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## Original Article

# A North/South collaboration between two national public health institutes – A model for global health protection

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**Abstract** Rapid international spread of emerging infections has increased interest in strategic collaborations, as they may be the best way to protect populations. Strategic collaborations can build capacity in less-resourced settings. As specialised institutions that provide a stable locus of expertise, continuity of experience, scientific knowledge, and appropriate human, technical, and financial resources, national public health institutes (NPHIs) are well-prepared to tackle public health challenges. We describe how a collaboration between the NPHIs of England and South Africa built a mutually beneficial professional relationship to help implement the WHO International Health Regulations, build capacity for health protection, and promote the exchange of information, advice, and expertise. We illustrate how this can be achieved in a mutually beneficial way.

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## Background

Recognition of the potential for rapid international spread of emerging infections led the 58th World Health Assembly to adopt revised International Health Regulations (IHR) on 23 May 2005. Countries are to share relevant information with the World Health Organisation (WHO)<sup>1</sup>. The IHR describe what all countries must be able to do to identify and

respond to public health threats. To develop the expertise required to respond to public health threats and to adhere to the IHR, specialised institutions are needed. Such expertise is often found within national public health institutes (NPHIs) and collaboration among existing NPHIs is vital for health security at the national and global levels<sup>2</sup>.

A NPHI is a science-based organisation, or network of organisations, that provides national leadership and expertise to achieve substantive, long-term improvements in the public's health<sup>3</sup>. NPHIs generally lead disease surveillance and outbreak investigations, provide reference laboratory services (specialist diagnostic services for rare organisms and confirmatory tests requiring specialised infrastructure and resources), and advise their governments on development and evaluation of interventions in public health.

Many NPHIs in low- and middle-income countries lack resources and expertise to deliver on all such responsibilities<sup>4</sup>. Collaboration among NPHIs is one way to ensure they fulfil these functions for their populations and contribute to global health security. In 2006, in recognition of this, Jeffrey Koplan (former director of the US CDC) and Pekka Puska (former director general of Finland's National Institute of Public Health and Welfare – THL), through initial grants from the Rockefeller Foundation and the Bill and Melinda Gates Foundation, formed the International Association of National Public Health Institutes (IANPHI). Key objectives included enlivening international advocacy, a scientific network for NPHIs, and building capacity of NPHIs in less well-resourced countries<sup>5</sup>.

The National Institute for Communicable Diseases (NICD) in Johannesburg is the NPHI for South Africa. From a central location in Johannesburg, it employs about 300 staff, provides reference microbiology, epidemiology, surveillance, and public health research to support government responses to communicable disease threats. NICD also reinforces public health responses in other African countries aided by its Biosafety Level 4 (BSL 4) laboratory, one of two on the continent. (BSL 4 laboratories provide the safest environment for working with dangerous pathogens, such as Ebola and Marburg viruses.) NICD is organised into functional centres that bring together expertise in both reference microbiology and epidemiology.

South Africa has one of the first and best-resourced national infectious disease control institutes on the African continent. But the country faces Africa's largest burdens of HIV (Human Immunodeficiency Virus)/AIDS



and tuberculosis (TB). Economic migration between South Africa and its neighbours creates additional challenges for the control of infectious diseases.

England's NPHI, Public Health England (PHE), established by statute in April 2013, replaced a predecessor organisation – the Health Protection Agency (HPA) – that had been responsible for the protection of population health and other smaller public health organisations. Creation of PHE in 2013 signalled intent to protect and improve the nation's health and well-being, and to reduce inequalities. PHE has about 5500 staff working across local, provincial, and national levels of government. For ease of reading we refer below to the organisation as HPA/PHE.

