# Guest Editorial

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Despite the public health and therapeutic weapons the health services theoretically have in their hands, the germs causing communicable diseases demonstrate again and again that living organisms with a fast multiplication rate and changeable genetic material have the capacity to adapt to new hosts, to jump over the species barriers and possibly infect humans and acquire the capacity to efficiently spread among them.

After years of local, low-level transmission in Africa – from primates to humans, then between humans – HIV was detected in the 1980s in the USA in a sexual environment that allowed its easy transmission.[1,2,3,4] It leaves a footprint in the history of modern human societies as the plague did in the Middle Ages, highlighting – as many other infectious diseases have done – the inequalities between rich and poor in regard to access to heath prevention knowledge and practice and health care. HIV changed human perceptions of sexual freedom: in Western societies, the sexual revolution of the 1960s and '70s was followed by more careful practices, as demonstrated in industrialised countries by the decrease in sexually transmitted infections in the 1980s and '90s[5,6,7] – although fatigue has appeared recently in some high-risk communities with regard to safe sexual practices.[8] Is the Pacific Island region the ground for the last wave of the HIV pandemic? What do we need to know to be able to avoid it? (See Sladden's article "Twenty years of HIV surveillance in the Pacific: What do the data tell us and what do we still need to know?")

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Nipah virus and SARS coronavirus both appeared in southern Asia and infected humans from an intermediate animal host that was infected 'by chance' from unknown animal reservoirs of these viruses.[9,10,11,12] The environment, influenced by human activities, allowed transmission from the animal reservoir to animals handled by humans, and then to humans.[13,14] Whereas Nipah virus affected a limited population in only a couple of countries[15], SARS spread internationally and, given initial questions about its epidemiological capacities, definitely gave the international community a serious scare[16]: what if SARS had the same communicability as measles or influenza viruses?

The global monitoring of the H5N1 epidemic allows the scientific community to better understand the epidemiological dynamics underlying the circulation of this avian influenza virus among birds and its jump from birds to people. It may or may not allow the prevention of a new influenza pandemic, if we succeed in identifying the scourge and take advantage of this 'window of opportunity' to kill it at birth.[17]

In the meantime, since the last DEN-1 epidemic in the Pacific Island region, 2005 hasn't been marked by dengue. However, from existing data we can infer that another epidemic will very likely soon affect the region (see the article "Dengue in the Pacific: An update of the current situation" by Singh et al.). DEN-3 and DEN-4 are the most likely candidates, as the last two regional epidemics were caused by DEN-2 and DEN-1, respectively in 1996–99 and 2000–04. The household-friendly mosquito *Aedes (Stegomyia) aegypti*, as well as other *Aedes* mosquitoes, is a dengue vector and seems to be well adapted to the environment of the Pacific Islands (see Guillaumot's article "Arboviruses and their vectors in the Pacific: Status report"), so much so that humans can't get rid of it. Community-based vector control activities are critical in tackling the vector where it lives (see Noel's article "Dengue fever larval control in New Caledonia: Assessment of a door-to-door health educators program"). Aedes mosquitoes can also transmit re-emerging vector-borne diseases such as the chikungunya in the Indian Ocean[18,19] and the epidemic polyarthritis from Ross River virus that repeatedly affects neighbouring Australia.[20,21,22,23,24,25]

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The lessons from the above emerging and re-emerging examples are clear:

1. Surveillance, at both animal and human levels, is

the key to monitoring existing diseases and the early detection of emerging ones. It must be supported by laboratory services able to identify the cause of 'unusual cases', especially any cluster that occurs.

2. Surveillance, including early detection, must be linked with early and appropriate response or it will not fulfil its mandate, i.e. to be action-oriented.
3. Questions related to travel are important to help detect diseases that may present in a common manner at the beginning, e.g. patient fever with body aches. These questions should try to identify all potential sources of the disease (e.g. recent travellers) in the usual environmental locations of the patient.
4. In the area of emerging diseases, animal reservoirs of various germs and potential diseases are a reality, and we would benefit from better knowledge and understanding of these organisms. Close collaboration between animal and human health research and services is crucial to better understanding the epidemiology of various germs and preventing and responding to any alert they may cause.

The Pacific Public Health Surveillance Network (PPHSN), created in 1996, has been focusing on surveillance and response development to, as priority targets, the epidemic diseases.[26] As a first step, PacNet was created in April 1997 to allow the sharing of information on epidemic diseases and, more importantly, to serve as an early warning tool. It took advantage of the spread of information and communication technology in the region, and now effectively links Pacific Island health professionals.

