The Health Care Experiments at Many Farms: The Navajo, Tuberculosis, and the Limits of Modern Medicine, 1952-1962

David S. Jones

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DAVID S. JONES

SUMMARY: In January 1952 a team of medical researchers from Cornell Medical College learned that tuberculosis raged untreated on the Navajo Reservation in Arizona. These researchers, led by Walsh McDermott, recognized a valuable opportunity for medical research, and they began a ten-year project to evaluate the efficacy of new antibiotics and test the power of modern medicine to improve the health conditions of an impoverished rural society. The history of this endeavor exposes a series of tensions at the heart of medical research and practice. Researchers exploited the opportunities made possible by the ill-health of a marginalized population, but did so with the cooperation and gratitude of the Navajo. They introduced new antibiotics that liberated patients from hospitals, but erected an intrusive system of outpatient surveillance. They provided innovative health-care services, but failed to reduce the dominant causes of morbidity and mortality. As every act of treatment became an experiment, they risked undermining the trust on which research and clinical care depended.

KEYWORDS: tuberculosis, antibiotics, Navajo, Indian Health Service, Walsh McDermott, Many Farms, research, efficacy, compliance
In the winter of 1952, tuberculosis raged untreated among the Navajo on their reservation in Arizona. Local hospitals had long been overwhelmed. When Walsh McDermott, an expert in the treatment of TB, learned of this epidemic, he was outraged: “infants with a uniformly fatal form of tuberculosis (miliary tuberculosis) for which effective drug therapy was then available, had to be refused hospitalization, and consequently sent home to die.”¹ Such deaths shocked McDermott, who had dedicated his career to antibiotic research. Even as he learned of Navajo tuberculosis, he was in the midst of secret trials of isoniazid, a promising new treatment, and he realized that the Navajo provided a valuable opportunity for demonstrating its power. McDermott and his team of researchers from New York Hospital “rushed out there.”² They soon learned that TB was but one of many preventable diseases on the Navajo reservation. They set out to create a comprehensive health system, a “hospital without walls” that would take responsibility for the “total health” of the Navajo.³

McDermott and his collaborators had a series of linked objectives for their work among the Navajo. First, they hoped to help people who died needlessly from treatable diseases. Second, they sought to test the ability of physicians, nurses, social scientists, and community leaders to cooperate and implement a program of scientific medicine in a foreign cultural context. Not content simply to provide care in hospitals and clinics, they wanted to reach into Navajo homes and reshape Navajo lives and beliefs with the precepts of medical science. Third, they planned to use the unique circumstances of the Navajo reservation to demonstrate the efficacy of modern medicine. They could test both the power of antibiotics against tuberculosis, and the power of modern medicine against the disease burden of a rural, impoverished society. McDermott believed that the “experiment is fascinating”: “to take all the capabilities of a university connected medical center and to apply them to the problems of a very poverty-stricken society, to put the two in apposition so to speak, to see what results you get.”⁴ These ambitious projects became the famous Health Care Experiment at Many Farms (Fig. 1).

1. [Walsh McDermott], “Interim Report on Indian Health, Committee on American Indians, 6/30/59,” p. 68 (emphasis in the original), Walsh McDermott Papers, box 10, folder 2 (henceforth cited in the form WMP/10/2), New York Weill Cornell Medical Center Archives, New York, N.Y. (henceforth MCA).


The research at Many Farms was not the first attempt to design and implement a modern health service for an underserved population. Nor was it the first to implement Western biomedicine in an exotic cultural context.\(^5\) However, it was the first such project to link an ambitious...
therapeutic program to an equally ambitious research program: every aspect of Navajo life would be studied, every aspect of medical treatment would be deliberately matched to Navajo lives, and every outcome would be measured and analyzed. Even though this project had a lasting impact on many areas of medical practice and research, it has received little attention from historians.6

The Many Farms experiments came at a crucial juncture in the history of medical research and medical care. McDermott’s faith that medicine could overcome the entrenched health problems of an impoverished society reflected the unprecedented optimism of postwar medical and social science. Inspired by its achievements and empowered by prosperity, the federal government had committed itself to programs for the betterment of populations worldwide. The discoveries of wartime science and technology, especially penicillin and DDT, led many Americans to believe that medicine had achieved unprecedented efficacy. The development of oral antibiotics, for instance, allowed physicians to treat previously fatal diseases on an outpatient basis. Doctors had new opportunities, and new challenges, for implementing their confidence. Determined to transform their faith into scientific truth, physicians committed themselves to the demonstration of efficacy through laboratory and clinical experimentation. Supported by rapidly expanding research funding, they began to test the power of medical technology at the bench, at the bedside, and in the community.7 Their pursuit of efficacy created a


new medical world in which every act of treatment simultaneously became an experiment.

The results surprised everyone. Even in the carefully designed and controlled setting of the Many Farms clinic, medical science had to contend with adverse social and economic conditions. Demonstration of the efficacy of antibiotics depended on the reliability with which patients took them. Systems of surveillance, created to improve the utilization of medical technology, threatened the trust on which patient-doctor relationships depended. McDermott had to argue that this relationship, one of the most powerful aspects of modern medicine, was intangible, unmeasurable, and outside the bounds of experiment. Setting out to prove the power of medicine and its experimental method, the Many Farms team had to compromise both.

Discovering Navajo Tuberculosis

Tuberculosis had only recently become a devastating problem among the Navajo. In contrast to most other American Indian tribes, the Navajo had been spared the catastrophic mortality that followed the arrival of Europeans in the Americas. In fact, they initially benefited from European arrival: adapting sheep and wheat to the arid Southwest, they developed from hunters to pastoralists, with a larger and healthier population than ever before.8 The arrival of Anglo-Americans in 1846 disrupted this success. An army led by Kit Carson burned Navajo crops and killed their herds, starving them into submission. After surrendering at the Canyon de Chelly in 1864, the Navajo endured four years of captivity along the Pecos River near Fort Sumner, New Mexico, where overcrowding, inadequate provisions, and demoralization eroded their health. The government soon declared this effort to civilize the Navajo a failure, and they

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were allowed to return to their homelands in Arizona and New Mexico, a vast but impoverished reservation (Fig. 2). 9

These initial contacts brought new diseases to the Navajo; smallpox, for instance, struck in 1853 and 1870. Contact also brought some promising new treatments: government physicians provided health care, notably vaccination, to many Navajo. Yet despite occasional successes, government health services on the reservation suffered from low standards,


Fig. 2. Navajo sheep and pastureland. (Courtesy of NewYork Weill Cornell Medical Center Archives, Photograph Collection, Navajo Project, #2309.)
high physician turnover, and a corrupt bureaucracy.\textsuperscript{10} Navajo health was preserved only by gradual improvements in economic conditions. Although their houses and crops had been destroyed, the Navajo benefited from sheep provided by the government, and from tourists, brought to the Southwest by railroads. By 1900 the tribe was prosperous, earning nearly $400,000 each year selling blankets (woven by women) and silver and turquoise jewelry (crafted by men) to eager tourists.\textsuperscript{11}

At the turn of the twentieth century, the Navajo were among the healthiest people in the United States. When Smithsonian anthropologist Aleš Hrdlička surveyed health conditions among the American Indians he found some, notably the Sioux, with tuberculosis mortality rates as high as 3,080/100,000. The Navajo and Pueblo, in contrast, had little, with rates as low as 60–90/100,000, lower even than the rate among the general population (150–550/100,000).\textsuperscript{12} This health did not last. Population growth, overgrazing, and droughts led to soil erosion that undermined the Navajo’s fragile subsistence. Fears of further overgrazing led New Deal activists to reduce drastically the size of Navajo herds. This shattered the Navajo economy.\textsuperscript{13} As they slid from prosperity to poverty, tuberculosis steadily proliferated. In 1925, the tuberculosis rate among the Indians of Arizona, 1,510/100,000, was twice that of Indians overall (630/100,000) and nearly twenty times that of the general population (87/100,000). Although the rate among the Arizona Indians had fallen, in absolute terms, to 302/100,000 by 1947, it remained nearly ten times that of the Caucasian population of Arizona (33/100,000) and of the general population of the United States (30/100,000). As late as 1955, disparities in case rates for infectious diseases reached shocking proportions. Incidence among the Navajo exceeded that among the general


\textsuperscript{11} Adair, \textit{Navajo and Pueblo Silversmiths} (n. 9), p. 117.


population by a factor of 15.8 for tuberculosis, 101.6 for pneumonia, and 1,163 for trachoma.  

