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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.

In this issue, we highlight 13 abstracts of recently published journal articles covering a diverse set of issues. In the spirit of the **International Year of Sanitation**, I would draw your attention to the interesting series of abstracts related to Urban Environmental Health. Links to the full-text and/or author email addresses are included if available.

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

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Urban Health Analysis

Indian J Med Sci. 2007 Nov; 61(11):598-606.

A study on determinants of immunization coverage among 12-23 months old children in urban slums of Lucknow district, India.

Nath B, Singh JV, Awasthi S, Bhushan V, Kumar V, Singh SK.

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Context: To find out the suitable factors for raising the coverage of immunization. **Aims:** To determine the coverage and to identify the various factors of primary immunization. **Settings and Design:** Urban slums of Lucknow district. **Methods and Material:** WHO 30-cluster sampling technique was used for the selection of the subjects. Mother, father or relative of a total of 510 children with 17 children per cluster were interviewed in the study. **Statistical Analysis:** Chi-square test, binary logistic regression and multinomial logistic regression analysis were done to test the statistical significance of the association. **Results:** About 44% of the children studied were fully immunized. Multinomial logistic regression analysis revealed that an illiterate mother (OR=4.0), Muslim religion (OR=2.5), scheduled caste or tribes (OR=2.3) and higher birth order (OR approximately 2) were significant independent

predictors of the partial immunized status of the child; while those associated with the unimmunized status of the child were low socioeconomic status (OR=10.8), Muslim religion (OR=4.3), higher birth order (OR=4.3), home delivery (OR=3.6) and belonging to a joint family (OR=2.1). **Conclusions:** The status of complete immunization is about half of what was proposed to be achieved under the Universal Immunization Program. This emphasizes the imperative need for urgent intervention to address the issues of both dropout and lack of access, which are mainly responsible for partial immunization and nonimmunization respectively.

Neuro Endocrinol Lett. 2007 Nov 20;28(Suppl3):40-41

Point prevalence study of the spectrum of infectious diseases and antimicrobial drug use in homogenous slum population of Mukuru in Nairobi.

Svabova V, Krumpolcova M, Bartkovjak M, Kutna K, Pivarník Z, Njambi S, Kamoche S, Svitkova A, Kandrava K, Kolenova A, Kiwou M, Kisac P, Krcmery Jr V.

University of Trnava, Mary Immaculate clinic and St. Elisabeth University College, Slovakia.

We performed a prospective point prevalence study with a simple prospective protocol and analyzed spectrum of infections (ID) etiology and antimicrobial therapy in all cases coming for one month (June 2006). Respiratory tract infections represented 33% of all visits followed by diarrheal infections (197 cases) and sexually transmitted disease (86), skin and soft tissue infection (68), AIDS (40) and malaria (26) cases. Majority of isolates were *St. aureus* (only 3 MRSA), *C. albicans* and NAC (19), (only 2 Fluconazol resistant) and *S. pneumoniae* (8) (2 penicillin resistant).

Healthc Q. 2007; 10(4): 133-8.

The use of audit to identify maternal mortality in different settings: is it just a difference between the rich and the poor?

van Dillen J, Stekelenburg J, Schutte J, Walraven G, van Roosmalen J.

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OBJECTIVE: To illustrate how maternal mortality audit identifies different causes of and contributing factors to maternal deaths in different settings in low- and high-income countries and how this can lead to local solutions in reducing maternal deaths. **DESIGN:** Descriptive study of maternal mortality from different settings and review of data on the history of reducing maternal mortality in what are now high-income countries. **SETTINGS:** Kalabo district in Zambia, Farafenni division in The Gambia, Onandjokwe district in Namibia, and the Netherlands. **POPULATION:** Population of rural areas in Zambia and The Gambia, peri-urban population in Namibia and nationwide data from The Netherlands. **METHODS:** Data from facility-based maternal mortality audits from three African hospitals and data from the latest confidential enquiry in The Netherlands. **MAIN OUTCOME MEASURES:** Maternal mortality ratio (MMR), causes (direct and indirect) and characteristics. **RESULTS:** MMR ranged from 10 per 100,000 (the Netherlands) to 1540 per 100,000 (The Gambia). Differences in causes of deaths were characterized

