



USAID
FROM THE AMERICAN PEOPLE

Urban Health Bulletin: A Compendium of Resources

July/August 2009 – Compiled by Environmental Health at USAID

I am very happy to highlight the first three abstracts on Urban Health Analysis section in this issue. Both abstracts go beyond descriptive analysis of challenges and instead **analyze efforts to address urban health problems**.

We welcome your comments and suggestions. If you are not already, please send your email address to receive future Urban Health Bulletins. If you have questions or comments about urban health issues, please contact:

Anthony Kolb, USAID Urban Health Advisor at: akolb@usaid.gov

Urban Health Analysis	Urban Environmental Health	Urban Vector Disease	Urban HIV/AIDS
---------------------------------------	--	--------------------------------------	--------------------------------

Urban Health Analysis

1: *Trop Med Int Health. 2009 Aug 28.*

Effect of behaviour change communication on qualified medical care-seeking for sick neonates among urban poor in Lucknow, northern India: a before and after intervention study.

Awasthi S, Srivastava NM, Agarwal GG, Pant S, Ahluwalia TP.

Department of Pediatrics, Chhatrapati Shahuji Maharaj Medical University, Lucknow, India.

Objective - To assess the impact of a behaviour change communication (BCC) intervention on qualified medical care-seeking for sick newborns in urban Lucknow, northern India.

Methods - Before and after intervention study conducted at two urban public hospitals at Lucknow. Neonates who did not have any morbidity or congenital malformation and were residents of Lucknow were enrolled within 48 h of birth and followed once between 6 and 8 weeks at the outpatients' clinic or home to assess the primary outcome measure which was qualified medical care-seeking for any neonatal illness. Mothers in the after-intervention phase received BCC intervention at enrolment, targeted at identification of danger signs of neonatal illnesses and promotion of qualified medical care-seeking. Analysis was by intention to treat.

Results - In the before-intervention phase, 510 neonates were enrolled (from March 2007 to August 2007) and 481 (94.3%) were followed up. In the after-intervention phase, 510 neonates were enrolled (September 2007-April 2008) and 490 (96.1%) were followed up. Neonatal morbidity was 50.3% (242/481) and 44.3% (217/490) in before and after intervention phases, respectively. Qualified medical care-seeking for neonatal illnesses was significantly higher among mothers after-intervention (OR = 2.12; 95% CI = 1.42-3.16; P = 0.0001).

Conclusion - Since the behaviour change intervention package led to significant improvement in qualified medical care-seeking for sick newborns, this may be tested for effectiveness in other settings and considered for scaling up here, with rising proportion of institutional deliveries.

2: *Health Educ Res.* 2009 Aug 3.

Community-based health programmes: role perceptions and experiences of female peer facilitators in Mumbai's urban slums.

Alcock GA, More NS, Patil S, Porel M, Vaidya L, Osrin D.

1University College London Centre for International Health.evelopment, Institute of Child Health, London WC1N 1EH, UK.

Community-based initiatives have become a popular approach to addressing the health needs of underserved populations, in both low- and higher-income countries. This article presents findings from a study of female peer facilitators involved in a community-based maternal and newborn health intervention in urban slum areas of Mumbai. Using qualitative methods we explore their role perceptions and experiences. Our findings focus on how the facilitators understand and enact their role in the community setting, how they negotiate relationships and health issues with peer groups, and the influence of credibility. We contextualize this within broader conceptualizations of peer-led health interventions and offer recommendations for similar community-based health initiatives.

3: *BMC Int Health Hum Rights.* 2009 Aug 28; 9(1):20.

Something old or something new? Social health insurance in Ghana.

Witter S, Garshong B.

BACKGROUND: There is considerable interest at present in exploring the potential of social health insurance to increase access to and affordability of health care in Africa. A number of countries are currently experimenting with different approaches. Ghana's National Health Insurance System (NHIS) was passed into law in 2003 but fully implemented from late 2005. It has already reached impressive coverage levels. This article aims to provide a preliminary assessment of the NHIS to date. This can inform the development of the NHIS itself but also other innovations in the region.

METHODS: This article is based on analysis of routine data, on secondary literature and on key informant interviews conducted by the authors with stakeholders at national, regional and district levels over the period of 2005 to 2009.

RESULTS: In relation to its financing sources, the NHIS is heavily reliant on tax funding for 70-75% of its revenue. This has permitted quick expansion of coverage, partly through the inclusion of large exempted population groups. Card holders increased from 7% of the population in 2005 to 45% in 2008. However, only around a third of these are contributing to the scheme financially. This presents a sustainability problem, in that revenue is de-coupled from the growing membership. In addition, the NHIS offers a broad benefits package, with no co-payments and very limited gate-keeping, and also faces cost escalation related to its new payment system and the growing utilisation of members. These features contributed to a growth in distressed schemes and failure to pay outstanding facility claims in 2008. The NHIS has had a considerable impact on the health system as a whole, taking on a growing role

in funding curative care. In 2009, it is expected to contribute 41% of the overall resource envelope. However there is evidence that this funding is not additional but has been switched from other funding channels. There are some equity concerns about this, as the new funding source (a VAT-based tax) may be more regressive. In addition, membership of the NHIS at present has a pro-rich bias, and a pro-urban bias in relation to renewals. Only a very small proportion is registered as indigents, and there is evidence of 'squeezing out' of non-members from health care utilisation. Finally, considerable challenges remain in relation to strengthening the purchasing role of the NHIS, and also settling debates about its structure and accountability.

