



**Southern African  
Centre for Infectious Disease Surveillance  
- SACIDS -**

**Report of the inaugural workshop held at the  
HQ of the Agricultural Research Council of  
South Africa, Pretoria  
22nd to 25th January, 2008.**

**Edited by  
Mark Rweyemamu and Tony Musoke  
Co-Chair of the Workshop**

Working towards: *One Africa, One Health*

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SACIDS WORKSHOP REPORT  
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**SOUTHERN AFRICAN CENTRE FOR INFECTIOUS DISEASE SURVEILLANCE (SACIDS)**

**I. OPENING:**

**OPENING SCPEECH BY DR. S. R. MOEPHULI, PRESIDENT AND CEO, AGRICULTURAL RESEARCH COUNCIL OF SOUTH AFRICA, 22 January 2008**



The Agricultural Research Council is a critical entity within South Africa's National System of Innovation as well as within the agricultural sector. The mandate of the ARC is to conduct research, technology development and technology transfer in order to contribute to the improvement of the quality of life of the people of South Africa. It serves as the primary implementation agent for government initiatives, programmes and projects as well as a support function for the success of the agricultural sector.

Further, the ARC is expected to play a crucial role towards the effective management of pests and diseases with a potential to adversely affect humans and the agricultural sector. The ARC achieves this mandate by providing diagnostic and analytical services for diseases and pests, on behalf of the government of South Africa, to the agriculture sector in the country and to other partners within the region. In short, the ARC plays an important part towards South Africa's bio-security.

The ARC's business plan is from time to time, aligned with the Department of Agriculture's mission of ensuring sufficient, safe and nutritious food; eliminating skewed participation and inequity in the sector; maximising growth, employment and income as well as enhancing sustainable management of natural agricultural resources; last mitigating and managing agricultural risks.

We are aware that increased global trade and massive flow of goods and people, coupled with ever growing impacts of climate change, many of our countries on this continent and beyond have become vulnerable to the outbreak and flow of new diseases and pests. These diseases, such as recent outbreaks of BSE, Avian Influenza, Classical Swine Fever to name a few, have presented significantly increased virulence with deadly impact on humans in some cases. Besides the adverse impact on the economy, it's clear that the outbreak of zoonotic diseases presents real threats to human development and survival.

This particular workshop is important for everyone involved particularly African countries. I believe this workshop is aimed at identifying partners to form a consortium for research on infectious diseases, particularly those with a dimension on wildlife, livestock and human health. We in the ARC trust that all participants in the workshop will engage with each other enthusiastically towards generating the right proposals for:

- a) Building capacity (institutional and human) within the Southern Africa and the rest of the continent;
- b) Developing research programmes aimed at finding possible solutions for managing and to mitigate pests and diseases, especially transboundary animal diseases;
- c) Generating new knowledge for effective management of new animal diseases towards increased productivity;
- d) Stimulating investments into agricultural research, technology development and technology transfer (infrastructure and human capital); and,
- e) Promoting our understanding for effective natural resource management and climate change impacts.

In the ARC we believe that human resource capacity, including associated infrastructure are critical towards ensuring effective administrative, governance, financial and management performance to enable the organization to deliver excellence in research and development. I would imagine these would be important for partners to the envisaged consortium as well. To this end, building critical mass for Africa's ability to address the potential outbreaks of pests and diseases would be essential elements of the projects.

Science and technology are critical to the process of sustainable development. It is for this reason the ARC subscribes to NEPAD's Comprehensive African Agricultural Development Programme. In particular, our focus is on pillar 4 of CAADP, which is about "improving agricultural research, technology dissemination and adoption". To implement this, we believe in strong partnerships with our counterparts within the African continent as well as beyond.

As we debate the design of these project proposals it's important we keep in mind those less fortunate, particularly the poor on the African continent who depend on livestock for their livelihood. I therefore, hereby implore you to design programmes and projects that will be translated into action by the rural poor on our continent. Such solutions must facilitate livestock productivity for the poor through improved animal health and breeding programmes; resulting in improved livelihoods. To this end, I hereby declare this workshop open and wish you all the luck in your deliberations.

I thank you,

## **II. STATEMENTS BY KEY GUESTS**

### **II.1 STATEMENT BY DR EMILY MOGAJANE, THE DEPUTY DIRECTOR-GENERAL OF THE DEPARTMENT OF AGRICULTURE, SOUTH AFRICA**

In her Statement Dr Mogajane remarked on the importance of infectious diseases to international market access for agricultural and livestock commodities. The Sanitary and Phytosanitary Agreements and the consequential standards set by the OIE and IPPC emphasise the importance of surveillance and risk assessment. International trade has to be under commonly agreed rules and standards which must be based on the best scientific evidence available.

Over the years she had noticed that many of such rules were set by scientists from the industrialised world. These may not always reflect the true state of affairs of countries in Africa. Without clear scientific evidence from the Africa side it becomes difficult to refute any apparent mismatch between the set standards or perceived risks with what we believe to be true of the situation in Africa.

In the reality of today, such scientifically solid evidence cannot readily be generated by any one country in Africa in isolation. We need the scientific community of Africa to work together to provide such evidence.

She also cited the importance of scientific collaboration in finding solutions to the infectious diseases that so badly afflict humans, animals and plants in Africa. The African scientific community needs to realise that solutions will have to be defined in Africa.

So from a policy perspective, Dr Mogajane felt that the SACIDS initiative was long overdue. She advised that it was important for SACIDS to seek some alignment with both SADC and NEPAD so that the work of the scientific community can progressively influence national and regional policies.

She wished the workshop and the SACIDS initiative every success.

## **II.2 STATEMENT BY PROFESSOR SANDY THOMAS, DIRECTOR, UK FORESIGHT PROGRAMME**

Thank you Dr Moephuli, for hosting the reception and opening this workshop.

Thanks to the great efforts of the organisers and other contributors in the run-up to the Workshop, we have a unique opportunity to exchange ideas and perspectives.

There has been excellent progress from the meetings last September, when we presented the Foresight report to the African stakeholders. The challenge is now to bring fresh and innovative thinking and action to meet the crippling burden of infectious diseases.

The door now is open to develop the “quantum leap” required, as called for in the Foresight report.

It is essential to deliver change through partnership

- across sectors: plants/animals/humans
- institutions
- academic
- sponsor community – pleased to see such strong representation

It is also essential to approach infectious diseases from an international perspective as infectious disease do not respect political or national boundaries

Thanks again to those who have shaped the event – in particular to co-chairs, Prof Mark Rweyemamu and Prof Tony Musoke.

We feel we have the right people engaged from across the African scientific community,

Since the outset, Foresight has developed a strong African team, Prof Mark Rweyemamu, Prof William OtimONape and Prof David Serwadda to ensure that authentic and meaningful African perspectives are brought to the analysis. There have also been many African contributors through science reviews, Workshops etc.

The UK Foresight Programme has as its core mandate to: “ *Strengthen strategic policy making by embedding a futures approach across government.* ”

Through:

- Understanding what types of futures might be possible
- Challenging presumptions
- Building a more robust approach to the future
- Using the best science to inform policy development

Thus, Foresight has a unique position within the UK Government as it is given the time and space to look further into the future than is usually possible. Its approach is internationally unique as it combines the best knowledge in the science base across multiple disciplines with expertise in how to do futures work.

With respect to the project on infectious diseases, the key question was:

*How can we use science and technology to improve our capability to detect, identify and monitor infectious diseases in order to better manage the risk from them?*

This study was global in nature and focused specifically on the UK and Africa.

We look, once again, to re-visit the challenge which lies ahead and bring to bear the combined thinking of top scientists so that we might together shine a light on the issue, map out a way forward and develop a framework for action.

It is now in the hands of the SACIDS consortium to consider how this can be achieved.

We hope that during the next 3 days we will jointly explore how we might take this forward in a regional, southern African perspective. The workshop provides an excellent opportunity to innovate and break new ground in meeting this immense future challenge. And, to catalyse the first steps in delivering the quantum leap called for by the Foresight report.

### **II.3 KEYNOTE PAPER BY PROFESSOR DAVID SERWADDA, DEAN MAKERERE UNIVERSITY SCHOOL OF PUBLIC HEALTH AND A COORDINATOR FOR THE AFRICAN STRAND OF THE FORESIGHT PROJECT ON INFECTIOUS DISEASE**

The focus of Professor Serwadda's paper was on: **Lessons from the Foresight Project on Infectious Diseases - Practical use of new diagnostic technologies in surveillance.** Professor Serwadda raised the following issues.

#### **The Aim of the Foresight Project:**

- To use the best available science to evaluate threats of infectious disease in humans, animals and plants.
- Over a span of the next 20-25 Years
- Vision for Management through detection, identification and monitoring (DIM).

#### **Africa Future Disease Risks for Humans were identified as:**

- New pathogen species and novel variants;
- Pathogens acquiring greater resistance;
- Zoonotic diseases that cross between animals species to humans;
- HIV/AIDS, tuberculosis and malaria;
- Acute respiratory infections;
- Sexually transmitted infectious diseases;

#### **The African Environment for DIM:**

- Low Per-Capita Income (\$765)
- Poor Infrastructure
- Unreliable Power / Water Supply
- Lack of Trained Personnel
- Most Population reside in rural areas
- Diagnosis mainly Syndromic

#### **Utility of New Technology in Africa:**

- Utility of new Technology can be high
- Main Considerations
  - Cheap
  - Easily Accessible
  - Effective
  - Reliable

#### **Some DIM Technologies from the Foresight Science Reviews:**

- Analysing nucleic acids or proteins to identify diseases
- Detecting unknown diseases
- Disease susceptibility



- Measuring cells' responses to infection

**DNA Based Technologies – Advantages:**

- Sensitive
- Specific
- Small samples required
- Minimize / Eliminate invasive procedures

**HIV / STD Specimens and assays:**

- Serum:
  - HIV viral load (PCR)
  - Serology: HIV, syphilis, HSV-2, HBV, HCV
  - PCR: HIV (including subtype), HBV, HCV
- Urine:
  - PCR: Chlamydia, gonorrhoea, trichomonas
- Vaginal swabs:
  - PCR: HSV-1, HSV-2, syphilis, *H ducreyi*, HPV
  - Hybrid capture: HPV
- Penile swabs: PCR, HPV, HSV-1, HSV-2, syphilis, *H ducreyi*,
- Saliva: HIV
- Foreskin tissues:
  - Immunohistochemistry for HIV target cells and HIV, inflammation
- Placentas:
  - Histopathology: Chorioamnionitis, malaria
  - Immunohistochemistry: HIV, target cells

**Site of Specimen Collection:**

- Samples collected in diverse setting, i.e.. Homes
- Population based surveillances possible

**Logistics:**

- Increasingly rural areas are accessible
- Location and mapping more precise

**Human Resource - need for:**

- Good Technicians
- Training
- Motivation

**Devices Used for Sample Analysis - Trends towards:**

- Miniaturisation
- Multiple Assays
- Link to data entry
- Link to Communication

**Conclusion:**

- New DNA based diagnostic technologies have greatly improved our ability to conduct field studies (surveillance) that were previously impossible
- Non-Invasive specimen collection (urine, self administered vaginal swabs, Volatiles) permit taking samples in diverse settings including home

### III. REPORTS ON IN-COUNTRY SWOT ANALYSES

#### III.1 DR Congo: Presented by Dr Leopold Mulumba

##### **National consortium institutions:**

- The Institute of Public Health of the Faculty of Medicine of the University of Kinshasa (Inst Public Health-DRC)
- Central Veterinary Laboratory, Kinshasa (CVL-DRC)
- The Faculty of Veterinary Medicine of the University of Lubumbashi (FVM-Lubumbashi)

##### **Strengths:**

Medical research and training

- DIM of HIV, Measles, TB, Sleeping Sickness, Malaria, Meningitis, Polio, Pests, Plague, Cholera, etc. Using Serology (ELISA), Bacterial cultures, Cell cultures (measles and Polio).
- Regional School of Public Health (under WHO umbrella) and 9 Medical Faculties (9 Universities) for the Country.
- National specific Unit for HIV investigation and monitoring for all the country.
- Main technologies used: serology (ELISA), PCR,
- Isolates DNAs collection (exported for advanced genotyping)

Livestock, Wildlife & Plants opportunities

- Central Veterinary Laboratory (national reference laboratory),
- One Faculty of Veterinary Medicine (6 academic years),
- Three Faculties of Agronomic Sciences,
- One postgraduate Regional programme in Natural resources Management,
- One National Institute for Nature Conservation (ICCN),
- Plant Disease analyses Unit being prepared with University of Kinshasa and Agronomic School of Gembloux (Belgium).

##### **Major weakness:**

Lack of:

- Technicians:
  - Average age of current technicians: > 45 years old;
  - Up dated training of technicians,
- Junior scientists (employment of new staff stopped),
- Reagents and consumables,
- Adequate remuneration because of low salaries
- Funding for research activities
- Libraries and access to internet, etc.

##### **Opportunities:**

- Our research institutes and Faculties may be exploited for practical training and advanced studies in tropical & emerging diseases of Humans (old Faculty of Medicine & its academic Hospital, created in 1954 – several diseases are present),
- Given particular ecological conditions: - Congo river basin, - many rivers and lakes – many natural reserves (9 official national parks) – many interface areas wildlife / livestock / humans: excellent ground for research on zoonotic and fish diseases
- The Central Veterinary Laboratory (CVL) with its facilities being upgraded may be used as a part of the SACIDS for some TADs (ASF) and emerging Zoonoses (Hemorrhagic fevers).