by HIV/AIDS in Namibia, sepsis and HIV/AIDS in Zambia, (pre-)eclampsia in the Netherlands and obstructed labour in The Gambia. **CONCLUSION:** Differences in maternal mortality are more than just differences between the rich and poor. Acknowledging the magnitude of maternal mortality and harnessing a strong political will to tackle the issues are important factors. However, there is no single, general solution to reduce maternal mortality, and identification of problems needs to be promoted through audit, both national and local.

Urban Health Programming

Health Policy Plan. 2007 Nov; 22(6): 381-92.

The role of community-based organizations in household ability to pay for health care in Kilifi District, Kenya.

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There is growing concern that health policies and programmes may be contributing to disparities in health and wealth between and within households in low-income settings. However, there is disagreement concerning which combination of health and non-health sector interventions might best protect the poor. Potentially promising interventions include those that build on the social resources that have been found to be particularly critical for the poor in preventing and coping with illness costs. In this paper we present data on the role of one form of social resource-community-based organizations (CBOs)-in household ability to pay for health care on the Kenyan coast. Data were gathered from a rural and an urban setting using individual interviews (n = 24), focus group discussions (n = 18 in each setting) and cross-sectional surveys (n = 294 rural and n = 576 urban households). We describe the complex hierarchy of CBOs operating at the strategic, intermediate and local level in both settings, and comment on the potential of working through these organizations to reach and protect the poor. We highlight the challenges around several interventions that are of particular international interest at present: community-based health insurance schemes; micro-finance initiatives; and the removal of primary care user fees. We argue the importance of identifying and building upon organizations with a strong trust base in efforts to assist households to meet treatment costs, and emphasize the necessity of reducing the costs of services themselves for the poorest households.

Ann N Y Acad Sci. 2007 Oct 22

Improving the Health and Lives of People Living in Slums.

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Urban poverty, ill health, and living in slums are intrinsically interwoven. Poverty is multidimensional and there is no agreement on a universal definition. UN-HABITAT has introduced an operational definition of slums, which is restricted to legal aspects and excludes the more difficult social dimensions. The WHO definition is more comprehensive and uses a health and social determinants approach that is strongly

based on the social conditions in which people live and work. Health and improving the lives of people living in slums is at the top of international development agenda. Proactive strategies to contain new urban populations and slum upgrading are the two key approaches. Regarding the latter, participatory upgrading which most often involves the provision of basic infrastructure is currently the most acceptable intervention in developing countries. In the context of urbanization of poverty, participatory slum upgrading is necessary but not sufficient condition to reduce poverty and improve the lives of slum dwellers. Empowering interventions that target capacity development and skills transfer of both individuals and community groups, as well as meaningful negotiations with institutions, such as municipal governments, which can affect slum dwellers' lives, seem to be the most promising strategies to improve the slum dwellers' asset bases and health. NGOs, training institutions and international development partners are best placed to facilitate horizontal relationships between individuals, community groups, and vertical relationships with more powerful institutions that affect the slum dwellers lives. The main challenge appears to be lack of commitment from the key stakeholders to upgrade interventions citywide.

Urban Environmental Health

Lancet. 2007 Nov 10; 370(9599): 1622-8.

Effect of city-wide sanitation programme on reduction in rate of childhood diarrhoea in northeast Brazil: assessment by two cohort studies.

Barreto ML, Genser B, Strina A, Teixeira MG, Assis AM, Rego RF, Teles CA, Prado MS, Matos SM, Santos DN, dos Santos LA, Cairncross S.

