



Project
MUSE[®]

Today's Research. Tomorrow's Inspiration.

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

David S. Jones

Bulletin of the History of Medicine, Volume 76, Number 4, Winter 2002, pp. 749-790 (Article)

Published by The Johns Hopkins University Press
DOI: [10.1353/bhm.2002.0186](https://doi.org/10.1353/bhm.2002.0186)



For additional information about this article

<http://muse.jhu.edu/journals/bhm/summary/v076/76.4jones.html>

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

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

I received valuable advice from Allan Brandt, David Barnes, Arthur Kleinman, Deborah Weinstein, Barbara Rosenkrantz, Nicholas King, Elizabeth Caronna, the History of Medicine Working Group at Harvard University, and several anonymous reviewers. Adele Lerner and James L. Gehrlich provided invaluable assistance at the NewYork Weill Cornell Medical Center Archives. The paper is drawn from my dissertation, "Rationalizing Epidemics: Historical Accounts of American Indian Health Disparities" (Ph.D. diss., Harvard University, 2001). This research was supported in part by a Medical Scientist Training Program Grant, National Institutes of Health.

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).

2. Walsh McDermott, “Early Days of Antimicrobial Therapy,” *Antimicrob. Agents & Chemother.*, 1968, 8: 1–6, quotation on p. 2.

3. John Adair and Kurt Deuschle, *The People’s Health: Medicine and Anthropology in a Navajo Community* (New York: Meredith, 1970), pp. 50, 95.

4. Walsh McDermott, “Conversation with Jane K. Zaidi (archivist), 7 February 1972,” WMP/11/5: “Navajo, Oral History Tape, Transcript 1951–52,” p. 12. For overviews of the project, see Walsh McDermott, Kurt Deuschle, John Adair, Hugh Fulmer, and Bernice



Fig. 1. The Navajo-Cornell Field Health Clinic at Many Farms, Arizona. (Courtesy of NewYork Weill Cornell Medical Center Archives, Photograph Collection, Navajo Project, #2307.)

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

Loughlin, "Introducing Modern Medicine in a Navajo Community: Physicians and Anthropologists Are Cooperating in This Study of Changing Patterns of Culture and Disease," *Science*, 1960, 131: 197–205, 280–87; Walsh McDermott, Kurt W. Deuschle, and Clifford R. Barnett, "Health Care Experiment at Many Farms: A Technological Misfit of Health Care and Disease Pattern Existed in This Navajo Community," *Science*, 1972, 175: 23–31.

5. For examples of early campaigns for rural health, see C. C. Ch'en, "The Rural Public Health Experiment in Ting Hsien, China," *Milbank Mem. Fund Quart. Bull.*, 1936, 14: 66–80; John Etling, *The Germ of Laziness: Rockefeller Philanthropy and the Public Health in the New South* (Cambridge: Harvard University Press, 1981); Shula Marks, "South Africa's Early Experiment in Social Medicine: Its Pioneers and Politics," *Amer. J. Pub. Health*, 1997, 87: 452–59. Western medicine in colonial contexts has received vast attention from historians. For examples of this excellent literature, see David Arnold, *Colonizing the Body: State Medicine and Epidemic Disease in Nineteenth-Century India* (Berkeley: University of California Press, 1993); Andrew Cunningham and Bridie Andrews, eds., *Western Medicine as Contested Knowledge* (Manchester, U.K.: Manchester University Press, 1997); Mary-Ellen Kelm, *Colonizing Bodies: Aboriginal Health and Healing in British Columbia, 1900–50* (Vancouver: UBC Press, 1998); Warwick Anderson, "The Possession of Kuru: Medical Science and Biocolonial Exchange," *Comp. Stud. Soc. & Hist.*, 2000, 42: 713–44.

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

6. Robert A. Trennert discussed Many Farms briefly in his history of health care on the Navajo reservation, *White Man's Medicine: Government Doctors and the Navajo, 1863–1955* (Albuquerque: University of New Mexico Press, 1998), pp. 215–17, and cited several unpublished papers by Wade M. Davies. Stephen J. Kunitz described the limited impact of the project on the Indian Health Service in *Disease Change and the Role of Medicine: The Navajo Experience* (Berkeley: University of California Press, 1983), p. 201 n. 1. I have found no sustained historical discussions of the project, and no analyses that use McDermott's archive at New York Hospital. McDermott himself has received some attention. Paul B. Beeson has provided a helpful biography in "Walsh McDermott, October 24, 1909–October 17, 1981," *Biographical Memoirs, National Academy of Sciences*, vol. 59 (Washington, D.C.: National Academy Press, 1990), pp. 283–307. David E. Rogers, who worked closely for McDermott for several decades, wrote two reflections on McDermott's career: see Walsh McDermott, with David E. Rogers, "Social Ramifications of Control of Microbial Disease," *Johns Hopkins Med. J.*, 1982, 151: 302–12; David E. Rogers, "The Early Years: The Medical World in Which Walsh McDermott Trained," *Daedalus*, 1986, 115: 1–18. My analysis of the meanings and impacts of Many Farms is adapted from David S. Jones, "Rationalizing Epidemics: Historical Accounts of American Indian Health Disparities" (Ph.D. diss., Harvard University, 2001).

7. For a discussion of the enthusiasm of postwar American society, see James T. Patterson, *Grand Expectations: The United States, 1945–1970* (New York: Oxford University Press, 1996). For the impact of this optimism on medicine, see Paul Starr, *The Social*

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

Transformation of American Medicine: The Rise of a Sovereign Profession and the Making of a Vast Industry (New York: Basic Books, 1982), pp. 335–51; Allan M. Brandt and Martha Gardner, “The Golden Age of Medicine?” in *Medicine in the Twentieth Century*, ed. Roger Cooter and John Pickstone (Amsterdam: Harwood Academic Publishers, 2000), pp. 21–37. For changes in the structure of medical research after World War II, see Harry M. Marks, *The Progress of Experiment: Science and Therapeutic Reform in the United States, 1900–1990* (Cambridge: Cambridge University Press, 1997).

8. For recent reviews of the impact of European pathogens on New World populations, see John W. Verano and Douglas H. Ubelaker, eds., *Disease and Demography in the Americas* (Washington, D.C.: Smithsonian Institution Press, 1992); David S. Jones, “Virgin Soils Revisited,” *William & Mary Q.*, forthcoming. For early Navajo health, see Stephen J. Kunitz, “Underdevelopment, Demographic Change, and Health Care on the Navajo Indian Reservation,” *Soc. Sci. & Med.*, 1981, 15A: 175–92; Trennert, *White Man’s Medicine* (n. 6), pp. 4–5.



Fig. 2. Navajo sheep and pastureland. (Courtesy of New York Weill Cornell Medical Center Archives, Photograph Collection, Navajo Project, #2309.)