##### **Risks:**

- Several prerequisites: financial sponsorship, BSL – 3 facilities not available, accreditation.
- Security on the border with Rwanda and Burundi and Uganda (risk for field work in that area)

### III.2 Mozambique: Presented by Dr Luis Neves

#### Consortium Institutions

- 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 – Ministry of Fisheries (INIP)

Other institutions that might adhere to the consortium:

- National Directorate of Veterinary Services – Ministry of Agriculture (DNSV)
- National Directorate for Health – Ministry of Health (DNS).

These institutions will play an important role as coordinators of surveillance field activities.

#### Strengths:

- Considerable number of junior staff willing to be trained and open to new challenges such as the One Medicine
- Availability of a Central Veterinary Laboratory, with different sections for diagnosis and research of infectious diseases
- The CVL includes 3 regional laboratories that perform basic techniques and with capacity to submit specimens to the CVL, therefore allowing epidemiological surveillance
- Recently rehabilitated laboratories
- Existence of a Biotechnology Centre where professionals of distinct areas (veterinary, human health and agronomy) can develop research activities)
- Research projects undertaken in collaboration with different institutions and professions (Tuberculosis, Cysticercosis)
- National Institute of Health is coordinating a Master Degree Course in Mozambique in Biomedical Sciences
- Experience for managing external funds to build up local capacity and implement public health programs
- Experience in coordination and implementation of surveillance programs for HIV, Measles, and Rubella in Mozambique

#### Weaknesses:

- Insufficient trained staff to conduct all research activities related to infectious diseases
- Excessive administrative work load
- Lack of qualified personnel in rural areas
- Lack of equipment and inadequate supply of reagents
- Insufficient number of specialized laboratories (cell culture, molecular biology)
- Poor and insufficient maintenance of equipment
- Financial disbursements not adjusted to research activities
- Low salaries of researchers (low level of motivation)
- Collaboration based on personal instead of institutional commitment
- Lack of reference labs at provincial level

#### Opportunities:

- The availability of scholarships for training of the young scientists employed without postgraduate qualification;
- Expansion of new technology (PCR, Flow Cytometer)
- The possibility of participating in regional challenging research models (diseases) targeting infectious disease trends in the country and the region
- Some major equipment accessible to shared use
- Exchange of information between researchers from different laboratories
- Existence of funding opportunities from different donors for research projects, on competitive basis
- Implement of EQA programmes

**Threats:**

- Compartmentalization and low level of information sharing
- Changes that might occur at the level of leadership, affecting efficiency and research environment
- People looking for more attractive jobs if conditions for staff retention are not created
- Risk of stopping collaboration when the researchers involved leave
- Non conducive political environment

**III.3 Tanzania – Presented by Dr Sayoki Mfinanga****National consortium institutions:**

- The National Institute for Medical Research (NIMR)
- Ifakara Health Research & Development Centre (IHRDC)
- The Muhimbili University of Health and Allied Sciences (MUHAS)
- The Faculty of Veterinary Medicine, Sokoine University. (FVM-SUA)
- The Central Veterinary Laboratory (CVL)

**Strengths:**

- Existing Multi-disciplinary consensus on infectious disease and One Medicine collaboration
- Training programme in SUA and MUHAS can be utilised for training targets
  - Training support and consultancy in epidemiology, microbiology
  - Field epidemiology being conducted involving MUHAS, MOHSW, NIMR, and IFHRC has just started and can also be utilised for the purpose
- Co-supervisions of postgraduate students and field work at NIMR and IFHRC will be used.
- Strong national and international collaborations
  - MOU between Medical and Veterinary Institutions
  - Research institutions and Universities, e.g. between NIMR, SUA and MUHAS
- Some Institutions have long experience with international funds management at (e.g. SUA, NIMR, MUHAS)
- Adequate expertise in TB epidemiology and control

**Weaknesses:**

- Human resources to detect infectious diseases
  - Few masters and PhDs
  - Few trained human resources at district level to cater for human, livestock and wildlife sectors
  - Medical and veterinary officers
  - Lab technicians
  - IT personnel(NB: In human health sector there is an acute shortage of highly qualified personnel)
- No motivation of staff and there is a constant brain drain
- Inadequate laboratory facilities and equipment
  - RT PCR machines
  - Sequencer PCR genotyping machine
  - Proteomics systems
  - Inadequate biosafety equipment,
  - Specimen storage equipment
  - CO2 Incubators for virus isolation
  - Incinerator, treated effluent disposal facilities
- Most medical laboratories are clinically oriented and few are oriented towards public health.
- Surveillance depends on syndromic approach
- The public health laboratory network is largely dysfunctional
- Lack of operational BSL3 laboratory
- Weak Laboratory Quality Management System
- Limited number of accredited laboratories
- Weak IT and data management facilities

- Lack of Isolation units for highly infectious diseases – both for humans and animals
- Inadequate teaching/research facilities

#### **Opportunities**

- The potential for sharing resources between medical and veterinary institutions at the analytical level, such as post-PCR molecular analysis, including nucleotide sequencing
- Generation of more comprehensive information on disease surveillance;
- Student and scientist exchange within the region;
- The utilization of university staff on research of a strategic relevance to the country and the region
- The potential to develop innovative and sustainable postgraduate programmes for human and animal health sciences, as the catchment would be from the whole region
- The potential for upgrading the existing BSL2 with BSL3 practices laboratory to BSL3
- Tanzania can offer:
  - SUA to host secretariat
  - Long experience with international funds management at SUA and NIMR, MUHAS
  - Coordination and consultancy support of TB,
  - Training support and consultancy in epidemiology, microbiology
  - Physical resource including laboratories and equipment
  - Highly qualified scientists within SUA, MUHAS, NIMR, CVL, IHDRC
  - Training Programme at MUHAS and SUA complemented by support from NIMR, IHRDC and CVL
  - Existing framework of close collaboration between medical and veterinary sectors underpinned by MoU's between institutions in the different sectors
  - Political and social stability and thereby a conducive working environment

#### **Threats**

- In case of Lack of political willingness to support training and research programmes.
- Institutional capacity may be weakened as a result of conflicts of interests due to misconception of ideas.
- Ageing profile of staff
- Brain drain to other organisations or country

### **III.4 Zambia: Presented by Dr Aaron Mweene**

#### **National consortium institutions:**

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

#### **Challenges:**

- Inadequate funding and logistical support for research
- Lack of coordination with related bodies on issues of infectious diseases
- Poor monitoring and surveillance of infectious diseases-near empty database
- Inadequate infrastructure including roads
- Inadequate sufficiently trained human resources
- Poor compliance
- Semi wild livestock and no infrastructure to assist with sampling
- Distances vast between villages
- Lack of meat inspection due to home slaughter

#### **Capacity building-laboratory:**

- Invest in updated infrastructure/equipment so as to attract Zambian scientists in the Diaspora
- Standardization of tests and interpretation of results
- Laboratory networking with Regional and World Reference Laboratories

- Build strong collaboration between various health service sectors (health, agricultural and veterinary)
- Improve capacity of surveillance systems to rapidly detect disease incursion and ensure rapid response
- Community participation in surveillance activities

**Capacity building-Training:**

- Curricula should be tailored so as to respond to the changing needs
- Train critical mass of young scientists (MSc, PhD, Post Docs) in the relevant fields to ensure continuity
- Handsome reward for scientific personnel and formulation of retention schemes
- Put in place viable continuous professional development (CPD) programmes for continued brushing up

**IV. REGIONAL CAPACITY ANALYSIS: REPORT OF THE SACIDS MISSION – Prof Rudovick Kazwala, Dr Janusz Paweska and Prof Mark Rweyemamu**

**Where the mission went:**

- Tanzania
- Zambia
- Mozambique
- South Africa
- (Discussions with DRC Delegation)
- SADC Secretariat
- NEPAD Secretariat

**What the mission did:**

- Meetings at policy level
  - Minister
  - Permanent Secretary
  - Vice Chancellor
- Meetings at senior management level
  - Ministry Directors (human and animal health)
  - Directors of Research
  - Deans
- Group meetings/workshops - inter-sectoral
- Overview of facilities

**Key points discussed during inter-sectoral stakeholder consultations:**

- Consensus on Infectious Diseases and One Medicine collaboration
- Infectious disease burden
- National research potential – HR, infrastructure, competence, training programmes
- SWOT - institutions
- What key training targets
- What key enabling research targets
- What key capacity development targets, i.e. innovations for breaking the low research output logjam – what would accelerate the transformation of African institutions into world class vibrant academic and research centres
- What are specific country/institutional requirements
- Regional coordination - What can country offer

**Consensus:**

There was a general consensus on the importance of infectious diseases at:

- Regional level
- Country level
- Institutional level
- Sector level

**Infectious Disease Burden:**

- More than 50% of sectoral ministry budgets are earmarked for control of infectious disease
- More serious infectious diseases have vertical programmes – with donor support
- Reactive to sporadic fatal infectious diseases outbreaks – country/donor support
- Bottleneck is in the capacity to diagnose infectious disease
- Surveillance is based on syndromic approach

**Impact of infectious diseases:**

- 70 to 90% of hospital cases reported to be due to infectious diseases (IDs)
- IDs constitute primary activity for national veterinary services
- Yet teaching and research on IDs are not specifically high priorities in all faculties

**One medicine and Networking:**

- Universal support for One Medicine inter-sectoral collaboration and regional network approach
- Need to form national virtual centres for infectious diseases (NatCIDS) – which could be part of the Regional network SACIDS/ACIDS
- Managing cross-cutting issues could be a challenge
- One Medicine approach – rather a new concept in the region. But one country hopes to pilot a One Medicine, Africa-UK Partnership research project
- Inter-sectoral collaboration practiced in response to outbreaks of fatal zoonotic diseases (e.g. Avian influenza and RVF) on ad hoc basis
- Emergency steering committees are formed and led mainly by the veterinary departments

**Inter-institutional research collaboration:**

- Academic and research institutions
  - Moderate collaboration
  - Joint research projects
  - Memorandum of understanding and Letters of agreements
  - inter-faculty facility - EMU biotech unit
- Animal and human health sector/institutions
  - Weak collaboration
  - Joint research project

**The Role of Science and Technology (S&T):**

- S&T is given weight throughout region – dedicated ministries/directorate for ST
  - But only RSA and Mozambique have National Research Fund under S&T
- Research agenda is driven by sectoral ministries
- Allocation of internal funds for research is very low <0.2% of GDP
- Countries do not have a dedicated national body to manage infectious diseases as a cross-cutting issue
- Qn: should NatCIDS link to Science & Technology Ministries/Agencies?

**Existing Regional networks and programmes in the region**

- Regional network examples:
  - SADC Committee of Deans of Medical Schools
  - SADC Livestock Technical Committee
  - SADC Plant Protection Technical Committee
  - SADC Network for Excellence in Clinical Trials
  - Academic institutions - agricultural forum e.g. RUFORUM, ANAFE
  - SADC for Capacity Development in Agricultural Universities
  - African Plant Diagnostic Network
- Regional Programmes:
  - IDSR in several countries - supported by WHO and USAID
  - SADC TADs in Mozambique, Tanzania, Zambia (Malawi, Angola) plus SADC Secretariat
  - NUFU Funded Veterinary Network for Environmental toxicology and zoonoses

- Cysticercosis Working Group in Eastern and Southern Africa (CWGESA)
- Bovine Tuberculosis Network for Africa
- Universal acceptance that SACIDS would fill a GAP

**Some examples of resource strengths in the region:**

- New laboratories in TZ (medical, veterinary, seed health) and Zambia (medical and upgrading of veterinary)
- HIV Lab in Mozambique is an example of transformation
- Human resource base (**Table 1**)
  - Reasonable number of suitably qualified in TZ
  - Greater need for accelerated HR capacity development for Mozambique, Zambia and DRC
- Staff retention a universal problem
  - Need for some innovative measures

**Capacity - Infrastructure and Equipment (Table 2):**

- Most laboratories ill-equipped with just basic equipment
- However, labs funded by vertical programmes are usually well equipped
- Post PCR DNA manipulation equipment is rare in the region
- Lack adequate technical staff to maintain molecular biology equipment
- High biosecurity lacking (BSL-4 and full BSL-3 only in RSA although some countries hope to have some BSL-3 facilities by end 2008)
- ICT facilities are inadequate

**Some key training needs identified:**

- Consciousness for biosafety – major infrastructural gaps exist in laboratories
- Identified Short/CPD training needs
  - Biosafety
  - Laboratory management
  - Specific techniques
- Identified Postgraduate training needs
  - Molecular biology (including cell biology and immunology)
  - Analytical epidemiology
  - Field epidemiology

**Some examples of gravity of funding location in the region**

- Norway support to SUA since 1996
  - Funding level was gradually shifted from north (Norway) to south (Tanzania) – at moment 80% south and 20% North
  - 100% funds allocated to SUA -
  - SUA provides financial management, audited internally and externally
- At UNZA external funds have a separate accounting system with a dedicated financial accountant



