“People for Peaceful Change”
A Manual on the Management
Of Leishmaniasis in Israel, Jordan
& Palestine [West Bank]

Report prepared by:
Dr Robert C Spencer MB BS MSc FRCPath, FRCP[G];
Hon DipHIC FFTM-RCPS [Glasg]
Consultant in Clinical & Environmental Microbiology
✉ rcs1947@hotmail.co.uk
“The Wise man......... will not, with the wiser, look to gold and silver as the only blessings of life; nor will he, with the cynic, smart at mankind for preferring them to copper and iron...... That which is convenient is that which is useful, and that which is valuable”.

Michael Faraday

ACKNOWLEDGEMENTS

This manual on the management of Leishmaniasis in Israel, Jordan and Palestine [West Bank] forms one of the tenets of “People for Peaceful Change” funded by the Department for International Development [DFID-UK Government]. The content is based on knowledge shared and contacts developed during 2018, managed by the Jerusalem office of Search for Common Ground [SFCG], an international non-government organisation with long-standing expertise in the field of conflict transformation [www.sfcg.org]. The project engaged junior and senior health professionals and laboratory technicians in a process of knowledge enrichment, skills development and interaction in order to provide an intersectional mechanism for a co-ordinated implementation of strategy and policy. Working on the premise “if you can’t measure it, you can’t improve it” [Peter Drucker], the long list of acknowledgements attests to the highly co-operative nature of this initiative. We gratefully thank those people and organisations without whom this project would not have achieved a successful outcome.

- The wholehearted and active engagement of the participants in the project – Israelis, Palestinians and Jordanians alike – who demonstrated a willingness to step beyond conflict and dedicate scarce time resources for the benefit of their peoples.
- The Board of the Middle East Consortium on Infectious Disease Surveillance [MECIDS] comprised of leading Jordanian, Palestinian and Israeli public health professionals [www.mecidsnetwork.org.] for their guidance and active participation.
MECIDS national co-ordinators, Professor Ziad Abdeen, Dr Ruthi Yishai and Dr Sami Sheikh Ali for their recruitment of participants and assistance in implementation of activities.

DFID for its generous funding.

The dedication of the SFCG Jerusalem office staff directly involved in the project, Wajdi Bkeirat Project Manager, Rami Assali Financial and Administrative Manager and Sari Husseini MECIDS Co-ordinator.

Our hope is that Israeli, Palestinian and Jordanian health officials will use this manual both nationally and co-operatively for the wellbeing of their societies.

**Leishmaniasis**

Leishmaniasis is a neglected disease, or rather a disease that affects neglected or marginalised peoples. It has largely been ignored because of its complex epidemiology and its association with poverty. However, Leishmaniasis remains the second most prevalent parasitic infection worldwide after malaria.

This world-wide disease is caused by an intracellular protozoan parasite [genus *Leishmania*] and transmitted by the bite of the female sandfly [genus *Phlebotomus* species] the vector. Leishmaniasis is a poverty-related disease with two main clinical forms: visceral and cutaneous Leishmaniasis. It has been estimated that 700,000 to one million new cases occur every year from nearly 100 endemic countries. The impact of global warming remains to be evaluated but will probably produce an increase in total numbers and in the number of endemic countries. In 2016, global vectorial capacity for the transmission of the dengue fever virus was the highest on record, rising to 9.1% for *Aedes aegypti* and 11.1% for *Aedes albopictus* above the 1950’s baseline. Why should this genus *Phlebotomus* species be any different?

Increased conflict in areas of endemicity of cutaneous Leishmaniasis and the resulting forced displacement of people, as seen in Jordan with the large influx of Syrian refugees, has resulted in a surge of cases in such endemic areas.
The World Health Organisation [WHO] lists Leishmaniasis as one of the neglected tropical diseases for which the development of drugs for such neglected diseases is a priority. Although cutaneous Leishmaniasis [CL] is not, in itself, life-threatening, it can result in devastating consequences on local, usually poor, communities. The disfiguring lesions it causes, especially on the face can lead to the affected persons being stigmatised, resulting in ostracism, deprived of education and resulting economic poverty. All of this occurring in those populations with already limited resources. Most of the estimated 600000 plus new cases, annually, occur in children of whom only a few receive treatment. Leishmania species can be categorised according to the source of the infection, as either anthrophonic which is transmitted directly from human to human by infected sand-flies or zoonotic where wild [e.g. hydraxes, 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. By comparison the incidence of visceral Leishmaniasis [VL] is numerically much less in the three countries concerned. Data obtained from the WHO show the basic country data for Jordan, Israel and Palestine West Bank. Note that at this present time, there are no cases of Leishmaniasis in Gaza – information supplied courtesy of the International Co-operation Department, Ministry of Health, Gaza.

Any control programmes must take into consideration changes into socio-economic factors such as migration, conflicts, urbanisation, land use and access to appropriate and timely healthcare.

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.
LABORATORY ASPECTS ON LEISHMANIASIS

In the Middle East, the lack of reliable and quality laboratory diagnostic capability compromises patient care, especially if there is a local perception that laboratory diagnostic testing is not helpful. Consideration should therefore be given to developing fully integrated national and international laboratory plans and strategies. These should include a comprehensive laboratory quality management system. This should apply to regional, national and international laboratories responsible for the health and security of their peoples.

The Middle East Consortium on Infectious Disease Surveillance [MECIDS]

Since it was founded in 2003, MECIDS has been dedicated to monitoring, preventing, and responding to health risks in Jordan, Palestine and Israel. MECIDS also conducts regular multinational training courses for regional health workers, giving them a chance to meet each other while honing their professional skills. Its vision is to promote long term health, stability and security in the region.

At its core, MECIDS serves as a framework through which the participating Ministries of Health share information about disease patterns and coordinate swift cross-border responses in the event of an outbreak. Biosafety and biosecurity, food-borne illnesses, avian influenza.

Middle East respiratory syndrome, coronavirus [MERS-CoV] and leishmaniasis – are the primary health concerns monitored by MECIDS.

With its administrative secretariat in Jerusalem and its scientific secretariat in Amman, MECIDS is able to connect and collaborate with a wide range of regional academic institutions, national centers for disease control, and health ministries.

The MECIDS framework allows informal sharing of sensitive information among network members. Members commit not to forward, publish or quote information, but can use for their own decisions.
This network of communication and information sharing is based on trust. To build such trust, people need to meet regularly in order to get to know one another professionally and personally and build a sound working relationship.
ISRAEL

BASIC COUNTRY DATA

Total Population: 7,624,600
Population 0-14 years: 27%
Rural population: 8%
Population living under 1.25 USD a day: no data
Population living under the national poverty line: no data
Income status: High income economy: OECD
Rating: Very high human development (ranking 17)
Per capita total expenditure on health at average exchange rate (US dollar): 1,960
Life expectancy at birth (years): 82
Healthy life expectancy at birth (years): 71

BACKGROUND INFORMATION

VL and CL are both endemic in Israel. Since 1995, both VL and CL have spread to new areas. Only sporadic cases of human VL used to occur, but in a survey of 1995, up to 11.5% of dogs were infected with *L. infantum* in villages between Jerusalem and Tel Aviv, suggesting a new endemic focus of VL [1].

The presence of CL was first documented at the beginning of the 20th century. CL by *L. major* is hyperendemic in the Jordan valley (especially in the lower and middle valley) and occurs mainly in the southern regions of Israel. There are small zoonotic foci in the Negev and Arava valleys [2]. Between 1983 and 1987, there was a gradual decrease in the incidence of CL as a result of the drought, which reduced the zoonotic foci and the *Psammomys* population [2]. Since 2003, the number of cases has increased again and 4 outbreaks have occurred in the last 5 years. In 2005, the incidence in soldiers was 200/100,000; the highest incidence now is among soldiers.

CL by *L. tropica* used to be uncommon, but has recently emerged in urban and rural foci of central and northern Israel and forms a potential public health concern [3]. In the past five years, outbreaks of CL due to *L. tropica* have occurred in Tiberias, Ma‘ale Adumim and Pduel; outbreaks due to *L. major* have occurred in Nizzana and Beit Se’an.
21% of VL cases are coinfected with HIV (6/28 cases from 1990-2008), but they were all imported.

Both CL and VL are thought to be underreported.

PARASITOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Leishmania species</th>
<th>Clinical form</th>
<th>Vector species</th>
<th>Reservoirs</th>
</tr>
</thead>
<tbody>
<tr>
<td>L. major</td>
<td>ZCL</td>
<td><em>P. papatas</em></td>
<td><em>Psammomys obesus, Meriones crassus, Microtus sociocaviais, Nosema indica</em></td>
</tr>
<tr>
<td>L. tropica</td>
<td>CL</td>
<td><em>P. sergenti, P. arabicus</em></td>
<td>Human, <em>Procavia capensis</em></td>
</tr>
<tr>
<td>L. infantum</td>
<td>ZVL, CL</td>
<td><em>P. syriacus, P. perffeliwi, P. tobbi</em></td>
<td><em>Canis familiaris</em></td>
</tr>
<tr>
<td>L. donovani</td>
<td>CL</td>
<td>unknown</td>
<td></td>
</tr>
</tbody>
</table>

MAPS AND TRENDS

Cutaneous leishmaniasis
Number of cases of visceral leishmaniasis

<table>
<thead>
<tr>
<th>Year</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>2</td>
</tr>
<tr>
<td>1995</td>
<td>2</td>
</tr>
<tr>
<td>1996</td>
<td>0</td>
</tr>
<tr>
<td>1997</td>
<td>3</td>
</tr>
<tr>
<td>1998</td>
<td>2</td>
</tr>
<tr>
<td>1999</td>
<td>3</td>
</tr>
<tr>
<td>2000</td>
<td>0</td>
</tr>
<tr>
<td>2001</td>
<td>3</td>
</tr>
<tr>
<td>2002</td>
<td>3</td>
</tr>
<tr>
<td>2003</td>
<td>3</td>
</tr>
<tr>
<td>2004</td>
<td>2</td>
</tr>
<tr>
<td>2005</td>
<td>0</td>
</tr>
<tr>
<td>2006</td>
<td>2</td>
</tr>
<tr>
<td>2007</td>
<td>0</td>
</tr>
</tbody>
</table>

Cutaneous leishmaniasis trend

CONTROL

The notification of leishmaniasis is mandatory in the country and a national leishmaniasis control program has been in place for CL since 2005. Case detection is passive. There is a leishmaniasis vector control program for CL; insecticide spraying occurs sporadically. There is a leishmaniasis reservoir program for CL; positive dogs are sacrificed if the owner agrees.

DIAGNOSIS, TREATMENT

Diagnosis
CL: on clinical grounds in local outpatient health centers. Confirmation by microscopic examination of a skin lesion sample can be performed in regional hospitals. PCR is performed in one diagnostic center in Israel.
VL: rK39 based ICT (in specialized hospitals) and PCR (in one diagnostic center).

Treatment
VL: antimonials, 20 mg Sb\textsuperscript{3+}/kg/day for 28 days. Cure rate is > 95%. Second line: liposomal amphotericin B, 3 mg/kg/day for day 1-5, 10, 14 and 21.
CL: antimonials, topical or systemic (20 mg Sb\textsuperscript{3+}/kg/day for 20 days). Paromomycin ointment is also used for CL.
ACCESS TO CARE

Care for leishmaniasis is provided for free, even though a small variable payment may be required for some drugs (e.g., paromomycin ointment). Treatment with liposomal amphotericin B (AmBisome, Gilead) is not reimbursed by all insurance companies. Treatment is thought to be accessible for all patients. CL is diagnosed and treated at health center and outreach post level. The diagnosis of VL takes place in specialized hospitals only. Only very few patients use the private sector (only for CL).

ACCESS TO DRUGS

Sodium stibogluconate and liposomal amphotericin B are included in the National Essential Drug List for VL, and sodium stibogluconate and paromomycin ointment are for CL. Drugs are not available at pharmacies or drug markets. Pentostam (GSK) and AmBisome (Gilead) are registered in Israel.

SOURCES OF INFORMATION

- Drs Dan Gandacu, Laor Orshan, Tamar Yeger, Ministry of Environmental Protection, IMRIC-Hebrew University-Hadassah, Jerusalem.
- Drs Eli Schwartz and Moshe Ephros, Medical Ctr. Tel Hashomer (ES) and Carmel Medical Ctr., Haifa (ME).
- Dr Charles L. Jaffe, Hebrew University-Hadassah, Jerusalem. Leishmaniasis in the European Region, a consultative intercountry meeting, Istanbul, Turkey, 17–19 November 2009.


JORDAN

BASIC COUNTRY DATA
Total Population: 6,047,000
Population 0-14 years: 38%
Rural population: 22%
Population living under USD 1.25 a day: 0.4%
Population living under the national poverty line: 13.3%
Income status: Upper middle income economy
Ranking: Medium human development (ranking 95)
Per capita total expenditure on health at average exchange rate (US dollar): 336
Life expectancy at birth (years): 73
Healthy life expectancy at birth (years): 61

BACKGROUND INFORMATION
VL is a rare disease in Jordan, and only about 15 cases have been reported since 1960; the last two of which in 2003 [1]. VL is most likely underreported.

CL due to L. major is endemic and used to be known as “Jericho boil”. Since 1985, outbreaks have appeared in areas where CL was previously unknown [2,3,4]. The Jordan valley is home to endemic areas with very high infection rates. In the hyperendemic area of Swaimeh, 100% of individuals over 5 years old were found positive in a leishmanin skin test survey in 1992. Higher infection rates (72.4%) are recorded in males than females (27.6%) in all age groups. Disease is more prevalent in children under 5 years (24%) than in those older than 50 (8%) [5].

CL due to L. tropica is less common. It occurs in the northern border area, where it is sporadic in rural villages [6]. Imported cases from Saudi Arabia have been found.

Outbreaks of CL have been reported every year for the past 5 years: in Aqaba (2006 and 2007), North Agwar (2008) and South Shuneh (2004 and 2005) with 100-200 cases. Severe underreporting of CL is suspected; between 2001 and 2003, an estimated incidence was 47 times higher than the officially reported number of cases [7]. Among the factors causing
underreporting were a lack of physicians' awareness of the importance of notification and lack of treatment.

No cases of HIV-Leishmania co-infection have been reported.

PARASITOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Leishmania species</th>
<th>Clinical form</th>
<th>Vector species</th>
<th>Reservoirs</th>
</tr>
</thead>
<tbody>
<tr>
<td>L. infantum</td>
<td>ZVL</td>
<td>unknown</td>
<td>Canis familiaris</td>
</tr>
<tr>
<td>L. tropica</td>
<td>CL</td>
<td>P. sergenti</td>
<td></td>
</tr>
<tr>
<td>L. major</td>
<td>ZCL</td>
<td>P. papatasi</td>
<td>Psammomys obesus, Meriones libycus</td>
</tr>
</tbody>
</table>

MAPS AND TRENDS

Cutaneous leishmaniasis

![Cutaneous Leishmaniasis Number of cases (2008)](image1)

![Cutaneous Leishmaniasis Incidence/10,000 (2008)](image2)

![Cutaneous leishmaniasis trend](image3)
CONTROL

The notification of leishmaniasis is mandatory. There is no national leishmaniasis control program. Case detection is passive.

DIAGNOSIS, TREATMENT

Diagnosis
CL: on clinical grounds. Confirmation with microscopic examination of skin lesion sample in specialized hospitals. PCR is only possible outside of Jordan.
VL: microscopic examination of aspirate (sometimes with cultures) in specialized hospitals. PCR is only possible outside of Jordan.

Treatment
CL: antimonials, intralesional and systemic (10 mg Sb³/kg/day), cryotherapy and antibiotics. Reported cure rate for topical treatment with antimonials is 100%.

ACCESS TO CARE

Medical care is provided for free in Jordan, and includes care for leishmaniasis. A small number of patients is treated outside the public health system, by the Royal Medical Services. VL can only be diagnosed and treated in specialized hospitals. CL is diagnosed (on clinical grounds) and treated in health posts and health centers, but there is no treatment available at this level, other than topical and oral antibiotics. Antimonials and cryotherapy are only provided at hospital level. The Ministry of Health provided antimonials (Pentostam, GSK) for the topical treatment of about 100 patients in 2007 and about 375 patients in 2008, which is less than the number of patients reported, therefore, leading to drug shortages. There is a lack of trained human resources to treat CL and a lack of awareness of the disease among the public and health workers. In some communities, CL lesions are considered a normal event; and in remote rural communities, traditional healing methods, such as plant extracts and lightened cigarettes, are used to destroy lesions.

ACCESS TO DRUGS

Sodium stibogluconate is included in the National Essential Drug List for VL and CL. For CL, also cryotherapy and several antibiotics are included. Pentostam (GSK) is the only drug registered in Jordan for leishmaniasis. Drugs for leishmaniasis are not available at private pharmacies and are not sold at informal drug markets.

SOURCES OF INFORMATION

- Dr. Khalil Abdul-Aziz Kanani, Ministry of Health.


WEST BANK AND GAZA STRIP

BASIC DATA

Total Population: 4,152,102
Population 0-14 years: 42%
Rural population: 28%
Population living under 1.25 USD a day: no data
Population living under the national poverty line: 21.9%
Income status: Lower middle income economy
Ranking: Medium human development (ranking 114)
Per capita total expenditure on health at average exchange rate (US dollar): no data
Life expectancy at birth (years): 72

BACKGROUND INFORMATION:

CL was first detected in the beginning of the 20th century [1]. VL and CL are both endemic, except in the Gaza strip, where both forms have not been reported. Both CL and VL are thought to be underreported.

VL by *L. infantum* is endemic in the West Bank and more common than in Israel. Between 1993 and 2007, 76 cases of VL were reported from the Hebron district, all in children under 9 years old [2]. Two large surveys among school children in the north and the south of West Bank showed a 7.5% resp. 8.4% seropositivity [2,3]. In bordering northern Israel, seroprevalence was 3.0% [4], probably referring to better economic circumstances.

