



Urban Health Bulletin: A Compendium of Resources

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The *Urban Health Bulletin* is a periodic update of USAID and non-USAID information on a range of urban health issues.

The dire nutritional status of the children of the urban poor is one of the most striking results of recent re-analysis of national health data in India. In this issue, I want to highlight a new article that highlights similar nutritional concerns among poor urban Indonesians.

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:

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Urban Health Analysis

Public Health. 2008 Jan 25

Malnutrition and morbidity among children not reached by the national vitamin A capsule programme in urban slum areas of Indonesia.

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OBJECTIVE: To determine whether vitamin A capsule programmes fail to reach children who are at higher risk of malnutrition and morbidity. Although it has been suggested that there are health disparities between children who are reached or not reached by these programmes, little quantitative work has been undertaken to characterize this relationship.

STUDY DESIGN: As part of a national surveillance system, nutritional status and other factors were compared in 138,956 children, aged 12-59 months, who had and had not received vitamin A supplementation in urban slum areas in Indonesia.

RESULTS: In total, 63.1% of children had received a vitamin A capsule within the previous 6 months. Among children who had and had not received vitamin A supplementation, respectively, the proportion with weight-for-age and height-for-age Z scores <-3 were 7.8% vs 8.6% (P<0.0001) and 9.4% vs 10.7% (P<0.0001), and with a history of diarrhoea in the previous week was 8.1% vs 10.7% (P<0.0001). In

families where a child had or had not received vitamin A supplementation, the proportion with a history of infant death <12 months was 5.2% vs 7.2% (P<0.0001) and child death <5 years was 6.7% vs 9.2%, respectively (P<0.0001). Children who had not received vitamin A supplementation were also significantly more likely to be anaemic and have diarrhoea or fever on the survey day compared with children who had received supplementation.

CONCLUSIONS: In the urban slums of Indonesia, children who do not receive vitamin A supplementation tend to be slightly more malnourished and ill, and are more likely to come from families with higher child mortality than children who receive vitamin A. Higher rates of child mortality in non-participating households suggest that reaching preschoolers could yield a disproportionate survival benefit. Importantly, children who are not reached by the vitamin A programme are also unlikely to be reached by vaccination and other services, emphasizing the need to identify and extend efforts to reach non-participants.

Diabetes Res Clin Pract. 2008 Jan 29

Urban rural differences in prevalence of self-reported diabetes in India-The WHO-ICMR Indian NCD risk factor surveillance.

Mohan V, Mathur P, Deepa R, Deepa M, Shukla DK, Menon GR, Anand K, Desai NG, Joshi PP, Mahanta J, Thankappan KR, Shah B.

Recent reports show strikingly high prevalence of diabetes among urban Asian Indians; however, there are very few studies comparing urban, peri-urban and rural prevalence rates of diabetes and their risk factors at the national level. This study is a part of the national non-communicable diseases (NCD) risk factor surveillance conducted in different geographical locations (North, South, East, West/Central) in India between April 2003 and March 2005. A total of 44,523 individuals (age: 15-64 years) inclusive of 15,239 from urban, 15,760 from peri-urban/slum and 13,524 from rural areas were recruited.

Major risk factors were studied using modified WHO STEPS approach. Diabetes was diagnosed based on self-reported diabetes diagnosed by a physician. The lowest prevalence of self-reported diabetes was recorded in rural (3.1%) followed by peri-urban/slum (3.2%) and the highest in urban areas (7.3%, odds ratio (OR) for urban areas: 2.48, 95% confidence interval (CI): 2.21-2.79, p<0.001). Urban residents with abdominal obesity and sedentary activity had the highest prevalence of self-reported diabetes (11.3%) while rural residents without abdominal obesity performing vigorous activity had the lowest prevalence (0.7%).

In conclusion, this nation-wide NCD risk factor surveillance study shows that the prevalence of self-reported diabetes is higher in urban, intermediate in peri-urban and lowest in rural areas. Urban residence, abdominal obesity and physical inactivity are the risk factors associated with diabetes in this study.