CONCLUSIONS: Some trade-offs will be necessary between the existing wide benefits package of the NHIS and the laudable desire to reach universal coverage. The overall resource envelope for health is likely to be stable rather than increasing over the medium-term. In the longer term, the investment costs in the NHIS will only be justified if it is able to increase the cost-effectiveness of purchasing and the responsiveness of the system as a whole.

4: BMC Womens Health. 2009 Aug 10; 9(1):23.

Reproductive and family planning history, knowledge, and needs: A community survey of low-income women in Beijing, China.

He H, Ostbye T, Daltveit AK.

BACKGROUND: The reproductive health status of China's low-income urban women is believed to be poor. Therefore, understanding their reproductive history and needs and improving services provision is very important. However, few studies have been done to assess reproductive health status, knowledge and needs in this low-income population. The purpose of this study is to broadly assess reproductive and family planning history, knowledge and health needs among low income urban women with an aim to informing health services interventions.

METHODS: 1642 low-income women age 18-49 from Haidian district, Beijing were selected. All were interviewed via a standardized questionnaire in 2006.

RESULTS: Most women reported at least one pregnancy and delivery (97.7%, 98.3%). Deliveries in hospitals (97.3%) by medical personnel (98.5%) were commonplace, as was receipt of antenatal care (86.0%). Nearly half had at least one abortion, with most (56.0%) performed in district hospitals, by physicians (95.6%), and paid for out-of-pocket (64.4%). Almost all (97.4%) used contraception, typically IUDs or condoms. Reproductive knowledge was limited. Health needs emphasized by the participants included popularizing reproductive health information, being able to discuss their reproductive health concerns, free reproductive health insurance, examination and treatment.

CONCLUSIONS: Among poor urban women in Beijing, antenatal care and contraceptive use were common. However, abortions were also common. Knowledge about reproductive health was limited. There is a need for better reproductive health education, free medical care and social support.

5: *Rev Saude Publica*. 2009 Aug; 43(4): 656-65.

Social inequality, urban growth and leprosy in Manaus: a spatial approach.

Imbiriba EN, da Silva Neto AL, de Souza WV, Pedrosa V, Cunha Mda G, Garnelo L.

Instituto Leônidas & Maria Deane, Manaus, AM, Brasil. elsia@amazonia.fiocruz.br

OBJECTIVE: To analyze the epidemiology of leprosy according to spatial distribution and living conditions of the population.

METHODS: Ecological study based on the spatial distribution of leprosy in the municipality of Manaus, Northern Brazil, from 1998 to 2004. The 4,104 cases identified in the Sistema de Informações de Agravos de Notificação (Sinan -National Notification System) were georeferenced according to the addresses in the 1,536 urban census tracts through four different sources: postal service (73.7% of addresses found), Property Registration Program (7.3%), Family Health Program (2.1%), and Instituto Brasileiro de Geografia e Estatística (Brazilian Institute of Geography and Statistics) data sheet (1.5%). Calculation of detection coefficient was performed based on the 2001 population. Local empirical Bayesian method was used for the spatial distribution analysis, in order to estimate leprosy risk, making rate variation shorter when they were calculated for small areas. Logistic regression was employed to analyze the association between geographical distribution and risk factors. The incidence of cases in children under 15 (severity indicator) and Social Need Index built from variables of the 2000 census were adopted as explicative variables.

RESULTS: The mean coefficient of detection was hyperendemic in 34.0% of the census tracts, and very high in 26.7%. Odds ratio was obtained for explicative variables and proved to be significant. Low-income and incidence in children under 15 were combined to identify priority areas for intervention.

CONCLUSIONS: Spatial analysis of leprosy showed that the distribution of the disease is heterogeneous and is more strongly present in regions inhabited by more vulnerable groups.

6: *Int J Paediatr Dent*. 2009 Sep; 19(5): 330-7.

Has urbanization become a risk factor for dental caries in Kerala, India: a cross-sectional study of children aged 6 and 12 years.

Christian B, Evans RW.

Community Oral Health and Epidemiology, Faculty of Dentistry, University of Sydney, Sydney, NSW 2145, Australia. bchr0064@usyd.edu.au

OBJECTIVES: The objectives of this study were to: (i) test the hypothesis that urbanization is a risk factor for dental caries in children aged 6 and 12 years in Kollam, Kerala; and (ii) identify other possible risk factors for dental caries. **METHODS:** A cross-sectional study design was followed. The subjects were stratified by socio-demographic status into urban middle class, urban poor, and rural poor. Caries experience was measured by visual examination of teeth according to the World Health Organization criteria. Data on potential risk factors were collected using a close-ended, structured, and interviewer-administered questionnaire. Data modelling was conducted using logistic regression analyses.

RESULTS: Eight hundred seventy-six children were examined; 53% of 6-year-olds and 90% of 12-year-olds examined were caries free. The caries experience rates were 1.40 decayed, missing, or filled primary teeth and 0.15 Decayed, Missing, and Filled Teeth (DMFT) for the 6- and 12-year-olds, respectively. Urban children did not have a higher caries experience compared with rural children. The only risk factor associated with a significant difference in DMFT scores was the dental visiting pattern. Children who visited the dentist had a significantly higher mean DMFT score ($P = 0.009$).

CONCLUSION: There was no evidence that urbanization is a risk factor for dental caries in Kerala. Dental caries experience was low, against any standard, in Kollam. Risk factors for caries were not identified.