The incidence of CL increased dramatically after 1967. Its incidence has further increased steadily over the last 4 years, with the highest incidence in the Jericho area. CL by *L. tropica* is endemic in the West Bank, while CL in the Jericho area seems to be mainly caused by *L. major* [1].

One case of HIV/CL co-infection was reported in a child in Jericho in 1994.
PARASITOLOGICAL INFORMATION

<table>
<thead>
<tr>
<th>Leishmania species</th>
<th>Clinical form</th>
<th>Vector species</th>
<th>Reservoirs</th>
</tr>
</thead>
<tbody>
<tr>
<td>L. infantum</td>
<td>ZVL</td>
<td>P. syriacus, P. perffiliewi, P. tobbi</td>
<td>Canis familiaris</td>
</tr>
<tr>
<td>L. tropica</td>
<td>ACL</td>
<td>P. sergenti</td>
<td></td>
</tr>
<tr>
<td>L. major</td>
<td>ZCL</td>
<td>P. papatasi</td>
<td>Psammomys obesus</td>
</tr>
</tbody>
</table>

MAPS AND TRENDS

Visceral leishmaniasis

Visceral Leishmaniasis
Number of cases (2009)

Cutaneous leishmaniasis

Cutaneous Leishmaniasis
Number of cases (2009)
CONTROL

The notification of leishmaniasis is mandatory in the territory and a leishmaniasis control program for CL has been in place since 1996. There is a leishmaniasis vector control program and insecticide spraying is regularly done. There is no leishmaniasis reservoir program, but surveys of dogs are regularly done and positive dogs are sacrificed.

DIAGNOSIS, TREATMENT

Diagnosis:
CL: on clinical grounds. Confirmation by microscopic examination of a skin lesion sample. PCR is performed in one diagnostic center in Jericho.
VL: confirmation by microscopic examination of bone marrow aspirate and PCR (in one diagnostic center).

Treatment
VL: antimonials, 20 mg Sb/kg/day for 3 weeks. In 2005, there were 2 treatment failures. Full recovery was achieved after treatment with amphotericin B.
CL: antimonials, intraleisional or systemic (20 mg Sb\(^7\)/kg/day) for 14 days and in case of poor response, an additional 7 days. Paromomycin ointment and cryotherapy are also sometimes used for CL.

ACCESS TO CARE

Care for leishmaniasis is provided for free. An unknown proportion of patients seek care in private facilities, which is very expensive. CL and VL are diagnosed and treated at primary health care level, but advanced diagnostic techniques are restricted to one research center in Jericho. The Ministry of Health purchases antimonials (Pentostam, GSK) for the treatment of VL and CL. Treatment is thought to be accessible for all patients.

ACCESS TO DRUGS

Sodium stiboglucone is included in the National Essential Drug List for VL and CL. Drugs for leishmaniasis are not available at pharmacies or drug markets. No antimonials are registered in West Bank and Gaza Strip.

SOURCES OF INFORMATION


“If everyone is moving forward together, then success takes care of itself”

Henry Ford

From my discussions with the people from all three nations, see Appendix 2, I would like to endorse the following proposals which using the above quote of Henry Ford to guide us, should be incorporated into “The Manual” [defined as a handbook or handy compendium of a large subject or treatise; an instruction book]. The Chambers Dictionary 13th Edition 2014.

- A Central or Regional Committee on Leishmaniasis should be organised, as soon as possible. This Committee would be a source of the harmonisation of guidelines/recommendations for the prevention and control; clinical and laboratory diagnosis, treatment, epidemiology and prioritising research proposals. There would be, per force, the need for “buy in” by the policy makers in the political, financial and medical institutions of each country. The constitution, terms of reference and remit to be decided amongst the three countries concerned. Should outside guidance be sought then SFCG, MECIDS or CORDS could be consulted. Any proposal must be manageable, affordable and achievable within a realistic time frame.

- The principle aim is to harmonise and standardise the management of Leishmaniasis.

- This proposed regional co-operation/collaboration is essential. Infections carries no passports and do not recognise international borders.

- Standardise laboratory diagnosis, together with validation of all laboratory tests – microscopy, culture and the latest molecular techniques.

- Jordan to be supported in its desire to create regional diagnostic laboratories in the North and South in order to relieve the pressure on the Central Public Health Laboratory in Amman. Training of sufficient technicians to work in these two new regional laboratories was also supported.

- Standard approach to prevention and control of vectors and hosts; personal and house protection; education and awareness training for the public and health sector workers.
Treatment protocols to be standardised e.g. should WHO Guidelines be adopted.

Co-ordinated response, whereby each country benefits from each other.

Create a national database of cases which can be shared with the other countries.

Capacity building should, as is anticipated, global warming lead to increase in vector numbers thereby increasing number of human cases.

There needs to be the political will to proceed, as this underwrites initiatives. The political issues as with Damocles Sword, hangs over everything.

Raise public, professional and political awareness and remove the silo mentality from Government ministers and their departments.

Social media is a new phenomenon and needs to be understood, as a matter of urgency. Some politicians and senior medical administrators are finding it very difficult to cope with.

In addition the importance of the role of MECIDS and CORDS [Connecting Organisation for Regional Disease Surveillance, www.cordsnetwork.org] should be reinforced. The “Modality of Co-operation” must change to enforce the bottom line of “Help the People”. We must move forward in collaboration. Apart from the necessity of “political will” there is the need to sufficient funding for this initiative to proceed. Funding can be sourced locally at national level [somewhat difficult given the current circumstances] or internationally, such as DFID, USAID, EU, Rockefeller. The search for funding is an important requirement as lack of money curtails scientific endeavour. Or put another way “The saddest aspect of life right now is that science gathers knowledge faster than society gathers wisdom” - Isaac Asimov. Let this Leishmania initiative prove him wrong.

We support the proposal by the Centers for Disease Control [Morgan et al ,2018] for the development of a strategic scientific framework for global health security, necessary to provide the public health community with an approach to study the implementation of programmes aimed at building capacity to prevent, detect and respond to public health threats such as leishmaniasis. The framework should include a focus on basic epidemiological research and surveillance to understand the causes of leishmaniasis, as well as to characterise the burden and risk factors for the disease, in addition to assessing the different models of laboratory diagnosis. These are necessary to inform political and public
health decision makers on which interventions are appropriate to develop, implement and evaluate in order to accelerate and optimise the management of leishmaniasis in Palestine West Bank, Israel and Jordan.

- As for the health sector, there are few sectors that make a stronger argument for cross-border collaboration in the interest of all involved. Infectious diseases and other health threats know no borders, and yet there is limited cooperation between Israelis, Palestinians and Jordanians, which is something our activities will address. A key approach to changing perceptions and promoting cross-border engagement is by letting people face and tackle challenges together, such as in the case of addressing Leishmaniasis, an infectious disease that cannot be contained without a joint effort, open information exchange, and minimum health standards in all three countries. Leishmania has received widespread news coverage and attention from politicians as the number of cases has strongly increased over the past few years. The disease is widely misunderstood by the public and causes physically alarming symptoms. Unfortunately, lack of access to medical equipment, lack of coordination and communication across borders, and unprepared local health workers have exacerbated the outbreak. The increasing number of reported cutaneous Leishmaniasis cases in Palestine, as well as other outbreak cases in Israel and Jordan, justifies the need to study the epidemiology of the disease. Al-Quds Public Health Society [AQPHS] has developed a new genome wide analysis technique they are testing, analysing, and preparing to publish in this research manuscript. The results from AQPHS research, which will be published in a future research publication, will strengthen the availability of cross-border data on Leishmaniasis while reducing the research gap between Israel and Palestine and Jordan, further progress towards standardizing high-quality data collection, and expand the basis for future trilateral cooperation on emerging diseases like Leishmaniasis.

- In a Design, Monitoring and Evaluation process carried out elsewhere in the People for Peaceful Change Project, we found moderate levels of shared empathy supporting public health cooperation but showed several large areas of disagreement between the two groups. Specifically, health workers show a high level of willingness to work together but largely distance themselves from wanting to promote larger social change outside of health topics.
Unequal access to resources and equipment as well as institutional resistance to large scale coordination are highly cited.

- **Key Connections:** Government health officials should promote the quality of life and well-being of people for all groups - 100% of Palestinians and 82.5% of Israelis agree/strongly agree.

- **Key Gap:** When someone from the “other” group tells me they have trouble feeling secure, I believe them - 33.3% of Palestinians and 75% of Israelis agree/strongly agree.

- **Communication channels for health cooperation:** Given the rising challenges of infectious diseases and other emergencies affecting both populations, there is a glaring weakness in shared resources, best practices, and response coordination. Specifically, when asked if the flow of information and communication has improved, 88.8% of Palestinians agreed, but only 37% of Israelis agreed and 50% were neutral.

- **Outreach skills and expand professional networks:** With minimum institutional cooperation between the two health ministries, and non-existent public or private channels, inability or unwillingness to access to experts and professionals across boundaries greatly undermines public health solutions. Only 41.7% of participants have personally reached out to a colleague from a different group in the last three months to work on health issues.

**The Way Ahead**

From the discussions with and between members of the scientific community from the three countries concerned two general priorities emerge.

1. There is an urgent need for the respective national health services of the participating countries to improve the capacity, early diagnosis and effective treatment of cases of Leishmaniasis.

