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investments into oil and gas drilling.

Some observers are skeptical that the R & D tax credits can be used in this way, however. For one thing, tax credits are only useful if a company makes taxable profits, and few biotechnology projects will be in that position for many years.

For another, the tax law specifically prohibits taxpayers from claiming credits for R & D unrelated to their own line of business, a prohibition that would seem to rule out the use of biotechnology tax shelters for wealthy individuals. Hutton,

which now does about \$700 million worth of business a year in tax shelters, claims to have found a way around these problems, however. "Whenever you write a 25 percent credit into the tax codes, you invite people to take advantage of it," says Schneider.

The restructured version of DNA Science would work with individual scientists in much the same way as the original company was supposed to function, and Schneider says that he hopes arrangements can still be worked out with John Baxter and with the Battelle Memorial Institute. The Weizmann Institute

presents a more difficult problem, however, because the tax credits do not apply to investments outside the United States.

Hutton hopes to file the first partnership arrangements with the Securities and Exchange Commission this fall, in time for the brisk business in tax shelters that usually takes place at the end of the tax year. If the arrangements are approved, biotechnology would then take its place alongside oil and gas drilling, movie productions, real estate, and racehorses, as a focus for tax shelter investments.—COLIN NORMAN

Health Care in the Soviet Union

Rising infant mortality reflects inadequacies of a system that in many areas is primitive and ill equipped

A nation's health care system, since it touches the lives of all the inhabitants, can be presumed to supply an illuminating picture of how the society as a whole operates.

Two recent publications, one a painstaking analysis of hard-to-get Soviet statistics, and the other an American doctor's personal view of health care in the U.S.S.R., go a long way toward casting light on what goes on in this vital sector of Soviet society.

The statistical report,* issued by the Commerce Department last September, was compiled by two of the world's leading experts on Soviet health, Murray Feshbach, now at the Georgetown Center for Population Research in Washington, D.C., and Christopher Davis of the Centre for Russian and East European Studies at the University of Birmingham in England. The report documents the alarming rise of infant mortality, perhaps the most significant single indicator of a nation's health, since the mid-1960's. It is now more than double the U.S. rate, having gone from 22.9 deaths per 1000 live births in 1971 to 31.1 in 1976, the last year for which such statistics are available. And when adjusted to match U.S. criteria—the Soviets don't count deaths that occur within the first week after birth—the figure goes to 35.6 (the rate in the U.S. and Western Europe is currently under 13).

In their report, Davis and Feshbach run through a catalog of possible reasons for the rise in infant mortality. Some Soviet analysts claim the apparent changes are only the result of improved statistical reporting, but the authors reject this explanation. They say that past improvements in reporting have not resulted in a rise in the infant mortality rate; that the rise has not been confined to Central Asia where many deaths went unreported in the past; and finally that if the increase were mainly statistical, authorities would be aware of that fact and "would not be expressing so much concern about the trend." The authors go on to dismiss such factors as housing and sanitation, which they say have not worsened. Nor do regional differentials account for the phenomenon, as the rise is not confined to heavily Muslim Central Asia. Instead, they find the most likely causes to be repeated abortions (the average Soviet woman has six during her reproductive span); environmental pollution, which may cause genetic defects and miscarriages; poor management of childhood influenza (linked to malnutrition), which often turns to fatal pneumonia; and alcoholism, which has become increasingly rampant among women as well as men.

Higher mortality rates are not confined to infants; overall mortality has risen from 6.9 per 1000 in 1964 to an estimated 9.5 in 1979. This reflects a rise in death rates among men, for whom life expectancy has fallen to 63—which

many observers attribute primarily to alcoholism.

That the Soviets are concerned about the trends is evidenced by the fact they have clamped down on publicizing mortality statistics in the past half-dozen years. In addition to the blackout on infant mortality data, says Feshbach, they have stopped releasing age and sex-specific data since 1974, and no data on the number of physicians by specialty have been available since 1975.

Demographer/economist Feshbach, who was one of the first to spot the "confusing" trends in infant mortality, says that one of the myths liberal America has clung to the longest is that Soviet health care is relatively immune to the difficulties that plague the rest of the system; the place where, if anywhere, socialism works. American visitors have always tended to be impressed by Soviets' claims that their system is *besplatno*, or free of charge to all.