Science. 2008 Feb 8; 319(5864):761-4.

The urban transformation of the developing world.

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Sometime in the next 20 to 30 years, developing countries in Asia and Africa are likely to cross a historic threshold, joining Latin America in having a majority of urban residents. The urban demographic transformation is described here, with an emphasis on estimates and forecasts of urban population aggregates. To provide policy-makers with useful scientific guidance in the upcoming urban era, demographic researchers will need to refine their data sets to include spatial factors as well as urban vital rates and to make improvements to forecasting methods currently in use.

Int J Environ Health Res. 2008 Feb; 18(1):1-15.

Informal recycling and occupational health in Santo André, Brazil.

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The collection of recyclables is a widespread activity among urban poor, particularly in countries with large socio-economic disparities. The health of recyclers is at risk because of unsafe working conditions, socio-economic exclusion, and stigmatization. Our study focuses on health problems and occupational risks of informal recyclers (in Brazil known as catadores).

In 2005 we conducted an in-depth socio-economic survey of 48 informal waste collectors in Santo André, Brazil. Almost all workers reported body pain or soreness in the back, legs, shoulders, and arms. Injuries, particularly involving the hands, are frequent. Flu and bronchitis are common, and one recycler had contracted Hepatitis-B.

Policy makers at all government levels need to address the pressing health issues affecting large numbers of informal recyclers in Brazil and abroad. Recyclers need to be involved in the design of waste management policies, and the public must be educated about the important environmental service these people provide.

Urban Health Programming

Trials. 2008 Feb 10; 9(1):7

Cluster-randomised controlled trial of community mobilisation in Mumbai slums to improve care during pregnancy, delivery, postpartum and for the newborn.

Shah More N, Bapat U, Das S, Patil S, Porel M, Vaidya L, Koriya B, Barnett S, Costello A, Fernandez A, Osrin D.

BACKGROUND: The United Nations Millennium Development Goals look to substantial improvements in child and maternal survival. Morbidity and mortality during pregnancy, delivery and the postnatal period are prime obstacles to achieving these

goals. Given the increasing importance of urban health to global prospects, Mumbai's City Initiative for Newborn Health aims to improve maternal and neonatal health in vulnerable urban slum communities, through a combination of health service quality improvement and community participation. The protocol describes a trial of community intervention aimed at improving prevention, care seeking and outcomes.

OBJECTIVE: To test an intervention that supports local women as facilitators in mobilizing communities for better health care. Community women's groups will build an understanding of their potential to improve maternal and infant health, and develop and implement strategies to do so. ***DESIGN:*** Cluster-randomized controlled trial.

METHODS: The intervention will employ local community-based female facilitators to convene groups and help them to explore maternal and neonatal health issues. Groups will meet fortnightly through a seven-phase process of sharing experiences, discussion of the issues raised, discovery of potential community strengths, building of a vision for action, design and implementation of community strategies, and evaluation. The unit of allocation will be an urban slum cluster of 1000-1500 households. 48 clusters have been randomly selected after stratification by ward. 24 clusters have been randomly allocated to receive the community intervention. 24 clusters will act as control groups, but will benefit from health service quality improvement.

Indicators of effect will be measured through a surveillance system implemented by the project. Key distal outcome indicators will be neonatal mortality and maternal and neonatal morbidity. Key proximate outcome indicators will be home care practices, uptake of antenatal, delivery and postnatal care, and care for maternal and neonatal illness. Data will be collected through a vital registration system for births and deaths in the 48 study clusters. Structured interviews with families will be conducted at about 6 weeks after index deliveries. We will also collect both quantitative and qualitative data to support a process evaluation.

Science. 2008 Feb 8; 319(5864): 766-9.

Health and urban living.

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The majority of people now live in urban areas and will do so for the foreseeable future. As a force in the demographic and health transition, urbanization is associated with falling birth and death rates and with the shift in burden of illness from acute childhood infections to chronic, noncommunicable diseases of adults. Urban inhabitants enjoy better health on average than their rural counterparts, but the benefits are usually greater for the rich than for the poor, thus magnifying the differences between them. Subject to better evidence, I suggest that the main obstacles to improving urban health are not technical or even financial, but rather are related to governance and the organization of civil society.

