

CORDS

Connecting Organizations for
Regional Disease Surveillance



REPORT: CORDS Conference 2018 Bangkok, Thailand, 29-30 January 2018

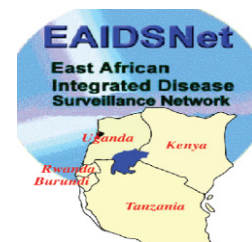
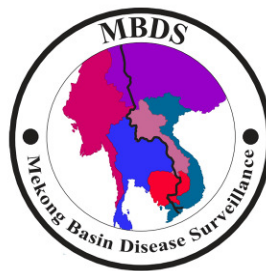


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This report summarises the 2018 CORDS Conference that was held as a side meeting of the Prince Mahidol Annual Conference in 2018, in Bangkok, Thailand.

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The Conference steering committee consisted of: Wiku Adisasmito, Prasert Auewarakul, Sibounhom Archkhawongs, Golubinka Bosevska, Yunus Karsan, Marlo Libel, Christophe Longuet, Julius Lutwama, Sovann Ly, Filomena Namuba, Stellah Nabatanzi, Kujtim Mersini, Emma Orefuwa, Mark Rweyemamu, Sabrina Salem, Amin Soebandrio, Bakary Sylla, Willy Were and Ruthi Yishai.

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Executive Summary

The CORDS 2018 took place on the 29-30 January 2018, as a side meeting immediately prior to the Prince Mahidol Awards Conference at the Centara Grand hotel, in Bangkok, Thailand.

The two-day event was attended by 173 international participants from 45 countries, 10 regional networks, and 5 continents. Participants comprised of network members, donors, regional organisations, academic institutions and the media.

The Conference comprised four themed plenary sessions, with two keynote talks and 41 presentations based on the strategic pillars of CORDS.

Experiences were exchanged with regards to the use of technology in disease surveillance across human and animal health sectors, community engagement, the importance of locally-owned, locally-driven initiatives, complementary efforts of state and non-state actors within the global health space, and finally, enablers of and barriers to the sustainability of established and nascent networks.

The CORDS conference was another step forward of great importance for the strengthening of collaboration and networking among CORDS member network countries and beyond in areas of common interest and joint activities and other international agencies and donors. It was considered as a great opportunity for the future of CORDS, that convened together a wide range of experts, epidemiologists, veterinarians and representatives from different organizations and institutions, partners and stakeholders and more, to discuss, review and refine the mission, strategy, objectives and future programmes.

The Conference served as a visualization tool towards partners, stakeholders and other national / international agencies. It allowed all involved the opportunity to present many interesting ideas that may potentially serve to build the foundation for future programmes and activities.

I. Introduction

CORDS is a network of front line disease surveillance networks in seven regional areas in Africa, Asia and the Middle East. This extended network includes public health, health care professionals, veterinary, microbiology, logistic, economic, social science, communication, community mobilisation and statistical experts with extensive surveillance and outbreak experience. Network experts manage and lead disease surveillance systems at local, national and regional levels and are actively engaged in innovative inter-country inter-sectoral (One–Health) initiatives and research.

CORDS connects – and unites – regional infectious disease networks around the globe and brings the voices and views of frontline people to the international policy table. By connecting networks, networks become stronger: they share information that enables more precise surveillance and the form communities of practice. Information sharing is a key element for earlier detection in regional infectious disease surveillance. CORDS networks have established ways to operate successfully – often as a result of a learning process that takes on board the lessons from their successes and drawbacks. These lessons are valuable intelligence tools that should be shared with other networks to enable learning from each other. Sharing information and best practice among networks, strengthening network operations and enabling communication are some of the key activities that CORDS HQ aims to facilitate.

CORDS is a collective with six founding regional disease surveillance networks, with plans to expand; it works in complement and cooperatively with the World Health Organization (WHO), the World Organization for Animal Health (OIE), and the Food and Agriculture Organization (FAO).

It is in this context, that CORDS has great relevance with knowledge and experience to connect peoples and governments across geopolitical borders to create an engine of engagement and systematized change. Since 2012, CORDS has focused on reducing and preventing the spread of infectious diseases by exchanging health information among surveillance experts in different countries/continents. As CORDS enters its sixth year of operation, it celebrated its notable achievements by providing a forum at PMAC for interactive engagement of network members.

The 2018 Prince Mahidol Conference on the theme of A World Safe from the Threats of Emerging Infectious Diseases was an opportune occasion for CORDS to promote cooperation and forge links between its networks, with other international agencies and PMAC attendees from around the world for the advancement of public health.

II. Conference Aims & Objectives

The two-day event was attended by 173 international participants from 45 countries, 10 regional networks, and 5 continents. Participants comprised of network members, donors, regional organisations, academic institutions and the media.

The objective of the CORDS conference was to provide a platform for networks to:

- To showcase successful inter-network projects among key stakeholders: CORDS network members, technical and funding partners, the Tripartite, and civil society;
- To provide a safe and robust platform for the exchange of experiences, learnings and best practices in disease detection, validation, and response;
- To identify activities that engage regional disease surveillance networks in information sharing and knowledge building;
- To understand opportunities that will complement and amplify network impact and the influence of international agencies within a global health framework.

Target participants:

Surveillance experts and regional surveillance members of CORDS from around the world, as well as public private partners. Even though preference for attendance was given to invitees, the conference was open for additional PMAC participants to join on site.

III. Plenary sessions

The programme for the conference which was developed by CORDS Steering Committee, was composed of selected abstracts submitted by CORDS networks and invited speakers presented during four sessions over two days.

Day 1 - Monday, 29th January

Welcome Address

CORDS Executive Director, Dr Christophe Longuet and CORDS Chair Prof Amin Soebandrio officially opened the conference, welcomed delegates and provided opening remarks.

Keynote talks

Keynote talk I – Professor Charlanne Burke, The Rockefeller Foundation

Prof Burke opened her talk highlighting the growing threat of emerging and re-emerging disease threats on our planet. She then went on to describe the work of the Rockefeller Foundation in helping to build regional disease surveillance networks since 1999.

During the first decade of the new millennium, under the leadership and guidance of local visionaries on the ground, and together with partners such as Ending Pandemics, the Nuclear

Threat Initiative, the Peter G Petersons, Mérieux and the Bill & Melinda Gates Foundations, in close collaboration with WHO, OIE, FAO and others, a total of six regional disease surveillance networks emerged.

CORDS' more recent work with The Rockefeller Foundation, Ending Pandemics, and the World Bank was highlighted, in particular how it played a part in mobilizing the capacity and expertise of its networks to help plan for a new surveillance network in West Africa—WANIDS, the West African Network for Infectious Disease Surveillance.

Trust, collaboration, capacity building of both institutions and individuals, sharing information and best practices, and reaching hands across boundaries and borders were cited as crucial factors in the effectiveness of networks.

Prof Burke talked about the role of CORDS in assisting the detection of outbreaks earlier and the resultant prevention of lost lives as the added value the platform provides to global disease protection and response. CORDS is complementary to other systems and efforts, by harnessing their power to achieve other goals such as health and human security, and helping countries to adapt to complex challenges.

Prof Burke emphasised the support of Rockefeller's new leadership, Dr. Rajiv Shah, in continuing to support the important work of CORDS and its networks.

Keynote talk II – Professor Larry Brilliant, Ending Pandemics

Prof Brilliant began his keynote talk by describing the paradigm of 'the first and the last mile' in Global Health, with the premise that CORDS has a role in 'the first and last mile and everything in between'.

The first mile, can be best illustrated with how we approach diseases such as Smallpox, Polio, Ebola, Malaria, Zika, etc. – and how they all begin at one moment in time, with one animal, one human, one diseased jumping to one human. This first mile is the quintessential concept of One Health, the complex interaction between the environment, microorganisms, humans, and animals.

Closely tied to this are considerations of geographical space, whereby people in the field may have to travel for hours, across distances, sometimes days away from the nearest health facility. It is also applicable in the disease eradication context, meaning the 'final push', ensuring the last case is eradicated.

By improving disease detection from the first mile, there will be economic savings in the future, and the last mile should be about focusing on eradication of diseases.

Dr Brilliant concluded by showing a short film illustrating the use of technology to support locally driven disease detection.

Special Lecture: Lessons learned from HIV for the next pandemic

Prof Françoise Barre – Sinoussi, Nobel Laureate, Honorary President of the Institut Pasteur International Network

Prof Françoise Barré-Sinoussi cited the past three decades of HIV/AIDS science as a good example of a broad multidisciplinary response to an emerging health threat, resulting in key breakthroughs in prevention, diagnosis and treatment. It has been, and still is, a model for the response against other emerging/re-emerging diseases, according to the humanist and very modern view of Louis Pasteur of translational science for globally improving the health of populations.

She stressed the need for political willingness, international investments, and advocacy against repressive legislation, stigma and discrimination.

Prof Barré-Sinoussi touched on some failures in large scale intervention and prevention, including lack of commodity security, the inability of vulnerable and marginalised groups to access treatment, insufficient research and an over reliance on biomedical approaches. Poor programmatic coordination, short term funding cycles and inappropriate policy environments were also discussed as limiting factors.

She discussed the link between the advent of HIV and its impact on societal changes at all levels. As diseases continue to emerge and re-emerge, such as Ebola, we must not forget the positive and negative lessons from HIV which are applicable to all infectious diseases.



Prof Barré-Sinoussi

The scientific programme commenced then with sessions based on the strategic pillars of CORDS. Promoting Innovation, Advancing One Health, Building Capacity and Building Sustainable networks.

Session 1: Promoting Innovation

Chair: Prof Julius Lutwama, EAIDSNet; Co-Chair: Mr Sari Hussein, MECIDS

The first session focussed on showcasing a number of disease surveillance innovations in the Global Health Space, from donor, international agency and frontline surveillance perspectives.

Lecture: Promoting Innovation for Efficient Healthcare Systems Prof Itamar Grotto, Ministry of Health of Israel

Prof Grotto described the factors behind the efficiency of the Israeli healthcare system. These are principally, strong community based healthcare focused on a primary care system, strong public health systems and continuous innovation.

Strong public health measures such as the introduction of universal Hepatitis A vaccination in 1998 and the halt of wild poliovirus within two years, were due to the implementation of a robust surveillance and response system and vaccination coverage.

The application of Big-Data to predict diseases is useful in identifying markers of diseases before people fall ill. A few examples were shown.

The K Health mobile application uses an Artificial Intelligent Doctor to analyse patients' symptoms and how physicians diagnose and treat them.

Medical Home allows patients to be monitored from home rather than sent to hospital. Results show better diabetes control, and a decrease in depression and hospitalisation

CancerSEEK detects cancer with a blood test and allows the sharing of patients' records through a central digital system.

Challenges highlighted included automatised and artificial intelligence, meaning Doctors must redefine their work. There is also a rise in chronic diseases in Israel, mostly due to obesity, sedentary lifestyle and poor nutrition.

Prof Grotto also talked about the Mosaic programme, a tool enabling personalised medicine and treatments through genomic, behavioural and clinical data analyses.

Panel: Innovation in Disease Surveillance

Innovative Tools for Event Detection: The Promise and the Peril, Prof Ann Marie Kimball, Chatham House

Prof Ann Marie Kimball gave examples of opportunities and challenges posed by the fourth industrial revolution as the introduction to her presentation. She noted that the revolution is quite uneven as there are great disparities with regards to technology access. The statistics

she gave were stark: 4.4 Billion of people have never been online, two billion are untouched by digital technologies and 400 million live outside the mobile cellular signal range.

Prof Kimball called for an 'all society' cross sectoral discussion around innovations.

The 50+ event based bio-surveillance systems online are however unevenly distributed. Several of these were highlighted, including Child Health & Mortality Prevention Surveillance (CHAMPS), and EARS.

In 2015, the EARS project was created with the ambition to bring together all internet searching FLOWS into one great feed on a website which would be then analysed by a group of dedicated analysts in the G7 countries + Mexico. Each country member curates for one week with reports that other countries can use. WHO is bringing this platform to its members and theoretically, in 10 years' time, every country should have some access to this internet based platform to compliment the surveillance from clinics and laboratories.

