Correspondence

Malaria in Car Nicobar Island in the aftermath of the tsunami: Some observations

Car Nicobar is a remarkably flat island located in the southeast of the Bay of Bengal, 230 km from Port Blair, which is the capital of Andaman and Nicobar Islands. The tropical climate of Car Nicobar Island provides an ideal environment for mosquito breeding and proliferation.[1,2] The tsunami of 26 December 2004 killed thousands of people and the entire population was rendered homeless.[1,3] Moreover, the intense geological activity resulted in subduction of land in the Nicobar group of islands by 0.5–0.8 m.[4,5] In 1989, a total of 3810 cases of malaria with an annual parasite incidence (API) of 194.4 per 1000 were reported from the island. The API came down to 4.3 per 1000 in 2002.[6] With this background, we analysed the trend in malaria surveillance and incidence from 2003 onwards and did an observational study during heavy rainfall to assess the environmental conditions that favour transmission of malaria. Table I depicts the malaria scenario of Car Nicobar Island in the context of the tsunami. We list the following 4 reasons for the large increase in the incidence of malaria in Car Nicobar Island in 2005.

1. The inundation of sea water and subsequent trapping created numerous pools of water.
2. The numerous streams of water which used to carry monsoon water to the sea used to get dried within a few hours of the rain stopping but post-tsunami they have become stagnant due to the altered geology.
3. The contact of sea water to the land has increased due to the geographic tilt from the network of creeks, periodic spring tides and diurnal high and low tides. This might have resulted in increased salinity of whatever water was stored inland.
4. The habitat of the tribal people has shifted from the sea shore to interior jungles following the tsunami.

All these factors favoured the breeding of *An. sundaicus*,[7] the predominant vector of malaria in these islands[8,9] and increased the chances of tribes getting exposed to the bite of a mosquito. Similarly, we suggest the following 4 reasons for the drastic decline in the incidence of malaria in 2006 and 2007.

1. The guidelines of the National Vector-borne Disease Control Programme (NVDCP) such as spraying, fogging and antilarval measures, were scrupulously implemented.
2. Impregnated bed nets were made available to the community.
3. The tribal community was made aware of the epidemic of malaria and measures for protection.
4. By mid-2006, large-scale production of larvivorous fish *G. affinis* was achieved and these were released in almost all artificial pools of water in the island.

Though for the present, the epidemic has been contained with these measures, keeping the long term perspective in mind, we have stepped up our applied field research to map out the habitat of malaria vector in Car Nicobar as well as the whole of Nicobar group of islands in the context of altered geology due to the tsunami.

TABLE I. Trend in malaria surveillance and incidence: Pre-tsunami *v.* post-tsunami years

Year	ABER	Malaria cases	*P. vivax* cases	*P. falciparum* cases	API/ 1000	AFI/ 1000
2003	119.26	485	237	248	23.90	12.22
2004	122.49	249	172	74	12.27	3.64
2005	124.19	1919	447	1452	105.35	79.71
2006	103.83	479	58	413	27.43	23.65
2007	153.80	229	7	221	9.70	9.36

ABER annual blood examination rate [(ABER=Total blood smears examined in a year/total population)×100] API annual parasite incidence [(API=Total confirmed cases in a year/total population)×1000)] AFI annual falciparum incidence [(AFI=Total falciparum positives in a year/total population)×1000)

ACKNOWLEDGEMENTS

We are grateful to the Tribal Council of Car Nicobar Island for their cooperation in our efforts to control malaria. This public health responsibility was supported by the internal funds of the Indian Council of Medical Research and Directorate of Health Services, Andaman and Nicobar Islands, India.

