funct Federal Radiation Council, for example, had representatives from agencies, such as Health and Labor, that would seemingly be more concerned about the safety of people than about the promotion of nuclear energy. Indeed, the FRC was occasionally sharply split on safety issues, with the health-labor forces opposing the atomic energy–military–commerce forces. One member of the White House Office of Science and Technology who kept tabs on FRC affairs told *Science*: "The FRC was pretty broad-gauged. It had the health nuts as well as the technological development nuts." Whether the FRC actually exerted much influence over most standards, however, is a matter of dispute. The FRC essentially adopted the standards previously recommended by NCRP and ICRP. Taylor, who was a member of the FRC group, claims the FRC went over the NCRP/ICRP recommendations with "a fine tooth comb" and concluded it could not improve upon them. But nuclear critics have accused the FRC of "rubber stamping." And even members of other standards-setting bodies acknowledge that the FRC was often disappointingly passive.

The standard that is most controversial today is one which stipulates that the radiation dose received by the general population should not exceed a yearly average of 170 millirems per person (exclusive of medical exposures and natural background radiation). This is the standard which has been specifically attacked by Gofman and Tamplin and which has been used in their calculations of the number of deaths that would allegedly result if the general public actually received this permissible dose. Significantly, both Taylor and Tompkins assert that this standard did not really originate with either the NCRP or ICRP but was essentially derived from a number originally proposed by a group of geneticists assembled by the National Academy of Sciences. The Academy's recommendation was put forth in a report issued in 1956 by the so-called BEAR committee, which studied the Biological Effects of Atomic Radiation under a special grant from the Rockefeller Foundation. The study was prompted by concern over fallout and was meant to provide an independent evaluation of the hazards of radiation. The key genetics committee was headed by Warren Weaver, of the Rockefeller Foundation, and included Nobelists George W. Beadle and the late H. J. Muller, as well as geneticists at AEC-supported laboratories. Defenders of the standards suggest that it is unfair to accuse this eminent group of a "pronuclear" bias.

Some critics carry the argument a step farther and claim that even if the scientists on the standards-setting groups have no nuclear biases at all, they are still not the appropriate people to make decisions on allowable exposure levels. Harold P. Green, a Washington attorney who specializes in nuclear matters, describes the standards setters as "a very narrow group" who are probably competent to estimate the risks involved in radiation but are hardly fit to decide what risks are "acceptable" to society. "The scientists don't have very much knowledge or experience with human values generally," he says. "Nor do they have any real degree of accountability to the public." Green suggests that the responsible groups should be more broadly representative, perhaps including economists, political scientists, sociologists, lawyers, theologians, psychiatrists, and others. But even that would probably not be enough, he suspects. "What is really needed is the kind of thing Gofman and Tamplin are doing—the stimulation of public debate," Green says. "Risk-benefit decisions are not scientific problems. They're political concerns and should be debated in the rough-and-tumble of the political process. What benefits does the public want and what risks is it willing to assume? The NCRP, in effect, has been saying to the public: 'You are going to have to assume these risks in order to have the benefits we say you want.' "

Neither the NCRP nor most other standards groups, it should be noted, deliberately sought this role. The literature of virtually all standards groups is laced with warnings that the standards involve value judgments and that the final decisions should be made by society, but thus far society has not really come to grips with the complex problem and the scientists have been left in charge by default.

As far as can be determined by the public record, the scientists have not really tried to perform a quantitative risk-benefit analysis in developing the standards. The various standards groups have refused to get involved in "the numbers game" of estimating how many deaths might result if the public received the radiation allowed by the standards. Nor have they tried to quantify the presumed benefits of atomic energy. Thus the public is left with little more than an assurance that the risk is "acceptable."

The standards are currently undergoing an intensive governmental review —the first in more than a decade. The new Environmental Protection Agency —which has assumed various radiation responsibilities from the old FRC, the Public Health Service, and the AEC— is coordinating the effort, and there will be input from the Academy and from the NCRP, among others. But there have already been charges that the Academy committee is biased, and there are continued grumblings about the closed-to-the-public nature of the process. Thus the review, whatever its findings, may not succeed in dissipating the reservoir of distrust in the public mind. A number of nuclear critics have suggested that there should be a searching public "trial" of the standards, with proponents and critics presenting their evidence before a neutral, qualified jury of some kind. That proposal has not gained much support. But it would seem highly desirable that some way be found to assure the public that its fate does not lie solely in the hands of a small group of scientists meeting behind closed doors.

—PHILIP M. BOFFEY

Health Insurance: Battle Focuses on Nixon and Kennedy Schemes

With the details of Administration policy spelled out in last week's Presidential message on health, Congress now has two major proposals from which to choose its solution to what President Nixon called in 1969 "the deepening crisis in American health care." A batch of health insurance schemes offered earlier have been incorporated into either Nixon's Health Insurance Partnership Plan or Senator Edward M. Kennedy's (D–Mass.)