The rise of tuberculosis among the Navajo and other tribes triggered governmental efforts to improve health services for American Indians. In 1909 Joseph Murphy, the first medical supervisor of the Bureau of Indian Affairs (BIA), argued that the “crusade against tuberculosis is one of the greatest works which the present generation has so far attempted.” At President Taft’s prompting, Congress responded with an emergency appropriation of $12,000. Total federal appropriations for Indian health increased quickly, from $40,000 in 1911, to $596,000 in 1925, $2,980,000 in 1935, $5,730,000 in 1945, and $17,800,000 by 1955. The BIA steadily expanded its medical personnel, from 83 physicians in 1900 to 200 in 1923. Hospital construction on the Navajo reservation followed suit: Fort Wingate, 1889; Leupp and Shiprock, 1908; Tuba City, 1911; Fort Defiance, 1912; Crownpoint, 1914; Toadlena and Kayenta, 1926; Tohachi, 1927; and Chinle, 1932. A sanatorium was built at Winslow in 1933. These efforts won praise from many government officials. The Commissioner for Indian Affairs argued in 1920 that the Indians are “better cared for today than at any time in the history of the race.”


Yet success remained elusive. Limited funding, and perhaps limited enthusiasm, undermined efforts to provide health care to the American Indians. World War I, for instance, diverted physicians and medical supplies and unleashed influenza. Elinor Gregg, a public health nurse sent to survey BIA health facilities in the 1920s, found terrible conditions. Chinle, for instance, had only “a shabby and derelict hospital which was a boarding-school infirmary with a no-account doctor and a stupid practical nurse.” 18 A 1928 Rockefeller Commission investigation of the “Indian Problem” was similarly critical of health services. 19 The New Deal brought new resources and cultural sensitivity to the BIA, but these efforts were undermined by World War II, which again diverted personnel and resources away from the BIA. 20 Although wartime jobs provided substantial income to the Navajo, postwar unemployment devastated the reservation. Government investigators found that the Navajo, with inadequate housing, diet, and social services, had been reduced to “abject poverty,” 21 conditions “incredible to most Americans who have not seen them.” 22 Navajo health “lagged almost two generations behind that of the general population.” 23 Tuberculosis and infant mortality have


22. Ibid., p. 6, and see pp. 1–9. See also Underhill, *Navajos* (n. 9), pp. 252–59; Adair and Deuschle, *People’s Health* (n. 3), p. 176. The postwar period was not entirely bleak for the Navajo and other American Indians. Peter Iverson has shown how the growth of Indian identity and nationalism during this time gradually increased Indian institutions and associations, which would fuel the activism of the 1960s and 1970s. An influx of federal money, for instance, facilitated the consolidation of the Navajo economy and identity. See Peter Iverson, “Building Toward Self-Determination: Plains and Southwestern Indians in the 1940s and 1950s,” *Western Hist. Rev.*, 1985, 16: 163–73.

reached what is believed to be the highest rate in the continental United States."24 Poverty caused disease that prevented the relief of poverty.

These problems did not go unnoticed. Congressional subcommittees visited the reservation in 1947 and found an “alarming degree” of poverty, distress, and ill health.25 William E. Warne, assistant secretary of Interior for Indian Affairs, was astonished: “In the United States of today we believe we have mastered these ancient enemies, and generally we have, but not in the Navajo country.”26 Congress passed emergency appropriations of $1,500,000, but severe blizzards led to continued hardship and suffering. Investigators called for a comprehensive $90,000,000 program of social and economic reconstruction, of which $4,750,000 would be spent on hospitals and health conservation. This Navajo-Hopi long-range rehabilitation act passed on 19 April 1950.27

Relief did not come quickly. A 1957 Indian Health Service (IHS) survey found that tuberculosis mortality persisted at unacceptable levels: 171.2/100,000 for the Navajo and Hopi, compared to 10–23/100,000 for the general population. Infant mortality, which had fallen to 28/1,000 among the general population, remained 76/1,000 among all Indians and 132/1,000 among the Navajo and Hopi.28 Despite the initiation of a massive economic aid program, tuberculosis remained at levels not seen among the general population for decades.

The Needs of Antibiotic Research, and the Navajo Solution

Most of the Navajo had to confront this epidemic of tuberculosis without assistance from physicians or public health officials. Campaigns against


TB before the 1950s had been based on case-finding and hospitalization for long-term supportive treatment. The advent of streptomycin in the 1940s improved the efficacy of this treatment, but patients still faced prolonged hospitalization to receive the intravenous medication. The prevalence of TB among the Navajo had long overwhelmed the limited supply of hospital beds on the reservation. With the tuberculosis hospital at Tuba City, Arizona, full of patients, further case-finding efforts had been abandoned. Into the early 1950s, patients with acute tuberculosis, “luckless individuals,” had to be “turned away from the hospital and sent home to die.”

A new solution was needed.

The solution came from an unexpected direction. In December 1951 an outbreak of infectious hepatitis struck a Navajo boarding school near Tuba City. With 315 of the 417 students sick in bed with fevers and jaundice, Bernice Laughlin (the BIA field nurse), Charles Clark (the acting director of the Western Navajo Hospital), and the teachers “were wearing themselves to exhaustion caring for the children,” and they sought aid from the recently established Communicable Disease Center (CDC). In 1950 Alexander Langmuir, the director of the CDC, had created the Epidemiologic Intelligence Service (EIS), an agency that offered expertise and assistance against outbreaks of contagious disease. The EIS sent Charles LeMaistre, one of its first trainees, to investigate. He arrived on New Year’s Day, 1952, and found “a near panic situation” with hundreds of students, teachers, and nurses suffering from hepatitis. LeMaistre conducted careful clinical and laboratory investigations and controlled the outbreak by treating the patients with gamma globulin.

Before joining the EIS, LeMaistre had specialized in tuberculosis, working in Walsh McDermott’s laboratory at New York Hospital to develop new treatments for the disease. During his investigations in Tuba

31. Elizabeth W. Etheridge, Sentinel for Health: A History of the Centers for Disease Control (Berkeley: University of California Press, 1992), pp. 17–44. The EIS was also designed as the front line of defense against biological warfare.
City, LeMaistre found many adults and children suffering, untreated, with the most lethal forms of TB. When he returned to New York Hospital to gather supplies for containing hepatitis, he told McDermott about the prevalence of untreated tuberculosis among the Navajo. McDermott was shocked by the situation: children had to be turned away and sent home to die. McDermott, “unbeknownst” to LeMaistre, was then in the midst of secret trials of isoniazid, a new antibiotic active against tuberculosis. The results were promising, but not definitive, and McDermott’s team was “looking for an ethnic [ethical?] situation in which we could test the drug.”35 The Navajo outbreak “provided exactly that situation.”36

The intersection between McDermott and Navajo tuberculosis was a fortuitous one. Prior to LeMaistre’s chance discovery, McDermott had known nothing about the extent of Navajo suffering: “I am ashamed to say that I did not know then how much tuberculosis there was out here among the Navajos.”37 This ignorance in a leading tuberculosis researcher, an editor of the American Review of Tuberculosis, is surprising. For decades, federal health officials had struggled to draw attention to the prevalence of TB among the Navajo and other tribes. McDermott’s ignorance demonstrates how easily American Indian ill health could be forgotten.