Sathya Prakash Manimunda
Regional Medical Research Centre (ICMR)
Post Bag No. 13, Dollygunj
Port Blair
Andaman and Nicobar Islands
sathya_pblair@yahoo.co.in

Wajid Ali Shah
G.B. Pant General Hospital
Port Blair
Andaman and Nicobar Islands

Ananganalluru Nagarajan Shriram
Attayooru Purushottaman Sugunan
Regional Medical Research Centre (ICMR)
Post Bag No. 13, Dollygunj
Port Blair
Andaman and Nicobar Islands

Eapen Titus
A. Charles
Santhosh Kumar Sur
B.J.R. Hospital
Car Nicobar
Andaman and Nicobar Islands

Paluru Vijayachari
Regional Medical Research Centre (ICMR)
Post Bag No. 13, Dollygunj
Port Blair
Andaman and Nicobar Islands
India

REFERENCES

1 District Administration, Nicobar district, Andaman and Nicobar Islands. Location and general particulars, islands statistics, life in Nicobar—post Tsunami. Available at *http://nicobar.nic.in/island_wise_info.htm* (accessed on 26 January 2008).
2 Das MK, Ansari MA. Evaluation of repellent action of *Cymbopogan martinii martinii* Stapf var *sofia* oil against *Anopheles sundaicus* in tribal villages of Car Nicobar Island, Andaman & Nicobar Islands, India. *J Vector Borne Dis* 2003;**40:**100–4.
3 National Institute of Public Finance and Policy. *State Development Report of Andaman & Nicobar Islands, June 2006.* New Delhi:National Institute of Public Finance and Policy. p. 252. Available at *http://www.nipfp.org.in/State%20Development%20Report%20of%A&NI-Final%20(June%2006).pdf* (accessed on 26 January 2008).
4 Ramanamurthy MV, Sundaramoorthy S, Pari Y, Ranga Rao V, Mishra P, Bhat M, *et al*. Inundation of sea water in Andaman and Nicobar Islands and parts of Tamil Nadu coast during 2004 Sumatra tsunami. *Curr Sci* 2005;**88:**1736–40.
5 National Institute of Public Finance and Policy. *State Development Report of Andaman & Nicobar Islands, June 2006.* New Delhi: National Institute of Public Finance and Policy. p. 142. Available at *http://www.nipfp.org.in/State%20Development%20Report%20of%A&NI-Final%20(June%2006).pdf* (accessed on 26 January 2008).

6 Malaria Research Centre Document. *Car Nicobar (Andaman & Nicobar Islands)*. Available at *http://www.mrcindia.org/idvc-profile/14.pdf* (accessed on 26 January 2008).
7 Krishnamoorthy K, Jambulingam P, Natarajan R, Shriram AN, Das PK, Sehgal SC. Altered environment and risk of malaria outbreak in South Andaman, Andaman & Nicobar Islands, India affected by tsunami disaster. *Malar J* 2005;**4:**32.
8 Senior White R. On the anthrophilic indices of some *Anopheles* found in east central India. *Indian J Malariol* 1947;**1:**111–22.
9 Malaria Research Centre. *Science and technology project report on integrated vector control of malaria, filarial and other vector borne diseases*. Delhi:Malaria Research Centre; 1989:374–7.

Geographical heterogeneity of immigration and career paths of medical graduates in India

I read with interest the report by Pai on career preferences of medical students who joined Grant Medical College, Mumbai 50 and 25 years ago.[1] The data from 50 years ago was understandably incomplete when compared with the data obtained for the batch that joined the institution 25 years ago. The following conclusions can be drawn from these data.

Brain drain of medical graduates from India to other countries has indeed decreased. This could be related to increased opportunities in terms of career potential and financial prosperity due to tremendous increase in the number of high quality corporate hospitals in India. Training facilities are now available in diverse specialties of medical disciplines. The burgeoning middle class with higher purchasing power understands that good medicine costs money and families are willing to pay for such services. Provision of medical insurance and tax benefits have also helped.