7: *Heart*. 2009 Sep; 95(18):1475-82.

Cardiovascular disease in South America: current status and opportunities for prevention.

Avezum A, Braga J, Santos I, Guimarães HP, Marin-Neto JA, Piegas LS.

Research Division, Dante Pazzanese Institute of Cardiology, São Paulo, SP, Brazil.
avezum@dantepazzanese.org.br

South America comprises widely different environments consisting of many complex and heterogeneous ethnicities, societies and cultures. During recent decades conspicuous advances in human and societal development have been made. South America now faces three major demographic shifts: population growth; urbanization (almost 90% of the population live in urban areas) and ageing. Recently, an epidemiological transition has been seen. Urbanisation has brought unfavourable and prominent changes, such as increased smoking rates, stress, lack of physical activity and poor diets (more fat and calories). Consequently, owing to the interaction between environment and genetic susceptibility, the modifications induced by urbanisation have resulted in enhancement of the cardiovascular risk factors and cardiovascular disease (CVD). This situation is responsible for the burden of CVD in South America, requiring effective action towards better detection and control of cardiovascular risk factors aimed at reducing the burden of disease in the region, which tends to be higher and increasingly serious.

8: *BMC Cardiovasc Disord*. 2009 Aug 23; 9(1):39.

Population based prevalence of high blood pressure among adults in Addis Ababa: uncovering a silent epidemic.

Tesfaye F, Byass P, Wall S.

BACKGROUND: The prevention and control of high blood pressure or other cardiovascular diseases has not received due attention in many developing countries. This study aims to describe the epidemiology of high blood pressure among adults in Addis Ababa, so as to inform policy and lay the ground for surveillance interventions.

METHODS: Addis Ababa is the largest urban centre and national capital of Ethiopia, hosting about 25 % of the urban population in the country. A probabilistic sample of adult males and females, 25-64 years of age residing in Addis Ababa city participated in structured interviews and physical measurements. We employed a population based, cross sectional survey, using the World Health Organization instrument for stepwise surveillance (STEPS) of chronic disease risk factors. Data on selected socio-demographic characteristics and lifestyle behaviours, including physical activity, as well as physical measurements such as weight, height, waist and

hip circumference, and blood pressure were collected through standardized procedures. Multiple linear regression analysis was performed to estimate the coefficient of variability of blood pressure due to selected socio-demographic and behavioural characteristics, and physical measurements.

RESULTS: A total of 3713 adults participated in the study. About 20 % of males and 38% of females were overweight (body-mass-index [greater than or equal to] 25 kg/m²), with 10.8 (9.49, 12.11) % of the females being obese (body-mass-index [greater than or equal to] 30 kg/m²). Similarly, 17 % of the males and 31 % of the females were classified as having low level of total physical activity. The age-adjusted prevalence (95% confidence interval) of high blood pressure, defined as systolic blood pressure (SBP) [greater than or equal to] 140 mmHg (millimetres of mercury) or diastolic blood pressure (DBP) [greater than or equal to] 90 mmHg or reported use of anti-hypertensive medication, was 31.5 % (29.0, 33.9) among males and 28.9 % (26.8, 30.9) among females.

CONCLUSIONS: High blood pressure is widely prevalent in Addis Ababa and may represent a silent epidemic in this population. Overweight, obesity and physical inactivity are important determinants of high blood pressure. There is an urgent need for strategies and programmes to prevent and control high blood pressure, and promote healthy lifestyle behaviours among the urban population of Ethiopia.

9: Eval Program Plann. 2009 Aug; 32(3): 197-203.

Factors influencing enrollment: a case study from Birth to Twenty, the 1990 birth cohort in Soweto-Johannesburg.

Richter LM, Panday S, Norris SA.

Child Youth Family and Social Development, Human Sciences Research Council, Private Bag X07, Dalbride 4014, South Africa. irichter@hsrc.ac.za

Longitudinal studies offer significant advantages in rendering data commensurate with the complexity of human development. However, incomplete enrollment and attrition over time can introduce bias. Furthermore, there is a scarcity of evaluative information on cohorts in developing countries. This paper documents various strategies adopted to minimize loss to follow up and describes a retrospective analysis of a small group of families who were missed during initial enrollment and through several subsequent rounds of data collection of the Birth to Twenty (BT20) birth cohort in Soweto-Johannesburg, South Africa that began in 1990. A purposive case study approach was used, and 10 of the 119 families missed at enrollment were interviewed to investigate why these families were not enrolled into the study. The findings demonstrate that high mobility, both within urban areas and between urban and rural areas, are a major challenge for longitudinal studies in densely populated urban areas. In addition, enrollment was also affected by individuals changing their names, largely motivated to facilitate access to employment under Apartheid, as well as varying motivations for participating in research. Longitudinal studies in the developing country context must be mindful of the political, social and economic climate that influences enrollment and ongoing cohort maintenance.

10: *Diabet Med.* 2009 Sep; 26(9):864-71.

High prevalence of diabetes and impaired fasting glucose in urban Latin America: the CARMELA Study.

Escobedo J, Buitrón LV, Velasco MF, Ramírez JC, Hernández R, Macchia A, Pellegrini F, Schargrotsky H, Boissonnet C, Champagne BM; CARMELA Study Investigators.

