30 December 2015

Leishmaniasis Gap Analysis Report and Action Plan

Strengthening the Epidemiologial Surveillance, Diagnosis and Treatment of Visceral and Cutaneous Leishmaniasis in Albania, Jordan and Pakistan

MECIDS
Middle East Consortium on Infectious Disease Surveillance

PAK ONE HEALTH ALLIANCE
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SECID
SOUTHEAST EUROPEAN CENTER FOR SURVEILLANCE AND CONTROL OF INFECTIOUS DISEASES

SOUTH-EASTERN EUROPE HEALTH NETWORK

CORDS

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Published 30 December 2015

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List of Acronyms

ACL	Anthroponotic Cutaneous Leishmaniasis
AIDS	Acquired Immunodeficiency Syndrome
CanL	Canine Leishmaniasis
CL	Cutaneous Leishmaniasis
CORDS	Connecting Organisations for Regional Disease Surveillance
DALY	Disability-Adjusted Life Year
DNDi	Drugs for Neglected Diseases initiative
IMC	International Medical Corps
IRC	International Rescue Committee
LHW	Lady Health Worker
MECIDS	Middle East Consortium on Infectious Disease Surveillance
ML	Mucocutaneous Leishmaniasis
MoA	Ministry of Agriculture
MoE	Ministry of Education
MoH	Ministry of Health
MoT	Ministry of Tourism
MSF	Médecins Sans Frontières/Doctors Without Borders
ND	Neglected Disease
NGO	Non-governmental Organisation
NTD	Neglected Tropical Disease
PCR	Polymerase Chain Reaction
PKDL	Post Kala-Azar Dermal Leishmaniasis
POHA	Pak (Pakistan) One Health Alliance
PZDD	Parasitic and Zoonotic Diseases Department
RDT	Rapid Diagnostic Test
SECID	Southeast European Centre for Surveillance and Control of Infectious Disease
SEEHN	Southeastern Europe Health Network
TB	Tuberculosis
UNAIDS	Joint United Nations Programme on HIV and AIDS
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNHCR	United Nations High Commissioner on Refugees
UNICEF	United Nations International Children’s Emergency Fund
VL	Visceral Leishmaniasis
WHO	World Health Organisation
ZCL	Zoonotic Cutaneous Leishmaniasis

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Letter from the Executive Director

Dear Partners in the Fight Against Neglected Diseases,

It has been an honour to collaborate with the talented and dedicated international network of experts and global health professionals as the Executive Director of Connecting Organistions for Regional Disease Surveillance (CORDS) for the past three years. At CORDS our mission is to link regional disease surveillance networks to improve global capacity to respond to infectious diseases. As we have been reminded recently, infectious diseases do not respect geopolitical borders. As a result, we share the increasing global burden of disease outbreaks and transmission. Diseases threaten not only our quality of health, but they also undermine our economic livelihoods and compromise our social interactions.

A rapidly changing world demands a proactive and systematic approach to addressing the various contributing factors to disease proliferation. Therefore, we advocate and support a co-ordinated One Health approach to interventions. Leishmaniasis is a threat to health security in regions as diverse as south eastern Europe, the Middle East, South America, Africa and Asia, and it must be addressed through a One Health framework. The time for action is now, and we can make great strides in this endeavour if we work together.

This Leishmaniasis Gap Analysis report will illustrate how CORDS has facilitated a large, multi-regional, country-led initiative with support from the Bill & Melinda Gates Foundation to achieve this goal. This report is unique in a number of ways. First, it addresses both forms of leishmaniasis: Cutaneous leishmaniasis (CL), which can cause severe disfiguration, and visceral leishmaniasis (VL), which, if untreated, can be fatal. Traditionally studied as separate diseases, CL and VL may have similar vectors, reservoirs and epidemiologic risk factors, which implies that being studied together can increase the potential for collective action against the total disease burden. Secondly, this report has facilitated collaboration across three distinct geopolitical areas, the Middle East, Europe, and Asia. Finally, this project represents extensive collaboration and sharing of lessons learned by the Republic of Albania (part of the SECID/SEEHN Network: Southeast European Centre of Infectious Disease Surveillance and Control/South East Europe Health Network), The Hashemite Kingdom of Jordan (part of MECIDS: Middle East Consortium on Infectious Diseases), and the Islamic Republic of Pakistan (POHA: Pak One Health Alliance) on relevant operational programming and research aimed at strengthening One Health epidemiological surveillance, diagnoses and treatment of leishmaniasis.

An early successful outcome of this project was that it raised the profile of leishmaniasis to key stakeholders, including WHO and UNICEF in the Republic of Albania, who are committed to ensuring access to treatment for VL at a lower cost, and the Global Fund to Fight AIDS, TB & Malaria in the Islamic Republic of Pakistan via presentations at their Country Coordinating Mechanism.

The study in Jordan specifically identified how leishmaniasis control and prevention can have an economic benefit associated with tourism in the Jordan River Valley. The Jordanian Ministry of Tourism has been invited to attend two follow-up workshops on how to best mitigate transmission to international pilgrims and visitors at Bethany-Beyond-the-Jordan, a recently designated UNESCO World Heritage Site and an increasingly popular tourist destination. Cross-border disease surveillance with MECIDS countries, particularly as it relates to tourism, necessarily includes awareness and cooperation.

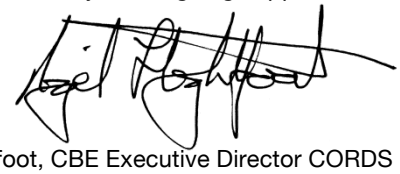
As a neglected disease, we consider these initial efforts a sign of progress and an indicator for future success, but not an invitation for complacency. More needs to be done. Representatives from the Ministry of Health of Jordan and an infectious disease expert from Pakistan demonstrated their collective interest and commitment to increasing visibility and funding for leishmaniasis prevention and treatment.

Further, the gap analysis conducted in Albania will be replicated by other mini leishmaniasis gap analyses in neighbouring countries (e.g. Montenegro, Macedonia, Kosovo, Bulgaria, Croatia, Bosnia and Herzegovina, and Serbia) with the intention of building regional surveillance capacity, sharing inter-sectoral data (e.g. prevalence/incidence data, integrated vector control, etc.), and making collaborative recommendations to policy makers for prevention and treatment. In addition, the sharing of this information is catalytic for building expertise in the region, a key component of a concerted effort to address leishmaniasis as a model for other vector borne diseases over a collection of relatively small countries in south eastern Europe with porous borders. Additionally, from an impact perspective, we know that having better-trained medical and public health professionals in place will ultimately positively affect the target population and reduce the disease burden.