The disciplines of medicine, surgery, gynaecology, paediatrics, ophthalmology and otorhinolaryngology still draw a large number of medical graduates. In spite of long training periods, difficult working hours and poor pay packets compared with those of their counterparts in software, banking and engineering fields, medical graduates are satisfied and feel that they lead a fulfilling life. One sad finding from this study is that only 4% of medical graduates from Grant Medical College were in government/academic jobs. This does not augur well for India. I believe that bright medical graduates should join teaching jobs so that our future medical graduates are better trained. The crisis of medical teachers in India has been highlighted in another paper in the same issue of the journal.[2]

Finally, the author has countered the idea floated in several papers[3,4] that large number of medical graduates leave India for a better life or financial prospects. While the argument holds true for students of some elite institution such as the All India Institute of Medical Sciences, it is certainly not true for the large majority of medical graduates. One recent problem which may force a large number of medical graduates to seek opportunities abroad and may start another wave of brain drain, as it happened for the 1957 entrants of Grant Medical College, is the insufficient number of seats for postgraduate training in India. Though medical colleges produce more than 20 000 graduates a year, only a small percentage get to do a postgraduate course due to the limited number of seats and restrictive rules of the Medical Council of India (MCI). While a small country such as Great Britain conducts the MRCP examination for 1200 medical graduates a year, a 20 times larger country (India) has much less seats for MD medicine and DNB (Medicine). Unless this anomaly is corrected, India will face another round of migration of medical graduates who aspire to higher training.

If we look for patterns of migration of medical graduates from India, there is interesting geographical heterogeneity. A large number of medical graduates migrate from Punjab, Gujarat and Delhi. This may be related to the higher levels of overall migration from these states and the opportunities of having a relative or a friend abroad who can provide support during the crucial early months of settling abroad and can also act as a surety for obtaining a visa. Though people from Kerala migrate everywhere they are present in overwhelming numbers in middle eastern countries where very few medical graduates migrate to from the northeastern states and Madhya Pradesh, Bihar, Rajasthan, Jharkhand and Chhattisgarh.

Geographical variations exist in the preference of specialties of medicine opted by medical graduates. I do not have detailed data to back this claim but I am surprised that so many cardiothoracic surgeons from Andhra Pradesh have gone to various parts of the world.

The dwindling number of medical graduates in research is a worldwide phenomenon. Besides financial reasons, a big issue is social apathy. Medical researchers are regarded as third-raters who have been dumped to the dustbin of a research career because of their incompetence. Unless society changes its attitude and the government takes corrective steps there may not be any medical graduate left to do research in India.

Kinjalka Ghosh
Department of Cardiology
P.D. Hinduja Hospital
Mumbai
Maharashtra

REFERENCES

1 Pai SA. Career preferences of medical students who joined Grant Medical College, Bombay in 1957 and 1982. *Natl Med J India* 2009;**22:**121–3.
2 Ghosh K, Ross C. The teacher and the taught: Medical education in India at the crossroads. *Natl Med J India* 2009; **22:**147–9.
3 Kaushik M, Jaiswal A, Shah N, Mahal A. High-end physician migration from India. *Bull World Health Organ* 2008;**86:**40–5.
4 Rao NR, Rao UK, Cooper RA. Indian medical students' views on immigration for training and practice. *Acad Med* 2006;**81:**185–8.

Learning from Binayak Sen: Doctors as advocates of the poor and marginalized

We were indeed pleased to read Professor Jacob's article on 'Health, health workers and human rights: Dr Binayak Sen and the silence of the medical fraternity in India'.[1] We would like to elaborate on two issues that were raised by Professor Jacob. The first is the fact that the police have argued that Dr Sen did not practise medicine. The second is the hesitance of the medical fraternity to take on the mantle of being 'advocates of the poor'.

Did Dr Sen practise medicine?

