

Biosecurity at the northern border: implementing a “one health, one medicine” strategy to reduce communicable diseases at their PNG source

Rick Speare and Lee F. Skerratt

Anton Breinl Centre
School of Public Health, Tropical Medicine and Rehabilitation Sciences
James Cook University
Townsville 4811
Australia

RS
4 Sept 09

Submission No. 4
(Pacific Health)

The North Queensland-PNG border is of concern as a conduit for communicable diseases to flow into Australia. To stop the entry of communicable diseases into North Queensland from PNG the most effective strategy is to assist the national government of PNG and the provincial government of the Western Province to control communicable diseases at source in the Western Province, particularly in the south. This could be done as nation building exercises on both sides. The health workforce along the southern coast of the Western Province is minimal in number, has a low level of skills, currently attempts to work with a deficient infrastructure, and has a severe lack of resources. The animal health workforce in the Western Province is non-existent. This situation offers the opportunity for Australia to assist itself and PNG.

We would like to propose that this standing committee considers making recommendations for strengthening the communicable disease control system for both humans and animals simultaneously in the southern zone of the Western Province. A very broad perspective is warranted since zoonotic diseases, diseases that jump from animals to humans, are a major concern to Australian biosecurity. Since the majority of emerging infectious diseases are zoonotic and spillover to humans from wildlife, surveillance strategies should include PNG wildlife as well as domestic animals.

The Western Province could be used as a model for exploring the efficiencies of the “one health, one medicine” concept, a concept that is gaining increasing traction globally. Infrastructure, particularly along the southern coast, could be strengthened to support both human and animal disease control (this should also include human and veterinary clinical components as well as public health activities), and a combined workforce could be trained to act collaboratively to use scarce resources efficiently. The advantages to Australia would be: 1) reduction at the PNG source of the risks of human and animal diseases invading Australia via Torres Strait, and 2) positioning Australia in a global leading role in putting into practice the “one health, one medicine” concept. The advantage to PNG would be a better functioning health system, and arguably for the first time, implementation of an animal health control system in the south of the Western Province.

Key Background Points

1. Communicable diseases have a high incidence in PNG, including in the Western Province.
2. These diseases include emerging infectious diseases (EID), diseases that re new or are expanding their distribution.
3. The North Queensland-PNG border is at the lower end of a corridor, the Indo-Papuan conduit, that is a pathway for emerging infectious diseases (EID) flowing from Asia through West Papua, then PNG and into Australia via Torres Strait.
4. Examples of EID that have already used this conduit to enter Australia are Japanese encephalitis, dengue, the Asian tiger mosquito (*Aedes albopictus*), and multidrug resistant tuberculosis (although multidrug resistant TB is generated locally in PNG).
5. Known EID that may use this conduit within the next 10 years are rabies (now moving west along the Indonesian archipelago into Bali), Chickungunya (recently arrived in Indonesia), Nipah virus of bats (now in East-Timor), and highly pathogenic avian influenza (H5N1 is now in West Papua near the PNG border).
6. New EID, the majority of which arise in wildlife, could easily enter Australia through birds and bats, which fly freely across this border.
7. Unfortunately, the control of communicable diseases in the Western Province is very poor, and arguably much worse along the south coast. The health system lacks infrastructure, resources, and an adequately trained workforce. The animal disease control system appears to be non-existent. Surveillance for wildlife diseases does not occur in PNG and is not well developed in Torres Strait.
8. For Australia protection from communicable disease entering via Torres Strait is most effectively done by decreasing the amount of communicable disease at the PNG source in the southern areas of the Western Province.
9. The markedly deficient health infrastructure and lack of a skilled workforce in the south of the Western Province is usually viewed as a challenge, but perhaps it could be viewed as an opportunity to bring in a new, more efficient system of delivering disease control and health care for humans and animals.
10. The “one health, one medicine” concept proposes that in some countries humans, domestic animals, wild animals and their local environment are so closely linked that only a holistic and integrated strategy will improve health overall. This strategy has been implemented in some locations in Africa where the limited resources have been used to simultaneously improve health of human populations and their livestock (eg, vaccination teams for both humans and livestock share transport, logistics, cold chains; or zoonotic disease surveillance includes both animal reservoirs and human victims).
11. The “one health, one medicine” concept has been discussed in Australia and strategies are being implemented at national level to link communicable disease databases. However, there has not been a field based application to demonstrate the practical usefulness of the concept.
12. The south of the Western Province with its poor infrastructure and limited skilled workforce may be a suitable location for a practical demonstration of the utility of the “one health, one medicine” concept. Funds could be used to build a health infrastructure to serve human and domestic animal health;

workforce could have higher level specialised professionals (doctors, veterinarians, or professionals with dual degrees) assisted by lower level workers who are trained to control communicable diseases in both humans and animals, and able to work across disciplines. A strong focus should be on communicable disease control, including surveillance in both human and animal residents of villages.

13. Wildlife disease surveillance could be included owing to the importance of wildlife disease in EID. This would be most easily done by workers collaborating with hunters to obtain a range of selected samples from captured animals or from the occasional wild animals found ill.
14. The “one health, one medicine” system could be run by PNG departments with strong support from Australia, including research support from JCU.
15. If successful in the resource-poor Western Province, the model could be trialed in other regions of PNG.
16. On the Australian side in Torres Strait, the standard communicable disease control system appears adequate. However, both it and veterinary surveillance could be strengthened to function more effectively.
17. The wildlife disease surveillance system in North Queensland is deficient and although there is a surveillance framework, the Australian Wildlife Health Network, it lacks resources to coordinate the Network regionally, undertake surveillance and conduct research. The estimated costs of this in our region would be approximately 1 million or 0.00001% of GDP, a fraction of our health care costs.
18. In summary: to protect the biosecurity of Australia, the PNG-Torres Strait border is critical. The inadequate control of communicable diseases in the south of the Western Province can be improved by implementing a combined human and veterinary health system based on the “one health, one medicine” concept. This should also include increased surveillance for diseases of birds and bats on both sides of the border to enable early detection of new emerging infectious diseases.