PUBLIC HEALTH RESEARCH AGENDA FOR INFLUENZA

One framework. Five streams. Sharing solutions.

REPORT ON THE SPECIAL SESSION ON IDENTIFYING THE

PUBLIC HEALTH RESEARCH NEEDS FOR INFLUENZA IN AFRICA

4 JUNE 2010, MARRAKESH, MOROCCO

World Health Organization

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1. Background

1.1 WHO public health research agenda for influenza

In November 2009, WHO convened a global consultation to launch the WHO Public Health Research Agenda for Influenza. The goal of this agenda is to guide research so that knowledge gained improves public health decision making in preventing and controlling influenza (1).

The *agenda* is built around areas of particular importance:

1. Reducing the risk of emergence of pandemic influenza (*Stream 1*)
2. Limiting the spread of pandemic, zoonotic and seasonal epidemic influenza (*Stream 2*)
3. Minimizing the impact of pandemic, zoonotic and seasonal epidemic influenza (*Stream 3*)
4. Optimizing the treatment of patients (*Stream 4*)
5. Promoting the development and application of modern public health tools (*Stream 5*)

The participants agreed that the agenda should be specified further in regional and country contexts. Following the launch of the *agenda*, two regional meetings were held in the WHO South-East Asian region and Western Pacific region in 2010 and 2011 respectively to implement the agenda at the regional level.

1.2 Objective of the meeting

A special session on public health research needs for influenza in Africa took place on 4 June 2010 in Marrakesh, Morocco. It was held at the end of the first Africa Flu Alliance (AFA) meeting.
The objective was to identify and discuss research needs specific to the African continent (2).
The meeting was attended by 80 participants, including from 19 African Region countries[1] and five Eastern Mediterranean Region countries[2], as well as international agencies and institutions.[3]

1.3 Respecting research needs in the regional context

The AFA is meant to provide a continuing platform of knowledge sharing between health authorities, health partners and international agencies to fill gaps in our knowledge of influenza in Africa. The first AFA meeting was held immediately following the technical meeting of the AfriFlu conference,

[1] Angola, Algeria, Botswana, Burkina Faso, Cameroon, Côte d'Ivoire, Cape Verde, Democratic Republic of Congo, Ethiopia, Ghana, Kenya, Madagascar, Malawi, Mauritania, Nigeria, Senegal, South Africa, United Republic of Tanzania and Uganda

[2] Egypt, Libyan Arab Jamahiriya, Morocco, Sudan and Tunisia.

[3] The African Field Epidemiology Network (AFENET), the European Commission (EC), the German Agency for Technical Cooperation (GTZ), the Coordination Organization for the Control of Endemic Diseases in Central Africa (OCEAC), the West African Health Organization (WAHO), the World Health Organization (WHO), the United States Centers for Disease Control and Prevention (US-CDC), the United States National Institutes of Health (US-NIH) and the United States Naval Medical Research Unit 3 (NAMRU3).

convened by the Agence de Médécine Préventive, which brought together influenza experts from the region and around the world (3). In the spirit of information sharing, during the special session on research needs in Africa a summary of the research recommendations issuing from the AfriFlu meeting was provided for discussion and further elaboration.

The special session on research needs for influenza was designed to emphasize the point that the focus of research must be on public health needs and should therefore reflect the questions asked by public health officials from the countries on the continent rather than those posed by researchers themselves. The overall focus should be on what these officials need to know in order to make evidence-based public health decisions, and thus the connection between research and implementation must always be made clear. This approach is not intended to limit research but rather to streamline it so that it responds to ongoing public health requirements as well as to the practical demands of public health emergencies.

2. Influenza and Africa: overall summary of discussion

Public health issues specific to Africa are varied and reflect regional and cultural differences. Some of the cross-cutting public health questions noted included general ones such as: why a pandemic happens and is it possible for us to know which virus will become the next pandemic virus and where it originates from? Why a particular virus has more severe effects in certain geographical areas than in others, how we might define more effective surveillance criteria.

Cross-cutting questions more specific to medical intervention and vaccination strategy include ascertaining the rate of transmission of a particular virus and determining whether antivirals slow it down, determining the age group distribution of victims of the virus, identifying the course and timing of a particular pandemic, and identifying any indirect factors that have an impact on influenza mortality. A top priority here is to ascertain the severity of an epidemic in terms of hospitalizations and influenza-related deaths.

