



COLLOQUIUM 2013

Health Systems & Control of Neglected Diseases in Asia

ITM 3rd International
Colloquium
20 – 23 November 2013
Bangalore, India

ABSTRACT BOOK



THE BELGIAN
DEVELOPMENT COOPERATION



Health Systems
&
Control of
Neglected Diseases in Asia

ITM 3rd International Colloquium
20 – 23 November 2013
Bangalore, India

ABSTRACT BOOK

Conference Location:

Hotel Park Plaza, Bangalore, India

- 1: BOULANGERIE HALL (Satellite Network Meeting on 20 Nov)
- 2: BOULANGERIE HALL (Colloquium 2013 Inauguration on 20 Nov)
- 3: GRAND VICTORIA HALL (Colloquium Oral Sessions; 21 to 23 Nov)
- 4: GRAND VICTORIA (Registration and information desk; 20 – 23 Nov)
- 5: GRAND VICTORIA (IT corner; 21 to 23 Nov)
- 6: GRAND VICTORIA (Poster Exhibition Area; 21 to 23 Nov)
- 7: GRAND VICTORIA (Lunch, coffee breaks; 21 to 23 Nov)
- 8: BOULANGERIE (Welcome reception on 20 Nov)
- 9: ITM Alumni social event. (Participation on invitation only; Lawn area on 21 Nov)
- 10: GRAND VICTORIA (Gala dinner for all colloquium participants on 22 Nov)

Accommodation

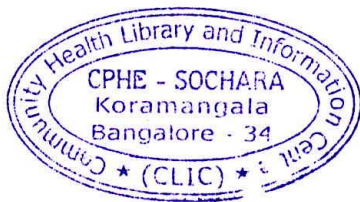
Hotel Park Plaza
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Rationale

2013 Colloquium: a unique event in Bangalore

Together with our institutional partner the Institute of Public Health (IPH) in Bangalore, ITM's Public Health department has been working hard to get the 2013 Colloquium Health systems and control of neglected diseases in Asia (20-23 November, Bangalore) on track. Building on the shared expertise in health systems research that the IPH-ITM partnership is known for, the Colloquium emerges as another highlight in a strong track record. It promises to be a great event, for two main reasons.

First, linking health systems and disease control is a deliberate choice of utmost importance based on "the recognition that stronger health systems can enhance the effectiveness of disease control programmes, and vice versa". The Colloquium takes the systems-programmes tandem a step further, "investigat(ing) pragmatic ways to maximise the mutual benefits". It thus offers researchers, policymakers and programme officers a platform to debate common challenges, to update on the state of the art of neglected diseases in terms of knowledge and practice, and to optimise the interface between disease control programmes and national health systems.

Second, the 2013 Colloquium is also unique in applying the widest possible but well grounded scope to neglected diseases: infectious diseases of poverty. These include the big three (HIV, TB, malaria), plus the 23 neglected tropical diseases, plus (re)emerging diseases. Indeed, there is today enough evidence to state that "infectious diseases are a proxy for poverty and disadvantage, affect populations with low visibility and little political voice, cause stigma and discrimination, impose a heavy health and economic burden, are low on many research funders' agendas, have greater impact where health systems are weak, and burden caregivers and families". There will also be contributions on non-communicable diseases of poverty.

With sessions on the state of the art of neglected diseases in Asia, design and evaluation of disease control programmes, the role of the private sector in disease control, disease control and health systems strengthening, and disease control and social determinants of health, the Colloquium is a firm step towards effective disease control, strengthened health systems and hopefully health for all in a better world. We are looking forward to it and will keep you informed!

Organising committee

- Narayan Devadasan
- Jitendra Panda
- Severine Thys
- Jan Boeynaems

Scientific committee

- Marleen Boelaert
- Narayan Devadasan
- Bart Criel
- Werner Soors
- Patrick Van der Stuyft
- Upendra Bhojani
- Prashanth NS
- Tine Verdonck
- Sahibi Hamid
- Suman Rijal

Supporting Agency

- The Belgian Development Cooperation

Website

- Colloq2013.in

Conference Programme

Wednesday, 20th November 2013

10:30 – 16:30 *Satellite workshop of the FA3 Strategic Network on Neglected Diseases and Zoonoses (on invitation only)*

Session 1 – Inauguration

16:00 – 18:00 Registration

18:00 – 19:00 Inauguration

- **Shri U T Khader** – Hon'ble Minister of Health & Family Welfare (Bangalore, India)
- **Dr L S Chauhan**, Director of the National Centre for Disease Control (New Delhi, India)
- **Prof Marleen Boelaert**, Head of Department of Public Health, Institute of Tropical Medicine (Antwerp, Belgium)
- **Dr N Devadasan**, Director of the Institute of Public Health (Bangalore, India)

19:00 – 20:30 Welcome Reception

Thursday, 21st November 2013

8:30 – 12:45 Session 2 - State of the art of the control of neglected diseases in Asia, part 1

Chair

Dr A C Dhariwal (NVBDCC, MoHFW, Govt. of India)

Co- Chair

Dr Ravi Kumar, (Central Health Services, India)

Key note speakers:

- Prof T Jacob John
(Christian Medical College, Vellore, India)
- Prof Suman Rijal
(B P Koirala Institute of Health Sciences, Dharan, Nepal)

Oral presentations:

Outbreak of Kyasanur Forest Disease in Karnataka, India. 2012
Kasabi Gudadappa

Diagnosis and referral practices related persistent fever syndrome in Nepal
Surendra Uranw

Zoonotic TB in a resource poor African community:
A perceived or real risk?
Anita Michel

Long term Efficacy of Liposomal Amphotericin B the
treatment of VL in Bihar
Raman Mahajan

Added value of insecticide treated curtains to control dengue
in Cuba
Toledo Maria Eugenia

Progress in Lymphatic Filariasis elimination in India
Pradeep K Srivastava

12:45 – 13:45 Lunch & Networking

13:45 – 17:00 Session 3: Planning and evaluation in disease control Chair
Dr Subash Salunke (Indian Institute of Public Health,
Bhubaneswar, India)

Co – Chair
Dr Katja Polman (ITM, Antwerp)

Key note speakers:
Dr Freddie Ssengooba (Makerere School of Public Health,
Kampala, Uganda)

Prof Guy Kegels (Institute of Tropical Medicine, Antwerp,
Belgium)

Prof Venkat Raman (University of Delhi, India)

Prof. Melissa Parker (Brunel University, UK)

Oral presentations:

Barriers in equitable control Schistosomiasis, China
Julie Balen

Added value of anthropological studies in

Neglected Zoonotic Disease control
Séverine Thys

19:00 – 21:30 ITM Alumni social event (on invitation only)

Friday, 22nd November 2013

8:30 – 11:15 Session 4: State of the art of the control of neglected diseases in Asia, part 2

Chair:

Prof. Shyam Sundar (Banaras Hindu University, Varanasi, India)

Co-Chair:

Prof. Hamid Sahibi (IAV, Morocco)

Oral Presentations:

Latent infection with *Leishmania donovani*, Bihar, India

Ankita Chourasia

High parasite burden in Healthy individuals contribute to progression of VL

Abhishek Kumar Singh

Replacement of indoor residual spraying to control Visceral Leishmaniasis, Nepal

Murari Lal Das

Effectiveness of long lasting insecticidal bed nets in reducing domestic sandfly density.

Adithya Pradyumna

Miltefosine in India and Nepal

Bart Ostyn

In vitro susceptibility of *Leishmania donovani* to Miltefosine: promastigote assay

Vijay Kumar Prajapati

Prevalence of HIV-VI co-infections and long term outcomes of co-infection patients with Liposomal Amphotericin B, Bihar, India.

Deepak Kumar

Reemergence of El Tor variant *Vibrio cholerae* O1 causing cholera epidemic during 2010 in the tribal areas of Odisha, India.

Bibhuti Bhushan Pal

11:30 -12:45 Posters Presentations

12:45 -13:30 Lunch and Networking

13:30 – 17:30 Session 6: Control of neglected diseases and social determinants of health

Chair:

Dr Sunil Nandraj (Public Health Foundation of India)

Co-Chair:

Dr Werner Soors (ITM, Antwerp)

Panel Discussion

Expert panel:

Prof Fran Baum (Flinders University, Adelaide, Australia)

Dr May Wejbe-Shanahan (Autonomous University of Yucatan, Merida, Mexico)

Dr Devaki Nambiar (Research Scientist, Public Health Foundation of India, New Delhi)

Dr Upendra Bhojani (Institute of Public Health, Bangalore)

19:00 – 21:30 Colloquium dinner – all Colloquium participants

Saturday, 23rd November 2013

8:30 – 12:45 Session 7: Control of neglected diseases and health systems strengthening (HSS) in Asia

Chair:

Dr Krishna D Rao
(Public Health Foundation of India)

Co-Chair:

Prof Bart Criel (ITM, Antwerp)

Key note speakers:

- Prof Virasakdi Chongsuvivatwong (Prince of Songkla University, Hat Yai, Thailand)
- Dr Bruno Marchal (Institute of Tropical Medicine, Antwerp)

Oral presentations

Role of Village health workers in control of Visceral Leishmaniasis, Bihar
Paritosh Malaviya

Active case finding strategy for TB case detection in urban slum
Muralidhara Prasad

Vertical, horizontal, diagonal: the policy debate continues, but where is the evidence?

Julie Balen

Integrating and adapting human resources at service delivery level with national disease control programmes

Preetha Menon

Community level morbidity control of lymphedema using self care and integrative treatment

AM Guruprasad

Unmet needs of health system for tackling Neglected Tropical Diseases in Bangladesh

SS Rahman

Experience of Sputum collection and transportation in TB care and control.

Muralidhara Prasad

13:00 – 14:00 Lunch & Networking

14:00 – 15:00 Session 8 – Closing session

Interactive feedback from the participants Concluding remarks

Prof Bruno Gryseels (Institute of Tropical Medicine, Antwerp)

Dr N Devadasan (Institute of Public Health, Bangalore)

21st, 22nd & 23rd November 2013

Poster presentations

Scrub typhus: a re-emerging and neglected disease of Rajasthan

J Rathore Singh

Where do PLHIV (People Living with HIV/AIDS) go and what do they prefer?

Engaging private providers in HIV/AIDS service provision in Tamil Nadu, India

Asirvatham Edwin Sam

Assessing maternal and neonatal tetanus risk in a tribal district of Odisha

Raveesha R Mugali

From clinics to community? Detection of ESBL producing Enterobacteriaceae from community water samples in Cochin, Kerala

Sushma Krishna

Challenge of melioidosis in Cambodia

Ellen Maling

An Epidemiological investigation of Cholera outbreak in Poonamallee

Municipal area, Tamil Nadu, India, December'2011-January'2012

Dhruba Mahajan

Is cash transfer program a viable option to support children affected and infected with HIV?: Evidences from Tamil Nadu State, India

Asirvatham Edwin Sam

Molecular identification of Hookworm species in a Multi-Centric efficacy trial across seven soil transmitted helminths endemic countries

Santosh George

An epidemiological study of drugs availability related to three infectious childhood diseases: Where does the compass point?