In 2008, the United Kingdom (UK) government published a new strategy document, *Health is Global*. It made a commitment to 'increase UK and global health security' by strengthening surveillance and response capacity to infectious diseases<sup>6</sup>. It called for establishing long-term links with equivalent institutions in other countries. When updated in 2011, the strategy defined 12 global health outcomes in three broad areas for action: global health security, international development, and trade<sup>7</sup>. Then governments of the UK, including Northern Ireland, signed a memorandum of understanding (MoU) with the Republic of South Africa for a reciprocal exchange of health-care professionals. It was intended to enhance clinical and technical skills in both countries, and explore best practices. The UK chose HPA as one of the institutions to implement the MoU. HPA welcomed the opportunity to establish a partnership with NICD in Johannesburg. As an institute with a similar mandate and relevant expertise, it could enable its neighbouring countries to develop these skills. To cultivate global health work, the Department of Health committed in 2008 a grant of £1.9 million over 5 years to the HPA. From this global health fund the secondment to South Africa was funded. The NICD, through its various training programmes, had a long history of supporting other African countries to build their capacity. In some countries, such as the Democratic Republic of the Congo, NICD responded more directly by investigating sources of emerging disease threats<sup>8</sup>. Initially structured as the HPA/NICD collaboration, it evolved to become *the PHE/NICD collaboration*.

We describe the HPA/PHE collaboration with NICD and assess its benefits as an example of a well-supported collaboration between two public health institutes with similar mandates. We embarked on the

collaboration to build a mutually beneficial professional relationship to contribute to:

- implementing the WHO IHR,
- building capacity for health protection, and
- promoting exchange of information, advice, and expertise.

We also describe risks and benefits associated with planning similar NPHIs collaborations in the future.

## **Description of the HPA/PHE Collaboration with NICD**

We exchanged personnel, resources, and expertise across both institutions. The Executive Director of Public Health Strategy who was responsible for Global Health at HPA/PHE and NICD's Executive Director provided leadership and oversight. To refine strategy jointly, leaders of both institutions met in person at regular intervals in both settings, and by teleconference. Staff reported progress to management and presented results from joint projects at institutional conferences. The HPA's board technical committee on global health and NICD's Management Group served as the governing body. These boards were the highest decision-making settings in the respective institutions.

HPA/PHE and NICD organised collaboration in two broad and complimentary areas: (i) long-term secondment from HPA/PHE to NICD of a senior consultant epidemiologist, and (ii) a series of short-term exchanges between specific departments in the two institutes.

### **Long-term secondment of a consultant epidemiologist**

HPA/PHE collaborators organised a competitive process for selection of a consultant epidemiologist for secondment from HPA/PHE to NICD for 2 years (2011–2013). Both institutes participated in the selection process and agreed on objectives for the duration of the secondment. These included:

- executing specific epidemiology projects,
- building epidemiological capacity at NICD,
- supporting short-term HPA/PHE secondees visiting each institute,
- providing, by the senior HPA/PHE epidemiologist, public health leadership within NICD,



- enabling exchange of resources across both institutes plus support for a sustainable relationship between them.

The consultant epidemiologist reported to the Director of NICD in South Africa and to HPA's Executive Director of Public Health Strategy (later PHE's Director of International Public Health).

### **Short-term secondments between HPA/PHE and NICD**

At the start of the collaboration the two institutes agreed on objectives for short-term secondees. HPA/PHE intended to expose senior public health registrars (doctors and other health-care professionals participating in a 5-year specialisation programme in public health) and scientists in the HPA/PHE to situations they would be unlikely to encounter in the UK. Specific objectives included: (i) developing expertise in the management of infectious disease outbreaks uncommon in the UK, and (ii) acquiring skills and confidence to manage outbreaks of these rare diseases should occur in the UK.

All parties emphasised the importance of building public health response capacity to protect populations in an increasingly connected and interdependent world. The registrars working in South Africa were meant also to experience the impact of a different health-care system on disease control activities – including practicalities of meeting surveillance priorities with reduced human, technical, and financial resources. UK public health registrars eligible for selection would have completed their professional examinations and acquired a high level of relevant competence in health protection.

The NICD chose to build capacity in specific skill areas through staff secondments to specific departments in the HPA/PHE. Selection for the short-term secondments from NICD to HPA/PHE entailed several steps:

- A steering committee comprised of senior colleagues from both institutes drafted selection criteria for individuals who would benefit from exchanges and for expected outputs. They managed the selection processes.
- Candidates from various departments vied for participation in exchanges, and through interactive workshops identified areas of interest.

