



**Urban Health Bulletin: A Compendium of Resources,**  
Issue #10 – September/October 2008 – Compiled by Environmental Health at USAID  
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## Introduction

In keeping with the 2008 International Year of Sanitation, there can't be a much better quote to include in this issue of the Bulletin than *"significant association between the lack of latrine and drainage systems surrounding houses and high incidence of cholera"* (the first abstract under Urban Environmental Health). Unfortunately, we may soon be able to dedicate a whole issue to the increasing association between cholera and rapidly urbanizing Africa (the next abstract). Something to discuss at the 2009 International Conference on Urban Health to be held in Nairobi – mark your calendars! - **Anthony Kolb, USAID Urban Health Advisor,** [akolb@usaid.gov](mailto:akolb@usaid.gov)

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## Urban Health Analysis

1 - *Int J Epidemiol.* 2008 Oct 24

### **Challenging assumptions about women's empowerment: social and economic resources and domestic violence among young married women in urban South India.**

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**BACKGROUND:** Although considerable research has documented the widespread prevalence of spousal violence in India, little is known about specific risk or protective factors. This study examines the relationships between factors that are often considered to be social and economic resources for women and recent occurrence of domestic violence.

**METHODS:** Data were collected from 744 young married women in slum areas of Bangalore, India. Unadjusted and adjusted multivariable logistic regression models were used to determine factors associated with having been hit, kicked or beaten by one's husband in the past 6 months.

**RESULTS:** Over half (56%) of the study participants reported having ever experienced physical domestic violence; about a quarter (27%) reported violence in the past 6 months. In a full multivariable model, women in 'love' marriages (OR = 1.7, 95% CI 1.1-2.5) and those whose families were asked for additional dowry after marriage (OR = 2.3, 95% CI 1.5-3.4) were more likely to report domestic violence. Women who participated in social groups (OR = 1.6, 95% CI 1.0-2.4) and vocational training (OR = 3.1, 95% CI 1.7-5.8) were also at higher risk.

CONCLUSIONS: Efforts to help women empower themselves through vocational training, employment opportunities and social groups need to consider the potential unintended consequences for these women, such as an increased risk of domestic violence. The study findings suggest that the effectiveness of anti-dowry laws may be limited without additional strategies that mobilize women, families and communities to challenge the widespread acceptance of dowry and to promote gender equity. Longitudinal studies are needed to elucidate the complex causal relationships between 'love' marriages and domestic violence.

2 - *J Urban Health*. 2008 Oct 18.

### **Quantification of Urbanization in Relation to Chronic Diseases in Developing Countries: A Systematic Review.**

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During and beyond the twentieth century, urbanization has represented a major demographic shift particularly in the developed world. The rapid urbanization experienced in the developing world brings increased mortality from lifestyle diseases such as cancer and cardiovascular disease. We set out to understand how urbanization has been measured in studies which examined chronic disease as an outcome. Following a pilot search of PUBMED, a full search strategy was developed to identify papers reporting the effect of urbanization in relation to chronic disease in the developing world.

Full searches were conducted in MEDLINE, EMBASE, CINAHL, and GLOBAL HEALTH. Of the 868 titles identified in the initial search, nine studies met the final inclusion criteria. Five of these studies used demographic measures (such as population density) at an area level to measure urbanization. Four studies used more complicated summary measures of individual and area level data (such as distance from a city, occupation, home and land ownership) to define urbanization. The papers reviewed were limited by using simple area level summary measures (e.g., urban rural dichotomy) or having to rely on preexisting data at the individual level. Further work is needed to develop a measure of urbanization that treats urbanization as a process and which is sensitive enough to track changes in "urbanicity" and subsequent emergence of chronic disease risk factors and mortality.

3 - *J Public Health Policy*. 2008 Sep;29(3):275-89.

### **Epidemiology and the macrosocial determinants of health.**

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In the past two decades, public health researchers have taken renewed interest in investigating the role of social factors in health. This holds substantial promise in terms of identifying manipulable social factors that are amenable to policy intervention. Most existing empirical and conceptual epidemiologic work, however, has focused on the more proximal social determinants, such as interpersonal relations. These factors, although perhaps easier to study epidemiologically, are much less relevant to policy makers than more "macrosocial"

factors such as taxation policies. Limited epidemiologic attention to macrosocial determinants of health is ironic given that macrosocial factors such as the rapid industrialization and urbanization in the 19th century contributed to the organization of public health practice and, tangentially, to academic public health research. We suggest here that greater investment in the study of macrosocial determinants has the potential to make a significant and unique contribution to the greater public health agenda and should be a prominent aspect of social epidemiologic inquiry in the coming decades.

*4 - Vaccine. 2008 Oct 7.*

#### **The cost-effectiveness of typhoid Vi vaccination programs: Calculations for four urban sites in four Asian countries.**

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The burden of typhoid fever remains high in impoverished settings, and increasing antibiotic resistance is making treatment costly. One strategy for reducing the typhoid morbidity and mortality is vaccination with the Vi polysaccharide vaccine. We use a wealth of new economic and epidemiological data to evaluate the cost-effectiveness of Vi vaccination against typhoid in sites in four Asian cities: Kolkata (India), Karachi (Pakistan), North Jakarta (Indonesia), and Hue (Vietnam). We report results from both a societal as well as a public sector financial perspective.