CORDS' aim was to connect regional disease surveillance teams for efficient sharing of best practices across inter-sectoral and cross-border communities. We have demonstrated this capacity by jointly supporting and empowering our networks.

I invite you to join our group in our goal of raising awareness around the millions of people suffering from leishmaniasis, and addressing barriers to its treatment and prevention. Our network of partners across Asia, Europe and the Middle East have completed a staggering amount of work in a six-month timeframe to catalyse effective and efficient cooperation across borders and disciplines to create real and lasting impact on these neglected diseases, but we need more action and a political commitment to end the needless suffering of millions.

With sincere appreciation for your on-going support,



Professor Nigel Lightfoot, CBE Executive Director CORDS

Executive Summary and Recommendations

Leishmaniasis: A neglected disease of marginalised people

Leishmaniasis is a neglected disease, or rather a disease that affects neglected or marginalised peoples. As one of the oldest infectious diseases (it has been referenced in texts dating back to the 7th century BC[1]) it has been ignored largely because of its complex epidemiology and its association with poverty.[2] However, leishmaniasis remains the second most prevalent parasitic infection in the world after malaria (see FIGURE 2).

Leishmaniasis is a vector borne disease caused by a protozoan parasite transmitted through the bite of an infected female sand fly (the vector). There are more than 20 species of *leishmania* causing two main clinical forms of the disease in humans. Cutaneous leishmaniasis (CL), which manifests as skin ulcers, which eventually heal, often leaving disfiguring scars. There is also the more serious visceral leishmaniasis (VL) or *kala-azar* ("black fever), which affects internal organs (particularly the spleen and liver). It can be fatal if left untreated.

Other manifestations of the disease include mucocutaneous leishmaniasis, (ML) a severe necrotic form of the disease related to CL which presents as skin and mucosal ulcers primarily on the nose and mouth, post-kala-azar dermal leishmaniasis (PKDL) and *leishmania* recidivans. In recent years, *leishmania* co-infection has emerged as a serious, sometimes untreatable, complication in immuno-compromised patients with HIV.

Leishmania species can be categorised according to the source of infection, as either anthropontic which is transmitted directly from human to human by infected sandflies or zoonotic where wild (e.g. hyraxes, sand rats) or domestic animals (e.g. canines) act as a reservoir host. Reservoir hosts do not always develop clinical disease but can maintain the parasite population and successfully transmit the infection to other subjects.

Figure 1: Health staff conducting interviews in Balochistan, Pakistan

Leishmaniasis is endemic in around 100 countries worldwide affecting some 14 million people, mostly in Asia, Africa, Central and South America.

The World Health Organization (WHO) estimate the annual incidence of CL at 1.5 million cases with a further 0.5 million of VL. Every year Leishmaniasis causes over 50,000 deaths and the loss of an estimated 2.4 million disability-adjusted life years (DALYs) putting it among the top ten in a global analysis of infectious diseases.[9]

Leishmaniasis is highly correlated with poverty, malnutrition and other diseases, which affect immunity, as well as issues such as crowded living conditions and poor sanitation. It is therefore unsurprising that the ongoing conflicts in Afghanistan, Syria and the Horn of Africa have all seen an increased incidence of leishmaniasis among those affected. Climate change, deforestation and rapid urbanisation are other factors favouring the spread of the vector, or increasing human contact, with reservoir host populations.[8]

Like other neglected diseases, leishmaniasis has received limited funding for the development and

against VL, pentavalent antimonials (an injection-based therapy for leishmaniasis) remain the mainstay for the treatment of CL since they were first introduced in 1922.

These drugs are expensive, potentially toxic and can require prolonged parenteral treatment. Increasing antimonial resistance is a major concern in some endemic areas with many patients failing to respond to treatment.

The symptoms of leishmaniasis are non-specific and easily mistaken for other diseases such as chronic malaria and schistosomiasis in the case of VL, while lesions of CL can be confused with other skin conditions including leprosy, fungal infection, cancer and tropical ulcer. The need to confirm diagnosis before treatment with costly and toxic drugs is a further burden on the healthcare systems of impoverished countries with limited access to modern diagnostic tools.

The lead subject matter co-ordinator for this project, James Crilly DVM, and the in-country teams have identified two priority objectives for actions arising from this gap analysis. Firstly, to improve the capacity of the national health services of the participating countries and to ensure the early diagnosis and effective treatment of all existing cases of leishmaniasis. Secondly, to develop and implement a co-ordinated programme of control and preventive measures to reduce the number of new cases occurring. Based on the experience of successful malaria control campaigns, they recommend a sustained focus on a limited number of targeted interventions to achieve the best results.

Although cutaneous and visceral leishmaniasis are two very different diseases with distinct