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,

9. Many authors review this history: Alexander H. Leighton and Dorothea C. Leighton, *The Navaho Door: An Introduction to Navajo Life* (Cambridge: Harvard University Press, 1945), pp. 5–9; John Adair, *The Navajo and Pueblo Silversmiths* (Norman: University of Oklahoma Press, 1946), pp. 24–25; Clyde Kluckhohn and Dorothea Leighton, *The Navajo* (1946; rev. ed., Cambridge: Harvard University Press, 1974), p. 23; Frank S. French, James R. Shaw, and Joseph O. Dean, “The Navajo Health Problem, Its Genesis, Proportions and a Plan for Its Solution,” *Mil. Med.*, 1955, 116: 451–54, on p. 452; J. Nixon Hadley, “Health Conditions among Navajo Indians,” *Pub. Health Rep.*, 1955, 70: 831–36, on p. 831; Ruth M. Underhill, *The Navajos* (Norman: University of Oklahoma Press, 1956); René Dubos, *Mirage of Health: Utopias, Progress, and Biological Change* (New York: Harper, 1959), p. 3; Kunitz, “Underdevelopment” (n. 8), pp. 175–77; Stephen J. Kunitz and Jerrold E. Levy, “Dances with Doctors: Navajo Encounters with the Indian Health Service,” in Cunningham and Andrews, *Western Medicine* (n. 5), pp. 95–105; Trennert, *White Man’s Medicine* (n. 6), pp. 4–5, 19–37.

high physician turnover, and a corrupt bureaucracy.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.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).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.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

10. Trennert, *White Man's Medicine* (n. 6), pp. 21, 43, 69–73. For a discussion of parallel troubles on other reservations, see Virginia R. Allen, "Agency Physicians to the Southern Plains Indians, 1868–1900," *Bull. Hist. Med.*, 1975, 49: 318–30.

11. Adair, *Navajo and Pueblo Silversmiths* (n. 9), p. 117.

12. Aleš Hrdlička, *Physiological and Medical Observations among the Indians of Southwestern United States and Northern Mexico* (Washington, D.C.: Government Printing Office, 1908), pp. 187, 210–11. See also Herbert A. Burns, "Tuberculosis in the Indian," *Amer. Rev. Tuberc.*, 1932, 26: 498–506; "Contagious and Infectious Diseases among the Indians," 1913, excerpted in U.S. Public Health Service, *Health Services for American Indians*, Public Health Service Publication no. 531 (Washington, D.C.: GPO, 1957), p. 282. For a review of early Navajo health, see Trennert, *White Man's Medicine* (n. 6), pp. 96–99.

13. Kunitz, "Underdevelopment" (n. 8), p. 177. See also Stephen J. Kunitz, "The Social Philosophy of John Collier," *Ethnohistory*, 1971, 18: 213–29; Trennert, *White Man's Medicine* (n. 6), p. 177.

population by a factor of 15.8 for tuberculosis, 101.6 for pneumonia, and 1,163 for trachoma.¹⁴

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.”¹⁵ 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 1933.¹⁶ 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.”¹⁷

14. For the 1925 data, see Burns, “Tuberculosis in the Indian” (n. 12), pp. 498–99. For the 1947 data, see Fred T. Foard, “Health Services for the North American Indians,” *Med. Woman’s J.*, 1950, 57: 9–16, on p. 12. For the 1955 data, see Hadley, “Health Conditions” (n. 9), p. 835.

15. Joseph A. Murphy, “The Prevention of Tuberculosis in the Indian Schools,” *Addr. & Proc., Nat. Educ. Assoc. United States*, 1909, 919–24, quotation on p. 919.

16. For histories of federal health services provided to American Indians, see George M. Kober, George E. Bushnell, Joseph A. Murphy, et al., *Tuberculosis among the North American Indians: Report of a Committee of the National Tuberculosis Association Appointed on October 28, 1921* (Washington, D.C.: GPO, 1923), p. 10; Lawrence W. White, Robert E. L. Newberne, and Joseph A. Murphy, “Historical Sketch of the United States Indian Medical Service,” in *idem*, pp. 97–100; USPHS, *Health Services* (n. 12), p. 92; U.S. Public Health Service, *The Indian Health Program of the U.S. Public Health Service* (Washington, D.C.: U.S. Department of Health, Education, and Welfare, 1966), pp. 18–19; Diane Therese Putney, “Fighting the Scourge: American Indian Morbidity and Federal Policy, 1897–1928” (Ph.D. diss., Marquette University, 1980), pp. 104, 108–9, 170–85; Kunitz, “Underdevelopment” (n. 8), p. 177; Trennert, *White Man’s Medicine* (n. 6), pp. 117–21. The period of hospital construction lagged behind the surge of hospital construction among the general population of the United States between 1870 and 1910: see Starr, *Social Transformation* (n. 7), pp. 145–79; Charles E. Rosenberg, *The Care of Strangers: The Rise of America’s Hospital System* (Baltimore: Johns Hopkins University Press, 1987), pp. 5, 97–121. For an overview of the Progressive Era, and its impact on public health policy, see Robert H. Wiebe, *The Search for Order, 1877–1920* (New York: Hill and Wang, 1967), esp. pp. 114–16.

17. “Report of the Commissioner of Indian Affairs, 1920,” quoted in Kober et al., *Tuberculosis* (n. 16), p. 88.

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

18. Elinor D. Gregg, *The Indians and the Nurse* (Norman: University of Oklahoma Press, 1965), p. 24. See also White, Newberne, and Murphy, “Historical Sketch” (n. 16), p. 100; Putney, “Fighting the Scourge” (n. 16), p. 198; Francis Paul Prucha, *Indian Policy in the United States: Historical Essays* (Lincoln: University of Nebraska Press, 1981), pp. 854–55; Trennert, *White Man’s Medicine* (n. 6), pp. 74–75, 161, 195–99.

19. For the Rockefeller Commission report, see Lewis Meriam, Ray A. Brown, Henry Roe Cloud, et al., for the Institute for Government Research, *The Problem of Indian Administration* (Baltimore: Johns Hopkins Press, 1928), pp. 3, 204. For the history and impact of this report, see Putney, “Fighting the Scourge” (n. 16), p. 309; Trennert, *White Man’s Medicine* (n. 6), pp. 136–38.

20. For expressions of such New Deal sensitivity, see Joseph W. Mountin and J. S. Townsend, *Observations on Indian Health Problems and Facilities*, Public Health Service, Public Health Bulletin #223 (Washington, D.C.: GPO, 1936), p. 41; Leighton and Leighton, *Navaho Door* (n. 9). For discussions of this, see Putney, “Fighting the Scourge” (n. 16), p. 328; Kunitz, “Social Philosophy” (n. 13).

21. J. A. Krug, *The Navajo: A Long Range Program for Navajo Rehabilitation* (Washington, D.C.: GPO, 1948), p. vii.

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.

23. Krug, *Navajo* (n. 21), p. 6.

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

24. Robert W. Young, *The Navajo Yearbook*, vol. 8: 1951–1961, *A Decade of Progress* (Window Rock, Ariz.: Navajo Agency, 1961), p. 67.

25. House Committee on Public Lands, *Report to Accompany H.R. 4627: Authorizing an Appropriation for the Immediate Relief of the Navajo and Hopi Indians*, 5 December 1947, 80th Cong., 1st sess., H. Rept. 1156, ser. 11123, p. 1.