Baseline disease burden estimates in the four areas are: 750 cases per year in two Kolkata neighborhoods (pop 185,000); 84 cases per year in the city of Hue (pop 280,000); 298 cases per year in two sub-districts in North Jakarta (pop 161,000), and 538 cases per year in three squatter settlements in Karachi (pop 102,000). We estimate that a vaccination program targeting all children (2-14.9) would prevent 456, 158, and 258 typhoid cases (and 4.6, 1.6, and 2.6 deaths), and avert 126, 44, and 72 disability-adjusted life years (DALYs) over 3 years in Kolkata, North Jakarta and Karachi, respectively.

The net social costs would be US\$160 and US\$549, per DALY averted in Kolkata and North Jakarta, respectively. These programs, along with a similar program in Karachi, would be considered "very cost-effective" (e.g. costs per DALY averted less than per capita gross national income (GNI)) under a wide range of assumptions. Community-based vaccination programs that also target adults in Kolkata and Jakarta are less cost-effective because incidence is lower in adults than children, but are also likely to be "very cost-effective". A program targeting school-aged children in Hue, Vietnam would prevent 21 cases, avert 6 DALYs, and not be cost-effective (US\$3779 per DALY averted) because of the low typhoid incidence there.

*5 - Immigr Minor Health. 2008 Sep 4.*

#### **Primary Healthcare Services Among a Migrant Indigenous Population Living in an Eastern Indian City.**

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This paper reports the accessibility and utilization of the healthcare services among a migrant indigenous community inhabiting slums of an eastern Indian city. It is based on data collected through semi-structured interviews conducted with heads of the households. The results indicated that the services of health personnel by visiting households are rare and the service provision was very poor. For curative services, the people heavily depend on private practitioners, including unqualified practitioners, by spending large proportions of their earnings. Due to migration, this community becomes more vulnerable to low utilization of healthcare services. This study warrants evolving a system of healthcare to cater the needs of vulnerable migrant groups in urban areas of India.

6 - *BMC Pediatr.* 2008 Oct 18;8(1):44.

### **Energy and macronutrient intakes in preschool children in urban areas of Ho Chi Minh City, Vietnam.**

Huynh DT, Dibley MJ, Sibbritt DW, Tran HT.

**BACKGROUND:** An increasing prevalence of overweight and obesity has been documented in preschool children in Ho Chi Minh City (HCMC), Vietnam. However, little is known about what preschool children in HCMC eat or how well their nutrient intake meets nutrient recommendations. This study aims to describe the energy and macronutrient intake and compare these nutrient intakes with the recommendations for Vietnamese children aged four to five years.

**METHODS:** The data comes from the baseline measurement of a one year follow-up study on obesity in 670 children attending kindergartens in HCMC. Dietary information for each child at the school and home settings was collected using Food Frequency Questionnaires (FFQs), by interviewing teachers and parents or main caregivers. The average energy and nutrient intake in a day was calculated. The proportion of children with energy intake from macronutrients meeting or exceeding the recommendations was estimated based on the 2006 recommended daily allowance (RDA) for Vietnamese children in this age group.

**RESULTS:** The dietary intake of the participants contained more energy from protein and fat, particularly animal protein and fat, and less energy from carbohydrates, than the RDA. Most children (98.1%) had mean energy intake from protein greater than the recommended level of 15%, and no child obtained energy from animal fat that was in accordance with the recommendation of less than 30% of the total fat intake. Nearly one half of children (46.5%) consumed less than the advised range of mean energy intake from carbohydrate (60%-70%).

**CONCLUSIONS:** In this preschool child population in HCMC, in which obesity is emerging as major public health problem, there is an imbalance in dietary intake. Healthy eating programs need to be developed as a part of an obesity prevention program for young children in HCMC.

7 - *PLoS ONE.* 2008 Sep 10;3(9):e3166.

### **Pedestrian road traffic injuries in urban Peruvian children and adolescents: case control analyses of personal and environmental risk factors.**

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**BACKGROUND:** Child pedestrian road traffic injuries (RTIs) are an important cause of death and disability in poorer nations, however RTI prevention strategies in those countries largely draw upon studies conducted in wealthier countries. This research investigated personal and environmental risk factors for child pedestrian RTIs relevant to an urban, developing world setting.

**METHODS:** This is a case control study of personal and environmental risk factors for child pedestrian RTIs in San Juan de Miraflores, Lima, Perú. The analysis of personal risk factors included 100 cases of serious pedestrian RTIs and 200 age and gender matched controls. Demographic, socioeconomic, and injury data were collected. The environmental risk factor study evaluated vehicle and pedestrian movement and infrastructure at the sites in which 40 of the above case RTIs occurred and 80 control sites.

