

14 16

CHILD SURVIVAL REVOLUTION

Vanderbilt University

April 1990

D.A. Henderson, M.D., M.P.H.
Dean

Johns Hopkins School of Hygiene and Public Health
School of Hygiene and Public Health

LESSON

I appreciate very much the opportunity to join with you in observing World Health Week. We might celebrate it if our distinguished Congressmen were not, yet again, engaged in cutting U.S. contributions to the World Health Organization. That your observance extends over a full week while most institutions observe only a day - suggests to me that you are seriously interested in international health - and to me this is a breath of fresh air in a still too parochial America. For one of the country's great medical centers to take this lead is especially encouraging and needed. With respected friends and long-time colleagues such as Bill Schaffner, (Gene Fowinkle) and Dave Karzon, I feel very much at home.

The newspapers today are filled with stories of dramatic, revolutionary changes in eastern Europe - change which is replete with hope that we might abandon a global security policy based on armament and detente for one built on "health, education and opportunity." And these indeed are the three building blocks identified by the President of the World Bank as the needed foundation for the decade ahead. What is not conveyed by the press is that an equally dramatic revolution in health, especially in the Third World, has already begun and it is about this revolution which I should like to speak today. It too has important implications which extend across the globe - and to the U.S.

The magnitude of change in the world's health and patterns over recent years is highlighted by simple data comparing mortality and life expectancy in 1960 and 1988 for the 131 largest countries. [Slide 1]

IMR	> 150	48	vs.	6
	< 25	26	vs.	41

Another measure - fostered by UNICEF - Mortality rates < 5 years.

[Slide 2]

	> 200(7/8)	70	vs.	15
	< 50	20	vs.	51

And, as you would suspect, life expectancy has risen dramatically.

[Slide 3]

There are changes over a 30-year period but, in fact, most progress has been made in the last decade. Still, to many, the Third World is viewed even today as an unchanging morass of poverty, disease and despair. You might be surprised to learn, however, that the world in which my parents grew up was not a healthier place.

[Slide 4] < 1 Year

[Slide 5] < 5 Years

[Slide 6] Life span

Note that the U.S. was comparatively prosperous and the census of 1900 revealed that 90% of the population was literate.

The transformation of health conditions in the U.S. had much more to do with the application of science to health than to either prosperity or literacy, *per se*. Today, we are at last beginning to deal scientifically and practically with health conditions in the developing world. The "Child Survival Revolution" is one of the most important of these initiatives. It is a response to Mahatma Ghandi's lament near the end of his life when he said: "I am hard hearted enough to let the sick die if you could only show me how to prevent others from becoming sick." It is a universal effort in which nations throughout the world are participating, joined by such disparate groups as the World Health Organization, the international and regional development banks and by Rotary International which itself, has raised \$250 million for the effort.

The Child Survival Revolution represents a new recognition of the potential of simple, inexpensive interventions to prevent disease and death and to promote the well-being of children. No less important has been a growing appreciation by political leaders that improved health plays a vital role in development, that healthy children offer a better hope for achieving their country's aspirations.

The genesis of the Child Survival Revolution has its origin in not one but several developments. To identify the most important helps to characterize it. An important component and its foundation, was the objective of providing well-established vaccines against six of the major diseases to all of the world's children - the diseases being

poliomyelitis, measles, tetanus, whooping cough, diphtheria and tuberculosis. This initiative followed inexorably from our experience gained in smallpox eradication. That program, coordinated by WHO, succeeded in only a decade, and at a total cost of less than \$8 million per year in international support, in eliminating from the earth one of the most feared diseases known to man. Parenthetically, I would note that because the U.S. no longer needs to vaccinate $10-15 \times 10^6$ citizens annually, it saves the equivalent of four times its annual contribution to WHO. Smallpox was a disease which, when the program began, annually claimed more than 10 million victims despite the fact that an effective vaccine had been known and available for more than a century and a half. However, an intensified program eradicated the disease in a little over ten years. What accounted for this abrupt change? First was the observation that in most countries, trained health personnel were in surprisingly plentiful supply and that even with moderately effective supervision, they were capable of a remarkably high standard of performance. The numbers needed were really very small. Competent, motivated leadership, even though few in number, made the difference. Second was the finding that villagers, when properly approached, were usually willing, in fact, eager, to cooperate in the program and often could serve as volunteer workers. Third, but most important, was the discovery that a system for the routine notification and investigation of cases and outbreaks could be reasonably easily established and that the findings were invaluable in stopping spread, in guiding strategy, in monitoring progress and in allocating resources.

