The report, *A Race against Time: The Challenge of Cardiovascular Disease in Developing Economies*, concluded that cardiovascular diseases could become a public health time bomb in developing countries if too little is done to reverse the trend.

Professor Shah Ebrahim, a cardiovascular diseases expert at Bristol University in England, said the projections were reasonable and should be enough to make policy makers take notice. He also said that cardiovascular diseases were also often neglected because of a lack of data and training.


Fiona Fleck, Geneva

**Brazilian genomics breakthrough offers hope for leptospirosis control**

A team of Brazilian researchers has sequenced the genome of a bacterium which causes leptospirosis, a disease which infects over 100 000 people and causes 1000 deaths worldwide every year. The breakthrough has been hailed as a first step towards creating a vaccine against one of the world’s most widespread zoonoses (diseases affecting both humans and animals).

“The research is important since … it will open new opportunities for developing quicker and more precise diagnostic tests and vaccines for preventing leptospirosis,” said Dr Carlos Morel from the Oswaldo Cruz Foundation, a biomedical research centre linked to Brazil’s Ministry of Health.

The researchers, whose findings were published in the *Brazilian Journal of Medical and Biological Research* (2004;37:459-77), analysed the 4.6-million-base-pair genome of the strain of bacteria mainly responsible for the disease in Brazil, *Leptospira interrogans* serovar *Copenhageni*. The results of their research have pointed to the identification of candidate proteins for this purpose. Although leptospirosis can be treated with antibiotics, when left untreated it can lead to kidney damage, liver failure and, in extreme cases, death.

“We have already isolated 23 proteins … that we consider potentially important for the development of a vaccine against leptospirosis,” said Ana Lucia Tabet Oller do Nascimento, a researcher from Butantan Institute in São Paulo and lead author of the study. The 23 proteins were selected because of their ability to induce the production of antibodies in humans, explained Nascimento. “However, we need now to test if such antibodies are in fact protective against the disease,” she added. The researchers are now analysing another 200 proteins.

Despite the success of their research, Nascimento estimated it would take around ten years to develop a vaccine or any other product offering protection against the disease.

“Nothing is done in the short term when we are talking about developing a vaccine, which includes several steps between the sequencing and the final product. To believe that genomics can shorten such a period of time is to believe in magic or miracles,” said Morel who views genomics research as a potentially powerful tool for controlling developing country diseases.

Leptospirosis occurs worldwide in urban and rural areas and in both tropical and temperate regions, mostly in developing countries. It is contracted by humans through direct contact with the urine of infected animals or by contact with a urine-contaminated environment. The disease has been found in both wild and domestic animals including rodents, insectivores, dogs, cattle, pigs and horses. It is therefore an occupational hazard for those who work outdoors or with animals and a recreational hazard for those who swim or wade in contaminated waters.

The number of human cases worldwide is not well-documented. According to WHO, it probably ranges from 0.1 to 1 per 100 000 per year in temperate climates to 10 or more per 100 000 per year in the humid tropics. During outbreaks and in high-risk groups, 100 or more per 100 000 may be infected. In Brazil 4128 cases were recorded in 2000, according to the National Foundation of Health.

The science of genomics — the branch of genetics that studies organisms in terms of their full DNA sequences (or genomes) — has been accelerating in recent years with very positive implications for combating diseases affecting developing countries, says the report *Genomics and world health*, published by WHO in 2002. However, according to the report, 80% of DNA patents in genomics between 1980 and 1993 are held in the US. Of the 1235 new drugs marketed between 1975 and 1999, only 13 were approved specifically for tropical diseases.

“In this regard, steps need to be taken to avoid the creation of a ‘genomics divide,’ to ensure that the benefits of the
New international convention allows use of DDT for malaria control

Malaria-endemic countries can continue using dichlorodiphenyltrichloroethane (DDT) to help control malaria due to an exemption clause in a convention banning the controversial substance. The Stockholm Convention on Persistent Organic Pollutants which came into force on 17 May, following its ratification by 50 states, outlawed the use of 12 industrial chemicals — dubbed the “Dirty Dozen,” — including DDT.

The exemption clause allows malaria-endemic nations to use DDT strictly for indoor residual wall spraying (IRS): a measure which contributed to slashing the number of malaria cases in South Africa from 64 622 in 2000 to 8016 last year.

“Malaria is now at its lowest level in ten years,” said Rajendra Maharaj, a specialist scientist working with South Africa’s national malaria control programme. “We attribute that to DDT.”

Under pressure from environmentalists, South Africa suspended DDT for IRS in 1996 after five decades of use and switched to another class of insecticide known as pyrethroids. But the 1999–2000 malaria epidemic in KwaZulu-Natal and neighbouring provinces prompted the government to revert to DDT for prevention and to introduce artemisinin-based combination therapy for treatment.

Other African nations, such as Eritrea, Ethiopia and Swaziland have continually used DDT for IRS in certain areas. China and India — the main supplier of the insecticide — are two other countries currently using DDT focally. Some other countries in eastern and southern Africa are considering the introduction of DDT as part of their malaria control operations in epidemic-prone areas. The United Nations Environment Programme estimates that about 25 countries will use DDT under exemptions from the DDT pesticide ban.

Recognizing the role of DDT in disease vector control, WHO helped lobby for the exemption provisions during negotiations on the content of the Stockholm convention in 2000. Allan Schapira of WHO’s Roll Back Malaria department said that IRS is often more rapidly effective in controlling epidemics than insecticide-treated bed nets. However, “insecticide-treated bednets remain the recommended method in settings of intense, ongoing transmission where it is at least as effective and usually much more acceptable by the populations,” said Schapira.

Junaid M. Seedat, Managing Director of the international non-profit organization, Massive Effort Campaign, which campaigns to raise awareness of developing country diseases, said WHO