Urban Environmental Health

J Water Health. 2008 Jun; 6(2):289-99.

Exploring intra-household factors for diarrhoeal diseases: a study in slums of Delhi, India.

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While infrastructure conditions constitute 'primary routes', contamination of water within households and other behavioural determinants are considered as 'secondary routes'. However, re-contaminated water has been considered not to constitute a serious risk though it occurs commonly in poorer societies. A study was conducted in Delhi where individual risk factors were located within a larger socio-economic, political and administrative framework, as they were often independent variables.

This component of the larger study hypothesised that behavioural factors at individual household levels lose significance as major determinants of diarrhoeal diseases once they are analysed in a holistic epidemiology frame. Determinants at the household level were explored through a dataset based on a primary survey of 300 households in three slum clusters.

Amongst households storing municipal water (proven to be safe at source), adhering to the best storage practices did not translate into lower incidence rates as compared to those with relatively unsafe practices. The explanation lay in factors which were external to the home and beyond the control of the affected household. Thus, household level behavioural factors such as storage practises should not be analysed in isolation as determinants of diarrhoeal illness particularly when pitted against stronger neighbourhood and external determinants.

Sci Total Environ. 2008 Feb 1

Use of human nails as bio-indicators of heavy metals environmental exposure among school age children in Kenya.

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Metal pollution and its health effects present a challenge currently facing the developing countries. Metal poisoning is usually difficult and expensive to assess or screen in these countries due to limited resources, which means that policies, guidelines, regulations and institutional managements are limited. Hair and nail as biopsy materials were suggested as more attractive biomarkers in assessing heavy metals environmental exposure.

This paper deals with quantitative determination of lead (Pb), cadmium (Cd), calcium (Ca), zinc (Zn), and iron (Fe) in fingernails of children (n=200) in urban and rural areas using atomic absorption spectrometry. Factors that were suspected to influence the accumulation of Pb and Cd in children were obtained through a questionnaire. The mean levels of heavy metals in children in urban areas were found to be higher (27.5+/-1.8 mug/g Pb and 0.73+/-0.08 mug/g Cd) than in rural

areas (19.7±0.9 µg/g Pb and 0.44±0.06 µg/g Cd). The difference was significant (P<0.05; DF=168, t-test). Other factors that were found to have significant influence were socio-economic background, health conditions, dietary habits and environmental risk exposure.

The results also showed that the school location has more influence on the heavy metals level than the area of residence. The children in a school near the highway were found to have a mean of 34.4±3.5 µg/g Pb as compared to those who lived near the highway (31.6±2.8 µg/g Pb), however the difference was not significant (P>0.05), suggesting a common source of contaminants in the areas. The correlation results also indicated that a high level of Pb in the nail influenced negatively Zn and Fe but not Ca levels (R=-0.256 Zn; -0.188 Fe) while high levels of Cd had a negative relationship with Fe only (R=-0.241). The association of toxic metals in the nails of children with environmental exposure, and nutritional status implies that policies and actions to reduce heavy metal levels must be implemented and reinforced to address the health issues affecting children and by extension the general public in this country.

Environ Monit Assess. 2008 Feb 15

Diurnal, seasonal and weekdays-weekends variations of ground level ozone concentrations in an urban area in greater Cairo.

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Ground level ozone (O₃) concentration was monitored during the period of December 2004 to November 2005 in an urban area in Greater Cairo (Haram, Giza). During the winter and summer seasons, nitrogen dioxide (NO₂) and nitric oxide (NO) concentrations and meteorological parameters were also measured. The mean values of O₃ were 43.89, 65.30, 91.30 and 58.10 ppb in daytime and 29.69, 47.80, 64.00 and 42.70 ppb in whole day (daily) during the winter, spring, summer and autumn seasons, respectively.

