medicare law of 1965 took the approach of the Wagner-Murray-Dingell Bill, in which working individuals contributed to a social fund, but narrowed coverage to people over 65 years of age. Medicaid, enacted in the same year, was a public assistance program funded by general state and federal taxes. Although many people understood these developments as movements toward national insurance programs like those of European countries, which had similarly begun with incremental coverage of the population, proposals for broader coverage were defeated in 1970, and then again in the 1990s (Bodenheimer & Grumbach, 1995, pp. 214-215).

Increasingly, even proposals for national health insurance made concessions to the growing private healthcare system. President Nixon's 1970 plan set the tone for the next decades of health insurance reform. He advocated for an employer mandate, under which the federal government would require employers to purchase private health insurance for employees, thereby preserving and expanding the role of the private insurance industry. Senator Ted Kennedy, who fought Nixon for three years with a plan of his own that would provide federally-funded coverage for all Americans, later embraced the employer mandate for fear that the insurance industry would thwart any government attempt to finance national health insurance. But after 1979, a decreasing portion of Americans had access to this private healthcare system, and Medicaid proved insufficient to provide care for the working poor (Klein, 2003, p. 264). Nevertheless, welfare capitalism became a dominant ideology, as the justification for health insurance moved away from the solidarity principles of social insurance and toward employer-centered paternalism. Whereas earlier propositions for national health insurance were premised on the idea of sharing risks across economic strata, private employer-based plans made the firm's cost-benefit analysis the central calculation in providing healthcare to qualifying workers. Workers earned their healthcare as part of their compensation package, and decisions about what services were to be covered were submitted to the firm's total budget.

The growing consensus that private insurance was the best way to fund healthcare in the United States reflected the emergent belief that healthcare decisions were a matter of personal autonomy. The waning of infectious diseases and corresponding absence of contagion made shared causes of illness invisible, even as what are now known as the social and structural determinants of health shaped medical outcomes. The rise and management of chronic disease promoted an idea of a person's health as emergent only from their own patterns of behavior. Without the visibility of infection, the cancer 'epidemic' was a purely private concern – figured in relation to personal choice rather than environmental toxins, food insecurity, or the chronic stress of poverty. Therefore, there was a dissonance between public health officials' assertion that chronic disease was a collective and widespread malady and the economic reality that left each patient-consumer to obtain healthcare on their own. The urging by medical associations to take pragmatic behavioral steps in the face of limited knowledge about the ontology of chronic disease placed health management within the principle of consumer responsibility, and implicated personal health outcomes in the ability to pay.

In the 1970s and 80s, the funding of healthcare became a significant political concern, and healthcare administration was encompassed by a business logic of cost containment. The framing of health as a business problem came to the fore in the early 1990s, when many large corporations enrolled their employees in self-insured plans. With self-insurance, employers themselves assumed the function of health insurers and placed themselves at risk for health care expenditures. This allowed them to take analysis of healthcare costs into their own hands and use insurance companies only to process claims and carry out other administrative tasks. In 1991, 40% of employees who received insurance through their employers were enrolled in self-insurance plans (Bodenheimer & Grumbach, 1995, p. 227). This development not only made big business the largest voice in the healthcare debate; it relinquished decisions about medical care to the economic calculations of corporations.

As the United States population aged, a greater number of individuals faced the risk of developing the chronic diseases that manifested once the average life expectancy increased. These people increasingly found themselves in Health Maintenance Organizations (HMOs), a form of insurance that restricted patients' access to providers who had contracted with the insurer, or in-network providers. HMOs differed from the traditional fee-for-service (FFS) form of indemnity insurance, which compensated individuals for any care that they received, regardless of the provider. HMOs brought the problem of cost containment to the forefront of healthcare, as they contracted with providers who charged affordable prices and refused to reimburse their enrollees for visiting higher-cost providers. By 1990, 95% of insured employees were enrolled in an HMO or similar plan, and many HMOs had contracted with federally funded programs (Bodenheimer & Grumbach, 1995, p. 228). HMOs attracted patients with their emphasis on preventive care, which for the firms was a way to prevent expenses from more serious interventions down the line. These organizations created networks of providers that were compensated with a yearly salary, rather than in proportion to the services they administered to patients. Patients in each plan formed a group whose health services were dispersed between these pre-approved practitioners. With this circumscribed care, HMOs effectively created a closed risk pool that distributed healthcare dollars between enrolled patients and contracted doctors.

Although patients were led to believe that their healthcare outcomes were contingent on only their own preventive actions, people who were enrolled in the same HMO were bound together through the principle of risk-sharing. The central premise of insurance, risk-sharing, in the words of none other than Adam Smith, “gives great security to the fortunes of private people, and by dividing among a great many the loss which would ruin an individual, makes it fall light and easy upon the whole society (cited Knights and Vurdubakis, 1993, p. 732).” In theory, risk sharing distributes the consequences of unforeseen and undue afflictions amongst a collective, so that the more fortunate subsidize the security of the less fortunate. But with private insurance, risk-sharing is configured along financial lines that limit the redistributive capacities of insurance. HMOs sought to limit their own financial risk, an interest that ran against the principle of healthcare as social security. Because HMOs were incentivized not to insure those who were more likely to need health services, an individual’s coverage options were limited by their chance of developing disease and the actuarial calculus resulted in an essentially regressive system. The circumscription of health risk by financial risk was intensified as for-profit HMOs overtook non-profit HMOs in the 1990s insurance marketplace (Klein, 2003, p. 270).