26. William E. Warne, quoted in Senate Committee on Interior and Insular Affairs, *Report to Accompany S. 1407: Rehabilitation of the Navajo and Hopi Tribes*, 2 June 1949, 81st Cong., 1st sess., S. Rept. 550, ser. 11293, p. 5.

27. For the background to the act, see Krug, *Navajo* (n. 21), pp. v–x; Bureau of Indian Affairs, “Summary of Navajo Development,” 8 April 1949, in Senate Committee on Interior and Insular Affairs, *Report to accompany S. 1407* (n. 26), p. 9. For the act itself, see *An Act to Promote the Rehabilitation of the Navajo and Hopi Tribes of Indians and a Better Utilization of the Resources of the Navajo and Hopi Indian Reservations, and for Other Purposes*, Public Law 474, 81st Cong., 2nd sess., 1950, pp. 44–45. For discussions of the Krug Report and Long Range Rehabilitation Act, see Kunitz, “Underdevelopment” (n. 8), pp. 178–79; Kunitz, *Disease Change* (n. 6), pp. 26–43; Trennert, *White Man’s Medicine* (n. 6), p. 210.

28. USPHS, *Health Services* (n. 12), pp. 39–57, 230–32.

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.”²⁹ 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,”³⁰ 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.³¹ 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.³² LeMaistre conducted careful clinical and laboratory investigations and controlled the outbreak by treating the patients with gamma globulin.³³

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.³⁴ During his investigations in Tuba

29. Steven M. Spencer, “They’re Saving Lives in Navajo-Land,” *Saturday Evening Post*, 23 April 1955, p. 92.

30. Ibid. See also Frederick Woltman, “The Medicine Men Accept Our Healing,” *World-Telegram & Sun Saturday Mag.*, 22 January 1955, p. 4.

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.

32. [McDermott], “Annual Report of the Division [of Infectious Disease, NYH], 1952,” WMP/11/5.

33. “Mickey” [Charles LeMaistre] to McDermott, 31 December 1951, WMP/11/5; McDermott, “Conversation” (n. 4), p. 1; Walsh McDermott, “Oral History Transcript,” p. 16, Oral History Transcripts, MCA, 54 F box 2.

34. Charles A. LeMaistre, Ralph Thompsett, Carl Muschenheim, James A. Moore, and Walsh McDermott, “Effects of Adrenocorticotrophic Hormone and Cortisone in Patients with Tuberculosis,” *J. Clin. Invest.*, 1951, 30: 445–56.

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

35. “Ethnic”: McDermott, “Conversation” (n. 4), p. 1; “ethical”: McDermott, “Early Days” (n. 2), p. 2.

36. McDermott, “Conversation” (n. 4), p. 1.

37. McDermott, in “Minutes of the Navajo Tribal Council,” 2 June 1959, p. 2, WMP/11/7: “Navajo Tribal Council Excerpts.”

penicillin, an awesome responsibility: he had to balance the clinical needs of patients against the research needs of the war effort.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.³⁹ McDermott, exploiting these new opportunities in the late 1940s and early 1950s, led laboratory and field trials of penicillin and many other antibiotics.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-acetylaminobenzaldehyde thiosemicarbazone), a new antituberculous drug, McDermott was sent to investigate; although Conteben itself proved to have little value, its related compounds merited further study.⁴¹ By 1951 McDermott, who had become an editor of the *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.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

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.

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

40. McDermott, "Oral History Transcript" (n. 33), p. 11.

41. "Medicine: War Booty," *Time*, 21 November 1949, pp. 98–99; H. Corwin Hinshaw and Walsh McDermott, "Thiosemicarbazone Therapy of Tuberculosis in Humans," *Amer. Rev. Tuberc.*, 1950, 61: 145–57; McDermott, "Early Days" (n. 2), pp. 1–2; McDermott, "Oral History Transcript" (n. 33), p. 11.

42. Walsh McDermott, "Antimicrobial Therapy," *Proc. Inst. Med. Chicago*, 1950, 18: 2–12; Carl Muschenheim, Walsh McDermott, and Richard B. Maxwell, "The Therapy of Miliary and Meningeal Tuberculosis: Review of a Five Year Experience," *Trans. Amer. Clin. & Climat. Assoc.*, 1951, 63: 257–65.

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.⁴³ 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."⁴⁴ 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."⁴⁵ Its course, fatal if untreated, was "so predictable" that the outcome of

43. National Tuberculosis Association, "Press Conference," 21 February 1952, Carl Muschenheim Papers (CMP), box 2, folder 6, "Conferences, 1950-55," MCA; McDermott, "Early Days" (n. 2), pp. 1-2. See also Frank Ryan, *The Forgotten Plague: How the Battle against Tuberculosis Was Won—and Lost* (Boston: Little, Brown, 1992), pp. 351-59.

44. Lawrence B. Hobson and Walsh McDermott, "Criteria for the Clinical Evaluation of Antituberculous Agents," *Ann. New York Acad. Sci.*, 1949, 52: 782-87, quotation on p. 783. For the unreliability of X-ray interpretation in pulmonary tuberculosis, see J. Yerushalmy, L. H. Garland, J. T. Harkness, et al., "An Evaluation of the Role of Serial Chest Roentgenograms in Estimating the Progress of Disease in Patients with Pulmonary Tuberculosis," *Chest*, 1951, 64: 225-48.

45. Charles M. Clark, DuMont F. Elmendorf Jr., William U. Cawthon, Carl Muschenheim, and Walsh McDermott, "Isoniazid (Isonicotinic Acid Hydrazide) in the Treatment of Miliary and Meningeal Tuberculosis," *Amer. Rev. Tuberc.*, 1952, 66: 391-405, 406-7, quotation on p. 407. Despite his support for randomization, McDermott rarely used it; he believed that the fatal outcome of untreated miliary tuberculosis allowed the use of case series and historical controls. See, e.g., Kurt Deuschle, Louise Ormond, Dumont F. Elmendorf Jr., Carl Muschenheim, and Walsh McDermott, with the technical assistance of Kurt Stern, "The Course of Pulmonary Tuberculosis during Long-Term Single-Drug (Isoniazid) Therapy," *Amer. Rev. Tuberc.*, 1954, 70: 228-265, on p. 237. For the clinical trial of streptomycin, see British Medical Research Council, "Streptomycin Treatment of Pulmonary Tuberculosis," *Brit. Med. J.*, 1948, 2: 769-82. Harry M. Marks has provided the authoritative history of debates over research methodologies in the mid-twentieth century. He shows how postwar antibiotic research led to the contested acceptance of randomized clinical trials as the ideal method of clinical research: see Marks, *Progress of Experiment* (n. 7), pp. 141-62.

treatment “affords an absolute criterion of the success or failure.”⁴⁶ McDermott also knew that previous exposure to streptomycin might change the susceptibility of the mycobacteria to the new drug.⁴⁷

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 military 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.”⁴⁸ 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.”⁴⁹ The Navajo reservation was, in effect, “a Third World country within the United States.”⁵⁰ McDermott likened each cramped and poorly ventilated Navajo home to “a transfer cabinet in a bacteriology lab.”⁵¹ As described by a *Time* magazine reporter who publicized McDermott’s work, each Navajo patient with military tuberculosis was “like a human test tube.”⁵² 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

46. Hobson and McDermott, “Criteria” (n. 44), p. 782.

47. See Charles A. Werner, Ralph Tompsett, Carl Muschenheim, and Walsh McDermott, “The Toxicity of Viomycin in Humans,” *Amer. Rev. Tuberc.*, 1951, 63: 49–61.