Medical Research Unit on Clinical Epidemiology, Mexican Social Security Institute, Mexico City, Mexico. jorgeep@unam.mx

AIMS: Cardiovascular risk is increased with glucose metabolism abnormalities. Prevalence data can support public health initiatives required to address this risk. The Cardiovascular Risk Factor Multiple Evaluation in Latin America (CARMELA) study was designed to estimate the prevalence of Type 2 diabetes, impaired fasting glucose and related risk factors in seven urban Latin American populations.

METHODS: CARMELA was a cross-sectional, population-based study of 11 550 adults 25-64 years of age. With a multi-stage sample design of a probabilistic nature, approximately 1600 subjects were randomly selected in each city.

RESULTS: Overall, the prevalence of diabetes was 7.0% (95% confidence intervals 6.5-7.6%). The prevalence of individuals with diabetes or impaired fasting glucose increased with increasing age. In the oldest age category, 55-64 years of age, prevalence of diabetes ranged from 9 to 22% and prevalence of impaired fasting glucose ranged from 3 to 6%. Only 16.3% of people with prior diagnosis of diabetes and who were receiving pharmacologic treatment, were in good glycaemic control (fasting glucose < 6.1 mmol/l). The prevalence of diabetes in individuals with abdominal obesity was approximately twofold higher. Participants with hypertension, elevated serum triglycerides and increased common carotid artery intima-media thickness were also more likely to have diabetes.

CONCLUSIONS: The prevalence of diabetes and impaired fasting glucose is high in seven major Latin American cities; intervention is needed to avoid substantial medical and socio-economic consequences. CARMELA supports the associations of abdominal obesity, hypertension, elevated serum triglycerides and carotid intima-media thickness with diabetes.

11: *J Nutr Educ Behav.* 2009 Sep-Oct; 41(5):347-52.

Adiposity and quality of life: a case study from an urban center in Nigeria.

Akinpelu AO, Akinola OT, Gbiri CA.

Department of Physiotherapy, College of Medicine, University of Ibadan, Nigeria.
aderonkeakinpelu@yahoo.com

OBJECTIVE: To determine relationship between adiposity indices and quality of life (QOL) of residents of a housing estate in Lagos, Nigeria.

DESIGN: Cross-sectional survey employing multistep random sampling method. **SETTING:** Urban residential estate.

PARTICIPANTS: This study involved 900 randomly selected residents of Abesan Housing Estate, Lagos, Nigeria.

MAIN OUTCOME MEASURES: Body mass index (BMI); waist circumference (WC); waist-to-hip ratio (WHR); triceps skin-fold thickness (TSFT); and abdominal skin-fold thickness (ASFT) were measured using International Standard of Anthropometric Assessment methods. QOL was assessed using Short Form-20. ANALYSIS: Data were analyzed using the Pearson product moment correlation coefficient and multiple regression analysis.

RESULT: The mean age of participants was 37.7 +/- 14.3 years, with a range of 20 to 80 years. The mean values of adiposity indices were 24.1 +/- 4.3 kg/m(2) (BMI), 11.5 +/- 5.3 mm (TSFT), 18.5 +/- 6.2 mm (ASFT), 81.8 +/- 11.2 cm (WC), and 0.89 +/- 0.1 (WHR). Although the overall mean QOL score was 72.02 +/- 11.9, women had significantly (P < .05) lower scores (70.1 +/- 5.2) than men (73.5 +/- 11.3). There was inverse correlation between QOL and each of the age and adiposity indices.

CONCLUSION AND IMPLICATIONS: Quality of life of the urban-dweller Nigerians decreased with increasing body adiposity and age. This finding suggests the need to further educate the Nigerian public on the association between high body fat and poor health.

12: *Infect.* 2009 Aug 22.

High prevalence of antimicrobial drug-resistant diarrheagenic *Escherichia coli* in asymptomatic children living in an urban slum.

Souza TB, Morais MB, Tahan S, Melli LC, Rodrigues MS, Scaletsky IC.

Departamento de Microbiologia, Imunologia e Parasitologia, Universidade Federal de São Paulo, São Paulo, Brazil; Departamento de Pediatria, Universidade Federal de São Paulo, São Paulo, Brazil.

METHODS: Seventy-nine school-age children between 5 and 10 years living in a slum and 35 children who attended a private school of the same city were included in the study.

RESULTS: DEC was found in 58% of the children living in the slum and in 17% of the control group (P=0.001). Resistance to at least one antimicrobial drug was found in 65% of DEC strains; resistant to two or more antimicrobial drugs was found in 46% of strains.

CONCLUSION: The high carriage status among the slum children point towards the widespread environment contamination in low socioeconomic housing conditions, in conformance with the pediatric population at higher risk for developing DEC diarrhea.

13: *J Urban Health.* 2009 Aug 11.

Health in the Urban Environment: A Qualitative Review of the Brighton and Hove WHO Healthy City Program.

Hall C, Davies JK, Sherriff N.