But, according to a book by William Knaus, *Inside Russian Medicine*,† this claim loses a lot of its significance when one is exposed to the available care. Not only is much of it shockingly inadequate by American standards, both in quality of care and the availability of supplies and equipment, but, he says, a large portion of what would in America be regarded as routine services are obtainable only through *blat*, or the connections, favors, and bribes that pervade

**Rising Infant Mortality in the U.S.S.R. in the 1970s* (U.S. Department of Commerce, Bureau of the Census, Washington, D.C., 1980).

†Everest House, New York, 1981.

transactions in the U.S.S.R. and that are necessary to get almost anything done well, on time, or indeed at all. He claims, for example, that hospitalized patients often have to pay nurses for such things as bedpans, fresh sheets, prompt injections, and other rudiments of care.

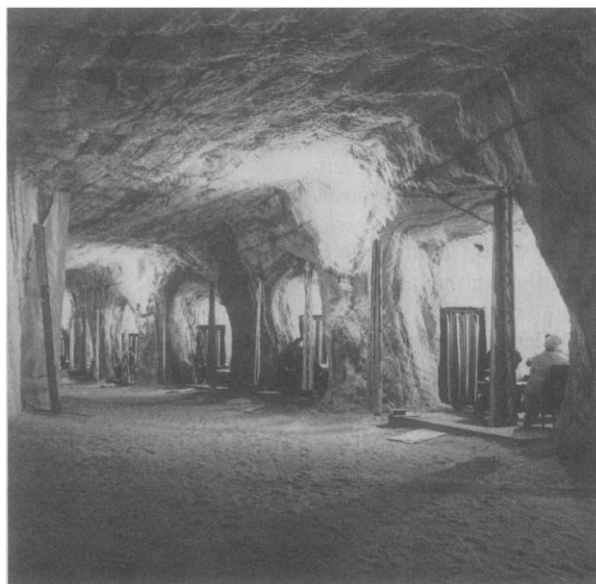
Knaus, who is co-director of the intensive care unit at George Washington University Hospital, spent a year (1973-1974) in the Soviet Union, as staff physician to a traveling U.S. Information Agency exhibit on outdoor recreation. During the course of the year Knaus, who speaks Russian, participated in the care of a number of Americans, including the emergency evacuation from Siberia to Tokyo, via a U.S. Air Force plane, of a Forest Service employee who almost died from imperfectly matched blood. The book conveys his firsthand impressions, including some case histories worthy of a novel, supplemented by information gained on subsequent visits and research. Although by no means a thorough portrait of the Soviet health care system, it conveys the flavor of care and of life as he witnessed it, everywhere from rural polyclinics to big-city hospitals. Although he refrains from political commentary, his account demonstrates how the Soviet political system affects every aspect of care. No Westerner reading this book will ever choose the Soviet Union as a place in which to suffer more than the sniffles.

Some history is important for understanding the present system. The Russians do not share the European and American tradition of reverence and high status for the medical profession. The present setup was designed in the 1920's and 1930's by the Bolsheviks, whose first priorities were to bring to heel the public health menaces of cholera, typhus, and malaria. The emphasis was on training large numbers of personnel and, as Knaus puts it, "medical care became a practical job, with emphasis on fundamental skills, not scientific knowledge." Because men were in short supply after the wars, the majority of those trained then, as now, were women. Most of these are what is known as *vрачи*, equivalent to but with less training than the Western general practitioner. The Soviet Union has 1 million doctors, twice the number in the United States, for a population of 266 million. Since the males among them (70 percent are women) are concentrated among the doctors with more specialized training, it is an overwhelmingly female-dominated system at the grass-roots level.

The health system, rooted in a net-

Asthma hospital in the Ukraine

This hospital is located 200 meters underground in the Solotvin salt mines in the Transcarpathian Mountains. Salt keeps the air very dry.



B. Krishtul/APN

work of polyclinics comparable to neighborhood health centers, probably demonstrates as well as any other the observation by political scientist David Powell, of Boston University's Russian Research Center, that "the Soviet Union is the most developed of all the underdeveloped countries in the world." Availability of services, supplies, and equipment varies widely. While Soviets are known to use lasers to dissolve tonsils and radioisotope scanning on varicose veins, in the vast rural domains modern medicine provides only a thin and patchy overlay on centuries-old folk practices.