2. International co-operation in the development and implementation of a trans-border co-ordinated programme of prevention and control measures in order that the incidence of new cases is reduced. One must emphasise that such regional co-operation/collaboration is not just essential, but without it all efforts will *per-force* be doomed to failure. Infectious diseases
carry no passports and international borders are not recognised. Whilst promoting the needs of regional co-operation, each country should seek to address any weaknesses identified, in their core capacities which would be required in order to implement effective programmes for prevention and control, and treatment. The creation of a Regional Committee on Leishmaniasis would be a huge step forward in facilitating such proposals.

In May 2007, the Sixtieth World Health Assembly adopted resolution WHA60.13 on the control of Leishmaniasis, urging Member States where Leishmanisis is a public health problem to: reinforce efforts to set up national control programmes; establish systems for surveillance, data collection and analysis; strengthen prevention and active detection and improve access to appropriate and affordable diagnosis and treatment of cases of both CL and VL; conduct epidemiological assessments of local situations and support studies on surveillance and control of Leishmaniasis; promote the sustainability of Leishmaniasis control; raise awareness and improve preventive practices at community level; and strengthen collaboration between countries that share common foci or disease threats.

We fully endorse the objectives of the WHO Programme as listed below:

- Strengthen public health services institutional capacities and enhance the capacity for decision-making related to leishmaniasis and its control;
- Improve capacities for early detection as well as access to appropriate and affordable diagnosis and treatment of VL and CL cases;
- Reinforce disease surveillance;
- Improve capacities for the prompt response to and prevention of leishmaniasis outbreaks;
- Strengthen appropriate vector and reservoir control interventions;
- Strengthen research capacities;
- Increase community awareness and participation in leishmaniasis prevention;
- Build and scale up partnership action to leishmaniasis control;
- Enhance intersectoral collaboration and
Strengthen cross-border co-ordination and co-operation

With regard to cross-border co-operation, which we view as essential a risk factor that poses a challenge to countries in Region is the importation of cases from neighbouring and other endemic countries either through migration or tourism.

In order to tackle this problem, cross-border collaboration on leishmaniasis control should be set up and promoted. In collaboration with WHO and other partners such as MECIDS and CORDS a functional mechanism should be established for regular and prompt exchange of relevant information, joint epidemiological surveys and assessments should be conducted and joint action plans should be developed to synchronize and harmonize activities to control and prevent leishmaniasis in border areas. In view of the many similarities in eco-epidemiological settings related to vector-borne diseases, including leishmaniasis, it is vitally important that closer co-ordination is promoted. Because leishmaniasis has many similarities to other vector borne diseases, such as malaria and dengue, improvements in the management of leishmaniasis should be presented in the context of a broader national and international vector borne disease strategy. This will raise the profile of leishmaniasis as a disease, no longer a neglected disease and provide access to personnel and other resources which are available for any other vector borne disease programmes. In addition by improving the capacity to manage an existing disease, such as leishmaniasis, will de-facts enhance epidemic preparedness and the ability to respond to other emerging and re-emerging infectious disease threats. This ability will become even more essential in the face of global warming and its effect on vector distribution.
REFERENCES


Accessed 03/12/2018.


APPENDIX 1

Al-Quds Public Health Society
Leishmaniasis in Humans and Animals
Cyprus - December 2017

Workshop Coordinator
Ziad Abdeen
Cell (+972) 2522308842
Email: Zabdeen13@gmail.com

Course Description
The purpose of this workshop is to introduce participants to infectious agents transmitted by arthropod vectors that produce an enormous disease burden worldwide, especially in underdeveloped countries. There are up to 2 million new cases per year mostly children, and results in 4 million DALYs lost. This workshop is designed to investigate the epidemiology of Leishmaniasis that principally affect people living in Middle Eastern countries. Topics include host-parasite-vector relationships; diagnostics; parasite biology; vector biology; epidemiology; host immunity and risk factors associated with infection. Options for treatment, prevention and control involving vectors, parasites and human behavior are examined, as well as needed public health policies and actions. Monitoring and evaluation of program such as vector control strategy. The class format will involve a combination of lectures, small group work, and discussion. We expect all participants to attend meeting sessions and actively participate. The workshop emphasizes teamwork.

Workshop Objectives
Upon successful completion of the workshop, participants should be able to:

1. Recognize and understand the zoonotic potential of Leishmaniasis
2. Understand the epidemiology of Leishmaniasis that is of great public health concern
3. Describe the route(s) of transmission of Leishmaniasis
4. Understand the complex relationships between host and vector that affect transmission and control.
5. Integrate the host and parasite relationships to understand the immune response nature of disease and disease manifestations.
6. Interpret epidemiological indices associated with patterns of Leishmaniasis transmission.
7. Monitor and evaluate different approaches to Leishmania control, either through vector control, chemotherapy and vaccines when they become available.
8. Describe and demonstrate competency-based training techniques
9. Describe levels of training evaluation

What will you achieve?
By the end of the workshop, you'll be able to...
1. Describe the cause of Leishmaniasis, the way it is transmitted and the basic epidemiology of the disease.
2. Identify the clinical pictures of Leishmaniasis and the tools used for the diagnosis and treatment of Leishmaniasis, in order to improve case management.
3. Identify and name the different control measures for Leishmaniasis
4. Reflect on the realities of implementing a Leishmania control programme and the role of community outreach, disease surveillance and control program evaluation.
5. Have an improved understanding of the fundamentals of monitoring and evaluation
6. Be able to apply these principles to the work of their institution in order to facilitate increased efficiency and effectiveness
7. Describe the steps needed to plan for training implementation.
8. Develop selected components of a training curriculum

Training/Learning Methodology:
- Discussion
- Group work
- Lecturette

Workshop Materials:

**Recommended text:**

# Leishmaniasis Workshop

## Sessions and Times

### Day 1

<table>
<thead>
<tr>
<th>Session 1</th>
<th>Time</th>
<th>Title</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>08:30-09:00</td>
<td>Registration</td>
<td>30 minutes</td>
</tr>
<tr>
<td></td>
<td>09:00-11:10</td>
<td>Welcome</td>
<td>130 minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Introduce yourself to the group</td>
<td>20 minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Alliterate – the name game</td>
<td>10 minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Answer the 4 Gs</td>
<td>35 minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Official Welcome</td>
<td>10 minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Training Objectives and Agenda</td>
<td>20 minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pre-Test</td>
<td>15 minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Break</td>
<td>20 minutes</td>
</tr>
</tbody>
</table>

### Session 2

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>11:10-13:00</td>
<td>History and Epidemiology and life cycle of Leishmaniasis</td>
<td>110 minutes</td>
</tr>
<tr>
<td></td>
<td>What is a parasite?</td>
<td>10 minutes</td>
</tr>
<tr>
<td></td>
<td>Definition, classification, pathogenesis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Definition of Leishmania and Leishmaniasis</td>
<td>10 minutes</td>
</tr>
<tr>
<td></td>
<td>History and Synonyms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>What is Epidemiology?</td>
<td>15 minutes</td>
</tr>
<tr>
<td></td>
<td>Incidence, Prevalence, health determinants</td>
<td></td>
</tr>
<tr>
<td></td>
<td>What is Public Health?</td>
<td>20 minutes</td>
</tr>
<tr>
<td></td>
<td>Geographical distribution</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Worldwide, regionally + maps</td>
<td>15 minutes</td>
</tr>
<tr>
<td></td>
<td>Impact of Leishmaniasis (DALY)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pathophysiology</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parasite Taxonomy</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parasite Morphology (different forms)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Promastigote (infectious form)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Amastigote (Disease causing form)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Life Cycle</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mode of Transmission</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Steps of phagocytosis</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Lunch</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:00-14:00</td>
<td>Lunch</td>
<td>60 minutes</td>
</tr>
</tbody>
</table>

### Session 3

<table>
<thead>
<tr>
<th>Time</th>
<th>Title</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>14:00-15:30</td>
<td>Types of Leishmaniasi, clinical manifestation and Symptoms</td>
<td>90 minutes</td>
</tr>
<tr>
<td></td>
<td>Types of Leishmaniasi (3 types)</td>
<td>10 minutes</td>
</tr>
<tr>
<td></td>
<td>Clinical manifestation of different species</td>
<td>15 minutes</td>
</tr>
<tr>
<td></td>
<td>Reservoirs</td>
<td>10 minutes</td>
</tr>
<tr>
<td></td>
<td>Vectors (important species)</td>
<td>10 minutes</td>
</tr>
<tr>
<td></td>
<td>Break</td>
<td>20 minutes</td>
</tr>
<tr>
<td></td>
<td>Assignment</td>
<td>10 minutes</td>
</tr>
<tr>
<td></td>
<td>Epidemiology of Leishmaniasi by country</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post-test</td>
<td>15 minutes</td>
</tr>
</tbody>
</table>
Leishmaniasis
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Contents</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table of contents</td>
<td>i</td>
</tr>
<tr>
<td><strong>UNIT ONE:</strong> Introduction</td>
<td>1</td>
</tr>
<tr>
<td>1.1 Purpose and use of module</td>
<td>1</td>
</tr>
<tr>
<td><strong>UNIT TWO:</strong> Core modules</td>
<td>3</td>
</tr>
<tr>
<td>2.1 Significance and definition of Leishmaniasis</td>
<td>9</td>
</tr>
<tr>
<td>2.2 Learning Objectives</td>
<td>9</td>
</tr>
<tr>
<td>2.3 Definition</td>
<td>9</td>
</tr>
<tr>
<td>2.4 Epidemiology</td>
<td>9</td>
</tr>
<tr>
<td>2.5 Etiology</td>
<td>13</td>
</tr>
<tr>
<td>2.6 Clinical features</td>
<td>14</td>
</tr>
<tr>
<td>2.7 Diagnosis</td>
<td>18</td>
</tr>
<tr>
<td>2.8 Case Management</td>
<td>19</td>
</tr>
<tr>
<td>2.9 Prevention and control</td>
<td>21</td>
</tr>
<tr>
<td><strong>UNIT THREE:</strong> Roles and Task Analysis</td>
<td>24</td>
</tr>
<tr>
<td><strong>UNIT FOUR:</strong> Glossaries</td>
<td>28</td>
</tr>
<tr>
<td><strong>UNIT FIVE:</strong> Abbreviations</td>
<td>29</td>
</tr>
</tbody>
</table>
UNIT ONE
INTRODUCTION