It is clear that this early warning tool depends on national capacities and willingness to share information (Carter's article "Disease surveillance during the VII South Pacific Mini Games, Palau 2005 – Lessons learnt" illustrates PacNet usefulness for international reporting). To enhance this willingness, PacNet has been complemented since 2001 by PacNet-restricted, a list of selected key individuals from Pacific Island country and territory (PICT) ministries and departments of health, plus WHO country liaison officers and the PPHSN Coordinating Body. It is used to send and share requests for information regarding outbreak news published in the media and not yet reported to PacNet or PacNet-restricted ('rumours' surveillance). Membership of this list should be reviewed in the light of the new International Health Regulations (IHR)[27] and should very likely include EpiNet team members and IHR focal point representation (see the article "Implementing the new International Health Regulations in the Pacific: Challenges and opportunities" by Oshitani et al.).

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After PacNet was established, it was found crucial to develop or strengthen laboratory support to surveillance activities. Thus, LabNet was created in April 2000[28]. A LabNet technical working body, with representatives from WHO, SPC and the New Caledonia Pasteur Institute – as key and leading technical laboratory players in the Pacific Island region – was set up to lead the process of development, which is still on its way. Crucial steps include the establishment and reinforcement of Level 2 laboratories – i.e. the four laboratories that have accepted a regional role, especially Mataika House and Guam Public Health Laboratory; the easy access of Level 1 (national/territorial) laboratories to quality rapid testing whenever relevant; and easy specimen referral, such as dried venous blood spots (see the article by Leydon et al., "Hands-on training/workshop on the laboratory diagnosis of measles virus infection: Victorian Infectious Diseases Laboratory, May 24–27 2005"), with well-established shipment procedures.

In March 2001 at the Ministers of Health meeting in Madang, WHO, supported by SPC, proposed that each PICT that did not have one in place identify a multidisciplinary rapid response team, or 'EpiNet team', to enhance and better organise response; these teams would be the action arm of the network.[29] This was done by all PICTs in the year following the meeting. It allows better organisation of communication and capacity-building activities. As mentioned in the Samoa Commitment in 2005, these teams should include or be part of the new International Health Regulations focal point (which in practice is often the case). A regional backup to support the country EpiNet teams – the regional EpiNet Team – is yet to be identified, set up and operationalised, as are funding mechanisms,[30] to logically become part of the Pacific Health Fund project.[31]

Though surveillance of non-communicable diseases (NCDs) is not among the priority targets of PPHSN, this doesn't prevent a number of articles on NCDs being published in this issue. They are an increasing public health priority in the region, and it is well known and recognised that promotion of healthy behaviours in the general population, such as a well-balanced diet and physical exercise, may assist in providing good resistance to and protection from viral illnesses, e.g. influenza. One more reason to be prepared for the next influenza pandemic …

Finally, collaboration with animal health services was clearly recommended and enhanced following 2003–04 PPHSN meetings. Animal health is a key component of pandemic influenza preparedness planning and existing and future surveillance and response development activities in the region. It is obvious that we need to go a step further by addressing threats at their source rather than waiting for human communities to become the battle field against plagues. Doing this will help us to progress in our knowledge and understanding of the evolving multiple faces of Mother Nature, and therefore adapt our response and help to secure the safety of our populations.

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## References


1. Gao F, Bailes E, Robertson DL, et al. Origin of HIV-1 in the chimpanzee Pan troglodytes troglodytes. Nature 1999 Feb 4, 397(6718):385–6.

2. Hahn BH, Shaw GM, De Cock KM, et al. AIDS as a zoonosis: Scientific and public health implications. Science 2000 Jan 28, 287(5453):607–14.

3. Korber B, Muldoon M, Theiler J, et al. Timing the ancestor of the HIV-1 pandemic strains. Science 2000 Jun 9,288(5472):1789–96.

4. Weniger BG & Berkley S. The evolving HIV/AIDS pandemic. In: J Mann & D. Tarantola, AIDS in the World II: 57–70.

5. De Schryver A & Meheus A. Epidemiology of sexually transmitted diseases: The global picture. Bull World Health Organ 1990, 68(5):639–54.

6. Kamwendo F, Forslin L, Bodin L, et al. Decreasing incidences of gonorrhea- and chlamydia-associated acute pelvic inflammatory disease: A 25-year \study from an urban area of central Sweden. Sex Transm Dis 1996 Sep–Oct, 23(5):384–91.

7. Bjartling C, Osser S, Persson K. The frequency of salpingitis and ectopic pregnancy as epidemiologic markers of Chlamydia trachomatis. Acta Obstet Gynecol Scand 2000 Feb, 79(2):123–8.