The potential of block chains as a tool to help foment trust in networks was posed, given its model of enabling transactional following by many users creating, a trust-based community. This technology is already used in rehab medicines and clinics in the USA.

In summary, Prof Kimball concluded that the Global Health community needs to assess whether the most robust surveillance systems are available where they are needed and that we must consider bringing forward new plans, new geospatial allocation of expertise and resources.

The WHO Health Emergencies Programme: Platforms and Systems to Manage Public Health Risks and Emergency Events, Dr Oliver Morgan, WHO

Dr Morgan provided the history of the creation of the WHO Health Emergencies (WHE) programme which was created by WHO member states in 2016. The WHE programme focuses on WHO strategic priorities: to keep the world safe; improve health, and serve the vulnerable to support attainment of the Sustainable Development Goals. Emergencies have the potential to disrupt and derail the SDGs.

WHE's focus areas are:

- Early warning, risk assessment and emergency response
- Prevention and control strategies for high-threat infectious hazards
- Preparedness, International Health Regulations assessment and core capacity strengthening
- Health systems strengthening in high-vulnerability countries

Emergencies programmes exist at all levels and are a core function for WHO. The Health Emergency Information department works on detection; verification, assessment, investigation or response and reporting. The detection process analyses 500,000 pieces of information, filters them, verifies them and investigates them using 10 formal risk assessments processes.

The following platforms and systems are utilised by the WHE:

- Emergency Dashboard to monitor events
- Event Management System (EMS) to document events
- Epidemic Intelligence from Open Sources (EIOS) to detect events through sharing and exchange of data (about to be launched in April 2018).
- Early Warning, Alert and Response in Emergencies (EWARS) to collect data from the field in situations when the health systems have collapsed and there is a need to establish surveillance systems quite quickly.
- Go.Data software developed in partnership with the Global Outbreak Alert & Response Network (GOARN) manages complex information.

Future plans include the prioritisation of EIOS and Go.Data; investing in strengthening and integrating other systems; leveraging data platforms to improve performance; sharing verified information in a short timeline and creating partnerships to address gaps and collectively find solutions for success.

Ending Pandemics, Dr Mark Smolinski, Ending Pandemics

Dr Smolinski of Ending Pandemics (EP) gave an overview of the organisation and its work, which aims to apply technology to find, verify and contain outbreaks faster no matter where they happen on the planet. EP works directly with governments, as disease surveillance and response are ultimately governments' responsibility. The philosophy of EP is that no community is too hard to reach and no country is too poor to innovate.

During his talk, Dr Smolinski stressed the importance for technologies to be created in-country in order to promote local ownership.

Dr Smolinski also described how Ending Pandemics works with CORDS to scale innovations from one country to neighbouring countries. An example of this, is the 115 Hotline being replicated from Vietnam to neighbouring countries through the MBDS network and CORDS. The participatory One Health disease surveillance initiative in Chiang Mai has been now replicated in Tanzania via CORDS through the AfyaData tool.

Ending Pandemics is also empowering and equipping epidemiologists with the latest tools and training to enable the immediate use of tools.

The need for greater transparency about what's happening across the globe and how this should be made publicly accessible intelligence was emphasised.

EP sees a lot of hope in crowdsourcing, not only for verification but also for detection through the eyes and ears of the public, volunteers, farmers etc. If signals can be obtained faster and local resources used to verify them, we will find outbreaks faster and contain them locally. Through regional collaboration, measures can be taken to ensure that nothing spreads beyond the region. Dr Smolinski proffered that this is why multi -regional networks such as CORDS are so important.

Finally, Dr Smolinski expressed his excitement in seeing eight countries in South Asia form a new regional network and shared hopes that the nascent network will join CORDS in the future.

Using Smart Phones Occupied with Intelligent Mobile & Web Apps for Electronic Systems of Disease Surveillance in Tanzania, Mr Eric Beda, SACIDS

The next presentation by Eric Beda provided further elaboration on the digital participatory surveillance initiative supported by EP, described by Dr Smolinski. The context in which SACIDS built its mobile app is based on the complexities of disease surveillance embracing the One Health approach. SACIDS is increasingly using computer systems and algorithms that are trying to link clinical, demographic, ecological and climatological data, explained Eric Beda.

The current Integrated Disease Surveillance and Response (IDSR) in Tanzania only captures clinical cases in disease surveillance. The community are the first to notice public health threats, animal diseases, wildlife diseases, water quality, and climate change.

SACIDS has been trying to build applications that can engage with and provide the community with the ability to report in real time and be able to contain outbreaks at the source. It is in this vein that SACIDS organised an EpiHack session gathering human and animal health experts, IT developers from over 10 countries in Arusha in December 2014 to look at public health challenges and identify tools to address them. The various field sessions and presentations led to the development of three prototypes by the IT developers present.

The prototypes developed aimed to collect health events rapidly, provide feedback to data collectors, through funding from Skoll Global Threats Fund (now Ending Pandemics) and the International Development Research Centre (IDRC), the Afyadata tool was created.

Afyadata, is a mobile and a web app enabling communities to collect data and send it to a server. The algorithm looks at the data gathered based on locations and symptoms reported and will deduce the kind of disease it may be and send further alerts.

The AfyaData team is working towards:

- Building a system for validation based on crowdsourcing where rumours can be verified by communities.
- AfyaShow: an internet podcast or radio station where the top 10 events could be discussed weekly and AfyaCamp; teams of students, researchers visiting communities to find sustainable solutions to specific issues. More information on Afyadata can be found [here](#).

East Africa Public Health Laboratory Networking Project Strengthens Disease Surveillance Using Regional Web-based Reporting System, Dr Benedict Mushi, EAIDSNET.

An outline of the main activities of the East African Public Health Laboratory Network (EAPHLN) mechanisms for data collection and sharing was provided by Dr Mushi. The EAPHLN has three main components: strengthening diagnostics and disease surveillance capacities, capacity building and operational research and knowledge sharing.

The East African Public Health Network under the umbrella of EAIDSNet, developed a web based reporting system for disease surveillance. The facilities supported are laboratories mainly based in cross border areas.

The system developed is based on the following approach:

- Coordinated approach to data collection, analysis, interpretation and dissemination
- Data sharing for joint response to outbreaks
- Timely collection and reporting via electronic systems
- Electronic information management system

The data collection and reporting flow starts from the health facilities to the districts, once approved the data are shared with national disease surveillance systems for final approval and are finally sent at the regional level via Application Programming Interface (API) from e-EAIDSNet Regional system.

The system can generate Geographical Information System (GIS) reports showing confirmed cases; send outbreak alert sums, emails and generate aggregate and graphical reports supporting decision-making.

Some of the main lessons learned from this initiative include:

-The Web-based electronic reporting system has strengthened the timely sharing of disease surveillance data among East African Community partner states and provides a platform for mounting a prompt and coordinated joint response to public health emergencies.

-The system detected increased cases of malaria reported in Burundi and Tanzania, which enabled a coordinated cross border response.

The web-based reporting system allows the East African region to better respond to public health events due to infectious diseases and is applicable across other regions.

Inter-sectoral and Inter-network Collaboration for Improving Disease Surveillance in East & Southern Africa, Prof Eron Karimuribo, SACIDS

Prof Karimuribo set out the case for inter-sectoral and inter-network collaboration in East & Southern Africa. As well as the well documented threat of zoonotic disease, 'humans and animals do not respect borders and 'in a globalised world, networks need each other'.

In 2009 SACIDS in collaboration with Imperial College and the Royal Veterinary College (RVC), SACIDS used EpiCollect to map human and animal health facilities in Ngorongoro and Kibaha in Tanzania.



Members of SACIDS

The first event that brought the networks together was in Arusha in 2010 where they benchmarked technologies and expertise in East African Communities and Southern African Development Community. The major recommendations that came out of that meeting were the promotion of cross-border and cross-sectoral collaboration and use of mobile technology tools to enhance surveillance. Following on from this, the 2014 EpiHack previously mentioned by Eric Beda was held, leading to the development of the AfyaData.

SACIDS has partnered with neighbouring countries and mentors from the US to work together to enhance programming capacity however, the programmers are driving the programming for AfyaData.

Prof Karimuribo concluded detailing the successes of this multi-network, multi stakeholder collaboration: SACIDS currently covers 11 districts and to date, the communities have reported around 7000 cases. The majority are animal cases but approximately 3% are human cases.

Panel: Improving Laboratory-Based Disease Surveillance

Building Capacities for Influenza Surveillance in the Republic of Macedonia (2014-2017), Dr Vladimir Mikikj, SECID

The next talk by Dr Mikikj was about the process of addressing shortfall in influenza surveillance in Macedonia, a country within the SECID network. Within Macedonia there is a network of 1320 GPs which report individually every week out of season and during the season they aggregate reports weekly. However, the main flaw with this system is that it is paper based as opposed to electronic which means there can be delays as well as possibility of errors.

The main objectives of the sentinel surveillance system developed, was to improve the surveillance of influenza, to obtain more precise EPI and virological data and to reduce severe respiratory infections as well as a reduction in epidemiological disease.

The support of SECID in 2014/15 in setting up this sentinel surveillance system was instrumental. With six sites covering five regions, only 1% of population was covered in order to build a network cluster which increased each season and by the last season the number of sites, mainly in the capital had increased to 16 sentinel sites, covering 2% of the population.

Results collected were from both sentinel and non-sentinel data showing results for both ILI (influenza like illness) and ARI (acute respiratory) cases and showed a similar trend for both sentinel and non-sentinel surveillance with a larger number from non-sentinel cases.

From the sentinel virological surveillance they were able to collect over 300 samples from 2014 to present day, while they were only able to collect 245 from non-sentinel virological surveillance. This showed how sentinel system is able to obtain not only more data, but more precise data. For the first time in Macedonia, there was the ability to look at the relationships within the system. SECID, WHO and CDC worked together to follow up and implement the influenza surveillance system. An evaluation was carried out of 38 indicators for nine attributes of one system.

Quantitative indicators, performed well, with a score 79.9% while qualitative indicators showed that the utility was good but it could be made to be more simple

A key point of learning was that the sentinel surveillance can be replicated for other priority diseases in one country and though there were gaps in disease surveillance previously, e.g. with virological data for influenza, these gaps can now be addressed. Other benefits included improving the database for epidemiological analysis and feedback reports, an increase in the number of specimens for each site every week, and an improved schedule for participating doctors.

This has led to an increase of almost triple the number of sentinels and after 2-3 years of preparation, work has begun on implementing electronic reporting, and the provision of additional training.

Genomic Profiling of Multidrug Resistance in Tuberculosis among Patients in Tanzania, Dr Bugwesa Katale, SACIDS

Dr Katale, who is a postdoctoral research fellow at Muhumbili University of Health and Allied Sciences in Tanzania, presented the situation regarding Drug resistant TB globally and in Tanzania.

Of the 10 million cases of drug resistant TB worldwide, 19% of these were treated. In Tanzania, there were over 60,000 new cases in 2014, with 3.9% of these treated. Whole genome sequencing and the development of new technology such as bio-informant software and genomic science have improved the understanding of transmission dynamics of pathogens such as TB.

Dr Katale presented details of a SACIDS led study looking at the genomic diversity and drivers of evolution of drug resistant TB strains in Northern Tanzania.

The study took the form of an unmatched case control study using 31 subjects and a control group of 10 subjects who responded well to first line drugs. A number of procedures were used to determine the mutations and the sputum samples were collected from all subjects including the control group

Microscopic examination was done before extracting DNA for sequencing and PCR amplification to produce a statistical analysis.

Software was used to align the reads to a reference genome to identify the SNP and perform phylogenetic analysis to identify the relationship among the NDR string and also the part of drug resistance.

Overall the results showed the detection of mutation of drugs, and also found diverse augmentations in the first and second line. In addition, observations found mutations in certain genes which are a reliable biomarker or hot spot regions for determining of MDR-TB in our local settings. Detected mutations mediating resistance to first line drugs correlated with phenotypic results.



