

### EVALUATION OF A RAPID IMMUNOCHROMATOGRAPHIC TEST FOR GLUCOSE-6-PHOSPHATE DEHYDROGENASE DEFICIENCY

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An individual's glucose-6-phosphate dehydrogenase (G6PD) activity level should be known prior to prescribing certain drugs, such as primaquine, for malaria prevention or treatment of malaria, due to the risk of hemolytic anemia when such drugs are used in those with G6PD deficiency. Current screening methods for G6PD deficiency are impractical for use in rural areas where malaria is endemic because of the need for large equipment or highly trained personnel. The NOW G6PD immunochromatographic test (ICT) is a rapid screening device for G6PD deficiency appropriate for use in malaria endemic areas. G6PD deficient and G6PD normal subjects enrolled at Boston Medical Center completed a demographic survey and provided 2 tubes of blood. Blood preserved in both EDTA and heparin from each subject was analyzed using the NOW G6PD test. Analysis of heparinized blood was performed using the Trinity Biotech quantitative determination of G-6-PDH. Results from the two methods were compared using 4.0 U G6PD/g Hb (as measured by the standard Trinity Biotech assay) as the cut off for G6PD deficiency. Between June 2007 and February 2008, blood from 50 G6PD deficient and 196 control subjects was analyzed. The average G6PD activity of the deficient samples was  $1.7 \pm 1.6$  U/g Hb; the average G6PD activity for the control samples was  $8.1 \pm 1.7$  U/g Hb. After lysed blood was applied to the NOW G6PD test device, results were read for the heparinized samples after 5 minutes and after 7 minutes for the EDTA samples. The sensitivity, specificity, positive and negative predictive values of the NOW G6PD test using heparinized whole blood were 0.98, 0.98, 0.72 and 1.00. The sensitivity, specificity, positive and negative predictive values of the test using EDTA whole blood were 0.98, 0.97, 0.63, and 1.00. In summary, the NOW G6PD rapid ICT is a sensitive screen for G6PD deficiency that requires minimal training and equipment, and allows for rapid diagnosis of G6PD deficiency.

### TWO CASES OF CUTANEOUS AND VISCERAL LEISHMANIASIS IMPORTED INTO GUATEMALA FROM SOUTH AMERICA AND ITS POSSIBLE PUBLIC HEALTH IMPLICATIONS

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Leishmaniasis is a zoonotic disease endemic to 88 countries with a yearly incidence of 1-1.5 million cases of cutaneous leishmaniasis and 500 000 of visceral leishmaniasis. One case of human cutaneous leishmaniasis and one case of canine visceral leishmaniasis imported from French Guiana and Brazil respectively were detected in Guatemala in 2008. The human patient referred to be infected while completing military exercises in Guiana's forests and the dog was infected in Ceara, Brazil. Clinical evaluations were performed by a medical and veterinary doctor for each case; samples for smears, cultures and PCR were obtained from the cutaneous lesion in both cases. Bone marrow and spleen aspirates were obtained from the dog. Diagnosis was performed following standard methods. The human patient showed a typical cutaneous leishmaniasis lesion on the left arm. The dog showed clinical signs of both cutaneous and visceral leishmaniasis such as extreme weakness, loss of appetite, emaciation and typical dermal lesions of cutaneous leishmaniasis in legs. Diagnosis was confirmed by the observation of parasites in different clinical samples. The human patient and dog were treated with pentavalent antimonials in a scheme of 10mg/kg for 10 days and 28mg/kg for 28 days respectively and both resolved in a clinical cure. To our knowledge these are the first reported cases of imported leishmaniasis to Guatemala from South America. Both cases were from a region where different species of *Leishmania* parasites other than those occurring in

Guatemala can be found. Implications of the transmission of new strains can vary from more aggressive clinical presentations, a wider geographical distribution, and resistance to current treatment schedules to outbreaks of the disease. Consequently, examination of dogs imported from endemic countries and possible cases of imported human leishmaniasis is needed. We insist on the development of guidelines for the detection, clinical/laboratory examinations, quarantine and managing of leishmaniasis imported cases by the Ministry of Health and Agriculture.

