



Imagining the Future of Medicine through a Lens of Prejudice: Lessons from the American Past

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Abstract:

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Keywords:

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ABSTRACT

Many healthcare management decisions today, such as those about facility construction, will have impact even decades beyond the traditional 5 or 10 year planning horizon. In order to get some idea of the possibilities and challenges of today's long range forecasts in healthcare, it is instructive to look at how well similar efforts fared a century ago. Looking in retrospect now, the task of prognostication then was impeded in part by a failure of vision due to prejudicial attitudes of the era.

Keywords: Forecasting; History of Medicine; United States

Many healthcare management decisions today, such as those about facility construction, will have impact on medical care for decades into the future. How confident should managers be in their long range prognostications? In order to get some idea, in the second decade of the 21st century, of the possibilities and challenges of projecting the future of medicine, it is instructive to look at how well similar efforts fared a century ago. In particular, a retrospective look can help us appreciate how the common biases of one's own time can impede the ability to fully envision possibilities for the future.

In the early twentieth century there was great interest in communicable disease, at a time when it was a major cause of death for both children and adults, and when the medical therapies for most infectious disease were absent. (Young, 1912) When a disease process occurred, it was not always obvious whether the cause was an unknown infectious agent or some other cause. Even after the work of Goldberger demonstrated a dietary deficiency as the cause of pellagra, some still argued that pellagra was really an infection. (Green, 1916) (Rajakumar, 2000) Conversely, while the concern for tuberculosis infection control was widespread, there was still argument being made that heredity might be a component of tuberculosis. (McWharf, 1911)

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Preventive therapy in the form of vaccination was already well-known worldwide, from the long history of vaccination to prevent smallpox. (BMJ, 1913) The District of Columbia Medical Society extended the paradigm of preventive care even into the operating room, as the “[t]he highest aim of the modern surgeon is the prevention of disease rather than its cure....[b]y practicing those operations which may save his patient from more serious ones in the future....” (Washington Post, 1913)

The prevention of the transmission of infectious agents between patients in hospital, by use of antiseptics and of aseptic technique, (Hill, 1914) was particularly important given the lack of effective remedies to treat infection when it occurred. The products of drug makers were often viewed with suspicion, in fear that the manufacturer deliberately had marketed a drug that was impure. (NY Times, 1910)

Tuberculosis was a particular concern (Koga, 1916); typhoid fever (Richardson, 1909) (Richardson, 1914), diphtheria and childhood diarrhea were also major killers over the decade; influenza rose to frightening prominence in 1918. (Washington Post, 1918) One of the arguments that was presented in favor of making birth control available to limit family size was that large family size created conditions that promoted tuberculosis in the children, and that smaller families would tend to be healthier. (Knopf, 1917) One contemporary estimate put the national cost of tuberculosis in lost earnings and medical expenses at over a billion dollars per year, with an estimated 150,000 deaths in 1910 in the United States from tuberculosis. Measured against the 1912 yardstick for catastrophe, the sinking of the Titanic, tuberculosis killed as many people in the U.S. every few days as perished in that disaster. (Brown, 1912)

The federal government’s role in oversight of food and drugs was in its infancy, and so what governmental oversight existed came largely at the state or local level. (NY Times, 1910 a, b) (NY Times, 1913) Food in general, and particularly milk, was known to have the potential to spread infection to those who ingested it. (Jordan, 1918) (Washington Post, 1919) An outreach program to the immigrant communities of Boston was designed to encourage mothers of infants to breastfeed them, or alternatively to get their infants a supply of cows’ milk that was wholesome. (Connolly, 1910) It was recognized in New York that the majority of the state’s dairy herds might have tuberculosis, and that active tubercle bacilli were in 5-10% of milk samples. In addition, 30 percent or more of milk shipments in New York state had bacterial counts in excess of the state’s standards. At the same time, the state’s health commissioner felt that the cost of stringent mandatory hygienic measures would raise the cost of milk, and wished to rely instead largely on education of dairy farmers and others in the milk distribution chain. (Fronczak, 1914)