48. [McDermott], “Annual Report” (1952) (n. 32). For the limitations of New York Hospital, see Dumont F. Elmendorf Jr., William U. Cawthon, Carl Muschenheim, and Walsh McDermott, with the technical assistance of Rebeckah Du Bois, “The Absorption, Distribution, Excretion and Short-Term Toxicity of Isonicotinic Acid Hydrazide (Nydrazid) in Man,” *Amer. Rev. Tuberc.*, 1952, 65: 429–42, on pp. 440–41.

49. Walsh McDermott, “Draft of Chapter II,” [undated], p. 2, WMP/11/6: “Navajo Project, 1957–1962.”

50. Kurt Deuschle, “Cross-Cultural Medicine: The Navajo Indians as Case Exemplar,” *Daedalus*, 1986, 115: 175–84, quotation on p. 176. Kunitz has described the Navajo reservation as an “internal colony” of the United States (Kunitz, “Underdevelopment” [n. 8], p. 175).

51. McDermott, “Oral History Transcript” (n. 33), p. 3.

52. “Medicine: Good News from the West,” *Time*, 21 July 1952, p. 55.

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).

54. Woltman, “Medicine Men” (n. 30), p. 4. Historians have examined many similar cases of researchers utilizing marginalized, ethnic populations for medical research. In each case, the unusually high burden of disease provided the justification for research that the researchers believed might have been ethically difficult among the general population. The extent to which the research subjects suffered from the research has varied tremendously. For examples, see Allan M. Brandt, “Racism and Research: The Case of the Tuskegee Syphilis Study,” *Hastings Cent. Rep.*, 1978, 8: 21–29; Marcia Angell, “The Ethics of Clinical Research in the Third World,” *New England J. Med.*, 1997, 337: 847–49; Lara Marks, “Human Guinea Pigs? The History of the Early Oral Contraceptive Clinical Trials,” *Hist. & Technol.*, 1999, 15: 263–88; David J. Rothman, “The Shame of Medical Research,” *New York Rev. Books*, 30 November 2000, pp. 60–64.

55. Spencer, “They’re Saving Lives” (n. 29), p. 92. See also McDermott, “Oral History Transcript” (n. 33), p. 16.

56. “Medicine: Good News” (n. 52), p. 55.

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

57. National Tuberculosis Association, “Press Conference” (n. 43); “Medicine: TB—and Hope,” *Time*, 3 March 1952, p. 44; “Medicine: Good News” (n. 52), p. 55; McDermott, “Oral History Transcript” (n. 33), p. 16.

58. McDermott, “Oral History Transcript” (n. 33), p. 17.

59. McDermott, “Conversation” (n. 4), p. 2.

60. “Minutes of the Navajo Tribal Council,” 25 April 1952, WMP/11/7; “Medicine: Good News” (n. 52), p. 55; Clark et al., “Isoniazid” (n. 45), pp. 392–93; Woltman, “Medicine Men” (n. 30), p. 4; Adair and Deuschle, *People's Health* (n. 3), pp. 36–37.

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.

62. Billy Bicenti, in "Minutes of the Navajo Tribal Council," 12 February 1954, p. 19, WMP/11/7.

63. McDermott and Muschenheim, for instance, both remained committed to advocacy for American Indian health for decades after their research among the Navajo had ended. Muschenheim, outraged by the injustices he observed, served as chairman of the health committee of the Association of American Indian Affairs and frequently testified before Congress: see Walsh McDermott, "Memorial to Muschenheim," 8 February 1978, p. 4, WMP/39/7; "Muschenheim, Carl, 8/74-4/77, 8/80"; Carl Muschenheim, "Statement before Subcommittee on Appropriations for Department of the Interior, U.S. Senate," 26 March 1976, CMP/1/19; "Association on American Indian Affairs." McDermott chaired President Lyndon Johnson's task force on American Indians and reviewed health programs for the Association of American Indian Affairs: see Walsh McDermott (chairman), "A Free Choice Program for American Indians: Report of the President's Task Force on American Indians," December 1966, pp. 4-9, WMP/11/9; "Program for American Indian Presidential Task Force, 1966"; "Finding Aid" (n. 38), p. 3; "Walsh McDermott, M.D.: A Need for 'Amenities and Human Support,'" *Mod. Med.*, 1973, 41 (22): 46; Alfred E. Clark, "Walsh McDermott, Medical Researcher, Dies," *New York Times*, 19 October 1981, D15.

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.

65. "Minutes" (1954) (n. 62), p. 14.

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.

68. Sam Akeah, in “Minutes of the Navajo Tribal Council,” 13 January 1955, p. 7, WMP/11/7.

69. Annie D. Wauneka, “Helping a People to Understand: A Navajo Leader Taught Herself and Then Others How to Fight Tuberculosis,” *Amer. J. Nursing*, 1962, 62: 88–90, quotation on p. 88.

70. *Ibid.*

71. Kurt Deuschle, “Tuberculosis among the Navajo: Research in Cross-Cultural Technological Developments in Health,” *Amer. Rev. Resp. Dis.*, 1959, 80: 200–206, quotation on p. 201.

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.”⁷²

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.⁷³ 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.⁷⁴ 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.”⁷⁵

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.”⁷⁶ It

72. Adair and Deuschle, *People’s Health* (n. 3), p. 64.

73. Clark et al., “Isoniazid” (n. 45), p. 411.

74. For McDermott’s review of his work, see Walsh McDermott, “Antimicrobial Therapy of Pulmonary Tuberculosis,” *Bull. World Health Org.*, 1960, 23: 427–61. For McDermott’s faith in the quality of his evidence, see Deuschle et al., “Course of Pulmonary Tuberculosis” (n. 45), p. 237.

75. Carl Muschenheim, “Albert Lasker Award, Draft of Acceptance Speech,” 1955, CMP/2/13. See also “Walsh McDermott, M.D.: A Need for ‘Amenities’” (n. 63), p. 481; Beeson, “Walsh McDermott” (n. 6), p. 297.

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.”⁷⁷ 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.⁷⁸

The Cornell physicians believed that in most cases “the patient can be assured of a ‘cure’ if he follows the doctor’s instructions.”⁷⁹ 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.”⁸⁰ 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.⁸¹

77. [McDermott], “Annual Report of the Division [of Infectious Disease, NYH], 1953,” WMP/11/5.

78. “Minutes” (1954) (n. 62), pp. 13, 23.

79. “Navajo-Cornell Field Health Research Project at Many Farms: Syllabus for Teachers in Navajo Health,” p. 102b, WMP/10/10.

80. Kurt W. Deuschle, Clarence Jordahl, and Gladys L. Hobby, “Clinical Usefulness of Riboflavin-Tagged Isoniazid for Self-Medication in Tuberculous Patients,” *Amer. Rev. Respir. Dis.*, 1960, 82: 1–10, quotation on p. 9.

