The Future Role of International Agencies in Control of Acute Respiratory Tract Infections

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Achievements in the control of acute respiratory infection (ARI) owe much to international collaboration in research, education, and delivery of services. This article highlights some of the current activities of the many international agencies involved and summarizes thoughts on their future roles. Key recent scientific advances include better surveillance, new and improved vaccines, refinement of standard clinical management plans and behavioral change techniques, and demonstration of the effectiveness of their application. Agencies involved include the World Health Organization, the International Union Against Tuberculosis and Lung Disease, national government agencies for overseas aid, many academic departments, and professional lung health associations. However, much remains to be done, especially in collaborative research, in the devising, implementing, and evaluating of health care delivery systems in low-income countries, and in mobilizing political will and resources. These are tasks beyond the capacity of any lone agency. Success will depend on how effectively we collaborate.

At the end of the acute respiratory infection (ARI) conference in Sydney in 1984, I concluded by reminding colleagues that ARI control will be achieved only by teamwork at national and international levels. This remained emphatically true in 1997. A hugely important dividend of the 1984 conference was that it helped to map out the problems and clarify how each of us, individually and through the national and international agencies with which we are associated, could contribute most effectively to the global effort. Now we have been able to stand back and take stock of progress, review relevant scientific advances, and reappraise contemporary needs and opportunities. This done, we must now refocus our efforts to match the new perspectives. My main aim, then, in this brief article is to suggest where our future activities need to be focused. But first it is important to acknowledge what has been achieved in the last 2 decades by effective collaboration between many scientists and organizations around the world, and the part played in these achievements by the major international agencies.

New Knowledge and New Technology

So what have been the main achievements? First, we now have a much more complete picture of the size and nature of the ARI problem in terms of morbidity and mortality in many countries that previously had little or no available information. This provides an essential baseline against which progress can be assessed and serves to guide future policies and priorities. One continuing deficiency, however, is the lack of techniques needed for the rapid and reliable identification and characterization of etiological agents, both bacterial and viral. Definitive knowledge of these is essential both to guide treatment and to monitor changes in resistance to antibiotics and the prevalence of types of organisms.

Standard clinical management regimens, which were in their infancy in 1984, have been refined and tested in the cauldron of primary care and in the demanding circumstances of remote locations with rudimentary service facilities.

We now have new and more effective vaccines, notably the Haemophilus influenzae vaccine, which, as recent trials in The Gambia have shown, can greatly reduce the incidence of pneumonia in children, and the even more exciting prospect of effective conjugate pneumococcal vaccines soon to be field-tested.

We know much more too about the relative importance of adverse environmental conditions associated with increased ARI incidence and related mortality, and some of these conditions are eminently accessible to effective interventions.

Finally, and most important, controlled field trials have shown that implementation of a combination of educational programs for mothers, involving appropriate child-rearing and care-seeking practices, and for primary care staff, involving early detection of pneumonia and use of standard management regimens, can significantly and in some cases dramatically reduce ARI-related mortality among children <5 years of age. This is impressive and encourages belief that we can make a worthwhile impact if only we can deliver timely and appro-
Private care where it is most needed. It is important to emphasize that most of these advances have come about through the concerted work of a network of investigators, which provides a model of what can be achieved through committed international collaboration.

**Activities of International Agencies**

Until the late 1970s, there was little appreciation of the size of the problem of ARI, and no attention was paid to it by any of the major international agencies. Then the World Health Organization (WHO) and the International Union Against Tuberculosis and Lung Diseases (IUATLD) both began to take an interest. Both recruited the assistance and collaboration of others, including funding from several national overseas development agencies and lung health associations and research input from academic institutions. This established a momentum that has proved both exciting and productive.