Of great concern is learning more about the disease burden of influenza in countries. Issues that cut across regions in this area include the cost effectiveness of particular public health interventions relative to the overall burden of the disease. An adequate scientific basis for that guidance is lacking. The over-riding issue needing research here is the impact of the disease on health systems, which takes in social as well as economic costs.

This last point is important because an overall goal of WHO is to limit the burden of all forms of the disease(seasonal, zoonotic and pandemic), which means that there needs to be a strong focus on operational research, particularly with regard to applications in resource limited countries, with the goal of enhancing capacity building. The effort also needs to support the advocacy required to obtain the necessary resources for achieving this goal.

3. Public Health research needs for influenza in Africa

3.1 Reducing the risk of emergence of pandemic influenza

In Africa, a particular risk factor is the role of animals, especially wild animals, in the spread of influenza. Research is needed to identify the kinds of viruses circulating in these animals, something that is quite challenging due to their diversity and mobility. The human-animal interface must be studied further, an investigation that would benefit from enhanced information sharing between veterinarians and human health researchers. Associated with this is the question of the economic burden that would fall on countries due to public health interventions aimed at limiting exposure to pigs and birds, where such interventions might interfere with both commercial and non-commercial food production.

Table 1: Consistent areas of research needs at global and African level in Stream 1

Research needs in Africa consistent with global needs	1.1 Factors associated with the emergence of influenza viruses with zoonotic or pandemic potential
	1.2. Factors associated with human infection at the human-animal interface
	1.3. Surveillance at the human-animal interface
	1.4 Preventive measures to reduce the risk of emergence of zoonotic and pandemic

3.2 Limiting the spread of pandemic, zoonotic and seasonal epidemic influenza

The discussion of this research area focused first on the need to study the effectiveness of public health interventions. Face masks need to be evaluated for their effectiveness in reducing droplet transmission, while the utility of border controls, travel restrictions and other social distancing measures is an appropriate subject of research. While hand washing has been established generally as helpful in limiting many kinds of disease spread, research should be done to investigate its specific effectiveness in slowing the spread of influenza. A cost-benefit analysis of fever screening machines should be undertaken as well.

Other suggestions included studying the effects of the seasons on influenza transmission, a topic of importance for deciding on the timing of vaccination programmes. Related to this were proposals to investigate the effects of population density and family size on transmission, along with ascertaining when a person with the disease would be most contagious. A household transmission in African context may also contribute.

Table 2: Consistent areas of research needs at global and African level in Stream 2

Research needs in Africa consistent with global needs	2.2 Dynamics of virus spread at global and local levels
	2.3 Public health measures to limit transmission

3.3 Minimizing the impact of pandemic, zoonotic and seasonal epidemic influenza

With regard to Africa, the discussion of this research area concerning minimizing the impact of influenza through public health policy included several suggestions regarding the actual and potential role of traditional medicine. It was agreed that studies assessing the effectiveness of this type of medicine in ameliorating symptoms should be undertaken, while it was suggested that traditional approaches might also be incorporated in vaccine programmes to help encourage vaccine usage.

Vaccination policies also need to be studied for their cost-effectiveness in Africa. Additionally, priority vaccination target groups need to be identified in the African context. In order to form the basis for these, influenza surveillance should be strengthened by integrating into existing systems.

Influenza vaccines used in the continent need to be matched with the viruses that are circulating in the region. Currently, virological surveillance in the continent is not fully supporting this evaluation due to insufficient geographical coverage and representativeness of the populations. Generally, the systems are weak in monitoring of any adverse effects associated with using a particular vaccine. Also, many countries have limited capacity in terms of regulatory function; this would require harmonizing vaccine approval throughout the continent. The nature of the current vaccines that obligates annual vaccination is a major obstacle for middle- and low-income countries. A need was expressed for more research into the development of vaccines which can develop generic and long-lasting immunity.

Pneumonia burden in children is disproportionately heavy in the continent. Among other infectious diseases, pneumonia is the number one killer of children under five years of age. It is unclear what proportion of the deaths is associated with influenza. The elevated proportion of the African population living with HIV/AIDS, urges the research needs on the effects of influenza on immuno-suppressed people. The populations are also suffering from pollution in households and from environment. Research is needed on influenza effects on people with such chronic respiratory conditions. Additionally, influenza's interactions with malaria, dengue and the like febrile endemic diseases require study, particularly as these interactions affect the disease severity in individuals and overall disease burden on countries.