Nayan Chakravarty

Morbidity and mortality of meningococcal diseases in Gaza Strip during 2012

Nedal Ghuneim

Syndromic approach to neglected infectious diseases (NID) at primary health care level: an international collaboration on integrated diagnosis-treatment platforms

Marleen Boelaert

Outcome of MDR-TB treatment at DOTS Plus site: A retrospective study from Maharashtra

Shriram Vitthal Gosavi

Single and Multiple Species Helminth Infections and Associated Morbidity in Hunan Province, China: Lessons Learnt and Implications for Integrated Control
Julie Balen

The effect of increasing private sector representation in a dengue fever surveillance network on incidence rates

Melo F`urtado Kheya

Burden of diarrhea, hospitalization and mortality due to cryptosporidial infections in Indian children

Rajiv Sarkar

Epidemiology and risk factors of cryptosporidial infections among children in a semi-urban slum in southern India

Rajiv Sarkar

A ten year experience of PPTCT clinic: Can we strengthen our health care system

Ravishekar N Hiremath

Vertical programs and health systems strengthening in India: Lessons from three programs

Sudha Ramani

Prevalence and risk factors for soil transmitted helminth infection among school children in south India

Deepthi Kattula

Patients' perception on available public health facilities and services for lymphatic filariasis: a qualitative study in Odisha, India

Gupteswar Patel

Comparison of the effectiveness of two different health education strategies on the utilization of Long Lasting Insecticide Treated bed Nets among the tribal population of Chhattisgarh – A community based intervention study

Mehul Chourasia

Public Health Standards and Filaria Control in India: A Review

Pratap Kumar Jena

Water Supply, Sanitation and Hygiene

Practices in Hunan Province, China: Implications for the Control of Neglected Diseases and Health System Strengthening

Julie Balen

Neglected Brucellosis: A community based explorative study in Odisha, India

Sarthak Sarathi Pattanaik

Clinico-epidemiological profile and management practices for snakebites in Himachal Pradesh, India, 2008-2012

Anadi Gupt

An assessment of knowledge of prevention and management of Rabies in interns and final year students of Shri M.P. Shah Government Medical College, Jamnagar, Gujarat

Amrita Sarkar

Role of NGOs and public health partnership to improve accessibility to health entitlements in rural India

Ashley Mary Thomas

Lessons learnt from Kaladrug-R: New tools for monitoring drug resistance and treatment response in Visceral Leishmaniasis in the Indian subcontinent

Marleen Boelaert

Comparative Evaluation Of Three PCR-Based Assays For The Diagnosis and Genotyping Of Cutaneous Leishmaniasis

Hamid Sahibi

Role of private health providers in Tuberculosis control: Preliminary findings from a qualitative research.

Vijayashree Holalkere Yellappa



State of the art
of the control of
Neglected diseases
in Asia.

PART 1

Oral Sessions

Outbreak of Kyasanur Forest Disease (KFD) in Bandipura national park, Chamarajanagara district, Karnataka, India, 2012

Gudadappa S Kasabi, Manoj V Murhekar, Shivanna Reddy

Background: Kyasanur forest disease (KFD), a tick-borne hemorrhagic fever has unique existence in five districts of Karnataka. In November 2012, we received information from Bandipura National park, a tiger reserve forest in Chamarajanagara district, about unusual death of monkeys and suspected cases of KFD among forest-watchers. The district is not endemic for KFD.

Methods: We defined suspected case of KFD as sudden onset of fever, headache, and myalgia among the staff of Bandipura National park since November 2012. We searched actively for suspected cases among forest-workers ($n=400$) working in all 38 anti-poaching camps. Blood specimens from the suspected patients, viscera from dead monkeys and tick specimens from forest were tested for the presence of virus using RT-PCR. We collected and analyzed the data to describe the disease by time, place and person.

Results: We identified six suspected case-patients (attack rate: 19/1000), four of which were laboratory confirmed. All case-patients had conjunctival congestion while two had vomiting, pain in abdomen and facial swelling. A total of nine monkey deaths were reported from the park prior to the outbreak in humans. All case-patients handled carcasses of dead monkeys with bare hands prior to their illness. One out of three monkey viscera sent for laboratory test were found positive for KFD virus by RT-PCR.

Conclusions: This was the first report of KFD outside the five endemic districts. The cluster was associated with handling of dead monkeys. We vaccinated all the forest-watchers with KFD vaccine and advised them to use tick repellents before going to forest.

Keywords: Kyasanur forest disease, India, outbreak

Exploratory qualitative study on healthcare provider diagnosis and referral practices in regard to neglected infectious diseases related to the persistent fever syndrome in eastern Nepal

Uranw S, Hendrickx D, Thapa B, Chappuis F, Rijal S, Boelaert M

Introduction: Febrile illness is one of the most common reasons for seeking medical attention in Nepal. Both healthcare providers and patients face significant challenges regarding the diagnosis and management of infectious diseases. We set out to document current diagnosis and referral practices of healthcare providers in relation to persistent fever syndrome (PFS).

Methods: We conducted a qualitative study consisting of observations, in-depth interviews and focus group discussions with healthcare providers. This study was implemented in primary healthcare centers and reference hospitals. Interviews and focus group discussions were recorded and transcribed. Data was analyzed using N/Vivo.

Results: Healthcare providers were not overly familiar with the term PFS, although knowledge about associated symptoms and infectious diseases was good. Symptomatic treatment was mostly practiced at primary healthcare level, while reference hospitals employed a diagnostics-based approach. Limited diagnostic facilities and high volume of patients were some of the factors underlying limited diagnostic-based practices. No specific protocols were available for the diagnosis and management of PFS. Only few PFS patients seem to be referred to a higher-level for further diagnostic work-up and clinical management. Financial concerns, community beliefs and folklore and delays in seeking care were an important barrier to referral.

Conclusion: An improved understanding of the current diagnosis and referral practices of healthcare providers is an important first step in developing and introducing new clinical algorithms. There is a perceived need for a clinical algorithm that would enable a systematic approach in diagnosis and case management of PFS cases at the primary healthcare level.

Zoonotic tuberculosis in a resource-poor African community: A perceived or real risk?

Musoke, J., Molefe, C.K., Michel, A.L.

Introduction: Both humans and cattle can be infected with either *Mycobacterium bovis* or *Mycobacterium tuberculosis*. For a comprehensive assessment of zoonotic tuberculosis (TB) it is important to include all causative agents of tuberculosis transmitted between humans and animals.

We implemented a study to assess the risk factors of bovine tuberculosis (BTB) in cattle and zoonotic TB in a resource poor rural community in South Africa. The study methods in phase 1 included a questionnaire survey among cattle owners and non-cattle owners as well as a prevalence study of bovine tuberculosis in the community's cattle population.

Preliminary findings include the first confirmation of *Mycobacterium bovis* infection in 2 out of 15 communal dip tanks whereby the prevalence at animal level was very low (0.34%). The proximity to the Greater Kruger National Park Complex, where BTB is endemic in African buffaloes, was identified as a likely driver for the presence of BTB. Our results further revealed that 95% of cattle in the study area were of indigenous or mixed breeds; 93% of the livestock owners interviewed did not introduce new animals from outside the community within the past year. The relative stability of the communal cattle herd managed by small scale farmers in an extensive farming system is considered an important contributor to the limited spread of BTB in this area. Among the predominant risk factors for zoonotic TB were the consumption of unpasteurised milk and the sale of milk to the community by 36% of farmers.

5-Year Programme Summary And Long Term Efficacy Of A 20 Mg/Kg Liposomal Amphotericin-B Regimen For The Treatment Of Visceral Leishmaniasis (VL) In Bihar, India

Burza, S. Mahajan R, Mitra G, Lima MA

Introduction: Since 2007 with support from the Rajindra Memorial Research Institute, Medecins Sans Frontieres has implemented a VL treatment project in a highly endemic area for *Leishmania Donovanii* in Bihar, India using 20mg/Kg Liposomal amphotericin-B (L-AmB) as first line treatment. Crucially, existing infrastructure and HR has been used in the PHCs to provide high quality care at the community level.

Methods: Intravenous L-AmB was administered in four 5 mg/kg doses to a total 20 mg/kg to all patients with laboratory confirmed primary VL. Treatment was administered at primary health center (PHC), district, or tertiary hospital over 4–10 days, depending on disease severity. Initial clinical cure was defined as improvement of symptoms, cessation of fever, and recession of spleen immediately following the last dose. An Excel-based database of the project was then analysed for the 5-year period from September 2007 to August 2012.

Results: A total of 8749 patients with laboratory confirmed primary VL was treated over 5 years. 1396 were treated at PHC, 6875 at district hospital, 314 at tertiary hospital, and 164 at community camps. Initial clinical cure was achieved in 99.3% (n=8692), with 0.3% (n=26) defaulting after initiation of treatment, and 0.4% (n=31) dying. 138 (1.6%) patients represented with parasite confirmed relapse. The mean (SD) time to relapse following completion of treatment was 1.1(0.8) years. No significant difference in the initial cure and tolerance was observed under different administration schedules.

Conclusions: This is the largest cohort worldwide of VL patients treated with 20 mg/kg L-AmB. It has very high initial and long-term efficacy and very low rate of adverse reactions when administered under field conditions in Bihar, India. Its use in the rural PHC setting has demonstrated that this is not necessarily a barrier to its use. The timing of relapse suggests that 1-year follow up may be appropriate in future studies.

Added value of insecticide treated curtains to control dengue in a setting with low Aedes infestation levels and an intensive vector control programme.

Toledo ME, Vanlerberghe V, Lambert I, Popa JC, Baly A, Abad Y, Van der Stuyft P

Introduction: No evidence exists on the effectiveness of Insecticide Treated Curtains (ITC) for reducing dengue vector density in contexts of intensive larviciding and adulticiding campaigns.

Methods: We set-up a cluster randomized controlled trial in urban Guantanamo, Cuba. Twelve clusters (about 500 houses each) were randomly allocated to intervention and control areas. In March 2009 under field routine conditions, we distributed long lasting ITC (PermaNet®) in the intervention cluster. The routine control programme continued its actions (regular house inspection, temephos application and indoor and spatial cypermethrine spraying) in the whole study area. We compared (100 houses) and evaluated the effect of ITC coverage on HI.

Results: At distribution, the ITC coverage (% of houses using at least 1 ITC) was 99.1% in the intervention areas (95%CI 97.7-100.0), with a median of 3 ITC/household. After 18 months, the coverage remained 97.4%. The local Aedes species stayed susceptible to deltamethrin (mortality rate of 99.7%) and the deltamethrin in the ITC remained active (mortality rate of 73.1%) after one year of use. Over one year after distribution, the infestation in the control area was 11% higher than in the intervention area (incidence rate ratio of 1.11 (95% CI 0.70-1.76)), but this difference was not statistically significant. The annual cost per household of ITC implementation was 7.1 USD against 79.7USD for all routine control interventions.

Conclusion: In an environment with intensive routine Aedes control actions, the additional implementation of ITC did not achieve a significant reduction in Aedes infestation levels.

Progress in Lymphatic Filariasis Elimination in India

Srivastava, P.K., Dhariwal, A.C. And Bhattacharjee, J.

Goal of elimination of Lymphatic Filariasis (LF) by 2015 was set in the National Health Policy - 2002 document of India. The initiative taken so far towards elimination programme through Annual Mass Drug Administration (MDA) has started paying dividends. The improved MDA coverage from 72% in 2004 to 88% in 2012 had led to reduction in overall microfilaria prevalence from 1.24% to 0.33% during the same period. As a result, out of 250 LF endemic districts, 186 have reported microfilaria prevalence of <1% during 2012. However, suboptimal drugs compliance has caused continuation of >1% microfilaria prevalence in certain areas. Stepping further towards elimination, Indian Programme has initiated conduction of Transmission Assessment Survey (TAS) as per WHO guidelines-2009. Core trainers of the country were trained by WHO at VCRC, Puducherry, India in July 2011. The success achieved so far in India through MDA is being validated through TAS in phased manner. So far TAS has been successfully conducted in 2 districts of Goa, one each of Puducherry and Tamil Nadu. During 2013-14, process has been initiated for conducting TAS in 50 districts under the programme.

Towards disability alleviation, the strategy of home based morbidity management for Lymphoedema cases and surgical operation of Hydrocele cases were initiated and progressively augmented. A total of 8, 77,594 lymphoedema and 4,07,307 hydrocele cases have been line listed from LF endemic districts. Surgical intervention for Hydrocele is regularly done in endemic districts. Between 2004 and 2012, a total of 1,10,679 hydrocele cases have been operated.

Planning
and
Evaluation
in disease
control

Oral Sessions

Control of Schistosomiasis in Hunan Province, China

Balen, J., Liu, Z.C., McManus, D.P., Raso, G., Utzinger, J., Li, Y.S.