**Table 1: SACIDS CONSORTIUM HUMAN CAPACITY POTENTIAL  
FOR INFECTIOUS DISEASE RESEARCH  
(Jan 2008)**

<b>Institution</b>	<b>PhDs/DSc &lt;45 yr</b>	<b>PhDs/DSc &gt;45 yr</b>	<b>MSc &lt;45 yr</b>	<b>MSc &gt;45 yr</b>
<b>Democratic Republic of Congo</b>				
CVL-DRC	0	0	1	2
Inst Public Health - DRC	2	6	10	5
Vet Faculty-Lubumbashi	2	10	12	5
<b>Mozambique</b>				
DCA –IIAM	0	0	0	7
FVM-EM	1	0	9	3
FM-EM	7	11	6	3
INS – MISAU	5	0	5	1
INIP	1	0	2	1
<b>South Africa</b>				
ARC-OVI	15	18	35	7
FVS-UP	5	11	4	3
NICD	19	8	23	5
Medical School Stellenbosch	8	6	14	3
<b>Tanzania</b>				
FVM-SUA	9	19	10	0
FM-MUHAS	6	20	7	13
NIMR	12	16	52	14
CVL	4	4	6	7
IHRDC	1	3	5	1
<b>Zambia</b>				
FVM-UNZA	11	7	11	1
FM-UNZA	10	3	35	12
CVRI	5	1	2	3
TDRC	1	3	8	2

Table 2: SACIDS CONSORTIUM INSTITUTIONAL COMPETENCE FOR INFECTIOUS DISEASES (Jan 2008)

Institution	Conventional serology AGID, HA, Aggltn	ELISA	Bacteriological culture	Mycoplasma &/ Mycobacteria culture	Cell culture & virus isolation	PCR and RT-PCR	Post-PCR Genetic typing	BSL-2	BSL-2 with BSL-3 practices	BSL-3	BSL-4	ISO or OIE or WHO accredited
<b>DRC</b>												
CVL-DRC	Yes	Yes	Yes	No	No	Yes	Some but not sequencing	Yes	No	No	No	No
Inst Public Health - DRC	No	Yes	Yes	No	No	No	No	No	No	No	No	No
Vet Faculty- Lubumbashi	No	No	Yes	No	Yes	No	No	yes	No	No	No	No
<b>Mozambique</b>												
DCA –IIAM	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No	No	No
FVM-EM	Yes	Yes	Yes	No	No	Yes	Some but not sequencing	Yes (end 2008)	No	No	No	No
FM-EM	Yes	Yes	Yes	No	No	Yes	No	Yes	No	No	No	No
INS – MISAU	Yes	Yes	Yes	??	Yes	Yes	Yes	Yes	No	No	No	No
<b>South Africa</b>												
ARC-OVI	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
FVS-UP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No
NICD	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Medical School Stellenbosch	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	no	some
<b>Tanzania</b>												
FVM-SUA	Yes	Yes	Yes	Yes	Yes	Yes	Some but not sequencing	Yes	Yes	No	No	No
FM-MUHAS	Yes	Yes	Yes	Yes	Yes (end 2008)	Yes	No	Yes	Yes	No	No	No
NIMR	Yes	Yes	Yes	Yes	Yes (end 2008)	Yes	No	Yes	Yes	Yes (end 2008)	No	No
CVL	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	No	No	No
IHRDC	Yes	Yes	No	No	No	Yes	Some but not sequencing	Yes	Yes	No	No	No
<b>Zambia</b>												
FVM-UNZA	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes (end 2008)	No	No
FM-UNZA	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No	No	Yes
CVRI	Yes	Yes	Yes	Yes	No	No	No	Yes	No	No	No	No
TDRC	Yes	Yes	Yes	Mycobact.	No	Yes	No	Yes	No	No	No	No

## V. THE EVOLVING PLANT DIAGNOSTICS NETWORK AND ITS POSSIBLE INTEGRATION INTO THE SACIDS NETWORK - Dr Alex McDonald

### **Motivation**

- "The capacity / ability to diagnose plant diseases is at the core of plant disease control irrespective of... the control strategy..."
- "It is highly unlikely that sufficiency financial resources will become available and committed for each country....."
- "...a more strategic and coordinated approach ....effective... attract significant internal and external resources"

### **Goal**

- "Develop a roadmap for the creation of a coordinated network for plant disease diagnostics in Sub-Sahara Africa"

### **Limiting factors for Plant diagnostics:**

- Infrastructure (laboratories, equipment and internet etc) not available, poorly maintained or not accessible
- Insufficiently trained personnel and no critical mass
- Advanced technologies, rarely available, limited opportunities for access to new technologies
- Access to diagnostic consumables is difficult
- Communication and connectivity to intermediate and end users poor to very poor
- Baseline data on the presence or absence of diseases lacking, no consolidated databases available
- Plant diagnostics are not recognized as an essential component , little if any political support
- Sustainability is a major problem
- Limited integration with intermediate and end users
- Access to intellectual property will become increasingly important

### **Key recommendations of Bellagio and Zanzibar Meetings**

- Plant diagnostic network be established in sub-Saharan Africa
- Network must address the key limiting factors
- Established and driven by and for Africans
- Initial network be limited with respect to crops (staple)
- Kenya, Mozambique, Nigeria, South Africa, Tanzania and Uganda
- Maize, sorghum, cassava and banana
- Design of a hub and node model
- Steering Committee and External Advisory Committee

### **Area of initial attention**

- Focus on staple foods confirmed
  - Maize
  - Sorghum
  - Cassava
  - Banana
  - Cowpea

### **Pioneer Countries**

- Mozambique
- South Africa
- Tanzania
- Kenya
- Nigeria
- Uganda

### **Problems and challenges**

- Creation of a network is enormously extensive and inclusive [other networks(!)]
- Diagnostic services for plant diseases secondary to research / training and project based
- Privately-funded enterprises have vested interests
- Existing infrastructures and knowledge bases could be exploited (provided..)
- Training is inherent to sustainable systems
- Governance is key to success
- Mobile clinics only successful when crews properly trained as general experts (cf. general practitioners in medicine)
- Variable national legislations and cross-border regulations (regional-based operations)
- Lack of or insufficient extension services
- Need for baseline surveys (diseases, pests and related socio-economic problems)
- Centralised data base
- Detection of emerging epi- / pandemics
- Transmission of data to plant breeders (regional scale)
- Reference frameworks
- Sharing of equipment & services
- National adoption of funder-initiated services

### **Key needs**

- Funding for
  - Equipment (real-time PCR etc.)
  - Surveys
  - Ad hoc testings / identifications
  - Movement of people rather than materials / equipment
  - Reference stocks
  - Routine screenings
  - Publications / info disseminations
  - Dedicated personnel e.g. coordinators, keepers of data bases, etc.
  - Sponsorships for formal and informal training

### **Examples of related existing networks**

- IITA's International Network (IPDN)
- Cassava Network
- Global Plant Clinic (not international)
- Global Mycotoxin Network
- Programme for Africa's Seed Systems
- Initiative to End Hunger in Africa
- Initiative for Health and Biomedical Innovation
- African Bio-fortified Sorghum

## **VI. LESSONS FROM OTHERS AND POTENTIAL COLLABORATORS**

### **VI.1 MESSAGE FROM DR. DAVID NABARRO, UNDP, New York**

Good morning. I am sorry I can't be with you in person at this really important meeting to discuss the setting-up of a Southern African system for disease surveillance and the network that is based around the centre to do that activity.

The reason why I can't be there is that I am actually going to be in Indonesia working with Government and Partners on aspects of Avian Influenza. Partly because, not only is the Avian Influenza problem important for poultry but also because we suspect that the current virus that is causing highly pathogenic avian influenza in many countries in the world could one day cause an influenza pandemic. And so my visit to Indonesia is quite important and prevents me from being with you in South Africa. So, with this message, what I am doing is addressing the part of the agenda that I was asked to cover and that was to use the case study work that is being going on in regard to Avian Influenza over the past few years as a kind of case study of

ways in which animal health and human health have been coming together. And also to identify the some of the enablers and barriers for an effective cooperation.

Now, I work at the United Nations Head Quarters in New York, but I was moved there in September 2005, at the request of the Director General of the World Health Organization and the Food and Agriculture Organization. The idea being to have a single focal point to coordinate between those concerned primarily with Animal Health and those concerned with Human Health. And off course we also be had the involvement in the setting up this role of the World Organization for Animal Health or OIE. And so my first enabling fact that I would like to identify, is strong backing from Senior Management and also from key Political leaders in any attempts to bring together work on animal and human health. And certainly that was important for the effort on avian influenza pandemic. Not only did we need to have high level involvement people within the United Nations system but we also needed to have member states within the United Nations that is governments and their leaders. Saying to the organizations that we want you to give this priority and we want you to work together we want a coordinated approach to this issue. And so shortly after I was appointed it was very useful that a number of governments got together and set up different kinds of partnerships for work on avian influenza and pandemic preventions. Perhaps the best known of these is the international partnerships on avian and pandemic influenza (APAPI). And the political support it has been given by APAPI in successive meetings during the last two and a half years has been very important in enabling me and my colleagues to continue to try to bring together groups and individuals who otherwise, frankly, would prefer to work more independently.

Now in addition to actually getting people to talk to each other and to work together, we also tried at the global level, to encourage synergised action. By that we really do mean: ***"The whole being greater than the sum of the parts"***. People working on animal health actually working out how it is they can better work with their human health colleagues, bringing together communications experts, people who know about financing and institutional development, so that the overall single approach, with involving different professional disciplines, is there and is going ahead.

Now that synergy doesn't come without a lot of effort. In a minute or two I am going to talk to you about some of the techniques we have used in the avian and human influenza work to try to build continuing synergy. One thing that was important to underline our work was to what we are doing to scientific and technically creditable. We needed to be sure that we got the best epidemiology, the best virology, the best work on host factors that influenced infection. The best work to help us explain why disease transmission occurred in certain settings and not in certain other settings. And also we needed to be conscious that actually the science is still giving us a lot of difficult questions that we can't fully answer. Evidence based, science based is key and we have to use that evidence base in order to develop a proper strategy. So at the global level, the key enabling factors, slightly in reverse order were:

- Good evidence with strong research backing,
- An agreed strategy for what is going to be done: this was pulled together by FAO, WHO, OIE and The World Bank in November 2005.
- Commitment to synergised action, "The whole being better than the sum of the parts".
- Strong political backing, both within the organizations in which different parts of the UN were coming together and also from Member States from governments themselves.

Now, I want to go to the country level: 60 countries during the last two and a half years where H5N1 Avian Influenza has been reported in some of these quite deeply entrenched, plus many other countries who have been preparing to respond to avian influenza and frankly most countries in the world who have been trying to get ready for the next influenza pandemic when it comes.

What are the factors at country level that enable effective action? Firstly, again it is strong leadership, **political leadership**. Quite honestly, civil servants like myself, can't do very much if we don't have politicians, people at the top saying, we want you to do this, we are going to back you if you do it, we are going to check up to see if it is done and if you get into

trouble we are going to help you sort out the difficulties. That political backing is the key and the countries that have done best are those where a Prime Minister or a Deputy Prime Minister has taken the lead bringing together different Minister in Cabinet checking to see the work is taken forward, taking responsibility for it, addressing various kinds of Committees of Legislators to ensure that the work is being done. Secondly, there's got to be **the capacity to surge**. Which means that when you do get a suspect bird die-off that makes you worried that there is avian influenza or when you do get human cases and you are perhaps worried that there has been a shift in the virus and sustained transmission is starting, you can get out there and study it quickly with the epidemiologist, with the community organizers, with the social mobilizers, enough cash frankly to enable people to get to where they are needed quickly. That surge capacity is very important. The countries that have done well in controlling avian influenza get out and surge quickly. Thirdly those who work on animal health, human health must come close together must be working together. One country where I have seen very good work, there is a tradition that every month the Head of Human Health and Head of Animal Health in the district will come together and reveal what is happening. And they will work also with the scientific and technical institutions and laboratories in the like, comparing what they are saying, making certain that they are giving the same basic message to Legislators so that we don't end up with mixed messages coming in Parliament.

The next point on what happens at country level is that there must be strong engagement between **public sector, private sector and voluntary agencies**. After all, it is the commercial sector that is primarily involved in livestock production; it also caused small backyard farmers but frankly if we don't take count of what is going on in the commercial sector, we won't do it right. In addition, the voluntary agencies, be they the civil society groups of town's people or service organizations, are absolutely key in providing the glue that brings people together so that they work as one. And of course the public sector must be there as well. So that kind of alliance between the different groups is very important. If people don't have incentives to report, to act, then they won't take advantage of what's on offer when it comes to disease control and of course unfortunately controlling animal disease often means restricting movements, stopping people going to market, and actually culling not only those that are affected but some healthy roundabout. So **incentives**, particularly compensation that encourage reporting, do lead to people cooperating with culling programmes is key. And finally, I would like to say that there has got to be excellent **public information and communication** so that people themselves understand what is happening, nothing should be hidden.

The six enabling factors are:

- Leadership
- Capacity to surge
- Strong links to animal and human groups at local level
- Good engagement between public, private and voluntary sector
- Incentives for reporting, for participating in control programmes
- Communication that engages everybody.