There was a considerable interest in public health and hygiene as a method of disease prevention. (Berg, 1910) The experience with yellow fever during the canal project in Panama demonstrated the role of mosquitoes in the disease transmission. American public health officials looked at the goal of controlling not merely mosquitoes but also the housefly (Terry, 1912) (Miller, 1914) (Levy, 1914) and the cockroach. (Longfellow, 1913)

The American military during the Spanish American War lost more soldiers to death from typhoid than from enemy action. In the succeeding years, there was military interest in vaccination as a public health strategy, and the American army adopted a compulsory vaccination approach in 1911. This produced effective typhoid control, both in the peacetime army and during the Great War later that decade, and the public health benefits for the civilian population too were apparent. (Chronicling America, 1913) (Chronicling America, 1919) Outside the military sphere, the role of

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the federal government in public health was much more limited, although there was already discussion of the potential utility of having a national department of health in addition to those at the state and local levels. (NY Times, 1910) (NY Times, 1911)

The discovery of the central role of DNA in molecular biology was still decades in the future. Nucleic acids were known as little more than an interesting material visible in stained specimens of cells in the nucleus when examined under the microscope. (Levene, 1914) Yet at the same time there was an interest in human heredity.

The focus on heredity largely expressed itself in interest in eugenics to improve the human race in general, but in specific to purify the racial stock to the white model of northern Europe. It is striking how deeply racial and ethnic prejudice was embedded not merely in the general society but even in the medical and scientific elite of the day. (Terry, 1913)

The racial attitudes of the medical community of the time betray attitudes seldom heard today, but the sexual attitudes of the medical community were more open and less prudish than one might expect. Education on sex for students of both genders, starting with young children, was advocated. The education was not just to review the biology of reproduction, but also the importance of selecting a mate with regard to eugenics, (Washington Post, 1913) and of avoiding a partner with venereal disease. (Willson, 1914)

Venereal disease was widely recognized as a public health issue. The medical community of the early twentieth century discussed the public health concerns about syphilis and gonorrhea in a manner that foreshadowed many of the discussions about HIV control in the late twentieth century. The importance of tracing of sexual contacts of syphilis patients was recognized, although class distinctions shaped the public health response. Under the procedures adopted by the New York City Board of Health, when syphilis was diagnosed in public and charity health clinics the names of the patients would be reported to the public health authorities. When syphilis was diagnosed in a patient being cared for by a patient who could pay for private physician care, then “the name and address of the patient need not be reported.”

“It will be noticed that a distinction is made between institutional cases (i.e., those in the care of hospitals, dispensaries and the like), and cases under the care of private physicians. This is really based on sound public health principles for, in general, it may be assumed that the institutional cases constitute the poorer and more ignorant class, and the class most in need of close supervision. We all make practically the same distinction in our tuberculosis work and in the work against contagious diseases. A case of diphtheria or scarlet fever in a tenement house is quite a different proposition from a case in a private dwelling.” (Bolduan, 1913)

Professor Ward of Harvard University wrote of the societal dangers posed by immigrants from southern and eastern Europe, many of whom were contract laborers who he said were not needed by the United States. He was concerned that the most genetically fit young men in Europe were among those who would have died in the Great War, and that postwar immigration could debase America’s genetic stock with survivors who were unfit (mentally, morally, economically and/or physically). (Ward, 1916)

The cost of war was a recurring theme throughout the second decade of the twentieth century. (Washington Post, 1913) Once war came to Europe, the effects of science and technology were apparent in the role of poison gas on land and the submarine at sea. A 1915 writer imagined that the further application of science to warfare could include further more destructive inventions,

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ranging from the release of the energy of atomic disintegration in a bomb or a death ray, to the use of bacilli as weapons of war. (Washington Post, 1915)

The American medical education establishment had been energized by a report issued by Abraham Flexner. Americans considered the American model of Johns Hopkins but also looked largely to Europe, and especially Germany, as a model for medical education reform. With the advent of new medical knowledge that might be more than any single general practitioner could master, there was interest in strengthening the role of the specialist, and in the care model of the Mayo clinic. (Wesbrook, 1916) On the other hand there was concern that the multiplicity of specialists, with their several narrow and conflicting points of view, could interfere with the relationship between the patient and her general practitioner. (Robinson, 1918)