**FINDINGS:** After adjustment, factors associated with increased risk of child pedestrian RTIs included high vehicle volume (OR 7.88, 95% CI 1.97-31.52), absent lane demarcations (OR 6.59, 95% CI 1.65-26.26), high vehicle speed (OR 5.35, 95%CI 1.55-18.54), high street vendor density (OR 1.25, 95%CI 1.01-1.55), and more children living in the home (OR 1.25, 95%CI 1.00-1.56). Protective factors included more hours/day spent in school (OR 0.52, 95% CI 0.33-0.82) and years of family residence in the same home (OR 0.97, 95% CI 0.95-0.99).

**CONCLUSION:** Reducing traffic volumes and speeds, limiting the number of street vendors on a given stretch of road, and improving lane demarcation should be evaluated as components of child pedestrian RTI interventions in poorer countries.

*8 - Cien Saude Colet. 2008 Nov-Dec; 13(6):1785-96.*

**[Urban health: "the city is a strange lady, smiling today, devouring you tomorrow"] [Article in Portuguese]**

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More than half of the world's population is living in cities and the world is turning more and more urbanized. This literature review explores the ramifications of urban transformation, showing how cities take shape and impact human health in our times. While cities can offer positive opportunities, their negative impacts related to the lack of social organization, precarious urban living and working conditions, lack of governance and opportunities as well as the lack of strategies for promoting social equity tend to increase the adverse effects on the health of the urban communities. The article also advocates the study of urban health as a branch of knowledge related to public health, proposing a common conceptual model and taxonomy for urban health. Future directions for research and practice are discussed in the light of some examples from the Brazilian scientific literature.

*9 - Int J Tuberc Lung Dis. 2008 Nov; 12(11):1268-73.*

**Health seeking and knowledge about tuberculosis among persons with pulmonary symptoms and tuberculosis cases in Bangalore slums.**

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SETTING: Bangalore city slums, India.

OBJECTIVES: To ascertain 1) health-seeking behaviour patterns in persons with pulmonary symptoms; 2) pathways followed by pulmonary tuberculosis (PTB) cases until diagnosis and treatment; and 3) their knowledge about TB-symptoms, cause, mode of transmission, diagnosis and treatment.

METHODS: In selected slums, persons with pulmonary symptoms identified during house visits and residents with PTB were interviewed using pre-tested, semi-structured questionnaires. Visits to relevant health centres were made to obtain information regarding their treatment.

RESULTS: About 50% of the 124 persons with pulmonary symptoms interviewed had taken action for relief; of these, three quarters had first approached private health facilities. About 19% had undergone sputum microscopy and 27% chest X-ray. Of 47 PTB cases interviewed, 72% first approached private health facilities; about 50% visited two health facilities before diagnosis and 87% visited two or more facilities before initiating treatment; 42 initiated treatment at government health facilities and five who initiated treatment at private health facilities were later referred to government health facilities. The majority of persons with pulmonary symptoms and PTB cases had poor knowledge about TB, and most of those with pulmonary symptoms were not aware of the availability of free anti-tuberculosis services at government health facilities.

CONCLUSION: Educational interventions targeted at slum dwellers and their health providers are needed.

*10 - J Infect. 2008 Sep;57(3):204-13.*

### **Transmission of *Streptococcus pneumoniae* in an urban slum community.**

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BACKGROUND: Inhabitants of slum settlements represent a significant proportion of the population at risk for pneumococcal disease in developing countries.

METHODS: We conducted a household survey of pneumococcal carriage among residents of a slum community in the city of Salvador, Brazil.

RESULTS: Among 262 subjects, 95 (36%) were colonized with *Streptococcus pneumoniae*. Children <5 years of age (OR, 8.0; 95% CI, 3.5-18.6) and those who attended schools (OR, 2.7, 95% CI, 1.2-6.0) had significantly higher risk of being colonized. Of 94 isolates obtained

from colonized individuals, 51% had serotypes included in the seven-valent pneumococcal conjugate vaccine. Overall, 10% (9 of 94 isolates) were nonsusceptible to penicillin and 28% (27 of 94 isolates) were resistant to cotrimoxazole. BOX-PCR, PFGE and MLST analyses found that 44% of the carriage isolates belonged to 14 distinct clonal groups. Strains of the same clonal group were isolated from multiple members of 9 out of the 39 study households. Nineteen carriage isolates had genotypes that were the same as those identified among 362 strains obtained from active surveillance for meningitis.

**CONCLUSIONS:** The study's findings indicate that there is significant intra- and inter-household spread of *S. pneumoniae* in the slum community setting. However, a limited number of clones encountered during carriage among slum residents were found to cause invasive disease.