Although McDermott had known nothing about Navajo tuberculosis, he knew a tremendous amount about the disease itself. He had contracted TB in 1935 during his training at New York Hospital. After many months at the Trudeau Sanatorium at Saranac Lake in New York, he returned to his training only to face nine hospitalizations over nineteen years and the resection of most of his left lung, before eventually treating himself with isoniazid. This experience had a decisive impact on his career. While at Saranac, McDermott worked in the outpatient clinic, gaining experience treating syphilis with Salvarsan (arsphenamine). On his return to New York City, he chose to specialize in infectious disease and began experiments on Salvarsan and the new sulfa drugs. His history of tuberculosis barred him from active duty during World War II. Left behind as others went to war, McDermott became head of the infectious disease service at New York Hospital in 1942. This position made him one of the first three civilian physicians given access to the rationed supply of

penicillin, an awesome responsibility: he had to balance the clinical needs of patients against the research needs of the war effort.\textsuperscript{38}

This experience also gave McDermott valuable connections both to pharmaceutical companies and to the growing federal research establishment. The postwar period witnessed a dramatic increase in federal research funding. The budget for the National Institutes of Health grew from $850,000 in 1946 to $12,475,000 in 1948, $81,000,000 in 1955, and $400,000,000 in 1960. Government agencies, especially the National Research Council, began organizing large cooperative trials of new antibiotics, including penicillin and streptomycin.\textsuperscript{39} McDermott, exploiting these new opportunities in the late 1940s and early 1950s, led laboratory and field trials of penicillin and many other antibiotics.\textsuperscript{40}

Tuberculosis remained his special interest. When streptomycin was introduced in 1945, McDermott’s service at New York Hospital was the second group in the United States given access to the new drug. When allied researchers heard rumors in 1949 that German researchers had developed Conteben (4-acetylamino benzaldehyde thiosemicarbazone), a new antituberculous drug, McDermott was sent to investigate; although Conteben itself proved to have little value, its related compounds merited further study.\textsuperscript{41} By 1951 McDermott, who had become an editor of the \textit{American Review of Tuberculosis}, had five years of experience with streptomycin and had experimented with para-aminosalicylic acid (PAS), viomycin, gliotoxin, and corticosteroids. Streptomycin, though most effective, was limited by both toxicity and the emergence of drug resistance.\textsuperscript{42} New hope came in 1951 when three companies—Squibb, Hoffman-La Roche, and Bayer—working independently and in secret, all zeroed in on one derivative of Conteben: isoniazid. Hoffman-La Roche began trials on Staten Island in June 1951. Squibb began trials with McDermott

\textsuperscript{38} McDermott, “Oral History Transcript” (n. 33), pp. 3, 8–9; “Finding Aid,” pp. 1–3, WMP; Beeson, “Walsh McDermott” (n. 6), pp. 284–86.

\textsuperscript{39} For the expansion in federal research spending, see NIH Factbook, 1st ed. (Chicago: Marquis Academic Media, 1976); Starr, \textit{Social Transformation} (n. 7), p. 347; Marks, \textit{Progress of Experiment} (n. 7), pp. 98–126.

\textsuperscript{40} McDermott, “Oral History Transcript” (n. 33), p. 11.


at New York Hospital in November. McDermott became aware of the simultaneous discovery on New Year’s Eve, 1951, when he was approached by Hoffman-La Roche to begin trials with them. Frustratingly, he and the other New York researchers lacked an appropriate population of research subjects.

The researchers faced a complicated situation. Studies with sulfa drugs and streptomycin had shown that pulmonary tuberculosis was a poor model for clinical research: its course varied from patient to patient, and its clinical criteria, especially chest X rays, were “highly subjective.” To generate useful data in pulmonary TB, researchers needed to use the “chance-selection” method to compare new drugs to the existing standard, streptomycin. This new technique had recently demonstrated its power in the British Medical Research Council’s randomized clinical trial of streptomycin for pulmonary tuberculosis. McDermott believed that two other forms of the disease, miliary (infection of the blood) and meningeal (infection of the central nervous system), provided simpler research models: “Miliary tuberculosis represents the ideal naturally occurring situation for the evaluation of an antimicrobial drug.” Its course, fatal if untreated, was “so predictable” that the outcome of


treatment “affords an absolute criterion of the success or failure.”

McDermott also knew that previous exposure to streptomycin might change the susceptibility of the mycobacteria to the new drug.

Because of these concerns, McDermott sought a very particular research population when he learned of isoniazid: he needed a population with many people suffering from acute miliary tuberculosis who had not yet received the benefits of antibiotics. Such patients were rare. The recent proliferation of new drugs “had created a serious problem from the standpoint of provision of suitable case material for drug evaluation.” Nearly all of the patients on the chest service at New York Hospital were already enrolled in studies. Since the value of streptomycin had already been proven, McDermott believed that he could not ethically withhold it from new patients.

The Navajo solved these problems. Decades of governmental mismanagement and economic nondevelopment had left the Navajo mired in rural poverty. Many lived in small, windowless, dirt-floored, mud and log dwellings; as McDermott and his collaborators later described them, the conditions resembled “those of the United States log cabin frontier society of 100 years ago.” The Navajo reservation was, in effect, “a Third World country within the United States.” McDermott likened each cramped and poorly ventilated Navajo home to “a transfer cabinet in a bacteriology lab.” As described by a *Time* magazine reporter who publicized McDermott’s work, each Navajo patient with miliary tuberculosis was “like a human test tube.” Health officials had decided that streptomycin, which required daily injections, could not be widely used on the impoverished and sparsely settled reservation; as a result, “large numbers of children and adults with acute forms of tuberculosis were there in

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circumstances which made the use of streptomycin difficult or impossible.”53 Isoniazid, in contrast, could be given orally. It could be tested on its own, on patients who had never been exposed to other antibiotics. According to another reporter, the situation “was made to order for the New York Hospital research project.”54

Antibiotic Research among the Navajo

McDermott’s enthusiasm for the Navajo project was tempered by the knowledge that he would have to move carefully. Navajo patients could not be controlled as easily as those on the wards of New York Hospital. In order to conduct this research, he needed to secure the goodwill and cooperation not just of Navajo patients, but also of the Bureau of Indian Affairs, which had official authority over Navajo health care.

When McDermott learned about Navajo tuberculosis, he told LeMaistre about the secret isoniazid trials and sent him back to Tuba City, with instructions to work through proper BIA channels to arrange an official invitation for McDermott to come to the reservation to begin treatment. The BIA granted permission to treat a single child with tuberculous meningitis. McDermott and his team found five patients with meningeal tuberculosis and two with miliary tuberculosis, and they treated all of them. Isoniazid gave rapid results: “within a few weeks the new medicines were rescuing desperately sick Navajo youngsters from an otherwise certain death.”55 Elsie and Little Joe were cured and “went to the circus instead of the cemetery.”56

In mid-February, news of the secret trials in New York and Arizona began to leak out in the press. On 21 February the National Tuberculosis

53. [McDermott], “Annual Report” (1952) (n. 32).
Association hosted a press conference to announce officially the research and its early promising results. This press conference fueled a media explosion.57 McDermott’s office was flooded with telephone calls, including one from the BIA superintendent for the Navajo. McDermott feared that he would be reprimanded for exceeding his invitation to treat only a single patient—but the opposite happened: the superintendent wanted to know if all of the excitement was really about the work McDermott had done among the Navajo. The Navajo, McDermott learned, “were immensely pleased . . . for once the Navahos got in at the beginning of something instead of getting in at the tail end the way they usually do in U.S. society.”58