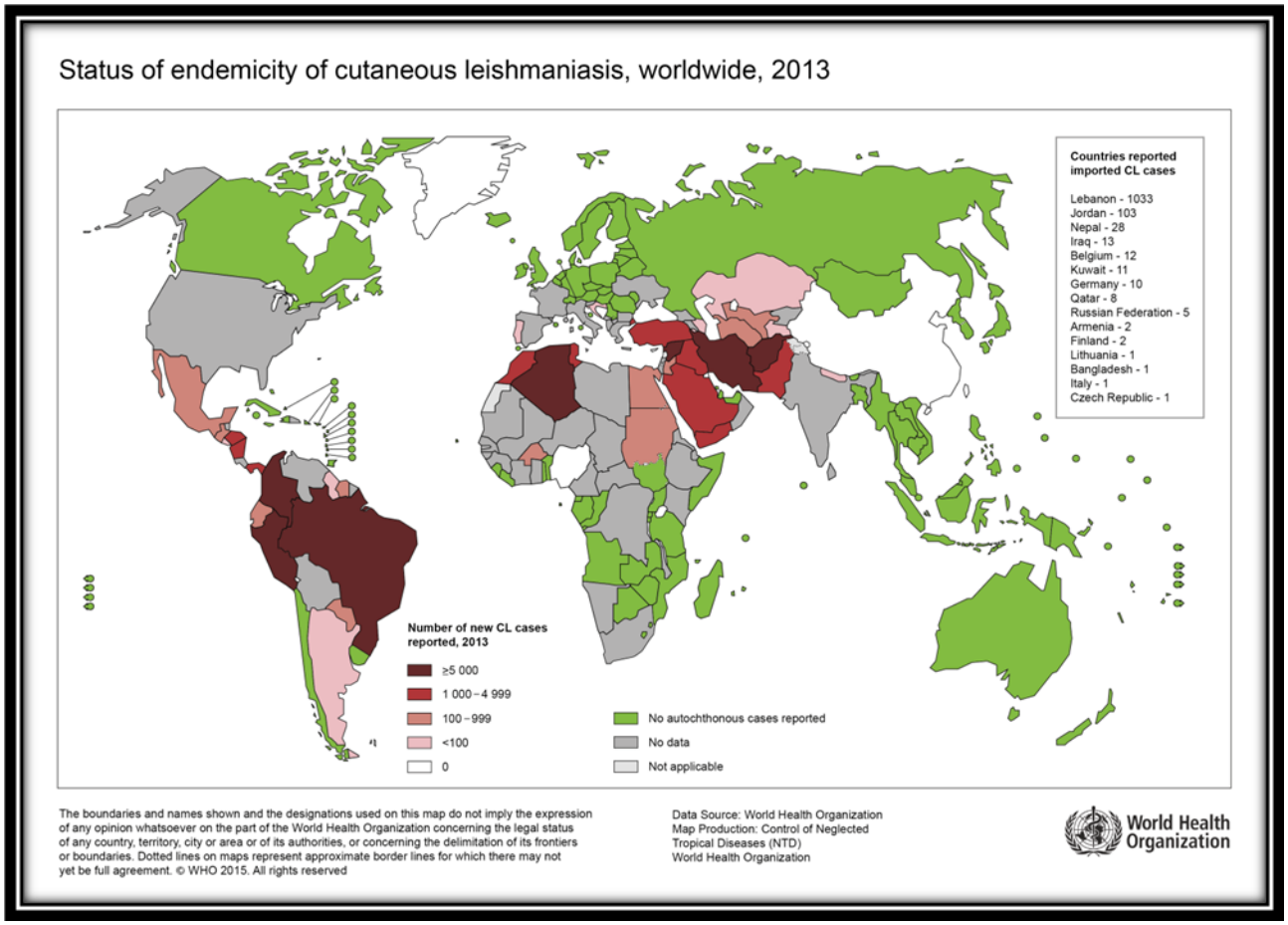


Figure 2: WHO incidence map[8]

pathologies and treatment protocols, here we studied them together in order to increase overall awareness of leishmaniasis and bring both diseases to the forefront of the neglected disease dialogue.

Each of the three countries that participated in the gap analysis has identified one key overarching priority area where support is needed:

1. Pakistan (Pakistan One Health Alliance: POHA) identified the institutional development for the promotion of a One Health approach and the ability to build corresponding capacities (skills, services, and drug supplies) in detection and response for the Leishmaniasis disease in country
2. Jordan (Middle East Consortium on Infectious Diseases: MECIDS) has prioritised preventing the spread of CL through targeted follow-up workshops to improve surveillance and promote risk reduction measures;
3. Albania (SECID/SEEHN: Southeast European Center Infectious Disease Surveillance and Control – South East Europe Health Network) is focusing on developing a One Health approach to improve early detection and treatment of paediatric visceral leishmaniasis cases, while also ensuring treatment for all adult cases and catalysing capacity-building activities in the region by encouraging mini-gap analyses to be carried out in other SECID/SEEHN partner countries. Turkey, a partner country of SECID, together with Iran, Iraq, Syria and Afghanistan should also be involved in surveillance methodology and control.

All countries have prioritized joint regional diagnostic and therapeutic trainings on both cutaneous and visceral leishmaniasis. Additionally, each country will seek to address weaknesses in the core capacities required to implement an effective programme for the treatment and control of leishmaniasis as identified in the gap analysis.

The country assessments focused on the priority interventions as defined in the “Strategic framework for leishmaniasis control in the WHO European Region 2014-2020.” The overall goal within this strategic framework is to eliminate mortality due to VL, significantly reduce morbidity due to VL and CL, contribute to improving the health status of populations at risk, and minimize the socioeconomic losses provoked by the disease in countries where leishmaniasis is a public health problem. Findings are summarised under the headings of “Governance”, “Case Management/Epidemiology”, “One Health Capacity Building” and “Civil Society”; study methodology details can be found in the respective full country reports. Additionally, the need for two capacity building workshops, regarding diagnostic techniques and current therapeutic protocols, was identified at the wrap-up workshop in Istanbul, Turkey in November 2015. The WHO Regional office will be invited to honour its commitment to providing strategic guidance and technical assistance in the workshops.

Priorities for Action

Based upon the findings in this gap analysis, the experiences and successes in each country will be shared and disseminated to the other partners in the networks, thus continuing the forward momentum of shared enterprise related to:

1. **Sustained resources**: improving access to lower-cost treatments. WHO has negotiated an arrangement with a number of pharmaceutical companies whereby low-income countries, UN agencies and certain NGOs can purchase anti-leishmaniasis drugs at substantially discounted prices. Drugs obtained under this scheme are used by both UNHCR and MSF to treat leishmaniasis cases in Syrian and Afghan refugee camps, by UNICEF/UNAIDS to combat HIV/leishmaniasis co-morbidities and by the countries in the WHO South-East Asia region for their ongoing Kala-azar eradication programme. The reasons why Pakistan, as a low-income country, is not availing itself of this scheme needs to be investigated. Indeed all of the project countries should question their eligibility, either directly or through participating NGOs or UN agencies, to ensure that anti-leishmaniasis drugs are available for those who cannot afford to pay for them, without putting an unsustainable financial burden on the public health budget. SECID/SEEHN has agreed to lead the discussion with WHO and UNICEF towards addressing consistent medication shortages, while MECIDS/Pakistan will work simultaneously with Drugs for Neglected Diseases initiative (DNDi) and pharmaceutical manufacturers to identify a more effective medication procurement plan.

