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Urban Health Bulletin: A Compendium of Resources

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Introduction

Given Indonesia's falling child mortality but persistently high **maternal mortality**, USAID is shifting its health assistance there to focus more strongly on the health of pregnant women. As such, I noted with interest our first abstract's finding that pregnancy-related illness and mortality was found to be **much higher in urban than rural areas**. Is this because women with complications seek treatment in urban centers? A number of interesting articles on the analysis of this and other urban health questions are included in this issue. Dig in!

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

BJOG. 2009 Jan: 116(1):82-90.

Estimation of population-based incidence of pregnancy-related illness and mortality (PRIAM) in two districts in West Java, Indonesia.

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OBJECTIVE: We introduce a new and untested approach for the measurement of life-threatening maternal morbidity in populations where not all women give birth in a health facility. By defining complications at the very extreme end of the severity spectrum, we postulate that its count in hospitals can be used to represent the incidence in the general population.

DESIGN: We counted all cases of life-threatening obstetric morbidity in hospitals and all maternal deaths in the population. Using these data, we describe the incidence of life-threatening morbidity in the total population, examine its variation across geographical areas and investigate its relationship with maternal mortality.

SETTING: Serang and Pandeglang district in West Java, Indonesia.

POPULATION OR SAMPLE: All women residing in the two districts.

METHODS: Cross-sectional study of maternal morbidity and mortality.

MAIN OUTCOME MEASURES: Pregnancy-related illness and mortality (PRIAM), consisting of life-threatening maternal morbidity (defined using the concepts of near miss and met need for life-saving surgery) and maternal mortality.

RESULTS: The incidence of maternal mortality and life-threatening complications at the population level was 421 and 1416 per 100,000 births, respectively, resulting in an overall ratio of PRIAM of 1837 per 100,000. The overall **incidence of PRIAM was much lower in rural than in urban areas (1529 and 2880 per 100,000, respectively, P < 0.001)**, and it was lowest in rural Serang (1304 per 100,000).

CONCLUSIONS: The approach tested in this study--relying on conditions that are 'absolutely' life-threatening such that their count in hospitals can be used to represent the incidence in the general population--is promising but needs further testing in populations with varied disease epidemiology and access to care. Continued investments in hospital-based audits of life-threatening morbidity may ultimately improve the quality and reliability of information on obstetric complications and facilitate the development of rigorous and standard criteria for the definition of life-threatening morbidity.

Health Place. 2009 Mar; 15(1):107-16.

Urban health in developing countries: what do we know and where do we go?

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The world became mainly urban in 2007. It is thus timely to review the state of knowledge about urban health and the current priorities for research and action. This article considers both health determinants and outcomes in low-income urban areas of developing countries. The need to study urban health in a multi-level and multi-sectoral way is highlighted and priorities for research are identified. Interventions such as the Healthy Cities project are considered and obstacles to the effective implementation of urban health programmes are discussed. Concepts such as the double burden of ill health and the urban penalty are re-visited. Finally, a call for a shift from 'vulnerability' to 'resilience' is presented.

Trop Med Int Health. 2009 Jan; 14(1):70-8.

Feasibility of satellite image-based sampling for a health survey among urban townships of Lusaka, Zambia.

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OBJECTIVES: To describe our experience using satellite image-based sampling to conduct a health survey of children in an urban area of Lusaka, Zambia, as an approach to sampling when the population is poorly characterized by existing census data or maps.

METHODS: Using a publicly available Quickbird image of several townships, we created digital records of structures within the residential urban study area using ArcGIS 9.2. Boundaries were drawn to create geographic subdivisions based on natural and man-made barriers (e.g. roads). Survey teams of biomedical research students and local community health workers followed a standard protocol to enroll children within the selected structure, or to move to the neighbouring structure if the selected structure was ineligible or refused enrollment. Spatial clustering was assessed using the K-difference function.

RESULTS: Digital records of 16 105 structures within the study area were created. Of the 750 randomly selected structures, six (1%) were not found by the survey teams. A total of 1247 structures were assessed for eligibility, of which 691 eligible households were enrolled. The majority of enrolled households were the initially selected structures (51%) or the first selected neighbour (42%). Households that refused enrollment tended to cluster more than those which enrolled.