81. For an early review of the problem of noncompliance, see R. Brian Haynes, D. Wayne Taylor, and David L. Sackett, eds., *Compliance in Health Care* (Baltimore: Johns Hopkins University Press, 1979). For the study of strep throat, see Daniel N. Mohler, David G. Wallin, and Edward G. Dreyfus, “Studies in the Home Treatment of Streptococcal

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

Here was a great irony for modern medicine. Armed with powerful antibiotics, physicians believed that they could transfer the treatment of serious diseases from hospitals to patients' homes, but this left them dependent on the pill-taking behavior of their patients. The Cornell

Disease: I. Failure of Patients to Take Penicillin by Mouth as Prescribed," *New England J. Med.*, 1955, 252: 1116–18. I have discussed the concerns with compliance and the efforts to measure and improve self-administration at Many Farms in more detail elsewhere: see David S. Jones, "Technologies of Compliance: Surveillance of Self-Administration of Tuberculosis Treatment, 1956–1966," *Hist. & Technol.*, 2001, 17: 279–318.

82. McDermott et al., "Introducing Modern Medicine" (n. 4), p. 283.

83. Richard W. Roberts and Kurt Deuschle, "Comparative Study of Urine Tests for the Detection of Isoniazid," *Amer. Rev. Respir. Dis.*, 1959, 80: 904–8, quotation on p. 904.

84. Physicians had long worried about Navajo adherence to prescriptions. For an early analysis of Navajo nonadherence, see Sydney J. Tillim, "Medical Annals of Arizona: Health among the Navajos," *Southwestern Med.*, 1936, 20: 273, 276–77, 310–13, 317–19, 355, 388–91, 432–33, on p. 432. Even as McDermott struggled among the Navajo, British researchers in India worked to improve adherence to outpatient tuberculosis treatment programs: see Wallace Fox, "The Problem of Self-administration of Drugs; with Particular Reference to Pulmonary Tuberculosis," *Tubercle*, 1958, 39: 269–74. For general discussions of physicians' perceptions of colonized populations as disease-ridden, unruly, and difficult to treat, see Arnold, *Colonizing the Body* (n. 5); Warwick Anderson, "Immunities of Empire: Race, Disease, and the New Tropical Medicine, 1900–1920," *Bull. Hist. Med.*, 1996, 70: 94–118. The concerns with adherence were not limited to colonial populations: see Peter Stradling and Graham Poole, "Self-medication in Tuberculosis," *Lancet*, 1958, 2: 1066–67, on p. 1066. As Paul Farmer has argued quite convincingly, physicians' attributions of noncompliance to cultural difference obscure the more fundamental contributions of poverty: see Paul Farmer, "Social Scientists and the New Tuberculosis," *Soc. Sci. & Med.*, 1997, 44: 347–58.

85. Roberts and Deuschle, "Comparative Study" (n. 83), p. 904; McDermott et al., "Introducing Modern Medicine" (n. 4), p. 282.

team worried that “more and more responsibility for the treatment of disease is being shifted from the doctor and nurse to the patient.”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?”⁸⁷ As later observers have noted, “to ‘take one’s medicine’ is in no sense the ‘natural thing’ for patients to do.”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.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.”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

86. Gladys L. Hobby and Kurt W. Deuschle, “The Use of Riboflavin as an Indicator of Isoniazid Ingestion in Self-Medicated Patients,” *Amer. Rev. Respir. Dis.*, 1959, 80: 415–23, quotation on p. 415.

87. *Ibid.*

88. Irving Kenneth Zola, “Structural Constraints in the Doctor-Patient Relationship: The Case of Non-compliance,” in *The Relevance of Social Science for Medicine*, ed. Leon Eisenberg and Arthur Kleinman (Boston: Reidel, 1981), pp. 241–55, quotation on p. 242.

89. Leonard G. Wilson, “The Rise and Fall of Tuberculosis in Minnesota: The Role of Infection,” *Bull. Hist. Med.*, 1992, 66: 16–52; Barron H. Lerner, “New York City’s Tuberculosis Control Efforts: The Historical Limitations of the ‘War on Consumption,’” *Amer. J. Pub. Health*, 1993, 83: 758–66; Sheila M. Rothman, “Seek and Hide: Public Health Departments and Persons with Tuberculosis, 1890–1940,” *J. Law, Med. & Ethics*, 1993, 21: 289–95; Ronald Bayer and Laurence Dupuis, “Tuberculosis, Public Health, and Civil Liberties,” *Ann. Rev. Pub. Health*, 1995, 16: 307–26; Barron H. Lerner, “Temporarily Detained: Tuberculous Alcoholics in Seattle, 1949 through 1960,” *Amer. J. Pub. Health*, 1996, 86: 257–65, on p. 262; *idem*, *Contagion and Confinement: Controlling Tuberculosis along the Skid Road* (Baltimore: Johns Hopkins University Press, 1998).

90. Stradling and Poole, “Self-medication in Tuberculosis” (n. 84), p. 1066. See also Fox, “Problem of Self-administration of Drugs” (n. 84), p. 274; Ronald Bayer and David Wilkinson, “Directly Observed Therapy for Tuberculosis: History of an Idea,” *Lancet*, 1995, 345: 1545–48.

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.⁹¹ While some of the doctors hoped to identify personality traits that exposed “the potentially unreliable patient before treatment is begun,”⁹² all agreed that there was “a pressing need for objective criteria.”⁹³ One solution, “urgently needed,” was urine testing.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.”⁹⁵ Tested in 1959, the technique was a success, differentiating patients who had, or had not, taken the drug.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.”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.”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-

91. Deuschle, “Tuberculosis” (n. 71), p. 204; “Research Grant Report,” p. 35, WMP/10/9: “Navajo-Cornell Field Health Research Project, 3/1/59.”

92. Hobby and Deuschle, “Use of Riboflavin” (n. 86), p. 415.

93. Roberts and Deuschle, “Comparative Study” (n. 83), p. 904.

94. “Research Grant Report” (n. 91), p. 36.

95. Hobby and Deuschle, “Use of Riboflavin” (n. 86), p. 415.

96. *Ibid.*, pp. 415–23; Deuschle, Jordahl, and Hobby, “Clinical Usefulness” (n. 80), p. 7.

97. Thomas Moulding, “Preliminary Study of the Pill Calendar as a Method of Improving the Self-Administration of Drugs,” *Amer. Rev. Respir. Dis.*, 1961, 84: 284–87, quotation on p. 284.

98. Thomas Moulding, “Proposal for a Time-Recording Pill Dispenser as a Method for Studying and Supervising the Self-Administration of Drugs,” *Amer. Rev. Respir. Dis.*, 1962, 85: 754–57, quotation on p. 754.

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.”⁹⁹

Such surveillance introduced secrecy, even deception, into the patient-doctor relationship.¹⁰⁰ 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.’”¹⁰¹ 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.¹⁰² 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.”¹⁰³ Aware of the dangers, they hoped that the problem could “be managed through careful conduct.”¹⁰⁴ Moulding suggested telling patients that forgetting was inevitable; surveillance simply allowed both patients and physicians to be aware of the magnitude of the forgetting.¹⁰⁵

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,

99. *Ibid.*, p. 756.

