RESEARCH FOR DEVELOPMENT

MID-CANADA AND THE THIRD WORLD

Paper presented for workshop discussion

at a seminar organized by

the University of Manitoba

and

the International Development Research Centre

Winnipeg, Manitoba

19-21 April 1983

WORKSHOP 6

Infectious Diseases

COMMUNICABLE DISEASES AND DEVELOPING COUNTRIES

by

ALAN S. MELTZER

Associate Director, Health Sciences Division

International Development Research Centre

"RESEARCH FOR THIRD WORLD DEVELOPMENT"

COMMUNICABLE DISEASES AND DEVELOPING COUNTRIES

For many years it was believed that the "classical" tropical diseases were the main threat to the health and wellbeing of people in developing countries. Consequently relatively little attention was paid to the more mundane "everyday" communicable diseases, such as measles. However, we now know that communicable diseases continue to pose a major threat to the lives of millions of people, particularly young children, in many developing countries. In spite of major advances in diagnostic and therapeutic techniques relative little progress has been made as far as the control of such diseases on a global scale is concerned. It is now becoming increasingly obvious that a simple "curative" approach is unlikely to have any significant long-term impact. Increasing attention is being focused on preventive aspects and it is becoming clear that the socio-economic aspects of the problem will need to be carefully evaluated if major gains are to be made in the near future. Too often in the past, the emphasis has been on the identification of a specific causative agent and the development of a specific chemotherapy or vaccine with relative little concern being paid to the human host and the environment. It is now realized that such an approach is far too simplistic. For example, the interrelationship between communicable diseases, malnutrition and the immune status of the host is an exceedingly complex one, and we know relatively little about the links between such factors. Even so, the

. 2

relationship is not an academic one. For example, malnourished children are often incapable of responding "appropriately" to the administration of potent vaccines for protection against measles or poliomyelitis. Only when the malnutrition is corrected can an adequate response to various vaccines be expected.Further research into this field will yield fruitful dividends. Concerning the "cold chain" problem of vaccines, improved technology is already providing some effective answers.

When control programs for communicable diseases are being formulated, one facet which requires careful evaluation, is the "delivery" component of the program. In many developing countries, the lack of an appropriate health infrastructure is a major obstacle as far as the implementation of control programs is concerned. It is rather ironic that in an age which boasts of sophisticated technology capable of locating the intriguing black "holes" of outer space, millions of our fellow humans continue to die because they do not have access to, or cannot afford, effective treatment for some communicable diseases. For example, the diagnosis of tuberculosis is relatively straightforward and we now possess over ten effective drugs to treat the disease. One eminent authority rightly points out that it is pertinent to ask the question, "Why, just over one hundred years since Robert Koch discovered the tubercle bacillus, is the number of tuberculosis cases in the world increasing?"

. 3

It is generally agreed that improved housing, adequate nutrition, and the provision of effective water and sanitation facilities have helped to reduce the mortality and morbidity associated with tuberculosis in the developed countries. Yet, so far, we have been unable to duplicate these results in the developing countries. It is a little depressing to realize that the 250 million dollars which would be needed each year to cure the 5 million people with highly infectious tuberculosis in developing countries, represents less than one quarter of the cost of a single nuclear-powered aircraft carrier. Obviously research alone will never provide all the answers as far as the control of many communicable diseases is concerned.

Spectrum of Communicable Diseases in Developing Countries

The spectrum of communicable diseases is a broad one. As might be expected, such diseases pose the greatest threat to the young child, and the highest mortality and morbidity rates are observed in the under-five year old group. Unfortunately, in most developing countries, the majority of these diseases go undetected, unreported and untreated, and hard data is difficult to come by. Such data is a prerequisite if pertinent control programs are to be developed. Measles is rife in many Third World communities. Most

. 4

developed countries have succeeded in "taming" this infection and it is difficult for us to envisage the immense impact the diseases has on millions of children throughout the world. The secondary respiratory infections which follow in the wake of the measles virus are veritable killers indeed.

For a long time, diarrhea was generally throught to be a fairly innocuous event. However, it is now known that diarrheal diseases are responsible for some 2 to 4 million deaths in developing countries each year. The causative agents are legion and include a wide range of bacteria and viruses and various intestinal parasites. The transmission of such infective agents is facilitated by poor water and sanitation facilities, and although there is a growing awareness of the socio-economic aspects of the problem as far as control programs are concerned, much more in the way of field research is required.