2. **Real-time, open-access data**: significant investments of time, human and financial resources are required to support open-source, data exchange protocols between network partners. The Leishmaniasis Virtual Group (Leishmaniax.net) has been created to address this need. It is a platform in which research findings and epidemiological surveillance data can be shared in real time between countries, networks, and Ministries of Health across geopolitical borders. SECID/SEEHN will be responsible for maintaining the site and updating it as necessary to include technological advancements and functionality enhancements as a data repository. See directly below for an update on this group.
3. **Integrating One Health principles into the agenda of existing coalitions**: The need for a co-ordinated multi-sectoral "One Health" approach for the control of leishmaniasis is universally acknowledged. The Pak One Health Alliance (POHA) has shown itself to be an effective mechanism for bringing relevant stakeholders together and initiating the debate, which ultimately led to this Gap Analysis project. It is recommended that other countries in MECIDS and SECID/SEEHN networks continue to develop similar forums, appropriate for their particular situation, to enable "One Health" principles to be applied to leishmaniasis, as a model for other diseases.
4. **Policy change** Due to a lack of awareness of leishmaniasis and its impact, none of the project countries have a clear national policy, or a dedicated budget for leishmaniasis. This was identified as a major constraint requiring advocacy and commitment at the highest level of government to change. Leishmaniasis has many similarities to other vector borne diseases, such as malaria and dengue, in terms of core component activities including surveillance, data management, epidemiology, vector control, public awareness and risk management. Therefore, improvements in the management of leishmaniasis should be presented in the context of a broader national vector borne disease strategy. This would raise the profile of leishmaniasis and provide access to personnel and resources available for other vector borne disease programmes. In addition, improving the capacity to manage a real and present disease like leishmaniasis will, de facto, enhance epidemic preparedness and the ability to respond to other emerging disease threats.

Birth of a Virtual Group

The Leishmaniax Virtual Group grew out of meetings among SECID/SEEHN, MECIDS, and CORDS in 2014. The key objectives are to establish a network of One Health systems and to build a system for sharing information as a basis for further collaboration. The Virtual Group is also tasked with addressing data inadequacies in the member countries.

The initiative has enabled a communication platform for international experts from different sectors to be developed. SECID/SEEHN, through the Virtual Group, hopes to build on this collaboration as well as explore other directions in which it may develop. These include using the leishmaniax.net website to increase public awareness of leishmaniasis, and promoting the use of risk reduction measures in different languages which are currently unavailable on the Internet.

The Leishmaniax platform is already a repository for both peer reviewed and unpublished scientific papers on all aspects of the disease by members of the Virtual Group, again in several languages. This could be further expanded into a comprehensive document library for leishmaniasis to help those interested in the disease keep abreast of current research findings and share best practices.

Republic of Albania

Executive Summary

Visceral Leishmaniasis (VL) is the most prevalent form of leishmaniasis found in Albania, an upper-middle income country in Southeastern Europe with a population of approximately 3.2 million. In Albania, VL remains predominantly a paediatric disease in impoverished rural communities. 68% of new cases are detected in children under the age of 5 years, and 80% in children under 10 years.[4] From January 1997 to December 2001, 867 parasitologically confirmed VL cases were recorded in 35 of 36 Albanian districts, with a cumulative morbidity of 2.8/10,000 population.[4] In 2001, the incidence rose to 0.7/10,000 population, which was 20-40 times higher than in the other European endemic countries.[4]

VL is found primarily in an endemic area made up of the western coast bordering the Adriatic Sea and the northern districts bordering Montenegro and Kosovo. While the incidence of VL in Albania has decreased in recent years, it remains the highest in Europe.

The immediate priorities identified in the Gap Analysis were the need to improve early detection of all cases, particularly in rural areas, tackle inadequate access to anti-*leishmania* drugs for the treatment of all patients, and ensure proper case-based surveillance. These and other weaknesses in the current capacity for the prevention and control of leishmaniasis in Albania are discussed in more detail below.

GOVERNANCE

Leishmaniasis is not perceived as a public health threat by the health or veterinary authorities in Albania. As a consequence, there is no national leishmaniasis control strategy with well-defined goals and objectives. In common with the other project countries, poor communication and the absence of any clear chain of command are seen as significant impediments to effectively co-ordinating the activities of different ministries and NGOs at national, prefecture and local levels. The major priorities to be addressed in this area include:

- Increasing awareness of policy makers and others for leishmaniasis as a public health priority;
- Establishing a One Health alliance and strategic plan with stakeholders under a single accountable authority;
- Promoting cross-border partnerships for research projects and operational initiatives to enhance One Health regional disease surveillance and control of leishmaniasis.

CASE MANAGEMENT/EPIDEMIOLOGY

Deficiencies in the reporting of leishmaniasis cases both at district level and nationally to the Institute of Public Health make it difficult to estimate the true burden and distribution of the disease. Following the Gap Analysis, improved protocols for recording, collating and analyzing individual VL case data have been implemented to address this issue. In the absence of any formal system for notification of cutaneous leishmaniasis cases in Albania, the prevalence of this disease remains unquantifiable.

The epidemiology of both CL and VL leishmaniasis in Albania has been investigated and indicates the paediatric distribution of disease in different areas, and it also implicates *Phlebotomus neglectus* and dogs as the main vector and reservoir host of leishmaniasis. Further scientific investigation has been hampered by inadequate funding and the lack of priority to implement further technologies such as One Health surveillance, geographic information systems (GIS), and polymerase chain reaction (PCR) diagnostic techniques to the study of leishmaniasis when such capacities exist within the country. Further research is required to elucidate the dynamics of leishmaniasis in Albania, especially in reservoirs, in order to develop an appropriate control strategy. Identification of cases residing in Kosovo and Serbia demonstrates the need for further cross-border investigation.

Due to the non-specific nature of the symptoms of VL and a lack of awareness of the disease by primary health care staff, diagnosis and treatment are often unnecessarily delayed. The consequences of such a failure can be severe. Left untreated, paediatric cases can rapidly develop fatal subsequent conditions such as bronchopneumonia or septicemia. National up to date treatment guidelines and a clinical audit process are missing. Preparation of such guidelines and more training to improve the clinical competence of those treating patients in the Mother Theresa University Hospital or in some districts is imperative.

At the same time, access to anti-*leishmania* drugs is limited due to budgetary constraints or other issues. Currently, the burden of sourcing and purchasing the necessary drugs frequently falls on the patients and their families which, for a case of VL, can cost €2,000 or more.