It seemed only logical to us that other vaccines might similarly be applied with good effect and, in the course of doing so, might serve to strengthen national health systems. Thus, as the smallpox eradication program was concluding, an Expanded Program of Immunization was launched - at a time when less than 5% of all children in developing countries were receiving any of the vaccines which were in common use in the industrialized countries - at a time when whole wards of hospitals were given over to treating whooping cough, polio, tetanus and measles.

In retrospect, it seems paradoxical that so little attention had been directed to providing vaccination, the single most cost-effective, most innocuous procedure in our entire medical armamentarium - and the simplest to administer. One might indeed ask the question if a health service cannot effectively perform the simplest and most effective of all procedures, what does it suggest about other aspects of the health care system? What it says is that when we have had were sickness-care not health care systems. Our primary concern - and, indeed, our medical training - was focused on treating those who reached a sickness care facility - a doctor's office, a PHC, a hospital. And, sometimes, providing vaccines, if they were available, to those who happened to come. However, when vaccines began to be taken out to the villages, when school teachers, village and religious leaders were recruited to help, immunization levels rose dramatically. Today, 70% of the world's children are receiving vaccines against these six diseases. In the Western Hemisphere, polio cases plummeted to such low levels that in 1985, an eradication campaign was proposed and three years ago, it began

in earnest. An extensive system for reporting and investigating cases is now in place. More than a year has elapsed since the last case was found in Brazil, more than two years in Central America and more than three years in the whole of the southern cone of South America. In fact, there have been only four cases of poliomyelitis in the last year in the whole of the Western Hemisphere - all occurring among immigrant laborers in one valley of western Mexico. And now, a global eradication effort has begun.

The second and more recent development contributing to the Child Survival Revolution was the discovery that deaths from diarrhea could be sharply reduced with a simple oral rehydration solution comprised of salt and sugar. Hopkins faculty working with colleagues in Calcutta and Bangladesh demonstrated its value in dealing with cholera and soon began to use it in treatment of other diarrheal diseases. With simplification of methods, it was possible to train mothers and village health workers to use it. The first 1,000,000 packets were purchased by UNICEF in 1975 - they lasted 18 months. Today, more than 1,000,000 packets are used daily. National programs are in progress in more than 100 countries. Indeed, even in this country, pediatricians are finding that effective oral rehydration, provided early, diminishes the need for hospitalization and intravenous therapy.

A third and even more recent development, an intervention which has only begun to be exploited, was the discovery by Al Sommer and his colleagues at our Dana Center that the periodic administration of vitamin A can

result in a dramatic decrease in childhood deaths in many parts of the world, largely deaths due to respiratory disease and diarrhea. Sommer's teams administered vitamin A in standard UNICEF capsules costing about seven cents, once every six months to one to six-year-old children in one group of Indonesian villages; a second group of villages served as a control. Death rates among children in the control villages were found to be 50% greater than those receiving vitamin A. Decreases in deaths due both to respiratory disease and diarrhea were observed. From other studies, it became apparent that vitamin A was vital to the maintenance of the integrity of surface epithelium and to humoral and cell-mediated immunity - effects which are compromised even among those who are marginally deficient. Vitamin A, has now been accepted by WHO and UNICEF for widespread use throughout the developing world.

However significant these changes have been, more is promised. Just over the horizon are a whole gamut of new and improved vaccines. As one speaker at a recent conference observed, there are few important diseases for which vaccines are not now moving through the development process. With the new techniques available to contemporary science, the time required for their development has been greatly abbreviated and field application is possible far sooner than ever before.