This positive publicity provided the introduction that McDermott’s team needed to both the BIA and the Navajo Tribal Council. The Tribal Council met with McDermott on 3 March 1952. Navajo leaders, enthusiastic about the initial results, were “very much interested in expanding the studies.”59 They invited McDermott to begin larger studies at the Navajo Medical Center at Fort Defiance, a 100-bed tuberculosis hospital in eastern Arizona. Working with Carl Muschenheim (chief of the chest service at New York Hospital), Charles Clark, and several others, McDermott began a larger program treating patients with isoniazid and streptomycin at Fort Defiance, Tuba City, and the Sage Memorial Presbyterian Mission Hospital in Ganado, Arizona. Squibb Pharmaceuticals supplied free isoniazid. On 25 April the Tribal Council voted unanimously to provide $10,000 to cover expenses. Initially, the hospitals were too overcrowded to provide adequate care. In August, however, Fort Defiance received a new medical director: Kurt Deuschle, a young physician fulfilling his doctor-draft requirements. He arranged funding to transfer many of the healthier patients to off-reservation sanatoria, allowing him to treat the sickest patients with antibiotics at the reservation hospitals. Isoniazid continued to produce excellent results.60

The Navajo were highly motivated to assist with this work. Before World War II, many had grown resigned to their lives of poverty and ill health. The experiences of Navajo soldiers and workers during the war

changed this: they became accustomed to money, education, modern housing, and better health care. Many became depressed on their return to the primitive conditions on the reservation.61 Their frustration only increased when they learned from McDermott how much more seriously they suffered from tuberculosis than other groups in the United States. As tribal councilman Billy Bicenti described in 1954, “We knew we were afflicted, but never knew to an extent what was ailing us and now these people [the Cornell physicians] have made it possible for us to see and realize that there is something that can be done about those things that have been harming us and killing us right along.”62 They eagerly accepted McDermott’s offer of medical research and treatment.

The researchers, meanwhile, were not simply interested in preserving their access to a valuable research population. Deuschle, McDermott, and Muschenheim were genuinely motivated to relieve the suffering caused by a treatable disease.63 Knowing that their work depended on the continued cooperation of the Navajo, they cultivated their relationship with them with great care, celebrating the results of both treatment and research. At a meeting with the Tribal Council in January 1953, McDermott described how Navajo children were “the first patients in the world” with miliary tuberculosis to receive isoniazid.64 In 1954 the researchers told the Navajo that physicians “all over the world” waited for the latest information from the Navajo reservation to appear in scientific journals.65

61. Underhill, Navajos (n. 9), pp. 252, 259.
64. McDermott, in “Minutes of the Navajo Tribal Council,” 5 January 1953, p. 1, WMP/11/7. This strategy is described in Adair and Deuschle, People’s Health (n. 3), pp. 38–40.
McDermott also took care to explain that “we do not do any experiments on the patients here”: the safety of all the drugs had already been tested at New York Hospital.66 McDermott, in contrast to many previous physicians on the reservation, made a serious effort to treat Navajo leaders and healers with respect. He met with them in 1953 to share ideas about tuberculosis. He flew several to New York City so that they could see the work done against TB in the wards and laboratories of New York Hospital. These efforts, and the success of isoniazid, clinched the respect and gratitude of the Navajo. In 1954 Bicenti described the work of McDermott’s team as a “miracle.”67 In 1955 tribal chairman Sam Akeah told McDermott that the Navajo were “deeply thankful” for his efforts.68

These alliances had many benefits. As McDermott and Deuschle began their work at Fort Defiance in 1952, they learned that many Navajo opposed long confinement in hospitals. To overcome this resistance, they worked closely with Annie Wauneka, the only woman on the Tribal Council and the chairman of its health committee. She had been appointed by the council “to look into this problem and see if I could find a way to convince Navajo patients to remain in the sanatoriums for treatment.”69 She overcame her own skepticism about medical explanations of tuberculosis by speaking with physicians and visiting their laboratories. Eventually “prepared to tell my people that only ‘white man’s medicine’ could cure tuberculosis,” Wauneka traveled to the hospitals and sanatoria, met with patients and their families, and convinced them to accept treatment.70 She also worked closely with Navajo medicine men to mediate between traditional and medical ideas about tuberculosis. Her work was invaluable to the Cornell physicians. In 1954 some Navajo patients threatened to flee the tuberculosis sanatorium in Tucson after a nearby tree was struck by lightning; told of the Navajo taboos associated with lightning, Deuschle had a medicine man from Fort Defiance flown to Tucson to sing a purifying ritual: “Anxiety was relieved and peace of mind restored.”71 The Cornell team also relied on former patients to

66. Ibid., p. 12.
67. Billy Bicenti, in ibid., p. 19. See also ibid., p. 18; Adair and Deuschle, People’s Health (n. 3), pp. 42, 47.
70. Ibid.
help educate other Navajo: “The demonstrated recovery of health was most convincing for these laymen who might otherwise have doubted the word of an outsider.”

Such collaboration provided treatment for the Navajo and research data for McDermott’s team. They published their first results in October 1952: their data, from New York City and the Navajo reservation, showed that isoniazid was “equivalent, and probably slightly the superior” to streptomycin. Over the next ten years, McDermott’s team worked among the Navajo and produced a series of studies on the safety and efficacy of isoniazid, PAS, pyrazinamide, streptovaricin, and nicotinamide. Although these case series lacked the ideal rigor of randomized trials, McDermott believed that their results provided convincing evidence of the efficacy of isoniazid. This achievement was widely recognized. In 1955 McDermott and Muschenheim were awarded the prestigious Albert Lasker Award. They were quick to share credit with the Navajo: accepting the Lasker Award, Muschenheim noted that the “honour of this award is also shared by the Navaho Tribe for contributing from their own funds to the isoniazid study, which was conducted in large part among their people.”

Outpatient Treatment and the Problem of Self-Administration

The treatment programs at Tuba City and Fort Defiance provided clear evidence of the power of isoniazid in hospitalized patients. This success raised a new question: would the drug be as effective in outpatient settings? Efforts to implement outpatient treatment with streptomycin had been limited by the requirement of daily injections. Isoniazid, given orally, did not have this limitation: it allowed an outpatient treatment program that could intervene “in the disease process in a typical community, distant from Fort Defiance with its full set of hospital services.”

72. Adair and Deuschle, *People’s Health* (n. 3), p. 64.
76. Adair and Deuschle, *People’s Health* (n. 3), p. xiv. See also Deuschle et al., “Course of Pulmonary Tuberculosis” (n. 45), p. 251.
allowed “a total program for tuberculosis control among the Navajo.”

Inspired by this vision, McDermott and Muschenheim sought help from the Rockefeller Institute’s René Dubos, an expert in both the microbiology and social origins of infectious diseases; together, they conducted preliminary health surveys on the reservation in 1953 and 1954. McDermott described his plans for this “total program” at the 1954 Tribal Council meeting, and the council voted another $10,000 to cover expenses.

The Cornell physicians believed that in most cases “the patient can be assured of a ‘cure’ if he follows the doctor’s instructions.” But they doubted whether patients would follow instructions as outpatients: “While it is true that the practitioner can deliver in the home today a more effective anti-tuberculous therapy than was available in the hospital ten years ago, the mere delivery of a therapeutic agent into the hands of the patient is no guarantee that the drug will be taken as prescribed.” This was not a new problem. Physicians had worried about the reliability with which patients followed prescriptions since the time of the Hippocratic Corpus. The development of outpatient antibiotic treatment for tuberculosis and other infectious diseases added new fears to this old problem. Studies among the general population quickly showed that patients rarely finished their prescriptions of penicillin for strep throat. Tuberculosis posed a more serious problem: since it could be highly contagious, patients who did not complete adequate treatment threatened public health. Furthermore, if antibiotics were taken irregularly, they bred bacteria resistant to them. These concerns justified physicians’ anxiety about patient reliability: patients’ inability to follow physicians’ instructions threatened not just their own health, but also public health and the future power of antibiotics. Such concerns with self-administration quickly grew into generalized anxiety about the problem of patient compliance, one of the most significant and ongoing problems facing medicine.