*11 - J Med Assoc Thai. 2008 Sep; 91(9):1447-54.*

### **Development of quality of life instrument for urban poor in the northeast of Thailand.**

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**BACKGROUND:** Measuring the quality of life is important for evaluation and prediction of life and social care needs. To evaluate Quality of Life (QOL) in an urban poor population in northeast of Thailand, the Urban Poor Quality of Life (UPQOL) instrument was developed

**OBJECTIVE:** To develop an initial instrument to measure urban poor QOL.

**MATERIAL AND METHOD:** The development was started with literature review and investigated in urban poor communities. The results were transformed into the items required to build a structured questionnaire. Five hundred twenty three subjects, representatives of urban poor, were selected to test this instrument. Descriptive statistics described feature of items and the samples, exploratory factor analysis conducted the items score, and confirmatory factor analysis conducted the construct validity.

**RESULTS:** The result found that the UPQOL instrument consisted of nine domains (education, income and employment, environment, health, infrastructure, security and safety, shelter and housing, civil society and political, and human rights domains) with eigen value rank from 1.5 to 4.2 and 61 items with the factor loading rank from 0.41 to 0.82. The internal consistency was 0.92. The correlation between items to domain ranged from 0.30 to 0.72 and domains to overall QOL ranged from 0.27 to 0.84. Confirmatory factor analysis showed that the structure fit all domains well. Domains and overall structure were good with CFI (> 0.95). The internal consistency value ranged from 0.73-0.93. UPQOL scores were able to discriminate groups of subjects with differences levels of QOL.

**CONCLUSION:** The UPQOL instrument is conceptually valid. The results support good validity and reliability. It forms the basis for future testing and application in other settings.

## Urban Environmental Health

12 - *Am J Trop Med Hyg.* 2008 Sep; 79(3):414-21.

### **Spatial analysis of risk factor of cholera outbreak for 2003-2004 in a peri-urban area of Lusaka, Zambia.**

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A cholera outbreak occurred in Lusaka city between November 28, 2003 and June 8, 2004, and 6,542 cases with 187 deaths (case fatality rate: 2.86) were reported. We analyzed the distribution of cholera cases, the mode of cholera transmission, and the risk factors affecting cholera infection in a peri-urban area of Lusaka by using a Geographic Information System (GIS) and a matched case-control method. Choropleth mapping of the incidences of cholera showed variation of the incidences in the study area. Our analysis indicated a significant association between the lack of latrine and drainage systems surrounding houses and high incidence of cholera. The matched case-control study showed the protective role of chlorination of drinking water and of hand washing with soap for cholera prevention. We concluded that cholera occurred because of personal behavior and the environment conditions of daily life.

13 - *Int J Health Geogr.* 2008 Aug 12; 7:44.

### **Spatial and demographic patterns of Cholera in Ashanti region - Ghana.**

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**BACKGROUND:** Cholera has claimed many lives throughout history and it continues to be a global threat, especially in countries in Africa. The disease is listed as one of three internationally quarantinable diseases by the World Health organization, along with plague and yellow fever. Between 1999 and 2005, Africa alone accounted for about 90% of over 1 million reported cholera cases worldwide. In Ghana, there have been over 27000 reported cases since 1999. In one of the affected regions in Ghana, Ashanti region, massive outbreaks and high incidences of cholera have predominated in urban and overcrowded communities.

**RESULTS:** A GIS based spatial analysis and statistical analysis, carried out to determine clustering of cholera, showed that high cholera rates are clustered around Kumasi Metropolis (the central part of the region), with Moran's Index = 0.271 and  $P < 0.001$ . Furthermore, A Mantel-Haenszel Chi square for trend analysis reflected a direct spatial relationship between cholera and urbanization ( $\chi^2 = 2995.5$ ,  $P < 0.0001$ ), overcrowding ( $\chi^2 = 1757.2$ ,  $P < 0.0001$ ), and an inverse relationship between cholera and order of neighborhood with Kumasi Metropolis ( $\chi^2 = 831.38$ ,  $P < 0.0001$ ).

**CONCLUSION:** The results suggest that high urbanization, high overcrowding, and neighborhood with Kumasi Metropolis are the most important predictors of cholera in Ashanti region.

14 - *Water Sci Technol.* 2008; 58(4):887-91.

**Improving access to water supply and sanitation in urban India: microfinance for water and sanitation infrastructure development.**

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This article summarises initial findings of a study to explore the potential of providing micro-financing for low-income households wishing to invest in improved water supply and sanitation services. Through in-depth interviews with more than 800 households in the city of Hyderabad in India, we conclude that, even if provided with market (not concessional) rates of financing, a substantial proportion of poor households would invest in water and sewer network connections.

15 - *Soc Sci Med.* 2008 Oct 25.

**Water insecurity and emotional distress: Coping with supply, access, and seasonal variability of water in a Bolivian squatter settlement.**

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Recent research suggests that insecure access to key resources is associated with negative mental health outcomes. Many of these studies focus on drought and famine in agricultural, pastoral, and foraging communities, and indicate that food insecurity mediates the link between water insecurity and emotional distress.

The present study is the first to systematically examine intra-community patterns of water insecurity in an urban setting. In 2004-2005, we collected interview data from a random sample of 72 household heads in Villa Israel, a squatter settlement of Cochabamba, Bolivia. We examined the extent to which water-related emotional distress is linked with three dimensions of water insecurity: inadequate water supply; insufficient access to water distribution systems; and dependence on seasonal water sources, and with gender.