- A steering committee evaluated these bids based on their objectives, feasibility, public health value, the personal development opportunity for the individual, and usefulness for the host department's future planning.

The steering committee of the HPA/PHE and NICD collaboration, made up of senior members of both institutions who drove the collaboration, assessed the secondments. They invited the consultant epidemiologist, seconded from HPA/PHE to NICD, to join the review. They used information gathered from review meetings, secondment reports, presentation of outcomes at conferences, and interviews with staff who benefitted from the secondment opportunities. In addition, each secondee was obliged to submit a proposal before the trip and a report afterwards, both of which formed part of the review.

## Outcomes of the HPA/PHE and NICD Collaboration

Over a period of 2.5 years (2011–2013), a senior consultant epidemiologist from HPA/PHE worked in NICD and 35 staff from both institutions participated in short-term exchanges at the other's institution of 2 weeks–3 months duration.

As epidemiologists were an uncommon resource in South Africa, NICD invited the seconded senior consultant epidemiologist to co-lead the Centre for Tuberculosis, supporting its transformation from a reference laboratory to a public health focused centre, integrating specialist epidemiology into the existing specialist microbiology service for TB. He used his expertise in epidemiology to help implement several important projects for the institute – conducting a National Tuberculosis Drug Resistance Survey, establishing a surveillance system for TB, and integrating laboratory-based TB surveillance with the Electronic TB register used to collate clinical data.

NICD made building capacity for epidemiology the key objective of the secondment. The seconded epidemiologist supported activities of the South African Field Epidemiology and Laboratory Training Programme (SAFELTP), an existing programme at the NICD, developed in partnership with the Centers for Disease Control, Atlanta, USA. He taught several short courses as part of SAFELTP.



Colleagues in both institutes benefitted from short-term exchanges as anticipated. HPA/PHE registrars, working with colleagues from their NICD host institution:

- investigated an outbreak of sporotrichosis among mine workers,
- conducted a door-to-door household survey following a community outbreak of a diarrhoeal illness related to contaminated water supplies in a semi-rural village,
- audited management of human exposures to rabies in rural clinics,
- carried out risk assessments for cases of suspected cases of viral haemorrhagic fevers,
- studied seroprevalence of Rift Valley fever in workers in the Kruger National Park,
- conducted surveillance for communicable disease events at mass gatherings during the 2010 World Cup and the 2013 African Cup of Nations.

This ‘learning by doing’ in South Africa enabled UK public health registrars to expand their epidemiological knowledge, skills, and abilities, and to perform epidemiology work in the field for diseases they would not typically see in their home country.

Similarly, short-term exchanges provided opportunities for colleagues from NICD to develop areas of expertise during their exchanges, including:

- specific laboratory methods such as molecular diagnostics for TB,
- hemagglutination inhibition and micro-neutralization diagnostics assays for influenza,
- multiple-locus variable number tandem repeats analysis (MLVA) for *Salmonella* Typhimurium and *Salmonella* Enteritidis typing,
- methods for the identification of pathogenic fungi.

The acquired expertise in diagnostic techniques were taken back to the host institute, NICD, and used to enhance laboratory capacity. Similarly, skills in epidemiology and data management around de-duplication of large data sets, and methods in data analysis and in geospatial analysis were used in the home institution.

