# News from here and there

### Zika virus disease causes microcephaly

On 1 December 2015, the Pan American Health Organization (PAHO) issued an epidemiological alert warning of a suspected link between Zika and Guillain–Barré syndrome or microcephaly, but with the caveat that final proof was lacking. However, the health ministries of Brazil and Mexico, where Zika cases have been seen, have stated that the link is Zika virus.

Zika virus disease is a mosquito-borne viral disease caused by the Zika virus, a member of the *Flavivirus* genus, family Flaviviridae. The virus is named after the Zika forest in Uganda where it was first isolated in 1947 in rhesus monkeys in the course of mosquito and primate surveillance. It then spread to Southeast Asia where it caused small sporadic infections. In 2007, the first major outbreak occurred in the Yap Islands of Micronesia. In 2013, a bigger outbreak occurred in French Polynesia, where the estimated infection rates were 70% on some islands. There were also reports of Guillain–Barré syndrome among adults.

The virus first appeared in the western hemisphere in February 2014, on Chile's Easter Island. Since then, it has spread over the length and breadth of Latin America. The first confirmed Zika virus infection in Brazil was in March 2015. Over the past 5 years, Brazil (population: 204 million), had 130 to 170 cases of microcephaly each year. From January to September 2015, this figure roughly doubled, and between October and December 2015, over 2400 new cases have been reported.

Zika virus is a 40 nanometre enveloped virus with an icosahedral shape. It has a non-segmented single-strand, positive sense RNA genome. The genome encodes for a polyprotein with three structural proteins and seven non-structural proteins. The virus is primarily transmitted to people through the bite of an infected Aedes species mosquito (*A. aegypti/A. albopictus*).

The Zika virus can be transmitted from an infected pregnant woman to her foetus during pregnancy or around the time of birth. Currently, there are no reports of Zika virus transmission through breastfeeding.

Sexual transmission of the virus is possible. The virus is present longer in semen than in blood. Zika virus has been detected in blood and other body fluids including urine, semen, saliva, amniotic fluids as well as cerebrospinal fluid. During the outbreak in French Polynesia, 2.8% of blood donors tested positive for Zika virus. The virus has also been found in blood donors in previous outbreaks. There have been multiple reports of transmission of the virus through blood transfusion in Brazil.

Most Zika virus infections are asymptomatic. Severe infection leading to hospitalization is uncommon and case fatality is low. However, as mentioned above, there is a likely link between Zika virus infection and Guillain–Barré syndrome or microcephaly. Infection is likely to give lifelong immunity.

No specific antiviral treatment is available for Zika virus infection. Infected people should get plenty of rest, sufficient fluids, and analgesics and antipyretics.

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### Paris Agreement highlights health effects of climate change

The Paris Agreement paves the way for the foundation of a new era in the global response to climate change. On 12 December 2015, in Paris, France, 186 countries published their action plan, which states the intended way to reduce their greenhouse gas emissions. India was also a signatory. The Paris Agreement on climate change has put health at the centre of the effort to control global warming and has sent a message to all countries that a reduction in fossil fuel burning will reduce illness and have a tremendous public health policy impact. As assured in the agreement, 'the right to health' will be central to the actions taken. The agreement not only sets ambitious aims to curb greenhouse gas emissions to keep global warming well below 2 °C; it also commits countries to strengthen adaptation. This includes implementing plans that should protect human health from the worst impacts of climate change such as air pollution, heat waves, floods and droughts, and the ongoing degradation of water resources and food security.

WHO has found that overall health effects of climate change are negative and climate change has a strong impact on the social and environmental determinants of health such as clean air, safe drinking water, sufficient food and secure shelter. Health is repeated three times in the core text of the agreement, and refers to the 'co-benefits' of tackling health and climate change at the same time. In this context, engaging with and addressing climate change-related impact on health is vital. Approaches based on human rights obligations, standards and principles are critical to understand and address the threat that climate change poses to human health and well-being. Sadly, only 15% of the countries have drawn up plans for climate change to include health. India is not among them. The lives of millions residing along the coast are endangered due to the risk of the sea level rising. The reduction target of 1.5 °C will minimize this risk.

PRITAM ROY, *New Delhi*

### Indian science on the ascent, reports *Nature Index 2014*

Indian science has shown an improvement in recent times—this is the finding of a report published by the journal *Nature* in collaboration with the Confederation of Indian Industry (CII). The report, entitled 'Indian science ascending' was released on 3 December 2015. The study was the first *Nature Index* report on India. The index evaluated about 60 000 scientific publications in 68 high-quality journals.

India is 13th in the list, with the USA, China and Germany being in the top three. The Indian Institutes of Technology (IITs), followed by the Council for Scientific and Industrial Research (CSIR) and the Indian Institute for Science Education and Research (IISER) were the organizations with the maximum research output. Chemistry has historically been a subject that Indian science has done well in and this was confirmed in this Index. Life science

research, however, clearly needs to be addressed by India. Of institutions that were devoted to life sciences, the National Institute of Immunology and the National Centre for Cell Science headed the list.

Other findings were that Indian scientists collaborate with scientists abroad. Collaboration was with 85 countries, of which the USA and Germany were most popular for collaboration. However, academia–industry collaboration is still low in India, according to the study.

With a science budget of ₹362.69 billion (US$ 6 billion) in 2014, the government spends only about 1% of the gross domestic product (GDP) on science.

Subbaiah Arunachalam, Distinguished Fellow at the Centre for Internet and Society, Bengaluru, told the *Natl Med J India*, 'There are some problems with the CII–Nature India report. All IITs are clubbed as a single institution. So are all CSIR labs and Indian Institutes of Science, Education and Research (IISERs). On any day, the Indian Institute of Science is far ahead of any IIT or any CSIR laboratory in research.' He added: 'True, India's contribution to life sciences is not on par with that to chemistry and physics. New biology research—studying biology at the molecular level—took time to pick up in India, whereas India had a number of both theoretical and experimental physicists and chemists of class for younger researchers to look up to. To name a few, S.N. Bose, J.C. Bose, M.N. Saha, C.V. Raman, K.S. Krishnan, Acharya P.C. Ray and the Calcutta school of chemists, and the natural products chemists (T.R. Seshadri, K. Venkataraman, T.R. Govindachari and D.K. Banerjee). In contrast, we had a few biologists and they were mostly into classical biology. Also, most research in India, especially biological research, is largely carried out in independent research institutes, rather than in universities from where the next generation of researchers comes. These institutes were set up only recently, and the faculty numbers are small. The total number of biology faculty in all leading Indian institutions put together will be less than the number of faculty in a medium size US university! We lack critical mass.'

Further, he stated, 'But things are changing, largely due to the visionary leadership provided by men such as the late Professor Obaid Siddiqi and the Department of Biotechnology. After an 8-month-long visit to India seven years ago, two American biologists Ronald D. Vale and Karen Dell concluded, "India is becoming an increasingly viable location to conduct biological research and a fertile ground for new biotechnology companies".'

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*The National Medical Journal of India* is looking for correspondents for the '**News from here and there**' section. We are particularly interested in getting newswriters from the north and northeast regions of India as well as from other countries. By news, we refer to anything that might have happened in your region which will impact on the practice of medicine or will be of interest to physicians in India. The emphasis of the news items in this column, which are usually from 200 to 450 words, is on factual reporting. Comments and personal opinions should be kept to a minimum if at all. Interested correspondents should contact SANJAY A. PAI at *sanjayapai@gmail.com* or *nmji@nmji.in*