Access to health care is a major requirement in improving health and fostering socioeconomic development. In the People's Republic of China (P.R. China), considerable changes have occurred in the social, economic, and health systems with a shift from a centrally planned to a socialist market economy. This brought about great benefits and new challenges, particularly for vertical disease control programs, including schistosomiasis. We explored systemic barriers in access to equitable and effective control of schistosomiasis. Between August 2002 and February 2003, 66 interviews with staff from anti-schistosomiasis control stations and six focus group discussions with health personnel were conducted in Hunan Province. Additionally, 79 patients with advanced schistosomiasis japonica were interviewed. The health access livelihood framework was utilized to examine availability, accessibility, affordability, adequacy, and acceptability of schistosomiasis-related health care. We found sufficient availability of infrastructure and human resources at most control stations. Many patients with advanced schistosomiasis resided in non-endemic or moderately endemic areas, however, with poor accessibility to disease-specific knowledge and specialized health services. Moreover, none of the patients interviewed had any form of health insurance, resulting in high out-of-pocket expenditure or unaffordable care. Reports on the adequacy and acceptability of care were mixed. There is a need to strengthen health awareness and schistosomiasis surveillance in post-transmission control settings, as well as to reduce diagnostic and treatment costs. This study contributes towards a growing multi-layered, in-depth understanding of barriers to equitable and effective control, so that the ultimate goal of schistosomiasis elimination in P.R. China can be reached.

Added Value of anthropological studies in neglected zoonotic disease control: Reports of three case studies

Thys S¹, Sahibi H², Mwape EK³, Knobel D⁴, Rahali T², Gabriël S⁵, Phiri A³, Van Rooyen J⁴, Simpson G⁶, Lefèvre P¹, Boelaert M¹, Rhalem A², Dorny P⁵ and Marcotty T⁵

For calling attention to their effect on poor, marginalised communities, widespread under-reporting and low prioritisation by national and international agencies, a number of endemic zoonoses in developing countries (anthrax, bovine tuberculosis, brucellosis, cysticercosis, echinococcosis, leishmaniasis, rabies, zoonotic trypanosomiasis and foodborne trematode infections) have recently been termed 'neglected zoonotic diseases' (NZDs). Although sharing characteristics with the neglected tropical diseases (NTDs), many NZDs present unique control challenges as they involve issues at the animal-human-ecosystem interface where they inflict a dual burden on communities, compromising livestock health while causing human morbidity and mortality.

To face these complex control issues, the "One Health" perspective emphasises the need for inter-sectoral collaborations between actors in agriculture, medicine, animal health, conservation and others in the social sciences, including anthropologists, sociologists and economists. While the 'One Health' paradigm recognises the importance of social and cultural factors in disease transmission dynamics and the planning of control interventions, the significance and potential role of applied anthropology for NZD control remains unclear.

Through three anthropological case studies, respectively assessing local knowledge and perception of rabies in the Mnisi community (Mpumalanga, South Africa), echinococcosis in the Amazigh population (High Atlas, Morocco) and cysticercosis – taeniasis in the Nsenga ethnic group (East Province, Zambia), the author attempts to reveal the complex relationships between different aspects of the social and biological world at the transmission dynamics level and therefore the potential contribution of applied anthropology for a more adapted and effective control of NZDs.

State of the art
of the control of
neglected diseases
in Asia.

Part 2

Oral Sessions

Latent infection with *Leishmania donovani* in highly endemic villages in Bihar, India.

Chourasia A, Hasker E, Kansal S, Malaviya P, Gidwani K, Picado A, Singh RP, Singh AK, Shankar R, Menten J, Wilson ME, Boelaert M, Sundar S.

Introduction: Asymptomatic persons infected with the parasites causing visceral leishmaniasis (VL) usually outnumber clinically apparent cases by a ratio of 4-10 to 1. We describe patterns of markers of *Leishmania donovani* infection and clinical VL in relation to age in Bihar, India.

Methods: We selected eleven villages highly endemic for *Leishmania donovani*. During a 1-year interval we conducted two house to house surveys during which we collected blood samples on filter paper from all consenting individuals aged 2 years and above. Samples were tested for anti-leishmania serology by Direct Agglutination Test (DAT) and rK39 ELISA. Data collected during the surveys included information on episodes of clinical VL among study participants.

Results: We enrolled 13,163 persons; 6.2% were reactive to DAT and 5.9% to rK39. Agreement between the tests was weak ($\kappa=0.30$). Among those who were negative on both tests at baseline, 3.6% had converted to sero-positive on either of the two tests one year later. Proportions of sero-positives and sero-converters increased steadily with age. Clinical VL occurred mainly among children and young adults (median age 19 years).

Discussion: Although infection with *L. donovani* is assumed to be permanent, serological markers revert to negative. Most VL cases occur at younger ages, yet we observed a steady increase with age in the frequency of sero-positivity and sero-conversion. Our findings can be explained by a boosting effect upon repeated exposure to the parasite or by intermittent release of parasites in infected subjects from safe target cells

Higher Parasite Burden in Healthy (Asymptomatic) Individuals Contribute In Progression of Visceral Leishmaniasis.

Singh AK; Sudarshan M; Chourasia A; Chakravathy J; Rai M; Sundar S

Abhishek Singh Kumar, Department of Medicine, Institute of Medical Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh, India

In an area endemic for Visceral Leishmaniasis (VL), subclinical or asymptomatic infections play a crucial role in progression of disease. We determined the parasite load by quantitative PCR (qPCR) in healthy infected population living in an area endemic for Visceral Leishmaniasis. We enrolled 13366 persons from 11 villages of highly endemic region of Bihar, India. We conducted two sero- surveys with 1 year time interval for identification of incident infected healthy individuals. Parasite load using TaqMan based qPCR were done on these sero-converted individuals and its matched control populations. Individuals having parasite load greater than 1 genome/ml of blood was considered as positive by qPCR. Follow-up visit to the homes of each individual were made to monitor the disease conversion in this cohort. Agreements between seroconversion and qPCR were accessed by kappa value. Total 235 persons had converted their serology within 12 month intervals. Of these 235 sero-converters 105 (44.6%) individuals were also positive by qPCR. However, similar number of control groups (87/ 237, 37%) also showed positivity by qPCR. The agreement between sero-converter and qPCR was moderate. Among all individuals only one had converted into disease that has parasite load of 146 parasite genome/ ml of blood. These findings suggest the usefulness of parasite load in healthy individuals living in an endemic area of Bihar and contribute as a good tool for VL elimination programme.

Replacement of indoor residual spraying to control Visceral leishmaniasis

Das M L¹, Kumar V², Mondal D³

Introduction: Visceral leishmaniasis is a neglected disease transmitted by *Phlebotomus argentipes* in 109 districts of India, Bangladesh and Nepal. In 2005 the three countries agreed to reduce annual VL incidence to 1/ 10,000 for its elimination. Toward this set target, vector control will play a significant role.

Objectives:

- To compare the effectiveness of three different types of alternative of IRS.
- To measure the community acceptance of interventions.

Materials and Methods:

Study design: This study was a multi-centre cluster randomized trial with three methods to control vector. The methods were Indoor Durable Wall Lining (IDWL) containing deltamethrin, Indoor Wall and Floor Plastering with Lime (IWFPL) and Impregnation of existing bed-nets (ITN) with slow release insecticide tablet containing deltamethrin.

Entomological activity: 2 weeks before intervention and 4 weeks after intervention sand-flies were collected for two consecutive nights by CDC light traps.

Results: Altogether 1297 houses inhabited by 2858 male and 2830 female were covered under this study. 1362 slept on floor but 4813 slept under bed net. In comparison to base line data, IDWL, IWFPL and ITN reduced the vector density by 68%, 18% and 16% respectively. However in the control arms there was a reduction of 12% without any intervention. Though, about 20 persons in each of the group IDWL and ITN had suffered from headache, itching, burning sensation of face and bad smell only 11 persons did not like the interventions.

Conclusion: Highest decrease in the density of *P. argentipes* was noticed by IDWL.

Effectiveness of community-level distribution of long-lasting insecticidal bed nets in reducing domestic sand-fly density in the Indian subcontinent – A systematic review.

Pradyumna A.

Visceral leishmaniasis (VL), with a prevalence of 2.5 million cases, is a major vector-borne disease in the adjoining regions of north-eastern India, Bangladesh and Nepal. As indoor residual spraying (IRS) showed limited success, newer approaches such as long lasting insecticidal bed nets (LLIN) are being tested. This systematic review on the effectiveness of LLIN in reducing domestic vector (sandfly) density identified four relevant community-level intervention studies from the Indian subcontinent, all of which were published in 2009-2010, and were of acceptable quality. A narrative synthesis was performed (meta-analysis was unfeasible), with simple transformations of results to facilitate inter-study comparison. All four studies reported a relative reduction in sand-fly density on an average between 31.9% and 59.7% in LLIN houses when compared with controls, though reduction levels were not consistent. Reductions were reported as early as one month and as late as 18 months post intervention. Two of the included studies also compared LLINs with IRS (which showed relatively greater reduction in vector density (63.6-72.4%)), and environmental measures (liming of walls) (which showed relatively lower reduction (26.8-42%)). No peri-domestic increase in sandfly density was reported following LLIN use, ruling out vector displacement. It was perceived as useful by over 50% of the community even six months post-distribution. This review established that use of LLINs reduced domestic sand-fly density when implemented at community level, but its usefulness in reducing VL incidence needs further regional research as one follow-up study reported no reduction in VL incidence despite reduced vector density with LLINs.

Risk factors for relapse of visceral leishmaniasis after initial cure with miltefosine in India and Nepal.

Ostyn B, Hasker E, Dorlo TPC, Rijal S, Sundar S, Dujardin JC, Boelaert M.

Background: High incidence of relapse in miltefosine-treated patients in India and Nepal followed up for twelve months.

Methods: in a prospective study in seven health care structures in India and Nepal, we collected data from 1016 VL patients treated with miltefosine according to the standard treatment guidelines and recorded early and late treatment outcomes up to 12 months after the end of treatment. We investigated patient and treatment characteristics associated with VL relapse.

Results: Clinical records from 78 relapse patients were compared with those of 775 patients who had no record of subsequent relapse. Relapse was 2 times more common amongst men compared to women (IRR 2.14, 95% CI 1.27-3.61), and 2 to 3 times more frequent in the 2 age groups below 15 compared to the over 25 year olds (Age 10 to 14: IRR 2.53; 95% CI 1.37-4.65 and Age 2 to 9: IRR 3.19; 95% CI 1.77-5.77). Previous VL history, or clinical presentation at time of diagnosis such as duration of symptoms or spleen size were no predictors of relapse.

Conclusions: Age and gender were associated with increased risk of VL relapse after miltefosine, suggesting that the mechanism of relapse at the current stage is mainly immunological and that the observed increase of relapse may be partly explained by the inclusion of younger patients compared to the earlier clinical trials, rather than a decrease in efficacy of miltefosine.



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In vitro susceptibility of leishmania donovani to miltefosine in Indian visceral leishmaniasis: Promastigote assay

Prajapati VK, Sharma S, Rai M, Ostyn B, Salotra P, Vanaerschot M, Dujardin JC and Sundar S

Promastigote miltefosine (MIL) susceptibility was performed on *Leishmania donovani* isolates from Indian patients with visceral leishmaniasis (VL) treated with MIL. Isolates that were obtained before the onset of MIL treatment, after completion of treatment (29th day), or at the time of fail were screened using in vitro promastigote assay. The MIL susceptibility of the pre-treatment isolates ($n=24$, mean $IC_{50} \pm SEM = 3.74 \pm 0.38 \mu M$) was significantly higher than that of the post-treatment group ($n = 26$, mean $IC_{50} \pm SEM = 6.15 \pm 0.52 \mu M$; $p = 0.0006$) but was found to be similar between the cure ($n = 22$, mean $IC_{50} \pm SEM = 5.58 \pm 0.56 \mu M$) and treatment failure group of isolates ($n = 28$, mean $IC_{50} \pm SEM = 4.53 \pm 0.47 \mu M$). The pre/post-treatment results thus showed a hardly 2-fold difference while cure Vs fail samples showed a similar susceptibility, suggesting that this higher tolerance is not responsible for MIL-treatment failure. Our work highlights the need for careful monitoring of MIL susceptibility for implementation in national VL elimination program.