Now, internationally we have been very lucky, not only have we had strong political support when I started out in 2005, but it has been sustained with regular meetings in Washington in October 2005; then in Beijing in January 2006; through to Vienna in June 2006; Bamako, Mali in December 2006; New Delhi in December 2007. Meeting of Countries bringing together Senior Officials or Ministers, together with voluntary groups, together with International Organisations, reviewing how they are getting on and discussing with each other some of the real difficult challenges they face. This participation of the Nations is absolutely critical, to taking forward an agenda or trying to get new ways of working and at the New Delhi meeting, the theme of the meeting was **"One World - One Health"**, and many of the Governments who took part said: **"we are going to work for bringing together human health and animal health so that we work as one"**. And inspired by that, the different organisations in the international system, both the UN organizations, like FAO, WHO, the international bodies like OIE had their own agreed consolidated action plan for how they are going to work together, this is publicly available. With this political support, with our consolidated plan that

brings together all the different programmes and with big emphasis at the country level on joint action led by Country Officials we have seen this kind of cooperative programming taken forward. It is not perfect, and although we have good finance promised by many countries and quite a lot delivered, I still believe that for African Nations there hasn't been enough money for developing capacity to do with avian influenza and preparing for a pandemic, but we are going to take this work forward, we are going to try and get a longer medium homostrategy ready for our next Intergovernmental meeting in October in Cairo. And we will give greater emphasis to convergence between animal and human health not only for avian influenza and pandemic preparedness but for other threats of disease that could emerge at the animal human interface and could affect human security.

Thanks for the chance to speak with you and I hope the meeting goes really well and I look forward about hearing about the results.

**VI.2 One Health – One Medicine collaboration for human welfare and economic development: the South African experience and what South African institutions can offer to the consortium - Prof Barry Schoub**

This presentation was a set of slides demonstrating the epidemics of the 21<sup>st</sup> Century, the global and regional implications and the facilities available at the South African National Institute for Communicable Diseases, which will form part of the SACIDS consortium. There was no written text provided.

**VI.3 MESSAGE FROM THE AFRICAN DEVELOPMENT BANK – Dr Chi Lawrence Tawah**

We would like to express our gratitude and appreciate to the Foresight Programme and the other Organizers of this workshop for inviting the Bank to participate in its deliberations in South Africa.

We acknowledge the importance of the workshop and would have loved to be there ourselves. However, circumstances beyond our control have not permitted us to participate or to send a representative there. We would appreciate your sharing the recommendations of the workshop with us. We are still available to assist in whatever way possible in the realization of the resolutions of the workshop.

As you may already be aware the Bank is supporting the SADC region in strengthening its capacity to manage the risks of TADs. For your information and as per my previous email to you sometime ago, some of the keys area of intervention are (a) the establishment of a Southern African Commission for the TADs, (b) the strengthening of networking institutions including provision of ICT for improving the networking, (c) the strengthening of national and regional diagnostic capacity (laboratories and epidemiology) and (d) human resource development (capacity building), among others.

In fact, we are looking at adapting this approach to other regions in sub-Saharan Africa, where livestock are important in the economy, if they request for Bank's assistance.

We believe, therefore, that the outcome of the discussions you would be having in Pretoria on the one medicine concept (humans, animals and plants) and the idea of a Pan-Africa Centre for Disease Control on the basis of the US CDC, probably starting with a regional centre for Southern Africa and gradually migrating towards a Pan-Africa Centre would be quite useful for the work of the Bank as we are also involved in supporting our regional member countries to improve on the health of their people (sound health and mind are important ingredients to economic growth and wellbeing) through strengthening of quality and efficient health delivery services and quality nutrition.

We wish you successful deliberations at the workshop and look forward to receiving the minutes of your discussions and recommendations.

Thanks for your understanding.

#### VI.4 THE WORLD BANK'S WORK IN MALARIA AND HIV/AIDS IN SUB-SAHARAN AFRICA - Dr Anne M. Pierre-St. Louis, Lead Health Specialist and Dr Oscar F. Picazo, Senior Health Economist

##### **Booster Program for Malaria Control in Africa**

- Previous approach of WB (1998-2005 focusing primarily on health systems strengthening) **did not** yield the intended results for malaria control and reductions in child mortality
- WB **revised** its strategy for and **recommitted** itself to malaria control in a major media event attended by five WB Vice-Presidents in April 2005
- The **Africa Region** launched the Booster Program for Malaria Control in September 2005 in a major event attended by all key partners

##### **Booster Program Objectives**

- Seeks to **contribute**, in collaboration with key partners, to the implementation of **national strategic and operational plans** for malaria control as developed by the affected countries themselves
- Finances, through these national plans, a combination of activities including, but not limited to:
  - Distribution of long-lasting insecticide-treated bednets (LLINs)
  - Indoor-residual house spraying (IRS), where appropriate
  - Intermittent prevent treatment for pregnant women
  - Treatment with artemisinin-based combination therapies (ACTs)
- Assists client countries to accelerate progress toward the achievement of the **Abuja targets** by 2008, which broadly speaking call for at least 60% utilization of effective malaria prevention and treatment
- Recognizes that achievement of the Abuja targets in the national plan is a **joint effort with all Roll Back Malaria partners** in the country

##### **Key Features of the Booster Programme**

- **Two pronged approach:**
  - Support rapid scale-up of proven interventions
  - Strengthen health systems
- **Flexible:** design of each Booster project adapted to country context and lending instrument (SWAp, Stand Alone, etc.)
- **Country-led:** supports national malaria control plans
- **Strong results focus:** program coverage and investments
- **Emphasizes partnership:** embedded into the RBM Partnership, encourages new malaria control partners
- **Regional:** addresses multi-country and cross-border issues

##### **Regional Integration Initiatives under the Booster Program: Examples**

- Zambia-Mozambique-Malawi
- Kenya-Uganda-Tanzania (centred on Victoria Lake Region)
- Rwanda-Burundi
- DR Congo-Nigeria-eastern border countries

##### **MAP Regional Initiatives in Southern Africa**

- The Great Lakes Initiative on HIV/AIDS Support Project (GLIA) for \$20 million was approved in March 2005 to add value to national efforts, and support interventions for mobile groups including refugees, internally displaced people and returnees. It provided seed capital for the formation of a regional institution, wholly owned by its member States. It involves UNHCR as an implementing partner as well as UNAIDS. GLIA countries are Burundi, Democratic Republic of the Congo, Kenya, Rwanda, Tanzania and Uganda).
- Southern Africa HIV/AIDS Transport Corridor Project would provide support to the world's most affected region, including Malawi, Zambia, Zimbabwe, Mozambique and



South Africa, to address coordination, monitoring and evaluation, and long-haul transport sector and key transport located communities.

### **Bank Support to HIV/AIDS Control in Middle Income Countries (MICs) Outside MAP**

- Institutional Development Fund (IDF) grants (Namibia, Swaziland) on M&E, capacity building
- Specific technical assistance and research
  - Impact of HIV/AIDS (Swaziland, Namibia request)
  - Impact of ARV treatment (Free State, South Africa)
  - Economic analysis of service delivery and financing of HIV/AIDS interventions (Botswana, Swaziland)
- New Bank HIV/AIDS projects under preparation
  - Botswana – under “buy-down” arrangement
  - Swaziland – “buy-down” arrangement being explored

### **World Bank Africa Region HIV/AIDS Agenda for Action (2007-2011)**

- Financier of last resort, but financier of first resort to cover program gaps
- Evidence-based and prioritized national HIV/AIDS strategies integrated in national development planning (national epidemiological profiles)
- Scale-up targeted multi-sectoral and civil society response, particularly among vulnerable groups
- Deliver effective results through increased country M&E capacity including strengthening surveillance systems
- Harmonize donor collaboration and knowledge sharing

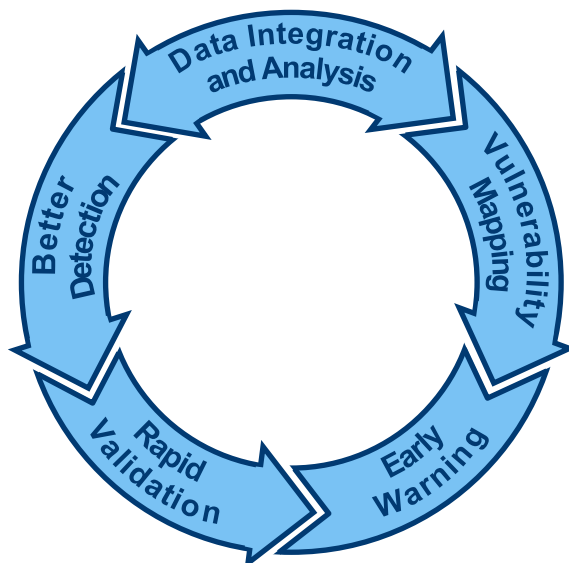
## **VI.5 GOOGLE.ORG: PREDICT AND PREVENT EMERGING THREATS - Dr Amy Luers**

The goal of the new initiative from Google.Org is to use IT technology in order to enhance the global capacity for identifying disease/infection “hot spots” and to enable rapid response

The Overriding theme is **One World, One Health** with an emphasis on:

- **Humans,**
- **Animals, and**
- **Environment**

The Overriding strategy is to exploit the power of information technology to effect the following steps in the predict – prevent focus:



This strategy has two pathways:

- Pathway ONE: Identify hot spots through:
  - Data sharing and access across sectors
  - Vulnerability Mapping  
(Integrating climate, land use, ecosystem stress, and other geographic information with health data)
- Pathway TWO: Enable response through
  - Better detection and rapid validation
  - Provide Early Warning

Some target technologies:

- Mobile technology
- Diagnostics
- Data sharing and management

## **VI.6 REGIONAL DISEASE SURVEILLANCE NETWORKS - Dr Louise S. Gresham PhD, MPH. Assistant Director, Global Health and Security Initiative GHSI/NTI**

The paper described the conclusions of the Bellagio conference on disease surveillance and on 2 examples of regional health surveillance

**Bellagio Call-to-Action** (Call-to-Action to be delivered at the Prince Mahidol Conference, Bangkok, Thailand January 31, 2008 by Terry Taylor GHSI/NTI)

- It was attended by 22 representatives from Africa, the Americas, Asia Europe and Middle East at the Rockefeller Bellagio Center, Italy 3-6 December 2007
- The theme of the meeting was: Public Health Surveillance Networks: Learning, Trust, Diplomacy, Science and Technology
- **Three areas of Action were identified:**
  - *Governance arrangements for networks*
  - *Efficient electronic knowledge management and sharing*
  - *Capacity building (human and laboratory)*

### **Examples of Regional Disease Surveillance Networks**

#### **1. Middle East Consortium on Infectious Disease Surveillance (MECIDS)**

##### **MECIDS Established 2003, comprises:**

Public health professionals from the Ministries of Health and academia of Jordan, Palestinian Authority and Israel, convened by the USA-based NGO formed the MECIDS.

##### **MECIDS Mission**

To facilitate cross-border cooperation in the detection and response to disease outbreaks

##### **First Efforts:**

Priority pathogens: food-borne diseases (Salmonellosis and Shigellosis)

##### **MECIDS Goals**

- Increase epidemiology and laboratory capacity
- Conduct multinational research and development
- Harmonize/standardize best practices and data collection
- Share data and communicate

### **MECIDS Governance Structure**

- Executive Council composed of:
  - Executive Chairperson (rotates)
  - Executive Board (3 members from each country)  
Based on equity and consensus
- MECIDS in-country Coordinators
- MECIDS Secretariat based in Amman, Jordan(non rotating)

### **Public-Private Partnerships**

Global Health and Security Initiative GHSI/NTI

- Support governance
- Promote standardization/harmonization
- Promote best practices, technologies
- Sponsor national and regional exercises that test capabilities to respond to Avian Influenza.
- Bring in other partners e.g. IBM for developing information; Becton Dickenson; World Bank

### **Regular Meetings**

- Revolving location of meetings
- Maintain relationships and build trust
- Exchange information
- Develop detailed project plans
- Monitor implementation

### **Human Resource Building**

- Field Epidemiology Training (FETP) Course
- Salmonella Training (Palestinians went to Israel)
- International Health Regulations (IHR2005)

### **Laboratory Capacity Building**

- Equip sentinel laboratories
- Supply reagents
- Increase staff

### **Recent Activities**

- Risk communication training
- IHR-Implementation workshop in cooperation with WHO headquarters
- Palestinian and Jordanian table top exercise on Avian and Pandemic influenza
- Software and Data Handling workshop (IBM)  
and PFGE lab training in Cairo

### **Evaluation Markers**

- Daily contact in times of urgency and Avian Influenza outbreak (March, 2006)
- Partners creating common data-sharing formats (IBM)
- Partners send samples to each other for laboratory confirmation and quality control

## **2. Mekong Basin Disease Surveillance (MBDS)**

Signed agreement Ministers of Health, 2000; 6 countries - Thailand, Vietnam, Myanmar, Laos, Hunan Province China, Cambodia.