8. Nicoll A, Hughes G, Donnelly M, et al. Catchpole M. Assessing the impact of national anti-HIV sexual health campaigns: Trends in the transmission of HIV and other sexually transmitted infections in England. Sex Transm Infect 2001 Aug, 77(4):242–7.

9. Chua KB. Nipah virus outbreak in Malaysia. J Clin Virol 2003 Apr, 26(3):265–75.

10. Li W, Shi Z, Yu M, et al. Bats are natural reservoirs of SARS-like coronaviruses. Science 2005 Oct 28, 310(5748):676–9.

11. Lau SK, Woo PC, Li KS, et al. Severe acute respiratory syndrome coronavirus-like virus in Chinese horseshoe bats. Proc Natl Acad Sci USA 2005 Sep 27, 102(39): 14040–45.

12. Poon LL, Guan Y, Nicholls JM, et al. The aetiology, origins, and diagnosis of severe acute respiratory syndrome. Lancet Infect Dis 2004 Nov, 4(11):663–71.

13. Epstein JH, Field HE, Luby S, et al. Nipah virus: Impact, origins, and causes of emergence. Curr Infect Dis Rep 2006 Jan, 8(1):59–65.

14. Chua KB, Chua BH, Wang CW. Anthropogenic deforestation, El Nino and the emergence of Nipah virus in Malaysia. Malays J Pathol 2002 Jun, 24(1):15–21.

15. Lam SK & Chua KB. Nipah virus encephalitis outbreak in Malaysia. Clin Infect Dis 2002 May 1, 34 Suppl 2:S48–51.

16. Heyman DL, Kindhauser MK, Rodier G. Coordinating the global response. In: World Health Organization 2006, SARS: How a global epidemic was stopped: 49–55.

17. Longini IM Jr, Nizam A, Xu S, et al. Containing pandemic influenza at the source. Science 2005 Aug 12, 309(5737):1083–7.

18. Mourya DT, Thakare JR, Gokhale MD, et al. Isolation of chikungunya virus from Aedes aegypti mosquitoes collected in the town of Yawat, Pune District, Maharashtra State, India Acta Virol 2001, 45(5–6):305–9.

19. Chastel C. Chikungunya virus: Its recent spread to the southern Indian Ocean and Reunion Island (2005–2006). Bull Acad Natl Med 2005 Nov, 189(8):1827–35.

20. Tesh RB, McLean RG, Shroyer DA, et al. Ross River virus (Togaviridae: Alphavirus) infection (epidemic polyarthritis) in American Samoa. Trans R Soc Trop Med Hyg 1981, 75(3):426–31.

21. Gubler DJ. Transmission of Ross River virus by Aedes polynesiensis and Aedes aegypti. Am J Trop Med Hyg 1981 Nov, 30(6):1303–6.

22. Le Gonidec G & Fauran P. Arboviral diseases in South-West Pacific islands (author's transl). Med Trop (Mars) 1981 Jan–Feb, 41(1):85–92.

23. Rosen L, Gubler DJ, Bennett PH. Epidemic polyarthritis (Ross River) virus infection in the Cook Islands. Am J Trop Med Hyg 1981 Nov, 30(6):1294–1302.

24. Mitchell CJ & Gubler DJ. Vector competence of geographic strains of Aedes albopictus and Aedes polynesiensis and certain other Aedes (Stegomyia) mosquitoes for Ross River virus. Am Mosq Control Assoc 1987 Jun, 3(2):142–7.

25. Klapsing P, MacLean JD, Glaze S, et al. Ross River virus disease reemergence, Fiji, 2003–2004. Emerg Infect Dis 2005 Apr, 11(4):613–15.

26. Souares Y. Telehealth and outbreak prevention and control: The foundations and advances of the Pacific Public Health Surveillance Network. Pac Health Dialog 2000, 7(2):11–28.

27. World Health Organization. Global health security: The revised International Health Regulations. Geneva, 2005.

28. Secretariat of the Pacific Community. Inaugural meeting of the PPHSN Public Health Laboratory Network. Noumea, New Caledonia, 2001. http://www.spc.int/phs/PPHSN/Publications/Labnet/labNetMeeting.htm

29. WHO & SPC. Madang Commitment towards healthy islands. March 2001. World Health Organization WPR/ECP/DPM/2001.

30. WHO & SPC. Samoa Commitment: Achieving healthy islands: Conclusions and recommendations. World Health Organization 2005.

31. Secretariat of the Pacific Community. Summary record of decisions: Fourth Meeting of the Conference of the Pacific Community, Koror, Palau, 18 November 2005.

**It cannot but happen... that those will survive whose functions happen to be most nearly in equilibrium with the modified aggregate of external forces.... This survival of the fittest implies multiplication of the fittest. (Herbert Spencer - 1865)**