1.1 Purpose and use of the modules

This module is prepared for public health officers, environmental health Workers and Laboratory technicians who need to work as cooperative team members. Other categories and members of health centre team could also use this module.

The module emphasizes teamwork. It will serve as a practical guide to the management of several forms of leishmaniasis. It is believed that this module will provide the theoretical background of knowledge for health centre team staff in different disciplines with practical approach. However, it doesn't mean that it should substitute other reference materials and textbooks.
2.2 Significance and brief description of Leishmaniasis

Leishmaniasis is one of the causes of morbidity and mortality in Ethiopia. It has been reported that cases of leishmaniasis occur in western parts of the country mainly but also in southern & eastern regions. People living in the low lands of aforementioned areas have always been at risk.

2.3 Learning objectives

Upon the completion of the activities in this module, the learner Will be able to:

1. Describe the causes and clinical pictures of Leishmaniasis
2. Make appropriate diagnosis of Leishmaniasis at individual and community level
3. Treat Leishmaniasis as recommended
4. Identify and name the different control measures for Leishmaniasis
5. Understand and identify the tasks and roles of the team members in a health Centre

2.4 Definition

Leishmaniasis are a group of parasitic diseases caused by protozoan flagellates of the genus Leishmania, transmitted through the infective bite of an insect vector, the phlebotomine sand fly.

2.5 Epidemiology

Magnitude

Global: Leishmaniasis is threatening 350million people in 88 countries on four continents. The annual incidence of new cases is estimated between 1.5 and 2 million.
There are estimated 12 million cases worldwide. In numerous underdeveloped countries, they remain a major public health problem.

Israel-Jordan-Palestine:
As mentioned earlier the disease affects people living in a significant portion of the region. Not a significant number of studies have been done in our country to determine the magnitude. The burden of leishmaniasis is not well studied in our region.

Geographical distribution
Global: Leishmaniasis are widely distributed around the world. They range over inter-tropical zones of America, Africa and extend in to temperate regions of South America, southern Europe and Asia. Their extension limits are latitude 45° north and 32° North.
Vector
Sand flies are Diptera of the family psychodidae, subfamily phlebotominae. Their life cycle includes two different biological stages; the flying adult and the development phases of egg, larva and pupa.

The adults are small flying insects of about 2-4mm in length, with a yellowish hairy body. During the day, they rest in dark & sheltered places. They are active at dusk & during the night. Both sexes feed on plants, but females also need a blood meal before they are able to lay eggs.

Reservoir
Most leishmaniasis is zoonosis and the reservoir hosts are various species of mammals. Depending on the focus, the reservoir can be either a wild or a domestic mammal. In particular cases, human beings can be the host also.

Life cycle
In nature, Leishmania are alternatively hosted by the insect (flagellated promastigotes) and by mammals (intracellular Amastigotes). When a female sand fly takes blood meal from an infected mammal; the insect ingests intracellular Amastigot. Inside the fly Amastigot are transformed into flagellated promastigotes in the mid gut. The promastigotes migrate into the anterior portion of the mid gut. The bite of an infected sand fly deposits infective promastigotes in the mammals' skin, which are rapidly phagocytosed by the cells of mononuclear-phagocyte system. The intracellular parasites change into amastigotes, which multiply by simple mitosis.
**LIFE CYCLE (L. donovani)**

**Transmission**

Leishmaniasis is a vector borne disease. It is mainly transmitted from the reservoir host to the healthy individual by the bite of female phlebotomus sand fly. The inoculation of promastigotes through the sand fly bite is the usual method of leishmaniasis transmission.

In visceral leishmaniasis, a few cases of congenital and of blood transfusion transmission have been reported. Exchange of syringes has been incriminated to explain the high prevalence of *L. infantum* /HIV confection in intravenous drug abusers in southern Europe.
Predisposing factors
Young children, travelers who are non-immune, refugees displaced people and laborers entering into leishmaniasis area are groups who are at risk of getting leishmaniasis.

Population movements, such as rural to suburban migrations are factors for visceral leishmaniasis extension, by exposing thousands of non-immune individuals to the risk of infection. Economic developments resulting in movement of population caused dramatic out breaks in parts of the world. People in rural areas with limited access to health services are the most affected.

Immunodeficient patients, particularly those with HIV infection, have been found to develop visceral Leishmaniasis more frequently when compared to normal individuals.

2.6 Etiology
The disease is caused by species of Leishmania.
Leishmania are dimorphic parasites, which present as two principal morphological stages: the intra cellular amastigotes in the mononuclear phagocytic system of mammalian host, and flagellated promastigote in the vector.

Classification: there are different species of the genus Leishmania, the majority of which commonly infect humans in whom they are responsible for various types of diseases: visceral, cutaneous (of diffuse or localized types) and mucocutaneous leishmaniasis.

The parasite has been classified into two subgenera: Leishmania sensu stricto present in both Old world and New Worlds, and viannia restricted to the New World. With in these two subgenera various species complexes were individualized.
### Table: Major Leishmania species that cause disease in humans

<table>
<thead>
<tr>
<th>Species</th>
<th>Clinical Syndrome</th>
<th>Geographical Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subgenus sensu stricto</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L. donovani complex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L. donovani</td>
<td>VL (PKDL, OWCL)</td>
<td>China, Indian Subcontinent, South western Asia, East Africa</td>
</tr>
<tr>
<td>L. infantum</td>
<td>VL (OWCL)</td>
<td>China, Indian subcontinent, Southwestern Asia, East Africa, Southern Europe</td>
</tr>
<tr>
<td>L. chagasi</td>
<td>VL (NWCL)</td>
<td>Central and South America</td>
</tr>
<tr>
<td>L. mexicana complex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L. mexicana</td>
<td>NWCL (DCL)</td>
<td>Texas, Mexico, South and Central America</td>
</tr>
<tr>
<td>L. amazonensis</td>
<td>NWCL (ML, DCL, VL)</td>
<td>Panama and South America</td>
</tr>
<tr>
<td>L. tropica</td>
<td>OWCL (VL)</td>
<td>India, Central Asia, South western Asia, Middle East, North &amp; Central Africa, East Africa</td>
</tr>
<tr>
<td>L. Major</td>
<td>OWCL</td>
<td>India, Central Asia, South western Asia, Middle East, North and Central Africa, East Africa</td>
</tr>
<tr>
<td>L. aethiopica</td>
<td>OWCL (DCL)</td>
<td>Ethiopia, Kenya</td>
</tr>
<tr>
<td><strong>Subgenus viannia</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L. (V.) braziliensis</td>
<td>(ML)</td>
<td>South America</td>
</tr>
<tr>
<td>L. (V.) guyanensis</td>
<td>NWCL (ML)</td>
<td>South America</td>
</tr>
<tr>
<td>L. (V.) Panamensis</td>
<td>(ML)</td>
<td>America, Venezuela, Columbia, Ecuador, Peru</td>
</tr>
<tr>
<td>L. (V.) Peruviana</td>
<td>NWCL</td>
<td>Peru</td>
</tr>
</tbody>
</table>

Abbreviations-VL-Visceral Leishmaniasis; PKDL-Post Kala-Azar Dermal Leishmaniasis; OWCL-Old World Cutaneous Leishmaniasis, NWCL-New World Cutaneous Leishmaniasis; DCL-Diffuse Cutaneous Leishmaniasis; ML-Mucosal Leishmaniasis

### 2.7 Clinical Features

(A) Visceral Leishmaniasis (VL)

**Incubation Period**

The incubation period is difficult to evaluate precisely. It is generally 2-6 months, but can range from 10 days to many years.

**Disease Onset**

The onset of disease may be sudden or gradual, the overall condition of the patient is usually good in the early stages.
Symptoms and signs

- Fever
  Fever is the major symptom with rapid rise in sudden onset and slow rise in gradual onset. It is intermittent and irregular, with double or triple rise per day usually to 38 – 39°C, but possibly reaching 40 – 41°C. It lasts for some weeks followed by a pyrexial period.