## Areas of benefit to NICD

1. *Microbiology Methods* required to diagnose public health relevant diseases evolve continually. HPA/PHE's specialist microbiology services provide a comprehensive range of clinical diagnostic and public health microbiology tests and services. Elements of the UK's system exist in eight regional laboratories across England and in national centres. Fourteen scientists from NICD spent 3–6 weeks with their counterpart laboratories in HPA/PHE, updating their skills in specific methods and learning new approaches to diagnostics.
2. *Epidemiology Methods* came to be recognised a specific need for NICD. To build capacity, 12 NICD epidemiologists and data analysts worked for 3 months with their counterparts in the epidemiology section of HPA/PHE. Visiting NICD scientists took home skills not yet in use at NICD, spurring completely new areas of work at NICD, such as geospatial analysis of epidemiological data. The visits also advanced collaboration in TB surveillance plus other areas. An epidemiologist from NICD who spent time with the health-care associated infections surveillance team in HPA/PHE is now planning a similar surveillance programme in South Africa.
3. *Management* expertise advanced when senior members of NICD staff spent shorter periods (1–2 weeks) with HPA/PHE counterparts in the UK exchanging ideas on management approaches in specific areas of work and exploring ideas for collaborative projects.
4. *Unexpected areas of engagement* evolved. NICD established, for example, a Biocontainment Engineering Management and Support Program with assistance from HPA/PHE colleagues. This undertaking grew out of a visit by HPA/PHE engineers and specialists to assess engineering capacity and gaps in critical containment equipment maintenance at NICD. One NICD engineer visited the BSL 4 laboratory in London, after which his hosts developed a training curriculum and training strategy for biocontainment staff.

## Areas of benefit to HPA/PHE

1. *Hands-on experience* for HPA/PHE staff working in South Africa equips registrars to manage similar situations in the UK. Rapid





spread of SARS in Toronto in 2003 revealed a need for clinical and public health capacity to respond,<sup>9-10</sup> and heightened awareness in the UK of the value of local expertise about uncommon infectious diseases. Exchanges with the NICD prepared UK public health registrars for risks that could emerge from an increasingly diverse UK population and from London as a major hub of global travel.

2. *Specific departments in HPA/PHE*, including the TB and HIV/ Sexually Transmitted Infections sections, used staff exchanges to form departmental level continuing relationships. Joint projects illustrate the value of these on-going collaborations, for example, exploring the use of whole genome sequencing to guide the use of public health responses to TB in low- and high-incidence settings.
3. *Formal collaboration* offers on-going informal access to mutually beneficial resources across both institutions. Colleagues from both institutes call their counterparts to discuss outbreak situations, or diagnostic options for rare pathogens.

### Challenges for both institutions

When someone visited the counterpart institution, colleagues at the home institution had to assume responsibility for the tasks usually performed by the travelling colleague. When some tasks depended on skills in short supply, substitution proved to be a noteworthy challenge. So too was the delicate matter of achieving balance between the needs and priorities of the institutions – and desires and needs for skills yielding benefits to the individuals seconded. As project funds came to an end, the steering committee realized how difficult it would be to fulfil the expectations raised by this collaboration over the long term. This collaboration has continued, albeit at a slower pace, using core budget at both institutes, rather than donor funds.

### Discussion

In an interconnected world, relationships with strategic partners may provide the best protection for the health of the public as they build capacity in less-resourced settings. Our collaboration between two NPHIs has led not only to important public health results for both countries, but also facilitated the exchange of public health expertise and

information. As planners and participants found the relationship benefitted both countries, it may guide others to establish mutually beneficial North/South professional and institutional arrangements. The strong UK–South Africa relationship may constitute a model for future public health collaboration and support implementation of IHR. Collaboration among NPHIs globally can increase our collective wisdom about using medical and public health services to contribute to understanding preventable causes of ill health<sup>5</sup>.

The HPA/PHE–NICD collaboration strengthened international networks critical for responding to public health emergencies as intended under IHR. NICD, by virtue of its role and capacity, provides the first response to emerging diseases in Southern Africa. When not adequately contained, such outbreaks may become multi-country problems that need larger responses, as was the case during a 2005 Marburg virus outbreak in Angola<sup>11</sup>. Close working relationships are critical for an efficient response and aided by good communication between partner institutes. To build capacity with short staff exchanges, trust and mutual respect needs to be established beforehand. In our collaboration, participants felt they and the work benefitted from such an environment.

As the evolution of UK's HPA into 'PHE' coincided with the UK collaboration with South Africa's NICD, staff of the latter observed the broadening of public health responsibilities beyond communicable diseases and environmental hazards in the UK. South Africa is now considering a similar expansion and is now discussing the potential benefits of widening the current mandate of NICD – based in part on lessons learnt by South African colleagues in the UK.