**World Health Organization**

The WHO Programme for ARI was formally launched in 1984. Since then there has been an impressive program of research and development. Initially, efforts were concentrated on the construction of simplified case-management protocols. In the ensuing years there has been extensive work on validation of the most discriminating and readily recognized clinical signs of pneumonia; on the pharmacokinetics of antibiotic therapy; on alternative treatment regimens; on the surveillance of antibiotic resistance; on the place of oxygen therapy and on the techniques of oxygen concentration and economical delivery; and into the special problems of the management of ARI in very young and malnourished infants.

An important later innovation was the development of the technique of “focused ethnographic study,” whereby social-cultural data on the factors that influence caretaker behavior were obtained. These data helped to improve the local relevance of the content and language of advice related to home care and prevention of ARI. Alongside all of this, a program of training for managers and caregivers was instituted, and a series of technical documents and practical guides and training materials was produced both for local health workers and for the education of mothers in the home management of ARI.

Recently, attention has turned to the evaluation of alternative preventive interventions. The aim was to identify the most effective, feasible, and affordable interventions to prevent childhood pneumonia. Available data were used to construct models to assess the potential impact of different interventions. These have identified vaccines, indoor air pollution, and nutritional factors as particularly important.

In the last few years, the WHO strategy has switched from promoting a series of vertical child health programs, of which the ARI program was one, to the concept of integrated management of childhood illness (IMCI). Logically, the ARI and diarrheal diseases programs were merged and then incorporated into a new Division of Child Health and Development (CHD).

For the immediate future the WHO aims to give priority to the development and trials of vaccines, especially the promising pneumococcal conjugate vaccines; research into the use of antibiotics in ARI and the problems of resistance; the reduction of indoor air pollution through the introduction of cleaner household energy sources; and the production and testing of IMCI training materials. The WHO is now vigorously promoting IMCI as the most effective strategy for reducing childhood mortality related to ARI as well as other causes, and is keen to encourage partner agencies to pick up this theme. It also looks to partners for long-term support for research and development, and particularly for help with training and program implementation.

**International Union Against Tuberculosis and Lung Diseases**

The IUATLD is, of course, best known for its distinguished record in the fight against tuberculosis. It is less well known that since the late 1970s the union has expanded its area of work and interest to other lung diseases and the promotion of lung health more generally. This includes work on asthma, occupational lung disease, ARIs, and the fight against tobacco. It is the only large international organization other than the WHO engaged in such a range of work, and I believe that its activities and commitment in this field deserve to be better known.

The aims of the IUATLD are the prevention and control of tuberculosis and the promotion of lung health and related community health, with particular focus on the priority problems of low-income countries. It pursues its aims through research, education, and technical assistance.

**Research.** Projects are sponsored and coordinated largely through its five scientific sections and their working groups. The respiratory section activities currently include working groups on model ARI program development; surveillance of and response to ARI drug resistance; research training courses; and asthma management in low-income countries. The section has also promoted the creation of a research database that provides an inventory of current research in the field of ARI and plans to expand the newly created Annik Rouillon Documentation Centre to provide a literature resource and information facility for lung disease as well as for tuberculosis.

**Education and training.** Funding agencies interested in supporting operational research on lung health services in low-income countries have reported disappointment at the poor quality of many project proposals, which they attribute to a lack of training in research methods. The IUATLD has a long history of providing international training courses in tuberculosis research and program management focused on the needs of low-income countries. It was well-placed, therefore, to take an
initiative to meet this need. Training based in developed-country institutions is now widely considered to be inappropriate. The IUATLD, in partnership with other international agencies and academic institutions, has therefore assembled teams of experienced academics who run short, repetitive courses in epidemiological research methods and strategies for the prevention of lung disease and the promotion of lung health in various regions of the world. The aim is to create a local cadre of research-competent clinical and public health collaborators capable of sustaining training programs and conducting research projects, thereby strengthening local capacity to plan and implement effective lung health programs.

Other educational activities include dissemination of information, exchange of expertise and experience, and stimulating scientific inquiry through conferences, publications, and scientific statements. It publishes the International Journal of Tuberculosis and Lung Disease and is keen to encourage ARI researchers to submit their work for publication in the journal, especially on issues related to service provision and public health.