Q&A session

Seroepidemiological Study to Identify Middle East Respiratory Syndrome Corona Virus (MERS-CoV) Transmission in Jordan, Israel and Palestinian Authority, Prof Dani Cohen, MECIDS.

MERS CoV was first isolated in 2012 in Saudi Arabia from a patient with pneumonia and has spread mostly in Saudi Arabia and the Middle East. Cases detected outside the Arabian Peninsula were associated with travel to an endemic Middle East country and contact with infected persons (secondary transmission).

MERS CoV is a viral disease which manifests with severe pneumonia and an incubation period of 2-14 days along with a fever and shortness of breath as well as an abnormal chest radiography observed in 100% of the cases. So far 27 countries have been affected by the disease with Saudi Arabia at the epicentre of this epidemic since 2012 with over 100 cases occurring there.

Camels are a secondary reservoir and humans develop the disease after coming in contact with these camels who then come in contact with patients and continue to share the virus.

Prof Cohen, responsible for the Israel arm of the MERS-CoV study, described how MECIDS created a platform for collaboration, which was used as to detect potential transmission of the Mers-CoV virus within Jordan, Palestinian Authority and Israel with an emphasis on high-risk groups such as pilgrims who may come in contact with MERS-CoV patients as well people working with camels. 2000 samples were examined in total. Out of all the sera which was screened by ELISA there were 3 positive subjects: Two healthy asymptomatic female volunteers from the general population in Jordan aged 38, 50 respectively. A pilgrim female patient Israel (age 53) who had influenza-like illness while being in Saudi Arabia. All the three positive results by ELISA were negative by the plaque reduction neutralization test so the infection was ruled out. In conclusion, despite the mass gathering and extremely intensive population "mixing", pilgrimage to Mecca was not associated with an increased risk of MERS-CoV acquisition and there was no camel to human transmission identified by screening.

More studies are needed to further examine transmission of MERS-CoV in the region and more than a one-year study to increase the sample size and detect potentially sub prevalence or circumvention but for the time being the negative results they observed are highly important.

The high-risk populations (pilgrims and camel shepherds) should be aware of MERS-CoV modes of transmission and maintain hygiene-related preventive measures.

The MECIDS platform was instrumental in obtaining important public health information on the risk of regional transmission of the virus. The platform and approach could be expanded to study transmission of other respiratory pathogens in the region (e.g. influenza/ILI etc.).



Prof Rweyemamu chairs a Q&A session

Session 2: Advancing One Health

Chair: Prof Mark Rweyemamu, SACIDS; Co-Chair: Dr Sovann Ly, MBDS

Lecture: Emerging Infections: Interventions from a One Health Perspective
Prof Ab Osterhaus, Centre of Infection Medicine and Zoonosis Research at Hannover Veterinary University

Over the past century there has been a reduction in newly emerging infections, however new infections have started to come forward again, due to multiple reasons. Two major infections which were brought under control were smallpox and the rinderpest virus.

The trajectory of some infectious diseases was examined in more depth by Prof Osterhaus. In Africa, other forms of the pox virus such as monkey pox circulate, showing the pox virus has crossed the species barrier. While the rinderpest virus was another virus that had been eradicated, but has been able to cross the species barrier to devastate populations of cattle.

There is the concern now that once a virus has been eradicated you might create a niche for new viruses and the question is will there be a similar situation with the measles virus. While it's been eradicated the morbilliviruses are crossing the species barriers.

Many studies have been carried out on the morbillivirus and they have found new forms of the morbillivirus in Nature 1988 and 2002. They crossed the species barrier and have been found in dolphins, cats, monkeys. In 1997, they identified the influenza A (H5N1) virus in humans using new molecular techniques. The human metapneumovirus (hMPV) was a new virus

which crossed the species virus to humans 200 years ago and has been in circulation ever since. This particular virus is in the same group as RSV, and is quite similar in terms of symptomology.



Prof Osterhaus delivers a lecture during the plenary session

When WHO started working on identification of the origin of SARS CoV, they constructed dozens of labs across the world, and they were able to identify the human metapneumovirus in Hong Kong. This was initially thought to be the cause of the disease but was shown not to be.

Monkey experiments with the human metapneumovirus and coronavirus were conducted to show that the coronavirus alone was sufficient to cause SARS CoV in monkeys. This led to vaccines and antivirals being developed as well as having good hygienic measures and good quarantines with good diagnostics we could stop the infection from spreading.

Ten years later a person from Saudi Arabia presented who had died from a mysterious virus, which was then discovered to be coronavirus, linked to camels. Various species were investigated, as the virus had spilled over from bats to camels to humans who had come into contact with these camels.

The main receptor of the virus was identified, which is important in developing new antiviral approaches, and thus potentially a vaccine, which was tested on camels which when vaccinated produced antibodies against the virus as well as against camel pox. The vaccine is now in Phase I trials and will soon enter Phase II trials.

They also did a lot of work on influenza, which has three types: seasonal, zoonotic and pandemic which has its basis in migratory birds which spread the virus, observing that the virus can now go directly from birds to humans.

They carried out a series of experiments including ferret experiments where they showed the H5N1 virus does not spread from ferret to ferret. However, they identified mutations which makes the virus transmissible from ferret to ferret which had pandemic potential.

Working with the MVA they made a vaccine based on the H5N1 virus and tested it on mice, ferrets and monkeys as well as vaccinating humans. They found humans which had these vaccines made very good antibodies against the HI – VN/1194/04. This means a population vaccinated with Vietnam vaccine and boosted a year later would be protected against both virus strains.

Panel: Making One Health Surveillance Work

Pan African network for Rapid Research, Response, Relief and Preparedness for Infectious Disease Epidemics (PANDORA), Dr Willy Were, EAIDSNet/SACIDS

There is a large burden of disease in East Africa as the hotspot of the Congo basin, and the large animal population there puts the population in East Africa at a high risk of disease transmission. Recently there have been outbreaks of Cholera, Rift Valley Fever, Yellow Fever, Dengue, Marburg and Ebola. There is a need for innovative approach to control the spread of disease in the region. Dr Willy Were detailed recent efforts of EAIDSNet to mitigate risks in the region.

The East African Community Integrated Disease Surveillance and Response Network (EAIDSNet) which carries out response to infections by human, animal and environmental disease control practitioners from Burundi, Kenya, Rwanda, Uganda and Tanzania. The EAIDSNet targets:

- Improved integrated Disease Surveillance & Response (IDSR) data quality and use in the region;
- Strengthened laboratory network;
- Improved joint cross border surveillance, preparedness, investigation, collaboration and response;
- Promote continuous exchange of expertise and best practices for Disease Surveillance and response.

The Pan African Network for Rapid Research, Response, Relief and Preparedness for Infectious Diseases Epidemics (PANDORA) is a consortium of organizations and institutions which wishes to grow disease surveillance and control in sub-Saharan Africa aimed at improving preparedness for and response to disease outbreaks and involves: Training, research, and strengthening health systems at all levels. The consortium is made up of several streams including the Work Package 9 which is working on improved surveillance and research.

SACIDS and East Central and South African health community (ECSA-HC) are working on a work package that includes early warning systems for emerging diseases, improved cross border surveillance and mechanisms for data sharing

Both SACIDS AND EAIDSNet will work to develop and expand use of electronic surveillance data systems. Other expected outputs include:

- Increased pool of trained scientists in the region
- improved laboratories in trans-boundary zones
- Novel digital systems applied for data collection will be part of early warning system
- Dissemination of disease surveillance data and best practices in regional fora
- Empowered cross-border communities

This should then lead to a reduction in epidemics - morbidity and mortality therefore leading to economic growth in the region. Dr Were emphasised this work as an example of where surveillance networks can develop efficiently to improve disease control in the region and extended an invitation to partners in the region to collaborate on the PANDORA initiative.

Estimating the Economic and Social Consequences for Patients Diagnosed with Human African Trypanosomiasis in Muchinga, Lusaka and Easter Provinces of Zambia (2004-2014), Dr Martin Simuunza, SACIDS

Human African Trypanosomiasis (HAT) is a neglected zoonotic parasitic disease caused by two parasites, which are undistinguishable morphologically. The disease is transmitted by infected mosquito bites and has had a large impact on the social and economic development of some Sub Saharan African communities.

In Zambia, there have been epidemics of this disease in Chama, Mpika and Rufunsa districts. A study was undertaken to look at the social and economic consequences of this disease at household level in these districts.

The study was initially carried out in 2014, so more active surveillance was employed by going into communities and interviewing locals which almost doubled the number of cases.

They found on average that patients with the disease lost 4.9 productive months, equating to US\$309.98 in lost income median costs incurred during hospitalization were US\$164 People self-medicated prior to hospitalisation either through traditional healers or were misdiagnosed at medical centres and faced an additional cost of US\$71.9.

Narratives from the focus group discussion showed many people were afraid of being diagnosed as HIV positive and would not go to the hospital, while in another case a misdiagnosis of a patient led to the individual's death as the disease was only discovered later.

HAT in Zambia has high disability adjusted life years (DALYs), potentially due to the severity of the disease and late diagnosis as well as high social consequences. There are also high economic losses due to disease at household level as it affects the breadwinners. Also, physical disabilities conferred a more significant effect on female patients due to loss of self-esteem.

In conclusion HAT is a disease that arises out of poverty and perpetuates and reinforces poverty at household level. The results of this study can help contextualise the importance of prevention both to affected populations and the costs of outbreak mitigation strategies.

Improved surveillance and diagnostic capacities of local medical facilities is needed so that cases are detected early as well as measures to mitigate the long-term effects of disability.

Gap Analysis of a Neglected Global Disease of Marginalized People ‘Leishmaniasis’, Jordan, Albania and Pakistan (2015), Dr. Mursalin, Pak One Health Alliance

Dr Mursalin of Pak One Health Alliance, presented the methods and findings of the multi-network Gap Analysis of Leishmaniasis project. This multi-country study was designed to strengthen the capacity of the national health services within each of the three participating countries for the treatment and control of Leishmaniasis. These countries were chosen due to the high prevalence of the disease within each country.

Weaknesses found in the current capacity for the prevention and control of Leishmaniasis include: poor governance with no well-defined Leishmaniasis control strategy goals and objectives, poor case management, there’s currently a shortage of anti-leishmanial drugs, weak one health capacity building and a weak civil society.

The priorities identified in the Gap Analysis for each country were:

- Improvement of early detection of all cases, particularly in rural areas,
- Management of inadequate access to anti-Leishmania drugs for treatment all patients,
- Ensure proper case-based surveillance.

In Jordan, it’s mainly zoonotic cutaneous Leishmaniasis caused by *L. major* and it’s considered a low public health priority. Jordan is at significant risk of introducing anthroponotic cutaneous Leishmaniasis (ACL) from Syrian refugees.

Jordan faces similar weaknesses in the current capacity for the prevention and control of Leishmaniasis to Albania. There is no leishmaniasis national programme or budget and cases are routinely under-reported in hyper-endemic areas. There is also weak one health capacity building and medical treatment is often delayed by patients initially resorting to ineffective traditional remedies.

Discussion Points from Q&A session

Question: *How do we support local government officials in implementing the changes which have been identified ten years ago to control disease?*

Answer: Dr. Mursalin (Pak One Health): At the government level, there needs to be intersectoral coordination.

Comment: Often these diseases are neglected and aren’t obvious to government officials and during a previous project they gathered officials from One Health across different countries and different sectors to make them aware of the disease though it took a different form in each country. We provided them with data and they also collected additional data and in terms of diagnostics they’ve improved and can now do molecular diagnostics. Through this project they were are also able to learn from each other

Question: *With regards to the last question on there being the same changes still needed from ten years ago, can technology play a role in supporting government officials or empowering the community? The issue is recognised at the community level, so could there be a use for knowledge-based feedback where people report a symptom and it goes into a knowledge warehouse where people can see it and look for support.*

Answer: Martin Simuunza (SACIDS): The role of technology is linking people sending information to officials and advising. Applying the experience in East and Southern Africa, they don't need monitoring, but they want to see what can be done to support them within their community. Also another key issue is that people have to be linked to the official system and the officials will be happy to see supplementary information coming from the communities so that they're aware of what's going on. This then acts as a continual process and this doesn't need to be done face to face, it could be done so there is a system which provides feedback immediately. There can be a basic reaction at the community level.