Cupping, the application of hot glasses on the flesh to create a vacuum to increase circulation, is still widely practiced. Mustard plasters are a common panacea. Herbal remedies abound.

The Soviets also appear to be straddling antique and modern ideas about hygiene. Knaus writes that hospital personnel are fanatical about keeping possible germ- or lice-infested matter from being brought into hospitals, but do not show the same concern for hygiene within. Toilets can be few in number and filthy; hospital sheets are changed only once a week; people are rarely bathed. Postoperative infections and hospital-spread diseases are common.

Nor do Soviets subscribe to American notions about the importance of relieving pain and suffering. Complaints of pain are brushed aside as childish and weak; comforting words and other gestures of caring are not part of the system.

The Russians have the same problems the Americans do in getting doctors to serve in rural areas, but their shortages have to do much more with supplies and equipment than with manpower. Equipment is old and faulty; the health minis-

ter himself, Boris Petrovsky, has said that 75 percent of x-ray film is of too poor quality to be useful; and diagnostic capabilities are thin. The result is that the average Soviet patient going into the hospital for surgery is not checked for most of the things an American would be checked for. (The U.S. spent \$55 per person on laboratory tests in 1978, about half of the Soviet per capita expenditure on all medical care.) Disposable needles, containers, and so forth are virtually nonexistent; this adds enormously to the hygiene problems (as is also noted in the Davis Feshbach report). There are persistent shortages of drugs and of such minor items as thermometers. Wheelchairs are not available, says Knaus, an observation confirmed by an emigré physician who says they are not manufactured in the U.S.S.R.

Prevention is the dogma of the Soviet health care system. Workers are supposed to have physicals every year, but by at least one important indicator screening is inadequate: more than half of cervical cancers in the U.S.S.R. are not discovered until they are terminal, or stage 4 (in the United States, 90 percent are discovered before stage 4) writes Knaus, quoting emigré gynecologist surgeon Victor Eisenberg. Contraceptives are inadequate and, like everything else, in short supply. There is an official mistrust of birth control pills; diaphragms come in only one size; and the poor-quality condoms are often rejected by the men.

Even the most cursory discussion of health in the Soviet Union cannot ignore the scourge of alcoholism. Knaus says it is known as the "third disease" after the two major killers, heart disease and cancer, and is a logical suspect in stomach

cancer, the most prevalent cancer in the Soviet Union.

Raised vodka prices and official campaigns have had zero effect on the rate of alcohol consumption which, according to David Powell, is rising steadily at a per capita annual rate of over 5 percent. Although the fast-growing Muslim population eschews alcohol, the Slavic population (two thirds of whom are of Russian nationality) is making up for this as more and more young people and women are becoming heavy drinkers. Knaus relates that one in ten alcoholics is a woman, but Powell, who has just completed a book on Soviet alcoholism, says the ratio is closer to one in five.

The toll, socially, economically, and in terms of health, is staggering. According to Powell, the economic cost of abuse is greater than the amount of revenue brought in by the state monopoly on vodka production—which in turn exceeds the amount they say they spend on defense (the real defense figures, of course, are larger). The state is in a severe double bind over the problem. To reduce official production is only to encourage production of moonshine, called *samogon*, which would only mean a loss of revenue. What's more, it is not entirely in the state's interest to curb consumption because, to paraphrase Marx, vodka is the opiate of the masses.

According to Vladimir Treml, an economist at Duke University, it is probable that tens of thousands of people die a year in alcohol-related accidents. He estimates that alcohol is implicated in 65 percent of drownings (the U.S. figure is 5 percent); 70 percent of fatal poisonings (compared with 4 percent in the U.S.) and incalculable numbers of accidents in the workplace and on the roads. In the late 1970's, says Treml, despite the fact there are few private motor vehicles, they had 60,000 traffic fatalities a year. The United States by comparison has 50,000 (alcohol is implicated in about half of the U.S. fatalities).