100. This regime of distrust and surveillance emerged during the height of the Cold War. The initial blush of postwar victory of antibiotics over infectious disease gave way to recognition that the battle would continue against an indolent enemy, tuberculosis. Mutual distrust between patients and doctors required constant surveillance (pill calendars and urine testing). Some even found a solution in radioactivity (as in Moulding’s pill clock).

101. McDermott et al., “Introducing Modern Medicine” (n. 4), p. 283.

102. *Ibid.*, pp. 283–84. See also Deuschle, Jordahl, and Hobby, “Clinical Usefulness” (n. 80), p. 5. While the researchers clearly had tremendous fear that surveillance would alienate patients, it is not clear whether most Navajo shared this fear, or were even aware of the surveillance. The extent to which Navajo patients cooperated with the project (discussed below) suggests that the surveillance actually had few adverse effects. Deciphering Navajo responses to surveillance in more detail would likely require ethnographic work, something beyond the scope of this paper.

103. Moulding, “Proposal” (n. 98), p. 756.

104. McDermott et al., “Introducing Modern Medicine” (n. 4), p. 283.

105. Moulding, “Proposal” (n. 98), p. 756.

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.¹⁰⁶ 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."¹⁰⁷ 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,"¹⁰⁸ or those of "less developed countries."¹⁰⁹

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."¹¹⁰ An "adequate field health service" could manage 97 percent of their disease on an

106. Michel Foucault, *Discipline and Punish: The Birth of the Prison* (1975), trans. Alan Sheridan (New York: Vintage Books, 1995).

107. McDermott et al., "Introducing Modern Medicine" (n. 4), p. 203. See also *ibid.*, pp. 189–99; McDermott, Deuschle, and Barnett, "Health Care Experiment" (n. 4), p. 24.

108. John Adair, Kurt Deuschle, and Walsh McDermott, "Patterns of Health and Disease among the Navahos," *Ann. Amer. Acad. Polit. & Soc. Sci.*, May 1957, 311: 88–90, quotation on p. 88.

109. Adair and Deuschle, *People's Health* (n. 3), p. 15.

110. McDermott, Deuschle, and Barnett, "Health Care Experiment" (n. 4), p. 24.

outpatient basis.¹¹¹ They envisioned a “hospital without walls”¹¹² that would manage the “total health” of the Navajo.¹¹³ Their fascinating experiment would place a modern medical system in an impoverished society and “see what results you get.”¹¹⁴

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 \$0.09.¹¹⁵ 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.”¹¹⁶ 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.”¹¹⁷ When McDermott proposed the field health project in 1955, the Navajo Council was “deeply thankful” and very willing to cooperate.¹¹⁸

111. Adair, Deuschle, and McDermott, “Patterns of Health and Disease” (n. 108), p. 85. See also [McDermott], “Interim Report” (n. 1), p. 83.

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.

114. McDermott, “Conversation” (n. 4), p. 12.

115. For a review of such programs, see Sidney L. Kark, Emily Kark, and J. H. Abramson, “Commentary: In Search of Innovative Approaches to International Health,” *Amer. J. Pub. Health*, 1993, 83: 1533–36. For hookworm campaigns in the United States, see Etling, *Germ of Laziness* (n. 5). For China, see C. C. Ch’en, “Scientific Medicine as Applied in Ting Hsien,” *Milbank Mem. Fund Quart. Bull.*, 1933, 11: 97–129; idem, “An Experiment in Health Education in Chinese Country Schools,” *ibid.*, 1934, 12: 232–47; idem, “Public Health in Rural Reconstruction at Ting Hsien,” *ibid.*, pp. 370–78; idem, “Rural Public Health Experiment” (n. 5). For South Africa, see Marks, “South Africa’s Early Experiment” (n. 5), pp. 452–59.

116. McDermott, “Conversation” (n. 4), p. 8.

117. Kurt Deuschle and John Adair, “An Interdisciplinary Approach to Public Health on the Navajo Indian Reservation: Medical and Anthropological Aspects,” *Ann. New York Acad. Sci.*, 1960, 84: 887–905, quotation on p. 889. See also Adair and Deuschle, *People’s Health* (n. 3), p. 65.

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.”¹¹⁹ 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.¹²⁰

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

119. Wauneka, Written Statement, 2 November 1953, read in the Senate Subcommittee of the Committee on Interior and Insular Affairs, *Hearings on H.R. 303: An Act to Transfer the Maintenance and Operation of Hospital and Health Facilities for Indians to the Public Health Service*, 28–29 May 1954, in *Congressional Hearings, Senate, Interior and Insular Affairs*, 83d Cong., 2d sess., 1953–54, vol. 14, 83 S1085-10, p. 43. For other critiques, see Herbert Hoover, *The Hoover Commission Report on Organization of the Executive Branch of Government* (New York: McGraw-Hill, 1949), p. 471; Lewis J. Moorman, “Tuberculosis on the Navaho Reservation,” *Amer. Rev. Tuberc.*, 1950, 61: 586–91.

120. For reforms of the IHS, see Stephen J. Kunitz, “The History and Politics of U.S. Health Care Policy for American Indians and Alaskan Natives,” *Amer. J. Pub. Health*, 1996, 86: 1464–73, on pp. 1464–65. See also Stephen J. Kunitz and Maggie Brady, “Health Care Policy for Aboriginal Australians: The Relevance of the American Indian Experience,” *Austral. J. Pub. Health*, 1995, 19: 549–58. Efforts to abolish the BIA had been unsuccessful as long as Democrats had controlled the White House. Eisenhower’s election opened a new opportunity for this old plan. The other pilot projects included a public health education program among the Pueblo, Apache, and Southern Ute (University of North Carolina), a tuberculosis study among the Pueblo (University of Pennsylvania), and a health education and prevention program at Tuba City (University of California). For discussions of the pilot studies, see Robert W. Young, *The Navajo Yearbook of Planning in Action*, vol. 5 (Window Rock: Navajo Agency, 1955), p. 26; Young, *Navajo Yearbook: 1951–1961* (n. 24), pp. 86–87; Adair and Deuschle, *People’s Health* (n. 3), pp. 47, 141; McDermott, “Conversation” (n. 4), p. 2.

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

121. For Adair’s expertise, see Adair, *Navajo and Pueblo Silversmiths* (n. 9). For examples of Alexander Leighton’s work, see Leighton and Leighton, *Navaho Door* (n. 9); Alexander Leighton, *My Name Is Legion: Foundations for a Theory of Man in Relation to Culture. The Stirling County Study of Psychiatric Disorder and Sociocultural Environment*, vol. 1 (New York: Basic Books, 1959). For the researchers’ interest in this expertise, see Deuschle, “Cross-Cultural Medicine” (n. 50), pp. 175–76.

122. Ruth Benedict, *Patterns of Culture* (1934; Boston: Houghton Mifflin, 1989), p. 10, and see p. xiv. Adair had studied under Ruth Benedict in the 1930s, and then worked in Cornell’s anthropology department when Leighton was there in the 1950s. Leighton, Benedict, and Tom Sasaki (a sociologist who worked at Many Farms) had advised the military during World War II. See Alexander Leighton, *Human Relations in a Changing World: Observations on the Use of the Social Sciences* (New York: Dutton, 1949).

