

Health progress and research culture in Bangladesh

The emergence of a research culture in Bangladesh promoting rigorous research, developing interventions, and translating evidence into policies made a substantial contribution to the improvement of health outcomes in Bangladesh. Notably, the reduction of mortality from diarrhoea and vaccine preventable diseases and control of fertility have made the most significant contributions to recent health gains. From basic research projects to clinical trials, some institutions played a key part in this progress.

Control of diarrhoea through use of oral rehydration therapy (ORT) is an example of rigorous research developed at the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B),¹ and implemented by BRAC, which took this discovery to every household through an innovative programme. Bangladesh has now the highest ORT use rate in the world.

Important contributions of Bangladesh research shaping national programmes include projects on neonatal tetanus immunisation,² measles vaccination and child survival,³ and DOTS delivery for the management of tuberculosis.⁴

Family planning is another important issue where the ICDDR,B has made substantial contributions. Development of innovative models adopted nationally,⁵ made Bangladesh a successful example for family planning and control of population growth. Several national surveys (such as Bangladesh Fertility Survey, Contraceptive Prevalence Surveys, and Demographic and Health Surveys) helped monitor progress of contraceptive prevalence and trigger actions for continuous improvement.

Research from ICDDR,B on the discrimination against women and girls⁶ helped draw attention of policy

makers and leaders to develop female-focused programmes, and thereby contributing to improve health.⁷

Diarrhoea management and family planning are good examples of research which started by identifying country's problems with consequence on health and overall development, solutions were sought, solutions were found, and solutions were adopted in mainstream programmes.

The current continuing interactions between policy makers and researchers clearly suggest interest in evidence-based policies. This is a huge shift from the 1980s when interactions were very limited and at times confrontational. The establishment of the ICDDR,B and the provision of continued support to the institution was a testimony to Bangladesh's commitment to research.

Research in Bangladesh has been limited to a few organisations. A search of articles published between January, 2003, and August, 2013, showed that six organisations—ICDDR,B (1632 publications), BSMMU (194), BRAC (163), Bangladesh Institute of Research & Rehabilitation in Diabetes (BIRDEM, 157), BRAC University (124), and University of Dhaka (118)—contributed 89% of the publications.

International partners have played an important part in promoting research in the country and training many local researchers. The creation of health research institutions such as Institute of Epidemiology, Disease Control and Research, and National Institute of Population Research and Training is also worth mentioning. Research done in the universities has been somewhat limited, unfortunately.

In our opinion home-grown evidence and its use in designing policies, strategies, and programmes is a major contributor to health progress in Bangladesh so far.

The dynamic problem-solving focused research and the adoption and implementation of the solutions found have been a unique Bangladesh feature that is usually not seen in countries of similar socioeconomic

development. However, the research capacity needs strengthening and increased investment.

We hope that Bangladesh gives full attention to strengthening research capacity of the relevant institutions, especially in the public sector, to exploit the full potential of the prevailing enabling research culture to derive better health for its people.

We declare that we have no conflicts of interest. We thank M Nazim Uddin (ICDDR,B) for his assistance.

**Abbas Bhuiya, Pran Gopal Datta, Ahmed Mushtaque Raza Chowdhury*
abbas@icddr.org

International Centre for Diarrhoeal Disease Research Bangladesh (ICDDR,B), Dhaka 1212, Bangladesh (AB); Bangabandhu Sheikh Mujib Medical University (BSMMU), Dhaka, Bangladesh (PGD); and BRAC, Dhaka, Bangladesh (AMRC)

- 1 Rahaman MM, Aziz KM, Patwari Y, Munshi MH. Diarrhoeal mortality in two Bangladeshi villages with and without community based oral rehydration therapy. *Lancet* 1979; **2**: 809–12.
- 2 Black RE, Huber DH, Curlin GT. Reduction of neonatal tetanus by mass immunization of non-pregnant women: duration of protection provided by one or two doses of aluminium-adsorbed tetanus toxoid. *Bull World Health Organ* 1980; **58**: 927–30.
- 3 Clemens JD, Stanton BF, Chakraborty J, et al. Measles vaccination and childhood mortality in rural Bangladesh. *Am J Epidemiol* 1988; **128**: 1330–39.
- 4 Chowdhury AMR, Chowdhury S, Islam MN, Islam A, Vaughan JP. Control of tuberculosis by community health workers in Bangladesh. *Lancet* 1997; **350**: 169–72.
- 5 Philips JF, Simmons R, Simmons GB, Yunus M. Transferring health and family planning service innovations to public sectors: an experiment in organization development in Bangladesh. *Stud Fam Plann* 1984; **15**: 62–73.
- 6 Chen LC, Huq E D'Souza S. Sex bias in the family allocation of food and health care in rural Bangladesh. *Popul Dev Rev* 1981; **7**: 55–70.
- 7 Bhuiya A, Chowdhury A. Beneficial effects of a woman-focused development programme on child survival: evidence from rural Bangladesh. *Soc Sci Med* 2002; **65**: 1553–60.

The challenges of malaria elimination

We share Chris Cotter and colleagues' (Sept 7, p 900)¹ concerns regarding the challenges ahead in strategic research for malaria control; however, we believe several issues demand closer attention, especially within historical context.