New Research Funds Asked by Nixon

In last week's health message to Congress, President Nixon called for the following additional research expenditures:

► $100 million for cancer research, to be administered by a new planning agency within the National Institutes of Health. A full discussion of the changes in cancer research funding will appear next week in *Science*.

► $6 million for research concerning sickle cell anemia. Most of the money will be administered by the National Heart and Lung Institute and by the Health Services and Mental Health Administration.

► $7 million for the National Institute on Alcohol Abuse and Alcoholism, a new division of the National Institute of Mental Health.

—R.J.B.

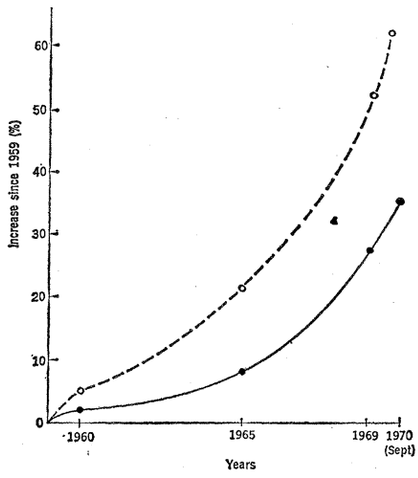
Health Security Bill. So that the congressional contest over health insurance has polarized around those two proposals.

From what promises to be one of the major political battles of the 92nd Congress, neither proposal is likely to emerge unaltered. Moreover, Kennedy's bill, which would establish a comprehensive national health insurance program, will probably die in the Senate Finance Committee chaired by Senator Russell Long (D–La.) or in Representative Wilbur Mills' (D–Ark.) House Ways and Means Committee. The liberal Democrats in the Congress, however, predict that strong public support will emerge for the Kennedy bill. Backed by such support, they hope to use the Kennedy bill as a vehicle for House and Senate floor amendments to establish national health insurance. It was through such a process that Congress enacted the Medicare program of health care for the elderly. To encourage development of the necessary public support for his bill, Kennedy, as the new chairman of the Senate Health Subcommittee, began hearings 22 February on national health insurance. He plans to conduct such hearings at various locations throughout the country over the next year.

Two problems have merged to generate a crisis in American health care: spiraling costs and, for many, insufficient access to medical services. In addition to proposing health insurance schemes, both the Administration and the rival Kennedy programs set forth reforms in health care delivery. The following is a comparison of the two proposals.

Concept. Drawn from a 6-month study of health options by planners within the Department of Health, Education, and Welfare (HEW), the President's Domestic Council, and the Office of Management and Budget, the Administration plan is based on compulsory private insurance. Employers would pay 75 percent of the cost of the premiums, and employees the remaining 25 percent. For families earning less than $3000, the government would supply free insurance; for those earning between $3000 and $5000, fees would be assessed on a sliding scale.

A committee representing the United Auto Workers, the AFL-CIO, and philanthropist Mary Lasker authored Kennedy's comprehensive federal insurance plan. To finance the program, the government would tax employees 1 percent of their salaries up to $15,000 while employers would pay 3.5 percent of their total payroll. The federal government would match the employers' 3.5 percent from general revenues. Kennedy projects the cost of his program as $53 billion in 1974, but HEW officials estimate the cost to the closer to $80 billion.



Increases in medical costs (dashed line) and the cost of living (solid line) since 1959.

Benefits. In his health message, President Nixon declared that to avoid squandering of resources and a further shortage of supply of medical services, some element of "cost consciousness" should be preserved in the health care system. To this end, the Administration program would charge each person for his first $100 of medical costs and 2 days in the hospital each year. After that, the individual would pay 20 percent of his medical costs up to $5000. Thus, assuming hospital charges of $60 per day, everyone would be liable to a maximum of $1470 in medical costs annually.

Under the Kennedy plan, limitations would be imposed only on drugs, nursing home care, and mental health care; free dental care would be restricted to children. There would be no minimum fees to be paid and no deductibles.

Prepaid Group Plans. Both the Kennedy and the Nixon schemes would encourage, through planning grants and low interest construction loans, the establishment of medical service organizations that charge their patients a flat annual fee for all services. Government studies have shown that groups such as the Kaiser Plan in California or Hospital Insurance Plan in New York provide medical services at costs far lower than conventional fee-for-service practice.

In addition to the loans and grants, the Kennedy bill would allow increased medical benefits to patients who choose to enroll in a prepaid plan rather than rely on fee-for-service. Even an individual private physician, under the Kennedy plan, could elect to see his patients on a prepaid basis.