- Weight loss
  Asthenia, loss of appetite and prominent muscle wasting of extremities is prominent feature in well-established VL.

- Splenomegaly
  Splenomegaly appears early and is almost invariably present. The spleen size increases regularly with duration of the disease eventually extending down to the left hypochondrium.

- Hepatomegaly
  Less frequent and appears later than Splenomegaly. Liver is slightly enlarged and painless. Rarely jaundice appears in later stages and is poor prognostic sign.

- Diarrhea
  Frequently reported and is due to ulceration of digestive mucosa.

- Cough
  Can occur as a result of pulmonary involvement with a dry, non-productive cough.

- Anemia
  Responsible for extreme paleness of skin and mucosa, giving grey appearance of patients (hence “kala-azar” – black fever)

- Bleeding
  Episodes of bleeding as epistaxis and rarely bleeding from gums, purpura, and petechiae can occur

- Ascites
  Considered as a late sign and bad prognostic sign, sometimes associated with edema and pleural effusions.
Biological Parameters

- Pancytopenia
  - Normochromic and normocytic anemia
  
  Leucopenia with neutropenia responsible for associated infection
  Thrombopenia responsible for bleeding with alterations of hepatic coagulation factors.

- Raised ESR, C reactive protein(CRP)

- Disturbed plasma protein profiles with low albumin levels and hyper gammaglobulinemia

(B) Cutaneous Leishmaniasis (CL)-Oriental sore

CL presents as skin lesions, which are generally localized, without involvement of the mucosa, and not generalized infection. They occur on exposed parts of the body accessible to sandflies: face, hands, forearms and lower limbs. Rarely, dermatotropic parasites may give rise to disseminated CL, with multiple nodules on large areas of the skin.

Localized Cutaneous Leishmaniasis (LCL): All species of Leishmania can cause localized CL.

  • Incubation period ranges from weeks to months
  • Starts as erythematous papule to reach its definitive size in a few weeks
  • The mature lesion is well defined with regular outline, round to oval in shape, variable dimension (0.5 – 10 cm on diameter) and usually multiple.
  • It can be ulcerative or dry with papulo nodular lesion covered by scales

Diffuse Cutaneous leishmaniasis (DCL): Some specific species of Leishmania can cause a diffuse form of CL

  • A non-ulcerative nodule rich in parasites represent this form of the disease
  • Starts as an isolated nodule then joining to form large patches disseminated all over the body.
It is related to a defective immune system of the patient. The lesions resemble that of leprosy and do not heal spontaneously and relapse is common after treatment.

(C) Muco-cutaneous Leishmaniasis (MCL)

MCL is due to L braziliensis and L. Panamensis occasionally. It is seen in the New world and they call it “Espundia”.

It has two stages. The first one is a primary cutaneous lesion, which eventually is followed by mucosal involvement.

The cutaneous lesion is similar with localized cutaneous leishmaniasis and the mucosal involvement start with the nasal mucosa later on destroying the nasal septum. The buccal mucosa is involved at later stages and the disease can progress to lips, palate and larynx.

(D) Post Kala-Azar Dermal Leishmaniasis (PKDL)

After a latent period of 1 year following kala-azar cure, skin lesions can appear in around 20% of cases. Beginning as depigmented macules, turn in to papular and then to nodular eruptions. Located initially on the face they can extend to the whole body.

2.8 Diagnosis

(1) History of residence and travel to Leishmania area

(2) Clinical history and physical finding

(3) Laboratory finding

Definitive diagnosis is based on the detection of the parasite or its DNA samples

Sample Collection

Bone marrow and spleen aspirations for visceral Leishmaniasis
Superficial skin/Mucosal scraping for cutaneous and mucocutaneous leishmaniasis

Detection methods

- The sample collected can be stained with panoptic May Grunwald Giemsa stain
  Amastigotes seen in monocytes or outside; called
  Leishman Donovan (LD) bodies

Cultured – NNN medium
  Grow as promastigotes

Inoculated into lab animals (Golden Hamster)
Molecular diagnosis by DNA detection or PCR technique

2.9 Case management

(A) Visceral Leishmaniasis

1. Provision of anti-leishmania drug
2. Correcting Nutritional deficiencies
3. Blood transfusion in case of severe anemia
4. Treating secondary bacterial infection

Drugs

1. Antimonials

- Sodium stibogluconate (pentostam®), meglumine antimonite (Glucantime®) are available. They have poor oral absorption; hence have only parenteral route.
- Supplied:
  -sodium stibogluconate as 100mlbott (100mgsb)ml
  -meglumine antimonite as 5ml ampule (85mgsb)
- Dose is 20 mg sb*/kg per day for 28 days on daily bases
2- Amphotericin B
- powerful antileishmanial used in the treatment of severe Leishmaniasis (VL, MCL) or forms resistant to Antimonials
- it is alternative 1st line drug
- formulated as a colloidal suspension which is administered as slow (6–8 hr) IV infusion 0.5-1mg/kg dissolved in 500 ml dextrose 5% on alternate days
- 14-20 infusions for a total dose of 1.5gm

3- Pentamidine
- restricted to treatment of CL
- 4mg/kg per injection
- IM or IV on alternate days
- short courses (four doses) for CL
- Long courses (period of weeks) for resistant VL

Clinical response in visceral leishmaniasis is slow. The patient becomes afebrile after 4-5 days of treatment; other clinical symptoms and biological parameters slowly regress.

(A) Localized CL
Management depends on the type and characters of the lesions, the Leishmania species involved the risk of extension and patients preference.
Possibilities are abstention, local or systemic treatment.

(B) Diffuse CL
Once established, DCL has proved to be resistant to treatment. Systemic pentavalent antimonial can improve clinical situation. There is a need to try other new products like liposomal amphotericine B and IFNγ.
(D) MCL
It is important to give systemic treatment before primary cutaneous lesion extends to facial mucosae. Once it involves the mucosa, treatment should be fast and with antimonials injected for 28 days. Amphotericine B can be used for poorly responding cases.

2.10 Prevention and Control

Intervention strategies for prevention and control are hampered by the presence of many reservoir hosts and multiplicity of sand fly vectors. There are many eco-epidemiological entities each requiring distinct control strategies.

Prevention
Aim of prevention
- Avoiding host infection
- Preventing subsequent progression to disease

Strategies
- Early diagnosis and treatment
- Prevent intrusion of people in to natural zoonotic foci
- Protect against infective bites of sand flies
- Health education
- Community participation

Individual prevention
- Avoiding risk of exposure: Avoid vicinity of sand fly breeding sites or resting sites
- Mechanical means: self protection form sand fly bite by wearing clothes, bed nets
- Chemical means: repellants applied to the skin

Collective measures
- Forest clearance: establishment of forest free zone of about 400 meters around human settlements
- Indoor residual spraying
Control

Aim of control
- interrupt life cycle of parasite
- limit or eradicate the disease

Targets are the vector and the reservoir

Strategies
Depend on ecology and behavior of the main targets
- Case detection and treatment: when reservoir is human
- Wild reservoir control: when reservoir are rodents, not applicable to other mammals
- Sandfly control
  
Destruction of breeding sites
Insecticide spraying

Other Methods
- Health talks.
- Mass media includes newspapers, leaflets, radio, television
- Role plays and dramas
- Community participation

Topics for Health Education
1. Undertaking Environmental control
   - Forest clearance
   - Destroying rodent sites
   - Identifying sand fly breeding sites and destruction of those sites

2. Reduction of contact between people and sand flies
   - Selection of settlement sites, should be at least 400 meters away from breeding and shading sites
   - Clearing trees and vegetation around living and working areas
- Increase use of insecticide impregnated bed nets
- Use of screen on windows
- Wearing protective clothing
- Applying insect repellants on the skin

3. Early reporting to nearest health institution when symptoms are detected

4. Community participation
   - Importance of community participation and
   - Intersectoral collaboration

5. Traditional malpractice
   - Study the traditional treatment & patient care procedures of leishmaniasis and identify useful and harmful practices
   - Based on the information and observations conduct studies to establish the usefulness of traditional healing methods in collaboration with other institutions.
# ROLE AND TASK ANALYSIS