In Albania where dogs and other canidae are proven maintenance hosts for *Leishmania infantum*, the cause of human VL, effective control of the disease in reservoir hosts is critical in breaking the cycle of human infection. Major constraints identified in the Albanian Gap Analysis in relation to canine leishmaniasis include:

- The Ministry of Agriculture (MoA), the authority in relation to canine leishmaniasis (CanL), does not implement any measures for its surveillance or control;
- There is no system for identifying and registering owned dogs in Albania despite this being a legal requirement;
- While private veterinary clinics in Tirana and other major cities may screen dogs for CanL using rapid diagnostic tests (RDTs), there is no mechanism for reporting positive cases to the MoA despite CanL being a notifiable disease;
- Confirmatory tests for CanL based on serology or PCR are not available at the national reference laboratory for animal diseases (frequently, the laboratory at the Institute of Public Health has been utilized as a reference laboratory);
- MoA does not operate any active surveillance or disease recording for CanL;
- Municipalities do not implement any measures to control the number of street dogs such as culling or spay and release. As a consequence there are large self-sustaining populations of feral dogs in both urban and rural environments in Albania.

The major priorities to be addressed in this area include:

- Establish a critical mass of regional experts and resources to conduct the research necessary for an evidence-based strategy for the surveillance and control of leishmaniasis and other vector borne diseases in the Balkans;
- Ensure an adequate supply of anti-leishmania drugs and treat all patients;
- Improve detection rates by targeted training of front line health care workers (and other doctors following the preparation of the national treatment and care guidelines) and the provision of inexpensive RDTs
- Establish one national molecular diagnostic capacity to detect leishmaniasis in humans, animals and vectors;

Figure 3: *Phlebotomus neglectus* sand fly in the midst of a blood meal.[10]

ONE HEALTH CAPACITY BUILDING

Operational protocols are needed to establish and build One Health capacity initiatives in Albania and with its SECID/SEEHN partners in Southeastern Europe.

- Develop guidelines for index case follow-up investigations with joint human vector and reservoir surveillance;
- Create and maintain an integrated database with human, animal and vector data;
- Engage with MoA, local government and the veterinary profession to reduce the prevalence of CanL as part of the overall national *leishmania* control programme.

CIVIL SOCIETY

Currently, there is low community awareness of leishmaniasis and a lack of community outreach and prevention programs, especially in impoverished rural communities where leishmaniasis is most prevalent. Recommendations to remedy this issue include:

- Develop an integrated vector control strategy based on the existing mosquito control programmes, including the use of personal protection measures and the involvement of the community and local government;
- Promote leishmania awareness through traditional means such as posters/information leaflets, vaccination and school health campaigns, as well as more innovative gender specific social media approaches.

Call for Action

The following specific activities for Albania were proposed at the project wrap-up meeting in Istanbul on 6th November 2015.

- Build regional capacities to establish a critical mass of experts to increase expertise for leishmaniasis, starting with a training workshop to enable other SECID/SEEHN countries to carry out their own mini-gap analyses. Subsequent initiatives could include establishing regional One Health field investigation and One Health surveillance capacity to better control vector borne and zoonotic diseases, especially in cross-border areas;
- In-service training and provision of RDTs for primary health care workers (particularly paediatricians, community and school health care workers) to increase paediatric VL detection rates;
- Preparation of national treatment and care guideline and clinical auditing process;
- Enhance treatment and care capacities in Tirana University Hospital Centre;
- Improve algorithm of laboratory confirmation of leishmaniasis in Albania, based on the experience of other Mediterranean countries.

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Hashemite Kingdom of Jordan

Executive Summary

While several areas of Jordan are endemic for zoonotic cutaneous leishmaniasis (ZCL) caused by *L. major*, the incidence is low relative to Pakistan and Albania, as well as neighbouring countries, such as Syria and Iraq. Therefore, the disease is considered a low public health priority.

VL cases are reported sporadically, the majority of which are contracted abroad; therefore, this form of the disease is not considered a significant problem in Jordan. Furthermore, the use of cryo-therapy as the first line of treatment in uncomplicated CL cases means that the cost and availability of anti-leishmanial drugs is not such a critical issue.

Historically, there has been little evidence of anthroponotic CL (ACL) caused by *L. tropica* in Jordan. Nonetheless, Jordan, like Lebanon and Turkey, which also host large numbers of Syrian refugees, is at significant risk of ACL becoming established, firstly among the refugee population and subsequently in the host communities (see FIGURE 4).

To prevent this from happening, the capacity of the health services to detect ACL cases early and treat them effectively needs to be improved. This will be particularly challenging given the marginalised status and transient existence of many of the refugees.

The Parasitic and Zoonotic Diseases Department (PZDD) of Ministry of Health (MoH) has identified the Al Maghtas Baptism Site on the River Jordan as a hotspot focus of ZCL with *Psammomys obesus*, the fat sand rat, acting as the main reservoir. With the numbers of visitors and pilgrims expected to increase significantly following the granting of UNESCO World Heritage status in July 2015, a specific programme of CL risk awareness and risk reduction should be developed for those visiting the site. As there is a similar complex of churches and guesthouses at Qasr al-Yahud on the adjacent West Bank, it is proposed that this initiative be developed in partnership with the other countries in the Middle East Consortium on Infectious Diseases Surveillance (MECIDS) network.

This project forms a unique model for conducting collaborative efforts to improve global and regional capacity to respond to leishmaniasis and other vector borne and infectious diseases. Using the virtual network leishmaniax.net as a platform can help to link regional disease surveillance networks to create a common database for inter-network collaboration and for real-time sharing of inter-sectoral information and data.

Jordan will be sharing their gap analysis with MECIDS partners at a proposed workshop at the Jordan River Baptism Site (on the Palestinian side) to increase awareness of the disease amongst pilgrims/visitors, and to develop a risk awareness and control programme based upon local vector and reservoir ecology in January/February 2016. Invited participants, in addition to the MECIDS partner countries of the Palestinian Authority and Israel, will include the Jordanian Ministries of Health, Agriculture, and Tourism.

