

This section looks back to some ground-breaking contributions to public health, reproducing them in their original form and adding a commentary on their significance from a modern-day perspective. John Sbarbaro reviews the 1991 paper by A. Kochi on WHO's strategy to control tuberculosis. The original paper is reproduced from *Tubercle* by permission of Churchill Livingstone.

## Kochi's tuberculosis strategy article is a "classic" by any definition

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An article written by Arata Kochi in 1991 (1) is reproduced on the following pages. In a world experiencing a multiplicity of journals, reports and scientific breakthroughs, the designation "classic" has been reserved for those scientific publications that have changed the course of history — for example Koch's discovery of the tubercle bacillus. The article by Kochi did not report a new scientific discovery — rather it depicted the devastating impact of tuberculosis around the world in such a clear and forceful manner that it changed the public health focus of the World Health Organization, national governments, and leading voluntary organizations. The striking reality that one-third of the world's population was infected by the tubercle bacillus and that, as a result, eight million new cases and three million annual deaths were occurring each year leapt to the reader's eye from the first page. The unfair burden of tuberculosis upon the poor of developing nations became apparent to all. The epidemiological division of countries into four groups and the incorporation of their health resources into the analysis provided a clear foundation for programmatic development and direction. The potential danger of the imminent spread of tuberculosis to industrialized countries (only an air flight away) was not lost on the reader, nor was the impending impact of dual infection with the human immunodeficiency virus (HIV).

Kochi's paper concisely pinpointed three major programmatic deficiencies that had to be overcome: inadequate treatment services, high rates of failure to complete therapy, and the worldwide absence of adequate governmental surveillance and monitoring systems. Had this article been written by a prominent academic, or even by the leader of the International Union Against Tuberculosis and Lung Diseases (IUATLD) — the leading nongovernmental organization in the field — it might have generated only local

and passing interest; that it came from the newly appointed head of WHO's tuberculosis programme and combined a powerful analysis of the problem with clear and direct programmatic objectives for the future gave the manuscript immediate stature.

It was recognized that BCG did not have a significant impact on reducing transmission of infection and that renewed emphasis had to be given to the treatment of infectious cases, especially those whose sputum was smear positive. The prime objective of tuberculosis control programmes was to be improvement of the cure rate of all patients under treatment. Specific targets and monitoring indicators were to be established, the most important being a goal of no less than an 85% cure rate. Standard therapy was to be replaced with short-course treatment, especially short-course regimens using combination medications.

Of major importance, and central to the long-term impact of this classic paper, improved systems for the management of treatment were to become the basis of a new two-pronged attack on tuberculosis. Kochi noted that Styblo and IUATLD had clearly demonstrated how important patient management was to their successes in Malawi, Mozambique, Nicaragua, and the United Republic of Tanzania. He acknowledged that, in the past, adherence to dogmatic technical policies had often suppressed new and innovative approaches. Under WHO's new policy, the principal focus would be on "management" and the measure of that management would be "rigorous cohort analysis" of the results and outcome.

Kochi noted that if the new programme could reach a worldwide cure rate of 85% the prevalence of tuberculosis would decrease by 50% and death rates would fall by 40%. Moreover, once recognized as effective by the community, successful treatment would draw new symptomatic patients to these treatment sites of excellence and case finding would increase as a result, reaching levels as high as 65–70%.

It was this sentinel analysis that laid the groundwork for WHO's subsequent powerful focus on proper case management, including the use of directly observed treatment, and led to the Global

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Tuberculosis Programme's development of a comprehensive management system (directly observed treatment, short course: DOTS). The DOTS strategy addressed five elements considered to be critical to an effective tuberculosis control programme, from ensuring a steady supply of quality drugs through to a sustained government commitment. This approach has been endorsed by voluntary and professional organizations throughout the world, for example by the Netherlands's KNVC, the American Thoracic Society and, perhaps most importantly, by IUATLD.

One of the five management system elements is the provision of a standardized, short-course (6–8 months) treatment regimen to every patient with active tuberculosis. To ensure that the treatment is both provided to and taken by the patient, directly observed therapy was established as an essential component of at least the first two months of treatment. A recent report from China (2) documents the effectiveness of this direct treatment approach: tuberculosis case rates have fallen from 127 per 100 000 in 1979 to 7.3 per 100 000 in 1996, with multiple-drug resistance almost disappearing (0.8% in 1996).

There are numerous publications documenting the effectiveness of DOTS as an international tuberculosis control strategy (3–5). However, the obvious question is: if DOTS is so effective a management strategy, why are only 21% of the world's active tuberculosis cases presently undergoing treatment through it? Why have so many tuberculosis control programmes ignored a public health management system that has proved so effective?

The failure lies not in the concept but in the professional and political leadership of many countries. Some physicians, through ignorance or perhaps fear of losing income, have kept their patients away from organized tuberculosis control efforts. Other professionals have focused on the call for directly observed therapy and concluded that it is unethical to impose a system of "supervised" treatment on patients. Some have raised the issue of human rights, feeling that "enforcing" treatment is a violation of an individual's civil freedoms.

In reality, directly administered and fully supervised treatment is a service to the patients, designed to help them through a crucial time in their lives. "Enforcement" conjures up concepts of blame, oppression, coercion, and confinement imposed without sensitivity to human and cultural needs; but, as actually applied, successful programmes of directly observed treatment seek to create a patient-centered, supportive relationship between the provider and the

patient — one that will sustain treatment even when the patient feels better and sees no need to continue taking the drugs. Whenever possible, some programmes have mobilized an array of social support systems including supplementary food, clothing, and even housing to assist the patient to complete treatment. Prompt follow-up of defaulters is equally important.

Why, then, is there lingering debate over the value of directly observing each dose of treatment? Sadly, some professionals continue to fantasize that a combination of patient education and caring professional concern can achieve the same results as authentic public health management. Ignored is the fact that scientific studies from all parts of the world have repeatedly confirmed that at least 30% of patients will not remain true to treatment; and, equally important, no personal or disease characteristics have been found to indicate which patients are likely to abandon treatment.

Although valuable, support services that promote adherence are not essential for programme success. Case management that results in completion of treatment is the single most critical component for success; and such case management must be adapted to the patient and to the patient's social environment (6). However, a decision to diverge from a programme that directly observes the patient taking treatment requires the existence of an effective, thorough and prompt reporting and evaluation system — one that will quickly identify failure (7). To do otherwise would be the ultimate in professional arrogance or negligence.

Kochi's classic paper crystallizes the role of public health — reemphasizing that tuberculosis is a disease not only of the individual but also of society. One person's disease can become everyone's as it is unknowingly spread to others through the air, and tuberculosis is thus an on-going challenge to all governments. Political leaders bear an inherent responsibility to protect the health of their people. Because tuberculosis primarily attacks the economic base of the country (people aged 15–45), the community injury that it causes extends far beyond individual disease and death. In many situations it will take strong, directive leadership by national governments to implement the management systems necessary for an effective DOTS programme, but the gains will be worth the cost. Once established, the managerial concepts of programme responsibility, accurate and timely reporting of results, and individual staff accountability can be systematically extended to all governmental health work. Such a result would be a fitting tribute to this "classic" public health paper. ■

## References

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