## Table 1: Knowledge-Objectives and Activities by Category of Health Professionals

<table>
<thead>
<tr>
<th>Learning Objective</th>
<th>H.O.</th>
<th>BSc Nurses.</th>
<th>EHO</th>
<th>MLT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Describe the causes of Leishmaniasis</td>
<td>Study the causes of Leishmaniasis</td>
<td>Study the causes of Leishmaniasis</td>
<td>Study the causes of Leishmaniasis</td>
<td>Study the causes of Leishmaniasis</td>
</tr>
<tr>
<td>Describe the modes of transmission of Leishmaniasis</td>
<td>Study the modes of transmission</td>
<td>Study the modes of transmission</td>
<td>Study the modes of transmission</td>
<td>Study the modes of transmission</td>
</tr>
<tr>
<td>Describe the life cycle of Leishmaniasis</td>
<td>Study the life cycle in definitive and intermediate hosts</td>
<td>Study the life cycle in definitive and intermediate hosts</td>
<td>Study the life cycle in definitive and intermediate hosts</td>
<td>Study the life cycle in definitive and intermediate hosts</td>
</tr>
<tr>
<td>State the diagnostic approach</td>
<td>Study the epidemiological pattern, the clinical features and laboratory methods of investigations</td>
<td>Study the epidemiological pattern, the clinical features &amp; laboratory methods of investigations</td>
<td>Study the epidemiological pattern, Environmental factors</td>
<td>Study the laboratory procedures and interpretation of results</td>
</tr>
<tr>
<td>Describe the recommended treatment protocol</td>
<td>Study the type, dose and routes of administration of drugs used for treatment of Leishmaniasis</td>
<td>Study the types of drugs</td>
<td>Study the types &amp; side effects of drugs</td>
<td>Study the types and dose of drugs</td>
</tr>
<tr>
<td></td>
<td>Study the supportive measures for admitted patients</td>
<td>Study about side effects of drugs</td>
<td>Study about supportive measures</td>
<td></td>
</tr>
<tr>
<td>Describe preventive and control measures</td>
<td>Study the preventive and control measures including the indications for prophylaxis</td>
<td>Study the preventive and control measures including indication for prophylaxis</td>
<td>Study the preventive and control measures</td>
<td>Study the preventive and control measures</td>
</tr>
<tr>
<td></td>
<td>Study epidemiological factors related with Leishmaniasis</td>
<td>Study epidemiological factors related with Leishmaniasis</td>
<td>Study epidemiological factors related with Leishmaniasis</td>
<td>Study epidemiological factors Related with Leishmaniasis</td>
</tr>
<tr>
<td>Identify epidemiological factors related with Leishmaniasis</td>
<td>Study epidemiological factors related with Leishmaniasis</td>
<td>Study epidemiological factors related with Leishmaniasis</td>
<td>Study epidemiological factors related with Leishmaniasis</td>
<td>Study epidemiological factors Related with Leishmaniasis</td>
</tr>
</tbody>
</table>
Table 2 Attitude – Objectives and Activities by category of Students

<table>
<thead>
<tr>
<th>Learning Objective</th>
<th>H.O</th>
<th>P.H.N</th>
<th>E.R.T</th>
<th>M.L.T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Help believe that Leishmaniasis is preventable</td>
<td>Encourage preventive measure of Leishmaniasis</td>
<td>Use different health education methods such as health talks, demonstration (campaign), mass media, community mobilizations</td>
<td>Encourage preventive measure of Leishmaniasis</td>
<td>Use different health education methods such as health talks, demonstration (campaign), mass media, community mobilizations</td>
</tr>
<tr>
<td></td>
<td>Use different health education methods such as health talks, demonstration (campaign), mass media, community mobilizations, income specialty mothers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Help believe that Leishmaniasis is treatable</td>
<td>- Provide information that Leishmaniasis is curable if medication is taken at the right time, dose and duration</td>
<td>- Encourage people to come early for diagnosis and treatment</td>
<td>- Help in organizing community distribution of anti-Leishmaniasis drugs whenever there is a need</td>
<td>- Encourage people to come early for diagnosis and treatment</td>
</tr>
<tr>
<td></td>
<td>- In a Leishmaniasis area any person with fever should visit the near by health institution</td>
<td></td>
<td></td>
<td>- in a Leishmaniasis area any person with fever should visit the near by health institution</td>
</tr>
<tr>
<td>Convince treating cases decrease transmission of Leishmaniasis</td>
<td>- Understand &amp; advice that care givers are as equally important as health professionals in the treatment of Leishmaniasis</td>
<td>- Understand advice that care givers are as equally important as health professionals in the treatment of Leishmaniasis</td>
<td>- Understand advice that care givers are as equally important as health professionals in the treatment of Leishmaniasis</td>
<td>- Understand and advice that care givers are as equally important as health professionals in the treatment of Leishmaniasis</td>
</tr>
<tr>
<td></td>
<td>- Respect caregivers &amp; communicate clearly</td>
<td>- Respect caregivers &amp; communicate clearly</td>
<td>- Respect caregivers &amp; communicate clearly</td>
<td></td>
</tr>
<tr>
<td>Help believe self protective measures reduce the risk Leishmaniasis</td>
<td>Give health education on self protection such as use of sand fly nets, window screens insect repellent, clothing, and prophylaxis</td>
<td>Give health education on self protection such as use of sand fly nets, window screens, insect repellent, and clothing, prophylaxis</td>
<td>Give health education on self protection such as use of sand fly nets, window screens, insect repellent, and clothing, prophylaxis</td>
<td>Give health education on self protection such as use of sand fly nets, window screens, insect repellent, clothing, and prophylaxis</td>
</tr>
<tr>
<td>Learning Objective</td>
<td>Activities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------------</td>
<td>------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detect early and treat Leishmaniasis case</td>
<td>- Conduct home visit &lt;br&gt;- Treat the case as recommended &lt;br&gt;- Establish and utilize the surveillance system &lt;br&gt;- Predict manage and evaluate an epidemic &lt;br&gt;- Early referral if required provide H.E on the Importance of Early medical seeking and treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Conduct home visit &lt;br&gt;- Treat the case as recommended &lt;br&gt;- Give treatment as prescribed provide H.E on the Importance early medical seeking and treatment &lt;br&gt;- Give supportive care for admitted patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Conduct home visit &lt;br&gt;- Establish and utilize the surveillance system &lt;br&gt;- Provide H.E on the Importance of early medical seeking and treatment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Conduct home visit &lt;br&gt;- Process and examine samples</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Communicate property with mothers and caregivers or patients about the Importance of taking medication early as prescribed follow up assess patient responses to medication Identity specific mothers and caregivers roles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Communicate property with the caregivers and mothers or patient about the Importance of taking medication early as prescribed follow up to assist patient response to medication Identity specific mothers and caregivers roles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Communicate property with the mothers and caregivers or patients on self and environmental protections</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Communicate property with the mothers and caregivers or patients Encourage and advise patients or caregivers to cooperate in giving blood sample</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promote practice of self protection</td>
<td>- Initiate they use of sand fly nets, with do screens, local repellents e.g. plants &lt;br&gt;- Encourage protection of the body with clothes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Initiate the use of sand fly nets, window screens, local repellents e.g. Plants Encourage protection of the body with clothes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Initiate the use of sand fly nets, window screens, local repellents e.g. Plants Encourage protection of the body with clothes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Initiate the use of sand fly nets, widow screen, local repellents e.g. Plants smoke encourage protection the body with cloth</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Promote environmental management</td>
<td>Encourage &amp; conduct environmental control to prevent the attraction and breeding of sand flies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Encourage &amp; conduct environmental control to prevent the attraction and breeding of sand flies</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Encourage &amp; conduct environmental control to prevent the attraction and breeding of sand flies</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
UNIT FIVE
GLOSSARY

Amastigote: oval, nonflagellated morphological form found in some of the hemoflagellate life cycle
Axoneme: intracellular portion of the flagellum
Blepharoplast: Basal body structure in hemoflagellates from which the axoneme arises
Definitive host: host in which the adult and/or sexual phase of a parasite occurs
Flagella- Tail- like extensions of the cytoplasm which provide a means of motility
Intermediate host: Host in which the larval or sexual phase of a parasite occurs
Promastigotes: long, slender hemoflagellate morphologic form containing a free flagellum
Undulating membrane: finlike structure that is connected to the outer edge of some flagellates
Erythrocyte sedimentation rate: The length of fall of erythrocyte when anticoagulated blood is stand erected for 1 hour
Kinetoplast: Structure consisting of a dotlike blepharoplast and a parabasal body
UNIT SIX
ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>CL</td>
<td>cutaneous leishmaniasis</td>
</tr>
<tr>
<td>VL</td>
<td>Visceral Leishmaniasis</td>
</tr>
<tr>
<td>MCL</td>
<td>Mucocutaneous leishmaniasis</td>
</tr>
<tr>
<td>PKDL</td>
<td>Post kala azar dermal Leishmaniasis</td>
</tr>
<tr>
<td>EDTA</td>
<td>Ethylene Di- potassium diamine tetra acetic acid</td>
</tr>
<tr>
<td>NNN media</td>
<td>Novy- Nicolle –McNeal</td>
</tr>
<tr>
<td>LD Bodies</td>
<td>Leishman Donovan Bodies</td>
</tr>
<tr>
<td>IgG</td>
<td>immunoglobulin G</td>
</tr>
<tr>
<td>IgM</td>
<td>Immuno globulin M</td>
</tr>
<tr>
<td>DAT</td>
<td>direct agglutination test</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immuno deficiency virus</td>
</tr>
<tr>
<td>MCL</td>
<td>Mucocutaneous leishmaniasis</td>
</tr>
</tbody>
</table>
“People for Peaceful Change”


Report prepared by

Dr Robert C Spencer
MB BS MSc FRCPath HonDipHIC
Consultant in Clinical & Environmental Microbiology
3 Lavender Close
Thornbury
Bristol
BS35 1UL
United Kingdom
Email: rcs1947@hotmail.co.uk
Participants