McDermott, like many of his contemporaries, realized that self-administration would be a major challenge in all patient populations: “To be faithful in the daily ingestion of a pill appears to be strangely difficult in any society.” 82 His team had particular concerns for the Navajo. Could Navajo patients, separated from their physicians by language, religion, and understanding of disease, be “entrusted to take daily antimicrobial therapy without direct supervision?” 83 Would cultural barriers amplify the problems of compliance? These concerns have been a familiar part of medical practice in colonial settings, from Indian reservations to India. 84 They had special significance for McDermott because of his parallel goals of treatment and research. He needed to know whether patients took the drugs as directed: did treatment failure reflect ineffective therapy, the development of resistance, or simply the failure of patients to take the drug? His team made the evaluation of the reliability of self-administration an explicit goal of the project. 85


team worried that “more and more responsibility for the treatment of disease is being shifted from the doctor and nurse to the patient.”\textsuperscript{86} The locus of power had shifted, but doctors did not know whether they could trust patients: “How much responsibility can be delegated to this particular person?”\textsuperscript{87} As later observers have noted, “to ‘take one’s medicine’ is in no sense the ‘natural thing’ for patients to do.”\textsuperscript{88}

The failure to self-administer isoniazid threatened both treatment and research, and McDermott’s team had to prevent it. Tuberculosis treatment, straddling the boundary between medicine and public health, provided a history rich in authoritarian precedent, including incarceration for compulsory treatment. Many health officials (and historians) believed that these coercive programs contributed to the eventual control of tuberculosis. Even as McDermott worked with the Navajo, thirty-one states allowed the forced isolation and treatment of “recalcitrant” patients.\textsuperscript{89} But the Navajo reservation, like much of the world, lacked the resources required for such programs. In some areas, such as Hong Kong, Madras, and London, public health officials found a compromise in directly observed therapy. The goal was to reclaim responsibility from the patients: “Therapy must thus be evolved which, so far as possible, excludes the risk of patient error.”\textsuperscript{90} But McDermott’s team lacked the resources needed for fully supervised therapy.

Since many of the patients were on long-term therapy for chronic TB, adherence could not be gauged by changes in clinical condition. The

\begin{itemize}
\item \textsuperscript{87} Ibid.
\end{itemize}
team initially estimated isoniazid used by monitoring prescription refills and pill inventories. Although most patients seemed to take their pills reliably, the researchers feared that some refilled the prescriptions without ever taking the pills.\textsuperscript{91} While some of the doctors hoped to identify personality traits that exposed “the potentially unreliable patient before treatment is begun,”\textsuperscript{92} all agreed that there was “a pressing need for objective criteria.”\textsuperscript{93} One solution, “urgently needed,” was urine testing.\textsuperscript{94} When direct assays for isoniazid proved infeasible on the reservation, the team worked with Chas. Pfizer & Co. to prepare pills that contained isoniazid plus riboflavin, a vitamin that can be detected in urine with a fluorometer. Such preparations, they hoped, “might offer a means whereby the recalcitrant patient who is not accepting medication can be quickly detected.”\textsuperscript{95} Tested in 1959, the technique was a success, differentiating patients who had, or had not, taken the drug.\textsuperscript{96}

The researchers, particularly Thomas Moulding, also developed innovative pill-packaging systems. The simplest placed a one-month supply of pills in a wall calendar. Prominently displayed, the calendar provided both “psychologic gratification” to patients who kept a perfect record, and a reminder to those who forgot; health workers could also check the calendars during “periodic surprise visits.”\textsuperscript{97} Concerned that uncooperative patients could simply discard unused pills to create a false impression of adherence, Moulding developed a clockwork device that “would allow the patient to remove his medication only at the proper time.”\textsuperscript{98} When this proved too fragile and expensive, he crafted a cylindrical device that patients rotated each day to receive their pills. The regularity of this rotation was recorded in the tracing left by a radioactive emitter on a sheet of film hidden inside, and occasional urine tests could reveal the “deception” of patients who removed and discarded pills. These tech-

\textsuperscript{92} Hobby and Deuschle, “Use of Riboflavin” (n. 86), p. 415.
\textsuperscript{93} Roberts and Deuschle, “Comparative Study” (n. 83), p. 904.
\textsuperscript{94} “Research Grant Report” (n. 91), p. 36.
\textsuperscript{95} Hobby and Deuschle, “Use of Riboflavin” (n. 86), p. 415.
\textsuperscript{96} Ibid., pp. 415–23; Deuschle, Jordahl, and Hobby, “Clinical Usefulness” (n. 80), p. 7.
niques allowed “the physician to know how well his patient has been following instructions and to mobilize that degree of personal or social persuasion needed when it is found that the patient has not taken medication properly.”

Such surveillance introduced secrecy, even deception, into the patient-doctor relationship. The team feared “a change in the relationship of family and physician from one of trust to one of resentment of a mysterious form of ‘inspection.’” Several families, for instance, refused to cooperate with the urine testing program out of concern that the tests would expose the use of peyote, which had recently been banned by the Tribal Council. Moulding feared that “lack of trust” might “cause sufficient antagonism that patient cooperation would be lost”; however, the researchers believed that the only alternatives to surveillance of outpatient treatment were “prolonged hospitalization or running the risk of insufficient therapy.” Aware of the dangers, they hoped that the problem could “be managed through careful conduct.” Moulding suggested telling patients that forgetting was inevitable; surveillance simply allowed both patients and physicians to be aware of the magnitude of the forgetting.

The Cornell team had shown that isoniazid could be the basis of effective outpatient therapy for tuberculosis. Outpatient treatment, however, raised new problems. While hospitalization had ensured adherence, outpatient treatment depended on self-administration, something many physicians did not trust. This transition fueled a new era of medical surveillance. Instead of wielding power over hospitalized Navajo bodies,
Deuschle and Moulding sought power through the acquisition of knowledge about Navajo bodies. This resembles the well-described transitions from autocratic to democratic discipline, from prisons and asylums to mutual community surveillance: in both, progressive desires for community participation gave way to distrust and surveillance.  

McDermott’s team, hoping to improve self-administration through surveillance and targeted persuasion, feared that they would erode the trust that outpatient treatment required.

From the Efficacy of Antibiotics to the Efficacy of Medicine

McDermott came to the Navajo reservation to demonstrate the efficacy of isoniazid. He quickly learned that tuberculosis was only the tip of an iceberg. During the health surveys in 1953 and 1954 he, Dubos, and Muschenheim found an impoverished population living in abysmal conditions, with dirty, crowded homes, contaminated water supplies, and no sanitary facilities. The resulting pattern of disease and mortality was “exactly what one would have expected.” Life expectancy was 30 to 40 years, compared to 70 for the nation as a whole. Infant mortality was three to four times the national average. Infections caused 75 percent of all disease, with diarrhea and pneumonia afflicting 70 percent of the children, and tuberculosis more than half. The conditions resembled those in the general population “fifty to one hundred years ago,” or those of “less developed countries.”

Just as McDermott and Deuschle had sought simultaneously to treat Navajo tuberculosis and exploit the opportunity for antibiotic research, they decided to attempt to treat the full burden of Navajo disease and exploit another opportunity for research: they would test the efficacy of a complete system of medical care. Navajo health conditions fit their needs perfectly. The Navajo were “a disease-ridden people whose disorders would be largely preventable within a modern society.” An “adequate field health service” could manage 97 percent of their disease on an ...
They envisioned a “hospital without walls” that would manage the “total health” of the Navajo. Their fascinating experiment would place a modern medical system in an impoverished society and “see what results you get.”

The Cornell researchers were not the first to attempt to design a field health service for an impoverished rural population. Innovative approaches to providing health care to rural communities had been attempted in the American South in the 1910s, in England in the 1920s, in China in the 1930s, and in South Africa and Israel in the 1950s. The Chinese system, for instance, provided a field health service at an annual per capita cost of $0.09. Instead, the uniqueness of the “Health Care Experiment at Many Farms” came from their self-conscious attempt to tie comprehensive medical treatment to comprehensive medical research.