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Prevalence Of HIV-VL And Long Term Outcomes Of Co-Infected Patients Treated With 20mg/Kg Liposomal Amphotericin B In Bihar, India.

Burza, S. Mahajan R, Mitra G, Lima MA

Introduction: MSF has treated over 10000 VL patients using 20mg/Kg L-AmB in Bihar since 2007, a state estimated to have an adult HIV prevalence of <0.28%. Although MSF does not provide ART, HIV-VL co-infections have been recognized as a high-risk group for both relapse and mortality after VL treatment. This abstract presents the field condition outcome of all co-infected patients treated from Jul 2007 until Aug 2012, and provides evidence of HIV prevalence in patients presenting with VL in Bihar.

Method: This was a retrospective database analysis using routine program data. MSF follow up is both passive (e.g. relapsing patients who self-present) and active. The range of time since completion of initial treatment ranged from 3 months to 5 years.

Results: From Jul 2007 to Aug 2012, 161 patients had been diagnosed with HIV-VL co-infection. 83.2% of who were male, with a mean age of 36.5 yrs (SD 10.4). 41% (n=66) patients presented with a history of VL relapse. No patients had initial treatment failure after receiving 20mg/kg L-AmB. Of 161 patients followed up at the end of 2012, 25 (15%) were not traced. Of these 25, only 7 had no record of any passive or active follow up following discharge. Mortality at 0.5, 1, 2, 3, 4 and 5 years after VL treatment was estimated as 14.4, 19, 22.5, 28.5, 28.5 and 59.1% respectively. Probability of relapse was 4.6, 16.6, 28.5, 28.5, 37.2 and 52.9% over the same time periods respectively.

From Mar 2011 to Dec 2012, MSF offered VCT to all patients >14 yrs diagnosed with VL and unknown HIV status. 1535 patients were eligible for VCT, of whom 1519 were offered VCT. Of these >99% accepted VCT. 3.4% of these tested positive for HIV.

Conclusion: This is the biggest cohort of HIV-VL co-infected patients treated in the Indian subcontinent. Both national HIV and VL programs are yet to acknowledge the importance of co-infection or to develop appropriate guidelines and VCT is not currently recommended for all VL patients. The 11 times higher prevalence of HIV infection in patients presenting with VL, together with the high mortality and relapse rate compared to immune-competent patients suggests this is an emerging issue that needs to be addressed.

Re-emergence of El Tor variant *Vibrio cholerae* O1 causing cholera epidemic during 2010 in the tribal areas of Odisha, India.

Pal B.B., Kar S.K., Khuntia H.K., Achary K.G., and Khuntia C.P.

Background: The epidemics of cholera were reported in the Kashipur, K.singhpur, B.cuttack blocks of Rayagada district and Mohana block of Gajapati district of Odisha during 2010. The present study was carried out to isolate the bacterial pathogen, its drug sensitivity pattern and to describe the spread of the disease in those areas.

Methods-A total of 68 rectal swabs collected from severe diarrhoea cases admitted to different health centers and diarrhoea affected villages were bacteriologically analyzed. Similarly 22 water samples collected from different villages from nala, chua, etc were tested for the presence of *V.cholerae*.

Results- Out of 68 rectal swabs tested 35 (71.4%) were *V.cholerae* O1 Ogawa and 14(28.6%) were *E.coli*; whereas all water samples were negative for *V.cholerae*. All *V.cholerae* strains were sensitive to gentamicin, norfloxacin, ciprofloxacin, azithromycin and ofloxacin; but were resistant to ampicillin, tetracycline, nalidixic acid, furazolidone, streptomycin, erythromycin, cotrimoxazole, neomycin and chloramphenicol.

Discussion: All *V.cholerae* strains were 100% resistant to tetracycline and they were El Tor variants harboring *ctxB* gene of classical strain which is the first report from this state. The date wise spread of the disease is described in the worst cholera affected villages of Kashipur, K.singhpur and B.cuttack blocks of Rayagada district. **Conclusions-** The present study indicated the reemergence of El Tor variants of *V.cholerae* strains in the same tribal areas with altered antibiogram after a gap of three years; and its spread in the tribal areas which needs close monitoring.

Control of neglected diseases
and health systems
Strengthening (HSS)
in Asia

Oral Sessions

Role of village health workers in control of visceral Leishmaniasis, Bihar"

Paritosh Malaviya; Epco Hasker; Rudra Pratap Singh; Jean-Pierre Van Geertruyden; Marleen Boelaert; Shyam Sundar

Introduction: In India visceral leishmaniasis (VL) elimination initiative faces some major shortcomings in monitoring of treatment and treatment outcomes which could be addressed by involving village health workers (VHWs). We reviewed the random periodic surveys for recording treatment outcomes and assessed the willingness and preparedness of VHWs in relation to VL for their involvement in VL.

Methods: Records of 150 randomly sampled patients from PHCs of Muzaffarpur district were examined. Both patients and physicians were interviewed using two specific questionnaires. Costs of this survey were properly documented and vehicle log books were maintained. Randomly sampled 200 VHWs were interviewed to explore their knowledge on signs and symptoms, transmission, diagnosis and treatment of VL and TB and willingness to become further involved in VL control.

Results: After all efforts 11 patients were untraceable due to erroneous recording of patients' characteristics and addresses at the PHCs. Per patient follow-up cost was US\$ 15.51. Total human resource involvement costs 75% whereas involvement of physician costs 51%.

VHWs know the symptoms and diagnosis of VL and TB but not the recommended first-line treatment and treatment administration. They are involved in TB control but not in VL control. They are organized, linked to the PHCs and ready to get more involved in VL control. They require proper training and demand monetary incentive to compensate for the additional workload.

Conclusion: A random survey to document clinical outcomes is costly and labor intensive. A health service based retrospective quarterly cohort monitoring developed by tuberculosis program could be a better alternative.

Active case finding strategy for tuberculosis case detection in urban slum

Banuru Muralidhara Prasad, Srinath Satyanarayana, Sarabjit Singh Chadha, Subarat Mohanty, Anand Das, Mohammed Ubaid.

Background: Active Case Finding (ACF) strategy is a cross sectional house-to-house survey among high risk community groups to identify TB symptomatics and provide treatment.¹ ACF in Tuberculosis is an emerging strategy and The Union with its partner conducted an ACF survey in Agra slum population by engaging volunteers to inform communities about TB care and control. During the survey, person with TB symptomatics were referred to nearest designated microscopic centres (DMCs). Volunteers were entrusted to follow-up on referrals made.

Results: In the survey population 91% had heard about TB, and among the households reached, about 17 households had one of their family members who had TB. Through ACF, 400 TB symptomatics were referred from 3940 households and 7 were found to be positive for sputum examination (3 male, 4 female).

Conclusion: Stigma about TB is still prevalent in the community though awareness levels were high. Low positivity rate in study, reflected on systems acceptability to strategies like ACF when the programme target of respective DMC was achieved. Health system staff expressed the limitation in availability of reagents, manpower, medicines, etc for such activities. The experiences highlight need for system strengthening to conduct ACF - within the framework of Universal Healthcare approach in areas particularly for marginalized and vulnerable populations.

¹Sekandi JN, Neushause D, Smyth K and Whalen CC (2009) Active case finding of undetected tuberculosis among chronic coughers in a slum setting in Kampala, Uganda, International Journal of Tuberculosis and Lung Disease, Vol 13 . No 4: PP 508-513

Vertical, horizontal, diagonal: the policy debate continues, but where is the evidence?

Balen, J., Jasseh, M., Conteh, L., Smith, P., Demba, A., d'Alessandro, U.

A longstanding debate within the health research field relates to the integration of 'international' disease control programmes into national health systems, with disagreements regarding the purpose, level, extent, timing, relative merits and outcomes of such integration. This debate is of particular importance in light of substantial increases in externally funded control programmes and global efforts aimed at health system strengthening. Indeed, increased attention from the global health community is being directed towards potential synergies among disease control programmes and health systems, with recent calls for coordination and integration of cross-cutting action aimed at reaching all of the Millennium Development Goals (MDGs), particularly the three health-related MDGs of reducing child mortality, improving maternal health and combating HIV/AIDS, malaria and other diseases. The aim of such integration is to "bring together different threads into one fabric" (Jeffrey Sturchio, Former President and CEO of Global Health Council, 2010), and thereby limit the negative consequences of working within disease-specific silos, whilst harnessing complementary strengths that have been established throughout decades of vertically-driven programmes. Our work presented here addresses key knowledge gaps by examining the nature and extent of cross-programme and programme-system integration in selected case-study countries from West Africa and Southeast Asia, namely: (1) The Gambia; and (2) Cambodia, respectively, bringing concrete evidence to the global policy debate. An improved understanding of the nature, extent and outcomes of interactions between disease control programmes and national health systems will enable more informed policy-making and implementation, increased effectiveness in the scale-up of programmes, and sustained success.

Integrating and Adapting Human Resources at Service Delivery Level within National Disease Control Programs- A Case Study

Menon P.K., Singh A., Kansakar B., Hira S.K., Balasubramaniam P.

Background: This paper is part of a larger on-going research study on "Identifying Operational Pathways for Accommodating and Integrating National Disease Control Programs within the Framework of Universal Health Coverage".

India currently has 15 disease control programs, traditionally designed at the Centre that exclusively engage allied health professionals at block level to work for individual programs. This replication of human resources across programs is a typical example of duplication of services that occurs in vertical programs resulting in fragmentation compounding health system inefficiencies.

Objectives: While the broader study aims to assess and identify potential operational pathways of integration of various disease control programs, this 'case-study' examines how some States have managed to work around rigid national policy and program design at service delivery level for efficient utilization of central resources.

Methods: The case-study is developed on emerging evidence from the original study which incorporates mixed methods. Data collection involves structured and semi-structured, interviews of key informants in six states selected on low, moderate, and high health indicators. Field data was supplemented by extensive literature review on national disease programs. Data is transcribed and analysed using Atlas Ti and SPSS software.

Observations: In attempting to identify operational pathways in integrating program components of vertical programs, this case-study focuses on State-led program implementation around human resource utilization. We demonstrate State driven multi-skilling and multi-tasking efforts as efficient ways to deliver related program services while effectively containing costs.

Community level morbidity control of lymphoedema using self care and integrative treatment

Aggithaya MG, Narahari SR, Bose KS

Background: There is no nationwide public health programme of proven effectiveness, in any endemic country to manage lymphatic filariasis (LF). Narahari et al developed a treatment protocol for LF integrating ayurveda, biomedicine and yoga to address the morbidity in rural communities. This presentation is on efficacy of the integrative treatment protocol when applied in a resource poor community village setting of South Indian states.

Methods: The study was conducted as a before-and-after interventional non randomized trial. Two LF endemic districts of south India, Gulbarga in Karnataka (GK) and Alleppey in Kerala (AK), were selected. All known patients on governmental records or specialist registers were invited to a training camp. Patients with grade two late or three lymphoedema with a family member for assistance were enrolled.

All patients received initial two weeks of supervised treatment as outpatients in the treatment centers. The outcome measures were, quality of life assessment using LF-specific QoL questionnaire, limb volume by water displacement method, girth measurement, and LF morbidity. This was carried out at baseline and at monthly follow ups, for three months.

Results: 730 patients (851 limbs) completed the three and half month follow up. The quality of life of patients improved significantly $P < 0.01$. There was a statistically significant reduction up to mid thigh level volume measurement for both small (0.7-1.1 liters) and large (1.8-5.0 liters) limbs, $P < 0.01$. Patient had fewer filarial fever episodes, and reduced bacterial entry points.

Conclusions: Self-care and integrative treatment is possible in resource poor Indian village settings.

Unmet needs of health system for tackling NTDs in Bangladesh

Shawon MSR, Bulbul MMI, Adhikary G.

