

- [ScienceWatch Home](#)
- [Inside This Month...](#)
- [Interviews](#)

- [Featured Interviews](#)
- [Author Commentaries](#)
- [Institutional Interviews](#)
- [Journal Interviews](#)
- [Podcasts](#)

Analyses

- [Featured Analyses](#)
- [What's Hot In...](#)
- [Special Topics](#)

Data & Rankings

- [Sci-Bytes](#)
- [Fast Breaking Papers](#)
- [New Hot Papers](#)
- [Emerging Research Fronts](#)
- [Fast Moving Fronts](#)
- [Research Front Maps](#)
- [Current Classics](#)
- [Top Topics](#)
- [Rising Stars](#)
- [New Entrants](#)
- [Country Profiles](#)

About Science Watch

- [Methodology](#)
- [Archives](#)
- [Contact Us](#)
- [RSS Feeds](#)



Interviews

Analyses

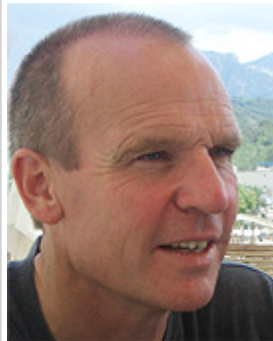
Data & Rankings

Special Topics : Tuberculosis : Christopher Dye - Tuberculosis

AUTHOR COMMENTARIES - From Special Topics

Tuberculosis - January 2009

Interview Date: January 2008



Christopher Dye

From the Special Topic of Tuberculosis

In our Special Topics analysis of tuberculosis (TB) research over the past decade, the work of Dr. Christopher Dye is ranked at #5 by total cites, based on 48 papers cited a total of 3,751 times. According to Essential Science IndicatorsSM from Thomson Reuters, Dr. Dye's full citation record for the period of January 1, 1998 and August 31, 2008 includes 92 papers, largely classified in the field of Clinical Medicine, cited a total of 4,660 times. This latter figure also includes papers on TB that weren't picked up in our analysis.

Dr. Dye is the Director of Health Information in the Office of HIV/AIDS, Tuberculosis, Malaria & Neglected Tropical Diseases at the World Health Organization in Switzerland.

In the interview below, he talks with ScienceWatch.com about his highly cited research on TB.

SW: Would you tell us a bit about your educational background and research experiences?

My first love was ecology and I trained as a biologist at the University of York in the UK, specializing in population biology, with plenty of ecology, genetics, mathematics, and computing. After a get-away-from-it-all year working as a desert ecologist in New Mexico, I came back to Oxford University in the UK to do postgraduate research.

I wanted to combine theory, experiments, and fieldwork, so I picked a project on mosquitoes. Mosquitoes have short generation times (compared to the three-year DPhil course) so I could do experiments on population dynamics. And mosquitoes live in every country of the world, so I had a wide choice of field sites. I first went to Kenya and Cameroon, and I have been going back to Africa regularly ever since, interspersed with visits to Asia, South America, and Eastern Europe. Of course mosquitoes also transmit pathogens, which is how I got interested in infectious diseases. Epidemiology is essentially disease ecology.

"...in sub-Saharan Africa...HIV coinfection is the most powerful known risk factor for developing active TB."

SW: What first interested you in TB research?

I'd been on the faculty of the London School of Hygiene and Tropical Medicine for 12 years and I was due for a sabbatical. Although I'd done plenty of research on infectious and parasitic diseases, I knew practically nothing about TB, and embarrassingly little about the World Health Organization.

During the mid 1990s, WHO was launching and expanding its "DOTS Strategy" for TB control (based on

combination drug therapy), and they were looking for an epidemiologist to help. I went to WHO in Geneva for one year and, 12 years later, I'm still there. I had not anticipated that the world's TB data had such rich possibilities, or that working at the boundary of science and policy would be so stimulating.

SW: Two of your most-cited papers (Dye C, et al., "Global burden of tuberculosis - estimated incidence, prevalence, and mortality by country," *JAMA-J. Am. Med. Assn.* 282[7]: 677-86, 18 August 1999 and Corbett EL, et al., "The growing burden of tuberculosis—global trends and interactions with the HIV epidemic," *Arch. Intern. Med.* 163[9]: 1009-21, 12 May 2003) deal with global trends in tuberculosis. What did the 2003 paper report that was different—for better or for worse—than the 1999 paper?