The American health care system showed much less of a role for the national government than was true in many European countries, (Standish, 1918) reflecting in part a contemporary American focus on the role of the business community rather than the government as a source of progress. In a December 1917 address by the president of the American Public Health Association, he noted that the efficacy of public health and hygiene measures varied dramatically among American cities, and he sought to enlist the insurance companies to become members of the APHA to address these disparities "...as a business proposition....Furthermore, the moral effect on the thirty-five to forty millions of policy-holders and their friends, of the knowledge that Public Health is of sufficient importance to engage the active cooperation of all the Insurance Companies on this continent, would in itself be of inestimable value." (Hastings, 1918)

The experience of national organization for American participation in the World War, however, already hinted at the possibility that some aspects of American public health might be addressed at the national level, either by the federal government itself or by nationwide agencies like the American Red Cross. (Farrand, 1919)

As more of the medical care of the ill moved beyond the scope of the family doctor to the realm of the specialists, it became so expensive for the patient "that in order to get back one's health one must either spend so much money that he becomes a financial invalid, or else apply to a charity hospital in the guise of a pauper." (NY Times, 1914) A sharp fall in the income of the general practitioner was blamed in part on the rise of the specialist. (Washington Post, 1910) There was some discussion of state (NY Times, 1917) or national health insurance; one proposal combined health insurance coverage with disability insurance and coverage of funeral expenses. Presaging later developments in health insurance, it was proposed that the insurance be grounded in the workplace, and be funded primarily by employees and their employer. (Health Insurance, 1916)

One author in 1918, considering the future role of the engineer, noted (Waddell, Jun, 1918) that "The world could manage to dispense with lawyers and clergymen, and, possibly, even with physicians, but it would be impracticable to get along without engineers." He predicted (Waddell, Jul, 1918) what the world would look like in 1968:

"Thanks to the efforts and hard study of biologists, surgeons and physicians, the ordinary limiting life of man has increased from the biblical three score years and ten to a full century. The studies of the biologists, combined with the coercive work of the Bureau of Sanitation at Washington, have resulted in cutting down nearly to zero the death-roll from all insect-borne diseases, such as typhus fever, malaria, yellow fever, bubonic plague, hookworm, meningitis and mountain fever, as well as other scourges such as smallpox,

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pellagra, typhoid fever, cholera and leprosy. The iron hand of the law, combined with a forced enlightenment of the public of all ages and both sexes through the newspapers and the schools, has succeeded in reducing the evil effects of venereal or vice diseases to a very small fraction of their former virulence. The investigations of the dietetists have taught humanity how best to eat, drink and exercise, not only so as to prolong life but also so as to enjoy it by the possession of good health; and the schools of all grades have taught these doctrines so thoroughly that the unscientific eating and drinking of three or four decades ago is now exceedingly rare. The almost universal adoption of the practise by physicians of giving preventive medicine, instead of trying to overcome disease after it has secured a hold on the patient, has resulted in materially increasing longevity and improving the status of the general health of the community. The total prohibition of liquor by the federal government in the third decade of the century added, on the average, six years to the life of those men who, otherwise, would have been steady drinkers, besides cutting down crime, profligacy and insanity. The neutralization of both sexes for crime, insanity, feeble-mindedness and bad cases of venereal disease not only has reduced by seventy-five per cent., in a single generation, the number of criminals, lunatics and idiots, but also has had a noticeable effect on the increase in longevity. While the efforts of certain scientists to prohibit the use of tobacco have proved to be a failure, as far as the populace is concerned, they have succeeded in convincing thinking men that the effect of nicotine on the system is to reduce materially one's mental acumen; consequently a very large percentage of the scientists and engineers of to-day do not use the weed. As a direct result of this there is a small but quite appreciable augmenting of their individual output. “

At the time the understanding of immunologic principles was still quite rudimentary. There was already some appreciation that transplantation across species barriers might be more problematic than transplants between two members of the same species. (Ingebrigtsen, 1915) (Washington Post, 1915)

Extension of the life span was seen as possible, largely by dietetic and hygienic measures. (Dublin, 1913) (Washington Post, 1913) It was argued that much of the mortality in later life reflected a constitution that had been injured in youth, not only by such familiar (to us) causes as alcohol, tobacco, bad diet, overweight; but also by venereal disease, constipation, eye-strain, and mouth disease. “The great broad fact seems to be that while we are freer of germs than our ancestors, our vital organs wear out sooner...”