Background & objectives: Neglected tropical diseases are a cluster of chronic disabling infections affecting under-privileged population (residing in rural area, urban slums & conflict zones) of low income countries. These infections contribute to poverty cycle, disruption in social stability and economic progress in developing tropical countries like Bangladesh. Health system strengthening is crucial to elimination of NTDs. Our objective is to contextualize the health system of Bangladesh to combat NTDs according to WHO suggested six building blocks of health system.

Findings: In Bangladesh, primary health service does not integrate NTD control program and community sensitization & mobilization is inadequate. Interrupted provision of priority drugs and lack of pharmacovigilance & data on adverse reaction have worsened the scenario. Capacity building of health workforce on NTD is limited and often faces nepotism. Absence of financial risk pooling mechanism marks inequitable access to healthcare by the destitute and make them more vulnerable to NTDs. Ineffective surveillance system and poor data generation, documentation and management system fail to guide the policy makers for developing adaptive strategies. There is no operational plan for NTDs in the latest sector wide approach, HPNSDP (2011-2016) of Ministry of Health & Family Welfare.

Conclusion: People-centered comprehensive primary care along with rationalizing and bringing coherence to fragmented elimination programs and strong and sustained political commitment and integration of NTD control program within national health policy, strategy and plan are crucial to tackle NTDs in Bangladesh.

Experience of Sputum collection and transportation in TB care and control

Banuru Muralidhara Prasad Mryutyunjaya Nayak

Introduction: Public health facilities in India are established based on population norms. Implementation of this norm had limitations resulting in non-uniform distribution of facilities affecting the universal access to health services and also for tuberculosis services. Tuberculosis services are available within these public health facilities for those with chest symptomatics. These units are labeled as DMCs at identified facilities. DMCs accessibility to chest symptomatic varies, as a result symptomatics reaching these facilities for examination is delayed.

Method: Project Axshya developed and implemented strategy to train volunteers in remote, rural part of villages in Meghalaya and Mizoram to sensitize communities about TB care and control; visit households who present with chest symptomatics. The volunteer inform household members about TB services and collects sputum of symptomatics (two samples) and transports to nearest DMC.

Result: Volunteers, transported sputum from 692 TB symptomatics to nearest DMCs (October'12-March'13). Laboratory technicians examined and diagnosed sputum samples of 68 symptomatics as positive. Volunteers communicated results and informed about DOTS providers. Four volunteers are acting as DOTS providers in areas where there are no ANMs/ASHAs/AWWs.

Conclusion: Burdened with poor public transportation and household economies, commutation of TB symptomatics to DMCs for seeking care/service is challenging. Through this mechanism of sputum collection and transportation a nexus of volunteers - local taxi drivers; communities unreached were reached and educated about TB care and control. Project was able to identify 68 TB patients who would otherwise not have got examined or would have reached DMCs in later stages of disease infecting healthy individuals.

Poster Exhibition

Scrub typhus: a re-emerging and neglected disease of Rajasthan

Dr Rathore Jalam Singh

Introduction: Scrub typhus is re-emerging and neglected infectious disease in Alwar and Rajasthan. Though some studies had reported presence of disease in decade of 70s, but after that till 2011 this disease was not considered in diagnosis. In 2011 during investigation of an outbreak of acute febrile illness in Alwar, NCDC documented scrub typhus as one of the causes of outbreak. In year 2012, total 82 cases including 3 deaths were found positive for scrub typhus in district.

Observations: Almost all blocks of the district have presence of disease and its more prevalent among adults especially females. Majority of the cases were reported in late or post monsoon season (Aug-Sep-Oct).

Lack of guidelines for prevention and control of disease is a hurdle to ensure curative and preventive services. Consideration of disease in diagnosis and initiation of empirical therapy by health professionals is another impediment.

Conclusion & Recommendations: Scrub typhus has been found as re-emerged and neglected cause of the Acute Febrile Illness in the region. There is a need for research to understand epidemiological situation, challenges and opportunities for preventive and curative services in Rajasthan and local strategy to halt the infection.

Scrub typhus should be included in vector borne program so that preventive and curative measures can be performed to halt transmission. Training of health professionals and involvement of ASHAs in identifying febrile cases can help screening of cases early and thus mortality can be prevented with start of early initiation of empirical therapy.

Where do PLHIV (people living with HIV/AIDS) go and what do they prefer? Engaging private providers in HIV/AIDS service provision in Tamil Nadu, India

Asirvatham Edwin Sam

Introduction: In India 75% of health care is provided by private providers. The percentage of HIV care by private providers is not known; they operate largely outside the National AIDS Control Program. This study aimed at understanding the utilization of services and provider preferences of PLHIV as these are prerequisites to change behavior and improve health practices among PLHIVs.

Methodology: This was a cross sectional study, carried out in twelve districts of Tamil Nadu. A sample of 667 PLHIV was selected using simple random sampling of registered PLHIVs; district sample size was in proportion to the number of PLHIVs registered. A pre-tested interviewer administered schedule was used to collect data.

Results: During last illness, 46.5% of PLHIV approached private facilities, 43.8% public, 5.2% pharmacists, 4% opted for self-medication and 0.4% traditional practitioners. Public facilities were accessed for HIV counseling/testing(HCT), advanced lab investigations, antiretroviral therapy, delivery, surgery and STI management. Private facilities were accessed for specialist consultation and management of opportunistic infections. PLHIVs with higher income and education were more likely to seek private facilities; however, for HCT, these were not factors. Given an opportunity, majority(64%) preferred private facilities; Education and income were the factors associated with the preference of private facilities.

Conclusion: The higher preference for private facilities emphasizes the need to engage private providers in the provision of HIV/AIDS care and treatment services. The study provides valid insights on the need to subsidize the cost at private facilities. Cost sharing approaches could be used through public-private partnership initiatives.

Assessing maternal and neonatal tetanus risk in a tribal district of Odisha

Dr. Raveesha R Mugali.

Introduction: Maternal and Neonatal Tetanus (MNT) has been a major public health concern in India. As is known, MNT can be prevented by immunizing pregnant women with tetanus toxoid, ensuring clean delivery and post-natal safe cord care. Through sustained immunization efforts and ensuring institutional safe deliveries, some states have successfully eliminated neonatal tetanus while some others are still reeling under it. The status of elimination is validated through using the WHO methodology-lot quality assurance with cluster sampling (LQA-CS). A pre-validation exercise precedes the LQA-CS survey to assess the MNT risk. This paper draws on evidence from one such pre-validation exercise in a remote tribal district of Odisha.

Methodology: The pre-validation exercise methodology included:

- Ranking of district for MNT risk in the state: this was done by tabulating primary and surrogate indicators of MNT from the last 3 years data and ranking with appropriate weightings.
- Assessment of health systems delivery in the district: With semi structured questionnaire, ANC, Immunization institutional deliveries.
- Assessment outreach services including cord care practices: A Field survey of 30 mothers in randomly selected villages.

Results: The pre-validation exercise shows that the district reported only 42%-Institutional deliveries. 48%-of deliveries were attended by SBA. 30%-of villages received periodic outreach health services due to security reasons (the district has been a hub of Maoist movement). The immunization coverage shows 46%-DPT3, 89%-TT coverage. 50 %-of mothers (n=30) used various materials to apply on cord stump like Blackened mud from the clay oven, goat-dung, snails-shell-powder and leaves-paste from trees. Barely 48 doctors were in place against sanctioned 87 (55%) while 14 % of health-worker posts were vacant.

Conclusion: The pre-validation-survey shows that the district is still under high risk of MNT. Behavioural-change -communication strategies for mothers & community towards MNT and safe-cord practices are critical. Improving access, effective-utilization of health-services particularly institutional deliveries with-SBA is needed. Strategies to reach the health services in security compromised areas through local community involvement are imminent to reduce the risk of MNT in this remote district.

From clinics to community? - Detection of ESBL producing Enterobacteriaceae from community water samples in Cochin, Kerala

Krishna S, Aswathy S, Dinesh K, Viswanath V, Panicker KN, Karim S

Introduction: Antimicrobial resistance is now a worrying global public health issue as infections caused by multi-drug resistant bacteria are associated with higher morbidity and mortality. Bacteria carrying resistance genes are moving beyond the hospitals into the community, infecting healthy people, and posing therapeutic challenges leading to fatal infections. Enterobacteriaceae that produce Extended Spectrum β -lactamases (ESBLs) confer resistance to commonly used antibiotics, are no longer limited to hospitals (70-90% Indian prevalence) but have emerged within the community settings.

Methodology: A total of 105 Enterobacteriaceae isolates obtained from 100 (46 well water, 45 tap and 9 river water) samples in and around Kochi were investigated for their production of ESBLs for better understanding of transmission of antibiotic resistance links and the public health risks involved. Coliform contamination rate in water samples and antimicrobial resistance pattern of obtained isolates were assessed.

Results & conclusion: Coliform contamination rate was 76%. Contrary to the belief of community water as an important source of dissemination and transmission of Multi-Drug resistant bacteria linking the clinics and community, our study results showed negligible prevalence of MDR(<1%) and 2 ESBL producing Enterobacter Spp (1.9%), confirmed by molecular methods. The city water does not currently pose a threat for ESBL hospital-community transmission of infections. The results may be regarded as a benchmark to monitor an impending problem at an early stage. Further epidemiological and environmental studies with plasmid analysis, phage studies, and frequency of the transfer of resistant elements may be undertaken to explore the dissemination pathophysiology and the unexplained links of transmission.

Challenge of melioidosis in Cambodia

Ellen Maling Phe T.^m; Kruiy L.^m; Thai S.^m; Veng C.^m; Vlieghe E.^m; De Smet B.^m

Melioidosis is a life-threatening community-acquired disease caused by *Burkholderia pseudomallei*, having its reservoir in soil. It is endemic in South-East Asia and Northern Australia, causing high mortality rates among infected individuals (20-50%). Invasive blood-borne dissemination into organs is the hallmark of the disease, with pneumonia being the most frequent presentation.

Diagnosis relies on culture of the bacterium, which causes an important diagnostic delay and requires a microbiology laboratory. Its treatment is difficult and long, due to high level of intrinsic resistance and ability to survive in macrophages. Ceftazidime or meropenem are required for the initial intensive therapy but both permanent access and affordability are difficult to ensure in Cambodia, especially in public hospitals.

In 2007, the Sihanouk Hospital Centre of HOPE, a tertiary hospital in Phnom Penh, Cambodia, implemented a blood culture based, passive surveillance. So far, 153 cases of melioidosis have been laboratory confirmed.

We observed a learning curve on melioidosis at several levels in the hospital. Although melioidosis is well known in the region, it was unfamiliar to most clinicians and laboratory staff at the start of the study. Our findings from this surveillance project, raising awareness at the local level, can be translated to a national level. Accordingly a national workshop for Cambodian health care workers was organized to share this experience, especially regarding the early diagnosis and appropriate treatment.

The public health impact of this disease warrants further research and actions. An immanent problem of melioidosis in Cambodia remains access to effective drugs and further development of quality-assured and affordable diagnostic microbiology capacity.

An Epidemiological investigation of Cholera outbreak in Poonamallee Municipal area, Tamil Nadu, India

Mahajan Dhruba¹, Ramakrishnan R², Murhekar M³, Mehendale Sanjay M⁴.

Background: Cholera causes frequent diarrheal outbreaks in India including Tamil Nadu. On 9th December, 2011 we investigated an outbreak (detected on 8th December) in Poonamallee (population 56,685) municipality to identify agents, source of infection, control and recommend preventive measures.

Methods: We reviewed records in hospitals and searched for cases with occurrence of e"3 loose stools with or without vomiting, within 24 hours between December, 2011 and January, 2012. We examined drinking water for chlorine level, microbiological content; collected rectal swabs for confirmation. We described outbreak in terms of time, place and person; we conducted a case control study with 95 patients and 195 controls in selected five wards with higher attack rates and performed univariate and multivariate analysis.