CONCLUSIONS: Sampling from a satellite image was feasible in this urban African setting. Satellite images may be useful for public health surveillance in populations with inaccurate census data or maps and allow for spatial analyses such as identification of clustering among refusing households.

J Trop Pediatr. 2009 Feb; 55(1):49-54.

The determinants of exclusive breast feeding in urban slums: a community based study.

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The actual rate of Exclusive Breast Feeding (EBF) (up to the age of 6 months) is dismally low in urban slums of India. The reasons and determinants of this are debatable. The study was planned to understand the determinants of EBF in the infants in urban slums. A community-based cross sectional study was done in urban slums of Gwalior, India. The data were collected by interviewing the caregivers of 279 infants aged between 6 and 11 months from November 2005 to July 2006. Only 11 (3.8%) mothers knew that EBF should be done till six months and 22 (7.8%) actually practiced EBF. A total of 178 (63.8%) and 212 (76.0%) newborns were given pre- and post-lacteal feeds with 26.2% discarding colostrum. Only 22 (7.8%) practiced EBF. The early breastfeeding (BF) initiation, Ante Natal Clinic (ANC) visits, mothers' education and immunization visits were significantly associated with higher probability of EBF. There were a number of myths and misconceptions about BF in this urban slum population. The correct information about BF was more common amongst the women who had frequent contacts with health facilities due to any reason or during ANC or immunization visit. Similarly, it is the continuum of good health and feeding practices and the mothers who start early BF or get their child immunized regularly are more likely to EBF their children. Considering the widely prevalent myths and low rate of utilization of health services along with high potential benefits of EBF, every opportunity of mothers' interaction with the health facility should be utilized for promoting correct and EBF practices.

Health Policy Plan. 2009 Mar; 24(2):83-93.

Estimating inequalities in ownership of insecticide treated nets: does the choice of socio-economic status measure matter?

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Research on the impact of socio-economic status (SES) on access to health care services and on health status is important for allocating resources and designing pro-poor policies. Socio-economic differences are increasingly assessed using asset indices as proxy measures for SES. For example, several studies use asset indices to estimate inequities in ownership and use of insecticide treated nets as a way of monitoring progress towards meeting the Abuja targets. The validity of different SES measures has only been tested in a limited number of settings, however, and there is little information on how choice of welfare measure influences study findings, conclusions and policy recommendations.

In this paper, we demonstrate that household SES classification can depend on the SES measure selected. Using data from a household survey in coastal Kenya (n = 285 rural and 467 urban households), we first classify households into SES quintiles using both expenditure and asset data. Household SES classification is found to differ when separate rural and urban asset indices, or a combined asset index, are used. We then use data on bednet ownership to compare inequalities in ownership within each setting by the SES measure selected. Results show a weak correlation between asset index and monthly expenditure in both settings: wider inequalities in bednet ownership are observed in the rural sample when expenditure is used as the SES measure [Concentration Index (CI) = 0.1024 expenditure quintiles; 0.005 asset quintiles]; the opposite is observed in the urban sample (CI = 0.0518 expenditure quintiles; 0.126 asset quintiles).

We conclude that the choice of SES measure does matter. Given the practical advantages of asset approaches, we recommend continued refinement of these approaches. In the meantime, careful selection of SES measure is required for every study, depending on the health policy issue of interest, the research context and, inevitably, pragmatic considerations.

J Pak Med Assoc. 2009 Feb; 59(2):89-92.

The health seeking behaviour of elderly population in a poor-urban community of Karachi, Pakistan.

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OBJECTIVES: To presents socio-demographic characteristics and health seeking behaviour of elderly and to determine frequency of Diabetes Mellitus and Hypertension in elderly population of a poor peri-urban community in Karachi, Pakistan.

METHODS: A cross-sectional study was conducted, targeting population aged 65 or above. A total of 438 respondents were interviewed after taking informed consent, between November 2005 and December 2005. Frequencies and Chi square values were calculated for different variables using SPSS 13.0.