Hypertension was a recognized entity, and its association with kidney disease was appreciated, (Rappleye 1918) but pharmacologic therapy played little role in addressing blood pressure. Dr. Hirshberg of Johns Hopkins, in a newspaper advice column “on medical, hygiene and sanitation subjects that are of general interest”, suggested a regimen for high blood pressure (Washington Post, 1920):

“You should try to get more rest and sleep. Do not overexert yourself. Your intestines should be kept open and active. Avoid hot dishes, nuts, peas and beans. Take a Bulgaria tablet with each meal and drink lots of water, cream and milk. Take one-half grain of nitrate of soda in a little water every four hours for a few days.”

It was noted that even in young men being examined for military service in the World War, many already manifested physical defects. One author advocated for annual physical examinations as a general practice, (Fisk, 1920) observing:

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“In a group of several thousands of insurance policy holders examined periodically under this system for the purpose of prolonging their lives, the death rate during a period of seven years was cut down 50%. It has been figured by a leading statistician that the periodic examination of any group will save at least three lives per thousand per annum, apart from the dividends in increased living capacity.”

The New York City Health Commissioner noted that life expectancy could be increased “from two to five years ...if our knowledge of disease and of the premonitory sign of disease is universally applied in an intelligent way” including an annual physical exam for all adults and children. (NY Times, 1914) Even William Howard Taft, the former President of the United States, was among the enthusiasts for the value of periodic physical examination as key to a long and healthy life. (NY Times, 1919) Early detection of premalignant lesions was sought, to offer the prospect of excising the lesion before it had a chance to turn into cancer. (Reynolds, 1918)

Dr. William Mayo, the President of the American College of Surgeons, expressed the hope that by twenty years in the future the U.S. life expectancy could increase by ten years, and noted that addressing what he saw as the cause of the cancer problem was an important step needed in order to reach that goal.

‘We must spread the knowledge that chronic irritation is the great underlying cause of the disease. Whenever a certain type of cancer exists in a race of men or in a country with great frequency, as compared to other races of countries, it is due to a single cause, usually a social condition. Good dentistry has eliminated a percentage of cancers of the jaw due to the irritation of defective teeth. Cancer of the lip and tongue is on the increase as the habit of smoking is on the increase in both sexes. It seems to be a well-established fact that in countries in which the breasts are allowed to remain exposed to the air without covering, cancer of the breast is extremely rare and the incidence is in direct ratio to the amount of covering of the breast and the pressure exerted on it.’ (NY Times, 1919)

There was also some speculation by others about psychic causes of cancer especially in women (Washington Post, 1920): “The causes of cancer are supposed to be unknown, but nothing could be more remote from the actual truth.... The reasons for the continued increase of cancer turn mainly on the fact that women are the principal sufferers from it, and the special causes which prevail in their case are accelerated by trouble, anxiety, worry and general wear-and-tear.... [C]ancer among women may be prevented by greater equanimity and cheerfulness.” (Washington Post, 1920)

Cancer therapy of the period was generally the province of the surgeon. It was recognized that potential cancer drugs could be tested in animals with cancer (NY Times, 1915), although this was of interest largely as a way to prove the worthlessness of anticancer patent medicines. (Wood, 1916) Cancer treatment considered predominantly of surgery (occasionally of radiation therapy, either from an x-ray apparatus or from radium) (NY Times, 1914) and there was major interest in making the cancer diagnosis early enough in the disease course that a surgical cure would be possible for the patient. (Lakeman, 1915) The U.S. Surgeon General recommended that radium, which had proved its merit in cancer therapy, should be added to American spring water in order to replicate the health benefits of the water of European health spas. (Washington Post, 1914)