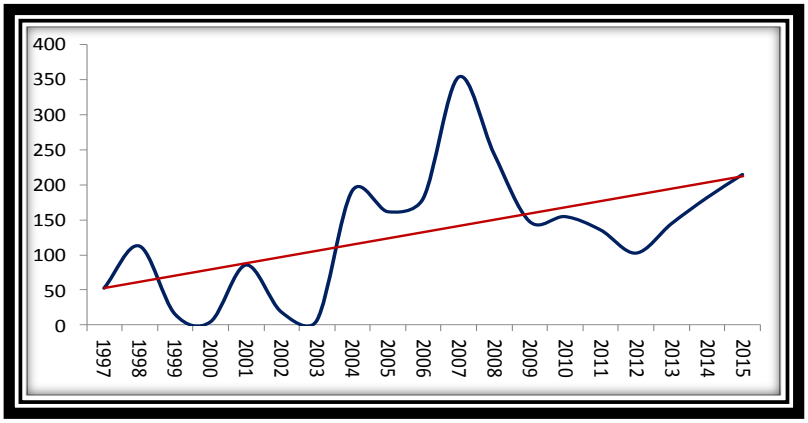

Figure 4: Cutaneous Leishmaniasis trend in Hashemite Kingdom of Jordan (# of confirmed cases 1997-2015)

GOVERNANCE

Unlike malaria, the management of leishmaniasis within the Jordanian MoH, is a horizontal rather than a vertical activity. Responsibility lies with the health directorate in each district. While the role of Parasitic and Zoonotic Diseases Department (PZDD) is to support the local health authorities, particularly in relation to surveillance and control activities, there is no leishmaniasis national programme or budget.

Even within PZDD, there is no dedicated leishmaniasis unit, relying instead on the staff and resources of the national malaria control programme. As a result it is difficult to coordinate and implement activities relating to *leishmania* effectively. A high-level of commitment from decision makers is needed for the establishment of a national vector borne disease unit within PZDD to be responsible for the disease and entomological surveillance. A specific surveillance protocol for leishmaniasis inside and around refugee camps, tourism areas, and other hyper-endemic foci also needs to be developed.

CASE MANAGEMENT/EPIDEMIOLOGY

As a notifiable disease, all suspected cases of CL and VL should be reported to health directorate in each district. In practice, cases are routinely under-reported as CL is considered “normal” by people living in hyper-endemic areas. Only severe cases or those with potentially disfiguring lesions requiring treatment with cryotherapy or pentavalent antimonials are routinely recorded. However, for the control of ACL, it is critical that all cases are identified and treated promptly in order to break the transmission cycle. This will require enhanced surveillance, reporting, and follow-up of all patients presenting with suspected *leishmania* lesions in non-endemic areas, particularly if there is any suspected involvement of refugees.

Most cases of CL in Jordan are treated on the basis of a presumptive clinical diagnosis without confirmation by direct smear/culture, which can only be done with any degree of confidence at the MoH Central Laboratory in Amman.

In order to increase the proportion of laboratory confirmed cases, it will be necessary to expand the capabilities of the appropriate staff in endemic areas in the taking and reading of cytologic smears from suspect CL lesions. Future surveillance of CL must include the capacity to differentiate between ZCL cases caused by *L. major* and ACL due to *L. tropica.* This again will require cytologic sampling of CL lesions for further PCR examination.

While the availability of anti-*leishmania* drugs is not a critical issue, there is a need for MoH to establish a more efficient procurement policy based on the anticipated annual requirement. Cryotherapy syringes and liquid nitrogen flasks are available in most dermatology clinics, however, written protocols for the

High dropout rates during treatment and ineffective post treatment follow-up, particularly among refugees, were other management issues identified in the gap analysis. For additional information on this point please refer to the full country report.

ONE HEALTH CAPACITY BUILDING

As in Albania, it is proposed to address the problem of weak inter-sectoral collaboration by the establishment of a One Health forum.

The participation of agencies such as the United Nations High Commissioner for Refugees (UNHCR), International Rescue Committee (IRC) and the International Medical Corps (IMC) who are responsible for the health of the Syrian refugees will be critical to establishing enhanced surveillance capacity for ACL in Jordan. The experience of their staff in Lebanon and Turkey where the risk of ACL is greater will also help to inform the Jordanian authorities on the most effective response to the threat. (Most refugees arriving in Jordan are from southern Syria while the endemic foci for ACL are mainly in the northern part of the country.)

Jordan is fortunate to have a strong academic research base and two separate centres, namely the Department of Medical Laboratory Sciences at the Hashemite University in Zarqa and the Department of Biological Sciences at the University of Jordan in Amman have practical experience in the use of molecular diagnostic tools for studying *leishmania* in humans, vectors and reservoir hosts. Both have previously collaborated with PZDD in joint studies and peer reviewed publications on the surveillance, diagnosis and treatment of leishmaniasis in Jordan and should be involved in future initiatives.

CIVIL SOCIETY

While community awareness of leishmaniasis is high in endemic areas, the prevalence of CL suggests that many people are not implementing risk reduction measures such as effective protection against sand fly bites. Furthermore, medical treatment is often needlessly delayed by patients initially resorting to ineffective traditional remedies. This results in an increased risk of residual scarring and disfigurement.

Elsewhere in the country awareness levels need to be increased as one of the measures to improve the early detection and reporting of possible ACL cases. In both Jordan and Pakistan, UNHCR staff have stressed that this must be done without creating the perception that refugees are spreading the disease.

The School Health Directorate within MoH was identified as a key partner both in raising awareness of CL and in improving the detection and reporting of suspected cases. Currently, there are estimated to be some 130,000 Syrian students in the Jordanian education system. Syrian students attend nearly all of the 3,500 public and 2,500 private schools in the country, each of which has a medical officer reporting to the local health directorate. A joint MoH/MoE in-service training programme for teachers who come into daily contact with students has been proposed. They are well placed to be part of an early warning system, and training members of the education system will help familiarise them with the appearance of CL lesions so that suspected cases can be referred to school medical officers for further follow-up.

Providing Syrian students with more information on the cause and symptoms of CL is also an effective method of increasing awareness of the disease among the refugee population, which again would encourage early diagnosis and treatment.

The need for a specific programme related to the risk of visitors and pilgrims contracting ZCL at the Al Maghtas Baptism Site has already been mentioned. This should be developed and implemented in association with the Ministry of Tourism, and the relevant church authorities of the various

adjacent Qasr al-Yahud site on the West Bank. Documenting cases of CL lesions developing after pilgrims have returned to countries where doctors may be unfamiliar with leishmaniasis is a particular concern.