RESULTS: Total population surveyed comprised of 438 elderly, 158 (36%) women and 280 (63.9%) men. Mean age for the population was 71.44 +/- 7.74. A total of 238 (54.3%) elderly were found to be economically active. More than half (n = 269, 61.4%) of the elderly were found to be illiterate. Only 72 (16.4%) of the elderly population were Diabetic and 132 (30.1%) were Hypertensive. Common symptoms that prompted elderly of Azam Basti to seek health care were fever (61.2%), generalized body aches (43.4%) and cough (40.4%). Over half of the (n = 269, 61.4%) responders reported factors which deterred them from seeking health care, out of which 62% reported financial constraint as the commonest factor. Deterrence from seeking health care was associated with illiteracy (p = 0.001) and living alone (p = 0.06).

CONCLUSION: The elderly population of this peri-urban community has financial constraints in seeking health care. Hypertension was found to be more prevalent among women as compared to men, ratio being 1:2. Less number of people knew they were diabetics; this might be attributed to ignorance and non-availability of investigations and screening.

Clin Infect Dis. 2009 Mar 1; 48 Suppl 2:S114-22.

Hospital-based surveillance of invasive pneumococcal disease among young children in urban Nepal.

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BACKGROUND: Streptococcus pneumoniae is a leading cause of pneumonia and meningitis in young children. Before implementation of the pneumococcal conjugate vaccine in developing countries, there is an urgent need to provide regional epidemiological data on pneumococcal disease. The aims of this study were to determine the prevalence and serotype distribution of invasive pneumococcal disease among young children hospitalized in urban Nepal.

METHODS: Children aged 2 months to 5 years who were admitted to Patan Hospital, Kathmandu, with fever and/or suspected pneumonia, meningitis, or bacteremia were recruited. Blood culture specimens were collected from all participants. In cases of suspected meningitis, cerebrospinal fluid specimens were cultured and were tested for S. pneumoniae antigen.

RESULTS: A total of 885 children were recruited during the 21-month study period. Of these, 76 (9%) had meningitis and 498 (56%) had pneumonia, on the basis of clinical criteria. Radiographically confirmed pneumonia occurred in 354 (40%), and probable or definite meningitis occurred in 47 (5%). S. pneumoniae was isolated in specimens from 17 (2%) of the children. Serotypes 1 and 12A were isolated most frequently, and only 1 of 17 isolates had a serotype contained in the currently available 7-valent pneumococcal conjugate vaccine.

CONCLUSIONS: More than 60% of children aged <5 years who were admitted with fever and/or suspected invasive bacterial disease in urban Nepal had the clinical syndromes of meningitis and/or pneumonia. A new generation of pneumococcal vaccines that prevent infection with a broader range of serotypes may be necessary to most effectively control pneumococcal disease in young children in Kathmandu.

BMC Infect Dis. 2009 Feb 19;9:20.

Patterns of soil-transmitted helminth infection and impact of four-monthly albendazole treatments in preschool children from semi-urban communities in Nigeria: a double-blind placebo-controlled randomised trial.

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BACKGROUND: Children aged between one and five years are particularly vulnerable to disease caused by soil-transmitted helminths (STH). Periodic deworming has been shown to improve growth, micronutrient status (iron and vitamin A), and motor and language development in preschool children and justifies the inclusion of this age group in deworming programmes. Our objectives were to describe the prevalence and intensity of STH infection and to investigate the effectiveness of repeated four-monthly albendazole treatments on STH infection in children aged one to four years.

METHODS: The study was carried out in four semi-urban villages situated near Ile-Ife, Osun State, Nigeria. The study was a double-blind placebo-controlled randomised trial. Children aged one to four years were randomly assigned to receive either albendazole or placebo every four months for 12 months with a follow-up at 14 months.

RESULTS: The results presented here revealed that 50% of the preschool children in these semi-urban communities were infected by one or more helminths, the most prevalent STH being *Ascaris lumbricoides* (47.6%). Our study demonstrated that repeated four-monthly anthelmintic treatments with albendazole were successful in reducing prevalence and intensity of *A. lumbricoides* infections. At the end of the follow-up period, 12% and 43% of the children were infected with *A. lumbricoides* and mean epg was 117 (S.E. 50) and 1740 (S.E. 291) in the treatment and placebo groups respectively compared to 45% and 45% of the children being infected with *Ascaris* and mean epg being 1095 (S.E. 237) and 1126 (S.E. 182) in the treatment and placebo group respectively at baseline.