There was considerable popular and medical interest in the unconscious mind, and how it might motivate behavior. (Washington Post, 1920) (Lewis, 1910) (Putnam, 1912) In the case of mental illness, as for cancer, the focus was very much on identifying the disease process in its

incipient stages, when it was expected to be largely preventable. (NY Times, 1910) Contemporaries worried about the pernicious effects of alcohol, opium, and other drugs: (Lombroso, 1912) “To say, for instance, that the number of insane will increase five times, and perhaps more, in the coming century, is only a simple statistical deduction from what we see happening in most civilized nations.... In the United States the population doubled in 30 years, while insanity increased six times or more, from 15,610 cases to 95,998. This is bound to happen everywhere, for the causes responsible for the plague are increasing in number and intensity. South America exports mate and cocoa. The Orient uses its opium and haschich, Northern Europe introduces into the South its beer and whisky, while the South sends north its spoiled maize; each one of these products being responsible for numerous deadly brain poisonings. Deadly also are the ether, the morphine and the codein, which, under the guise of medicine, given at the hospitals, proceed to disturb the peaceful home of the citizen and lay snares for his mind in the same way as has been done for centuries by wine, and still worse by its substitutes, beer, brandy, and vermouth. It is easy to preach in fiery words against this state of things. Refuge is taken in intoxicants when the mind is most excitable and excited, when it seeks to wrest from the increasing dullness of the daily life a bit of artificial happiness.

“There was little in the pharmacologists’ armamentarium for those with mental illness, once it did occur. In many state hospitals for the insane, the patients were largely kept restrained rather than treated. Even in the more progressive institutions, where restraints were disfavored, ‘[t]he treatment of the insane to-day, briefly summed up, may be said to be the provision of pleasant and sanitary surroundings, good nursing, proper medical attendance, suitable diet, entertainment and congenial occupation.’ (Briggs, 1910) Mainstream medicine recognized that it had relatively little to offer the mentally ill and their desperate caregivers, creating a void that nonscientific faddists and even outright charlatans would tend to fill. (White, 1914)

The racial ethos of the period was reflected in the health professions. (Allen, 1915) The views of nonwhite patients and nonwhite physicians (individually, or as expressed collectively by the National Medical Association) were given little attention by the contemporary majority society. (National Medical Association website) With hindsight nevertheless, it is instructive to consider the views offered by Dr. Dailey of “The Future of Medicine” (Dailey 1916) in his presidential address to the National Medical Association. Dr. Dailey prophesied several overarching themes:

- “1-Broader and more uniform standards of medical education; the requirement of a fifth or clinical or hospital year.
- 2-Continued fusion of medical schools, reduction in the quantity of medical literature.
- 3-Greater simplicity in medicine, in the way of less drugs giving, greater attention to diagnosis and to psychic phases of medicine. Heightened importance of diet and hygiene. More attention to instruction of the public in regard to prophylaxis.
- 4-Narrowing of the role of surgery in the treatment of disease.
- 5-Future triumphs of medicine in the fields of sero and chemotherapy.
- 6-Passing of the family doctor in the old sense. Every man to some extent a specialist.
- 7-A large part of medical practice in the hands of the State.“

As one assays the opinions of thought leaders and visionaries of the 1910s, some of their most prescient predictions came from projecting recent past trends into the future, such as that of ever-increasing life expectancy, driving the need to address chronic disease issues. Some of the

false predictions also arose from extrapolating too confidently from the past into the future, such as the prospect of eliminating insect disease vectors from the environment.

Some of the omissions in predictions made in the early 20th century reflected not just simple voids in knowledge, but also cultural blind spots that are much easier to see today. The promise of genetic engineering was many decades in the future, as it was not yet known even what material carried the genetic information, but there was already a considerable understanding of heredity and of Darwin's explication of evolution. The filter of racial prejudice of the era helped sidetrack much of the medical community's interest into eugenics to produce future citizens, rather than into consideration of how to use knowledge of individual biological differences to better shape the care of current patients.

By their very nature, a prognosticator's blind spots are difficult for the prognosticator to appreciate. One strategy that may help us better imagine the future of health care is to gather as many different perspectives as possible from multiple sources, rather than rely on a few contemporary thought leaders. Those outside the mainstream may perhaps be more open to conceive of the most dramatic paradigm shifts that may occur. In any event, as we may consider predictions today about the future of healthcare, some humility is in order, as our present blind spots too may only prove apparent in retrospect.

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