

March 29<sup>th</sup> -2011



## BRIEFING NOTE ON

**The Southern Africa Centre for Infectious Disease Surveillance (SACIDS) [www.sacids.org](http://www.sacids.org)**

### 1. The Infectious Disease Burden to Africa

Several studies now show that Africa most probably has the highest burden of infectious diseases and yet the least capacity for their prevention, control and risk management. Accordingly, infectious diseases, whether they affect humans, animals or crops, continue to be a fundamental impediment to both economic development and human health in Africa. The low African or African based capacity for rapid detection, identification and monitoring of infectious diseases makes Sub-Saharan Africa acutely vulnerable also to emerging and re-emerging diseases. Until this challenge is met, the development of the continent will continue to be severely retarded. The importance of infectious diseases to Africa could not be greater. By attacking crops, livestock and people, they cause starvation, illness and death, they impair economic development and, at worst, can destabilise entire countries. By interacting with each other and with society in complex ways, they create a vicious spiral of decline. Of the human diseases in Africa, HIV constitutes a 'time bomb'. The estimated 26 million people now infected are likely to develop AIDS over the next decade. The effects of other diseases such as malaria and tuberculosis, which are already severe, will be amplified by the large numbers of people with suppressed immune systems. Women will be disproportionately affected, and life expectancy, already reduced to around 40 years in some countries with high HIV prevalence, will further decline.

Livestock agriculture is an important industry across sub-Saharan Africa, but disease is its biggest constraint. Africa hardly participates in international trade in animal products, largely on account on account of the disease constraint as most countries are unable to meet the sanitary requirements. Accordingly, Africa is failing to participate effectively in the demand-driven so-called "Livestock Revolution" and is thereby locked in the vicious poverty

trap of low productivity, low demand, low off-take on account of poor access to profitable markets and low health status on account of exposure to infectious diseases and sub-optimal nutrition.

The available evidence from several sources leads to the following conclusions on the future threat of infectious diseases, which are most pertinent to Africa:

- Many existing diseases will remain important, but new diseases will emerge in the future – noting that in the last 25 to 30 years some **70 to 80% of new/emerging infectious diseases of humans had originated from animals**;
- Economic development, changing in habitation and farming systems, globalisation of travel and trade as well as climatic variations are likely to fuel the spread of infectious diseases;
- Major infectious diseases are endemic in Africa and Asia; they constitute a high risk for future marginalisation of Africa;
- Human mobility and access to international markets for African animal and plant commodities could be severely constrained by infectious diseases in Africa;
- Societal contexts will be crucial in realising the benefits of the new technological systems. Culture and governance issues are often under-rated in disease management programmes in Africa;
- Substantial advances in infectious disease prevention and management will be made through integration of research across sectors (human, animal, plant) and disciplines (natural and social science). This convergence of technologies for DIM offers opportunity for innovative approaches in managing infectious disease risks in Africa.

## 2. The SACIDS Initiative

When considered against the backdrop of relatively low internal capacity for risk managing such an enormous burden of the infectious disease in Africa, it is increasingly becoming apparent that the most cost-effective strategy for addressing this problem will need close collaboration between several sectors (primarily the human and animal health sectors) and a form of sharing expertise and resources across African institutions. Accordingly the One Health approach becomes even more relevant to Africa than to other continents in the fight against infectious diseases.

It is this realisation that propelled academic and research institutions involved with infectious diseases of humans and animals (domesticated or wild; terrestrial or aquatic) in southern Africa (initially the DRC, Mozambique, South Africa, Zambia and Tanzania) to join up forces to form the **Southern African Centre for Infectious Disease Surveillance (SACIDS)** [www.sacids.org](http://www.sacids.org) – see Annex 1, with its Headquarters at Sokoine University of Agriculture, Morogoro, Tanzania. SACIDS operates in an innovative partnership with world-renowned centres of research in industrialised countries, especially the University of London Colleges that constitute the London International Development Centre (LIDC), <http://www.lidc.org.uk/>, including the Royal Veterinary College - RVC - and the London School of Hygiene and Tropical Medicine -LSHTM. Other partnerships include collaboration with the International Livestock Research Institute (ILRI), other institutions in the USA and UK. SACIDS is a founder member of CHORDS (Connecting Health Organizations for Regional Disease Surveillance), which is a One Health focused global partnership of regional disease surveillance networks concerned with enhancing local capacity for interventions in response to infectious disease threats – thereby enhancing global health security.

The SACIDS inter-sectoral collaboration is further reinforced at the national level by forming national virtual centres for infectious diseases known as ***National Centres for Infectious Disease Surveillance (NatCIDS)***, as national platforms for infectious diseases across administrative, sectoral and project lines. Collectively, the NatCIDS form the core of SACIDS.