Q&A session

Panel: Addressing Antimicrobial Resistance Using the One Health Approach

Antibiotic Use and Antimicrobial Resistance, Dr Jorge Pinto Ferreira, OIE

The One Health concept is part of the global strategy for controlling diseases and combatting AMR. Counterfeit products are a problem in veterinary as well as human sector. Falsified /counterfeit pharmaceutical products can lead to antimicrobial resistance, decreased therapeutic effect and diminish the availability of quality assured authentic authorised products.

The One Health Concept is there to improve management of risks and consequences that arise at the interface between animal, human and ecosystem: Human, Ecosystem, Animals, living together harmoniously.

In October 2017, FAO, OIE and WHO reaffirmed their commitment to provide multi-sectoral, collaborative leadership in addressing health challenges. The scope of their collaboration will be enlarged to more broadly embrace the “One Health” approach recognizing that the human health, animal health and the environment are interconnected

The main challenge about AMR and sharing data is that there is a lack of regulatory framework to collect these data. Until recently it was not mandatory to collect these data and none of the

countries had obligations to do so. Countries do so on a voluntary basis. The lack of regulatory framework is a major obstacle. The other is the lack of coordination between the sectors, human sectors and animal sector is now discussing but the environmental sector is still behind. The tripartite discussions are yet to be developed. The OIE is currently working with countries to put this dialogue in place.

The OIE believes it is vital to enable adequate access to effective antimicrobial agents to treat animal diseases, but emphasises the need to regulate that access through the intervention of well-trained veterinarians, whose ethics are ensured by national Veterinary Statutory Bodies as laid down by law.

The OIE seeks to improve control of the production, authorisation, import and distribution of antimicrobial agents and to regulate their use in animals through adequate legislation, qualified practitioners, and a structured veterinary profession.

OIE also encourages responsible and prudent use of antimicrobial agents in veterinary medicine. This is principally determined by the quality of the antimicrobial and by the distribution, prescription and administration of veterinary medicinal products containing antimicrobial agents. Recommendations are provided for each of the parties involved, listed below:

- Regulatory authority
- Veterinary pharmaceutical industry
- Wholesale and retail distributors
- Veterinarians
- Food-animal producers

To summarise: in order to succeed in using the antibiotics in a responsible and prudent way, need strong legislation, well-structured veterinary (and health) services are needed.

OIE has published the OIE Annual Report on the use of antimicrobial agents intended for use in animals. Numbers still need to be used in careful manner and we are very cautious about the way we use our numbers because of the data collection issue.

The second report is available [here](#).

At a practical level, communications, media tools have been put in place at a tripartite level,

WHO, OIE, FAO have their material and there is a platform about AMR and many countries already have some national action plans in place.

More is available on the [OIE web portal](#)

The SACIDS One Health Approach to Genomics Driven Surveillance for Antimicrobial Resistance - a Potential Collaboration with EAIDSNet, Dr Stephen Mshana, SACIDS

A total of 600 humans, 984 animals and 70 environmental sites were sampled from the city of Mwanza, Tanzania. Whole genome sequence was carried out on 118 selected ESBL isolates (25 from animals, 25 from humans, 15 from environment and 53 from neonates).

- 334 humans, 55 (16.5 %) carried ESBL-PE

- The blaCTX-M-15 allele was detected 37/42 (88.1%)
- The blaCTX-M-15 was located in multiple IncY and IncF plasmids
- Eight Sequence types were obtained, ST 131, ST 38, ST 617

Varieties of Escherichia coli genotypes carrying ESBL genes were found to circulate between humans, animals and environment. The Escherichia coli ST38 carrying blaCTX-M-15 was detected in all compartments while Escherichia coli of the clonal complex ST-10 (ST-44 and ST-617) which was also detected in humans was predominant clone in animals. The Klebsiella pneumoniae of the ST45 carrying blaCTX-M-15 was predominantly found to infect and colonize the neonates. In addition to the blaCTX-M-15 these isolates were found to carry multiple resistance genes for quinolones and aminoglycosides.

Similar results appeared with ESBL-PE in environment and Fish

The dissemination and persistence of bla_{CTX-M-15} in different compartments in the city of Mwanza appeared to be due to the horizontal transfer of multiple IncF and IncY plasmids.

A One Health study of the flow of antimicrobial resistomes in different ecosystems will lead to an understanding of the antimicrobial resistance complexity, which will contribute to rational selection/definition of cost-effective interventions and policy.

SACIDS advocates a 2-Level One Health approach to antimicrobial resistance surveillance Established within SACIDS, is the capability for genomic resistome surveillance, which now permits SACIDS to propose a 2-stage AMR collaboration programme with EAIDSNet based on a 2-level approach:

- Level 1 to involve One Health based phenotypic antibiotic surveys by national public health and veterinary laboratories, possibly through the ECSA
- Level 2 to comprise genomic resistome analysis, as described above to be undertaken by SACIDS associated laboratories with capacity for genomics.
- There is a pan-species distribution of ESBL-producing E. coli clonal groups in farming communities
- Persistence of blaCTX-M-15 in the Mwanza city is complex, involves both clonal spread of resistant strains and dissemination by commonly occurring IncY plasmids
- Genomic surveillance of resistant pathogens is a cost-effective approach to track AMR strains
- A One Health study of the flow of antimicrobial resistomes in different ecosystems will lead to Understanding of the antimicrobial resistance complexity and will support programming rational selection/definition of cost-effective interventions and policy.



Members of the SACIDS and EAIDSNet Networks

Antimicrobial Resistance in Macedonia Compared with the Balkan region and Europe: Results of CAESAR Network, Prof Golubinka Bosevska, SECID

Professor Bosevska outlined the importance of tackling the misuse of antibiotics and the working being done in Europe, with a particular focus on the Balkan region. The misuse of antibiotics leads to the emergence and selection of resistant bacteria. Doctors in Europe and worldwide now are sometimes facing situations where infected patients cannot be treated adequately because the responsible bacterium is totally resistant to available antibiotics.

Today, antimicrobial resistance is increasingly widespread in the WHO European Region as resistant microbes know no borders. Effective infection prevention and control is one of our most powerful weapons to address this global health threat stated Prof Bosevska.

A systematic approach to tackling this issue began in 2008 in collaboration with ECDC and WHO. An action plan was developed in order to provide an overview of the scale of antimicrobial resistance (AMR) in Europe with a lens on the Balkan region, and the Republic of Macedonia in particular.

A national strategy and action plan for the control of antimicrobial resistance in Macedonia covering 2012-2016 was drawn up, with the following components:

1. Information and education of patients and general population
2. Strengthening the surveillance system and control of AMR and consumption of antimicrobials

3. Use of control and preventive measures to support prudent use of antimicrobials
4. Continuous education and training of health professionals

The Central Asian and Eastern European Surveillance of Antimicrobial Resistance (CAESAR) was put in place. The goal of the AMR surveillance data collected and presented is to provide a representative description of the antimicrobial susceptibility of common bacterial pathogens found in bloodstream infections to the main antimicrobial groups indicated for treatment of these infections.

To date, nine countries (Belarus, Bosnia and Herzegovina, Georgia, Montenegro, the Russian Federation, Serbia, Switzerland, the former Yugoslav Republic of Macedonia and Turkey) and Kosovo (in accordance with United Nations Security Council resolution 1244 (1999) have submitted data to the CAESAR database.

Percentages of resistance in invasive strains isolated in the Republic of Macedonia are significantly higher than the average in the EU, and similar to those in South Europe and the Balkan region. A significant increase in third-generation cephalosporin resistance of E.coli has been found.

Key findings include:

- Emergence of carbapenem resistant E. coli is a major issue
- Multidrug-resistant K. pneumoniae has become common in the European Region
- High proportions of multidrug resistance and carbapenem resistance K. pneumoniae and multidrug-resistant Acinetobacter spp - reflect the dissemination of resistant clones in the health care settings and indicate the serious limitation in treatment options
- Increasing levels of community-associated MRSA

Urgent activities aimed at reducing the development and spread of AMR in Macedonia and Balkan region are needed, targeting the following objectives:

- Improving awareness and understanding of antimicrobial resistance through effective communication, education and training of population health workers, veterinarians, politicians and others;
- Reinforcement of the monitoring of consumption of antibiotics and resistance bacterial resistance to antibiotics in human and veterinary medicine;
- Reduction of the incidence of infection through effective sanitation, hygiene and preventive measures;
- Optimisation of the use of antibiotics in human and veterinary medicine; a
- Develop cooperation with institutions dealing with the problem of antibiotic resistance (ECDC, WHO, World organization for health of animals (OIE) and other networks).

Strengthening the Regional Role in EID research: the APEIR experience **Prof Wiku Adisasmito, APEIR**

APEIR is a research network with members and partners from 30 institutions in 6 countries: Cambodia, China, Lao PDR, Indonesia, Thailand and Vietnam that enables experts from across sectors to do joint research in emerging infectious disease (EID). APEIR was initiated in 2006, named APAIR (Asia Partnership on Avian Influenza (AI) Research). It was to promote regional collaboration in AI research. APEIR's focus was expanded in 2009 to EID,

subsequently APAIR changed its name to APEIR. In 2009 to 2011, APEIR conducted 5 research activities on AI. In 2012-2016, APEIR run a second set of collaborative research that covered two topics: Biosecurity and EID response. The former was a joint project between APEIR, MBDS, and ASEAN+3 FETN. The latter covered antimicrobial resistance and wildlife trade themes, including knowledge generation, capacity building, and policy advocacy activities. In 2011 to 2016, APEIR co-facilitated EcoHealth Field Building Leadership Initiative (FBLI) to conduct research, capacity building, and knowledge translation in Southeast Asia (SEA) and China.

In maintaining enthusiasm and energy for its activities, APEIR keeps striving to expand the network with academic experts. APEIR has been challenged with new wave of One Health (OH) that has better research capacity and great infrastructure through universities. Thus, APEIR was moved to the Indonesia One Health University Network (INDOHUN), a university network that covers 20 universities member and OH networks in SEA and Africa. This incorporation makes APEIR a stronger network.

APEIR has overcome challenges in organizing multi-country research networks, particularly in harmonizing all of the key players. From developing proposal until writing publications, a coordination dynamic occurs. For instance, in developing proposals, besides producing great ideas, establishing and maintaining communication among members can require great determination. APEIR manages to make people work together. It requires a strategic approach and lobbying of relevant parties. This has brought APEIR bigger coverage, from regional to global level. Currently, APEIR is developing cross-sector policy harmonization on AMR that covers CORDS networks. APEIR and CORDS have succeeded in gaining the interest and agreement of development partners on this topic. It is also attractive to donors since they prefer to collaborate with organizations that can cover several countries and have government partners to ensure knowledge translation will take place.

APEIR advances One Health by collaborating as part of EID research. APEIR widens the collaboration with Harvard University and University College London in developing proposals on food system and antimicrobial resistance. Currently, APEIR is in process to gain ASEAN legal entity as organization on EID in the region.

APEIR as a research platform works to support public health development and improvement in SEA (EID hotspot) and China. APEIR is incorporated with INDOHUN in order to strengthen the network and its research capacity. APEIR has overcome challenges by harmonizing coordination dynamics across research network, which requires determination.

The Fleming Fund One Health Programme on AMR, Dr Toby Leslie, Mott MacDonald

Dr Toby Leslie, the Global Technical Lead for the [Fleming Fund](#), gave an overview of The UK Department of Health's work on AMR which aims to:

- improve the quality and quantity of surveillance data for AMR using a One Health approach.
- Improve reporting sharing and use of surveillance data locally, nationally and globally through global AMR surveillance (GLASS). The three grants programmes within the Fleming Fund portfolio cover country grants, a fellowship scheme and regional grants.