The diurnal cycles of O₃ concentrations during the four seasons revealed a uni-modal peak in the mid-day time, with highest O₃ levels in summer due to the local photochemical production. The diurnal variations in NO and NO₂ concentrations during the winter and summer showed two daily peaks linked to traffic density. The highest levels of NO_x were found in winter. Nearly, 75%, 100%, 34.78% and 52.63% of the mean daytime concentrations of O₃ during spring, summer, autumn and the whole year, respectively, exceeded the Egyptian and European Union air quality standards (60 ppb) for daytime (8-h) O₃ concentration. About, 41.14% and 10.39% of the daytime hours concentrations and 14.93% and 3.77% of the daily hour concentrations in summer and the whole year, respectively, exceeded the Egyptian standard (100 ppb) for maximum hourly O₃ concentration, and photochemical smog is formed in the study area (Haram) during a periods represented by the same percentages.

This was based on the fact that photochemical smog usually occurs when O₃ concentration exceeds 100 ppb. The concentrations of O₃ precursors (NO and NO₂) in weekends were lower than those found in weekdays, whereas the O₃ levels during the weekends were high compared with weekdays. This finding phenomenon is known as the "weekend effect". Significant positive correlation

coefficients were found between O(3) and temperature in both seasons and between O(3) and relative humidity in summer season, indicating that high temperature and high relative humidity besides the intense solar radiation (in summer) are responsible for the formation of high O(3) concentrations.

Urban Vector Disease

J Vector Ecol. 2007 Dec; 32(2):319-27.

The association between distance to water pipes and water bodies positive for anopheline mosquitoes (Diptera: Culicidae) in the urban community of Malindi, Kenya.

Impoinvil DE, Keating J, Chowdhury RR, Duncan R, Cardenas G, Ahmad S, Mbogo CM, Githure JI, Beier JC.

The increasing risk of mosquito-borne diseases in African urban environments has been partly attributed to failed planning and resource underdevelopment. Though engineered systems may reduce mosquito proliferation, there are few studies describing this relationship.

This study investigates how engineered systems such as roads and piped water systems affect the odds of anopheline immatures (i.e., larvae and pupae) occurring in water bodies located in Malindi, Kenya. *Anopheles gambiae* s.s. (Giles), *An. arabiensis* (Patton), and *An. merus* (Dointz) were identified in urban Malindi, with *Anopheles gambiae* s.s. being the predominant species identified. The Breslow-Day test was used to explore interactions among independent variables. Logistic regression was used to test whether water bodies positive for anopheline immatures are associated with engineered systems, while controlling for potential confounding and interaction effects associated with urban water body characteristics.

Water bodies more than 100 m from water pipes were 13 times more likely to have anopheline immatures present, compared to water bodies that were less than 100 m from water pipes (OR = 13.54, 95% CI: 3.15-58.23). Roads were not significantly associated with water bodies positive for anopheline immatures. Statistical interaction was detected between water body substrate type and distance to water pipes. This study provides insight into how water pipes influence the distribution of water bodies positive with immature anophelines in urban environments.

Sci Total Environ. 2008 Feb 7

Spatial correlation of incidence of dengue with socioeconomic, demographic and environmental variables in a Brazilian city.

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Dengue is endemic in most tropical countries. The reasons for its maintenance are related to several risk factors including socioeconomic factors. Urban space and time are also two important dimensions to describe the dynamics of an outbreak. The aim of this study was to evaluate the existence of a spatial correlation of the incidence of dengue and to identify variables that explain the spatial dependence in a medium-

sized city of Brazil. We analyzed registered autochthonous dengue cases from September 1994 to August 2002 correlating them with socioeconomic, demographic and environmental variables using the Moran index. Our results indicate spatial dependence of the incidence of dengue and that socioeconomic factors were critical both at the beginning of the study and later on; other variables related to the organization of urban space were also involved in the occurrence of the disease. The use of spatial analysis tools is important to identify critical control areas with several variables intimately related to the modulation of the disease dynamics.