**Moderator & Rapporteur:** Dr Robert C Spencer

**Palestine:**

Professor Ziad Abdeen

Dr Amer Al-Jawabreh

Dr Suhai Oraiqat

**Israel:**

Dr Ruthi Yishai

Dr Tamar Yeger

Dr Fouad Akad

**Jordan:**

Dr Sami Sheikh Ali

Dr Gazi Sharkas

Dr Khalil Kanani

**Staff:**

Sari Husseini

Wajdi Bkeirat

Muayyad Ghoul

**Observers from CORDS**

Dr Christophe Longuet & Ms Sabrina Salem

**Introduction**
Leishmaniasis, especially of the cutaneous form, is a known major clinical problem across the Middle East, including Jordan, Palestine and Israel. Some countries have noticed a resurgence of cases in recent years. Each of these three countries use different ways of diagnosis, whether clinical or laboratory, different therapeutic modalities depending on availability of appropriate medicines and different methods of control and prevention. The workshop was developed along the lines of

1. Incidence and distribution of Leishmaniasis in each country
2. Epidemiology and control
3. Mode of transmission and vectors
4. Clinical and laboratory diagnosis
5. Treatment
6. Future developments in research and areas of mutual cooperation. For instance studies on the factors affecting the transmission of the disease, role of new urban constructions in populated areas, development of effective control measures, increase awareness amongst all healthcare professional and assist in an intensive public education programme especially in areas of known Leishmaniasis foci.

Presentations by each country

Palestine West Bank

There are no cases in Gaza [personal communication to RCS by International Cooperation Department, ministry of Health, Gaza].

All future discussion relates to The West Bank. It is estimated there are 300-400 cases per year of cutaneous leishmaniasis [8-10 cases per 100000 population]; visceral leishmaniasis is sporadic with only 2-7 cases per year. CL caused by *L.tropica* and *L.major*. VL by *L.infanta*. The life cycle of the parasite was reviewed as was the role of zoonotic hosts such as the rock hyrax and
domestic dogs. The diagnosis is a combination of clinical in the first instance followed by laboratory investigations which could include Giemsa stain microscopy, culture using Novy-MacNeal-Nicolle [NNN] Media, PCR with RFLP sequencing [Jericho Reference Laboratory] and serology in cases of VL. A standardised protocol is used in all laboratories. Treatment is with sodium stibogluonate [Pentostam] with ambisome as second line. Prevention and control included spraying during the “biting Season”, May –September; window screens but bed nets are not used.

Jordan

They report some 200 -300 cases of CL per year [3.2 per 100000 head of population and some 20 cases of VL. In the last few years there has been an increase mainly due to the influx of large numbers of Syrian refugees. Before 1993 there are no statistics. Compared to their neighbouring countries, Syria, Iraq and Saudi Arabia, they have a much lower incidence of the disease. The epidemiology concerning L. major, L. tropica and L. infantum and their vectors and hosts such as rock hyrax and fat sand rat were presented. All cases in Jordan are considered zoonotic except in Syrian refugees where anthropophilic transmission is thought to occur. Diagnosis is mainly clinical as laboratory facilities are not available at the regional level. The central laboratory in Amman performs Giemsa staining of smears, culture and blood PCR. They do have an immunofluorescent test specific for L. infantum in cases of VL. They wish to create regional laboratories in the north and south to relieve workload pressure on the central laboratory in Amman. Treatment is given in accordance with WHO Guidelines. For CL cryotherapy is used mainly but local infiltration of pentostam is also used. For VL systemic pentostam is given for 30 days. As regards prevention and control they advocate window screens, education and awareness campaigns, chemical and environmental control of hosts and vectors.
Israel

*L.major* occurs in sandfly areas such as Jordan Valley, East & Central Negev and Dead Sea. *L.tropica* occurs in rocky areas such as Jerusalem, Judea, Samaria, East Galilee and Tiberias. In 2017 there were over 1000 laboratory confirmed human cases, mainly CL variety. As regards diagnosis there are no standardised methods of sampling and no strict protocol. They use microscopy, do not culture, PCR techniques include Taqman, RFLP and HRM. In cases of VL they also confirm with serology. Treatment depends on species of Leishmania, the hospital and the doctor. Leishmaniasis is a notifiable disease. Prevention and control is multi-faceted with public information on what and what not to do; habitat control with regard to the rock hydrax [a protected animal], infrastructure [all boulders crumbled] fence treatment. They do not spray but target breeding sites of sandflies as per mosquitos.

Priorities for Research and Public Health Policy

The participants split into two groups to consider this proposal based on suggestions from two peer reviewed articles on Leishmaniasis:


These ideas covered general approaches, diagnosis, treatment, vaccines, epidemiology, prevention and control. With regard to public health, harmonisation of notification, prevention and control guidelines, therapeutic options and development of cost effective prevention and control strategies.
Suggestions. These are listed in no particular order of importance.

Each proposal should be manageable, affordable and achievable within the time frame.

Israel has stopped spraying because you have to spray every few days during the biting season which has a deleterious effect on humans and the environment.

Differences in protocols for diagnosis and treatment

How to take samples

Availability of the different laboratory methods – microscopy, culture, PCR [species specific for *L. major/tropica/infant*], serology rK39. Sample preservation. Jericho has a large store at -80 degrees of samples.

Training of technical and scientific personnel.

Establishment of a Leishmaniasis Unit for Jordan/ for all three countries.

Treatment depends on Leishmaniasis species. Topical v intra lesion; systemic for VL.

Vector and reservoir control with cooperation between ministries of health, environment, agriculture and the municipalities. Rick assessment, mapping, surveys. In the Middle East it is estimated that upto 17 sandfly species have been implicated in leishmaniasis.

Control and prevention – vector – spray not spray, window screens, bed nets, insecticides. Human – awareness, education, repellants. Reservoir - destroy habitat, relocate hydrax, but where?

Creation of a regional/national committee with representatives from relevant ministries [see above]. To meet three/four times per year with updates on progress made.

Train technicians.
Strengthen capacity
Laboratory diagnostic protocols
Vector studies
Reservoir studies

Adopt WHO Criteria for case management. Develop a national protocol.
Create national database which could be shared with each other country – patient demography, treatment, diagnosis, epidemiology.

Research into therapeutic options.

Vaccination. Leishmanisation as practised, allegedly by Bedouins, and various local armed forces.


Funding by governments and / or outside bodies. How to achieve increase in funding at a time of austerity.

Use of media especially of the social type.

**General Discussion. Here I have adopted Chatham House Rules whereby the identity or affiliation of the participant is not revealed. The following bullet points are not in any order of importance.**

1. Gaps and how to fill them. Where do we go from here?
2. Have a finance person on board.
3. Make visits to other countries. Exchange ideas.
4. Keep up energy and momentum
5. Diseases do not own passports and ignore international borders.
6. Each country has the disease.
7. Problems seem to be growing.
8. Co-ordinate responses
9. Need good surveillance and good competent staff.
10. Improved access to diagnosis and treatment.
11. A disease of poor and marginalised people.
12. Educate the dermatologists.
13. Demography in all three countries.
15. Capacity building
16. Species diagnosis in human cases.
17. Surveillance and control differs – plea for commonality.
18. When or if to spray.
19. Political will and commitment to eradicate leishmaniasis.
20. Way forward to remove the problem.
21. Use risk communication experts. Social media.
22. Training including veterinarians.
23. Standardisation of laboratory diagnosis with improved capability.
24. Treatment is resource based.
25. What to do with the hydrax?
26. Syrian refugees are not the only leishmaniasis problem in Jordan. There are indigenous cases.
27. How to move forward as it is not easy to promote this disease given all the other health problems in the region.
28. Need for a political initiative.
29. How to share data.
30. Need for all political entities in each country to talk to each other. Need “buy in”.
31. Political issues hang over everything.
32. Ministries have a “silo mentality”.
33. Political decisions are taken but kept under wraps because of the fear of kick-back.
34. The malign influence of social media on individuals who may show their heads above the parapet.
35. Importance of MECIDS.
36. Role of CORDS
37. The modality of cooperation has to change.
38. Bottom line is “Help the People”.
39. Role of SFCG.
40. International funding – DFID, USAid.
41. Creation of a Central Leishmaniasis Laboratory.
42. Funders want to see an impact on “The Benefits to People”.

“Hot Wash Up”

Again Chatham House Rules Apply

1. Impressed with this small committed meeting.
3. Ministries do not appreciate the role of scientific research.
4. Shared common interests.
5. List of challenges in the way ahead.
6. Do not close our eyes to politics, which cannot be ignored.
7. If we make mistakes, admit them and go forward.
8. How do we know which are the right buttons to press to achieve our goals.
9. Need tangible results to impress Governments.
11. Need for diagnostic protocols, technical training, standardised laboratory work.
12. Common protocols but flexible at the same time to take in differences between the three countries.
13. Plan future activities to address the challenges ahead.
14. Do not forget ecological needs.
15. “A pessimist is an optimist but with more experience”
17. Collaboration of specialists is essential but not sufficient in itself.
18. We must not lose momentum, which may happen if funding doesn’t arrive.
19. Valuable discussion as a platform for developing guidelines, for tracking disease and look forward very much to future collaboration