International Health Development Research Centre, University of Brighton, Brighton, UK, caroline.hall@brighton.ac.uk

Phase IV of the WHO European Region's Healthy Cities Program ended in December 2008. This article presents the findings from a recently completed review of Brighton and Hove's Healthy City Program which aimed to scope whether added value had accrued from the city's role as a

WHO Healthy City during phase IV. In contrast to most other evaluations of healthy cities, this review adopted a qualitative approach representing an appraisal of the Brighton and Hove Healthy City Program from the internal viewpoint of its local stakeholders. In addition to documentary analysis and a facilitated workshop, a series of in-depth interviews (N = 27) were conducted with stakeholders from the Brighton and Hove Healthy City Partnership representing each of the sectors reflected in the Local Strategic Partnership (public, statutory, elected, community and voluntary, neighborhood and communities, business). The key findings of the review are presented in a way which reflects the three key areas of the review including (1) the healthy cities approach, (2) participation in phase IV of the WHO Healthy Cities Program, and (3) the Brighton and Hove Healthy City Partnership. These findings are discussed, and recommendations for action at local, national, and European levels are proposed. In particular, we argue that there is an urgent need to develop a suitable monitoring and evaluation system for the WHO Healthy Cities Program with appropriate indicators that are meaningful and relevant to local stakeholders. Moreover, it would be important for any such system to capitalize on the benefits that qualitative methodologies can offer alongside more traditional quantitative indicators.

Urban Environmental Health

14: Occup Environ Med. 2009 Aug 10.

Biomass Fuel Use and Indoor Air Pollution in Homes in Malawi.

Fullerton DG, Semple S, Kalambo F, Malamba R, Suseno A, Henderson G, Ayres JG, Gordon SB.

Malawi-Liverpool-Wellcome Clinical Research Laboratories, Universities of Malawi and Liverpool, Malawi.

BACKGROUND: Air pollution from biomass fuels in Africa is a significant cause of mortality and morbidity both in adults and children. The work describes the nature and quantity of smoke exposure from biomass fuel in Malawian homes.

METHODS: Markers of indoor air quality were measured in 62 homes (31 rural and 31 urban) over a typical 24 hour period. Four different devices were used (one gravimetric device, two photometric devices (Sidepak and University of California Berkley), and a carbon monoxide (HOBO) monitor). Gravimetric samples were analysed for transition metal content. Data on cooking and lighting fuel type together with information on indicators of socio-economic status were collected by questionnaire.

RESULTS: Respirable dust levels in both the urban and rural environment were high with the mean 24h average levels being 226microg/m³ (SD 206microg/m³). Data from real-time instruments indicated respirable dust concentrations were >250microg/m³ for over 1 hour per day in 52% of rural homes and 17% of urban homes. Average carbon monoxide levels were significantly higher in urban compared to rural homes (6.14ppm vs 1.87ppm; p<0.001). The transition metal content of the smoke was low, with no significant difference found between urban and rural homes.

CONCLUSIONS: Indoor air pollution levels in Malawian homes are high. Further investigation is justified because the levels that we have demonstrated are hazardous and are likely to be damaging to health. Interventions should be sought to reduce exposure to concentrations less harmful to health.

15: *Toxicology*. 2009 Aug 3;262(2):130-7.

Diabetes is associated with increased sensitivity of alveolar macrophages to urban particulate matter exposure.

Mo Y, Wan R, Wang J, Chien S, Tollerud DJ, Zhang Q.

Department of Environmental and Occupational Health Sciences, School of Public Health and Information Sciences, University of Louisville, 485 E. Gray Street, Louisville, KY 40202, USA.

Many epidemiological studies and animal experiments have shown that individuals with preexisting diseases, such as asthma, chronic obstructive pulmonary disease (COPD), and diabetes mellitus (DM) are more susceptible to particulate matter (PM)-related health problems. However, the mechanisms underlying this susceptibility are still unclear. PM has been shown to affect macrophage functions. We hypothesized that exposure to PM in the setting of DM and high glucose levels would result in enhanced macrophage activation. Rabbits were rendered diabetic with alloxan administered intravenously. Blood glucose concentration was measured daily for the first several weeks and weekly thereafter using a blood glucose meter. After 9 months of diabetes (blood glucose great than 450mg/dl), rabbits were sacrificed and bronchoalveolar lavage was performed to collect alveolar macrophages. Alveolar macrophages were exposed in vitro to urban particulate matter SRM 1648 (U-PM). Our results showed that U-PM caused dose-dependent cytotoxic effects, and these effects were significantly higher in macrophages obtained from DM rabbits than those from normal rabbits. Reactive oxygen species (ROS) generation in macrophages from DM rabbits with exposure to U-PM was also greater than in macrophages from normal rabbits. Our results also showed that exposure of macrophages to U-PM caused an increase in cytokine mRNA expression level and activity of matrix metalloproteinase 9 (MMP-9), but not MMP-2, and that these effects were greater in macrophages from DM rabbits. These results demonstrate that U-PM caused severe oxidative stress in macrophages from DM rabbits and up-regulation of cytokine expression and MMP-9 activity.

16: *Curr Microbiol*. 2009 Sep;59(3):302-8.

Diarrheogenic *Escherichia coli* strains recovered from urban pigeons (*Columba livia*) in Brazil and their antimicrobial susceptibility patterns.

Silva VL, Nicoli JR, Nascimento TC, Diniz CG.

Laboratory of Bacterial Physiology and Molecular Genetics, Department of Parasitology, Microbiology and Immunology, Institute of Biological Sciences, Federal University of Juiz de Fora, Juiz de Fora, MG, 36036-900, Brazil.