### **MBDS Governance Structure**

- Executive Council composed of:
  - Executive Chairperson (rotates)
  - Executive Board (2 members from each country)
  - based on equity and consensus
- MECIDS Secretariat in Bangkok (non rotating)

#### **MBDS 6-year Action Plan**

- GHSI helped develop seven core strategies
- Example: ICT, Human Resource Capacity laboratory capacity, human-animal interface
- Each strategy assigned lead country
- Allows funder harmonization
- Equitable
- Sustainable
- Horizontal program management

#### **MBDS and GHSI/NTI**

- Support the strengthening of management systems to enable these countries to work as a regional network to reduce burden of infectious disease for their populations
- Supports best practices

#### **Commonalities of Regional Networks**

- Governance (rotating chair, non-rotating secretariat, in-country staff)
- MOH signed agreement
- Linkage with academia
- Standardization where appropriate (lab and data)
- Data sharing
- Effective communication
- Political strife

### **VI.7 CENTRE FOR INFECTIOUS DISEASES, UNIVERSITY OF EDINBURGH: Foresight User Challenge 1: How UK institutions could collaborate with SACIDS as partners in capacity building and research – Prof Sue Welburn**

The University of Edinburgh is the 5th ranked biomedical research university in Europe and the focus of the SACIDS application on the detection, identification and monitoring of infectious diseases fits in well with some of our strengths in research and research training. Through members of our Centre for Infectious Diseases (CID) we are heavily involved in work on diagnostics, surveillance, epidemiology and animal and public health. Many of our projects have an Africa focus, including major programmes on malaria, sleeping sickness, rabies and cattle diseases. We also run training programmes on relevant topics, including e-learning, CPD and external courses.

CID's remit can be expressed as follows:

- "The Centre embraces a 'one medicine' approach to infection research, covering a range of human and animal pathogens and using an array of approaches. These include looking at the impact diseases have on populations (epidemiology); the evolution of the pathogen; the immune response that develop to fight the pathogens and prevent disease; the molecular basis of pathogen virulence, all of which contribute to better diagnosis and treatment of disease, e.g. through vaccine and drug development. Critical to the Centre's success is an integrated strategy involving research from the gene to population and including basic to applied to clinical research."
- The Centre is a leading teaching and research academic institution in Europe, which has a focus on the local and international dynamics of infectious diseases, including emerging diseases of humans and animals. It is well placed to assist and provide guidance to the SACIDS consortium, particularly in the area of epidemiology and postgraduate training programmes, including e-learning, CPD and guidance for the proposed Virtual Graduate School.

## VI.8 ROYAL VETERINARY COLLEGE, UNIVERSITY OF LONDON: Foresight User Challenges 2 and 3: How UK institutions could collaborate with SACIDS as partners in capacity building and research – Prof Joe Brownlie

The Foresight project on infectious diseases set out to examine interactions between 3 domains, namely:

- (i) Future risks
  - identify drivers and risks
  - model interactions
  - ranking

There were expert consultation to develop a risk framework; a 2-stage survey of expert opinion, case studies and summary views developed by experts

- (ii) Future Science
  - Science reviews;
  - Definition of future technology challenge packages
- (iii) Societal issue
  - culture, governance
  - implications of control

**The Future Science Review** covered by some 40 leading scientists covered 10 topics, namely:

- Intelligent sensor networks
- Data mining and fusion
- Non-invasive scanning and screening
- Genomics and bioinformatics
- Interrogation of natural signals/biomarkers
- Biosensors/biomarkers
- Predictive and real-time epidemiological modelling
- Earth observation
- Host genetics and engineering
- Immunological techniques/responses

Thus, as well as considering future patterns of risk, the project reviewed our understanding of the societal context in which diseases are managed. It also reviewed the leading edge science in areas that might contribute towards developing potential new forms of DIM. As a result, the project identified four key areas where DIM might make a big impact in the future. We called these the “**User Challenges**”.

- i. Data mining: Novel information technology for the capture, analysis and modelling of data for early detection.
- ii. Genomics and post-genomics: Early detection of new or newly resistant/virulent pathogens using genomics and post genomics.
- iii. Hand-held devices: Taking technology for identification of infectious diseases to individual user by designing smart swabs or hand held devices that analyze fluids.
- iv. High throughput screening: of people, animals and plants using surrogate, non-invasive markers (e.g. electromagnetic radiation, volatiles), for example in airports, containers and livestock markets.

The question for this workshop is “How could UK institutions collaborate with SACIDS as partners in capacity building and research?” I am focusing on two of the above:

**UC2:** Early detection and **characterisation of new or newly resistant/virulent pathogens** using genomics and post genomics.

Essentially this User Challenge refers to the laboratory competence for detecting and identifying (typing) and characterising disease causing agents.

A marked increase in sequencing power is predicted over the next 10 years. Professor Julian Parkhill, of the Sanger Institute and an author of the Genomics and Bioinformatics Science Review predicts that we are only ~ 15 years away from being able to sequence the human genome overnight.

#### UK Institutional capabilities

- Wellcome Trust-funded Sanger Centre
- Major UK Bio-science Centres
- World reference laboratories e.g. at IAH, NIBSC, VLA

Specialist research e.g. Directly commissioned following Foresight programme, i.e. **“Biosecurity micro-array chip for detecting human, animal & plant pathogens”** which is a consortium project involving the Institute of Animal Health (IAH), the Veterinary Laboratory Agency (VLA), the Central Science Laboratory (CSL), the Centre for Environment, Fisheries and Aquaculture (Cefas) and the RVC of the University of London

**UC3:** Taking technology for identification and characterisation of infectious diseases to individuals by designing **smart swabs, hand-held or portable devices** that analyse fluids.

Technology delivery systems are developing fast. Examples include ELISA strips, lateral flow devices, digital pen, and mobile telephony. There are also disease specific point-of-care or field based diagnostic tools which are based on forms of PCR or nanotechnology that are being developed usually as alliances between academic and commercial institutions. Examples include devices for FMD, HIV.

The Royal Veterinary College (RVC) is hoping to lead a consortium of UK and Tanzanian medical and veterinary institutions to pilot a One Medicine approach to surveillance of infectious diseases of human and animals in the Selous ecosystem where there is a high human-livestock-wildlife interface.

#### International Actions: Smart Partnerships

- Recurring demand for ‘Smart Partnerships’ with Africa - important to build on existing links and develop new ones.
- Institution to institution, person to person to promote the sharing of:
  - Knowledge and expertise
  - Best practice
  - Facilities

### VI.9 INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE and the BIOSCIENCES FOR EASTERN AND CENTRAL AFRICA (BECA) HUB – Dr Phil Toye

ILRI is the only research centre in the network of the Consultative Group on International Agricultural Research (CGIAR) whose primary focus is on livestock research. Its Headquarters are located in Nairobi and Addis Ababa. ILRI undertakes livestock research with the aim of alleviating poverty. It has opened a liaison office in Maputo for southern Africa. Its research operations have recently been re-structured along four themes, namely:

- (i) Targeting and Innovation;
- (ii) Improving Market Opportunities;
- (iii) Biotechnology - biosciences and bioinformatics for animal health and genetics; and
- (iv) People, Livestock and the Environment.

The Biotechnology Theme focuses on the development of vaccines and diagnostics and the characterization and conservation of animal genetic resources.

BecA is an initiative endorsed by The New Partnership for Africa's Development (NEPAD) Comprehensive African Agricultural Development Programme (CAADP) and developed in the framework of Centres of Excellence for Science and Technology. BecA provides a focal point for the African scientific community to address agriculture-related problems of importance for alleviating poverty and promoting development. BecA's unique feature is the recent establishment of a shared research platform (the BecA Hub), located at and partly supported by ILRI, Nairobi. The Hub is open to biosciences researchers in central and eastern Africa, particularly in animal and crop sciences, and has competences and state-of-the-art facilities in the areas of Bioinformatics, Diagnostics (Nucleotide- and protein-based), Gene sequencing, Genetic engineering, Genomics/Genetics, Molecular breeding, Proteomics, Vaccine technology/immunology and, Vectors (e.g. ticks). The Hub is linked with a network of participating laboratories ('Nodes') throughout eastern and central Africa. The Hub and Nodes constitute the BecA Network (BecANet).

## **VII. CONCLUSIONS FROM GROUP DISCUSSIONS**

### **VII.1 SACIDS VISION**

A Southern African society protected from devastating infectious diseases affecting the health of **humans, animals** (both terrestrial and aquatic), and **plants** (crop, forest and ornamental), thereby promoting livelihoods, socio-economic development including market access and the environment.

### **VII.2 SACIDS MISSION**

To harness innovation in science and technology in order to improve Southern Africa's capacity (including human, financial and physical) to detect, identify and monitor infectious diseases of humans, animals, plants and their interactions in order to better manage the risk posed by them.

### **VII-3. SACIDS PHILOSOPHY**

Working towards One Africa, One Health.

### **VII.4 SACIDS OBJECTIVES**

- To formulate One Health – One Medicine concept through promoting inter-sectoral collaboration through national and regional joint programmes linking public, animal and plant health.
- To improve the DIM of infectious diseases of humans, animals and plants by sharing relevant science and technologies
- To establish a standardized integrated disease surveillance and response system (IDSR) including early warning systems for infectious diseases in the region
- To establish Southern Africa-North smart partnerships
- To establish relevant research programmes that will enhance the effectiveness of national and regional operations for human, animal and plant health service delivery
- To identify existing training programmes and define needs for training and capacity building at all levels and address deficiencies
- To foster a culture of formal mentoring for young scientists and technicians
- To regularly audit capacity available within the consortium
- To create subject specialist consortia for academic and research institutions
- To establish a system of governance for SACIDS

## VII.5 SACIDS ENABLING RESEARCH TARGETS

High level DRIVER	Immediate DRIVER	Disease package	Justification
<b>INTER-SPECIES INFECTION TRANSMISSION</b> Human-livestock-wildlife interface	Ungulate	FMD Tb/Brucellosis African swine fever	Zoonotic Socio-economic impact
	Small mammals and birds	Haemorrhagic fevers Avian influenza Rabies	Socio-economic impact
<b>CLIMATE</b>	Weather dependent vector-borne virals	RVF	Zoonotic Socio-economic impact
	Weather dependent vector-borne protozoon	Trypanosomosis Malaria Tick-borne diseases	Zoonotic Socio-economic impact
	Weather dependent vector-borne bacterial	Cholera Plague	Zoonotic Socio-economic impact
<b>STRATEGIC</b>	Human	HIV TB Malaria	Zoonotic Socio-economic impact
	Animal	FMD CBPP	Socio-economic impact
<b>AFRICAN PLANT DIAGNOSTICS</b> Mozambique South Africa Tanzania {Uganda Kenya Nigeria}	Stable food crops	Maize Sorghum Cassava Banana Cowpea	Food security Socio-economic

## VII.6 TRAINING AND STAFF RETENTION

Solution	Milestone
<b>Staff retention</b>	
Create more research posts (technologists, scientists, vets, medics etc);	At outset and continuous, analysis of situation and planning of approach and implementation
Creation of Postdoctoral fellowships of 3 to 5 years would be a useful mechanism for retention of highly qualified staff on bench carrying out research	
Career path opportunities; Decent remuneration; Incentive schemes for innovation; Mentoring; Knowledge access and management; Sufficient technical support; Proper infrastructure	



<b>Training</b>	
Community education/outreach	0-24 months planning 25 onwards, continuous
Audit of training facilities and addressing needs	0-12 months
Scholarship/fellowship schemes	0-6 months to establish 7 onwards, implement
Post doc opportunities	0-6 months to establish 7 onwards, implement
E-learning	0-12 months inventory nationally and internationally 0-24 workshops and develop new courses 0-13 onwards implement and continuous
Continuing education (accredited)	Continuous needs analysis and implementation
Short courses e.g. <ul style="list-style-type: none"> <li>• Laboratory biosecurity and biosafety</li> <li>• Quality management/assurance</li> <li>• Ethics</li> <li>• Research methodology</li> <li>• )</li> <li>• Bioinformatics</li> <li>• Risk analysis/management</li> <li>• Specialised laboratory techniques e.g. DNA manipulation</li> </ul>	Continuous needs analysis and implementation
Exchange schemes, internships	0-12 mths, Establish principles and scheme 13 mths onwards awards made continuous
Exposure of under graduates to research	0-12 planning and then implement vacation scholarships Intercalated degrees Curriculum review for research exposure in under graduate programme and recommendations
Virtual graduate school Collaboration for MSc, PhD and Postdoc programmes.  Formal training: postgraduate (tailor-made for regional needs) MSc/MMed/MVM, PhD and Postdoc training Delivery through (i). distance learning/e-learning/virtual faculty and (ii). harmonised curricula <ul style="list-style-type: none"> <li>• Field based epidemiology e.g. Field epidemiology training programme (FETP) &amp; Field epidemiology laboratory training programme (FELTP)</li> <li>• Analytical epidemiology</li> <li>• Molecular biology</li> </ul>	0-12 mths planning 13 onwards implementation
Formal training: undergraduate <ul style="list-style-type: none"> <li>• Harmonized curriculum within SACIDS</li> <li>• Veterinary and medical students to be taught zoonotic diseases from a common platform</li> </ul>	0-12 mths planning 13 onwards implementation

## VII.7 ICT CONCEPT PAPER AND REGIONAL NEEDS

### Activities

1. Data handling
  - a. Confidentiality
  - b. Raw data
  - c. Database
  - d. DPT
2. Information generation
  - a. knowledge management
3. Communication channels
  - a. internal
  - b. external
4. Technology infrastructure
  - a. networks
  - b. mobile communication

Task	Activities	Date	Budget	Comments
Secretariat	PC, mail web server, LAN	Yr 1	50,000	
ICT strategy	Develop ICT strategy, coordinate research	5 Yrs	\$1,000,000 incl operating exp	Strategist, Data and information needs study, Computing resource needs
Database Development	Develop dB for knowledge management, surveillance data,	0-yr5	\$200,000	
Hardware, Network, Software	PCs, servers, Vstats		2,000,000	4 V stat stations per country x 4 (check on costs)
Web site	Develop website		20,000	Protocols and SOPs
Dissemination Products	External information products		\$50,000	
Literature access	Subscription to information sets	5 yrs	500,000	
Geospatial information	Analysis, research	5 yrs	1,000,000	For research
Grass root DIM	Pilot projects, proof of concepts	5 yrs	5,000,000	
			<b>\$11,620,000</b>	

