

Surveillance and management of influenza on the African continent

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Evaluation of: Yazdanbakhsh M, Kremsner PG. Influenza in Africa. *PLoS Med.* 6(12), e1000182 (2009).

The African continent is burdened with a very heavy load of communicable diseases over and above other severe health problems. Not surprisingly, influenza has received relatively little attention on the continent even though it is, in its own right, a major cause of morbidity and mortality – to a much greater extent than in the developed world owing to the aggravating prevalence of underlying diseases. The paucity of laboratory support can be a serious drawback in the clinical management of patients. For example, cases of febrile illnesses are frequently erroneously treated as malaria. In addition, this deficiency of laboratory capacity is a serious gap in the overall global surveillance of influenza and, indeed, of new emerging infections in general. Influenza has been one of the most rigorously studied of all human viruses, having been isolated three-quarters of a century ago and intensively investigated since then. Much is known about its molecular biology, but its epidemiological behavior and its unpredictability still remain public-health problems to this day. Furthermore, while most literature on influenza has been published from developed countries of the world, where the winter season plays a pivotal role in its epidemiology, by contrast, relatively little is known about influenza behavior in tropical countries and even less in the African continent. How important it is to have a comprehensive surveillance facility in all parts of the world has been graphically illustrated by the totally unexpected and unpredicted start of the 2009 novel influenza A (H1N1) pandemic in North America.

KEYWORDS: clinical diagnosis • febrile illnesses • global network • influenza • surveillance

This short paper by Yazdanbakhsh and Kremsner [1] draws attention to a major gap in the global influenza surveillance network on the African continent [2]. Of the 46 countries constituting the WHO African region (AFRO), only 18 have national influenza centers, of which only ten are able to carry out diagnostic PCR for influenza [101,102]. Of the 16,664 laboratory-confirmed cases in 2009 from 30 countries on the continent, 12,636 (76%) were reported from South Africa, which accounts for only 5% of the continent's population [103]. Similarly, 92 of the 131 deaths in Africa (70%) were reported by South Africa alone – the total for Africa representing less than 1% of the total global deaths [104].

The paper by Yazdanbakhsh and Kremsner not only highlights this major deficiency in global surveillance, but it also points out how the dearth of laboratory support in most of

the continent is a serious drawback for patient management. Influenza, because of its non-specific clinical presentation, is reliant on laboratory support – in developed countries, the diagnosis of the initial cases in an influenza outbreak are dependent on laboratory confirmation and this facilitates subsequent management of epidemiologically linked cases. The African continent, however, especially in the tropics, is beset with a range of causes of febrile illnesses. In the absence of laboratory confirmation, nonspecific illnesses presenting with pyrexia are often treated empirically as malaria. However, as the authors point out from their observations at the Lambarene Research Centre in Gabon, only approximately 5% of these cases turn out to be malaria on blood smear [1]. Although Africa is burdened with very serious competing communicable disease priorities, especially HIV, TB and

malaria, the authors correctly point out that influenza, which is still a significant illness burden for the continent, should not be bypassed. The illness burden of influenza, although as yet uncharted, is undoubtedly far greater in Africa than the developed world, owing to underlying tropical diseases, immunosuppression and malnutrition, which greatly complicate the infection. For example, an outbreak of presumably H3N2 influenza in Madagascar from July to August 2002 resulted in 30,304 recognized cases and 754 deaths, 95% of them in rural areas away from health facilities [3]. Another serious H3N2 influenza outbreak was reported the following year in the Democratic Republic of the Congo, with 170 deaths in 27,211 cases [4]. A recent study in a hospitalized population in South Africa also demonstrated the greater severity of influenza in the indigenous African population [5]. Few studies of influenza have been carried out in HIV-infected persons. An earlier study in a pediatric hospitalized population in Johannesburg, South Africa, despite not demonstrating greater severity of infection, did show that secretion of the virus was prolonged [6]. Other studies have demonstrated that influenza-associated complications are both more common and severe in immunosuppressed populations [7].

The relative unresponsiveness to influenza vaccine in immunosuppressed populations in Africa was highlighted by the authors and is indeed of great concern [1]. As was suggested, clinical trials of influenza vaccines urgently need to be carried out in African populations. Data from a single study in HIV-infected persons showed the vaccine to be safe, although there are as yet no efficacy data available [8]. In South Africa, influenza vaccination is recommended for HIV-infected persons with CD4 counts above 200 cells/ μ l [7]. Unfortunately, outside of South Africa, very few countries within the WHO AFRO region have influenza vaccination programs of any significance as financial resources need to be diverted to diseases considered to be of higher priority.

There is now ample evidence that influenza is common in tropical regions, occurs throughout the year and also contributes very significantly to the illness burden of impoverished developing countries [9–11].

Five-year view: what can be done?