Malar J. 2008 Jan 25; 7(1):20

A tool box for operational mosquito larval control: preliminary results and early lessons from the Urban Malaria Control Programme in Dar es Salaam, Tanzania.

Fillinger U, Kannady K, William G, Vanek MJ, Dongus S, Nyika D, Geissbuehler Y, Chaki PP, Govella NJ, Mathenge EM, Singer BH, Mshinda H, Lindsay SW, Tanner M, Mtsiwa D, de Castro MC, Killeen GF.

BACKGROUND: As the population of Africa rapidly urbanizes, large populations could be protected from malaria by controlling aquatic stages of mosquitoes if cost-effective and scalable implementation systems can be designed.

METHODS: A recently initiated Urban Malaria Control Programme in Dar es Salaam delegates responsibility for routine mosquito control and surveillance to modestly-paid community members, known as Community-Owned Resource Persons (CORPs). New vector surveillance, larviciding and management systems were designed and evaluated in 15 city wards to allow timely collection, interpretation and reaction to entomologic monitoring data using practical procedures that rely on minimal technology. After one year of baseline data collection, operational larviciding with *Bacillus thuringiensis* var. *israelensis* commenced in March 2006 in three selected wards.

RESULTS: The procedures and staff management systems described greatly improved standards of larval surveillance relative to that reported at the outset of this programme. In the first year of the programme, over 65,000 potential *Anopheles* habitats were surveyed by 90 CORPs on a weekly basis. Reaction times to vector surveillance at observations were one day, week and month at ward, municipal and city levels, respectively. One year of community-based larviciding reduced transmission by the primary malaria vector, *Anopheles gambiae* s.l., by 31% (95% C.I. = 21.6-37.6%; $p=0.04$).

CONCLUSION: This novel management, monitoring and evaluation system for implementing routine larviciding of malaria vectors in African cities has shown considerable potential for sustained, rapidly responsive, data-driven and affordable application. Nevertheless, the true programmatic value of larviciding in urban Africa can only be established through longer-term programmes which are stably financed and allow the operational teams and management infrastructures to mature by learning from experience.

Pediatr Infect Dis J. 2008 Feb; 27(2): 130-135.

Life-Threatening Malaria in African Children: A Prospective Study in a Mesoendemic Urban Setting.

Ranque S, Poudiougou B, Traoré A, Keita M, Oumar AA, Safeukui I, Marquet S, Cabantous S, Diakitè M, Mintha D, Cissé MB, Keita MM, Dessein AJ, Doumbo OK.

BACKGROUND: The population exposed to malaria within African cities has steadily increased. However, comprehensive data on life-threatening malaria features and risk factors in children from urban areas with seasonal malaria transmission, such as in Bamako (Mali), are lacking.

METHODS: Children admitted to the Gabriel Touré Hospital in Bamako with severe malarial anemia (SMA) and/or cerebral malaria (CM) were prospectively included in the study. Indicators of either SMA or CM were analyzed using logistic regression; and death hazard ratios (HRs) were estimated through survival analysis.

RESULTS: The study included 455 children: 66% presented with CM, 34% with SMA, 3% with hypoglycemia (HG); 5% with dehydration; 17% with respiratory distress (RD); 25% with splenomegaly; and 92% with hepatomegaly. The children with CM were older than those with SMA. CM was more often associated with dehydration, HG, and RD, whereas SMA was more often associated with splenomegaly. The overall case fatality rate was 16%, and 94% of the children who died had CM. HG [HR: 2.37; 95% confidence interval (CI): 1.04-5.39; P = 0.040], RD (HR: 4.23; 95% CI: 2.46-7.30; P < 10) and a deep coma with a Blantyre score of less than 3 (HR: 6.78, 95% CI: 2.43-18.91; P < 10), were all independent predictors of death.

CONCLUSIONS: These findings delineate the patterns of severe malaria in children in a West African mesoendemic urban setting. They validate practicable prognostic indicators of life-threatening malaria for use in the limited facilities available in African health centers and provide a frame of reference for further research addressing life-threatening malaria in this setting.