We found that access to water distribution systems and female gender were significantly associated with emotional distress, while water supply and dependence on seasonal water sources were not. Economic assets, social assets, entitlements to water markets, and entitlements to reciprocal exchanges of water were significantly associated with emotional distress, while entitlements to a common-pool water resource institution were not.

These results suggest that water-related emotional distress develops as a byproduct of the social and economic negotiations people employ to gain access to water distribution systems in the absence of clear procedures or established water rights rather than as a result of water scarcity per se.

16 - *Int J Environ Health Res.* 2008 Oct; 18(5):335-55.

**Water disinfection and hygiene behaviour in an urban slum in Kenya: impact on childhood diarrhoea and influence of beliefs.**

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In this research project, we studied factors that presumably affect the incidence of diarrhoea among young children in urban slums in developing countries: consumption of safe drinks, hygiene behaviour, cleanliness of household surroundings and the quality of raw water. Beliefs concerning the causes of diarrhoea were also related to health-improving behaviour, namely the application of the water-treatment method SODIS (solar water disinfection) and hygiene behaviour. We conducted a survey in a shanty town in Nairobi, Kenya. Field workers interviewed 500 households. Analysis with regression models revealed that two out of the four postulated factors were significant: children have a lower risk of contracting diarrhoea when they consume high percentages of safe drinks and live in households with good hygiene. As regards beliefs, we found that biomedical knowledge of children's diarrhoea as well as the perceived social norm for treating water was associated with the use of SODIS and good hygiene.

*17 - Water Sci Technol. 2008; 58(3):563-70.*

### **A framework for planning of sustainable water and sanitation systems in peri-urban areas.**

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There are billions of people around the world that lack access to safe water supply and basic sanitation, a situation which puts the affected in severe health conditions as well as economical and social despair. Many of those lacking adequate water supply and sanitation systems can be found at the fringe of the cities in so called peri-urban areas, especially in the developing world. Planning in these areas is highly complex due to challenging environmental and physical conditions, high population density and unclear institutional boundaries. This article presents a framework aiming to support the planning process for sustainable water and sanitation systems in peri-urban areas. The suggested framework is based on different available planning approaches from a review of literature and websites of organisations and companies. It consists of a recommendation of important steps in the planning process as well as supporting tools. Further, it incorporates a set of sustainability criteria important for the peri-urban context and allows for the development of site specific systems. The framework has the aim to be flexible for different planning situations, and for suiting planners with different perspectives and amount of resources.

*18 - Am J Epidemiol. 2008 Oct 20.*

### **Air Pollution, Economic Development of Communities, and Health Status Among the Elderly in Urban China.**

Sun R, Gu D.

In Western societies, the impact of air pollution on residents' health is higher in less wealthy communities. However, it is not clear whether such an interaction effect applies to developing countries. The authors examine how the level of community development modifies the impact of air pollution on health outcomes of the Chinese elderly using data from the third wave of the Chinese Longitudinal

Health Longevity Survey in 2002, which includes 7,358 elderly residents aged 65 or more years from 735 districts in 171 cities. The results show that, compared with a 1-point increase in the air pollution index in urban areas with a low gross domestic product, a similar increase in the air pollution index in areas with a high gross domestic product is associated with more difficulties in activities of daily living (odds ratio = 1.41, 95% confidence interval (CI): 1.09, 1.83), instrumental activities of daily living (linear coefficient = 0.98, 95% CI: 0.58, 1.37), and cognitive function (linear coefficient = 2.67, 95% CI: 1.97, 3.36), as well as a higher level of self-rated poor health (odds ratio = 2.20, 95% CI: 1.68, 2.86). Contrary to what has been found in the West, Chinese elderly who live in more developed urban areas are more susceptible to the effect of air pollution than are their counterparts living in less developed areas.

19 - *Acta Trop.* 2008 Jul 31.

### **Carriage of *Leptospira interrogans* among domestic rats from an urban setting highly endemic for leptospirosis in Brazil.**

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A survey was conducted to identify reservoirs for urban leptospirosis in the city of Salvador, Brazil. Sampling protocols were performed in the vicinity of households of severe leptospirosis cases identified during active hospital-based surveillance. Among a total of 142 captured *Rattus norvegicus* (Norwegian brown rat), 80.3% had a positive culture isolate from urine or kidney specimens and 68.1% had a positive serum sample by microscopic agglutination test (MAT) titre of  $\geq 1:100$ .

Monoclonal antibody-based typing of isolates identified that the agent carried by rats was *Leptospira interrogans* serovar Copenhageni, which was the same serovar isolated from patients during hospital-based surveillance. *Leptospira* spp. were not isolated from 8 captured *Didelphis marsupialis* (Opossum), while 5/7 had a positive MAT titre against a saprophytic serogroup. *R. rattus* were not captured during the survey.

The study findings indicate that the brown rat is a major rodent reservoir for leptospirosis in this urban setting. Furthermore, the high carriage rates of *L. interrogans* serovar Copenhageni in captured rats suggest that there is a significant degree of environmental contamination with this agent in the household environment of high risk areas, which in turn is a cause of transmission during urban epidemics.