### VILLAGE BASED MALARIA CONTROL IN UNDERPRIVILEGED COMMUNITIES-RWANDA: SHOWCASE OF RWANDA VILLAGE CONCEPT PROJECT IN MUYOGORO VILLAGE

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The aim of our study was to assess the impact of malaria symptoms knowledge, attitude towards preventive measures as well as treatment seeking behaviors among members of Muyogoro Village community in South province of Rwanda. Malaria cause 40% of consultations in health facilities; thus assessing and analyzing local malaria problems are a prerequisite for successful control interventions. A descriptive and cross section study was done. Sessions on malaria prevention methods and health promotion were carried out 3 years ago and are still on course. Subsidized insecticide treated net was offered to every participant at completion of the sessions with the support of Rwanda National Malaria Control program(PNILP). A total of 300 participants were considered. Among respondents, 92.5% recognize that mosquito bites was the real cause of malaria, 100% recognize fever as the main symptom in malaria. Headache, joint pain, stomach trouble, losing weight and obesity had respectively 96.8%, 93.7%, 79.4%, 39.2% and 14% of respondents. 95.8% consider that cutting bushes as one of the most efficient method to prevent against malaria, 95% prefer the use of insecticide treated mosquito net and 94.6% believe that removing stagnant water as the main prevention method against malaria as well, while avoiding going outside when raining and sharing food with someone who has malaria were respectively responded by 67.6%, 19.2%. Asked on what they will do first during malaria attack, 95.7% of respondents answered that they would seek immediate hospital treatment, with 2.6% who will ignore the signs and just rest in bed. This is to notice that responding on the importance of health insurance, 94.6% of respondents believe that it allows them to form cooperatives for the cost of health insurance and 88% recognize that health insurance allows them to get hospital treatment at cheaper price. In conclusion, treatment seeking practice in malaria was related to level of education, culture and religion. We suggest that malaria public enlightenment efforts should be intensified through a much mobilized community based sensitization with the support of local and health authorities in order to achieve behavioral impact regarding malaria prevention and treatment seeking; effective malaria preventive methods be made affordable and that support be provided to make malaria treatments at public hospitals free.

### PRELIMINARY STUDY ON THE INCIDENCE OF SNAKEBITES IN BOLIVIA

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Investigations on the incidence and mortality from snakebites in Bolivia were based on cases treated in health facilities as reported by Health Authorities and six household studies carried out in different regions of Bolivia (Departments of La Paz, Tarija, Cochabamba and Santa

Cruz), representing the main biotopes of Bolivia: Amazonia, piedmont and Altiplano. The investigation in health facilities concerned all the country between 1996 and 2000. An average of 600 bites were treated each year in health centers of Bolivia (national annual incidence = 10 bites per 100,000 people). We observed a great disparity of the incidences according to seasons (maximum during the southern spring which corresponds to the rainy season) and departments (maximum in the Amazonian Departments of Beni and Pando, and Department of Cochabamba). Altiplano areas were quite free of snakebites. The household surveys showed annual incidences from 30 bites per 100,000 inhabitants in the Departments of Tarija and Cochabamba to 110 bites per 100,000 inhabitants in the Department of Santa Cruz, with intermediate incidences in the Department of La Paz (44 in altitude and 75 in the Amazonian region). However, in some place, annual incidence may exceed 200 snakebites per 100,000 inhabitants. Annual mortality was between 0.1 per 100,000 inhabitants in the Chaco region of the Department of Tarija or in the Department of Cochabamba and 3.9 in the mountainous regions of the Department of Tarija or Santa Cruz. These investigations confirmed that the highest incidence is observed in male adults and that the case fatality rate seemed relatively low (about 2 %). They also showed that a majority of victims looked after traditional practitioners and did not consult in modern medical centers; we observed also that the availability of antivenoms was very poor. That probably explains the low incidence reported by the National Health Services.