### Value Added

cross sectoral, multi disciplinary, economies of scale, standardisation, facilitates action, knowledge transfer, real time data and information, cost effective  
Strategic importance

### Partnering Institutions

Enhances and optimizes limited resources in interaction, coordination; broaden knowledge base through partnerships and communications; promotes best practice; assist in training and education through access to literature, data, and information

## Making a difference to Africa

Improved capacity for preparedness for, response to, and control of infectious disease outbreaks leading to reduced morbidity and mortality in humans and animals, socio-economic benefits and improvements to livelihoods

### VII.8 BIOSAFETY AND QUALITY MANAGEMENT NEEDS

1. Recognition of Quality Systems and accreditation
  - 1.1 Implementation of Quality Systems within SADC very limited
  - 1.2 Accreditation status achieved by a few laboratories, mostly situated in SA.
  - 1.3 Only one international accreditation body in SADC – SANAS
  - 1.4 Most countries do not have a dedicated budget and capacity for implementation and maintenance of quality system activities and accreditation
  - 1.5 Harmonisation and standardisation of samples procedures, laboratory practices and diagnostic assays
  - 1.6 Limited number of SADC countries participate in EQA schemes - mostly driven by other countries
  - 1.7 Regional/local production of EQA panels very limited

#### Solutions

1. To established a dedicated Quality assurance management at institutional/laboratory level – deadline 5 years
2. Harmonise/standardise sampling, transportation, handling, storage and disposal – deadline 2 years
3. established at least one regional EQA scheme for serological RVF diagnoses (human and animal) – first year
4. established at least one regional EQA scheme for detection and identification of RVF diagnosis – 2ed year
5. Budget for training of Quality assurance managers

#### Budget

1. Training – 4 persons per country (medical and veterinary) SANAS formal training (one week) and two on-site training (USD 110 000)
2. Monitoring of implementation Quality systems by trained staff (USD 25 000)
3. EQA (USD 10 000) per run
  
2. Biosafety and biosecurity capacity building
  - 2.1 SACIDS should play an important role in strengthening regional capacity in responding to and recognition of emerging and re-emerging infectious diseases of public health and animal health importance
  - 2.2 Most newly emerged and emerging infection agents are classified as BSL 3 and 4 pathogens.
  - 2.3 Newly emerging infection agents at least until fully identified and characterised must be handled by BSL3 or 4 facilities
  - 2.4 Current high biosafety and biosecurity capacity (lab infrastructure, staff, resources) extremely limited including trained staff
  - 2.5 Inventory and auditing of current available biosafety and biosecurity resources in National Laboratory system, clinics, academic research facilities both human and animal.
  
3. Search/Surveillance
  - 3.1 Outbreak responses to emerging/re-emerging/new diseases in the region driven by external resources
  - 3.2 Long term epidemiological/surveillance studies and studies on reservoir host not established

## Solutions and budget

1. Mobile (Portable) laboratory units BSL3 (equipped including spare parts) – 2 per country (USD 360 000) in first year
2. Implement BSL-3 laboratory practices in established BSL2 laboratories
3. Establish regional outbreak response unit, identify and validate laboratory equipment for use in outbreak settings – PCR based diagnosis using a robust amplifier (Smartcycle) for differential detection and identification: budget 350 000 USD first year.

## VII.9 INSTITUTIONAL CAPACITY DEVELOPMENT STRATEGY

### Enablers

Political support (will): political backing at national and regional level  
Collaboration Medical – Veterinary – Environment (e.g. National AI task forces)  
Leadership  
NatCIDS  
Common interests and needs  
MoU's between institutions  
Private/Public / civil society partnerships  
Senior management commitment  
Sufficient resources  
Aspiration to change status quo  
Transparency  
Communication  
SACIDS need to be a legal entity

### Barriers

Inertia  
Bureaucracy  
Isolation  
Lack of critical mass  
Conflict of interest / duplication with existing networks  
Resources availability

### Governance for SACIDS

#### Membership

SADC member  
Research institution  
Universities  
Diagnostic institutions  
Private sector institutions

#### Board

Advisory board  
Senior members from SADC countries + Treasurer  
Executive board  
Discipline based (7-9)

#### Secretariat

Located at an institution through a bid procedure  
Not more than 5 persons: coordinator, project/financial management, office manager

#### Communication

Website  
Internet  
Bulletins and meetings  
Intranet  
IT and infrastructure

## Resource mobilisation

- Develop business plan and roadmap for Establishing NatCIDS and SACIDS
- Identify sources of funds national and international
  - National government
  - Non-traditional private donors (e.g. Anglo-American, oil companies etc.)
  - Create prizes (e.g. "Google prize")
  - Traditional donors
  - Develop strategy for sustainability

## Research management

- Project planning and management
- Grantsmanship and scientific writing

## VII.10 INTERIM GOVERNANCE

It was agreed that the interim Secretariat for SACIDS should be located at the Sokoine University of Agriculture, Morogoro in association with the Tanzanian National Institute for Medical Research, Dar es Salaam. The following were elected as interim SACIDS officials:

Director	:	Prof Mark Rweyemamu
Deputy Director (Medical)	:	Prof Barry Schoub
Deputy Director (Veterinary)	:	Prof Rudovick Kazwala
National Coordinator – DRC	:	Prof Jean-Marie Kayembe Ntumba
National Coordinator – Mozambique	:	Dr Luis Neves
National Coordinator – South Africa	:	Prof Tony Musoke
National Coordinator – Tanzania	:	Dr Sayoki Mfinanga
National Coordinator – Zambia	:	Dr Aaron Mweene

## VIII. NEXT STEPS

### The next steps for the initial 12 months (i.e. February 2008 to February 2009):

- The first step is to prepare a submission to the Wellcome Trust for strengthening health research capacity focusing on five countries with medical and veterinary faculties, namely the DRC, Mozambique, South Africa, Tanzania and Zambia (submitted on 13<sup>th</sup> Feb 2008).
- The next step will be to seek financial support for the establishment of an interim SACIDS Secretariat structure including offices, IT, locally recruited professional and support staff (programme assistant/office manager, administrative secretary, ICT manager), consultants, travel and operation costs plus the cost of the SACIDS Director.
- Sensitise all the medical, veterinary, wildlife and plant sectors, particularly the academic and research institutions, as well as the science and technology ministries/agencies of the 14 SADC Member States through both targeted visits and forums of the SADC Secretariat and NEPAD
- Consultations on and approval of appropriate long-term structure, governance and management of SACIDS
- Recruitment of more institutions into the SACIDS network
- Develop a medium term business plan for SACIDS
- Resource mobilization for SACIDS programmes and projects
- Contribution to supporting nascent SACIDS core activities

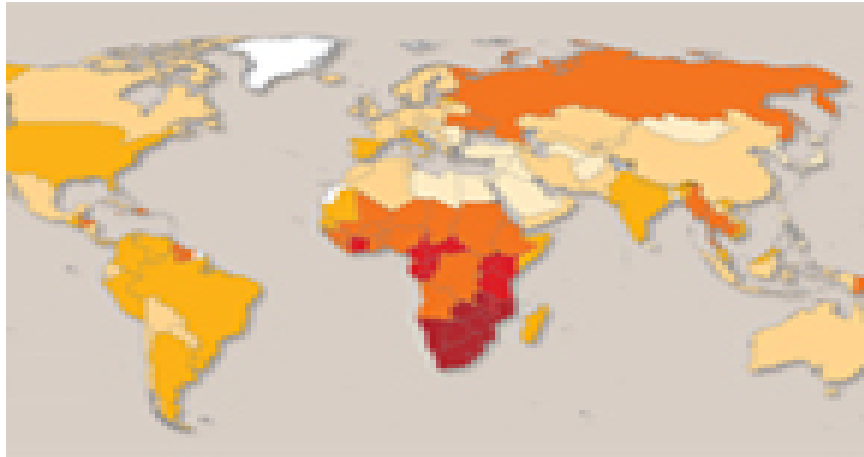
### Expected outputs by March, 2009

- SACIDS constitution developed and approved
- SACIDS Secretariat established
- SACIDS membership institutions identified and enrolled
- Modalities of sharing DIM of major infectious diseases in the region established
- A Governance structure for SACIDS agreed to (at least in principle) by medical, veterinary and plant academic and research institutions of SADC Member States and the relevant regional organs such as the Secretariats of SADC, NEPAD and/or AU

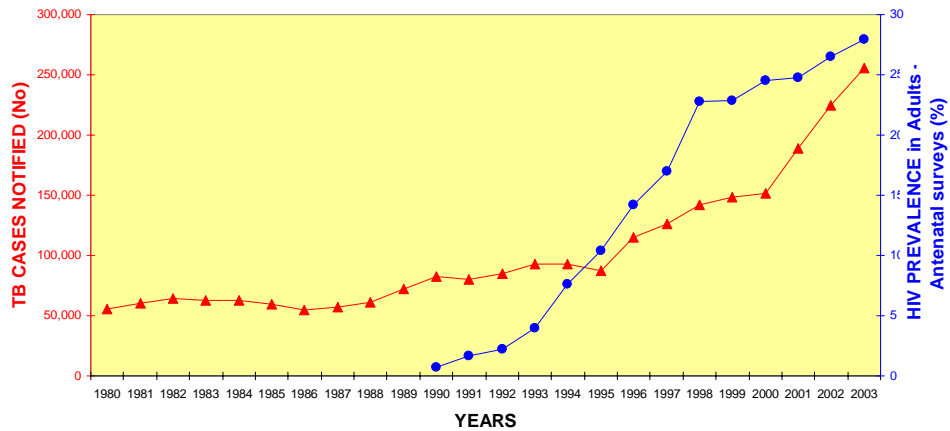
- Resources for SACIDS' maintenance and programme of activities for subsequent 2 years mobilised

**IX. DISEASE BURDEN EXAMPLES**

**Southern Africa is the Global epicentre for HIV/AIDS**



**TB NOTIFICATION  
AND HIV PREVALENCE – SOUTH AFRICA  
1980-2003**



## Ebola Outbreaks since first identification in 1976

### EBOLA FEVER OUTBREAKS

(EXCLUDING RESTON VIRUS AND LABORATORY INFECTIONS)

YEAR	COUNTRY	VIRUS SUBTYPE	DEATHS/CASES (%)
1976	SUDAN	EBOLA SUDAN	151/284 (53%)
1976	ZAIRE (DEM REPUBLIC CONGO)	EBOLA ZAIRE	280/318 (88%)
1977	ZAIRE (DEM REPUBLIC CONGO)	EBOLA ZAIRE	1/1
1979	SUDAN	EBOLA-SUDAN	22/34 (65%)
1994	GABON	EBOLA ZAIRE	31/52 (60%)
1994	IVORY COAST	EBOLA IVORY COAST	0/1
1995	DEMOCRATIC REPUBLIC CONGO	EBOLA ZAIRE	250/315 (81%)
1996	GABON	EBOLA ZAIRE	21/37 (57%)
1996	GABON	EBOLA ZAIRE	45/60 (74%)
1996	SOUTH AFRICA	EBOLA ZAIRE	1/1
2000-1	UGANDA	EBOLA-SUDAN	224/425 (53%)
2001-2	GABON	EBOLA ZAIRE	53/65 (82%)
2001-2	REPUBLIC OF CONGO	EBOLA ZAIRE	44/59 (75%)
2002-3	REPUBLIC OF CONGO	EBOLA ZAIRE	128/143 (89%)
2003	REPUBLIC OF CONGO	EBOLA ZAIRE	29/35 (83%)
2004	SUDAN	EBOLA-SUDAN	7/17 (41%)
2005	REPUBLIC OF CONGO	EBOLA ZAIRE	9/12 (75%)
2007	DEMOCRATIC REPUBLIC CONGO	EBOLA ZAIRE	167/374 (45%)?
2007	UGANDA	EBOLA NEW TYPE?	?