Technical assistance. The IUATLD has extensive experience in assisting low-income countries in the design and delivery of programs for tuberculosis control. It makes sense to build on this experience and to take advantage of the strong network of individual members and member associations in most such countries to undertake similar services in relation to ARI control. Some of the recommended features of control programs are too costly to be practical in many countries, and it is essential to strip these down to the bare essentials and assist in shaping precisely focused action at the district hospital level, with the primary objective of saving lives and avoiding inappropriate antibiotic use. To assist in this work, the IUATLD has recently produced simple guides for the management of asthma and of cough or difficult breathing in children. Both guides will now be subject to operational trials.

Other Agencies

Of course, none of the work described above could have been successfully prosecuted without the support and collaboration of a large number of other agencies and individuals. There has been generous financial aid for research, training, and program development provided by a range of public and private funding bodies, including national governments through their contributions to the WHO and United Nations Children’s Fund (UNICEF), and in other ways, outstandingly through U.S. Agency for International Development (USAID), the Canadian International Development Research Center, the British International Development Department, the Australian Agency for International Development (AusAID), and the member associations of IUATLD and of other organizations such as Save the Children Fund.

However, while the funding was mandatory to underpin the core work, equally important have been the largely unpaid contributions of numerous academic institutions and individuals in both developed and developing countries around the world who have provided essential expertise and research endeavors. The channels for such work have been many and varied. Some were by direct input into the programs of the international agencies and others through bilateral or multilateral ad hoc collaboration. The common ingredients of all these efforts have been hard work and selfless commitment to collaboration.

Future Roles for International Collaboration

The priorities for the future are to a large extent “more of the same” of what has been so productive in the past decade. However, contributors to this conference have identified the need for significant shifts in emphasis as well as for new work related to new technologies and changes in the nature of the problem. As ever, there is a need for strong partnerships between developed and developing countries, between funding bodies and academic researchers, between teachers and operational agencies, and between managers and those who deliver services in the field. We should look to them individually and corporately, in particular (1) ensure that we have in place systems that will provide a continuous flow of high-quality information on mortality and morbidity rates in target populations and on the prevalence of causal organisms and of antibiotic resistance; (2) promote research into improved vaccines, treatments, and diagnostic technologies and to give high priority to trials of new products and alternative regimens; (3) collaborate in the production of high-quality educational materials that are locally and culturally appropriate; (4) promote intersectoral action related to environmental interventions that have been shown to be effective; (5) conduct operational studies into the most cost-effective ways of providing services within the constraints of local resources; (6) provide training in research methods and in the management and delivery of effective preventive and treatment services within the context of local circumstances; (7) provide assistance and advice on realistic program implementation in countries with the highest child mortality rate related to ARI; and (8) help mobilize support for ARI programs among the health professions, administrators, politicians, and the public, including parents, community leaders, and health care workers at all levels.

Conclusion

When we met in Sydney in 1984, at the conclusion of that seminal event, I reminded the audience that 90,000 children had died of ARI while we had been talking about how to save them. Despite the efforts of the intervening years, while there has been some progress, ARI remains the biggest killer of
young children around the world. We have heard that the main reason for this is our failure to deliver potentially life-saving interventions where they are most needed, which we know could be effective if properly applied. We cannot allow ourselves the luxury of complacency induced by the limited success achieved to date while this scandal persists.

It is clear from the presentations at this conference that we have between us, individually and in the international agencies with which many of us are associated, the experience, the skills, the knowledge, and most of the technology required to ensure that the appalling toll of ARI among the world’s children is brought low. The technology we most lack is in simple, effective, and efficient health care delivery systems appropriate to poor economies and difficult terrains, yet this was the object of research least often mentioned at this conference. The challenge we face is to work together to remedy this deficiency, to mobilize the necessary resources, and to accord appropriate priority to implementing the feasible and effective interventions that are already available to us. In 1984, we were poised to advance. Now we must bend all our efforts to win!