The UK Department of Health aims to improve quality and quantity of surveillance data for AMR using a One Health approach and improve reporting, sharing and use of surveillance data locally, nationally and globally through the Global AMR Surveillance System (GLASS) and other channels. We plan to start small and aim for incremental improvement.

Dr Leslie stressed that the process of development will be incremental. Future phases will build in additional layers by identifying priorities and focussing surveillance on AMR transmission and control. This requires strong leadership at national and international level for OH governance. Interpretation of standardised integrated data will be a powerful tool in addressing AMR if it is underpinned by strong scientific rationale.

Day 2 - Tuesday, 30th January

Session 3: Network Capacity Building

Chair: Prof Amin Soebandrio, APEIR

Lecture: Africa Centers for Diseases Control and Prevention: An Opportunity to Strengthen Public Health Networks on the Continent, Dr John Nkengasong, Africa CDC

In September 2014, at an assembly devoted to responding to the Ebola outbreak, African leaders formally endorsed an accelerated timeline to launch the Africa Centres for Disease Control and Prevention (Africa CDC), together with five regional centres.

Dr John Nkengasong, incoming Director of the Africa Centres for Disease Control and Prevention, stated the compelling reasons which led to the establishment of the Africa CDC:

- 1) Rapid population growth leading to increased and rapid population movement across the continent and the world (the estimated population of Africa was 280 million in 1960 and 1.2 billion in 2016, and is estimated at 2.4 billion by 2050;
- 2) Existing endemic (HIV, TB, and Malaria), emerging infectious pathogens, and the ascendance of antimicrobial resistance;
- 3) Increasing incidence of non-communicable diseases and injuries;
- 4) Persistently high maternal mortality rates; and 5) threats posed by environmental toxins.

The Africa CDC will advocate for a network model to better harness public health assets on the continent. As such, the Addis Ababa headquarters will be linked to five Regional Collaborating Centers (RCCs) in Egypt, Nigeria, Gabon, Zambia, and Kenya, respectively. Each RCC region will be equipped with laboratories with advanced diagnostic capacity to rapidly detect known and unknown pathogens and will house a Regional Integrated Surveillance and Laboratory Network (Africa CDC RISLNET) to leverage all available public health assets in their respective regions, including universities, national public health institutes,

private laboratories, centres of excellence, non-governmental organizations, and veterinary networks.

The Africa CDC will advocate and promote the establishment or strengthening of National Public Health Institutes (NPHIs) in each member state, resulting in an African Public Health Network (APHN) of NPHIs. These institutions will serve as coordinators of the One Health approach to disease control and prevention including coordinating engagements with ministries of agriculture, health, communications, defence, wildlife, and communication. The operating model outlined above, if well implemented, will constitute the Africa health security strategy (AHSS). AHSS will serve to facilitate and define a continental dimension to the global health security agenda. The Africa CDC will work in close collaboration with the WHO and other public health bodies to better coordinate and create synergies to efficiently respond to disease threats on the continent and implement the AHSS.

Operational Research Project Management experiences, Challenges and Lessons Learned in East Africa Public Health Laboratories Networking Project, Dr Mary Karimi, EAIDSNet

Dr Karimi presented the findings of a review into operational research project management experiences at cross border areas in Kenya.

Key challenges with the implementation found were:

- fluctuation of reimbursement of funds resulted into rescheduling of certain project activities at very short notice;
- Group dynamics and conflicts at the operational research secretariat and study sites necessitated impromptu meetings of the parties involved;
- Trained study site staff transfers and rotations without proper handover were frequent and threatened to stall project activities. This necessitated fresh training;
- Some members of the research teams at times fell ill, requiring emergency care.

Some lessons learned from the review included, the importance of interpersonal skills (influence without authority) were essential at all stages of the project. Timely and constant communication with study site coordinators and prioritisation of scheduled projects with programme management tools helped to monitor performance.

A Network to Enhance Regional Cross-border Collaboration on Health-related Issues. Dr Sovann Ly, MBDS

Dr Sovann Ly's presentation mainly focused on the well-established cross-border information exchange mechanisms in the South East Asian network.

MBDS cross border information exchange frequency is as follow:

- Within 24 hours of diagnosis

- Every Monday of the week
- Every 5th day of each month
- Quarterly

The information shared within 24 hours of detection is of crucial importance. They are emergency disease alerts on off shore and this enables early responses.

MBDS has experimented with this and has effectively controlled cluster of measles, cholera and diarrhoea.

MBDS's core strategies centre on epidemiology, capacity building, and community based surveillance and risk communications. The channels used are the MBDS app, website which enable constant communications at regional level.

The other areas MBDS would like to improve on the capacity building element of their work.

The information sharing system is decentralised, coordinated and collaborative, with information flowing from various levels: national to provincial, districts, communities and villages. These different levels contact each other and communicate from country to country without any interference.

The MBDS network members have been working with each other for almost 20 years and have established friendships as well as strong working relationships.

In terms of achievements, MBDS has:

- Established a solid network that sustained itself for a long time. Currently they have limited support however the work is ongoing in each country.
- Early detection and prompt response explained by the trust among the network and no political barriers
- Ongoing engine for information exchange, mechanism, tools development
- Capacity building
- Regional platform
- Multi-sectoral teams have been established
- Team work, communications and information sharing

To address its current challenges, MBDS needs:

- Further advocacy in order to access support to maintain their system and collaboration
- Improve their communication
- Continue joint outbreak investigation
- Wider regional coverage surveillance
- Address the language barrier (google translate training)
- Capacity at bordering provinces (capacity and access during weekends and holidays)

The friendship, trust and partnership built among the people involved are social capital gained for MBDS.



Members of SECID

The process of Evaluating Timeliness of Outbreak Detection and Response in Southeast European Region, Dr Kujtim Mersini, SECID

SECID's focus has been on the timeliness of diseases, in terms of the start of a disease in a patient as well as the start of an outbreak

Through the surveillance they capture certain dates and timelines/lags distributed for both individual case based scenarios and outbreak scenarios from the disease start to the disease end. SECID worked in five countries (Kosovo, Macedonia, Bulgaria, Albania, Bosnia and collected 10 priority diseases for 3 countries and they came up with 63 outbreaks and over 6000 cases as well as developing a tool to standardise information across countries in order for the data to be more comparable.

While the surveillance system captures a large range of data, two main issues have been: 63% of cases from DLR diagnostics aren't repeatable due to the nature of high spreading disease. Data isn't captured at a high level, 66% of data from hospitalisation is missing, sometimes the surveillance system doesn't capture the disease. Large time lags between the disease detection and laboratory diagnosis as well as between hospital arrival and diagnosis

with the latter likely due to patients arriving before receiving laboratory confirmation of the disease. The difference in detection period varies from disease to disease as some diseases may receive more attention whilst others are neglected.

Influenza Season 2016-2017 in Serbia, Sentinel Surveillance of Severe Acute Respiratory Infection, Dr Dragana Dimitrijevic, SECID

Sentinel surveillance of severe acute respiratory infections (SARI) was implemented in Serbia in November 2009 using a network of 24 regional institutes of public health and 11 sentinel hospitals in 4 cities participated.

Dr Dimitrijevic gave a summary review of sentinel surveillance findings of SARI in Serbia in 2016-2017 influenza seasons and also helped to point out the importance of activities of Southeast European Center for Surveillance and Control of Infectious Diseases (SECID)

From October 2016 to May 2017 virological data was collected and analysed epidemiological weekly at the national level. The study found the influenza period started in week 49 of 2016 which is 4 weeks earlier than the normal start of influenza period, however this was similar to many European countries.

The influenza season peaked between mid-December 2016 and mid-January 2017, with a positivity rate of over 50% out of a total of 730 cases. A total of 507 respiratory specimens were collected and tested these for the influenza viruses with the proportion of laboratory-confirmed influenza cases reaching a high of 68.4% in week 50 of 2016. All three viruses A(H3), A(H1) pdm09 and B were confirmed during the influenza season with the A virus most predominant accounting for 99.6% of all sentinel SARI detections and of those the 72.7% were H3.

The highest number of influenza cases and sentinel SARI detections occurred in the first week of January. Thirteen deaths were registered among sentinel SARI laboratory-confirmed influenza cases which were all from intensive care units.

Canada's Priorities to Mitigate Global Biological Threats, Dr Robert Clark, Canada's Global Partnership Program

Dr Clarke described the genesis of Canada's Global Partnership Program, a ten-year programme which was started after the events of 9/11 following the G8 meeting in Canada. The programme focuses on responding to and preventing chemical, biological, nuclear (CBRN) attacks by supporting and coordinating projects and activities to prevent the proliferation of CBRN weapons and material.

The focus of the programme has shifted away from nuclear aspects such as the removal of nuclear submarines, chemical weapons and other waste leftover from the cold war towards biosecurity. The partnership has grown to include 31 countries and partner organisations e.g.

INTERPOL, ASEAN, UNODA providing varying levels of funding, but it also extends to non-members who are also able to apply for funds for projects.

The global partnership programme (GPP) have agreed to five deliverables:

- Secure and account for high risk material
- Develop effective measures to prevent, detect and respond to deliberate misuse of biological agent.
- Strengthen national and global networks identify quickly and respond to biological attacks
- Strengthen principles, measures and instruments for biological non-proliferation.
- Decrease the risks for proliferation by strengthening and promoting secure and responsible handling of biological science

The GPP has partnered with existing health authorities such as the WHO and OIE for larger projects since 2009 at the global level involving delivering programming at the health/security interface.

The GPP has worked in Africa, the Americas, the Middle East and Southeast Asia supporting efforts for biobanking, working with infrastructure programmes, making sure people have safe environments to work in, helping increase capacity to detect and respond, strengthen surveillance systems and working on biosafety.

Discussion points from Q&A session

Question: Do you have any specific mission for your region to minimise time between detection, response and treatment?

Dragana Dimitrijevic (SECID): Actions should be geared towards the community and population, so they can see they need to go and see the doctor first so this will shorten one operation should target the patient, so they should seek care. There should be greater awareness so when they see symptoms arising they will go and see the doctor which will shorten the period of disease and cascading events in the health service. On the other hand the health services, while the will is there and the surveillance systems are there, the problem is they need to be faster, increased speed of diagnosis. If the whole surveillance system worked faster it would be much better and better serve the community.

Question: Should the patient see a doctor in a private practice or in the hospital?

Dragana Dimitrijevic (SECID): It doesn't matter if it's a practice doctor or a doctor at the hospital it is the health institution that is coming into contact with the patient. On one side is case based but on the other side the outbreak management which is a higher level of response for governmental structures and public health structures. While response is fast the outbreak mitigates this as the outbreak control takes quite a long time.

Question: The influenza cases where the samples are negative, is there a case for integrating the surveillance of influenza with other viruses e.g. in Ireland they've had bad influenza problems comparatively with a number of deaths and it was preceded by a high prevalence of respiratory something in the population in the month before influenza season. Is there a synergy between other viruses and the severity of the outbreak of influenza yearly? Should we look at more than just influenza?

Kujtim Mersini (SECID): In Serbia in influenza season we tested cases for influenza of different types including A, B, H1 and H3 which is the first step. Of course it's possible, results weren't included for other diseases as her topic was purely on influenza however in previous seasons they have tested for other respiratory viruses but it depends on the capacity of the reference laboratory and the technical and financial support during the season.

Question: What are your experiences on if and how you've worked with social scientists in your countries to get an understanding or integrated understanding on the knowledge of preferences and behaviours of service users and communities?

Sovann Ly (MBDS): Yes, we have experience working with social scientists, there is an agreement during the period of research if the scientist see any pathogens they notify them and there is also a commission which does this too.