20 - *Sci Total Environ.* 2008 Oct 25.

### **Infection risk assessment of diarrhea-related pathogens in a tropical canal network.**

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A quantitative microbial risk assessment (QMRA) of *Cryptosporidium*, *Giardia* and diarrhegenic *Escherichia coli* (DEC) infection was performed using Monte Carlo simulations to estimate the human health risks associated with the use of canal water for recreational purposes, unrestricted and restricted irrigation in a tropical peri-urban area. Three canals receiving municipal, agricultural, and, predominantly, industrial wastewater were investigated.

Identification of pathogenic protozoans revealed the major presence of *Cryptosporidium hominis* and both assemblages A and B of *Giardia lamblia*. The highest individual infection risk estimate was found to be for *Giardia* in an exposure scenario involving the accidental ingestion of water when swimming during the rainy season, particularly in the most polluted section, downstream of a large wholesale market. The estimated annual risks of diarrheal disease due to infection by the protozoan parasites were up to 120-fold greater than the reported disease incidence in the vicinity of the studied district and the entire Thailand, suggesting a significant host resistance to disease beyond our model's assumptions. In contrast, annual disease risk estimates for DEC were in agreement with actual cases of diarrhea in the study area.

## **Urban Vector Disease**

*21 - Malar J. 2008 Oct 27; 7(1):218.*

### **Human population, urban settlement patterns and their impact on *Plasmodium falciparum* malaria endemicity.**

Tatem AJ, Guerra CA, Kabaria CW, Noor AM, Hay SI.

**BACKGROUND:** The efficient allocation of financial resources for malaria control and the optimal distribution of appropriate interventions require accurate information on the geographic distribution of malaria risk and of the human populations it affects. Low population densities in rural areas and high population densities in urban areas can influence malaria transmission substantially. Here, the Malaria Atlas Project (MAP) global database of *Plasmodium falciparum* parasite rate (PfPR) surveys, medical intelligence and contemporary population surfaces are utilized to explore these relationships and other issues involved in combining malaria risk maps with those of human population distribution in order to define populations at risk more accurately.

**METHODS:** First, an existing population surface was examined to determine if it was sufficiently detailed to be used reliably as a mask to identify areas of very low and very high population density as malaria free regions. Second, the potential of international travel and health guidelines (ITHGs) for identifying malaria free cities was examined. Third, the differences in PfPR values between surveys conducted in author-defined rural and urban areas were examined. Fourth, the ability of various global urban extent maps to reliably discriminate these author-based classifications of urban and rural in the PfPR database was investigated. Finally, the urban map that most accurately replicated the author-based classifications was analysed to examine the effects of urban classifications on PfPR values across the entire MAP database.

**RESULTS:** Masks of zero population density excluded many non-zero PfPR surveys, indicating that the population surface was not detailed enough to define areas of zero transmission resulting from low population densities. In contrast, the ITHGs enabled the identification and mapping of 53 malaria free urban areas within endemic countries. Comparison of PfPR survey results showed significant differences between author-defined 'urban' and 'rural' designations

in Africa, but not for the remainder of the malaria endemic world. The Global Rural Urban Mapping Project (GRUMP) urban extent mask proved most accurate for mapping these author-defined rural and urban locations, and further sub-divisions of urban extents into urban and peri-urban classes enabled the effects of high population densities on malaria transmission to be mapped and quantified.

**CONCLUSION:** The availability of detailed, contemporary census and urban extent data for the construction of coherent and accurate global spatial population databases is often poor. These known sources of uncertainty in population surfaces and urban maps have the potential to be incorporated into future malaria burden estimates. Currently, insufficient spatial information exists globally to identify areas accurately where population density is low enough to impact upon transmission. Medical intelligence does however exist to reliably identify malaria free cities. Moreover, in Africa, urban areas that have a significant effect on malaria transmission can be mapped.

*22 - Tanzan J Health Res. 2008 Apr; 10(2):103-7.*

### **Mosquito larval habitats and public health implications in Abeokuta, Ogun State, Nigeria.**

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The larval habitats of mosquitoes were investigated in Abeokuta, Nigeria in order to determine the breeding sites of the existing mosquito fauna and its possible public health implications on the residents of the City. The habitats were sampled between August 2005 and July 2006 using plastic dippers and a pipette. The habitats were grouped as ground pools/ponds, gutters/open drains, tyres, domestic containers and treeholes/ leaf axils.

Ten species of mosquitoes were encountered in the five habitats namely *Mansonia africana*, *M. uniformis*, *Culex quinquefasciatus*, *Aedes aegypti*, *Ae. albopictus*, *Ae. vittatus*, *Cx tigripes*, *Anopheles gambiae* s.l., *An. funestus* and *Eretmapodite clynsogaster*. *Ae. Aegypti* bred in all the habitats sampled while *Cx quinquefasciatus* bred in four habitats except tree holes/leaf axils. *An. gambiae* s.l and *Ae. albopictus* occurred in three habitats while other species bred only in one or two habitats. Ground pools and domestic containers recorded the highest number of species followed by gutters/open drains. Tree holes/leaf axils was the least preferred habitat with the lowest number of species occurrence. However, statistical analysis revealed non-significant difference in species occurrence in the five habitats.