123. McDermott et al., “Introducing Modern Medicine” (n. 4), p. 287.

124. For postwar interest in international health, see George Rosen, *A History of Public Health* (1958), expanded ed. (Baltimore: Johns Hopkins University Press, 1993), pp. 460–61; World Health Organization, *The First Ten Years of the World Health Organization* (Geneva: World Health Organization, 1958). For the Cold War politics behind such work, see Harry Cleaver, “Malaria and the Political Economy of Public Health,” *Internat. J. Health Serv.*, 1977, 7: 557–79; Javed Siddiqi, *World Health and World Politics: The World Health Organization and the UN System* (London: Hurst, 1995).

125. McDermott et al., “Introducing Modern Medicine” (n. 4), p. 197. See also John Adair and Kurt Deuschle, “Some Problems of the Physicians on the Navajo Reservation,” *Human Org.*, 1958, 16: 19–23, on p. 19; Deuschle, “Tuberculosis” (n. 71), p. 206; Adair and Deuschle, *People’s Health* (n. 3), pp. xiii, xv.

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.

127. Robert W. Young, “Foreword,” in John Adair, Kurt Deuschle, and Clifford R. Barnett, *The People’s Health: Medicine and Anthropology in a Navajo Community*, 2d ed. (Albuquerque: University of New Mexico Press, 1988), p. xii.

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.

132. McDermott, “Oral History Transcript” (n. 33), p. 7.

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.

136. Edward Taylor, “Transcript of Interview with Jane K. Zaidi,” 16 March 1972, p. 2, Oral History Transcripts, MCA, 54 F box 2; Adair and Deuschle, *People’s Health* (n. 3), pp. 50–52, 60; Adair, Deuschle, and Barnett, *People’s Health* (n. 127), p. 156.

137. Adair, Deuschle, and McDermott, “Patterns of Health and Disease” (n. 108), p. 89.

138. Hadley, “Health Conditions” (n. 9), pp. 832–33.

began “a constant and prodigious effort to collect this vital statistics data accurately and completely,” questioning teachers, missionaries, traders, and community leaders.¹³⁹ They developed an innovative patient record system based on clans and family residential camps that reflected “the patterns of living of the Navajo.”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.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.¹⁴² These linguistic obstacles were exaggerated by what Adair and Deuschle perceived as “the behavior of the stolid and undemonstrative Navajo patient.”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.¹⁴⁴ These efforts enabled the physicians to question their patients “with sufficient accuracy to permit the full range of application of modern medicine.”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.”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

139. “Research Grant Report” (n. 91), p. 14.

140. Adair and Deuschle, *People’s Health* (n. 3), p. 94.

141. *Ibid.*, p. 106. See also Deuschle and Adair, “Interdisciplinary Approach” (n. 117), p. 895.

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, *People’s Health* (n. 3), pp. 108–27.

143. Adair and Deuschle, “Some Problems” (n. 125), p. 20.

144. Adair and Deuschle, *People’s Health* (n. 3), p. 125. See also Herbert Landar, “The Language of Pain in Navaho Culture,” in *Studies in Southwestern Ethnolinguistics: Meaning and History in the Languages of the American Southwest*, ed. Dell H. Hymes and William E. Bittle (Paris: Mouton, 1967), pp. 119–44.

145. Adair and Deuschle, *People’s Health* (n. 3), p. 125.

146. “Research Grant Report” (n. 91), p. 22.

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.

150. Adair and Deuschle, *People’s Health* (n. 3), p. 12. See also Deuschle, “Tuberculosis” (n. 71), p. 201; Adair, Deuschle, and Barnett, *People’s Health* (n. 127), pp. 161, 166–67.

151. Adair and Deuschle, *People’s Health* (n. 3), pp. 67–92, quotation on p. 92. See also “Syllabus for Teachers” (n. 79); Bernice W. Mansell and Ellen Loughlin, “The Navajo Health Visitor,” *Pract. Nursing*, 1958, 8: 13–15; Kurt W. Deuschle, “Training and Use of Medical Auxiliaries in a Navajo Community,” *Pub. Health Rep.*, 1963, 78: 461–69.



Fig. 3. Teaching the health visitors: Gyla Brooks teaches comparative anatomy (human and sheep) to Agnes Dennison, Lillian Ashley, and Ken Dennison. (Courtesy of NewYork Weill Cornell Medical Center Archives, Photograph Collection, Navajo Project, #2303.)

visitors collected data about health (Fig. 4).¹⁵² This “enabled the medical team to reach out to the home and gather demographic information that could not have been obtained by other means.”¹⁵³

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.

153. Deuschle and Adair, “Interdisciplinary Approach” (n. 117), p. 899.



Fig. 4. A home visit at Many Farms: Don Reider (anthropologist) and Frank George (Navajo health visitor) interview a Navajo mother outside her hogan. (Courtesy of NewYork Weill Cornell Medical Center Archives, Photograph Collection, Navajo Project, #2310.)

freedom.¹⁵⁴ 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

154. Max Weber, *The Protestant Ethic and the Spirit of Capitalism* (1904–5), trans. Talcott Parsons (New York: Routledge, 1992), pp. 180–83; John Patrick Diggins, *Max Weber: Politics and the Spirit of Tragedy* (New York: Basic Books, 1996), pp. 16, 79–82, 109, 253, 267, 280–83.

health visitors—“operated harmoniously and productively throughout the term of its existence.”¹⁵⁵ Adair and Deuschle believed that the team “enjoyed a splendid reputation among the Navajo.”¹⁵⁶ 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.”¹⁵⁷ 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.¹⁵⁸ 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.¹⁵⁹

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-

155. Young, “Foreword” (n. 127), p. xiv.

156. Adair and Deuschle, *People’s Health* (n. 3), p. 142.

157. Deuschle and Adair, “Interdisciplinary Approach” (n. 117), p. 903. See also Adair, Deuschle, and Barnett, *People’s Health* (n. 127), pp. 145–47, 153–55.

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.

159. Deuschle, “Cross-Cultural Medicine” (n. 50), p. 177. For the project as a model for medical anthropology, see *ibid.*, p. 182; Sandra K. Schackel, “*The People’s Health: Medicine and Anthropology in a Navajo Community*—book review,” *New Mexico Hist. Rev.*, 1991, 66: 240; Alan L. Silver and David N. Rose, “Kurt W. Deuschle and Community Medicine: Clinical Care, Statistical Compassion, Community Empowerment,” *Mount Sinai J. Med.*, 1992, 59: 439–41, on p. 440; Arthur J. Rubel and Linda C. Garro, “Social and Cultural Factors in the Successful Control of Tuberculosis,” *Pub. Health Rep.*, 1992, 107: 626–36, on p. 632. McDermott worked as an international health advisor for President Lyndon Johnson, USAID, and the United Nations. Deuschle left Many Farms to become chairman of the Department of Community Medicine at the University of Kentucky, and then at Mt. Sinai School of Medicine: see Alan L. Silver and David N. Rose, eds., “Urban Community Medicine: The Mount Sinai Experience, Honoring the Work of Kurt W. Deuschle,” *Mount Sinai J. Med.*, 1992, 59: 439–68. David Rogers, who worked with McDermott at Cornell and at Many Farms, became chairman of community medicine at Vanderbilt University, then dean of Johns Hopkins University School of Medicine, and finally president of the Robert Wood Johnson Foundation: see David E. Rogers, “Kurt W. Deuschle as an Actor and Community Medicine as His Stage,” *Mount Sinai J. Med.*, 1992, 59: 450–52, on p. 450.

cratic 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.”¹⁶⁰ 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.”¹⁶¹ Because of such pressures, the Many Farms project had little lasting impact on the care provided by the IHS.¹⁶²

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.”¹⁶³ 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.”¹⁶⁴

160. Adair and Deuschle, “Some Problems” (n. 125), p. 19.

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.