Urban pigeons (*Columba livia*) come into close contact with humans and animals, and may contribute to the spread of infectious agents. These may include human pathogens such as diarrheogenic *Escherichia coli* strains, which are able to survive in pigeon feces, thus creating potential for human exposure and infection. Our objectives were to determine the occurrence of diarrheogenic *E. coli* strains in fresh feces from urban pigeons and their drug susceptibility patterns. *E. coli* strains were isolated from 100 fresh feces samples and presumptive phenotypic species identification was carried out, confirmed by amplification of specific 16S ribosomal RNA encoding DNA. Multiplex PCR was performed to characterize pathogenic strains. Drug susceptibility patterns were determined by the agar dilution method. Enteroinvasive *E. coli*, Shiga toxin-producing *E. coli*, enteropathogenic *E. coli*, and enterotoxigenic *E. coli* were detected at an overall rate of 12.1%. Among the isolated *E. coli* strains, 62.1% were

susceptible to all tested drugs, whereas 37.9% were resistant to at least one of the antimicrobials tested. Amikacin was the less effective drug (36.8% resistance), followed by ampicillin (7.8%). No resistance was detected to gentamicin, ceftriaxone, and ceftazidime and almost all the isolates were susceptible to ampicillin-sulbactam (98.4%), levofloxacin (97.8%), and trimethoprim-sulfamethoxazole (96.1%). Since these pigeons may harbor multidrug-resistant pathogens, their presence in an urban environment could be an important component of infection spread, with impact on public health.

17: *Indian J Gastroenterol.* 2009 Mar-Apr; 28(2):62-4.

Cholera outbreak secondary to contaminated pipe water in an urban area, West Bengal, India, 2006.

Bhunia R, Ramakrishnan R, Hutin Y, Gupte MD.

Field Epidemiology Training Programme (FETP), National Institute of Epidemiology (NIE), Indian Council of Medical Research (ICMR), Chennai, Tamil Nadu, India.

Outbreaks of cholera are common in West Bengal. In April 2006, Garulia municipality reported a cluster of diarrhea cases. We investigated this cluster to identify the etiological agent, source of transmission and propose control measures. We defined a case of diarrhea as occurrence of ≥ 3 loose/watery stools a day among the residents of Garulia since April 2006. We searched for cases of diarrhea in health care facilities and health camp. We conducted a gender and age-matched case-control study to identify risk factors. We inspected the sanitation and water supply system. We collected rectal swabs from diarrhea patients and water specimens from the affected areas for laboratory investigation. Two hundred and ninety-eight cases of diarrhea were reported to various health care facilities (attack rate: 3.5/1000, no deaths). The attack rate was highest among children (6.4/1000). *Vibrio cholerae* El Tor O1 Inaba was isolated from two of 7 rectal swabs. The outbreak started on 10 April 2006, peaked on 26 April and lasted till 6 May. Cases clustered in an area distal to leaking water pipelines. Drinking municipal water exclusively was significantly associated with the illness (OR 13, 95% CI=6.5-27). Eight of the 12 water specimens from the affected area had fecal contamination and poor chlorine content. This outbreak was due to a contaminated municipal piped water supply and *V. cholera* O1 Inaba was possibly the causative organism.

Urban Vector Disease

18: *Trop Med Int Health.* 2009 Aug 25.

Pupal sampling for *Aedes aegypti* (L.) surveillance and potential stratification of dengue high-risk areas in Cambodia.

Seng CM, Setha T, Nealon J, Socheat D.

World Health Organization Cambodia, Phnom Penh, Cambodia.

Objectives - To identify and describe the distribution of dengue vectors and factors affecting this distribution in Cambodia, with a view to practicing rational, evidence-based dengue outbreak prevention activities.

Methods - Entomological survey with a questionnaire component in 100 randomly selected

households in each of 13 clusters of high or low human population density of seven Cambodian provinces. Entomological and other indices were calculated, and statistical methods used to describe factors of potential outbreak risk.

Results - *Aedes aegypti* was the principle dengue vector in all clusters, making up 95.5% (20 555 of 21 325) of the *Aedes* pupae population. The majority of pupae were recovered either from large concrete water storage jars (16 230; 76.1%) or concrete water storage tanks (2819; 13.2%). There were small but significantly higher levels of dengue vector infestation in rural than urban areas. The mean pupae density over the survey was 16.4/house, which ranged between clusters from 5.2/house to 56.9/house. The 'pupae-per-person' index was 2.4 and 3.6 in urban and rural areas, respectively, and was independent of mean human population density or household water container distribution.

Conclusions High populations of household-associated dengue vectors were present in all surveyed clusters. The highly skewed distribution of pupae in a limited number of key containers suggests adoption and further development of community-based control measures targeting these containers holds most potential chance of controlling dengue outbreaks in Cambodia.

19: Rev Saude Publica. 2009 Aug; 43(4):666-73.

Spatial analysis of dengue and the socioeconomic context of the city of Rio de Janeiro (Southeastern Brazil).

de Almeida AS, Medronho Rde A, Valencia LI.

Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brasil. asasobral@gmail.com

OBJECTIVE: To analyze the dengue epidemic in relation to the socioeconomic context according to geographical areas.

METHODS: An ecological study was conducted in the municipality of Rio de Janeiro (Southeastern Brazil), in areas delimited as neighborhoods, based on information about notified dengue cases concerning residents in the municipality. The average incidence rate of dengue was calculated between the epidemiological weeks: 48th of 2001 and 20th of 2002. The occurrence of dengue was correlated with socioeconomic variables through Pearsons' correlation coefficient. Moran's global and local indexes were used to assess the spatial auto-correlation between dengue and the variables that significantly correlated with the disease. The multiple linear regression model and the conditional auto-regression spatial model were used to analyze the relationship between dengue and socioeconomic context.