If diarrheal diseases are the number one killer of young children in developing countries, then acute respiratory infections rank a close second and are responsible for over 2 million deaths per year. In parts of Africa, such diseases account for over twenty percent of all childhood deaths. The well-nourished child of the Western world can easily shrug off the effects of a mild respiratory infection, but the undernourished child, subject to repeated attacks of diarrhea, and the unwilling host to malaria and other parasites soon succumbs. Relatively little is known about the etiology of acute respiratory infections in young children and it is encouraging to see

. 5

that the World Health Organization is considering the implementation of a suitable control program. Research, both basic and applied will be an integral part of such a program.

Cultural practices may be associated with the transmission of some communicable diseases. An example of this is to be seen in the case of tetanus, which is thought to cause the deaths of over 50,000 children each year in developing countries. The practice of applying cow-dung to the umbilicus of the newborn child is a custom which dies out slowly. Improved immunization programs and health education campaigns hold the answer to the problem.

Our patterns of interest in communicable diseases continue to evolve in response to clinical research findings. For many years, there was relatively little interest in the realm of sexually-transmitted diseases, and these ubiquitous diseases were virtually ignored in both the developed and developing countries. Now there is ample evidence to show that these common communicable diseases are responsible for much morbidity, particularly in women and young children. As a result, many countries have now initiated baseline information surveys, particularly with reference to gonorrhea. Improved reliable, inexpensive diagnostic techniques, and the developmewnt of improved therapeutic guidelines are paying dividends as far as field programs are concerned.

. 6

Control Strategies

In days gone by, the control of communicable diseases was seen to hinge on the identification of a special causative agent, and the development of appropriate therapy for each and every disease. Curative methods were assumed to be the answer. We now know that if such diseases are to be controlled, equal attention must be given to the preventive aspects, particularly as far as the developing countries are concerned. To merely treat a child with a given disease with a specific therapy will have little impact in the long run. Unless malnutrition is corrected, housing improved, and water and sanitation facilities upgraded, the child in question is more than likely to succumb to another communicable disease at a later date. The W.H.O. Control of Diarrheal Diseases (CDD) Program is cognisant of of this aspect, and attempts to introduce a comprehensive control program look promising. Research maintains a high profile in the program, constituting a productive component and the dissemination of research findings is also an important aspect.

Most cases of communicable diseases continue to go unreported in many developing countries. Obviously before effective control programs can be fomulated, it is first necessary to obtain the basic epidemiological data which is the keystone to future preventive programs. Immunization programs have an important role to play in any national health program, and the WHO Immunization Program has much to offer. It is now accepted that successful immunization programs will have many important spin-offs.

. 7

For example, it is generally agreed that an efficient immunization program against measles will do much to reduce the morbidity and mortality associated with the acute respiratory infections which commonly follow measles.

Training of health personnel, particularly at the primary health care level, the development of simple, inexpensive diagnostic tests and the introduction of simple therapeutic guidelines suitable for use in a rural setting, will all play an important part in future control programs.

Canadian Input

There can be little doubt that Canadian expertise in communicable diseases can play an important part in assisting developing countries to develop appropriate research and control programs. Good laboratory services are an essential part of any communicable disease control program, and the expertise available at the Laboratory Centre for Disease Control is recognized internationally. Other institutions and researchers have already formed viable and productive links with their counterparts in developing countries. Of course, researchers at this University have already made major contributions to communicable disease research, particularly in East Africa. Several Canadian agencies are also active in supporting research, both indirectly by funding such agencies as the W.H.O., and also supporting research and control programs directly.

The Health Sciences Division, IDRC, is presently supporting a wide range of health projects, which are intended to provide some of the answers to the questions associated with communicable disease research in developing countries. The topics covered include tuberculosis, acute respiratory infections, vector control, diarrheal diseases, sexually-transmitted diseases, time-temperature indicators for vaccines, dengue fever and the link between the immune response and malnutrition, and a wide range of projects in the field of water and sanitation.

There can be little doubt that Canadian researchers are in the forefront of many avenues of communicable disease research. Communicable diseases are here to stay, and in future years partnerships between Canadian researchers and their counterparts in developing countries will undoubtedly help to lessen some of the "North-South" disparities which figure so prominently in the realm of communicable diseases.