HIV/AIDS among the Urban Poor

Cost Eff Resour Alloc. 2008 Jan 23; 6(1):2

Integrating tuberculosis and HIV services for people living with HIV: costs of the Zambian ProTEST Initiative.

Terris-Prestholt F, Kumaranayake L, Ginwalla R, Ayles H, Kayawe I, Hillery M, Godfrey-Faussett P.

BACKGROUND: In the face of the dual TB/HIV epidemic, the ProTEST Initiative was one of the first to demonstrate the feasibility of providing collaborative TB/HIV care for people living with HIV (PLWH) in poor settings. The ProTEST Initiative facilitated collaboration between service providers. Voluntary counselling and testing (VCT) acted as the entry point for services including TB screening and preventive therapy, clinical treatment for HIV-related disease, and home-based care (HBC), and a hospice. This paper estimates the costs of the ProTEST Initiative in two sites in urban Zambia, prior to the introduction of anti-retroviral therapy.

METHODS: Annual financial and economic providers' costs and output measures were collected in 2000-2001. Estimates are made of total costs for each component and average costs per: person reached by ProTEST; person pre-test counselled for VCT, person tested and completed VCT; person started and completed isoniazid preventive therapy; clinic visit; HBC patient; and hospice admission and bednight.

RESULTS: Annual core ProTEST costs were (in 2007 US dollars) \$84,213 in Chawama and \$31,053 in Matero. The cost of coordination was 4%-5% of total site costs (\$1-\$6 per person reached). The largest cost component in Chawama was voluntary counseling and testing (56%) and the clinic in Matero (50%), where VCT clients had higher HIV-prevalences and more advanced HIV. Average costs were lower for all components in the larger site. The cost per HBC patient was \$149, and per hospice bednight was \$24.

CONCLUSIONS: This study shows that coordinating an integrated and comprehensive package of services for PLWH is relatively inexpensive. The lessons learnt in this study are still applicable today in the era of ART, as these services must still be provided as part of the continuum of care for people living with HIV.

AIDS Behav. 2007 Dec 27

New Populations at High Risk of HIV/STIs in Low-income, Urban Coastal Peru.

Cáceres CF, Konda KA, Salazar X, Leon SR, Klausner JD, Lescano AG, Maiorana A, Kegeles S, Jones FR, Coates TJ; The NIMH HIV/STD Collaborative Intervention Trial.

The HIV epidemic in Peru is concentrated primarily among men who have sex with men. HIV interventions have focused exclusively on a narrowly defined group of MSM and FSW to the exclusion of other populations potentially at increased risk. Interventions targeting MSM and FSW are insufficient and there is evidence that focusing prevention efforts solely on these populations may ignore others that do not fall directly into these categories. This paper describes non-traditional, vulnerable populations within low-income neighborhoods. These populations were identified through the use of ethnographic and epidemiologic formative research methods and the results are reported in this publication. Although the traditional vulnerable groups are still in need of prevention efforts, this study provides evidence of previously unrecognized populations at increased risk that should also receive attention from HIV/STI prevention programs.

AIDS Care. 2008 Feb; 20(2): 146-9.

Reasons for unsatisfactory acceptance of antiretroviral treatment in the urban Kibera slum, Kenya.

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The aim of this study was to explore why patients in the urban Kibera slum, Nairobi, Kenya, offered free antiretroviral treatment (ART) at the Medecins Sans Frontiers (MSF) clinic, choose not to be treated despite signs of AIDS. Qualitative semi-structured interviews were conducted with 26 patients, 9 men and 17 women. Six main reasons emerged for not accepting ART: a) fear of taking medication on an

empty stomach due to lack of food; b) fear that side-effects associated with ART would make one more ill; c) fear of disclosure and its possible negative repercussions; d) concern for continuity of treatment and care; e) conflicting information from religious leaders and community, and seeking alternative care (e.g. traditional medicine); f) illiteracy making patients unable to understand the information given by health workers.