Forming a backdrop to many of the efforts to minimize the impact of influenza is the role of the media and its influence during epidemics and pandemics. In communicating the risks of influenza to the general population as well as to high-risk target groups, the media can play both a positive and negative role. For example, it can contribute in sensitizing these populations to the need for vaccination or passing on rumours and misconceptions that hinder the immunization programme. Research needs to be done on both these types of roles, creating support for encouraging vaccine uptake and compliance with public health policies as well as a basis for countering negative perceptions.

Table 3: Consistent and additional areas of research needs at global and African level in Stream 3

Research needs in Africa consistent with global needs	3.2 Improve immunogenicity, availability and delivery of influenza vaccines
	3.3 Public health policies to reduce the impact of disease
Additional research needs for Africa not covered in the global agenda	Studies to access the actual and potential role of traditional medicine
	Effect of influenza on populations with on immuno-suppressed health conditions, as well as interactions with pneumonia, malaria, dengue and other febrile diseases.

3.4 Optimizing the treatment of patients

When the discussion turned to Stream 4, optimizing treatment, the first concern was to improve surveillance and connect rapid, effective diagnosis with patient care, which would include identifying risk patients who would most benefit from interventions. Determining the best use of antivirals in Africa was a related issue. Supporting these efforts would require research into the pathogenesis of severe influenza along with a study of the role of vaccination in subsequent infections. An underlying concern was the need to develop a clinical case definition for influenza that will enable improved surveillance and diagnosis. The challenge is to differentiate influenza from other acute respiratory conditions and other febrile disease such as malaria, dengue and other endemic infections. Research is therefore required to find improved methods for influenza diagnoses.

Alternatives to reliance on hospital-based treatment were discussed, with a proposal put forward to study the effectiveness of home-based care where hospitals are not readily accessible. The use of traditional and local remedies was mentioned again in this context, and it was suggested that this would be a valuable area for research. Additionally, a study of the effectiveness of over-the-counter remedies was recommended, as was investigating the means of identifying and limiting the use and impact of counterfeit drugs. At the institutional level, it was proposed that ways of improving the clinical management of patients in health care facilities be explored, with special attention to infection control measures.

Table 4: Consistent and additional areas of research needs at global and African level in Stream 4

Research needs in Africa consistent with global needs	4.1 Factors associated with pathogenesis and clinical severity
	4.2 Improve clinical management of patients
	4.3 Health care capacity and response
Additional research needs for Africa not covered in the global agenda	Studies of the effectiveness of over-the-counter remedies
	Investigating the means of identifying and limiting the use and impact of counterfeit drugs

3.5 Promoting the development and application of modern public health tools

The final stream, promoting the development and application of modern public health tools, brought forth suggestions for research into using recent technological innovations to help understanding influenza in Africa. Monitoring devices, mobile phone use and procedures for integrating the experiences of community health care workers into the alert and response system were considered to be areas worthy of research.

With regard to surveillance, it was proposed that mathematical modeling be applied in order to see how it might better provide coherent knowledge created from available data. This would be particularly useful where surveillance information is only partial. Determining the amount and quality of information necessary for this kind of modeling was seen to be another important research topic, since models are useful only if the information they are modeling is good.

In the important area of communication, research on the information found on social networking sites would provide a good picture of the perceptions held by the general population regarding influenza and, most importantly, about immunization and other public health interventions. This would make it easier to counter misconceptions and to reinforce accurate perceptions.

Table 5: Consistent areas of research needs at global and African level in Stream 5

Research needs in Africa consistent with global needs	5.1 Modern tools for early detection and monitoring of disease
	5.2 Role of modelling in public health decision making
	5.3 Modern tools for strategic communication

The session ended with an agreement to examine and develop these suggestions further to form the basis of the continent-specific *Public Health Research Agenda for Influenza* with prioritization.

References

(1) WHO Public Health Research Agenda, November 2009, http://www.who.int/influenza/resources/research/2010_04_29_global_influenza_research_agenda_version_01_en.pdf

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