### Conjectured Status of selected Zoonoses and Emerging Diseases in the SADC Region – 2007

(Rudovick Kazwala, Anita Michel, Leopold Mulumba,)

Country	Disease Status							
	Bovine TB		Brucellosis		Rabies	RVF	Ebola/Marburg	Avian influenza
	Animal	Human	B. abortus	B. melitensis				
Angola	Present 2005/6: (8)	Unknown	Confirmed clinical disease	Not reported	2005-07: 18 reported outbreaks	absent	2005: (9) Marburg virus	absent
Botswana	Reported absent	no	Confirmed clinical disease	2007: 4 outbreaks	2007: (73)	1 human case?	absent	absent
DRC	Present	Yes	No information	Not reported in 2005 - 2007	Not reported but present	Not reported	present	absent
Lesotho	2005: (1)	No	Confirmed clinical disease		2005-07: Not reported but known to occur	absent	absent	absent
Madagascar	Present 2005: (1)	Unknown	Never reported		2005-07: (66)	absent	absent	absent
Malawi	Present	Yes	No information		2005-07: (39)	Present?	absent	absent
Mauritius	Present 2005: (1)	Unknown	No information		Not reported	absent	absent	absent
Mozambique	Present 2005/6: (3)	Unknown	2006-2007: (21)		2005-07: 10 cases reported	present	absent	absent
Namibia	Not reported	No	Confirmed clinical disease		2005-07: 235 cases reported	absent	absent	absent
S. Africa	Present, incl wildlife reservoir 2006: (4)	Unknown	2006-2007: (536)		2007: (1) wildlife	2005-07: (964) 2007: approx. 30 human cases	Present (game in KNP) 7 human cases	absent
Swaziland	Present	Unknown	2006-2007: (2)	Not reported	2005-07: (65)	absent	absent	absent
Tanzania	Present	Yes	Confirmed clinical disease	Not reported	2005-07: Not reported	2007: (19)	absent	absent



Country	Disease Status							
	Bovine TB		Brucellosis		Rabies	RVF	Ebola/Marburg	Avian influenza
	Animal	Human	B. abortus	B. melitensis				
Zambia	Present, incl wildlife reservoir	yes	2007: (2)	Not reported	2005-07: (57)	Absent?	absent	absent
Zimbabwe	Reported absent		Confirmed clinical disease	Not reported	2005: (234) 2006-07: (125)	Absent?	absent	absent

**Notes:** ( ) outbreaks reported. Source: OIE – WAHID website  
Rabies: human deaths only sporadically reported (WHO)

### Conjectured Status of selected TADs in the SADC Region – 2007

(Mark Rweyemamu, Wilna Vosloo, Leopold Mulumba, Swithine Kabilika and Mmeta Yongolo)

Country	Disease Status					
	FMD	CBPP	ASF	Lumpy skin disease (LSD)	Newcastle Disease	Rinderpest
Angola	Last reported 1974; suspected 2001 - status unclear	Endemic and recorded every year in southern Provinces	Endemic throughout country	Prevalent in the south. 10 outbreaks recorded in 2005	Endemic and widespread; recorded annually	Last recorded 1972
Botswana	OIE recognized FMD free zones. Last outbreak in free zone 2003 (SAT-2).	CBPP free country. Last incursion 1995 which was eliminated;	ASF free; Last outbreak 1999	Sporadic throughout country. Occurs mainly during wet season	Controlled in commercial flocks; recorded sporadically every 2 -3 years in backyard chickens	Last recorded 1899
DRC	Severe outbreaks in the East of the country: North and South <u>Kivu</u> in 2005 and 2006, on the boulder with Burundi, Rwanda and Uganda. Very probably new challenge in naive populations following refugees' movements in relation with the peace agreement signature. SAT1, 2, 3 and 0 involved. Other acute occurrences never reported. But before these severe clinical forms of the disease, the OIE reports (Ibidem, 1985) mentioned the serological evidence of the SAT 2 in 1976 and	Endemic and clinical disease repeatedly reported in <u>Ituri</u> (prevalence estimate 14%) on the DRC border with Uganda since the 1970s and 1980s (within the traditional farming system as dominant). Antibodies detected in Cattle sera samples from other zones (Kivu (1%), Katanga (1%), and Kasai (1%) following a retrospective screening from the (*)	Endemic but first severe outbreak confirmed at OVI in 1954 (**), 1957 (relevant isolates stored at OVI, Pirbright), 1961 and since then till to day many outbreaks, unfortunately neither recorded nor claimed. Other following severe outbreaks in Kinshasa (1986, 1999, 2001, 2003, 2005, 2006, 2007), Ituri on the Uganda boulder (2007), Kipushi on the Zambia boulder (2007), Dilolo on the Angola boulder	Suspected on the DRC boulder with Tanzania.	Endemic but with periodic severe outbreaks. Recent confirmation 2006 (pigeon) and 2007 (poultry farm with 50% mortality rate i.e. 3500 cases / 7000). Both confirmations were made at OVI.	DRC has a RP free status.

Country	Disease Status					
	FMD	CBPP	ASF	Lumpy skin disease (LSD)	Newcastle Disease	Rinderpest
	1985 in the East of the country.		(2007) and North Ubangi District on the boulder with the Republic of Central Africa (RCA) (2007). The prevalence in the free ranging pigs is 30%. Several strains collected from some of these outbreaks (***)			
Lesotho	FMD Free country; Never been recorded	CBPP free country. Never been recorded	No ASF ever recorded	Sporadic during rainy season. One outbreak recorded in 2005	Last outbreak 2002	Last recorded 1896
Madagascar	FMD free country; Never been recorded	CBPP free country; Never been recorded	First recorded in 1998; since reported annually		Endemic; reported annually	Never been recorded
Malawi	Sporadic incidence; 18 outbreaks since 1957; generally through incursions from neighbouring countries. But the SAT-2 outbreak in 2003 in southern Malawi (Chikawa) was internally derived from buffalo in Lengwe Park. One limited SAT-2 outbreak in Chitipa district (Northern Malawi, bordering Zambia and Tanzania) during March 2004.	CBPP free country; Never been recorded	Endemic. Reported ASF outbreaks were 41 for 2001; 16 for 2002; 9 for 2003; 25 for 2004; 35 for 2005 and 12 for 2006 to Sept. Control is by serological screening, movement control, market suspension, slaughter.	Sporadic. Reported outbreaks were 29 for 2001; 13 for 2002; 15 for 2003; 17 for 2004; 14 for 2005 and 2 for 2006. In July 2005 the CVO described the situation of LSD thus: There were occurrences of sporadic	Endemic and widespread in village chickens. ND outbreaks recorded recently were 13 for 2001; 12 for 2002; 7 for 2003; 8 for 2004; none for 2005 and 3 for 2006 to Sept	Never been recorded

Country	Disease Status					
	FMD	CBPP	ASF	Lumpy skin disease (LSD)	Newcastle Disease	Rinderpest
				outbreaks reported throughout the country during the months of January to September. Control is by Movement control, vaccination, market suspension, control of arthropods.		
Mauritius	FMD free country; Never been recorded	CBPP free country; Never been recorded	ASF free; Never been recorded		Last outbreak 1998	Never been recorded
Mozambique	After 17 years of absence of FMD in Mozambique, were reported a total of 21 outbreaks between November 2002 and September 2003, in the provinces of Maputo (2), Gaza (17) and Manica (2). Source of incursion was Zimbabwe. Last outbreak in Gaza province in September 2003. Surveillance and vaccination is the measure been implemented in the districts at risk in	CBPP free country; Never been recorded	Endemic in central and northern provinces; spread to south including Maputo Province since 2003. Previous epidemic in Maputo Province in 1974 killed about 70% pigs. Recent recorded outbreaks have been 2 for 2001; 5 for 2002; 3 for 2003; 15 for 2004 and 19 for 2005. In August 2005 new outbreaks were reported in Gaza province since the last records in	Sporadic. The number of outbreaks of LSD has increased from 2 outbreaks in 2004 to 5 in 2005 with a total of 288 cases recorded. Most of these cases were reported in Tete province (4 outbreaks with 286 cases). The vaccination and animal	Endemic and widespread in village chickens; controlled in commercial flocks; Vaccination of village chickens with thermo-stable vaccine increasingly effective.	Last recorded 1896

Country	Disease Status					
	FMD	CBPP	ASF	Lumpy skin disease (LSD)	Newcastle Disease	Rinderpest
	Maputo, Gaza, Sofala and Manica provinces.		the year 1999. The disease is believed to have spread from Maputo to Gaza province through illegal movement of pig and pig products. During 2005, 19 outbreaks were reported with 1632 cases and 1156 deaths. Most cases were reported in Tete (4 outbreaks, 839 cases with 837 deaths), Maputo (7 outbreaks, with 540 cases and 98 deaths) and Gaza provinces (4 outbreaks, with 33 cases and 30 death)	movement control are the measures being implemented.		
Namibia	South is FMD free zone; Last outbreak in northern infected zone was in 2001 and was eliminated	Southern zone is CBPP free; Sporadic incidence in northern strip bordering Angola. Incidence there has been declining from 198 outbreaks in 1998 to 4 to 6 annually since 2001, thanks to intensive vaccination. In 2003 CBPP occurred in Caprivi after 60 years.	Sporadic in confined areas where recorded in low incidence but practically annually	Prevalent in the Northern Communal Areas, particularly in the Eastern Caprivi region, e.g. Katima Muliro (Caprivi) recorded 25 of the 38 outbreaks in the country in	Sporadic but recorded annually	Last recorded 1907

Country	Disease Status					
	FMD	CBPP	ASF	Lumpy skin disease (LSD)	Newcastle Disease	Rinderpest
				2005.		
S. Africa	Most of country FMD free without vaccination. Last outbreak in Free zone was in 2000; Infected area confined to the Kruger National Park (KNP) in North East where sporadic incidences are recorded. For example SAT-2 outbreaks were reported between July - October 2004 at two dip-tanks near Letaba, Tsikuyu and Bend Mutale. In August 2006 a SAT-3 outbreak was identified in the controlled buffer zone next to the KNP. The status of the OIE recognized FMD free zone of South Africa was not affected by these outbreaks.	CBPP free country. Last outbreak 1924	Sporadic in confined to north-eastern areas where recorded in low incidence but practically annually	Sporadic throughout country: 35 outbreaks in 2004 and 10 in 2005	Controlled through compulsory vaccination and notification. Sporadic incidence every 5 to 7 years. Last outbreaks in 2004 in Kwa-Zulu Natal and Eastern Cape Provinces.	Last recorded 1904
Swaziland	FMD free country. Last FMD incursion (SAT 2) from neighbour 2001	CBPP free country; Never been recorded	Never been recorded		Last outbreak 2001	Last recorded 1898
Tanzania	Endemic; recorded every year in many districts (e.g. 54 outbreaks for 2001, 56 for 2002, 160 for 2003, 68 for 2004 and 42 for 2005); serotypes O,	CBPP free for 25 years until 1991. Then 2 incursions in north. Disease since spread through most of country; now endemic and in 2004 was	Endemic in certain eco-system habited by wild suidae; sporadic in peri-urban areas. Outbreaks in Arusha and Dar es Salaam		Endemic and widespread in village chickens Recorded annually; during 2004 was reported in 35	Last recorded 1997

Country	Disease Status					
	FMD	CBPP	ASF	Lumpy skin disease (LSD)	Newcastle Disease	Rinderpest
	SAT-1, SAT-2 and previously also Type A. Current status of this type is unclear.	recorded 25 out of 121 districts	eliminated through surveillance and zoo-sanitary/biosecurity measures. In 2004 outbreaks in West-North-west of country (Kasulu, Kibondo, Kigoma and Mwanza)		of 121 districts. Vaccination of village chickens with thermo-stable vaccine increasingly effective.	
Zambia	Sporadic. The SAT-2 outbreak in 2004 was suspected to originate from buffalo. In 2000 (SAT-2) and 2002 (SAT-2 and Type O) outbreaks in north probably from Tanzania. In 2004 a total of 6 outbreaks were reported.	CBPP spread from Angola. Incursion Western Province; since spread to south-west, western and parts of southern provinces	Endemic in Eastern Province; sporadic elsewhere 2001, 2002		Controlled in commercial farms; Endemic and widespread in village chickens; recorded annually	Last recorded 1896
Zimbabwe	Until 2001 had large zones recognized as FMD free. 2001 to 2004 outbreaks (SAT-1 and SAT-2) initiated through buffalo-cattle contact; spread through southern and central. Currently low incidence but not regained freedom status	CBPP free country; Last outbreak 1904	Last recorded 1992		Well controlled in commercial farms but endemic in village chickens	Last recorded 1898

## Notes:

### DRC

(\*) – Little is known about CBPP in DRC; it is misevaluated as sometimes confused and reported as TBC by inexperienced field technicians due to the similarity of the clinical picture.

(\*\*) – Very probably from Angola

(\*\*\*) – The current data are indicating a very possible involvement of new strains. Initial molecular comparisons based on VP72 genomic (highly conserved) region suggested genetic similarities with two watersheds, the ESACWA group (genotype I) and the genotype II, respectively in southern Africa for the 1950s outbreaks (Katanga and Bas Congo) and West Africa for the 2001 outbreaks (Kinshasa). With regard to the 2007 outbreak in Ituri, the genetic similarity was established with the Eastern Africa circulating strains (genotype IX). Genomic comparisons of the ORF9L region (central part of the ASFV variable genomic region), indicates high variability in sub groups.

### MALAWI - FMD

Northern Malawi:

1957 Karonga (Type O); 1959 Karonga (Type SAT-2); 1962 Karonga (Type O); 1966 Karonga (Type A); 1970 Karonga (Type SAT-1); 1975 Karonga (Type SAT-2); 1981 Karonga (Type O); 1982 Chipita (Type O); 1998/99 Karonga (Type O); 2000/2001 Mzimba (Type SAT-1); The last outbreak reported was a SAT 2 serotype in March, 2004, at Chiwanga dip tank in Chitipa district of Karonga ADD which was successfully controlled through vaccinations and movement control.

Southern Regions:

1973 Nsanje/Chikwawa (Type A); 1974 Nsanje (Type O); 1976 Nsanje/Chikawa Type (SAT-3); 1985 Nsanje (Type O); 2003 Chikawa (Type SAT2).