McDermott and Deuschle knew that this project would require even deeper cooperation from the Navajo than had the initial tuberculosis research. The early successes in 1952 and 1953 had established an excellent relationship with the Navajo: “we were well known and we were well liked already from the tuberculosis program. We were no real strangers.” Isoniazid had demonstrated, in the bodies of the Navajo, the power of modern medicine. Success against TB provided “the entering wedge in setting up a successful medical program in this community.” When McDermott proposed the field health project in 1955, the Navajo Council was “deeply thankful” and very willing to cooperate.

112. The idea of a “hospital without walls” came from René Dubos: see Adair and Deuschle, People’s Health (n. 3), pp. 50, 144, 168.
113. [McDermott], “Annual Report” (1953) (n. 77); Adair and Deuschle, People’s Health (n. 3), p. 95.
118. “Minutes” (1955) (n. 68), p. 7. See also Adair and Deuschle, People’s Health (n. 3), p. 61.
Deuschle and McDermott also exploited a remarkable series of convergences. First, they secured funding from the Public Health Service (PHS). As discussed earlier, the BIA had long been criticized for failing to provide adequate health services for American Indians. After World War II, complaints from government investigators, the American Medical Association, and the Indians themselves reached a critical level. Annie Wauneka, for instance, testified to Congress that the Navajo “think there is no real health program. If there is, we haven’t heard about it or seen it. And our sick people are paying for it.” Critics demanded that Indian health services be transferred from the BIA (within the Department of the Interior) to the health-care professionals of the PHS (within the Department of Health, Education, and Welfare). This transfer served other purposes as well. It facilitated Republican efforts to end the special status of American Indians and weakened political support for the BIA, something that would enable their western land-development schemes. The transfer, passed in 1954, took effect in 1955. The PHS, realizing that it needed new methods to confront Indian ill health, funded McDermott’s project as one of several pilot programs.

Second, McDermott recruited anthropologist John Adair, who had worked among the Navajo since the 1930s. Researchers at Cornell, led by psychiatrist Alexander Leighton (who had also worked among the Navajo), had demonstrated the impact of culture on patterns of disease and health. Researchers at Cornell, led by psychiatrist Alexander Leighton (who had also worked among the Navajo), had demonstrated the impact of culture on patterns of disease and health.


the provision of medical care. McDermott believed that anthropological expertise would help him improve the fit between health care and local culture.121 This activism fit the broad role that social scientists saw for themselves in the postwar international order. Ruth Benedict, who had trained Adair and then worked with Leighton on military projects during the war, believed that the turbulence created by postwar globalization created new opportunities for social scientists: there had “never been a time when civilization stood more in need of individuals who are genuinely culture-conscious.”122 McDermott welcomed such expertise: without it, “the possibility of actually doing harm through technologic development programs in health is very real.”123

Third, Deuschle and McDermott tapped into the new energy directed toward international health. The creation of the World Health Organization in 1948 inaugurated a period of unprecedented international health activity. Cold War politics increased the stakes, with President Harry S Truman making health assistance a goal of U.S. foreign policy. 124 McDermott, Deuschle, and Adair, impressed by both the “sheer size of the international technologic development movement” and the “recently developed power to make rapid and truly significant changes in the status of their health,” all felt this excitement.125 They believed that new systems


of health care were needed. The Navajo reservation provided a convenient model: “the situation of the Navajo is a crude replica in miniature of conditions in many parts of Asia, Africa and South America.” 126 It “offered a natural, readily accessible laboratory within which to develop procedures and techniques” for international health.127 They could study the Navajo to improve the health of similar populations worldwide.

As with the antibiotic research, McDermott’s team simultaneously used explicit metaphors of laboratory research and downplayed the experimental aspects of the project. They described how the coexistence of many diseases, which could be managed independently, allowed “an experiment of Nature.” 128 But at a community meeting in September 1955, they carefully explained that the program was “not an experiment.” 129 Wauneka emphasized that “these methods have been tried elsewhere and shown to be very effective.” 130 Deuschle added that “the white man was using the same mode of treatment in his own community as he was using in theirs.” 131 McDermott later described the fine line between care and research. He believed that it “would not have been ethically appropriate to go in and study the Navahos, so to speak, and then do nothing in return.” 132: the “social contract” required that the research subjects benefit from the research. 133 The team was “entirely candid” about the bargain: “in exchange for high quality health services,” the Navajo provided an “instructional medium through which the Cornell team and the Public Health Service would perfect the special techniques and procedures required for the conduct of an effective health program under Reservation conditions.” 134

This plan reflected McDermott’s daring ambition. A small field health program, in a remote part of the country, would serve as both a model for

126. [McDermott], “Interim Report” (n. 1), p. 64.
128. McDermott, Deuschle, and Barnett, “Health Care Experiment” (n. 4), p. 29. Belief in such an “experiment of Nature” was crucial to the justification of the Tuskegee Syphilis study; see Brandt, “Racism and Research” (n. 54), pp. 21–29.
129. Adair and Deuschle, People’s Health (n. 3), p. 55.
130. Ibid.
131. Ibid., p. 61.
133. Ibid., p. 8.
134. Young, “Foreword” (n. 127), p. xiv. For an analysis of such exchange relationships between researchers and patients in colonial contexts, see Anderson, “Possession of Kuru” (n. 5).
international health and a test of the power of modern medicine. This was a product of the remarkable postwar optimism about the power and universal applicability of science. McDermott would not have begun this experiment had he doubted that the results would validate his faith in medicine and its experimental method.

Reaching Navajo Patients

Deuschle, Adair, and McDermott knew that managing the “total health” of a population would require considerable effort. They wanted to concentrate all of their effort (and funding) in an intensive program in a small part of the reservation, but they knew that this would be politically unpopular among the Navajo. Relying on Wauneka and Adair to manage intratribal politics and tensions, Deuschle and McDermott convinced the Tribal Council to accept their focused project. 135 With the advice of the council, they chose an area centered on the communities of Many Farms and Rough Rock. They announced their plans at a community meeting on 16 September 1955. Construction of the clinic at Many Farms proceeded rapidly. After Navajo medicine men purged the building of evil spirits, the clinic opened on 7 May 1956. It was a gala affair, attended by more than a thousand Navajo from throughout the Chinle valley. In 1958 the team added a satellite clinic in a donated railroad refrigerator car at Rough Rock, twenty-two miles from the main facility. 136

The project’s success at providing health care depended on its ability to collect accurate health information and gain access to the population. This required both close collaboration between physicians and anthropologists, and continued cooperation from the Navajo. Researchers had long bemoaned the terrible quality of Navajo demographic data. Data collection was confounded by the variability of individuals’ names over their lifetimes and the lack of a postal address system on the reservation. An effort to distribute identification numbers had been ignored by most Navajo, who were, according to Adair, “not a record-conscious people.” 137 Even such simple tasks as registering births and deaths eluded the BIA into the 1950s. 138 To overcome these problems, the Many Farms team

135. McDermott noted that this was “not easy to do” (McDermott, “Conversation” [n. 4], p. 7). See also Adair and Deuschle, People’s Health (n. 3), pp. 50–52.
137. Adair, Deuschle, and McDermott, “Patterns of Health and Disease” (n. 108), p. 89.
began “a constant and prodigious effort to collect this vital statistics data accurately and completely,” questioning teachers, missionaries, traders, and community leaders.\textsuperscript{139} They developed an innovative patient record system based on clans and family residential camps that reflected “the patterns of living of the Navajo.”\textsuperscript{140} The system “provided as complete a record as possible” of both “the health picture of an individual in his living unit” and “the health status of the unit as a whole”; it also offered “a compact body of research material based upon social and medical environment” and allowed the researchers to adapt the health-care system specifically to the needs of the Navajo.\textsuperscript{141}