RESULTS: The neighborhoods located in the west zone of the municipality presented high rates of average dengue incidence. The variables presenting significant correlation were: percentage of households connected with the general sanitary network, households with washing machines, and population density per urban area. Moran's spatial auto-correlation index revealed spatial dependence between dengue and the selected variables. The utilized models indicated percentage of households connected with the general sanitary network as the sole variable significantly associated with the disease. The residual figures in both models revealed significant spatial auto-correlation, with a positive Moran Index ($p < 0.001$) for linear regression model, and a negative one ($p = 0.005$) for the conditional auto-regression one.

CONCLUSIONS: Problems related to basic sanitation contribute decisively to increase the risk of the disease.

20: *Malar J.* 2009 Jul 15; 8:160.

Fever treatment in the absence of malaria transmission in an urban informal settlement in Nairobi, Kenya.

Ye Y, Madise N, Ndugwa R, Ochola S, Snow RW.

African Population and Health Research Centre, Nairobi, Kenya. yyazoume@aphrc.org

BACKGROUND: In sub-Saharan Africa, knowledge of malaria transmission across rapidly proliferating urban centres and recommendations for its prevention or management remain poorly defined. This paper presents the results of an investigation into infection prevalence and treatment of recent febrile events among a slum population in Nairobi, Kenya.

METHODS: In July 2008, a community-based malaria parasite prevalence survey was conducted in Korogocho slum, which forms part of the Nairobi Urban Health and Demographic Surveillance system. Interviewers visited 1,069 participants at home and collected data on reported fevers experienced over the preceding 14 days and details on the treatment of these episodes. Each participant was tested for malaria parasite presence with Rapid Diagnostic Test (RDT) and microscopy. Descriptive analyses were performed to assess the period prevalence of reported fever episodes and treatment behaviour.

RESULTS: Of the 1,069 participants visited, 983 (92%) consented to be tested. Three were positive for *Plasmodium falciparum* using RDT; however, all were confirmed negative on microscopy. Microscopic examination of all 953 readable slides showed zero prevalence. Overall, from the 1,004 participants who have data on fever, 170 fever episodes were reported giving a relatively high period prevalence (16.9%, 95% CI: 13.9%-20.5%) and higher among children below five years (20.1%, 95%CI: 13.8%-27.8%). Of the fever episodes with treatment information 54.3% (95%CI: 46.3%-62.2%) were treated as malaria using mainly sulphadoxine-pyrimethamine or amodiaquine, including those managed at a formal health facility. Only four episodes were managed using the nationally recommended first-line treatment, artemether - lumefantrine.

CONCLUSION: The study could not demonstrate any evidence of malaria in Korogocho, a slum in the centre of Nairobi. Fever was a common complaint and often treated as malaria with anti-malarial drugs. Strategies, including testing for malaria parasites to reduce the inappropriate exposure of poor communities to expensive anti-malarial drugs provided by clinical services and drug vendors, should be a priority for district planners.

21: *Malar J.* 2009 Jul 29; 8:176.

Treatment of malaria from monotherapy to artemisinin-based combination therapy by health professionals in urban health facilities in Yaoundé, central province, Cameroon.

Sayang C, Gausseres M, Vernazza-Licht N, Malvy D, Bley D, Millet P.

Department of Tropical Medicine, Centre René Labusquière, University of Bordeaux 2, Bordeaux, France. sayangcollins@yahoo.fr

BACKGROUND: After adoption of artesunate-amodiaquine (AS/AQ) as first-line therapy for the treatment of uncomplicated malaria by the malaria control programme, this study was designed to assess the availability of anti-malarial drugs, treatment practices and acceptability of the

new protocol by health professionals, in the urban health facilities and drugstores of Yaoundé city, Cameroon.

METHODS: Between April and August 2005, retrospective and current information was collected by consulting registers and interviewing health practitioners in urban health facilities using a structured questionnaire.

RESULTS: In 2005, twenty-seven trade-named drugs have been identified in drugstores; quinine tablets (300 mg) were the most affordable anti-malarial drugs. Chloroquine was restricted to food market places and no generic artemisinin derivative was available in public health centres. In public health facilities, 13.6% of health professionals were informed about the new guidelines; 73.5% supported the use of AS-AQ as first-line therapy. However, 38.6% apprehended its use due to adverse events attributed to amodiaquine. Malaria treatment was mainly based on the diagnosis of fever. Quinine (300 mg tablets) was the most commonly prescribed first-line anti-malarial drug in adults (44.5%) and pregnant women (52.5%). Artequin was the most cited artemisinin-based combination therapy (ACT) (9.9%). Medical sales representatives were the main sources of information on anti-malarials.

CONCLUSION: The use of AS/AQ was not implemented in 2005 in Yaoundé, despite the wide range of anti-malarials and trade-named artemisinin derivatives available. Nevertheless, medical practitioners will support the use of this combination, when it is available in a paediatric formulation, at an affordable price. Training, information and participation of health professionals in decision-making is one of the key elements to improve adherence to new protocol guidelines. This baseline information will be useful to monitor progress in ACT implementation in Cameroon.

22: Trans R Soc Trop Med Hyg. 2009 Aug 27.

Household risk factors for clinical malaria in a semi-urban area of Burkina Faso: a case-control study.

Yamamoto S, Louis VR, Sié A, Sauerborn R.

Department of Tropical Hygiene and Public Health, University of Heidelberg, Im Neuenheimer Feld 324, 69120, Heidelberg, Germany.