It is not surprising that those who know of these developments have been captivated. In consequence, increased funds for health programs have been made available and the commitment of politicians is greater than it has ever been. This September, a global meeting of heads of State will

occur in N.Y. - its purpose - to focus even greater attention on child health. Note, however, that each of the new initiatives are only a decade old and indeed, most progress has been made within the past five years.

It is characteristic of revolutions, however, that in the excitement of the moment, critical deficits are often ignored or overlooked - deficits which potentially could frustrate the primary goal - in this case - healthy children who realize their full potential. This is no less the case with the Child Survival Revolution. I perceive two areas of special importance.

The first is the need for an ongoing, far-reaching program of research directed toward prevention and to the solution of 3rd world problems. To program managers, such a plea is too often labeled as the irrelevant cry of academics concerned more about their own careers than "getting on with the task." We must not forget, however, that those once engaged in malaria eradication viewed that problem as entirely an administrative one - to apply DDT to the walls of houses. Deliberately, research programs were terminated in 1955 when the eradication program began. A decade later, with mosquitos' resistance to DDT and a global program foundering, there were no alternatives available and no research laboratories to take up the task. Politicians argued similarly when the global smallpox eradication program began. A good vaccine was available, the problem was entirely an administrative one - to apply it in the field. We resisted this view and promoted research throughout

the program. By the time it concluded, little was the same as it had been - vaccine production methods had improved, new vaccinating devices were in universal use, our understanding of the epidemiology of smallpox had greatly changed and the campaign strategy and tactics substantially altered. Indeed, without the research component, smallpox would still be with us.

In the Child Survival Revolution, we need to seek constantly for simpler, more effective tools and for better means for applying them. For example, none of the vaccines now in use are fully satisfactory. All could be improved but none have been improved over the past 25 years. Meanwhile, candidate vaccines are beginning to emerge from the laboratory but little support is yet being provided for testing them in the field; for the development of simpler preparations for administration; for the evaluation of different types of programs; for the application of surveillance systems to monitor progress. Nutritional research in the developing countries is almost nonexistent. This is not surprising. As a recent International Commission on Health Research documented - 95% of medical research funds are expended for problems of the industrialized countries which account for 7% of the years of premature mortality.

Second and most important, we must continue to bear in mind that our ultimate goal is for each newborn to realize the potential inherent within him at birth. To assure healthy children but to fail to educate them and to provide an economy which fails to employ them is the

ultimate exercise in futility. The numbers of children to be educated and employed is a critical part of the equation and is our concern. Child spacing and breastfeeding are themselves directly important to the health of the child but no less are smaller families which can be adequately fed. Family planning services are still woefully inadequate; methods of contraception leave a lot to be desired; and support for these programs by some governments (?) remains seriously deficient. To be successful, family planning programs, like each of the others, need to be marketed throughout a community - services need to be convenient - they need to be user friendly - characteristics seldom found in traditional sickness-care systems.

At the heart of what we are talking about is the beginning of a fundamental change in health policy - from one whose concern has been care for individuals who become sick to one whose concern is the health of the community. And so our attempt in this country and in Europe to formulate health objectives for the year 2000 - to establish measurement systems to assess progress and eventually to redirect resources toward the realization of those goals.

To achieve many of the objectives will require community-based programs of education, of marketing and of far more user-friendly systems which deliver services. If there are other ways to deal meaningfully with such problems as AIDS or substance abuse or teenage pregnancy, I don't know them. But we have a lot to learn as to how best to implement such programs. Hopefully, we now know that we need something somewhat more

sophisticated than a fearless national leader counseling "just say no" and incarcerating those who don't.

What we are not learning about community-based programs in Third World countries is thus highly relevant to our own problems. And the results are both exciting and dramatic.

The potential in diagnosis and therapy is growing exponentially, nurtured by a magnificent base of biomedical research. You know it well - organ transplantation, fiber optics, nuclear imaging, recombinant DNA technology and others. To the press, to many of our colleagues, these developments appear to be the true frontiers of medicine. They are frontiers, but there are other frontiers, other challenges, sometimes less newsworthy but far more dramatic and urgent if we, as a species, are to achieve equilibrium with planet earth. And the cutting edge to that problem is wanted children who are given the opportunity to grow in health to adulthood.