164. *Ibid.*, p. 168. See also Cara E. Richards, “Cooperation between Anthropologist and Medical Personnel,” *Human Org.*, 1960, 19: 64–67, on p. 67.

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.¹⁶⁵ This failure surprised McDermott: “When one considers our pre-experiment expectations, soundly grounded in the conventional wisdom, these results were clearly disappointing.”¹⁶⁶

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.

166. McDermott, “Draft of Chapter II” (n. 49), p. 11.

modern medicine; it simply represented the “gross misfit between our modern medicine and the disease pattern of overly traditional societies.”¹⁶⁷ 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.”¹⁶⁸ 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.¹⁶⁹ Home-based nursing care would likely have been more effective than physicians and their “superb” technology.¹⁷⁰ 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 syncytial 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.¹⁷¹

167. Walsh McDermott, “Environmental Factors Bearing on Medical Education in the Developing Countries: A. Modern Medicine and the Demographic-Disease Pattern of Overly Traditional Societies: A Technologic Misfit,” *J. Med. Educ.*, 1966, 41 (Suppl.): 137–62, quotation on p. 155.

168. McDermott, “Conversation” (n. 4), p. 11.

169. McDermott, Deuschle, and Barnett, “Health Care Experiment” (n. 4), p. 28. Returning for a reunion in 1977, McDermott was impressed by the improvements in reservation infrastructure, especially the increased availability of running water: McDermott, “Oral History Transcript” (n. 33), pp. 20–21. But as recently as May 2000, many on the reservation remained without running water: personal observations, Indian Health Service, Crownpoint Service Unit, New Mexico, May 2000.

170. Walsh McDermott, “Draft,” 1969, p. 37, WMP/10/3: “Many Farms: Bruce Lecture, 4/1/68, and Drafts and Alternate Starts, 6/30/69.”

171. McDermott, Deuschle, and Barnett, “Health Care Experiment” (n. 4), p. 30. See also Walsh McDermott, “Absence of Indicators of the Influence of Its Physicians on a Society’s Health: Impact of Physician Care on Society,” *Amer. J. Med.*, 1981, 70: 833–43, on pp. 839–41.

This intangible aspect of medical care, which McDermott labeled “samaritanism,” was “extraordinarily difficult to analyze and measure.”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.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.¹⁷⁴ As he described so compellingly, antibiotics had transformed once-fatal diseases, notably pneumonia and tuberculosis, into treatable, outpatient conditions.¹⁷⁵ He believed that physicians could take these technologies into

172. Walsh McDermott, “Medicine: The Public Good and One’s Own,” *Perspect. Biol. & Med.*, 1978, 21: 167–87, quotation on p. 169. See also McDermott, Deuschle, and Barnett, “Health Care Experiment” (n. 4), p. 23.

173. For discussions of the ways in which technology has distanced doctors from their patients, see Stanley Joel Reiser, *Medicine and the Reign of Technology* (New York: Cambridge University Press, 1978); Lewis Thomas, *The Youngest Science: Notes of a Medicine-Watcher* (New York: Viking Press, 1983); Hughes Evans, “Losing Touch: The Controversy over the Introduction of the Blood Pressure Instruments into Medicine,” *Technol. & Cult.*, 1993, 34: 784–807; Edward Shorter, “The History of the Doctor-Patient Relationship,” in *Companion Encyclopedia of the History of Medicine*, ed. W. F. Bynum and Roy Porter (New York: Routledge, 1993), 2: 783–800, esp. p. 794; Joel D. Howell, *Technology in the Hospital: Transforming Patient Care in the Early Twentieth Century* (Baltimore: Johns Hopkins University Press, 1995), esp. pp. 6, 230.

174. Rogers, “Early Years” (n. 6), p. 2.

175. McDermott, with Rogers, “Social Ramifications” (n. 6), pp. 302–12.

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 an 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

176. Walsh McDermott, "Medical Institutions and Modification of Disease Patterns," *Amer. J. Psychiatry*, 1966, 122: 1398–1406.

177. McDermott, "Absence of Indicators" (n. 171), pp. 833–43.

178. For McDermott's arguments, see Walsh McDermott, "Evaluating the Physician and His Technology," *Daedalus*, 1977, 106 (winter): 135–57; McDermott, "Absence of Indicators" (n. 171), pp. 833–43. For those of Thomas McKeown and other critics of medicine, see Thomas McKeown, *The Role of Medicine: Dream, Mirage, or Nemesis* (Princeton: Princeton University Press, 1979); John B. McKinlay and Sonja M. McKinlay, "The Questionable Contribution of Medical Measures to the Decline of Mortality in the United States in the Twentieth Century," *Milbank Mem. Fund Quart.*, 1977, 55: 405–28.

clinical studies validated the efficacy of therapies, clinical experience showed that substantial obstacles hindered their deployment.¹⁷⁹ 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.¹⁸⁰ The elusiveness of medical power, demonstrated so clearly at Many Farms, challenged the optimism of medicine.

179. Consider the many obstacles (moral, political, economic) to the deployment of medical treatments for sexually transmitted diseases, whether penicillin for syphilis or antiretroviral therapy for HIV: see Allan M. Brandt, *No Magic Bullet: A Social History of Venereal Disease in the United States since 1880* (Oxford: Oxford University Press, 1987), pp. 172–78; David S. Jones and Allan M. Brandt, “AIDS, Historical,” in *Encyclopedia of Microbiology*, 2d ed., ed. Joshua Lederberg, vol. 1 (San Diego: Academic Press, 2000), pp. 104–15, esp. pp. 112–15.

180. For examples, see Robert G. Evans, Morris L. Barer, and Theodore R. Marmor, eds., *Why Are Some People Healthy and Others Not? The Determinants of Health of Populations* (New York: Aldine de Gruyter, 1994); Robert G. Evans, “Health Care as a Threat to Health: Defense, Opulence, and the Social Environment,” *Daedalus*, 1994, 123 (fall): 21–42; Richard Wilkinson, *Unhealthy Societies: The Afflictions of Inequality* (London: Routledge, 1996); Norman Daniels, Bruce Kennedy, and Ichiro Kawachi, eds., *Is Inequality Bad for Our Health?* (Boston: Beacon Press, 2000).