Factors that contributed to a successful collaboration included:

- A steering committee of senior staff members of both organisations assured quick resolution of bottlenecks.
- Logistics for the secondment was eased by a dedicated international office within HPA/PHE and a senior administrator who took on the project management responsibilities in NICD. They managed all travel requirements, from the processing of visas and travel to arranging specific meetings among colleagues.

The IANPHI was formed in 2006 with a US\$20 million, 5-year grant from the Bill and Melinda Gates Foundation through Emory University, the host and coordinating institution<sup>12</sup>. It recognised the need for NPHIs



to work more closely together. The Association wanted countries to begin to coordinate their national public health efforts. NPHIs exist for the public good; improvements in NPHIs contribute to improving population health<sup>13</sup>.

## Conclusion

Globalisation and threats of new and re-emerging diseases mean that NPHIs are needed to ensure competent and efficient responses. NPHIs provide a stable locus of expertise, continuity of experience, scientific knowledge, and appropriate human, technical, and financial resources to tackle public health challenges both within and among countries<sup>4</sup>. Knowledge and expertise gained by one institute protects the population of that country and other countries with which it is shared.

We have illustrated a mutually beneficial way to share. We urge the NPHIs of other countries explore this approach. We view the mutual benefits of the collaboration between NICD and HPA/PHE as a success for the Health is Global Strategy of the UK Government. The strategy was designed in recognition of the complexity of our globalised world, the changed perspective it demands of us, and the new alliances we need to build to meet its challenges<sup>14</sup>.

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## Notes and References

1. International Health Regulations. (2005), <http://www.who.int/ihr/9789241596664/en/>.
2. Rodier, G., Greenspan, A.L., Hughes, J.M. and Heymann, D.L. (2007) Global public health security. *Emerging Infectious Diseases* 13(10): 1447–1452.
3. Institutes; IAoPH. (2007) Framework for the Creation and Development of National Public Health Institutes.
4. Adigun, L., Dusenbury, C. and Schoub, B.D. (2007) Public health in Africa – The role of national public health institutes. *South African Medical Journal* 97(11): 1036–1039.
5. Binder, S.L., Adigun, L., Dusenbury, C., Greenspan, A. and Tanhuanpää, P. (2008) National public health institutes: Contributing to the public good. *Journal of Public Health Policy* 29(1): 3–21.
6. UK Department of Health. (2011) *Health is Global*. London: UK Department of Health.
7. Department of Health. (2011) *Health is Global: An Outcomes Framework for Global Health 2011–2015*. London: UK Department of Health.
8. Swanepoel, R. *et al* (2007) Studies of reservoir hosts for Marburg virus. *Emerging Infectious Diseases* 13(12): 1847–1851.
9. Muller, M.P. *et al* (2006) Early diagnosis of SARS: Lessons from the Toronto SARS outbreak. *European Journal of Clinical Microbiology & Infectious Diseases* 25(4): 230–237.
10. Svoboda, T. *et al* (2004) Public health measures to control the spread of the severe acute respiratory syndrome during the outbreak in Toronto. *New England Journal of Medicine* 350(23): 2352–2361.
11. Lawrence, J. and Hill, D.R. (2005) Largest ever Marburg haemorrhagic fever outbreak, Angola. *Eurosurveillance* 10(4): E050407.2.
12. Koplan, J.P., Puska, P., Jousilahti, P., Cahill, K. and Huttunen, J. (2005) Improving the world's health through national public health institutes. *Bulletin of the World Health Organization* 83(2): 154–157.



13. Buss, P., Koplan, J.P., Dusenbury, C., Binder, S. and Rosenberg, F. (2009) National public health institutes: A coordinated and comprehensive approach toward influenza A H1N1 and other threats to public health. *Revista Panamericana de Salud Pública* 26(2): 184–188.
14. Primarolo, D., Malloch-Brown, M. and Lewis, I. (2009) Health is global: A UK Government strategy for 2008–13. *Lancet* 373(9662): 443–445.