A WHO-sponsored congress was held in November 2009 at the National Institute for Communicable Diseases in Johannesburg. This was attended by delegates from many African countries and existing resources for influenza surveillance were examined before proposals were made for future development [105]. A number of hospital-based severe acute respiratory infection and community-based influenza-like illness studies were presented. In addition, active training of laboratory personnel from many of these countries is progressing and will certainly yield promising results, with an increasing number of them planning on acquiring PCR diagnostic capabilities. Within the next 5 years, Africa should see the progressive development of a network of diagnostic laboratories able to perform diagnostic and, in some cases, virus characterization tests for influenza. The continent already has an efficient network of polio and measles diagnostic laboratories as part of the WHO global laboratory network and it is envisaged that this network could, by extension, also become the continent's network of influenza laboratories. This would not only benefit the health of the populations of these respective countries, but would also greatly assist and contribute to the global network for early detection of new emerging virus infections, including influenza.

Summary

Laboratory surveillance of influenza on the African continent needs to be considerably strengthened, both to improve management of patients with febrile illnesses and to provide important information to the global surveillance of influenza.

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Key issues

- Influenza is responsible for a major illness burden in Africa owing to underlying diseases and conditions prevalent on the continent.
- Owing to competing illness priorities, the tendency is for influenza to be sidelined.
- Laboratory support is an essential component both for the diagnosis of influenza outbreaks and for their management.
- Febrile illnesses tend to be empirically treated as malaria owing to a lack of laboratory support; however, much of this is due to influenza.
- The global surveillance for influenza is dependent on a comprehensive coverage of all parts of the world to detect the emergence of new strains.
- The African continent still remains a gap in this surveillance.
- There is active planning to expand the laboratory network for influenza surveillance in Africa using the existing polio and measles networks as a model.
- These laboratory networks are of value globally, not only for influenza but for all newly emerging infectious diseases.

References

Papers of special note have been highlighted as:

- of interest
- of considerable interest

- 1 Yazdanbakhsh M, Kremsner PG. Influenza in Africa. *PLoS Med.* 6(12), e1000182 (2009).
- 2 Schoub BD, McAnerney JM, Besselaar TG. Regional perspectives on influenza surveillance in Africa. *Vaccine* 20(Suppl. 2), S45–S46 (2002).
- **One of the first calls to improve surveillance of influenza in Africa.**
- 3 Centers for Disease Control and Prevention (CDC). Influenza outbreak – Madagascar, July–August 2002. *MMWR Morb. Mortal. Wkly Rep.* 51(45), 1016–1018 (2002).
- 4 WHO 2003. Influenza outbreak in the district of Bosobolo, Democratic Republic of the Congo, November–December 2002. *Wkly Epidemiol. Rec.* 78(13), 94–96 (2003).
- 5 Karstaedt AS, Hopley M, Wong M, Crewe-Brown HH, Tasset-Tisseau A. Influenza- and respiratory syncytial virus-associated adult mortality in Soweto. *SAMJ* 99(10), 750–754 (2009).
- 6 Madhi SA, Ramasamy N, Besselaar TG, Saloojee H, Klugman KP. Lower respiratory tract infections associated with influenza A and B viruses in an area with a high prevalence of pediatric human immunodeficiency type 1 infection. *Pediatr. Infect. Dis. J.* 21(4), 291–297 (2002).
- **Details the effect of HIV on respiratory infection in children.**
- 7 Schoub BD. Recommendations pertaining to the use of viral vaccines: influenza 2010. *SAMJ* 96(7), 598 (2006).
- 8 Kunisaki KM, Janoff EN. Influenza in immunosuppressed populations: a review of infection frequency, morbidity, mortality, and vaccine responses. *Lancet Infect. Dis.* 9(8), 493–504 (2009).
- **Very good review of the effect of immunosuppression on influenza.**
- 9 Viboud C, Alonso WJ, Simonsen L. Influenza in tropical regions. *PLoS Med.* 3(4), 468–471 (2006).
- **Very good perspective on the epidemiology of influenza in tropical regions.**
- 10 Nguyen HL, Saito R, Ngiem HK *et al.* Epidemiology of influenza in Hanoi, Vietnam, from 2001 to 2003. *J. Infect.* 55(1), 58–63 (2007).
- 11 Abdullah Brooks W, Terebuh P, Bridges C *et al.* Influenza A and B infection in children in urban slum, Bangladesh. *Emerg. Infect. Dis.* 13(10), 1507–1508 (2007).
- 102 WHO. Countries able to perform PCR to diagnose influenza A (H1N1) virus infection in humans www.who.int/csr/resources/publications/swineflu/country_pcr_capacity/en/index.html (Accessed 19 January 2010)
- 103 WHO. Pandemic influenza (H1N1) 2009 www.afro.who.int/en/pandemic-influenza-h1n1-2009/situation-updates (Accessed 19 January 2010)
- 104 WHO. Pandemic (H1N1) 2009 – update 83 www.who.int/csr/don/2010_01_15/en/index.html (Accessed 19 January 2010)
- 105 Presentations from the 2009 Africa Influenza Science Symposium: December 7–11, 2009 (Johannesburg, South Africa) www.team-psa.com/afss2009 (Accessed 19 January 2010)
- **Very comprehensive coverage of influenza in Africa through PowerPoint presentations from the conference.**

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Websites

- 101 WHO National Influenza Centres www.who.int/csr/disease/influenza/centres/en/index.html (Accessed 19 January 2010)