Data collection in the clinics required accurate communication between patients and doctors. This was undermined by the many incompatibilities between the Navajo and English languages that had long led to terrible miscommunication.\textsuperscript{142} These linguistic obstacles were exaggerated by what Adair and Deuschle perceived as “the behavior of the stolid and undemonstrative Navajo patient.”\textsuperscript{143} To overcome this, the Cornell team selected skilled interpreters and trained them in both Navajo and Western concepts of disease. They made detailed studies of Navajo descriptions of symptoms, especially pain, going so far as subjecting volunteers to “a series of painful stimuli” and recording their descriptions.\textsuperscript{144} These efforts enabled the physicians to question their patients “with sufficient accuracy to permit the full range of application of modern medicine.”\textsuperscript{145}

As they worked to improve their knowledge of Navajo symptoms, the researchers extracted substantial data from the bodies of Navajo patients. They hoped “to acquire complete medical and routine laboratory examinations of all members in the district.”\textsuperscript{146} They performed physical exams, vision and hearing tests, X rays, urinalyses, blood counts, syphilis tests, and electrocardiograms. Blood samples were drawn from as many

\begin{itemize}
\item \textsuperscript{139} “Research Grant Report” (n. 91), p. 14.
\item \textsuperscript{140} Adair and Deuschle, \textit{People’s Health} (n. 3), p. 94.
\item \textsuperscript{141} Ibid., p. 106. See also Deuschle and Adair, “Interdisciplinary Approach” (n. 117), p. 895.
\item \textsuperscript{142} The Navajo language lacked, for instance, generic words for “color,” for short periods of time, or for subtleties and gradations of pain. See Adair and Deuschle, \textit{People’s Health} (n. 3), pp. 108–27.
\item \textsuperscript{143} Adair and Deuschle, “Some Problems” (n. 125), p. 20.
\item \textsuperscript{145} Adair and Deuschle, \textit{People’s Health} (n. 3), p. 125.
\item \textsuperscript{146} “Research Grant Report” (n. 91), p. 22.
\end{itemize}
patients as possible and “frozen and stored for later serological testing as indicated.”147 “Special medical studies” (e.g., ear, throat, sputum, and stool cultures) were conducted on 250 students at four local schools.148 The team saw this work as a major triumph: they had established a “medical scan” of the Navajo.149 Their success demonstrated the extent to which the Navajo cooperated with the Many Farms researchers.

These efforts produced ample information on patients who came into the clinics. Getting patients to the clinic, however, could be a struggle. The team gained crucial assistance from its cooperation with medicine men. McDermott and Deuschle had worried that their support of traditional healers might undermine their project: sick patients, seeking care from medicine men, might delay before coming to the Cornell clinic or disregard prescribed treatments. The opposite happened. Medicine men blessed the team’s medical health-care facilities and came to the clinic with their own health problems. Navajo diagnosticians even referred Navajo patients to the Many Farms clinic for treatment. As one hand trembler stated, “Sometimes your hand will point where there is a hospital, so you will know that the patient needs to be taken there.”150

McDermott’s ambitions reached beyond the clinic. He wanted the health program to be aware of, and involved in, the daily lives of Navajo patients. This was made possible by the project’s crucial innovation: the health visitor program. The team knew that although field health projects would always be understaffed, a few trained local assistants could extend the reach of the professional staff. They selected former tuberculosis patients and led them through a four-month curriculum that covered the basic skills and knowledge of medicine and public health (Fig. 3). After a one-year apprenticeship, health visitors worked independently, but always in close consultation with the clinic staff. The health visitors were culturally fluent and trusted by the community: “their understanding of the ways of the people, their home life, religion, methods of child care, and so on, were invaluable to the clinic staff.”151 Whether home visits were medical or “would seem to be chiefly social in character,” the health

147. Ibid.
148. Ibid. See also Deuschle, “Tuberculosis” (n. 71), p. 203.
149. McDermott, Deuschle, and Barnett, “Health Care Experiment” (n. 4), p. 27.
visitors collected data about health (Fig. 4). This “enabled the medical team to reach out to the home and gather demographic information that could not have been obtained by other means.”

This “prodigious effort” to gain information about Navajo patients proceeded in parallel with the team’s efforts to measure the self-administration of isoniazid. Hoping to free patients from the demands of hospitalization, the team established an outpatient treatment program. The regimes of outpatient surveillance were crucial to the design, implementation, and evaluation of the project. They were an heir of the “iron cage” of bureaucratic rationality: individuals in pursuit of economic and social freedom inevitably erect bureaucratic structures that then constrain this

152. “Research Grant Report” (n. 91), p. 47.
freedom. The BIA had long tried to “civilize” American Indians by imposing bureaucratic structures onto their populations, exchanging their traditional freedoms for Christianity, education, and hygiene. While explicitly outside the bureaucratic world of the BIA, the Many Farms team respected and shared its need to assert order. Dedicated to providing health care to improve the lives of the Navajo, they created an intensive program of social surveillance and sought to shape Navajo lives with the dictates of medical science.

Outcomes and Conclusions

The Cornell clinic at Many Farms operated from 1956 to 1962. According to the researchers, the clinic—and its collaboration between physicians, social scientists, tribal leaders, medicine men, interpreters, and

health visitors—“operated harmoniously and productively throughout the term of its existence.” Adair and Deuschle believed that the team “enjoyed a splendid reputation among the Navajo.” Sixty percent of the population was seen each year; over 90 percent of the population was seen at least once. The collaboration facilitated health care and “enabled the medical team to carry on sensitive medical research and derive reliable results that would not have been possible otherwise.” The researchers published scores of articles on tuberculosis, infant health, Navajo diet, the etiology of diarrhea, cardiac risk factors, accident rates, Navajo income sources, the persistence of subclinical influenza, hemolytic anemia, congenital hip disease, Navajo linguistics, and geographic variations in iron-binding globulins. The project became a model for the growing field of medical anthropology. Just as McDermott won acclaim for his work on isoniazid, his experiences at Many Farms made him “sought after as a world health consultant”; Deuschle and many of the other researchers had similar success.

Despite these achievements, the program fulfilled few of the researchers’ hopes. Its many failures taught them a series of lessons. First, while innovation was possible in a small, university-based research program, the innovations at Many Farms could not be generalized to the bureau-

156. Adair and Deuschle, People’s Health (n. 3), p. 142.
158. For a nearly complete list, see Adair, Deuschle, and Barnett, People’s Health (n. 127), pp. 263–66. See also Jones, “Rationalizing Epidemics” (n. 6), pp. 637–56.
ocratic structures of the Indian Health Service. The depth of IHS regulations angered the Many Farms physicians: “Some of the more rigid doctors take on the attitude that ‘government’ is a mass conspiracy solely invented to keep them from seeing their patients.” The health visitor program, invaluable at Many Farms, produced outrage among IHS officials. At a 1959 meeting in Washington, D.C., an IHS nurse argued that the university researchers had failed to make the role compatible with existing IHS structures: “We have thousands of things to consider that you don’t; salary levels, tenure, overlap of functions, compatibility of personnel, overall program determinations. Believe me, it isn’t easy. In government we have lots of things to consider.” Because of such pressures, the Many Farms project had little lasting impact on the care provided by the IHS.

Second, while the doctors, nurses, and anthropologists collaborated productively, tensions did appear. Physicians, accustomed to clinical autonomy, had to yield to the research goals of the project directors. Social scientists had to learn to work within an organization. While the physicians focused on curative work, the nurses and anthropologists emphasized prevention. Since the researchers shared both social and professional lives, these tensions had few outlets, which had severe consequences for their mental health: “Anxiety, tension, worry, sometimes augmented by overwork and lack of relaxation resulted in mental stress; a number of the staff had to resort to psychiatric aid to regain their equilibrium.” Deuschle and Adair identified these tensions, which they had self-consciously attempted to overcome, as the largest failure of the program. In the end they realized that they had not paid “sufficient attention to the beliefs, values, and structuring of our own society”; future projects would have to “find more effective ways of bridging gaps within our own bureaucracy. It is only then that we will truly have a hospital without walls.”