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BACKGROUND: A city-wide sanitation intervention was started in Salvador, Brazil, in 1997 to improve sewerage coverage from 26% of households to 80%. Our aim was to investigate the epidemiological effect of this city-wide sanitation programme on diarrhoea morbidity in children less than 3 years of age. **METHODS:** The investigation was composed of two longitudinal studies done in 1997-98 before the intervention (the sanitation programme) and in 2003-04 after the intervention had been completed. Each study consisted of a cohort of children (841 in the preintervention study and 1007 in the postintervention study; age 0-36 months at baseline) who were followed up for a maximum of 8 months. Children were sampled from 24 sentinel areas that were randomly chosen to represent the range of environmental conditions in the study site. At the start of each study an individual or household questionnaire was applied by trained fieldworkers; an environmental survey was done in each area before and after introduction of the sanitation programme to assess basic neighbourhood and household sanitation conditions. Daily diarrhoea data were obtained during home visits twice per week. The effect of the intervention was estimated by a hierarchical modelling approach fitting a sequence of multivariate regression models. **FINDINGS:** Diarrhoea prevalence fell by 21% (95% CI 18-25%)-from 9.2 (9.0-9.5) days per child-year before the intervention to 7.3 (7.0-7.5) days per child-year afterwards. After adjustment for baseline sewerage coverage and potential confounding variables, we estimated an overall prevalence reduction of 22% (19-26%). **INTERPRETATION:** Our results

show that urban sanitation is a highly effective health measure that can no longer be ignored, and they provide a timely support for the launch of 2008 as the International Year of Sanitation.

Am J Trop Med Hyg. 2007 Oct; 77(4): 699-704.

Fecal contamination of drinking water within peri-urban households, Lima, Peru.

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We assessed fecal contamination of drinking water in households in 2 peri-urban communities of Lima, Peru. We measured *Escherichia coli* counts in municipal source water and, within households, water from principal storage containers, stored boiled drinking water, and water in a serving cup. Source water was microbiologically clean, but 26 (28%) of 93 samples of water stored for cooking had fecal contamination. Twenty-seven (30%) of 91 stored boiled drinking water samples grew *E. coli*. Boiled water was more frequently contaminated when served in a drinking cup than when stored ($P < 0.01$). Post-source contamination increased successively through the steps of usage from source water to the point of consumption. Boiling failed to ensure safe drinking water at the point of consumption because of easily contaminated containers and poor domestic hygiene. Hygiene education, better point-of-use treatment and storage options, and in-house water connections are urgently needed.

Trop Med Int Health. 2007 Dec; 12 Suppl 2: 82-90.

Helminth infections among people using wastewater and human excreta in peri-urban agriculture and aquaculture in Hanoi, Vietnam.

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OBJECTIVE: To assess the prevalence of helminth infections and their associated risks in a community using both wastewater and human excreta in agriculture and aquaculture. **METHODS:** A cross-sectional study was conducted in a peri-urban area in Hanoi, Vietnam. Data on the demography, socioeconomics and sanitation were collected from a survey of 400 agricultural households. Parasitological examination for the eggs of *Ascaris* sp., *Trichuris* sp. and hookworm was performed on single stool specimens obtained from study household members' 15-70 years and 0-72 months of age. **RESULTS:** Of 807 stool samples collected from 620 adults and 187 children, 39% were infected with helminths. The prevalence of infections with *Ascaris* sp., *Trichuris* sp. and hookworm was 21.6%, 9.8% and 21.8%, respectively. Univariate and multivariate analyses showed that being an adult, female gender, living in a household without a latrine, excreta composted for less than 1 month and use of fresh human excreta were significantly associated with co-infection with all three helminths. Being an adult was an independent determinant for infections with individual helminths. The absence of a latrine and use of stored urine for irrigation were associated with an increased risk of *Ascaris* infection. Risk factors for *Trichuris*

infection were inadequately composted excreta and year-round wastewater contact; risk factors for hookworm infection were female gender, household without a latrine and use of fresh human excreta. **CONCLUSION:** Wastewater exposure did not pose a major risk for helminth infection in this community. Instead, lack of sanitation facilities and use of fresh or inadequately composted human excreta in agriculture were important risk factors.