The risk of malaria can be influenced by the household environment. The range of these risks can be more diverse in semi-urban areas, which can include a mix of different housing styles and environments. This study examined the effect of different housing and household characteristics on malaria risk among 98 case and 185 control children in the semi-urban area of Nouna, Burkina Faso. Characteristics were assessed via questionnaires and direct inspection. Those characteristics associated with a decreased risk of malaria were floors constructed of earth bricks and running water in the neighbourhood. Electrification of the home and house age of <10 years were associated with an increased risk of malaria. The findings of this study suggest that modification of the household environment could be a feasible way to reduce the risk of malaria, particularly in semi-urban areas.

23: *Trop Med Int Health*. 2009 Aug; 14(8):877-84.

A socioenvironmental composite index as a tool for identifying urban areas at risk of lymphatic filariasis.

Bonfim C, Netto MJ, Pedroza D, Portugal JL, Medeiros Z.

Fundação Joaquim Nabuco, Ministério da Educação, Recife, Brazil.
cristine.bonfim@fundaj.gov.br

OBJECTIVE: To describe the spatial distribution of lymphatic filariasis and its relationship with the socioenvironmental risk indicator, thus identifying priority localities for interventions in endemic urban areas.

METHODS: The study area was the municipality of Jaboatão dos Guararapes, State of Pernambuco, Brazil. The data sources were a parasitological survey and the 2000 demographic census. From these data, a socioenvironmental composite risk indicator was constructed using the 484 census tracts (CT) as the analysis units, based on the score-formation technique. Census tracts with higher indicator values presented higher risk of occurrences of filariasis.

RESULTS: Six thousand five hundred and seven households were surveyed and 23 673 individuals were examined, among whom 323 cases of microfilaremia were identified. The mean prevalence rate for the municipality was 1.4%. The indicator showed that 73% (237/323) of the cases of microfilaremia were in high-risk areas (third and fourth quartiles) with worse socioenvironmental conditions (RR = 4.86, CI = 3.09-7.73, P < 0.05).

CONCLUSIONS: The socioenvironmental composite risk indicator demonstrated sensitivity, since it was able to identify the localities with greater occurrence of infection. Because it can stratify spaces by using official and available data, it constitutes an important tool for use in the worldwide program for eliminating lymphatic filariasis.

Urban HIV/AIDS

24: *Cult Health Sex*. 2009 Jul 27:1.

'If you start thinking positively, you won't miss sex': narratives of sexual (in)activity among people living with HIV in Nairobi's informal settlements.

Undie CC, Ziraba AK, Madise N, Kebaso J, Kimani-Murage E.

African Population and Health Research Center, Nairobi, Kenya.

Drawing on qualitative data, this paper examines narratives of sexual activity (or the lack thereof) among people living with HIV in two urban poor contexts in Kenya and the ways in which these narratives intersect with the discourse of a ubiquitous HIV-prevention strategy - the 'ABC' (Abstinence, Be Faithful, Condom Use) approach. The exploration of these narratives gives insight into the ways that the notions and meanings around sexual activity are informed and re-shaped by the experience of living with HIV in urban poor settings and into the complex ways in which the components of the ABC approach feature in the lives of PLHIV in these contexts. As the sexuality of people living with HIV in sub-Saharan Africa is an under-researched area, this paper sheds light on the realities of living with HIV in urban poor settings and illuminates the context that informs constructions of sexuality in this milieu.

25: *BMC Public Health*. 2009 Aug 25; 9(1):310.

Effects of neighbourhood-level educational attainment on HIV prevalence among young women in Zambia.

Kayeyi N, Sandoy IF, Fylkesnes K.

BACKGROUND: Investigations of the association between socio-economic position indicators and HIV in East, Central and Southern Africa have chiefly focused on factors that pertain to individual-level characteristics. This study investigated the effect of neighbourhood educational attainment on HIV prevalence among young women in selected urban and rural areas in Zambia.

METHODS: This study re-analysed data from a cross-sectional population survey conducted in Zambia in 2003. The analyses were restricted to women aged 15-24 years (n=1295). Stratified random cluster sampling was used to select 10 urban and 10 rural clusters. A measure for neighbourhood-level educational attainment was constructed by aggregating individual-level years-in-school. Multi-level mixed effects regression models were run to examine the neighbourhood-level educational effect on HIV prevalence after adjusting for individual-level underlying variables (education, currently a student, marital status) and selected proximate determinants (ever given birth, sexual activity, lifetime sexual partners).

RESULTS: HIV prevalence among young women aged 15-24 years was 12.5% in the urban and 6.8% in the rural clusters. Neighbourhood educational attainment was found to be a strong determinant of HIV infection in both urban and rural population, i.e. HIV prevalence decreased substantially by increasing level of neighbourhood education. The likelihood of infection in low vs. high educational attainment of neighbourhoods was 3.4 times among rural women and 1.8 times higher among the urban women after adjusting for age and other individual-level underlying variables, including education. However, the association was not significant for urban young women after this adjustment. After adjusting for level of education in the neighbourhood, the effect of the individual-level education differed by residence, i.e. a strong protective effect among urban women whereas tending to be a risk factor among rural women.

CONCLUSION: The findings suggested structural effects on HIV prevalence. Future research should include more detailed mapping of neighbourhood factors of relevance to HIV transmission as part of the effort to better understand the causal mechanisms involved.