Robert Clark (Canada GPP): We have underestimated the importance of having social scientists as part of our teams, we've seen huge social implications which haven't been addressed because social scientists weren't involved and we've carried out a number of projects related to that first response, as social scientist bring another type of skill level to the planning process. This has been underestimated in infectious disease team as part of our understanding how the psycho-social effects of these diseases affect people for example, in animal health when there have been outbreaks of cholera many farmers suffer from PTSD. So there are a lot of psycho social aspects which are neglected in the response teams

Question: When the tsunami occurred, infectious diseases increased so what support should there be in terms of public health?

Dragana Dimitrijevic (SECID): There are more efforts from the public health, there are emergency procedures, in the nature of disaster times public health response is quite fast, most health institutions are regularly prepared and they should prepare for the worst so as not to get caught out.

Question: In communities in the Sierra Leone border areas, there are quite similar ethnically, how do you involve communities in the system, as it takes time for the communities to come out to help?

Sovann Ly (MECID): There needs to be a system which everybody has access to, like ICT for example, in Cambodia they made sure everyone could access UN help and this access is free of charge. This is also shared with other regions.

Question: Could this approach which has been discussed also be implemented to build bio strength or to deal with bio weapons?

Robert Clark (Canada GPP): Yes, this what we've been trying to do with our networks or systems, so if there's an existing approach or way of doing things which helps with protection and outbreak response we try and reinforce them. They have funded existing networks structures and approaches to help build their capacity.

Question: Do you think we need to have a special additional training to deal with bio strengthening?

Robert Clark (Canada GPP): What we have done is sponsor events and workshops and bring together the security health community that are involved to solve problems, which has been effective in building linkages so people know who to call if they think it's a deliberate attack, as people need to know who those counterparts are.

Question: How could your growth be expanded to other regions? How could your system or approach be implemented globally?

Dragana Dimitrijevic (SECID): SECID is a member of CORDS and there have been a number of initiatives where we have done cross network activities, and there is always room for activities to be replicated in another network, this allows for experience sharing and learning, they have learnt from MBDS, there is always work from CORDS to harmonise the approaches and find the best solutions.

Kujtim Mersini (SECID): It's quite useful and significant and it's important that each network together has leaders and coordinators for each part to make coordination operational, from the base level upwards. Through this all networks will be functional and allow networks to meet each other.

Sovann Ly (MBDS): Networks allows us to share our experience with each other.

Robert Clark (Canada GPP): It would be interesting to see which networks are thriving and why others aren't and connecting these networks together with the work of CORDS can help support these networks and share best practices as a good way to understand why certain things work and why they don't.

Session 4: Building Sustainable Networks

Chair: Dr Sovann Ly, MBDS; Co-chair: Prof Julius Lutwama, EAIDSNet

Lecture: Building Sustainable Networks

Prof Suwit Wibulpolprasert, International Health Policy Program Foundation and Ministry of Public Health Thailand and Dr Anond Kulthannusorn

Prof Wibulpolprasert, a pioneer of the MBDS network, talked about the definition and characteristics of a well-functioning network. He posited that to prevent networks failure, meetings need to be regular and punctual, serious actions need to be taken when agreed.

He emphasised the fact that *'Trust is based on credibility, reliability and intimacy / self-interest'* and is essential to any network. His advice was: if all participants attended the meeting based on public interest, their regional network would be strong and CORDS would be strong. The fact that CORDS is an informal network without heavy procedures and conventions gives it its particular spirit and enables information sharing in a simpler manner'.

Network Experiences

The final session in the programme, Building Sustainable Networks, provided a platform to CORDS networks to share information about their individual structures, strategic direction and mode of operation. This session aimed to share lessons between existing CORDS networks and other disease surveillance networks external to CORDS, about how they have managed to sustain themselves over the years.

Sustaining and Strengthening Capacity of Regional Networks and Partnership to Respond to Emerging Infectious Diseases in Asia, Prof Wiku Adisasmito, APEIR

APEIR, a resource network for researchers from universities and government institutions across Asia, was introduced by Prof Wiku Adisasmito. The work of APEIR is shaped around collaboration on Emerging Infectious Diseases. An avian Influenza outbreak in 2015 catalysed the formation of the network. The secretariat is based in Thailand and is attached to the Health System Research Institute in the ministry of public health.

In 2007, the decision was taken to expand the network's work on other infectious diseases and to move the secretariat to INDOHUN (Indonesia One Health University Network) in Indonesia. As INDOHUN is part of SEAOHUN (South-east Asia One Health University Network) that enabled much wider expansion and connection.

From 2009 to 2011 APEIR's collaborative research was mainly based in the South-east Asia. Since 2012 APEIR extended its collaboration with other networks and partners such as IDRC and GPP

APEIR has partnered with IDRC Canada to initiate the EcoHealth Field Building Leadership Initiative from 2011 to 2016 to conduct research, capacity building and knowledge translation

in the field of EcoHealth in South East Asia and China. As EID affect livestock and food, APEIR researchers are working on areas connected to food system and NCD research initiatives.

Prof Adisasmito highlighted challenges facing APEIR as a network, these include the need to diversify funding sources, and also not having a legal entity, and the networks future plans include seeking recognition as a legal entity working on EID in the region.

Evolution of MBDS Network and the Regional Importance of Collaboration, Prof. Soe Lwin Nyein, MBDS

Prof Soe Lwin Nyein set the context for the creation of MBDS -prior to the formation of the MBDS network, cross border information sharing was quite challenging, due to different government policies in various countries. This made it difficult to prevent and manage pandemic diseases and ultimately save lives.

MBDS' main objectives are to:

- Strengthening capacity in disease surveillance, outbreak investigation and responses
- Strengthening health manpower development in epidemiology
- Establishing a sub-regional surveillance network

A series of meetings enabled MBDS members to collaborate and exchange information. Some of the key milestones that arose from these meetings include:

In 2008-2009 the establishment of the MBDS' seven Core Strategies; in the same year the cross-border activities expanded between the six countries and for the first time Myanmar and Thailand signed and MoU enabling them to share information. In 2010, MBDS team visited Rwanda to share experiences with EAC EAIDSNet. In 2014, a meeting was held on mitigating Biosecurity Threats in Southeast Asia supported by Canada GPP

The Evolution of SACIDS from Concept towards a Sustainable Structure, Prof Gerald Misinzo, SACIDS

The formation of the SACIDS network in 2008 followed acknowledgments from different stakeholders that there was a need to focus on Africa as most infectious disease events departed from Africa and yet the continent had very limited capacity to contain these diseases, said Professor Misinzo during his presentation. The vision of SACIDS, to create an African Society protected from devastating infectious diseases affecting the health of humans, animals and ecosystems is shared by SACIDS members which comprise veterinary and medical universities and research institutions in DRC, Tanzania, Mozambique, Zambia and South Africa. The components of SACIDS core strategy and business plan were discussed, including the creation of a Regional One Health Focus, Research Platform and Centre of Excellence were highlighted – the latter, of which has been realised.

SACIDS' pathway to impact is to develop research and training through the centers of excellence; provide a forum for networking and think-tanking and the focus is to have an impact on the communities themselves.

Prof Misinzo described SACIDS' core strategy to pull infrastructural and human capacity across the region through the virtual centre concept via 'smart partnerships' with partners in the global north, operating in communities of practice. Postgraduate students and researchers work with a community of experienced mentors supporting them to achieve their objectives.

He also highlighted that SACIDS strategy meets CORDS and Ending Pandemics shared motto of 'timely detection and identification of diseases at the community level or at source' The strategy is achieved by reporting diseases timely through the use of mobile technology such as AfyaData that can be sequenced on the field.

SACIDS future plans include aiming to transform SACIDS into a Foundation and set it up as One Health Forum and Innovation Hub.

SACIDS theory of change focuses on the communities themselves and the centers of excellences do discovery and to adapt researches that can be translated by the innovation lab and then the findings are implemented into the communities.

Key takeaways for networks from Prof Misinzo's talk include having a portfolio of funding sources allowing for targeting of specific activities and a well-developed strategy that defines the networks ambitions.

Strengthening Communicable Disease Response in South East Europe through Regional Networking and Establishing a Regional Development Center, Prof Silvia Bino, SECID

Prof Bino started off her presentation by outlining the historical background to the creation of the SECID network. In its first incarnation, SECID started off as the South East European Health Network. This network was borne out of many changes in the Balkan region, which had seen lots of turmoil, internal migration and social instability. This resulted in a rise in communicable diseases. In 2001, the 'Dubrovnik pledge' called for the set up of a network to tackle communicable diseases as a priority, taking into account the complexity of interactions in South East Europe. This network was multi-country, multi-level and involved multiple stakeholders. This new network consisted of sub-regional centres and networks based on different priorities at the national and subnational levels.

Each country within the region took the lead for a regional priority – Albania's remit was that of communicable disease surveillance and control. All governments in the region provided political support and agreement. In time, SEEHN moved from a health to a One Health network.

The success and longevity of the network has been based on mutual understanding and a desire of the people in the region to work together with neighbouring countries. Along the journey, there have been some challenges encountered, at the local and regional level. HR, training, budgetary restraints, availability of technologies and lack of effective surveillance systems to rapidly detect and respond to diseases are some. There have also been obstacles to have laboratory detection of outbreaks/diseases in region.

Despite this, the need for cooperation and buy-in to values from all stakeholders has ensured sustainability.

SECID has autonomy in management through an agreement with the Institute of Public Health in Albania since 2013. Prior to that, between 2002 and 2013, SECID went through different phases, convened many meetings had projects and collaborated with WHO Europe, however it lacked autonomy.

Prof Bino then gave examples of initiatives that SECID had been involved in facilitated by CORDS. These include the Leishmaniasis virtual group which is mediated by the Leishmaniasis platform which houses published papers in local languages. SECID has also been involved in several cross-border workshops on One Health and Risk Communication, as well as a joint Leishmaniasis Gap analysis with MECIDS and Pak One Health. As other contributors to the conference have repeatedly stated, trust among partners is essential. Prof Bino also added that the benefits of activities towards regional activities must be realised, and countries must see improvement in their daily work.

Tracking Inter-country Transmission of *Salmonella* Infantis Using the Laboratory-based Surveillance Network Established by MECIDS, Dr Ravit Bassal, MECIDS

In 2005, the Middle East Consortium for Infectious Disease Surveillance (MECIDS) established a regional, laboratory-based surveillance network to facilitate identification of local and trans-border transmission of food-borne diseases. This platform was used to investigate if the emerging shift in predominance of *Salmonella* serotypes associated with salmonellosis in Israel, namely *Salmonella* Infantis replacing *Salmonella* Enteritidis and *Salmonella* Typhimurium, was also observed in the Palestinian Authority and Jordan correlating with the level of food exchange between the countries.

The MECIDS *Salmonella* laboratory-based surveillance comprises patients referred to sentinel laboratories for stool and/or blood cultures, food-handlers referred to sentinel laboratories for stool cultures and food items received by food laboratories. In the 3 countries, specimens are tested for the presence of *Salmonella* using harmonized standard operating procedures. Organisms defined as *Salmonella* at sentinel laboratories are submitted to the National Reference Laboratories for confirmation and phenotype and genotype characterization.

After many years in which *Salmonella* Enteritidis and *Salmonella* Typhimurium were the leading serotypes causing non-typhi salmonellosis in Israel, from 2009 onwards *Salmonella* group C serotype Infantis became the predominant serotype accounting for more than 30% of the *Salmonella* spp. isolated from stool samples of patients with gastroenteritis. Careful examination of the *Salmonella* serogroups isolated in the Palestinian Authority and Jordan showed at the same time, similar emergence of *Salmonella* group C in the Palestinian Authority but not in Jordan where serogroup B dominated. Moreover, *Salmonella* isolates from human and food specimens archived in Jordan (n=277) and Palestinian Authority (n=103) and further serotyped, showed that in the Palestinian Authority 40% of isolates were *S. Infantis* (leading serotype) whereas in Jordan only 3% were *S. Infantis* while the leading serotypes were *S. Agona*, *S. Anatum* and *S. Blockley*.

The *Salmonella* laboratory-based surveillance established by MECIDS proved to be sensitive and specific in the identification of regional trends in *Salmonella* species temporal predominance most probably directly associated with the extent of food products exchange among the 3 countries, and corresponding to foodborne transmission of the pathogen.