The 1999 paper was the first major synthesis of data that defined the scale of the global TB problem, in terms of infection and disease and as a cause of death. By 2003 we needed to update our assessment, but we also used that second paper to look more closely at the major cause of TB's resurgence during the 1990s, namely coinfection with HIV, especially in Africa. Those two papers were really offshoots of the work we publish every year in our WHO report on "Global Tuberculosis Control." We distribute about 10,000 copies of that report around the world, and it has a far wider audience than the journal publications.

SW: Your 2001 *NEJM* paper (Espinal MA, et al., "Global trends in resistance to antituberculosis drugs," 344[17]: 1294-1303, 26 April 2001), among others, discusses the growth of resistance to anti-tuberculosis drugs – how big of a problem is drug resistance, and what can be done about it?

We know that around 1 in 10 new TB cases in former Soviet countries is multidrug resistant (MDR-TB); that is, resistant to (at least) the two main first-line drugs used in combination therapy, isoniazid and rifampicin. The numbers of multidrug-resistant cases are also high in India and China. Within the last year, patients have been found with extensively drug-resistant TB (XDR-TB) in more than 50 countries; these strains are refractory to second-line as well as first-line drugs. Globally, the number of resistant cases is probably increasing year on year, though we do not yet have the data to be sure. It is a good bet, too, that the number of strains resistant to both first- and second-line drugs is increasing, and we need to closely monitor the distribution of these strains from now on.

But there is some good news about drug resistant TB: countries that have taken the problem seriously—including Estonia, Hong Kong, and the United States—have shown that MDR cases can be reduced even more quickly than drug-sensitive cases.

SW: The interaction of tuberculosis and HIV seems to be a growing concern – can you walk our readers through the reasons why?

"Epidemiology is essentially disease ecology."

We estimated in 1999 that, while there are 8 to 9 million new cases of TB each year, as many as 2 billion people carry dormant TB infections. These dormant infections stay dormant for life in the majority of people, unless their immunity is somehow compromised. HIV coinfection, if left untreated with antiretroviral drugs, destroys immunity, allowing the dormant or latent mycobacteria to progress to active disease. This has happened on a devastating scale in sub-Saharan Africa, and HIV coinfection is the most powerful known risk factor for developing active TB.

There is, however, some good news, too, about the interaction between TB and HIV: new HIV infections are now falling in most parts of the world, and we have some effective methods to prevent TB among HIV-positive people—antiretroviral drugs to clear HIV virus and maintain immunity, and isoniazid to prevent active TB. WHO and other organizations are working to encourage much wider use of these treatments, in addition to promoting methods for preventing HIV and TB infection.

SW: What are the biggest obstacles in establishing and maintaining prevention and control programs for tuberculosis?

A decade or more of evidence suggests to me that, while good DOTS programs can cure almost all TB patients, they do not diagnose and begin treatment soon enough to have a major impact on transmission. The problem lies in the interaction between the biology of TB and the organization of health care. Where health services are not easily accessible, as in some of the most affected countries of Asia and Africa, TB patients do not go to a clinic or hospital care until they are quite sick, or until they realize that a persistent cough is not going to get better without treatment, after which they have transmitted infection to other members of their families and communities.

SW: What would you like the "take-away lesson" about your research to be?

That the world is full of under-exploited information. Much of my work has been done with the data that

are routinely collected by health ministries. In WHO we have relatively good access to those data but, even so, we can only work with a fraction of it. The fullest possible analysis of these data, ideally done by national TB programs, would put us in a far stronger position to combat entrenched endemic disease like tuberculosis. ■

Christopher Dye, DPhil, FMedSci
Office of HIV/AIDS, Tuberculosis, Malaria & Neglected Tropical Diseases
World Health Organization
Geneva, Switzerland

Christopher Dye's current most-cited paper in *Essential Science Indicators*, with 1,195 cites:

Dye C, *et al.*, "Global burden of tuberculosis - estimated incidence, prevalence, and mortality by country," *JAMA-J. Am. Med. Assn.* 282(7): 677-86, 18 August 1999. Source: *Essential Science Indicators* from Thomson Reuters.

Keywords: tuberculosis, TB, epidemiology, infectious diseases, WHO, HIV, global tuberculosis control reports, multidrug resistance, dormant infections, prevention, control.

 PDF

[back to top](#) 

[Special Topics : Tuberculosis](#) : Christopher Dye - Tuberculosis

[Scientific Home](#) | [About Scientific](#) | [Site Search](#) | [Site Map](#)

[Copyright Notices](#) | [Terms of Use](#) | [Privacy Statement](#)