Results: Total 172 residents suffered from diarrhea with an attack rate of 3 per 1000 population. Two case-patients died (CFR=1.16%). Laboratory isolated *Vibrio Cholerae* O1 from 12 of 43 rectal swabs; 50% of water sample collected from various sources showed fecal contamination; Drinking municipal pipe water was 2.31 (95% CI 1.02-5.41) times more among cholera case-patients, on the other hand drinking bottled water and boiled water were 3.03 (95% CI 1.08-10.53) and 2.98 (95% CI 1.62-5.71) times more respectively among controls.

Conclusions: Fecal contamination at the source of drinking water probably contributed to this outbreak. Pipe water supply was stopped with arrangement of alternate water supply. Pipes were repaired and water was chlorinated prior to the supply. The outbreak was controlled and we recommended regular cleaning, chlorination and adopting household safe water usage to prevent outbreak.

Is cash transfer program a viable option to support children affected and infected with HIV? Evidences from Tamil Nadu State, India

Asirvatham Edwin Sam

Background: Children affected and infected with HIV are primarily from the poor households and they are deprived of basic needs. The Government of Tamil Nadu implemented a cash transfer program to address the children's education, nutrition, health-care and socioeconomic needs through a trust with a corpus fund of \$1million. The objective of the study was to assess the effectiveness of this program in achieving its intended purposes.

Methods: The study was undertaken in 10 districts from four clusters of districts in the state of Tamil Nadu. A sample of 153 beneficiaries was selected using the probability to proportionate size method from each district. In addition to the secondary data, interviews were conducted using a semi-structured interview schedule. The caretakers were interviewed for children below 15 years.

Results: Among study participants, 37% were double orphans, 53% were paternal and 10% were maternal orphans. Around 63.4% were from rural areas; 30% were under the care of grandparents. Food expenditure was the primary household expenditure. The cash transfer programs disbursed an average amount of INR2617. The respondents reported improvements in school attendance (98%) and performance (94%). Around 42% reported an improvement in the food consumption. Among children on ART (81), both mean hemoglobin level (10.04 mg to 10.76 mg; $p < .001$) and mean CD4 level (738.75 to 1014.34; $p < 0.01$) increased significantly.

Conclusion: This program was found to be effective especially in supporting the education of children. It is imperative to scale up the program as it reached only a low proportion of eligible beneficiaries.

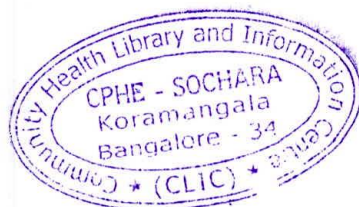
Molecular identification of hookworm species in a multi-centric efficacy trial across seven soil transmitted helminths endemic countries

Santosh George, Bruno Levecke, Gagandeep Kang, Peter Geldhof, Jozef Vercruysse

Soil transmitted helminths (STH, *Ascaris*, *Trichuris* and hookworms-*Ancylostoma duodenale* and *Necator americanus*) are the most prevalent parasitic infections worldwide, including countries like India. The accurate diagnosis of hookworm infection in humans is central to effective control and the detection of the parasite. Therefore, in this study molecular identification of two important species of hookworm namely, *A. duodenale* and *N. americanus* was done using a semi-nested standardized polymerase chain reaction (PCR).

The study was carried out from samples collected in a multi-centric drug efficacy trial, which looked at the efficacy of a single-oral dose of mebendazole (500mg) against STH. From six developing countries, namely Brazil, Cambodia, Cameroon, Ethiopia, Tanzania and Vietnam, 5,830 children were assessed for anthelmintic efficacy. From each of the six countries, approximately 200 random stool samples, positive for STH, either at baseline or both at baseline and follow-up, were preserved in 70% ethanol and sent to the Laboratory of Parasitology, Ghent University. 20 subjects who were excreting eggs only at baseline and 20 subjects who were excreting STH both at baseline and at follow-up were selected at random. The sampling strategy resulted in approx 60 stool samples per country. The study was carried out to help understand the role of zoonosis and anthroponotic mode of infection for STH and to verify to which extent treatment has an impact on STH species originating from animals.

The study found *N. americanus* mainly in countries of Asia and South America; whereas for samples from Africa both hookworm species were found prevalent. Sequence analysis revealed 99% homology with sequences available in NCBI database. On analysis, 54% of samples tested were positive for hookworm by microscopy and PCR, whereas 30% of samples positive microscopically for hookworm were missed out in PCRs. This can be due to the presence of PCRs inhibitors coupled with degraded template DNA.



PH-130
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An epidemiological study of drugs availability related to three infectious childhood diseases: Where does the compass point?

Nayan Chakravanty

Globally more than 6.9 million children die under the age of five every year, of which many are attributed to preventable infections. Three most infectious diseases, contributes to about 10 percent of all childhood deaths are due to diarrhea, 7 percent to malaria and 9 percent to ARI. Access to affordable and timely availability of essential drugs can play a vital role in reducing morbidity and mortality. The study provides an insight into the availability of common drugs with respect to infectious disease load of ARI, diarrhea and malaria. A mixed-method approach using both qualitative and quantitative study techniques were used. Hospital level data from randomly selected PHCs and CHCs were collected. The data collected were both on disease load and availability of drugs during the study period (2009-2012), using a retrospective cohort. Results represented that the month of September having highest morbidity. ARI is most prevalent, with total case loads of 1,539 cases. However the Vital and Essential drugs availability for ARI was found to be 7 per cent, 57 per cent for malaria and 98 per cent for diarrhea against requirements. Drug supply was found to be erratic, having weak correlation with the pattern of disease morbidity. The study adds to the existing body of literature by demonstrating the system level gap that exists in availability of vital drugs. In addition, it provides a useful guide to policy makers by establishing drugs requirement based on disease load, not just in the state of Odisha, India but also across other LMIC.

Morbidity and mortality of meningococcal diseases in Gaza Strip during 2012

Nedal Ghuneim, Majdi Dheir, Fouad Issaw

Background: Meningococcal disease (MD) is a serious life-threatening infection with a high case-fatality rate especially in infants. In Gaza Strip, MD remains one of the most challenging infections.

Methods: Cross-sectional study carried out involving all confirmed reported cases from 1st January 2012 to 31st December 2012 were studied.

Findings: A total of 2049 cases with clinically diagnosed meningitis patients were reported during the year 2012. 103 cases (5%) of them were positive for *Neisseria meningitidis* with an incidence rate of 6.3 per 100.000 population. The majority of reported cases 63 (61.2%) were meningococcal septicemia (incidence rate was 3.8 per 100.000) and 40 cases (38.8%) were meningococcal meningitis (incidence rate was 2.4 per 100.000).

There was a male predominance 56 cases (54.4%) than female. The mean age of cases was 4.7 years while the median age was 3 years and age distribution showed that it occurred mainly in under five children where 75.7% (78 cases) were reported. The highest reported incidence was in Rafah governorate (9.4/100000) followed by Gaza and Mid-Zone governorates (6.7/100000). Serogrouping was done for 20 cases (19.4%) and showed only serogroup B. The case fatality rate (CFR) among all cases was 23.3% (36.5% among meningococcal septicemia and 2.5% among meningococcal meningitis with a p-value of 0.000). Results show that 58.3% of deaths were among females (p-value was 0.117).

Interpretation: Gaza strip still highly endemic with MD with high CFR mainly from septicemia possess a challenge for continuous monitoring of surveillance of MDI

Syndromic approach to neglected infectious diseases (NID) at primary health care level: an international collaboration on integrated diagnosis-treatment platforms

M. Boelaert, F. Chappuis, S. El Safi, K. Lim, P. Lutumba, Y. Mahendradhata, F. Meheus, P. Mertens, M. Miles, R. Peeling, S. Rijal, M. Sacko, S. Sundar, M. Traore, J. Utzinger, J. Weinbach

Neglected Infectious Diseases (NID) such as trypanosomiasis, leishmaniasis, schistosomiasis and soil-transmitted helminthiasis receive less than 5% of global investment for tropical diseases research. Clinical praxis in disease-endemic countries (DEC) is rarely evidence based and does not make use of latest innovations in diagnostic technology. NID-related research on diagnostics is particularly underfunded, and diagnostic tools are lacking for a number of NID. The aim of this proposal is to bridge the gap between existing technological innovation in diagnostics and clinical care practice for NID in resource-poor settings. The specific objectives are to develop simple, cost-effective diagnosis-treatment algorithms for three NID-related clinical syndromes: persistent fever, neurological and digestive syndromes. Evidence-based algorithms for the primary care level will be designed with a patient-centred approach, following guidance from DEC stakeholders and making the best possible use of existing assays and treatments. Relevant diagnostic technology and diagnostic platforms will be introduced according to the specific epidemiological contexts in Africa and South-Asia. The research consortium brings together a network of clinical epidemiologists, a diagnostics development group, several partners from academia and SMEs. The consortium further includes work packages on reference laboratory, economic evaluation, quality assurance and translation to policy. By developing accurate and affordable diagnostic platforms and by optimizing diagnostic-treatment algorithms, this project will rationalise treatment use, circumvent progression to severe presentations and thereby reduce NID morbidity/mortality and hinder the emergence of resistances. The project will result in two main deliverables: policy recommendation for health authorities in DEC, and a series of innovative diagnostic platforms.

Outcome of MDR-TB treatment at DOTS Plus site: A retrospective study from Maharashtra

Gosavi SV, Kulkarni G, Dugad SR, Patil MS

Introduction: As per Global TB report, 2012, out of the estimated 73,000 estimated MDR TB patients living in India, only 1,660 cases were notified and 1,136 cases were put on treatment. However no study so far has reported outcome of Cat- 4 treatment in India. Therefore, this study was conducted with an objective to determine the outcome of treatment of MDR-TB & associated factors such as age & sex.

Methodology: The present study included the retrospective analysis of diagnosed cases of multidrug resistant TB patient admitted in DOTS Plus site at Medical College for Category 4 treatment. The study was conducted during the period from July 2013 to August 2013. Data were collected from register maintained at DOTS Plus site with prior permission from Medical Director of hospital.

Result: Total 231 patients of MDR-TB enrolled for Category 4 treatment between January 2012 and June 2013. Among the study subjects, 67 (29%) were in the age group of 15-24 years followed by 62 (26.8%) in 25-34 years and 56 (24.2%) were in the age group of 35-44 year. 151 (65.3%) were males and 80 (34.6%) were females. Out of 231 patient 177 (76.6%) were still on Cat 4 while 10.3%, 8.6%, 3.9% & 0.4% patient were found to be defaulted, died, transfer out & switch to Cat 5, respectively.

Conclusion: MDR-TB is mainly affects the young and male population. Some patients were defaulter & died before treatment. Appropriate supervision and monitoring of the DOTS Plus activities will play an important role in shaping future policies and recommendations.

Single and Multiple Species Helminth Infections and Associated Morbidity in Hunan Province, China: Lessons Learnt and Implications for Integrated Control

Balen, J., Raso, G., Li, Y.S., Zhao, Z.Y., Yuan, L.P., Utzinger, J., McManus, D.P.

The World Health Organisation (WHO) launched an innovative action plan for the integrated control of neglected tropical diseases involving individual programmes joining to concurrently deliver a combined “package” of low-cost, safe and effective drugs. The People’s Republic of China (PR China) has made great strides toward reducing the burden of schistosomiasis and soil-transmitted helminthiasis, facilitated by sustained political commitment and a multi-faceted control strategy. However, very few studies have been reported on the distribution and interaction of multiple species helminth infections. We carried out a comparative study of households in rural and a peri-urban settings of Hunan province in November and December 2006 to determine the extent of single and multiple species infections, the underlying risk factors, and the relationships with clinical manifestations and self-reported morbidity. Complete parasitological, clinical and questionnaire data were obtained for 1,298 inhabitants. The overall prevalences of *S. japonicum*, *A. lumbricoides*, hookworm and *T. trichiura* were 6.5%, 5.5%, 3.0% and 0.8%, respectively; the majority of the infections were of light intensity. We found significant negative associations between wealth and infections with *S. japonicum* and *A. lumbricoides*. Clinical manifestations of splenomegaly, hepatomegaly and anaemia were prevalent (9.0%, 3.7% and 10.9%, respectively), the latter two being significantly ($P < 0.05$) associated with schistosomiasis. Self-reported symptoms were more common among females but there was considerable under-reporting in both sexes when relying only on spontaneous recall. Our findings may guide the design and targeting of a more equitable, comprehensive and integrated parasitic disease control programme in Hunan province, China and elsewhere.