The role of EMPHNET in Responding to Public Health Challenges in the Eastern Mediterranean Region, Dr Mohannad Al-Nsour, EMPHNET

The Eastern Mediterranean Public Health Network (EMPHNET) is a non-profit organization that was established in 2009 with the goal of improving health status in the Eastern Mediterranean Region (EMR). It builds national and regional capacities in several priority public health areas, such as outbreak investigation, disease surveillance, rapid response, International Health Regulations (IHR) implementation and more. EMPHNET provides technical assistance by supporting Field Epidemiology Training Programs (FETPs). Its main technical areas of focus include applied epidemiology and research, non-communicable disease, communicable disease, and health security.

EMPHNET collaborates with associations, institutions, networks and organisations that hold similar views. Its efforts grew by building a network of expertise, which it sees as one of its strongest attributes for meeting public health needs in the region. EMPHNET supports and promotes innovative approaches in meeting the various public health challenges of the region. In addition, EMPHNET is guided by its commitment to change and acknowledges the importance of knowledge sharing as an ongoing process.

The EMR has been known for ongoing socio-political unrest throughout contemporary history. For decades, the region has been home to both man-made and natural disasters. Most recently, the advent of the Arab Spring in Late 2010 spread through the EMR countries, causing major insurgencies and civil wars in Iraq, Libya, Syria, and Yemen that continue today. Major earthquakes have hit Pakistan and Afghanistan in the last five years. Together, these factors have created an excess of unprecedented public health challenges. Despite the ongoing efforts undertaken by governments to improve health outcomes, increasing population growth together with escalating health needs have made it difficult for them to bring about positive gains. Therefore, it becomes crucial to look for sustainable strategies to counteract the increasing challenges and to introduce new health initiatives and programs to offset staggering improvements in health outcomes. Field Epidemiology Training Programs (FETPs) have been identified as one of the main strategies to overcome these challenges.

Building Sustainable Networks: Experiences and challenges of EAIDSNET, Prof Julius Lutwama, EAIDSNET

The East African Integrated Disease Surveillance Network (EAIDSNet), which was established in 2000, is a regional collaborative initiative of the National Ministries of the East African Community Partner States responsible for human, animal health, wildlife and the environment in collaboration with national health research and academic institutions. The overall goal of EAIDSNet is to reduce morbidity and mortality due to common communicable diseases in the East African Region through the establishment of a strong network capable of generating and exchanging useful epidemiological information for early warning of impending epidemics as well as supporting joint planning and implementation of disease control measures.

Professor Lutwama shared that during its 17 years of existence, EAIDSNet has progressively achieved recognition, particularly with regards to capacity to conduct cross border activities and inter-country assistance with diseases control. Despite this recognition, EAIDSNet has gone through numerous experiences and challenges in adhering to systems of governance,

maintaining interest, attracting resources and fostering sustainability. There have been additions of new partner states, changes in organization of the responsible national ministries, lack of funded projects, lack of trust and transparency among all partner states, etc., all of which have variously affected the sustainability of this regional network. Never the less, a number of key factors have been identified towards ensuring sustainability.

There are numerous ways in which EAIDSNet has tackled the sustainability challenge:

- Partners understanding the benefit of being in the network;
- Creating trust among all members;
- Developing cohesive programmes acceptable to all partners;
- Having a coordinated organization structure for shared governance;
- Maintaining transparency and accountability;
- Providing information as agreed to partners of the network;
- Mobilizing technical and financial resources;
- Engaging in cooperative agreements with international organizations.

Prof Lutwama stressed the need for well-coordinated joined up efforts, closing with the moniker 'The more you win funds, the more you win'.

Building Sustainable Laboratory Networks, Benoit Miribel, Fondation Mérieux

Director General of Fondation Merieux, Benoit Miribel set out the importance of diagnostics in surveillance and the control of epidemics, and the role played by Fondation Mérieux. Fondation Mérieux' has four objectives, namely:

- 1) Increase vulnerable populations' access to diagnostics by strengthening clinical laboratories in national healthcare systems in partnership with health authorities and local players
- 2) Create and enhance local applied research capabilities by training researchers and developing collaborative programs for diseases that affect developing countries
- 3) Encourage knowledge-sharing and public health initiatives leveraging Les Pensières Center for Global Health
- 4) Improve health conditions for mothers and children to contribute to reducing maternal and child mortality

Mr Miribel outlined the case for building laboratory networks and the ways in which Fondation Mérieux does this work via supporting infrastructure development, capacity building and the strengthening health systems. Core to the sustainability of this work is the involvement and ownership by local experts. The role of emerging technologies was also discussed, including automated data collection. Key achievements were cited, including regional laboratory strengthening in West Africa within the West African Network of Clinical Laboratories (RESAOLAB).

Creating a New Regional Surveillance Network in West Africa, Dr Bakary Sylla, CORDS

CORDS Senior Consultant, Dr Bakary Sylla, outlined the background and current activities of the newly formed West African network, - the West African Network for Infectious Disease

Surveillance (WANIDS). The catalysis of the formation of this network was very much spearheaded by the West African Ebola epidemic. This devastating epidemic with its dramatic socio- economic impact revealed:

- Weak health systems in the Economic Community of West African States (ECOWAS) space
- Lack of qualified staff
- Poor laboratory capacity
- Poor preparedness for a big event
- Lack of effective cross border working
- Poor coordination capacity
- Misunderstanding and lack of communication with communities
- Poor surveillance capacity

The fifteen countries of ECOWAS committed WAHO to establish Regional Centre for Disease Surveillance and Control (RCSDC) and assure an effective disease surveillance system with the following mandate:

- Contribute to strengthening infectious disease surveillance systems in member countries and ensure their sustainability;
- Create a dynamic of trust and close collaboration between the countries;
- Contribute to executive training, strengthening and creation of specialized testing and diagnostic laboratories;
- Facilitate the sharing of knowledge, promote research and scientific communication

National Coordination Institutions are national institutions (Public Health Institute, National Laboratory, Health National Security Agencies, EOCs, etc.) that are in charge of coordinating the surveillance activities in– country; Surveillance and Early Warning, Investigation and Rapid Response, Laboratories, Training and Research, in the context of One Health Approach and compliance with IHR and GHSA, with the support of Technical and financial partners.

The network will work to contribute to the pooling of efforts through the identification of champions at the national and regional level. A number of tools and documents have been developed to support including the signing of a MoU and manual of operation. A number of gatherings have been held to build trust among NCI leads. The nascent network has also benefitted from the experience and expertise of CORDS, who have worked across borders with various languages and systems.

CORDS and its networks have demonstrated that working together in a network improves capacity to recognise a health threat, detect, respond and learn lessons. CORDS is continuing to provide support to WANIDS as it becomes operational and envisages further exchange and collaboration in the future.

Establishing One Health Disease Surveillance Network: A Recent Convergence in South Asia, Prof Sithar Dorjee, Khesar Gyalpo University of Medical Sciences of Bhutan

South Asia is a global hotspot for infectious diseases, with 1.8 billion people living in the region. Bangladesh and India are the most two densely populated countries.

Prof Dorjee, who is currently based at the Khesar Gyalpo University of Medical Sciences of Bhutan, outlined the case for engaging the South Asian region within the global health landscape, and shared the vision of the new network which is committed to finding, verifying and responding to outbreaks faster using a One Health approach.

An Inaugural workshop was conducted in December 2017, in Bangkok organised by FAO and EP to gain commitment from stakeholders in the new network and to share current capacities in human and animal health disease surveillance.

Expected benefits:

- Functional and effective disease surveillance systems are in place to detect outbreaks in a timely manner;
- Adequate capacity for rapid containment of disease outbreaks locally and regionally;
- Information are shared between sectors and across borders between countries;
- Network of highly trained experts in disease surveillance and outbreak management in place for paid mobilization;
- Collaborative researchers are initiated on a priority basis;
- Building trust and sharing resources;
- Continued training program of young professionals in place.

Priorities for this nascent network include:

- Organise priority activities to keep this network engaged and active
- Carry out advocacy to gain bureaucratic and political support

EP will continue to support this nascent network in partnership with FAO throughout 2018, and there are plans to engage with CORDS in the future.

Reproducibility of Results and Performance of TB diagnostics in East Africa Public Health Networking Project in Kenya, Dr Willie Githui, EAIDSNet

Reproducibility of laboratory results and performance of diagnostic tools forms a major part of quality assurance in diagnosis, which is key to patient care. Dr Githui described how, prior to the work carried out by EAIDSNet, there was no documented comparison of reproducibility of results and performance of TB diagnostics in different geographical settings. These were determined in an East Africa Public Health Laboratory Networking Project- Operational Research (EAPHLN-OR) TB study sites in Kenya.

People presumed to have TB, aged 18 years and above were enrolled in a cross-sectional study between 2013 and 2016 at nine selected public health facilities in Kenya. Spot and morning sputum specimens collected from participants on two consecutive days with a total of 5,715 specimens.

At the study site, a proportion of each specimen was processed for ZN, FM and GeneXpert MTB/RIF. The remaining portion was shipped to the Kenya Medical Research Institute (KEMRI) laboratory, Nairobi. ZN, FM, GeneXpert and Lowensen Jensen (LJ) cultures were done according to standard procedures. KEMRI laboratory personnel were blinded of the study site results. Data were processed with SPSS version 24 software.

Reproducibility was determined by Kappa values using specimens as units of analysis and performance by diagnostic values (sensitivity, specificity, positive/ negative predictive values) using the patient as unit of analysis. LJ culture was used as the gold standard. Results at the study sites were compared with those from KEMRI.

GeneXpert indicated excellent reproducibility of results but no significant difference in performance in different study sites in Kenya, suggesting that under ideal conditions GeneXpert is reliable irrespective of site setting. However, with higher specificity and positive/negative predictive values, microscopy could compliment GeneXpert in detection of mycobacteria especially in settings with inadequate capacity including infrastructure, human resource and high workload.

Indo-Pacific Centre for Health Security, Madeleine Moss, Deputy Head of the Indo-Pacific Centre for Health Security, Australian Government

Australia is committed in increasing the health security agenda and has committed a total of 300 million Australian dollars over 5 years. The Indo Pacific Health Centre for Health Security was launched in October 2017 and has the following objectives:

- Promoting Global and Regional Cooperation
- Catalysing international responses to countries' identified needs
- Applying Australia's strengths in health security and;
- Accelerating access to new and effective tools.

The West African Ebola outbreak was catalytic in the organisation renewing its focus on the role it should be playing in global health security. Work is currently being undertaken in TB, Malaria and Zika in the Indo-Pacific region. Partnerships with the WHO, Malaria Alliance and JEE alliance are underway.

The partnership with the JEE alliance seeks ways in which technical and financial support can be given to support the implementation of the One Health approach.