Thus the SACIDS model is one of a Virtual Centre that links the core institutions in southern Africa with centres of Excellence in the “North”, bound by a common mission of harnessing innovation in science and technology in order to improve southern Africa’s capacity to detect, identify and monitor infectious diseases of humans, animals and their interactions in order to better manage the risk posed by them.

The SACIDS **One Health** focus is to address infectious diseases in the endemic settings of Sub-Saharan Africa, with a particular attention to southern, central and East Africa through a *collaborative effort between natural and social sciences to advance the understanding of interactions between humans, animals and the environment to improve public and animal health.*

### **3. The initial focus of SACIDS Activities**

Initial funding for SACIDS has come from the **Wellcome Trust**, the **Rockefeller Foundation** and the **Google Foundation** (initially through NTI and later directly). So far SACIDS has focused on four thrusts:

- The first has been on training a cadre of One Health young scientists with the technical expertise in either molecular biology or analytical epidemiology. This is done through 2 unique MSc courses that have been launched respectively at Sokoine University in Tanzania and the University of Zambia in Lusaka plus a series of targeted short courses for practitioners. The uniqueness of the two MSc courses is that each includes core modules on the understanding of key challenges of One Health Capacity plus a second set of core modules that are on the specific technical subjects. The second peculiar feature of these MSc courses is that the degree awarding universities have tapped into local and regional expertise as well as the technical support of The London School of Hygiene and Tropical Medicine (LSHTM), The Royal Veterinary College (RVC) of the University of London, the International Livestock research Institute (ILRI) and the Wellcome Sanger Institute in Cambridge in developing the curricula.
- The second thrust is pursuing theme driven research, focusing primarily on such themes as **Climate dependent, vector-borne diseases** (represented by Rift Valley fever), **Diseases with potential inter-species concern/spread between wildlife, livestock and humans** (represented by Tuberculosis), **Diseases of Economic importance** (represented by Foot-and-mouth disease), **Bacterial rare diseases** (represented by Plague) and **Dangerous Emerging diseases** (represented by Viral Haemorrhagic fevers -Ebola and Marburg).
- The third thrust has been to foster the sharing of expertise and resources across consortium institutions, especially in a disease emergency. A prime example of the value of this approach was the speed with which a new Arenavirus, called LuJo <http://www.virology.ws/2009/05/29/lujo-virus-a-new-hemorrhagic-fever-virus-from-southern-africa/> was identified thanks to collaboration between Zambia and

South Africa as well as the international expertise. This thrust also focuses on surveying innovative ways either alone or in partnership with others in order to enhance Biosafety and quality management in the microbiological laboratories of the SACIDS consortium institutions in southern Africa.

- The fourth thrust has been on examining approaches and technologies that have the potential for improving the efficiency of disease alerts and surveillance that lead to improving effective responses, especially to epidemics of an unfamiliar nature in the remote areas of sub-Saharan Africa. Coupled with these novel systems for disease surveillance, the SACIDS partnership is collaborating with others in health policy research and in targeting one health approaches to examine the disease burden in the dryland ecosystems of southern and East Africa.

These activities are part of a response to the realisation of the inadequacy of inter-sectoral collaboration in disease surveillance, epidemic disease preparedness and response as well as the lack of an enabling policy platform. This has led SACIDS and its partners to realise that effective risk assessment and management of epidemic and emerging diseases in Africa, and the world at large, will require a paradigm shift. Accordingly, the SACIDS smart partnership has developed a conceptual framework for One Health research in the form of a paper that has recently been published in *The Lancet ID*, which is entitled:

**Towards a conceptual framework to support one-health research for policy on emerging zoonoses.** Coker, R., Rushton, J., Mounier-Jack, S., Karimuribo, E., Lutumba, P., Kambarage, K., Pfeiffer, D.U., Stärk, K. and Mark Rweyemamu, M. (2011). *The Lancet Infectious Diseases* 11: 326 - 331

(Accessible at: [http://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(10\)70312-1/fulltext](http://www.thelancet.com/journals/laninf/article/PIIS1473-3099(10)70312-1/fulltext) )

The SACIDS model of a Virtual Centre located in Africa that seeks effective collaboration with international research expertise is still novel and relatively underfunded for its ambition. Nevertheless the goal of global health security is likely to be well served the more there are similar local innovations like SACIDS that are based in the settings of developing countries where conventional epidemic diseases and emerging ones are likely to be hotspots and which require to tap into global expertise.