The availability of the habitats to support the breeding of *Aedes*, *Culex* and *Anopheles*, which are known vectors of urban yellow fever, lymphatic filariasis and malaria suggest that the residents of Abeokuta City are at risk of mosquito-borne diseases. It is important that residents of the City are enlighten on the environmental factors that contribute to mosquito breeding and that the Government should institute proper sanitation measures to reduce mosquito breeding sites.

*23 - Vector Ecol. 2008 Jun; 33(1):107-16.*

### **Abundance of immature *Anopheles* and culicines (Diptera: Culicidae) in different water body types in the urban environment of Malindi, Kenya.**

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In this study we 1) describe the abundance of Anopheles and culicine immatures in different water body types in urban Malindi, Kenya, 2) compare Anopheles immature density in relation to culicine immature density, and 3) identify characteristics that influence the likelihood of water bodies being co-colonized by Anopheles and culicines. Entomological and environmental cross-sectional surveys conducted in 2001 and 2002 were used in the analysis. A total of 889 Anopheles and 7,217 culicine immatures were found in diverse water body types in 2001 and 2002. Car-track pools (n = 45) and unused swimming pools (n = 25) comprised 61% (70 of 115) of all water bodies found and served as the main habitats for Anopheles immatures. Of the 38 water bodies found containing Anopheles immature mosquitoes, 63% (24 of 38) were car-track pools and unused swimming pools. Culicine immatures utilized several water body types as habitats. We found that Anopheles and culicine immatures had higher density when occurring individually compared to when they occurred simultaneously. We determined that season, permanency, and water body area size influenced the likelihood of water bodies being simultaneously positive for Anopheles and culicines. Though Anopheles immatures were found in diverse water body types, their numbers were low compared to culicine immatures. The low density of Anopheles immatures suggests that Anopheles larval control is an achievable goal in Malindi.

*24 - Malar J. 2008 Aug 4; 7:151.*

### **Impact of urban agriculture on malaria vectors in Accra, Ghana.**

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To investigate the impact of urban agriculture on malaria transmission risk in urban Accra larval and adult stage mosquito surveys, were performed. Local transmission was implicated as Anopheles spp. were found breeding and infected Anopheles mosquitoes were found resting in houses in the study sites. The predominant Anopheles species was Anopheles gambiae s.s.. The relative proportion of molecular forms within a subset of specimens was 86% S-form and 14% M-form. Anopheles spp. and Culex quinquefasciatus outdoor biting rates were respectively three and four times higher in areas around agricultural sites (UA) than in areas far from agriculture (U). The annual Entomological Inoculation Rate (EIR), the number of infectious bites received per individual per year, was 19.2 and 6.6 in UA and U sites, respectively. Breeding sites were highly transitory in nature, which poses a challenge for larval control in this setting. The data also suggest that the epidemiological importance of urban agricultural areas may be the provision of resting sites for adults rather than an increased number of larval habitats. Host-seeking activity peaked between 2-3 am, indicating that insecticide-treated bednets should be an effective control method.

*25 - Malar J. 2008 Sep 16; 7:178.*

### **Malaria transmission in Dakar: a two-year survey.**

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**BACKGROUND:** According to entomological studies conducted over the past 30 years, there was low malaria transmission in suburb of Dakar but little evidence of it in the downtown area. However; there was some evidence of local transmission based on reports of malaria among permanent residents. An entomological evaluation of malaria transmission was conducted from May 2005 to October 2006 in two areas of Dakar.

**METHODS:** Mosquitoes were sampled by human landing collection during 34 nights in seven places in Bel-air area (238 person-nights) and during 24 nights in five places in Ouakam area (120 person-nights). Mosquitoes were identified morphologically and by molecular methods. The Plasmodium falciparum circumsporozoite indexes were measured by ELISA, and the entomological inoculation rates (EIR) were calculated for both areas. Molecular assessments of pyrethroid knock down resistance (Kdr) and of insensitive acetylcholinesterase resistance were conducted.

**RESULTS:** From May 2005 to October 2006, 4,117 and 797 Anopheles gambiae s.l. respectively were caught in Bel-air and Ouakam. Three members of the complex were present: Anopheles arabiensis (> 98%), Anopheles melas (< 1%) and An. gambiae s.s. molecular form M (< 1%). Infected mosquitoes were caught only during the wintering period between September and November in both places. In 2005 and 2006, annual EIRs were 9,5 and 4, respectively, in Bel-air and 3 and 3, respectively, in Ouakam. The proportion of host-seeking An. gambiae s.l. captured indoors were 17% and 51% in Bel air and Ouakam, respectively. Ace 1 mutations were not identified in both members of the An. gambiae complex. Kdr mutation frequency in An. arabiensis was 12% in Bel-air and 9% in Ouakam.