Call for Action

Priorities for detecting and responding to leishmaniasis and other vector borne diseases in the MECIDS/Middle East region should focus on the following activities:

1. Establish a vector borne disease control unit within PZDD to improve the capacity for epidemiological and entomological surveillance and control activities;
2. Identify and commission the research needed to develop an evidence-based national control strategy. This includes identifying and mapping the distribution and density of vector and reservoir species and quantifying their *Leishmania* burden in order to understand the dynamics of the disease. There is also a need to develop specific interventions and demonstrate their impact for the treatment, prevention or control of leishmaniasis;
3. Develop/update case management protocols and provide necessary training, equipment and drugs for detection, diagnosis and treatment at national, regional (governorate) and local levels. This should include the development of molecular diagnostic capacity in one or more centres in the country;
4. Based on One Health principles, strengthen inter-sectoral cooperation between MoH and NGOs working with refugees, universities, Ministries of Agriculture, Education and Tourism and other stakeholders.
5. Conduct awareness campaigns for the targeted population to improve early detection and timely treatment of leishmaniasis.

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MECIDS
Middle East Consortium on Infectious Disease Surveillance

Islamic Republic of Pakistan

Executive Summary

The Islamic Republic of Pakistan, the sixth most populous nation in the world, has nearly 200 million inhabitants and is bordered by China, India, Afghanistan, and the Arabian Sea. Strategically located in South Asia, the country has hosted migrant populations since its creation as an independent nation in 1947. The increased movement of people is a global phenomenon that has implications related to infectious disease control, and the experience of Pakistan has informed our recommendations for managing leishmaniasis infections elsewhere.

The predominant form of leishmaniasis in Pakistan is anthroponotic CL (ACL) due to *L. tropica* which, appears to be an emerging disease introduced in recent decades by refugees from Afghanistan, which has since become established in the host communities in Balochistan and elsewhere in north-west Pakistan *(see FIGURE 5).*

There are also well-documented foci of zoonotic CL caused by *L. major,* particularly in rural areas of the Sindh province. Historically paediatric visceral leishmaniasis, assumed to be anthroponotic VL caused by *L. donovoni,* appears to have been common in the foothills of the Hindu Kush in northeast Pakistan. In the last two decades, the number of reported cases has declined in tandem with the rise in ACL cases, although it is unclear whether this represents a real decrease in the prevalence of VL or is an artifact due to limited surveillance/diagnostic capacity during a time of growing political instability. Nevertheless, the gap analysis confirmed that ACL is currently the greater problem.

Throughout this report, the need to consider leishmaniasis control in the broader context of a comprehensive vector borne disease strategy has been stressed. Pakistan, where both malaria and dengue are responsible for thousands of deaths annually, provides the clearest illustration of how an integrated vector management capacity using a combination of methods such as chemical control, environmental management and personal protection could be applied in a variety of vector borne disease situations.

In Pakistan, the key interventions identified in the gap analysis are to provide effective and timely treatment of the estimated 50,000 new CL cases each year, to improve the quality of lives for those currently living with this disfiguring and socially ostracizing disease and to prevent further anthroponotic transmission, especially in communities on the Afghanistan and Pakistan border.

The Pakistani gap analysis is the most comprehensive and detailed of the three project countries, involving extensive field studies which have provided a quantitative assessment of many critical components, including the availability of anti-leishmanial drugs, adoption of risk reduction measures such as the use of bednets, and key capacities for an effective intervention strategy.

GOVERNANCE

The decision in 2011 to devolve the responsibilities of the federal MoH to the respective provincial administrations is considered to have made the co-ordination of programmes like those for malaria and polio more difficult, as well as removing national level oversight. Similar constraints can be anticipated as national and provincial health managers, together with UNHCR and the agencies responsible for health services in refugee and IDP camps, attempt to implement a national *leishmania* strategy for Pakistan.

On the positive side, the establishment of the District Health Information System (DHIS) as a public sector source for recording, compiling, consolidating and sharing health data including leishmaniasis at the national level is a valuable surveillance tool in a country so large and diverse that it is difficult to

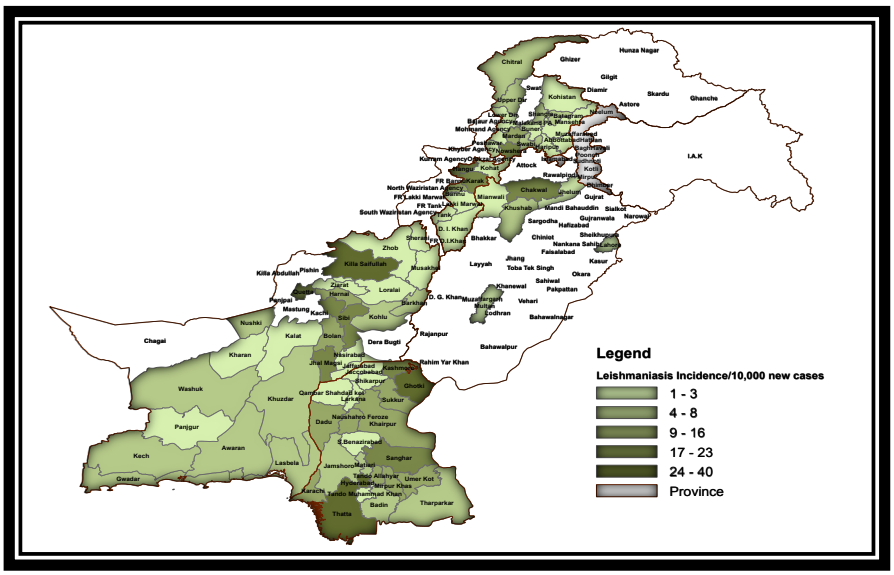

Figure 5: Cutaneous Leishmaniasis Estimated Incidence Pakistan, 2014 (DHIS data reported per 10,000 new cases)

CASE MANAGEMENT/EPIDEMIOLOGY

The twin priorities of a disease control programme are to cure those who are affected and to prevent new cases from occurring. The first of these objectives is primarily dependent on the quality of case detection and management, including diagnosis, treatment and follow-up. A consistent finding in the Pakistani gap analysis was the weakness of this aspect of the leishmania programmes, specifically ensuring that all patients received timely and appropriate treatment. While the clinical competence of those treating patients is generally good to excellent, lack of access to effective drugs and/or their high cost, together with delays in the diagnosis and treatment were identified as serious constraints.

Figure 6: Interviews with patients in remote areas of Pakistan, 2015

The problem is most acute in impoverished rural communities, where the burden of cutaneous leishmaniasis is high. In the absence of mechanisms for the registration, importation and distribution of quality assured anti-leishmania drugs, patients are frequently treated with smuggled or counterfeit products found in the marketplace or locally manufactured generic products of dubious quality and efficacy.