The Soviets are not notably successful in treating alcoholism although a variety of systems have been set up to deal with the problem. There are some hospitals devoted to alcoholism treatment whose patients work during the day and return for the night. There are also "preventorium" to which inveterate alcoholics are sentenced, that combine features of a hospital and a work camp. Knaus writes that most alcoholics are treated on an outpatient basis, and they make up a quarter of the clients at psychiatric polyclinics. There, group and individual therapy are offered by psychiatrists who exhort patients to go back to work.

The medical care system of the Soviet Union embraces a range as extreme as the range of populations within her borders. At one end, folk medicine remains intact; at the other, a small coterie of world-class physicians and researchers cater to the privileged. Modern clinical advances seldom make their way to the masses. The Soviet *vrach* is not much of a reader of medical journals. Knaus relates that the two major Russian monthly journals have a combined circulation of 70,000—for 1 million doctors—compared with the combined circulation of 400,000 of the *Journal of the American Medical Association* and the *New England Journal of Medicine*, which reach 80 percent of U.S. physicians. Access to foreign medical journals is dependent on what the state decides to translate and disseminate.

The impression gleaned from Knaus's book might be unduly harsh. As he himself would be the first to attest, there are many physicians in the U.S.S.R. whose dedication and talents go a long way toward offsetting the deficiencies of the system. "I can think of no greater challenge than being a Soviet doctor," he writes.

Physicians often do establish personal relationships with their patients in polyclinics. The fact that the average Soviet citizen sees a doctor or *feldsher* (physician's assistant) 14 times a year suggests that citizens at least get considerable emotional support for their complaints, whether psychological or physical.

Science talked with two American doctors who have had extensive exposure to the Soviet system. One (who didn't want to be mentioned by name because he is involved in other sensitive activities) feels the book is "accurate," but perhaps overly negative. He observed that in comparison to other segments of society such as housing and transportation, the medical care system is well developed. At the very least, he said, it has three virtues: no barriers to access, it handles routine illnesses well, and there is no shortage of doctors.

The other physician, Patrick Storey, associate dean at the University of Pennsylvania Medical School, called the Knaus book "muckraking" and found the tone offensively condescending. However, he said, "what he has written is pretty much the truth—they have lousy hotels, lousy hospitals, lousy everything except subways." He does not believe, however, that the personal treatment of patients is as callous as indicated by the book. He also has high praise for their physician-run emergency system.

The medical attaché at the Soviet Embassy was unavailable for comment on the book. One emigré physician, however, Valery Portnoi at George Washington University, says things aren't as bad as Knaus paints them. Satisfactory care is obtainable without *blat*, for example. Portnoi, who comes from Riga, also says in many polyclinics there are organized teams of specialists that make diagnostic work more efficient than in the U.S. Furthermore, he says, in the Soviet Union doctors develop close rapport with their patients and do not "hide behind their white coats" as in the United States.

Future trends for Russian health do not look particularly encouraging, just as they do not for the economy as a whole. With ever larger defense expenditures from a virtually stagnant economy, little money can be expected for new equipment and upgrading of facilities.

Meanwhile, the demographics are shifting. In the U.S.S.R., as in the West, the population is aging. There are few nursing homes; housing is always in short supply; and increased burdens on already crowded hospitals can be expected. The steady increase in alcohol consumption shows no signs of abating. The nutrition picture is not improving. Rickets, commonly associated with underdeveloped countries, is showing up in the countryside, according to the Davis and Feshbach report. The incidence of lung cancer is rising, correlated with the continued increase in cigarette smoking. Health problems associated with pollution are likely to increase.

The Soviet government made colossal strides, after the revolution, in eliminating plagues and raising life expectancy. But the system appears to have reached its limits by the mid-1960's. Although the country has a number of physicians and researchers as well as some modern specialized facilities—most of them in Moscow—for the most part, modern medical advances do not make their way to the mass of Soviet citizens. As Knaus writes, "the majority of their clinics and hospitals remain crowded with patients, filled with physicians, but empty of the equipment and other technical support needed to provide modern medical care."

Some say that comparison with Russia's low-cost, manpower-intensive system could offer a useful perspective on the faults of the U.S. health system, which is high-cost, high-technology, and relatively manpower-scarce. But at this point it would appear the Soviet system offers little to envy.

—CONSTANCE HOLDEN