The effect of increasing private sector representation in a dengue fever surveillance network on incidence rates

Melo Furtado K, Kar A

Background: The under-representation of the private sector in dengue fever (DF) surveillance has been stated to be one of the causes for under-estimation of DF, thereby affecting disease control. Our objective was to establish whether increasing private sector health facilities in a surveillance network (CODREN) would improve case detection for dengue fever.

Method: We mapped and set up a network of all private sector medical practitioners in a single administrative ward of Pune city, Maharashtra. Participants were requested to report suspected and confirmed cases of DF. Data generated by this network was compared to that collected by the local unit of the National Vector Borne Disease Control Programme (NVBDCP).

Results: The total number of cases detected by CODREN was 262 (annual incidence rate 12.4 cases per 10 000 population) as compared to 162 cases (annual incidence rate 7.7 per 10 000) detected by the NVBDCP. Discrepancy in the data arose from the recording of cases diagnosed using the NS1 antigen. CODREN detected 144 cases while only 23 cases were recorded by the NVBDCP, even though the case data was obtained from the same reporting centres.

Conclusion: The discrepancy in the recorded data was due to under-recording of cases by the public health sector, possibly due to issues of case definition. Sentinel sites identified under the NVBDCP were responsible for providing data on all cases. Adding other private sector facilities to the surveillance did not contribute to increased case reporting.

BURDEN OF DIARRHEA, HOSPITALIZATION AND MORTALITY DUE TO CRYPTOSPORIDIAL INFECTIONS IN INDIAN CHILDREN

Cryptosporidium spp. is a common, but under-reported cause of childhood diarrhea throughout the world, especially in resource-poor settings. Children under the age of 2 years are at the highest risk. A comprehensive national estimate of the burden of cryptosporidiosis in developing countries is, however, not available.

We used a combination of published and unpublished studies as well as national statistics to determine the rates of cryptosporidial diarrhea, hospitalization and mortality among children <2 years of age in India.

Our estimates suggest that annually, one in every 6-11 children <2 years of age will have an episode of cryptosporidial diarrhea, 1 in every 169-631 children will be hospitalized and 1 in every 2894-7246 children will die due to cryptosporidiosis.

Since there are approximately 45 million children <2 years of age in India, these estimates suggest that *Cryptosporidium* results in 4.2-7.7 million diarrheal episodes, 71.9-268.6 thousand hospitalizations, and 6.3-15.7 thousand deaths each year in children <2 years of age in India.

These estimates provide a useful assessment of the under-recognized burden of cryptosporidiosis among Indian children and makes a compelling case for further research on transmission and prevention modalities of *Cryptosporidium* spp. in India and other endemic countries.

EPIDEMIOLOGY AND RISK FACTORS OF CRYPTOSPORIDIAL INFECTIONS AMONG CHILDREN IN A SEMI-URBAN SLUM IN SOUTHERN INDIA

Cryptosporidium spp. is a common cause of parasitic diarrhea throughout the world and causes significant endemic disease and morbidity in developing countries. However, the mechanisms of transmission and risk factors of cryptosporidiosis in such settings are not completely understood.

Between September 2008 and April 2011, 176 children residing in semi-urban slums of Vellore, southern India were enrolled, pre-weaning, in a quasi-experimental study on the effect of bottled drinking water on cryptosporidiosis and followed until the age of 2 years; 160 children (90.9%) completed the follow-up. Diarrheal and monthly surveillance stools were collected and tested for presence of *Cryptosporidium* spp. by PCR.

One hundred and seventy-seven episodes of parasitologically-confirmed cryptosporidiosis were observed in 105 (59.7%) children at a rate of 0.56 episodes/child-year of observation. Majority of infections were asymptomatic. Thirteen children whose stool samples were negative by PCR were positive by serology.

In a nested case-control study among those who completed the follow-up, presence of one or more older siblings in the house (OR=4.39, $P=0.005$), stunting at 6 months (OR=5.89, $P=0.008$) and presence of cow in the house or handling of cow-dung by the primary caregiver (OR=2.70, $P=0.032$) were associated with increased risk of multiple cryptosporidiosis, whereas maternal age of >24 years was protective (OR=0.38, $P=0.051$). Drinking bottled water did not confer additional protection.

The results suggest sustained transmission of cryptosporidiosis among Indian slum children, possibly through multiple pathways. Effective disease control strategies will require a multi-faceted approach that takes into account the complex nature of the host-parasite interaction.

A ten year experience of pptct clinic: can we strengthen our health – care system

Hiremath RN, Ghodke S, Vidhya G, Bhalla S, Sinha S

Introduction: The PPTCT programme aims to prevent the perinatal transmission of HIV from an HIV infected pregnant mother to her new born baby. The programme entails counselling and testing of pregnant women in the ICTCs.

Objectives: To find out the coverage of PPTCT service, dropouts, intervention efficacy with other determinants and to make necessary recommendations to strengthen our health care system based on the findings of the study

Material and methods: The 10 year data of PPTCT program at large tertiary care centre in Pune was collected and analyzed.

Results and discussion: Out of 27683 pregnant women who availed PPTCT services, 108 tested positive. The prevalence rate was found to be 0.39%. Of 108 HIV positive women, 55.6% delivered in the hospital, 17.6% had undergone MTP/ Abortion, 2.7% were referred to other Government hospital and 24.1% were loss to follow up. In respect to PPTCT intervention 73.3% had ARV and 26.7% had ART. There were total of 60 child births. Just like ANC's, drop-out in service utilization was observed among exposed children also. Only 18 of the exposed children could be traced till the age of 06 months and 18 upto 18 months while 02 are under HIV follow up and 22 were loss to follow up. No child was tested reactive for HIV antibodies.

CONCLUSION:

There is an urgent need to induce faith, confidence and motivation among the women and make her accept the verdict and avail the facilities. In order to improve access and reduce various gaps, PPTCT services should be made available to all ANC's with necessary awareness campaigns and health care system strengthening should be carried out to prevent and proper monitoring of dropouts cases.

Vertical programs and health systems strengthening in India: Lessons from three programs

Vertical programs have had a long history and an important place in the public health system of India. This study focuses on the interaction between local health systems and three vertical programs in India—National AIDS Control Program (NACP) (HIV/AIDS), Revised National Tuberculosis Control Program (RNTCP) (TB) and National Vector Borne Disease Control Program (NVBDCP) (Malaria). It also examines factors that create an enabling environment for vertical programs to strengthen health systems.

A total of 103 in-depth interviews were conducted in 2009 and 2010 in six states of India. Key informants included managers of disease control programs and health systems, both at state level and national level, and staff from peripheral health facilities. Key themes were analyzed using the World Health Organization (WHO) building block and the Systems Rapid Assessment framework.

We found that vertical programs contribute to strengthening some components of the health system: by sharing human and infrastructural resources, increasing demand for health services, by improving public perceptions of service quality, encouraging involvement of civil society in health services and sharing disease-specific information with local health system managers. These synergies were observed more frequently in the RNTCP and NVBDCP compared with the NACP. The study findings suggest that certain conditions enable vertical programs to have a positive influence on health systems—one, the program needs to have an explicit policy to strengthen local health systems, and two, it should be embedded within the health system administration.

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Prevalence and risk factors for soil transmitted helminth infection among school children in south India

Kattula D, Sarkar R, Ajjampur SSR, Minz S, Levecke B, Muliyil J and Kang G

Soil-transmitted helminths (STH) are a major public health problem in tropical and sub-tropical countries, affecting the physical growth and cognitive development in school-age children. This study aimed to assess the prevalence and risk factors of STH infection among school children aged 6-14 years in Vellore and Thiruvananthapuram districts in south India. Children aged 6-14 years, going to government and government aided schools ($n=33$) in Vellore and Thiruvananthapuram districts were screened to estimate the prevalence of STH and a case control study was done on a subset to assess the risk factors for the infection. The prevalence of STH was 7.8%, varying widely by school from 0 to 20.4%, in 3706 screened children. Hookworm (8.4%) rates were high in rural areas, while *Ascaris* (3.3%) and *Trichuris* (2.2%) were more prevalent among urban children. Consumption of de-worming tablets ($OR=0.25$, $P<0.01$) offered protection, while residing in a field hut ($OR=6.73$, $P=0.02$) and unhygienic practices like open air defecation ($OR=5.37$, $P<0.01$), keeping untrimmed nails ($OR=2.53$, $P=0.01$) or eating food fallen on the ground ($OR=2.52$, $P=0.01$) were important risk factors for STH infection. The epidemiology of STH is changing in India. Identifying risk factors and dynamics of transmission in vulnerable groups can help to plan for effective prevention strategies.

Patients' perception on available public health facilities and services for lymphatic filariasis: a qualitative study in Odisha, India

Gupteswar Patel, Dr.Swapnil More, Rojalin Swain, Dr.Ambarish Dutta, Dr. Krushna Chandra Sahoo.

Background: Globally, 40 million people live with the long-term effects of lymphatic filariasis (LF), which is the second leading cause of disability and, still considered as a neglected disease. The LF in India is more endemic in coastal regions but there are few studies with regards to community awareness of the disease and LF-related services available to the community through the public health system in this region. Therefore, this study aims to explore the patients' perception on the disease and available LF-related public health services to rationalize the current strategy.

Methods: A qualitative in-depth interview study was conducted among ten LF patients in coastal district of Odisha. A semi-structured interview guide was developed based on the objective of the study. The data were analyzed using content analysis.

Findings: Patients perceived that, due to filariasis they are suffering from long-term physical and psychosocial problems such as social stigma and underemployment. They conceptualized from the existing inadequate awareness generated by the public health system that long-term effects of filariasis are incurable. They opined that, if any supportive assistance can be provided, it will be useful for their daily sustenance.

Conclusion: The findings suggest that, there is need for awareness and special services to support filariasis patients especially with regarding the curability of LF complications. They recommended that government should include filariasis patients as physically disabled persons for subsidizing their livelihoods that can lead to maintenance of healthy and participatory life instead of dependency in them.

Comparison of the effectiveness of two different health education strategies on the utilization of Long Lasting Insecticide Treated bed Nets among the tribal population of Chhattisgarh - A community based intervention study

Chourasia M K, Abraham V, John J

Purpose- Malaria is endemic in India, especially in tribal populated states since the last 5 decades. Effective use of long lasting insecticide treated bed nets (LLITNs) can reduce the burden of malaria. Health education plays a major role in improving the utilization by changing the practice and behavior of the community. This study assessed the knowledge and behavior of the tribal community regarding malaria and compared two methods of health education for effective utilization of bed nets among tribal people.

Method- A community based intervention study was carried out. A total of 218 households were selected and two different health educations were given in respective villages. A follow up was done after a period of two months. Data was entered in Epidata 3.1 and analysis was performed using SPSS 16 software.

Results- The findings of the study show that proportion of utilization of bed nets was significantly higher among villages with household training as compared to the villages with mass education ((28.2%, 95% CI- 15.8-40.6). Use of bed nets was significantly associated with knowledge of disease symptoms, transmission, and prevention. Mean increase in knowledge score from baseline to two month follow up was significantly higher in the household intervention as compared to mass campaign (0.547, 95%CI- 0.18-0.91, p value-0.004).

Conclusion- Overall findings suggest that household training is a more effective form of health education for improving knowledge and promoting practices of daily personal protective measures such as using LLITNs as compared to the routine mass education.