**CONCLUSION:** Malaria is transmitted in Dakar downtown area. Infected mosquitoes were caught in two subsequent years during the wintering period in two distant quarters of Dakar. These data agree with clinical data from a Senegalese military Hospital of Dakar (Hospital Principal) where most malaria cases occurred between October and December. It was the first detection of An. melas in Dakar.

*26 - Cad Saude Publica. 2008 Oct; 24(10):2385-95.*

**[Intra-urban dynamics of dengue epidemics in Belo Horizonte, Minas Gerais State, Brazil, 1996-2002] - [Article in Portuguese]**

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This study aimed to describe the temporal-spatial patterns of dengue epidemics in Belo Horizonte, Minas Gerais State, Brazil, from 1996 to 2002 and to analyze residential address as a proxy for exposure. Reported dengue cases were analyzed according to week of onset of symptoms and residential census tract. Local Moran's index was used to assess spatial autocorrelation of incidence coefficients, and recurrent census areas over different epidemic waves were also verified. Ripley's K-function was used to compare spatial distribution patterns between the two population groups, assuming that they were distributed differently around the city. A total of 99,559 dengue cases were analyzed, resulting in seven epidemic waves with different durations and intensities, with cases clustering in a small fraction of areas, thinning out both spatially and temporally. Distinct case distribution patterns were

observed according to the two exposed groups, suggesting the need to improve the reporting of possible place of infection. The observed endemic pattern of the disease also requires specific strategies and poses a major challenge for health surveillance services.

27 - *J Am Mosq Control Assoc.* 2008 Sep; 24(3):410-4.

**Field evaluation of a previously untested strain of biolarvicide (*Bacillus thuringiensis israelensis* H14) for mosquito control in an urban area of Orissa, India.**

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A previously untested strain of *Bacillus thuringiensis israelensis* (Bti) serotype H14 (ID No. VCRC B17) has been evaluated under field conditions in an urban area of Rourkela city, India for its impact on the larval density of different mosquito species in a variety of habitats. The persistence of the biolarvicide used in an aqueous solution varied in different habitats. The lowest field application rate of 0.5 ml/m<sup>2</sup> remained effective for about 10-12 days and provided 80-100% reduction in larval abundance of anopheline species, including *Anopheles culicifacies* breeding in unpolluted water bodies. However, in stagnant polluted waters in drains and cesspools supporting culicine breeding, the biocide at the same rate persists for 5-6 days only. An application rate of 1 ml/m<sup>2</sup> to stagnant drains and cesspools, resulted in 84-100% reduction in the larval population of *Culex quinquefasciatus* over a period of 2 wk. Based on the field observations, an operational dose of 0.5 ml/m<sup>2</sup> at fortnightly intervals is suggested for clean water sources supporting anopheline breeding. However, to control breeding of culicine mosquitoes in stagnant and polluted waters, an operational dose of 1 ml/m<sup>2</sup> at fortnightly intervals is required. The study showed that Bti serotype H14 (VCRC B17) is a suitable biolarvicide that can be used against different mosquitoes in different types of urban habitats.

## **HIV/AIDS**

28 - *East Afr J Public Health* Apr; 5(1): 1-5

**Role of governmental and non-governmental organizations in mitigation of stigma and discrimination among HIV/AIDS persons in Kibera, Kenya.**

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**OBJECTIVE:** This study assessed the role of governmental and non-governmental organizations in mitigation of stigma and discrimination among people infected and affected by HIV/AIDS in informal settlements of Nairobi.

**METHODS:** This was a descriptive cross-sectional study and used a multi stage stratified sampling method. The study was conducted in Kibera, an informal settlement with a population of over one million people which makes it the largest slum not only in Kenya but in sub-Saharan Africa. The study targeted infected individuals, non-infected community

members, managers of the organizations implementing HIV/AIDS programmes and service providers. In the process 1331 households were interviewed using qualitative and quantitative data collection instruments. Statistical Package for Social Sciences (SPSS) and Nudist 4 packages were used to analyze the quantitative and qualitative data respectively.

**RESULTS:** More than 61% of the respondents had patients in their households. Fifty five percent (55%) of the households received assistance from governmental and non-governmental organizations in taking care of the sick. Services provided included awareness, outreach, counseling, testing, treatment, advocacy, home based care, assistance to the orphans and legal issues. About 90% of the respondents perceived health education, counseling services and formation of post counseling support groups to combat stigma and discrimination to be helpful.

**CONCLUSION:** Stigma and discrimination affects the rights of People Living with HIV/AIDS (PLWHAs). Such stigmatization and discrimination goes beyond and affects those who care for the PLWHAs, and remains the biggest impediment in the fight against HIV/AIDS in Kibera. Governmental and non-governmental organizations continue to provide key services in the mitigation of stigma and discrimination in Kibera. However, personal testimonies by PLWHAs showed that HIV positive persons still suffer from stigma and discrimination. Approximately 43% of the study population experienced stigma and discrimination.