161. Adair and Deuschle, People’s Health (n. 3), p. 147. See also Doris Schwartz, “Notes on Three Weeks at the Cornell-Navajo Field Health Project: Manyfarms, Arizona, 1956,” p. 4, Doris Schwartz Papers, MCA, box 1, folder 3. One of the incompatibilities, for example, was that the Many Farms team allowed health visitors who did not have drivers’ licenses to drive to hogans.
162. For the limited impact, see Kunitz, Disease Change (n. 6), p. 201 n. 1; Jerrold Levy, quoted in Adair, Deuschle, and Barnett, People’s Health (n. 127), p. 246 n. 2.
163. Adair and Deuschle, People’s Health (n. 3), p. 163. See also pp. xiv, 144, 168.
Third, the researchers were forced to acknowledge the tremendous resilience of the diseases generated by poverty. Physicians and public health experts had long known that poverty created a host of susceptibilities to disease, including malnutrition, overcrowding, and inadequate sanitation. The Cornell researchers had recognized these processes as the ultimate causes of Navajo morbidity and mortality. However, infused with the confidence of postwar medicine, McDermott and Deuschle had hoped that medical technology, especially antibiotics, would allow them to prevent and treat diseases even in the context of rural poverty. Their successes against tuberculosis had strengthened this hope: while the Many Farms clinic operated, there were no deaths from that disease, and the incidence among children declined from 50 percent to 6 percent. However, the incidence of the five leading causes of morbidity and mortality—pneumonia, diarrhea, ear infections, measles, and impetigo—remained constant. This failure surprised McDermott: “When one considers our pre-experiment expectations, soundly grounded in the conventional wisdom, these results were clearly disappointing.”

McDermott faced a crisis. He had rushed to Tuba City for two reasons: he had hoped to relieve the suffering of patients who died needlessly, and he had hoped to use this treatment to demonstrate the power of isoniazid. In these he was successful: the treatment of Navajo patients with miliary and meningeal tuberculosis demonstrated the power of isoniazid. His team won lasting gratitude from the Navajo, and international recognition from medicine and the media. These successes inspired Deuschle and McDermott to begin their more ambitious project: to implement a field health service that would treat the full burden of Navajo disease and prove the full scope of medicine’s power to improve the health conditions of even an impoverished society. In this the Many Farms clinic was unsuccessful.

The researchers were not defeated by the outcome. Instead, they continued to reformulate the results in order to salvage positive lessons from their work among the Navajo. First, the Many Farms team declared that the failure to improve overall morbidity and mortality did not indict

165. Deuschle, “Tuberculosis” (n. 71), pp. 202–5; McDermott, Deuschle, and Barnett, “Health Care Experiment” (n. 4), pp. 25–27. The burden of disease changed more quickly than medical capability. By the time the team had achieved success against tuberculosis (the leading cause of death in 1952), viral pneumonia and diarrhea (against which they could do little) had become the leading causes of death.
modern medicine; it simply represented the “gross misfit between our modern medicine and the disease pattern of overly traditional societies.” McDermott reminded his readers that medicine made many demands on patient behavior and took certain things for granted: “that somebody has windows in the house and water in the room—things like that.” While some diseases, like tuberculosis, could be managed with antibiotics in “slum conditions,” others, like infant mortality, required fundamental changes in household conditions and practices. Home-based nursing care would likely have been more effective than physicians and their “superb” technology. Health services had to be deliberately matched to socioeconomic conditions.

Second, McDermott argued that important aspects of the power of physicians remained untested. Their work among the Navajo gave the Many Farms researchers new appreciation of the complexity of patient-doctor relationships. Physicians, armed with the authority of science, had unmatched power to reassure patients who did not have serious disease and to provide hope for those who did. Physicians could provide care in a way that no one else could:

who can measure the value obtained by those Many Farms parents who could see obviously expert professionals hovering over their child, desperately ill with pneumonia caused by respiratory syncitial virus? They see someone making a fight. To point out that, in the particular circumstances, the penicillin the child is receiving happens to be valueless, in a technological sense, would seem a petty, if not callous, irrelevancy.

This intangible aspect of medical care, which McDermott labeled “samaritanism,” was “extraordinarily difficult to analyze and measure.”\textsuperscript{172} The Many Farms project had never intended to evaluate this form of care, focusing instead on the evaluation of medical technology.

These attempts to rationalize the failures at Many Farms left fundamental tensions unaddressed. The results had led McDermott to proclaim the power of intangible aspects of the patient-doctor relationship—but the isoniazid studies had placed this relationship at risk. Outpatient treatment had required surveillance to ensure that patients self-administered their medications, but Deuschle and Moulding feared that this surveillance introduced distrust into the patient-doctor relationship. Physicians faced a potentially difficult choice. They could assist patients with technology, and with expert reassurance—but these two aspects of physician power sometimes existed in tension. New tools expanded physicians’ abilities to diagnose and treat patients, thereby providing reassurance. At the same time, these new technologies, by reducing the importance of physical exams, or by requiring systems of surveillance, erected barriers between patients and doctors and undermined physicians’ ability to provide reassurance.\textsuperscript{173}

McDermott’s many dreams for Many Farms remained elusive throughout the remainder of his career. He never doubted the fundamental power of medical technologies. Throughout his life he maintained a “profound sense of wonder” at the power of antibiotics.\textsuperscript{174} As he described so compellingly, antibiotics had transformed once-fatal diseases, notably pneumonia and tuberculosis, into treatable, outpatient conditions.\textsuperscript{175} He believed that physicians could take these technologies into

\begin{footnotes}
\item[174] Rogers, “Early Years” (n. 6), p. 2.
\item[175] McDermott, with Rogers, “Social Ramifications” (n. 6), pp. 302–12.
\end{footnotes}
the most challenging conditions of urban slums and rural poverty and treat once-formidable diseases. But instead of defining a central role for physicians in international health, the research at Many Farms showed that physicians and their technologies were actually ill suited for the health needs of most of the world’s populations: in settings of extreme poverty, where basic standards of hygiene and sanitation did not exist, public health and skilled nursing could provide more appropriate, and more realistic, care. Despite the unprecedented resources available for medical care in postwar America, difficult decisions about resource allocation continued to arise. McDermott came to understand that an intensive and powerful system of medical care, taken for granted by most people in the United States, remained unattainable, and inappropriate, luxury for others.176

McDermott also learned that the efficacy of medical art and science, something that seemed so self-evident to him, defied his attempts to apply the experimental method to clinical medicine. Just as his technology had limited value at Many Farms, samaritanism remained elusive; he struggled to measure and test its power for years after the closure of the Many Farms clinic, always without success.177 As debates over the efficacy of medicine became increasingly heated during the 1970s, McDermott, the great experimentalist, maintained his claim that researchers could measure the value of physicians’ technology, but not the value of their compassion.178

Taken together, McDermott’s trials of the efficacy of antibiotics and modern medicine reveal the power and limitations of postwar medicine. In the second half of the twentieth century, physicians developed great confidence in their many new treatments and willingly subjected them to rigorous analyses of efficacy. Every medical act became an experiment, from an individual physician’s optimization of a patient’s blood-pressure regimen, to the formal structures of randomized clinical trials. Medicine became a world rich in the language of the laboratory, of observation and control, of surveillance and compliance. But nearly every time that


clinical studies validated the efficacy of therapies, clinical experience showed that substantial obstacles hindered their deployment. Postwar medicine also witnessed the proliferation of new health-care needs and resources. New expectations of expanded access to health care in the United States and reinvigorated excitement about the prospects for improved international health were matched by increased health-care funding through Medicare, Medicaid, and international development programs. These new demands and new opportunities obligated physicians to subject their medical systems to trials of their efficacy. But even as thousands of studies combined to create a vision of therapeutic power, lingering questions remained about the contribution of medicine to the health of societies. The elusiveness of medical power, demonstrated so clearly at Many Farms, challenged the optimism of medicine.