S Afr Med J. 2007 Aug; 97(8 Pt 2): 782-90.

Estimating the burden of disease attributable to urban outdoor air pollution in South Africa in 2000.

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OBJECTIVES: To quantify the mortality burden attributed to urban outdoor air pollution in South Africa in 2000. **DESIGN:** The study followed comparative risk assessment (CRA) methodology developed by the World Health Organization (WHO). In most urban areas, annual mean concentrations of particulate matter (PM) with diameters less than 10 microm (PM₁₀) from monitoring network data and PM with diameters less than 2.5 microm (PM_{2.5}) derived using a ratio method were weighted according to population size. PM₁₀ and PM_{2.5} data from air-quality assessment studies in areas not covered by the network were also included. Population-attributable fractions calculated using risk coefficients presented in the WHO study were weighted by the proportion of the total population (33%) in urban environments, and applied to revised estimates of deaths and years of life lost (YLLs) for South Africa in 2000. **SETTING:** South Africa. **SUBJECTS:** Children under 5 years and adults 30 years and older. **OUTCOME MEASURES:** Mortality and YLLs from lung cancer and cardiopulmonary disease in adults (30 years and older), and from acute respiratory infections (ARIs) in children aged 0 - 4 years. **RESULTS:** Outdoor air pollution in urban areas in South Africa was estimated to cause 3.7% of the national mortality from cardiopulmonary disease and 5.1% of mortality attributable to cancers of the trachea, bronchus and lung in adults aged 30 years and older, and 1.1% of mortality from ARIs in children under 5 years of age. This amounts to 4,637 or 0.9% (95% uncertainty interval 0.3 - 1.5%) of all deaths and about 42,000 YLLs, or 0.4% (95% uncertainty interval 0.1 - 0.7%) of all YLLs in persons in South Africa in 2000. **CONCLUSION:** Urban air pollution has under-recognised public health impacts in South Africa. Fossil fuel combustion emissions and traffic-related air pollution remain key targets for public health in South Africa.

Cad Saude Publica. 2007; 23 Suppl 4: S643-9.

Household solid waste bagging and collection and their health implications for children living in outlying urban settlements in Salvador, Bahia State, Brazil. [Article in Portuguese]

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This paper presents a study on the bagging and collection of household solid waste and the health implications for children. The research was conducted in nine human settlements on the outskirts of Salvador, Bahia State, Brazil.

Intestinal nematode infection, predominantly involving *Ascaris lumbricoides*, *Trichuris trichiura*, and hookworms, was used as an epidemiological indicator in 1,893 children from 5 to 14 years of age. The study also included diarrhea incidence and nutritional status as shown by anthropometric indicators in 1,204 children less than 5 years of age. There was a higher prevalence of the three nematodes in children living in households without proper bagging/isolation and collection of household solid waste as compared to those in areas with regular garbage collection and adequate isolation of solid waste. The differences were statistically significant when other socioeconomic, cultural, demographic, and environmental risks factors were considered in the analysis. Similar results were also observed for epidemiological indicators, diarrhea incidence, and nutritional status.

Urban Vector Disease

Acta Trop. 2008 Jan; 105(1):81-6.

Marked differences in the prevalence of chloroquine resistance between urban and rural communities in Burkina Faso.