Cost Controls. Even if a substantial number of physicians can be lured into prepaid practice, and already the American Medical Association has expressed its doubts, rising hospital and other medical costs will continue to plague any health insurance program. Enacted in 1965, both Medicare and the Medicaide program of medical care for the indigent have exceeded budgetary expectations year after year. On the same day that the Administration unveiled its new health insurance program, HEW Secretary Elliot Richardson announced cutbacks in Medicare benefits, aimed at saving the government $383 million in the current fiscal year.

The Medicaide program has been nearly bankrupt for several years.

Under the Administration's new health insurance program, increasing costs would not drain the federal till as they would under the Kennedy scheme. Rather, they would add to the rates paid by individuals and their employers for the required private insurance. But whether the bills are picked up by individuals, private insurance companies, or the federal government, inflationary costs remain a detriment to adequate medical services. Thus, both the Kennedy and the Nixon bills call for some forms of cost control.

The Nixon program would transfer the regulation of health insurance companies from the states to the federal government and would institute some as yet unspecified controls over doctors' and hospital fees. HEW spokesmen, however, have indicated that such controls are unlikely to exceed those used in the continually inflating Medicare program. The Nixon plan might thus lead to constantly rising insurance costs.

Cost controls under the Kennedy plan would be more stringent. The government would pay hospitals only on the basis of predetermined annual budgets. All doctors electing the fee-for-service method of payment would be limited in their total income to the amount that the same number of doctors would be paid if they had elected to be paid on a prepayment basis.

Aid to Medical Education and Redistribution of Medical Services. Both the Administration proposal and the Kennedy bill would encourage medical practice in rural and slum areas and increase the number of physicians and paramedical personnel being trained. The Kennedy bill, however, offers few specific proposals. Rather, it would establish a Resources Development Fund of up to 5 percent of the total health insurance program ($2 to $4 billion) to improve the overall quality of medical service. This money would be used to aid medical education, fund various experiments in health care delivery, and develop medical services in areas where they are scarce.

To meet the medical needs of rural and slum areas, Nixon offered three proposals in his health message, including a $22 million program of direct federal subsidies to prepaid group practices in these areas. In areas still short of services, the government would operate outpatient clinics similar to those now financed by the Neighborhood Health Centers program. To further add health manpower to scarcity areas, Nixon asked for $10 million to finance the Emergency Health Personnel Act of 1970. That act, passed with little public notice at the end of the last Congress, allows the Secretary of HEW to recruit doctors into the Public Health Service in order to serve in areas of the country with physician shortage. And since time spent in the Public Health Service substitutes for military duty, there should be no shortage of volunteers.

In order to bolster the quality of services in scarcity areas, Nixon asked the Congress for $40 million next year for the construction of Health Education Centers. Conceived by the Carnegie Commission on Higher Education, such centers would be satellites of local medical schools, built around an existing community hospital or clinic.

Also in the health message, the President requested that government support for the training of allied health personnel be increased from its current level of $20 million to $29 million next year, with $15 million earmarked for the training of physicians' assistants.

To encourage the output of M.D.'s, the President indicated that the government would shift most of its support of medical schools to a form of payment in which the school receives money on the basis of the number of students it graduates (capitation grants). He also asked Congress for an additional $60 million to increase capitation grants to medical schools from the current level of $2400 per head to $6000 per head.

—ROBERT J. BAZELL

Stanford School of Medicine (III): Varieties of Medical Experience

In the late 1950's Stanford medical school broke with convention by lengthening the regular 4-year course for the M.D. degree to 5 years. A decade later Stanford switched to an elective system which offers the medical student an option of acquiring his M.D. in about 3 years.

This reversal was seen by many as representing a swing away from a research bias in the Stanford curriculum and toward a greater stress on clinical training and community service. The shift occurred during a period when social and political awareness was growing at Stanford and at other medical schools, but the causes of the shift were too complex to be attributed simply to a surge in medical populism.

Improved teaching in the sciences in high school and college produced a better prepared and more scientifically sophisticated incoming medical student. And the fact that almost all new M.D.'s go on to specialty training these days means that medical schools no longer need concentrate on producing physicians ready to enter practice after a year's internship.

Medical schools have also been faced with the task of preparing their graduates for a proliferating variety of careers in academic medicine, medical administration, and group and private practice. Stanford's 5-year plan, in fact, was devised in part to break the lockstep system of medical education and to allow a variety of study plans.

The key to flexibility under the 5-year program was to have been a block of open time in both the basic science and clinical training programs. The idea was that the student would spend about half the assigned time at any stage learning what the department or teaching group felt was important and the other half pursuing his special medical interests.

The Stanford plan developed an essential pattern of 3 years of basic sciences and 2 years of clinical training. Students complained that there was no early, meaningful exposure to patients, and there were a lot of wry, local jokes about Stanford offering the "DNA degree."

What was ambiguous from the start was whether open time was to be devoted to elective courses or was to be