One of the most telling comments regarding the second priority of preventing new cases was made by a physician from MSF during the dissemination workshop in Islamabad when he stated that they were treating 800 CL patients per month at his clinic in Quetta and did not have any time for education or control activities. Herein lies the problem for Pakistan, there is an urgent need for operational research to improve the diagnosis and treatment of ACL.

ONE HEALTH CAPACITY BUILDING

The role of the Pak One Health Alliance (POHA) in initiating the dialogue that led to this project has been acknowledged elsewhere. Going forward, it is envisaged that POHA will continue to take a lead role in co-ordinating the activities of the various stakeholders in the next step of designing an effective, evidence-based leishmaniasis control strategy.

hoped that Pakistan can develop similar mutually beneficial alliances with its neighbours. The possibility of co-operating with their Afghani counterparts in districts on the Afghanistan/Pakistan border in joint activities to strengthen ACL diagnostic and treatment capacity has been proposed as one such initiative.

CIVIL SOCIETY

The potential role of community health workers, teachers, and others who come into regular contact with infants and children in the early detection of leishmaniasis cases, and encouraging patients to seek prompt medical treatment has been highlighted previously. The use of mobile technology including short message service (SMS) and photo sharing apps is a further innovation for improving the reporting and recording of suspected CL cases in areas where the administrative capacity of the health care system is limited. As with other aspects of leishmaniasis control, such innovations would be directly applicable to other diseases.

In Pakistan, village based lady health workers (LHWs) are already registering home births in a number of districts using mobile technology. The possibility of training LHWs to detect and report suspected CL cases on a pilot basis utilising the existing communications infrastructure was proposed at the Pakistan workshop.

Another aspect of CL, particularly prominent in Pakistan, is the life changing consequences that disfiguring CL lesions can have for young women, resulting in social exclusion, reduced marriage prospects, and depression. As in Jordan, the risks associated with the use of traditional remedies for the initial treatment of CL lesions should be highlighted in any awareness campaigns, in addition to promoting the use risk reduction measures.

Call for Action

As discussed above, POHA will investigate the feasibility of cross-border co-operative initiatives with Afghanistan for the diagnosis/treatment of leishmaniasis in the districts bordering the Pakistani border.

They will update the treatment protocols for leishmaniasis in line with the latest WHO guidelines appropriate for Pakistan. POHA is keen to hold, in co-ordination with the government, provincial dissemination and roadmap workshops in country by the end of December 2015 to share the major findings of the gap analysis.

- The main priority remains the procurement of affordable, quality assured anti-*leishmania* medication. Drugs for Neglected Disease initiative (DNDi) has been identified as a potential partner in both sourcing the drugs and developing country-appropriate treatment protocols.
- The Pakistani team will also explore the possibility of utilising mobile technology and community health workers to improve detection.
- POHA would be keen to launch focused health and related staff's capacity building and increase the supply of drugs in high disease prevalent districts, especially those adjoining Afghanistan. Additionally, POHA would like to organise operational research on the disease determinant in high-risk districts.

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UNITE FOR CAUSE

Full country report available at: www.pakonehealth.org and www.leishmaniax.net

Annexes

Annex A: Works Cited

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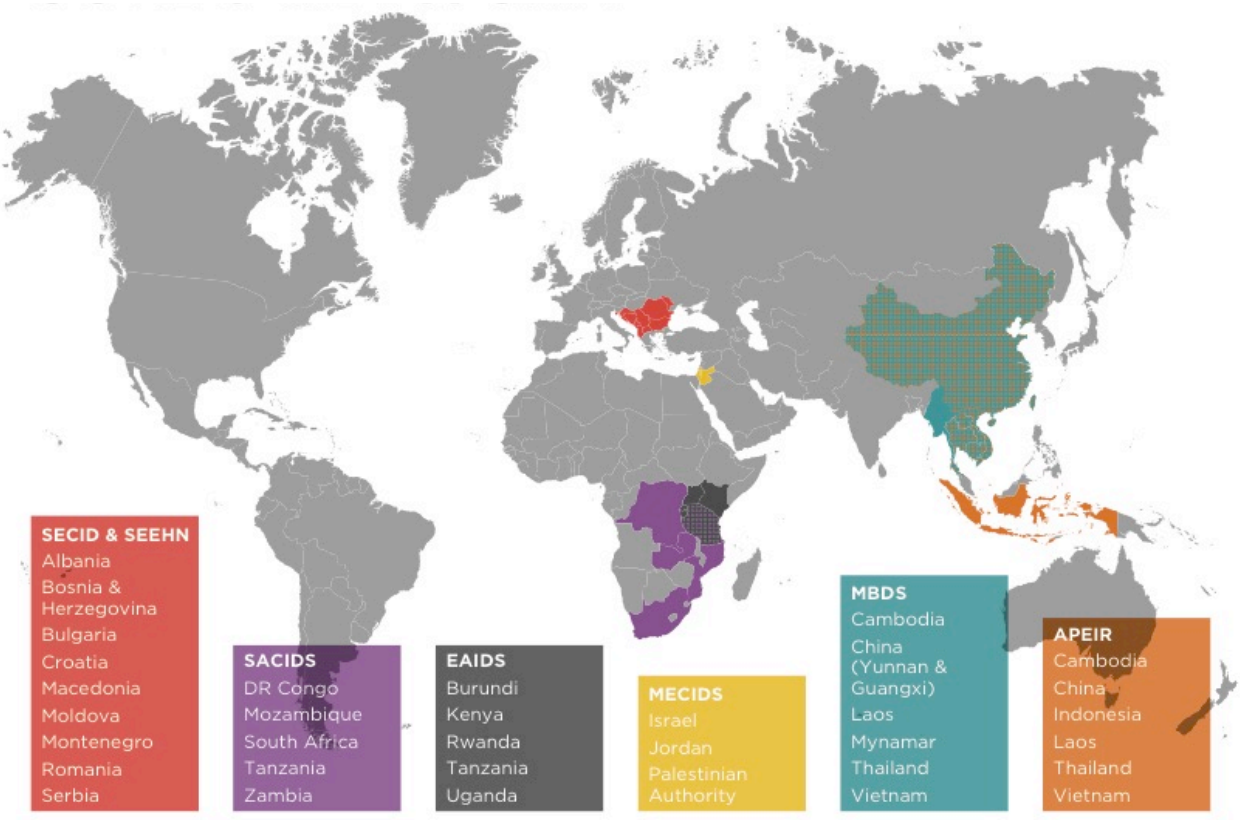
Annex B: CORDS Network



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