Anyone with even a superficial knowledge of the history of medicine would be aware that Dr Sen is only one in a long line of physicians who responded to the social determinants of health that they saw in the communities they worked for. Numerous doctors such as Rudolph

Virchow, Ernesto Che Guevara, Slavador Allende, Norman Bethune, Dwarkanath S. Kotnis, N. H. Antia, Rajnikant Arole (to name a few of the more well known) have recognized the broader determinants of health and have openly articulated this responsibility of the medical profession. Referring to a cholera outbreak in Berlin during the mid-1800s, Virchow wrote, 'Is it not clear that our struggle is a social one, that our job is not to write instructions to upset the consumers of melons and salmon, of cakes and ice cream, in short, the comfortable bourgeoisie, but is to create institutions to protect the poor, who have no soft bread, no good meat, no warm clothing, and no bed, and who through their work cannot subsist on rice soup and camomile tea...?'[2]

Thus, the practice of medicine with a deepened sense of social awareness is a vital and dynamic stream within the history and practice of medicine. While the articulation of human rights and invoking the concept of the fundamental human right to health is more recent than this stream of 'social medicine', it is equally dynamic with the office of the special rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health (*http://www2.ohchr.org/english/issues/health/right/*) laying down clear frameworks and principles with which to work. Numerous health networks today invoke this concept. The Right to Health campaign of the Jan Swasthya Abhiyan (*http://phm-india.org/*), and the Right to Primary Health Care Campaign of the Jan Arogya Andolana–Karnataka[3] are recent examples in India. Thus, Dr Sen's move from the tertiary care Christian Medical College, Vellore (CMC) through Shaheed Hospital, Hoshangabad and Tilda Mission hospitals to being the national vice-president of the People's Union for Civil Liberties (PUCL) is an understandable rational journey that merely follows and responds to the evidence that working among the poor and marginalized throws up.

Physicians as advocates of the poor

Dr Sen's imprisonment without bail for 2 years is an example of how those who ask uncomfortable questions about existing inequities, and forced models of 'development' are increasingly being targeted. The unprecedented support which the campaign for the release of Dr Sen received from wide-ranging quarters, including Nobel laureates, artists, students and academics, is an index of the popularity and value of his work as a public health and medical practitioner. The campaign which created high levels of energy and interest, and involved the use of online networking tools effectively should serve as an example of citizen activism in the face of oppression of voices of dissent.[4,5] While doctors may not have been the most visible or numerous in the campaign, there were hundreds who did get involved in various ways. More than 100 medicos, including senior medical practitioners from across the country wrote to the Prime Minister in May 2009 asking for a review of Dr Sen's imprisonment.[6] Most importantly, news about the issues and the campaign reached a large number of medical practitioners through coverage in medical journals.[7–9] It is imperative that the momentum gained from rising awareness of the linkages between equity, health and human rights as represented by Dr Sen's work should be shared widely and serve as a model for medical practitioners, especially trainees in medical colleges.

The fact that there are deeper reasons for ill-health, rather than only germs, genes and toxins was recognized and accepted as early as the 1980s by international health institutions, with the UNICEF invoking the framework of dividing causes into immediate, intermediate and basic—the basic causes included poverty, unemployment, etc. Vicente Navarro and Debabar Banerji are respected academics who have consistently made the connection between ill-health and structural causes. More recently, the writing of Paul Farmer,[10] and numerous academics and practitioners attached to the People's Health Movement have spelt out these links. Publications such as Global Health Watch-1 and -2 (*http://www.ghwatch.org/*) too highlight these.

The links between ill-health and the problems of corporate-led neo-liberal globalization are today more 'evidence-based' than ever. It thus becomes a responsibility and ethical imperative rather than merely an ideological idiosyncrasy for all practising physicians to recognize these links and raise our collective consciousness as well as our voices to protest these injustices happening in the name of development. Dr Sen's is among that small but growing band of health workers who are merely trying to be, in the words of Virchow, '...advocates for the poor'.