Karen Kasamaki/Corbis

See *Series* pages 1734 and 1746

Submissions should be made via our electronic submission system at <http://ees.elsevier.com/thelancet/>

Foremost, the factors that contribute to the successful elimination of malaria remain obscure; indeed, debate has scarcely progressed in almost 90 years.² Without realistic consideration of this fundamental gap, the potential for resurgence remains. Although the epidemiological situation has changed dramatically, the massive *Plasmodium vivax* epidemic in Sri Lanka in 1968, caused by programme changes, population movements, and undetected low-level infections remains a stark reminder of malaria's truly explosive potential for resurgence.³

The increasing focus on hot-pops, forested areas, and migration is not new; the issues raised in a WHO report⁴ more than 20 years ago are essentially unchanged, aside from trading one type of resistance (chloroquine) for another (artemisinin). Without transnational cooperation to address parasite persistence within these populations in southeast Asia, these same issues will appear in Reviews in another few decades' time.

Finally, we were gratified to see renewed focus on local control as a priority in Cotter and colleagues' Review.¹ Wisdom expressed 75 years ago resonates clearly, cautioning against premature generalisable solutions and stating that although no royal road for malaria control exists, research can provide solutions to the multitude of diverse local problems.⁵ Comprehensive assessment of the microepidemiology was and should remain the crucial consideration in control and elimination of malaria.

We declare that we have no conflicts of interest.

***Andrew A Lover, Richard J Coker**
andrew.a.lover@gmail.com

National University of Singapore, Saw Swee Hock School of Public Health, 117597 Singapore, Singapore (AAL, RJC); and Communicable Diseases Policy Research Group, London School of Hygiene and Tropical Medicine, Bangkok, Thailand (RJC)

- 1 Cotter C, Sturrock HJ, Hsiang MS, et al. The changing epidemiology of malaria elimination: new strategies for new challenges. *Lancet* 2013; **382**: 900–11.
- 2 James SP. The disappearance of malaria from England. *Proc R Soc Med* 1929; **23**: 71–87.

- 3 Gramiccia G, Beales P. The recent history of malaria control and eradication. In: Wernsdorfer WH, Gregor IM, eds. *Malaria: principles and practice of malariology*. Edinburgh, New York: Churchill Livingstone, 1988.
- 4 WHO. Regional Office for South-East Asia. Forest-related malaria in countries of the South-East Asia Region: report of the informal consultative meeting, New Delhi, 18–22 February 1991. New Delhi, World Health Organization, South-East Asia Region, 1991.
- 5 Swellengrebel NH. Presidential address at the opening of the Third International Malaria Congress. *Acta Conv Tertii Malariae Morbis* 1938; **2**: 19–23.

Chris Cotter and colleagues¹ have recently outlined new strategies for moving forward in the field of malaria elimination. In the subsequent issue of *The Lancet*, Lucy Tusting and colleagues² discussed socioeconomic development as an intervention against malaria. These reports^{1,2} reflect the complexity of malaria but underestimate that malaria is also a disease of the broader ecological environment. As a result, the opportunity for malaria strategies to target both health and climate change is lost.

Climate change can be considered as the “biggest global health threat of the 21st century”.³ Vector-borne diseases are repeatedly highlighted as a key area which will be affected by climate change. The relation between malaria incidence, geographic distribution, and environmental factors such as temperature, precipitation, seasonality, and deforestation means that mitigation and adaptation strategies must be central to any malaria intervention. Otherwise, climate change has the capacity to undo the success made in the fight against malaria. According to Costello and colleagues,³ estimates suggest that 260–320 million more individuals could be affected by malaria by 2080 as a consequence of new transmission zones. A resurgence of malaria or entry into non-endemic areas would have important health and socioeconomic costs.

Chris Cotter and colleagues¹ discuss interventions promoting changes in receptivity to malaria transmission. If health professionals harness the synergies between the environment

and health, they have a chance to change the receptivity of our future environment to malaria and tackle several issues simultaneously.

I declare that I have no conflicts of interest.

Ruth M Little
rmlit1@student.monash.edu

Monash University, Melbourne, VIC 3004, Australia.

- 1 Cotter C, Sturrock HJW, Hsiang MS, et al. The changing epidemiology of malaria elimination: new strategies for new challenges. *Lancet* 2013; **382**: 900–11.
- 2 Tusting LS, Willey B, Lucas H, et al. Socioeconomic development as an intervention against malaria: a systematic review and meta-analysis. *Lancet* 2013; **382**: 963–72.
- 3 Costello A, Abbas M, Allen A, et al. Managing the health effects of climate change. *Lancet* 2009; **373**: 1693–733.

Malaria vaccine technology roadmap

Despite the major public health effect of the scale-up of available control measures, malaria remains the largest single cause of child mortality in many settings in Africa.¹ More than 3 billion people remain at risk of malaria, and roughly 1800 people die of it each day,² with children and women from poor communities being most affected. Although continued innovations in diagnostic testing, antimalarial drugs, and vector control measures are likely to have an important role in accelerating progress, malaria vaccines also have great potential to contribute to defeating malaria—if they can be successfully developed.

The malaria vaccine technology roadmap was initially published in 2006. On Nov 14, 2013, WHO publishes the first comprehensive update to this global strategic research and development roadmap. It is the result of extensive consultations with scientists and public health experts from non-endemic and malaria-endemic countries, industry, non-governmental organisations, and funding agencies. The updated roadmap was reviewed and endorsed by WHO advisory committees for immunisation and malaria.^{3,4}



Published Online
November 14, 2013

[http://dx.doi.org/10.1016/S0140-6736\(13\)62238-2](http://dx.doi.org/10.1016/S0140-6736(13)62238-2)

For the 2006 malaria vaccine technology roadmap see http://www.malariavaccine.org/files/Malaria_Vaccine_TRM_Final_000.pdf