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BACKGROUND: Chloroquine (CQ) resistance has reached high levels in Africa in recent years. Little is known about variations of resistance between urban and rural areas. **OBJECTIVES:** To compare the rates of in vivo resistance to CQ and the prevalences of the main molecular marker for CQ resistance among young children from urban and rural areas in Burkina Faso. **METHODS:** The current analysis used the frame of a randomized controlled trial (ISRCTN27290841) on the combination CQ-methylene blue (MB) (n=177) compared to CQ alone (n=45) in young children with uncomplicated malaria. We examined clinical and parasitological failure rates as well as the prevalence of the *Plasmodium falciparum* chloroquine resistance transporter gene (*pfcr*) T76 mutation. **RESULTS:** Clinical and parasitological failure rates of CQ-MB differed significantly between urban (70%) and rural areas (29%, $p < 0.0001$). Likewise, CQ failure rates were higher in the urban setting. Matching this pattern, *pfcr* T76 was more frequently seen among parasite strains from urban areas (81%) when compared to rural ones (64%, $p = 0.01$). In the presence of parasites exhibiting *pfcr* T76, the odds of overall clinical failure were increased to 2.6-fold ([1.33, 5.16], $p(\text{LR}) = 0.005$). CQ was detected at baseline in 21% and 2% of children from the urban and the rural study area, respectively ($p(\text{Chi}) = 0.002$). **CONCLUSION:** Even within circumscribed geographical areas, CQ efficacy can vary dramatically. The differences in the prevalence of *pfcr* T76 and in CQ failure rates are probably explained by a higher drug pressure in the urban area compared to the rural study area. This finding has important implications for national malaria policies.

HIV/AIDS among the Urban Poor

J Health Popul Nutr. 2007 Jun;25(2):146-57.

HIV risk perception and constraints to protective behaviour among young slum dwellers in Ibadan, Nigeria.

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This study examined the relationship between HIV/AIDS risk perception and protective behaviour among sexually-active urban young slum dwellers in Ibadan, Nigeria. The multistage sampling techniques were used for selecting 1,600 respondents aged 15-24 years. Of these, 1,042 (65%) respondents who reported unprotected sex in the last three months were selected for analysis. Although the sexually-active respondents demonstrated basic knowledge of HIV/AIDS and high risk perception, risky behaviour was common and protective behaviour was poor. About 48% of 505 males and 12% of 537 females had multiple partners. Similarly, 29% of males and 38% of females were engaged in transactional sex. Only 14% of males and 5% of females used any form of protection, resulting in the high rates of sexually transmitted infections reported by 27% of males and 10% of females. Structural and environmental constraints were identified as barriers to adopting protective behaviour. Therefore, programme and policy interventions should be designed to address the peculiar circumstances of urban young slum dwellers to curtail the HIV epidemic.

Mem Inst Oswaldo Cruz. 2007 Nov 6

Autochthonous horizontal transmission of a CRF02_AG strain revealed by a human immunodeficiency virus type 1 diversity survey in a small city in inner state of Rio de Janeiro, Southeast Brazil.

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As part of an ongoing study on the features of AIDS spread towards small cities and rural areas, we present a molecular survey of human immunodeficiency virus type 1 (HIV-1) polymerase sequences recovered between 2004 and 2006 from 71 patients receiving care in the city of Saquarema, inner state of Rio de Janeiro. Phylogenetic reconstructions found the two prevalent lineages in the state (subtypes B [59 strains, 83.1%], F1 [6 strains; 8.4%], and BF1 recombinants [four strains; 5.6%]), as well as two (2.8%) CRF02_AG strains, which seems to be an emerging lineage in the capital. These CRF02_AG sequences were recovered from a married heterosexual couple who never traveled abroad, thus providing the first molecular evidence of autochthonous horizontal transmission of this lineage of major global importance. Also, three phylogenetic clusters of strains recovered from a total of 18.3% of the cohort were uncovered. Their close genetic relatedness suggests they were recovered from patients who probably took part in the same chain of viral spread. In conjunction with our previous surveys from

inner Rio de Janeiro, these results suggest that although small cities harbor unique molecular features of HIV-1 infection, they also clearly reflect and may rapidly absorb the diversity recorded in large urban centers.