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### CLUSTERING OF HANSEN'S DISEASE (LEPROSY) IN A POPULATION IN NORTHEAST BRAZIL

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The introduction of Multidrug Therapy (MDT) for the treatment of Hansen's disease in 1981 led to a dramatic reduction in the global disease burden: In Brazil the prevalence has been reduced from 19 cases per 10,000 population in 1985 to 2.4 in 2004, but there is still around 50,000 new cases diagnosed yearly. The disease is spread throughout the country, but more clustered in the North and Western Central Regions. Here we analyze the spatial distribution of Hansen's disease (leprosy) in endemic area in Brazil, testing the hypotheses of nonrandom patterns and constant risk of disease. A random sample of 808 out of 1293 Hansen's disease cases diagnosed between 1995 and 2006 was selected and geocoded. Spatial autocorrelation and spatial cluster analysis were used to identify areas of risk of disease. Factor analysis was performed to adjust for socio-economic variables potentially influencing clusters. Hansen's disease cases were not distributed randomly, with disease risk varying markedly between districts. The incidence of disease was higher around population dense regions. A significant relationship between the geographic distribution of disease and the social condition of the population was observed. Cluster analysis identified two areas of high risk, one with relative risk of 5.9 ( $p=0.001$ ) and the other 6.5 ( $p=0.001$ ), respectively. Our study demonstrates the power of GIS and spatial analysis to identify and explain the epidemiology of transmissible disease as Hansen's disease. This provides a powerful tool in designing strategies for disease control, in particular through allowing early recognition and prompt diagnosis, which in turn should lead to reduction in disease severity caused by delay in treating the disease. Early start of multi drug therapy will reduce the transmission of Hansen's disease to the community.

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### ASSESSING THE CARDIAC EFFECTS OF ARTESUNATE (AS) AND MEFLOQUINE (MQ) IN HEALTHY VOLUNTEERS IN A SAFETY AND PK, SINGLE DOSE, RANDOMISED, TWO PHASE CROSS OVER STUDY OF A NEW FIXED DOSE AS/MQ COMBINATION AND LOOSE AS + MQ

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Evaluating QT prolongation as a risk marker for Torsades de Pointe ventricular tachycardia is an essential step for registering new drugs. The ECG effects of a new fixed dose combination of artesunate and mefloquine (AS/MQ) and loose AS+MQ were assessed in a safety and pharmacokinetic, two phase, cross over study in healthy adults. Doses received were: (i) AS 200 mg/MQ 400 mg and (ii) AS 200 mg + MQ 500 mg, given 90 days apart. ECGs were performed at baseline, 1h, 4h, 24h, Day 90 and repeated at cross-over. PK samples were taken on D0, 1, 2, 3, 5, 7, 14, 28, 53, 76, 90. A QT correction formula (QTc)  $QT / (RR)^{0.4}$  gave the best QT - RR regression line. Analysis was by ANOVA for repeated measures. There were no statistically significant differences between the two arms regarding the PR, QRS and QTc intervals over time. The mean baseline QTc values were 399 (range 367 to 425) ms for both arms. The mean and mean changes (vs. D0) in the QTc for all patients combined was not statistically significant at any of the time points. One female had a QTc flagging ( $\geq 430$ ms male,  $\geq 450$  ms female) value (453 ms). Another female had an increase of 38 (9.5%) ms to 439 ms at one time point. Mean PR and QRS intervals were normal at all time points. The ECG interval changes were small and clinically insignificant. Future ECG PK analyses are unlikely to find a drug effect.

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### INTEGRATED MAPPING FOR TRACHOMA AND URINARY SCHISTOSOMIASIS IS MORE COST EFFICIENT THAN SINGLE DISEASE APPROACHES. A STUDY OF 'COST DRIVERS' IN PLATEAU AND NASARAWA STATES, NIGERIA

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Integrated approaches to neglected tropical disease control are thought to be more efficient than single focus approaches. The purpose of this study was to assess the cost of integrated mapping for trachoma and urinary schistosomiasis (SCH) compared to the costs of trachoma only and SCH only mapping. Three different mapping regimens were employed in Plateau and Nasarawa States at the district level: 1) trachoma only mapping using a cluster survey sampling method (13 districts); 2) SCH only mapping using school based survey methods (4 districts); and 3) an integrated mapping strategy for both trachoma and SCH using a combination of cluster and school based methods (8 districts). Costs were systematically collected for employed personnel, transportation, consumables/supplies and per diems and were allocated to training or field work activities. The cost per district of trachoma only mapping was \$1,761 and for SCH only the cost per district was \$3,630. The cost per district of integrated mapping was \$2,196. Per diem costs were the largest

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