Public Health Standards and Filaria Control in India: A Review

Jena PK, Kishore J

Filariasis is a neglected and endemic communicable disease affecting 250 districts and around 553 million Indians, contributing to 80% of disease burden in South East Asia region. Filariasis control is a part of integrated National Vector Borne Disease Control programme. The standard of service delivery of Filariasis control programme at Sub-Center(SC), Primary Health Center(PHC), Community Health Center(CHC) etc. is guided by Indian Public Health Standards (IPHS). This review of IPHSs for filarial control focuses on systemic approach to disease control. IPHS sets norms for service delivery and job responsibilities of health human resources. Assistance in detection, control and reporting of Filariasis and Mass Drug Administration are part of essential service package at SC and job responsibility of male and female health worker. Filariasis diagnosis and treatment is a part of essential service package at PHC and CHC in endemic areas only. At PHC level Medical officers, health assistant (male) and lab-technicians are assigned appropriate job responsibilities. However job assignment of female health worker to detect hydrocele, exclusion of female health supervisor in filarial control will create cultural barrier and supervisory issues during implementation. Filariasis clinic, a part of filarial control programme is not covered in the existing IPHS. Further exclusion of health service in non-endemic areas in the IPHS would hamper disease surveillance. Revision of IPHS at par with other national programmes, extending application of IPHS for non-endemic areas, and setting norms for private practitioner and community involvement may aid in elimination of lymphatic Filariasis.

Water Supply, Sanitation and Hygiene Practices in Hunan Province, China: Implications for the Control of Neglected Diseases and Health System Strengthening

Balen, J., Li, Y.S., McManus, D.P., Utzinger, J., Raso, G.

Clean water supply, sanitation and hygiene practices (WASH) have wide-ranging health implications. Inadequate sanitary conditions and poor knowledge, attitudes and practice of good personal hygiene, such as hand washing with soap, play a major role in the high incidence of numerous communicable diseases, with negative consequences for health and development across communities. Indeed, a recent systematic review of the literature confirmed that good hygiene practices reduce neonatal mortality and that hand washing with soap reduces the risk of endemic diarrhoea, as well as respiratory and skin infections, while face washing prevents trachoma and other eye infections. We conducted a pilot study on WASH in a *Schistosoma japonicum* endemic area of Hunan province, China. Questionnaires were used to obtain quantitative data on defecating behaviour and hygienic practices in 2,000 inhabitants of rural and peri-urban villages. Although both settings were well endowed with latrines, inhabitants still declared that they sometimes defecated elsewhere, in particular near to streams where the vegetation offers hideouts. China has not yet invested widely in public education regarding personal hygiene and public health practices. The active involvement of health professionals in hygiene, sanitation, and water supply is crucial to accelerating and consolidating progress in disease control and health system strengthening.

Neglected Brucellosis: A Community Based Explorative Study In Odisha, India

Pattanaik sarthak

Introduction: Under the umbrella of Tuberculosis, Malaria & HIV/AIDS all other infectious diseases are being neglected in India. Further zoonotic disease like Brucellosis is in the state of playing its role in community like a silent killer, causing a great economic loss to livestock sector as well as mankind. According to OIE brucellosis is one of the slowly emerging diseases in the developing countries. In Odisha this disease is greatly neglected as very few studies have been conducted.

Methodolgy: This study was conducted by questionnaire at community level & in-depth interview at professional level, also literature reviews. Tribal livestock-keepers, dairy farmers/workers, farm-owners, vets, Medicos are the key informants of this study.

Finding: The study found peoples in regular contact with dairy cows for long duration have backpain, joint pain, unknown fever, headache and orchitis. There is huge knowledge gap in diagnosis of clinical brucellosis, as diagnosis is purely laboratory based. The state immunization status against brucella in livestock sector is very poor.

Discussion: Brucellosis incidence among livestock in Odisha is highest found in India. Study by mohanty et al (2000) reports 9% seropositive to the tube agglutination test. Finding shows brucella may be underlying cause which is being neglected.

Conclusion: As a preliminary study brucella infection can't be avoided. Regular screening, efficient diagnostic technique, vaccination, awareness are the key solution. The 'One Health' concept is relevant here which makes collaboration and integration of medical and veterinary programmes to uproot the problem. Further study is required for quantitative measurement.

Clinico-epidemiological profile and management practices for snakebites in Himachal Pradesh, India, 2008-2012

Gupt A, Bhatnagar T, Murthy BN

Background: WHO classifies snakebite as a neglected tropical disease. In India snakebites are managed as per standard guidelines although prevalence of species of snakes may vary across different regions. We describe the clinico-epidemiological profile and management practices of snakebite cases in Himachal Pradesh.

Methods: We extracted records of snakebite cases at Zonal Hospital, Solan, from 2008 to 2012. We estimated time trends, age and sex distribution of cases, and distribution of bites by colour of snake. We categorized the clinical manifestations into syndromes. Cases with locally toxic, hemotoxic or neurotoxic manifestations were classified as poisonous bites. Amongst the poisonous cases, we analyzed trends in use of vials of anti-snake venom (ASV) and its clinical outcomes and financial implications.

Results: Of the total 497 snakebites during five years, cases increased from 77 (2008) to 110 (2012), 73% occurred in rainy season (July-September), and 63 % among 30-39 year old females. Colour of snake was recorded in 159 (32%) of which 122 (77%) were green. In all, 171 (34%) were poisonous out of which 96 (56%) were hemotoxic. Out of 25 referred envenomings, 2 (8%) were given ASV at peripheral institutes. Use of ASV vials decreased from 747 (2008) to 71 (2012), with a corresponding reduction of 266% in the expenditure on ASV per cured patient. Cure rate remained above 70%. Five (3%) poisonous cases died.

Conclusions: The cost of effective treatment of snakebites can be substantially reduced by rationalizing the management practices, and producing monovalent antitoxin as per predominance of specific species of snakes.

An assessment of knowledge of prevention and management of Rabies in interns and final year students of Shri M.P. Shah Government Medical College, Jamnagar, Gujarat

Sarkar A, Parmar D.V.

Introduction: Rabies is one of the most important zoonotic diseases in India. Dogs are the main reservoir of rabies in India. In Southeast Asia, untreated, improperly treated or neglected cases lead to thousands of deaths yearly. Rabies can be completely prevented through proper management, but once contracted its almost always fatal.

Objectives: To assess the knowledge regarding preventive measures, post-exposure prophylaxis, wound management and use of RIG among the interns and final year medical students of Shri M.P. Shah Government Medical College, Jamnagar, Gujarat.

Materials and methods: It is a cross-sectional study conducted in July, 2013. Data was collected using pre-tested questionnaire from 100 interns and final year students of Shri M.P. Shah Government Medical College, Jamnagar, Gujarat.

Results: It was seen that only 59% knew that vaccination of dogs was an essential preventive measure, 80% and 68% agreed that pre-exposure vaccination and educating the people regarding pre- and post-exposure prophylaxis were useful, respectively. Also 89% and 59% were aware that wound should be washed immediately and antiseptics should be applied, respectively. 50% and 29% were not aware of the schedule and dose of the PEP, respectively. Only 35% knew about both IM and ID route of administration of PEP. Only 66% were aware that the site of administration of PEP is deltoid.

Conclusion: The study showed that there was no proper knowledge about the prevention and management of rabies in the study population which needs to be overcome immediately with proper training.

Role of NGOs and public health partnership to improve accessibility to health entitlements in rural India

Thomas, A. M., Abraham, G., Lalthanmawia, R., John, P.

Introduction: The National Rural Health Mission aims to provide equitable access to health services in rural India. But low demand and poor accessibility to health entitlements under NRHM challenges the government's efforts to improve health and control disease among the marginalized populations. This study highlights the role of public-private partnership between NGOs and public health functions which aimed to bridge the gaps, increase demand for health services and hence improve access to NHRM health entitlements.

Methods: 40 NGOs were trained using Participatory Communication methods on community mobilization, participatory governance and networking in 40 blocks of 7 states from 2009 to 2012. Based on stratified random sampling 8 NGOs were selected and 8 Focus Group Discussions held. The study conducted 4 KIs and 1 FGDs with community members and 13 KIs and 1 FGD with health care professionals to understand how this partnership helped improve communities' accessibility to public health services.

Results: The 40 NGOs increased awareness and advocated for the NRHM health entitlements using the participatory communication strategy among 100,000 populations in each district respectively. This resulted in increased immunization, regular Ante Natal Care and institutional deliveries among the target audience. The NGOs helped enhance the capacity of the public health service providers, local media, Panchayati Raj Institutions on their roles and responsibilities for the NRHM commitments. The NGOs created forums and spaces for dialogue among various stakeholders in the community to promote the exchange of experiences, innovations, learning and challenges.

Discussion: The NGOs developed innovative communication strategies, empowered the public health service providers, innovated spaces for equitable participation of the community, health service providers and PRIs in decision making and health planning. The part

nership hence empowered people of marginalized, rural populations to access and utilize the NRHM health entitlements in rural India which in turn contributes to the field of disease control.

Lessons learnt from Kaladrug-R: New tools for monitoring drug resistance and treatment response in Visceral Leishmaniasis in the Indian subcontinent

Ostyn B, Vanaerschot M, Roy S, Salotra P, Carter C, Berriman M, Eichner M, Maes L, Schoenian G, Rijal S, Sundar S, Boelaert M, Dujardin JC.

Background: Kaladrug-R project

We present the most relevant findings of four years (2009-2012) of clinical-epidemiological and parasitological research on treatment response and drug resistance in previously treated and new cases of VL in India (Muzaffarpur district, Bihar) and Nepal (Terai region).

Miltefosine (MIL):

- Up to 20% MIL-relapse observed when patients are followed up for 12 months, early treatment failure of MIL is not observed.
- Relapse is not due to re-infection, low-drug quality or under-exposure to the drug.
- Age and gender were risk factors for MIL-relapse.
- Although MIL-resistance is inducible in vitro, true MIL-R strains have as yet not been identified in clinical samples.
- An association between parasite infectivity and MIL-treatment outcome of the patient was observed.

Paromomycin (PMM) and pentavalent antimonials (SSG):

- PMM-R is easily induced in vitro, vigilance is required when implemented in clinical practice
- SSG-R strains, which are still present in the Indian subcontinent, more efficiently manipulate the host's immune system, causing higher parasite burdens: what is their legacy for the efficacy of other treatments?

VL-epidemiology

- *L. donovani* population in the Indian subcontinent is fairly homogeneous, but highly divergent strains circulate in the hilly regions of Nepal.
- Asymptomatics significantly outnumber clinical cases. Mathematical modeling shows that if these are able to transmit parasites to sandflies, this reservoir can be most efficiently tackled through adequate vector control.

VL-control take home messages

- Importance of late treatment outcome monitoring, up to 12 months after treatment.
- Tools for VL-treatment outcome monitoring at primary health care level available.
- Importance of vector control

Role of private health providers in Tuberculosis control: Preliminary findings from a qualitative research

Vijayashree Holalkere Yellappa, Pierre Lefe

Background: Private practitioners (PPs) are the first choice for seeking Tuberculosis (TB) care in India. Since 2001, National TB Programme (NTP) engages with PPs through Public Private Mix Schemes (PPMS) to ensure universal access. We conducted this study to understand what barriers exist to engage PPs in NTP

Methods: This study employed a qualitative approach. Field work consisted of in depth interviews with TB patients($n=24$), PPs(54) and programme managers ($n=10$) and focus group discussions with RNTCP field staff in Tumkur district from March to August 2013

Results:

Providers: None of the PPs interviewed had formally signed-up for any PPMS. Collaboration was largely understood as routine referrals of TB suspects to NTP. Interaction between the public and private sector was minimal and was mostly informal. There was low awareness about the PPMS among PPs. Record maintenance was perceived as a major barrier to collaborate

Patients: Analysis of patient's itineraries revealed that, it is indeed complex with patients shopping for care in-between public and private providers. This had led to delays in seeking care, getting timely diagnosis thus leading to delay in initiating the treatment. Factors such as family support, economic condition, knowledge about TB have influenced the pathway of patients seeking care.

Discussion: The findings suggest that there is an urgent need for promoting integrated and constructive notions of collaboration between private and public sector. Strategies may be aimed at enhancing interactions and providing regular trainings to inform PPs about the availability of PPMS in order to seriously aim for universal access to TB care in India.