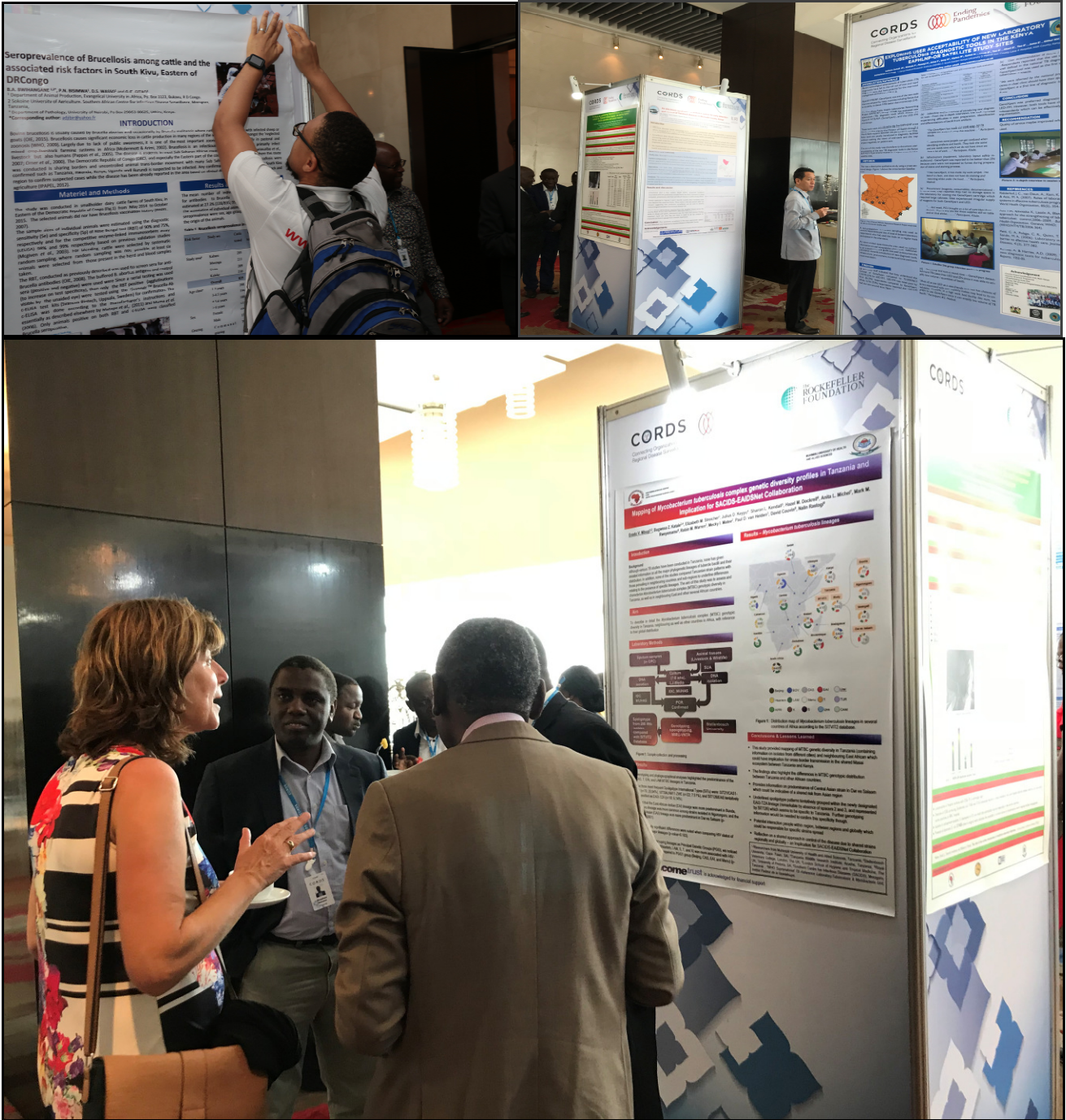
The Indo-Pacific Centre is currently scoping new partnership opportunities in SE Asia and the Pacific islands. The organisations approach relies on principles that support the building of links within existing structures. It recognises that it is one player of many in the region, and is looking forward to its activity to be integrated into operating institutions.



Participants during the CORDS Conference

IV. Poster Session

Of the total 56 abstracts submitted to the CORDS Conference, 25 were selected to be presented as posters. Posters were displayed in an exhibition place adjacent to the conference hall. A total of 24 posters were selected for display during the conference. CORDS operated a 'marketplace' exhibition during the coffee break sessions, where poster authors manned answered questions. In addition to these manned sessions, posters were displayed during the course of the entire conference.



Poster session

V. Press Conference

On Monday 29th January CORDS worked with Thai partners to hold a press conference for local and national Thai media. Over 20 journalists attended from both print and broadcast publications to listen to a panel representing CORDS six international networks and funders. We were honoured to have Nobel Laureate Pr. Françoise Barré-Sinoussi speak on her leading research on HIV/AIDS. Also presenting were Christophe Longuet, CORDS Executive Director, Amin Soebandrio, CORDS Chair, Silvia Bino from CORDS Southeast European network, SECID, Julius Lutwama, Chair of the East African Network, EAIDSNet, Charlanne Burke,

Associate Director, The Rockefeller Foundation and Mark Smolinski, President of Ending Pandemics.

All of the speakers spoke briefly to the media covering aim of the event, to promote and exchange on the best practices of CORDS' Networks and partners and to showcase their specific infectious disease surveillance projects and identify potential activities that can be replicated across the globe in order to meet the needs of the Global Health Security Agenda.

The CORDS conference was featured on the national news that evening and there were four pieces in print press with a total circulation of 2.19 million as well as 17 online news pieces.



(L) Mark Smolinski, Charlanne Burke, Amin Soebandrio, Christophe Longuet, Françoise Barré-Sinoussi, Silvia Bino
(R) CORDS ED Christophe Longuet gives opening remarks during the press conference in the presence of local media

VI. Conclusion and Next Steps

The CORDS Conference 2018 was another step forward towards the strengthening of collaboration and networking among CORDS member network countries and beyond, in areas of common interest and joint activities and other international agencies and donors.

The conference was considered a great opportunity for shaping the future of CORDS, having convened a wide range of experts, epidemiologists, veterinarians and representatives from different organisations and institutions, partners and stakeholders and more, to discuss, share experiences, learn about the latest developments within the Global Health landscape.

The CORDS Conference served as a communication tool for CORDS activities across networks, with partners, stakeholders and other national / international agencies.

The format of this conference, based on the strategic pillars of CORDS, enabled all parties to present many interesting ideas linked directly to CORDS' mission.

The CORDS conference was successful in raising awareness of CORDS' work among individuals and organisations who had not been previously aware of CORDS' work.

Participation was higher than anticipated, and demonstrated the need and desire for networks and partners to link with other experts in their field and beyond.

An evaluation provided very encouraging feedback about the conference. Those who provided feedback welcomed the opportunity to interact with other experts to share experiences in order to improve surveillance in their respective regions, and a request was made for similar meetings on a frequent basis. Suggested topics for future conferences included AMR, One Health and multi-stakeholder collaboration.

Since the conclusion of the CORDS conference, the CORDS team has been working to further cultivate some of the relationships initiated in Bangkok, and this has fed into the development of resource mobilisation and partnership engagement plans. Renewed engagement with the tripartite will also feed into future CORDS activities including a newly funded CORDS Internetwork Project on Digital Health Event information.

In addition to reconnecting with established partners such as the WHO, OIE and FAO, CORDS will seek to collaborate with other established and nascent networks who participated in the conference such as EMPHNET, SASN and SEGA.

Annex I – Conference Programme

Monday 29, January 2018

Time	Theme	Speakers
Session 1: Promoting Innovation Chair: Prof. Julius Lutwama, EAIDSNet Co-Chair: Mr. Sari-Husseini, MECIDS		
9:45--10:00	Lecture: Promoting Innovation for Efficient Healthcare Systems	Prof. Itamar Grotto, Israeli-Ministry-of-Health
10:00--10:45	Panel: Innovation in Disease Surveillance	Innovative Tools for Event Detection, Prof. Ann-Marie Kimball, Chatham-House The WHO Health Emergencies Programme: Platforms and Systems to Manage Public Health Risks and Emergency Events, Dr. Oliver Morgan, WHO Ending Pandemics, Dr. Mark Smolinski, Ending-Pandemics
10:45--11:15	Coffee break & Poster session	
11:15--12:15	Panel: Innovation in Disease Surveillance Using a Digital Approach	Innovative tools and approaches for surveillance in animal health, Dr. Julia Pinto, FAO East Africa Public Health Laboratory Networking project strengthens disease surveillance using regional web-based reporting system, Dr. Benedict Mushi, EAPHLN Using smart phones occupied with intelligent mobile & web apps for electronic system of disease surveillance in Tanzania, Mr. Eric Beda, SACIDS Inter-sectoral and inter-network collaboration for improving disease surveillance in East & Southern Africa, Prof. Esron Karimuribo, SACIDS Open discussion
12:15--13:00	Panel: Improving Laboratory-Based Disease Surveillance	Building capacities for influenza surveillance in the Republic of Macedonia (2014-2017), Dr. Vladimir Mikiki, SECID Genomic profiling of multidrug resistance tuberculosis among patients in Tanzania, Dr. Buawesa Katale, SACIDS Seroepidemiological study to identify Middle East Respiratory Syndrome-Corona Virus (MERS-coV) transmission in Jordan, Israel and Palestinian Authority, Prof. Daniel Cohen, MECIDS Open discussion
13:00--14:00	Lunch break & Poster session	

Time	Theme	Speakers
Session 2: Advancing One Health Chair: Prof. Mark Rweyemamu, SACIDS Co-Chair: Prof. Nguyen Dang Vung, MBDS		
14:00--14:15	Lecture: Emerging Infections: Interventions from a One-Health Perspective	Prof. Ab Osterhaus, Center of Infection Medicine and Zoonosis Research at Hannover Veterinary University
14:15--15:05	Panel: Making One-Health Surveillance Work	Pan-African network for rapid research, response, relief and preparedness for infectious disease epidemics (PANDORA), Dr. Willy Were, EAIDSNet/SACIDS ¶ Estimating the economic and social consequences for patients diagnosed with human African Trypanosomiasis in Muchinga, Lusaka and Eastern provinces of Zambia (2004-2014), Dr. Martin Simuunza, SACIDS ¶ Gap analysis of a neglected global disease of marginalized people 'leishmaniasis', Jordan, Albania and Pakistan (2015), Prof. Silvia Bino, SECID ¶ Open discussion
15:05--15:30	Coffee break & Poster session	
15:30--16:50	Panel: Addressing Antimicrobial Resistance Using the One-Health Approach	Antibiotic use and antimicrobial resistance, Dr. Jorge Pinto-Ferreira, OIE ¶ The SACIDS One-Health approach to genomics driven surveillance for antimicrobial resistance -- a potential collaboration with EAIDSNet, Dr. Stephen Mshana, SACIDS ¶ Antimicrobial resistance in Macedonia compared with Balkan region and Europe: Results of CAESAR network, Prof. Golubinka Bosevska, SECID ¶ Strengthening regional role in EID research: APEIR experience, Prof. Wiku Adisasmito, APEIR ¶ The Fleming Fund One-Health Programme on AMR Dr. Toby Leslie, Mott MacDonald ¶ Open discussion
16:50--17:00	Wrap-up of day 1	¶

Tuesday, 30 January 2018



Time	Theme	Speakers
Session 3: Network Capacity Building Chair: Prof. Silvia Bino, SECID Co-chair: Prof. Amin Soebandrio, APEIR		
9:00--9:15	Lecture: Africa Centers for Diseases Control and Prevention: An Opportunity to Strengthen Public Health Networks on the Continent	Dr. John Nkengasong, Africa-CDC
9:15--10:15	Panel: Building Capacity in the Regions	Operational research project management experiences, challenges and lessons learned in East Africa Public Health Laboratories networking project, Dr. Mary Karimi, EAIDSNet ¶ Reproducibility of results and performance of TB diagnostics in East Africa Public Health Networking Project in Kenya, Dr. Willie Githui, EAIDSNet ¶ The Australian government's new Health Security Initiative for the Indo-Pacific Region, Ms. Madeleine Moss, Indo-Pacific Centre for Health Security and JEE Alliance ¶ Open discussion ¶
10:15--10:45	Coffee break & Poster session	
10:50--12:00	Panel: Building Capacity in the Regions (Cont'd)	A network to enhance regional cross-border collaboration on health-related issues, Dr. Sovann Ly, MBDS ¶ Mediterranean Programme for Intervention Epidemiology Training as an approach to addressing international health risks in the Mediterranean region, Dr. Gordana Kuzmanovska, SECID ¶ The process of evaluating timeliness of outbreak detection and response in Southeast European Region, Dr. Kujtim Mersini, SECID ¶ Influenza Season 2016-2017 in Serbia, sentinel surveillance of severe acute respiratory infection, Dr. Dragana Dimitrijevic, SECID ¶ Canada's priorities to mitigate global biological threats, Dr. Robert Clarke, Canada's Global Partnership Program ¶ Open discussion
12:00--12:30	¶ Poster session	
12:30--14:00	Lunch Break	