Rakhal Gaitonde
rakhal.gaitonde@gmail.com

Anant Bhan
Premdas E.
Sukanya R.
Srinivasan C.
Renu Khanna
Sarojini N. B.
Mira Sadgopal
Manisha Gupte
On behalf of Medico Friend Circle (*www.mfcindia.org*)

REFERENCES

1 Jacob KS. Health, health workers and human rights: Dr Binayak Sen and the silence of the medical fraternity in India. *Natl Med J India* 2009;**22:**35–7.
2 Virchow R. *Werk und Wirkung.* Berlin:Rutten & Loenig; 1957. Quoted in: Waitzkin Howard. One and a half centuries of forgetting and rediscovering: Virchow's lasting contributions to social medicine. *Social Medicine* 2006;**1:**5–10.
3 Jan Arogya Andolana Karnataka (JAAK), Karnataka. Activity Report: From April 2006 to August 2007. Available at *http://www.sochara.org//images/stories/PDFs/jaak%20synthesis.pdf* (accessed on 16 August 2009).
4 Chaturvedi S. Detention of Dr Binayak Sen: Something must be seriously wrong somewhere. *Indian J Community Med* 2008;**33:**212–13.
5 Sathyamala C. Binayak Sen: Redefining health care in an unjust society. *Indian J Med Ethics* 2007;**4:**104–5.
6 Free Binayak Sen Campaign. 100+ medicos write to PM. 2009 May 15. Available at *http://www.binayaksen.net/2009/05/100-medicos-writes-to-pm/* (accessed on 28 July 2009).
7 Mudur G. Indian paediatrician has been two years in prison without trial. *BMJ* 2009;**338:**b1864.
8 Anonymous. A right to a fair trial, a right to life. *Lancet* 2009;**373:**1146.
9 Bhan A. Binayak Sen awarded the Jonathan Mann award for Global Health and Human Rights. *Natl Med J India* 2008;**21:**157.
10 Farmer P. Challenging orthodoxies: The road ahead for health and human rights. *Health and Human Rights* 2008;**10:**15–19. Available at *http://www.hhrjournal.org/index.php/hhr/article/view/33/10*0 (accessed on 16 August 2009).

Futile medical care: An ethical battleground

Is it ethical to aggressively treat and resuscitate a patient with a terminal disease such as metastatic cancer, contrary to expressed wishes of the patient and family? Does the situation change a few days after the operation if the patient had a major organ failure and voluntarily consented to surgery? Does it matter whether the medical care is free or paid for?

I have often been part of debates such as these during my residency and fellowship training in the USA. Unfortunately, no amount of experience from the physician side of the doctor–patient relationship fully prepares you when you happen to be on the other side. Recently, a family member, approaching 80 years of age, underwent surgery for recurrence of colon cancer. This turned out to be more complicated than expected and, in spite of good medical care, she developed postoperative acute renal failure. Medical statistics indicate a grim

prognosis in this scenario. In view of the terminal nature of the underlying disease, the family and patient expressed a desire for comfort care without dialysis and, in the event of cardiopulmonary arrest, desired that there be no ventilation or resuscitation.

As the communicating member of the family, I was somewhat surprised to be told that our view would be 'taken into consideration'. In my training, disregarding a patient's wishes concerning artificial prolongation of life was unethical unless there were strong reasons. The motive of the physicians did not seem to be financial gain because they showed a willingness to reduce/waive some charges; but to give the patient a 'chance'. Any unwillingness to give the patient a 'chance' was frowned upon in a paternal manner and the expressly stated wishes of the conscious but sedated patient or family were simply ignored. It transpired that the fates were kind and the patient passed away within 2 days despite dialysis, inotropic cardiac support, intubation and ventilation, and all the brouhaha that we can do to hang on to a departing soul. I found it particularly galling that when the patient and family refused intubation, they were firmly told that ethics did not permit such care to be withheld. What these ethics may be remains unclear. Preservation of life at all costs is in itself not ethics and seems borne of fear, greed or sheer ignorance. While I do not doubt that in this case the treating physicians meant well, this is a good example of the old saying that the road to hell is paved with good intentions. Ethical considerations in end-of-life care should be a mandatory part of medical curriculum and continuing medical education.

Anurag Agrawal
Centre of Excellence, Translational Research in Asthma and Lung disease (TRiAL)
Institute of Genomics & Integrative Biology
New Delhi
a.agrawal@igib.res.in