### ZIMBABWE – FMD

#### Primary Outbreaks before 2001

- Between 1991 till 1997 no FMD outbreaks
- In August 1997: one outbreak at Mkwazi Ranch adjacent to Save Wildlife Conservancy, Chiredzi
- In 1999: two outbreaks (SAT3 at Mapanza Estate in June; and SAT1 at Mkwazine Ranch in July); adjacent to, and inside, Save Conservancy, Chiredzi
- 
- Thus, historically, primary outbreaks have been in the agro-ecological zone 5 in the south-east of the country bordering onto National Parks and Game Conservation Areas and in the western zone. These areas contain buffalo that are persistently infected with FMD virus. This ecological zone also contains game ranches that keep buffalo that are not certified as free from FMD virus. The National Parks have been fenced to prevent buffalo-cattle contact and the game ranches are strongly fenced to prevent buffalo escape. The 1999 and 2001 outbreaks could be linked to the same high risk areas as the source of infection.

#### The 2001 to 2006 epidemic

The spread of FMD in Zimbabwe from 2001 to 2006 could be traced by the Zimbabwean authorities to 5 primary outbreaks, all involving buffalo-cattle contact:

- The first primary outbreak (type SAT2) was reported on 17<sup>th</sup> August, 2001 at a Cold Storage Commission Feedlot, 15 km south east of Bulawayo. The source was traced back to Mavimba ranch in Beitbridge district in Matabeleland South province, where there was a small herd of buffalo, which had been in contact with the resident cattle herd.



- The second primary outbreak (type SAT 2) was reported at Lupane in Matabeleland North province on 28<sup>th</sup> August 2001. .... This was a result of cattle/buffalo contact when villagers occupied a game farm with wild buffalo.
- The third primary outbreak (type SAT 2) was reported on 22<sup>nd</sup> October 2001 at Manondo Ranch in Umguza district in Matabeleland North province. .... The outbreak was suspected to have resulted from another cattle/buffalo contact in adjacent Chesa Forest Area.
- The fourth primary outbreak (type SAT 2) was reported simultaneously at two foci on either side of the Save Valley Wildlife Conservancy on 16<sup>th</sup> August 2002 in Bikita (Masvingo province) or Chipinge (Manicaland province). It is believed there was a concurrent outbreak in wildlife within the conservancy and this spilled over into cattle in the adjacent communal areas via small antelope species such as impala and kudu.
- The fifth primary outbreak (type SAT 1) was reported on 1<sup>st</sup> October 2002 at Davata Diptank in Chiredzi district of Masvingo province. Davata Diptank is at the confluence of the Bube and Limpopo rivers near Gona-re-Zhou National Park. This infection may have originated from wild buffalo moving up and down the river systems from the Kruger in South Africa or Gona-re-Zhou National Parks in Zimbabwe. This was probably the source of the SAT1 outbreak of October 2002. This outbreak spread locally and may have been the source of FMD spread to Mozambique.

The last recorded outbreak in Zimbabwe (up to September 2006) was on 11<sup>th</sup> March 2006 at Jerwe in Bikita District of Masvingo Province

#### **ZAMBIA – CBPP**

Three epidemics in 1914, 1945 and 1997 all in Western Province probably from Angola. In February 2002 the disease spread to North-western Province; In March 2002 disease spread to other districts within Western Province; In August 2002 disease spread within North-western Province; In Feb 2003 disease spread to Mufumbwe within North-western Province. CBPP has become endemic in Western and North-western Provinces. Also Zambia threatened in north by disease in Tanzania.

#### **TANZANIA – RINDERPEST**

Tanzania was the last country in SADC to experience rinderpest. Last outbreak was in 1997; Provisional freedom from Rinderpest from July 1998; OIE recognition of rinderpest disease freedom May 2005; OIE freedom from infection recognised May 2007.

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## **XI. SUMMARY OF SACIDS SUBMISSION TO THE WELLCOME TRUST 14 FEB 2008**

### **AFRICAN HEALTH RESEARCH CAPACITY STRENGTHENING THROUGH:**

#### **One Medicine Africa-UK Research Capacity Partnership Programme on Infectious Diseases in Southern Africa<sup>1</sup>**

##### ***Applicants:***

This preliminary proposal is submitted by a consortium of academic and research institutions, known as the Southern African Centre for Infectious Disease Surveillance (SACIDS), which is a virtual centre/network linking institutions in southern Africa with those in the UK and other science centres of the "North". For this application the consortium members will be as follows:

Director: Professor Mark Rweyemamu (Part-time Professor, Sokoine University of Agriculture at Morogoro, Tanzania; Visiting Professor, Royal Veterinary College, University of London; and nominated as Extraordinary Professor, Faculty of Veterinary Science, University of Pretoria, South Africa).

Deputy Director (Medical): Professor Barry Schoub (National Institute for Communicable Diseases, South Africa).

Deputy Director (Veterinary): Professor Rudovick Kazwala (Sokoine University of Agriculture, Morogoro, Tanzania).

##### Principal Co-applicants:

- Professor Antony Musoke (Onderstepoort Veterinary Institute and University of Pretoria) – research coordination;
- Professor Koos Coetzer (University of Pretoria) – training coordination
- Dr Aaron S. Mweene (School of Veterinary Medicine, University of Zambia) – institutional development and liaison with strategic programmes, especially avian influenza and HIV.

##### Co-investigators:

- Prof Jean-Marie Kayembe Ntumba (Faculty of Medicine, University of Kinshasa) – Democratic Republic of Congo (DRC), National virtual Centre for Infectious Disease Surveillance (NatCIDS);
- Dr Luis Neves (Vet Faculty, Eduardo Mondlane University) – Mozambique NatCIDS;
- Dr Sayoki Mfinanga (National Institute for Medical Research) – Tanzania NatCIDS;
- Dr Aaron Mweene (Veterinary Faculty, University of Zambia) – Zambia NatCIDS;
- Dr Janusz Paweska (NICD, South Africa) – haemorrhagic fevers and Rift Valley fever;
- Prof Paul van Helden (Medical School, University of Stellenbosch, South Africa) – TB (human and bovine)
- From the Onderstepoort Veterinary Research Institute (OVI) will be Dr Wilna Vosloo (FMD), Dr Anita Michel (BTB); Dr Phelix Majiwa (Molecular Biology); Ms Delille Wessels (Biosafety and Quality Management)

##### Collaborators:

- Professor Joe Brownlie (RVC, University of London) – Coordinator London and Peri-London institutional link, including the London School of Hygiene and Tropical Medicine, the Veterinary Laboratory Agency and the Institute of Animal Health
- Professor Mark Woolhouse (University of Edinburgh) – Coordinator Scottish institutional link;
- Dr Phil Toye (ILRI-BECA, Kenya) – Biotechnology in animal health link with the CGIAR system

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<sup>1</sup> Throughout this proposal the term Southern Africa refers to the countries that constitute the Southern African Development Community (SADC) i.e. Angola, Botswana, the Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, South Africa, Swaziland, United Republic of Tanzania, Zambia and Zimbabwe.

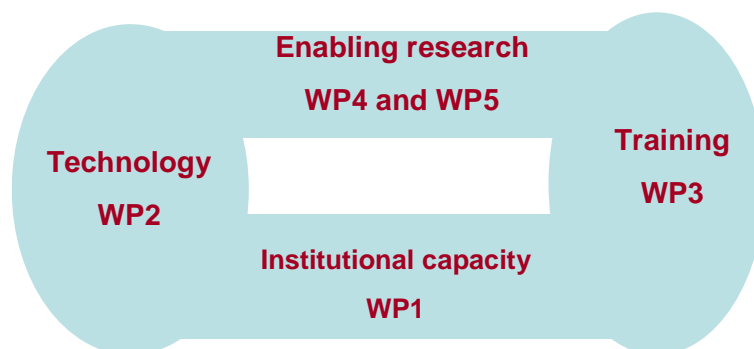
## EXECUTIVE SUMMARY

This proposal is submitted by a consortium of southern African academic and research institutions in partnership with the universities of London and Edinburgh in the UK together with the International Livestock Research Institute (ILRI) in Kenya. This consortium is known as the Southern African Centre for Infectious Disease Surveillance (SACIDS). Within each of the four neediest countries (i.e. the Democratic Republic of Congo, Mozambique, Tanzania and Zambia) the faculties of medicine and veterinary medicine plus national medical and veterinary research institutes will form a national virtual centre to be known as the National Centre for Infectious Disease Surveillance (NatCIDS). Three institutions in South Africa, namely the National Institute for Communicable Diseases (NICD), the Onderstepoort Veterinary Research Institute (OVI), the Faculty of Veterinary Science of the University of Pretoria and the Medical School of Stellenbosch University plus the two UK institutions and ILRI, will act as mentors for the scientists and the institutions in the 4 neediest countries.

The Secretariat of the consortium will be based at the Sokoine University in Morogoro, Tanzania. The Royal Veterinary College, University of London will provide the financial and procurement management support to the consortium secretariat in order to ensure compliance with the systems that are recognised by the Wellcome Trust.

The overriding concept of the proposal is the One Medicine<sup>2</sup>, inter-sectoral collaboration for research capacity strengthening for infectious diseases of humans and animals. We have selected infectious diseases as the entry point for research capacity strengthening and the One Medicine theme because Africa presents unique opportunities for infectious disease study. Africa has the highest burden of infectious diseases of humans and animals in the world; the science and technologies for studying these diseases are practically identical; and some 80% of newly emerging infections of humans over the last 30 years have been shown to originate from animals. The countries of the Southern African Development Community (SADC) have ecological systems which represent, probably, the highest human-livestock-wildlife interface in the world. Accordingly, inter-species transmission of infections is the core of the enabling research driver for this proposal. By focusing on these ecological systems, we shall also be addressing the needs of the poorest members of the southern African communities. We have selected to concentrate on diseases for which small mammals (Work Package 4) or the African buffalo (Work Package 5) are either the reservoir or main transmission vector for infections to humans and/or livestock.

## The SACIDS Chain-link



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<sup>2</sup> The term **One Medicine** as used in this application denotes: "the science of health and disease without considering species differences between humans and animals in broader zoological context" - as described by Virchow in the 19<sup>th</sup> century and Schwabe in the 1960s

The proposal is presented in 4 inter-linked work domains of enabling research, technology, training and institutional capacity, as shown in the diagram above. These are to be implemented through the following 5 work packages:

- 1. Work Package 1 (WP1) – Enhancing the biosafety and quality management environment**
- 2. Work Package 2 (WP2) - Enhancing the capacity for information and communication technologies**
- 3. Work Package 3 (WP3) – Enhancing skills through training**
- 4. Work Package 4 (WP4) – Enhancing research capability by focusing on diseases of humans and livestock, which are associated with small mammals**
  - **WP4-1: Rift Valley fever**
  - **WP4-2: Marburg and Ebola**
- 5. Work Package 5 (WP5) - Enhancing research capability by focusing on diseases of humans and livestock, which are associated with the African buffalo**
  - **WP5-1 Tuberculosis**
  - **WP5-2 Foot-and-mouth disease (FMD)**

## **XII. ACKNOWLEDGEMENTS**

This workshop was the first step, hopefully, towards an eventual SADC-wide and even African-wide network for the Detection, Identification and Monitoring (DIM) of infectious diseases. It was made possible through the generous financial grant of the Foresight Programme of the UK and the Agricultural Research Council of South Africa. The workshop focused primarily on infectious diseases of humans and animals and drew participants from the 5 southern African countries that had both medical and veterinary faculties/universities in addition to national medical and veterinary research institutes, whilst realising that eventually SACIDS would cover the whole of SADC and also cater for the DIM of plant diseases. The workshop also included invited potential partners from science centres in the UK and USA as well as potential sponsors.

Before the workshop, institutions in each country had undertaken an in-country SWOT analysis with respect to the potential capacity for effective DIM of infectious diseases, including emerging diseases. A three-person mission visited each of the participating countries to meet not only scientists from the national consortia but also senior, policy-level academic and government leaders as well as the Secretariat of SADC and NEPAD. We wish, on behalf of the participants and SACIDS consortium, to express our sincere gratitude to these leaders for their guidance and support during these consultations. As Dr Nabarro points out in his statement to this workshop, such leadership is fundamental to the success of multi-disciplinary initiative.

We thank Dr Fred Musisi of FAO and the FAO Representations in Tanzania, Mozambique and Zambia for in-country logistic support and guidance.

We thank the Chief Executive Officer of the Agricultural Research Council, Dr S Moephuli, for his financial and logistics support and the Local and International Organizing Committee for the smooth organisation of the agenda and logistics of the workshop. In this regard we wish to express special appreciation to Ms Jackie Willmot for managing the logistics of the entire workshop cycle.

This workshop has benefited from the conclusions and recommendations of the UK Foresight international study on infectious diseases. We acknowledge with gratitude that this study had included a specific focus on Africa, which was led and coordinated by African scientists and involved over 50 African specialists in infectious diseases of humans, animals and plants. The personal engagement in the study, the process and the post-report follow up actions in Africa by the Chief Scientific Advisor to the UK Government, Sir David King, together with the Director and Assistant Director of the Foresight Programme, respectively Professor Sandy Thomas and Mr Jon Parke including their guidance to AU-Foresight workshop in Pretoria, September 2007 and the present SACIDS workshop, have been most inspiring.

Finally we wish to thank all the contributors from outside the southern African region for their guidance and readiness to share their experiences with us. In this regard we wish to single out the statement by Dr Nabarro of the UN which has provided us with an insight into the enablers that will guide our future actions, as we, the scientists of southern Africa, strive to make our contribution to the goal of: ***One Africa, One Health.***

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