FIGURE 1. A 1974 *New York Times* article entitled "Agreed: Here Comes National Health Insurance" illustrates the public's dissatisfaction with private insurers' financial rationales for healthcare decisions.

Financially-driven private insurance firms were not the first case in which economic concerns impinged on healthcare delivery; even within traditional FFS programs, healthcare dollars were limited. But the rise of profit-driven HMOs placed inordinate control over health in the hands of firms that made contract and coverage decisions based on a logic of economic rationality. Decisions about which doctors patients were allowed to see, which services they could receive, and how often they could seek care, were submitted to a matrix that bound physician services, treatment, and medical technologies together through cost-containment strategies on the part of the insurance firm. Individuals seeking healthcare were privy neither to the nature of these decision-making processes nor to the mechanisms that tied them to other patients through risk-sharing. Each HMO constituted its own social network, in which the care received by individuals implicated the care received by all other individuals in the same risk pool.

Private insurance was a method of financing care that took shape in conversation with the redefinition of illness called for by the proliferation of chronic disease. As definitions are inextricably bound up with institutions, the upheaval of certainty over the nature of disease called for a corresponding reorganization of healthcare. The calculus of private insurance firms represented a profoundly different logic of risk-sharing than that which characterized the control of infectious disease. The spread of infectious disease through physical contact with others nearby made communitarian thinking necessary for everyone within the same geographic area. Each person's actions tangibly influenced the infection rate of their community as a whole. Chronic diseases, on the other hand, had no single specific cause. A person's risk of developing a chronic disease, rather than conceived as the outcome of particular ways of living together, was tabulated on abstract actuarial terms. The insurers that calculated probabilities of risk did so by grouping patients together into risk pools, but this mechanism of sociality was invisible to communities of enrollees.

Whereas earlier proposals for national health insurance were premised on the idea of subsidizing the care of less fortunate citizens with collectively pooled resources, profit-driven private insurance fabricated ideal insurance pools based on individual risk profiles. This led firms to deny coverage for applicants who were more likely to develop chronic conditions in the future, or already had chronic diseases at the time of application (Bodenheimer & Grumbach, 1995, p. 228). Although community rating, the principle of charging everyone the same premium regardless of age, gender, or preexisting conditions, was mandated, firms were often allowed to equivocate, effectively preventing people who needed care from getting it (Klein, 2003). However, even without medical underwriting, insurance firms made treatment decisions based on calculations of individual risk. A 1996 article in the *Wall Street Journal* demonstrated the growing interpenetration of cost calculations and rationales for treatment, of financial and medical risk. The article described the process whereby HMOs decided how and how widely to prescribe statins, a class of cholesterol-lowering drugs that had been proven effective in preventing heart attacks and death from heart disease. Statins were advertised directly to consumers by four major pharmaceutical companies, leading patients to believe that these drugs might prevent any incipient threat from heart disease. These statins, however, were not guaranteed to prevent disease in all cases, and any general improvement in heart health would take at least two years to manifest. The pressure for HMOs to maximize short-term financial payoffs, in addition to the high turnover rate of patients from HMOs year to year, made in uneconomical to prescribe statins to all patients who requested them. Instead, HMOs targeted high-risk patients for treatment. One HMO noted that "by plugging into a formula such data as age, sex, levels of both total and HDL cholesterol…blood pressure and whether a person smokes or has diabetes, a doctor [could] calculate a patient's risk of dying of heart disease over the next five to 10 years" (Winslow, 1996). HMOs developed treatment guidelines based on their patients' risks of dying from heart disease, and used information systems to track doctors' prescription patterns and changes in cholesterol levels amongst their members. They economized care by allocating resources according to data about their enrollees' physiology and behavior, calibrating the type and amount of care received by patients with their global budget.

Conclusion: Medicine and Political Life

Whereas late 19th century campaigns against infectious diseases relied on centralized state power, the 20th century preoccupation with prevention of chronic diseases accompanied a rise in private insurance that relied on a different technology of governance. Public health projects to defeat infectious disease were undertaken to achieve the particular goal of removing disease from a population. They used knowledge about the biological risks of contagion to produce health as a public good. But the communal threat of infectious diseases waned, chronic diseases were constituted as a matter of private health, and governments made fewer active interventions to address the development of disease in populations. Public authority over health maintenance decreased, and private health insurance assumed the authority to govern the prevention of illness. Impulses toward "positive health" gave way to an actuarial accumulation of more precise knowledge over enrollees. Technologies of prevention and treatment were integrated into statistical universes that identified patients by their location in a constellation of measurable risks. These risks bound the insured together according to the logic of economic rationalization based on ratings, rather than to any communitarian notion of health.

Positive health proposed that medical and public health institutions should build an environment in which people could be physically secure, satisfied, and free from the undue stresses of poverty and hardship (Yamashita 1992, pp. 125). Health was understood to encompass the exact components of the lifeworld that organize the public sphere. It was taken not only to be affected by, but to *constitute* the realm of human action in which people are afforded both equality and dignity. However, this broad scope for public health was undermined as the governance of health was handed over to private companies. Insurance firms, in making risk-based coverage decisions, effectively claimed the right to implicitly define health and disease. These firms delineate health according to the measurements of their enrollees, who are tethered together by risk but not by a sociality grounded in shared place or political life.

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