## **Annex 1: The SACIDS Consortium Smart Partnership**

### **CATEGORY 1: THE SOUTHERN AFRICAN PIONEER PARTNERS and CONSTITUENT MEMBERS OF SACIDS BY AGREEMENT:**

#### **Partner 1 – Tanzanian National Consortium**

National Coordinator – Professor Mecky Matee, Head Dept Microbiology, Muhimbili University of Health and Allied Sciences, MUHAS, Dar es Salaam

- The National Institute for Medical Research (NIMR)
- Ifakara Health Research & Development Centre, Tanzania
- The Muhimbili University of Health and Allied Sciences (MUHAS)
- The Faculty of Veterinary Medicine, Sokoine University (FVM-SUA).
- The Central Veterinary Laboratory (CVL)
- The Tanzania Wildlife Research Institute (TAWIRI) and Tanzania National Parks (TANAPA)
- The Institute of Resource Assessment (IRA), University of Dar es Salaam

#### **Partner 2 – Democratic Republic of Congo National Consortium**

National Coordinator – Professor Jean-Marie Kayembe Ntumba, Associate Dean, Faculty of Medicine Institute of Public Health Kinshasa

- The Institute of Public Health of the Faculty of Medicine of the University of Kinshasa;
- The Faculty of Veterinary Medicine of the University of Lubumbashi;
- National Institute for Biomedical Research (**INRB**)
- The Central Veterinary Laboratory in Kinshasa.
- National Institute for Nature Conservation (ICCN),

#### **Partner 3 – Mozambique National Consortium**

National Coordinator – Dr Luis Neves, Faculty of Veterinary Medicine, Eduardo Mondlane University

- Faculty of Medicine - Eduardo Mondlane University (FM-EMU)
- Faculty of Veterinary Medicine – Eduardo Mondlane University (FVM-EMU)
- Directorate of Animal Sciences – Institute of Agricultural Research of Mozambique - Ministry of Agriculture (DCA-IIAM)
- National Health Institute – Ministry of Health (INS)
- National Institute for Fisheries Inspection (INIP)

#### **Partner 4 – Zambia National Consortium**

National Coordinator – Dr. Aaron S. Mweene, Dean, School of Veterinary Medicine, University of Zambia.

- School of Veterinary Medicine, University of Zambia
- School of Medicine - University of Zambia
- Central Veterinary Research Institute (CVRI)
- Tropical Diseases Research Institute (TDRC)

#### **Partner 5 – South African Institutes in the SACIDS Consortium**

National Coordinator – Professor Antony Musoke, Director OVI.

- National Institute for Communicable Diseases of the National Health Laboratory Service (NICD/NHLS), Johannesburg, South Africa
- Onderstepoort Veterinary Institute of the Agricultural Research Council (ARC-OVI), Pretoria
- Faculty of Veterinary Science University of Pretoria (FVS-UP), at Onderstepoort
- Stellenbosch University, Medical School, Cape Town

**CATEGORY 2: THE LONDON STRATEGIC SMART PARTNERS:**

- The London International Development Centre, University of London
- The Royal Veterinary College, University of London,
- The London School of Hygiene and Tropical Medicine, University of London,
- The Institute of Education, University of London
- The Imperial College, London
- The Institute for Animal Health

**CATEGORY 3: THE SOUTH-SOUTH COLLABORATING INSTITUTIONS:**

- The East African Integrated Disease Surveillance Network (EAIDSNet)
- Faculty of Tropical Medicine and BIOPHICS, Mahidol University
- The SADC Epidemiology and Informatics Sub-committee of the Livestock Technical Committee
- The SADC TADs Programme of SADC Secretariat
- AFENET
- AFRIQUE One Consortium
- SACORE Consortium
- Connecting Health Organizations for Regional Disease Surveillance (CHORDS)
- Mekong Basin Disease Surveillance (MBDS) Network

**CATEGORY 4: THE CGIAR PARTNER:**

- The International Livestock Research Institute (ILRI), Nairobi

**CATEGORY 5: OTHER COLLABORATING INSTITUTIONS FROM THE NORTH:**

- The Centre for Population and Eco-Health, University of Glasgow
- The Centre for Infectious Diseases, University of Edinburgh,
- The Global Health and Security Initiative of NTI, Washington
- The Centre for Zoonosis Control Hokkaido University, Japan
- The School of Veterinary Medicine, University of Calgary, Canada
- The Department of Geography, University of Cambridge, UK
- The International Institute for Environment and Development
- Institute of Tropical Medicine and International Health, Berlin, Germany
- The Meteorology Office, Hadley Centre, Exeter, UK
- Fondation Mérieux, France
- InSTEDD (Innovative Support to Emergencies, Diseases and Disasters), Stanford University, California, USA and Cambodia