CONCLUSION: Results from this study show that the moderate prevalence and low intensity of STH infection in these preschool children necessitates systematic treatment of the children in child health programmes.

Urban Environmental Health

J Trop Pediatr. 2009 Feb;55(1):42-5.

Relationship between intestinal parasitic infection in children and soil contamination in an urban slum.

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PURPOSE: Urban slums are well known for their high infant mortality and morbidity rates, and parasitic infections seem to be a common problem among these children. The aim of the present study was to determine protozoa and nematodes prevalence among children of a selected community located in São Paulo, Brazil, and access the relation between soil and children infection.

METHODS: Soil contamination samples from 15 strategic locations in the slum area as well as stool samples (examined for protozoa and nematodes through five different methods) from 120 children aged 2-14 years (49% M: 51% F, mean +/- SD = 7.9 +/- 3.8 years) were assessed in a cross-sectional study. Children's domicile locations were determined, and a comparative analysis was undertaken to correlate children and soil infection.

RESULTS: Overall infection rate was 30.8% (n = 37), without difference between genders. The most frequent intestinal protozoa were *Endolimax nana* (20.8%), *Entamoeba coli* (15.8%) and *Giardia lamblia* (16.7%). Frequencies of *Ascaris lumbricoides* and *Enterobius vermicularis* in stool samples were 2.5 and 1.7%, respectively. No cases of hookworms, *Schistosoma mansoni* or *Tricuris trichiura* were identified. Polyparasitism occurred in 10.8% of the children, while 69.2% were free of parasitic infections. Out of the 15 soil samples analyzed, *Ascaris* sp. eggs were found in 20% and hookworm eggs in 6.7%.

CONCLUSION: Helminth infection is not as prevalent as previously reported in urban slums in São Paulo, neither as clinical disease nor in soil samples. Protozoa intestinal infection, however, is still frequent in some marginalized populations in São Paulo. Improvement in living standards, mostly sanitation might decrease the prevalence of these diseases.

Ann Trop Med Parasitol. 2009 Mar;103(2):149-57.

The socio-demographic, environmental and reservoir factors associated with leptospirosis in an urban area of north-eastern Brazil.

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In an ecological study based on the 18 microregions that form the city of Recife, the capital of the Brazilian state of Pernambuco, associations between socio-demographic, environmental and reservoir factors and the incidence of leptospirosis in the city were

investigated. Incidence over a 5-year period (2001-2005) and 14 variables were analysed, using central trend and dispersion measurements, Pearson's correlation and multiple linear regression. Variables relating to education, income, housing type, sewage system, rubbish collection and hydrographic factors were found to be significantly correlated with leptospirosis incidence ($P < 0.05$ for each). Just two variables - the proportion of heads of households with incomes less than or equal to the legal minimum (U.S.\$83.55/month), and the proportion of households from which rubbish was dumped in skips, lakes, rivers or the sea or on vacant land - explained 60% ($P = 0.017$) of the differences in disease risk observed between the various areas of the city.

Health Place. 2009 Mar; 15(1):69-78.

Urban sanitation and health in the developing world: reminiscing the nineteenth century industrial nations.

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The dichotomy in development trajectories of urbanisation, industrialization and economic change, and the associated environmental health challenges, between the industrialised nations and the developing world, could offer useful lessons, especially for the latter. This paper examines points of convergence in the underlying factors and theories, underpinning urbanisation, sanitation and health in the 19th century industrialised nations and the developing world and explores the major reasons why many low income countries have not managed to redress their urban sanitation and health problems. It concludes that any meaningful developments in low income countries may require strategies, policies and actions, which emphasise local realities over and above global concerns and priorities.

Urban Vector Disease

Malar J. 2009 Jan 13; 8:13

Social and environmental malaria risk factors in urban areas of Ouagadougou, Burkina Faso.

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BACKGROUND: Despite low endemicity, malaria remains a major health problem in urban areas where a high proportion of fevers are presumptively treated using anti-malarial drugs. Low acquired malaria immunity, behaviour of city-dwellers, access to health care and preventive interventions, and heterogenic suitability of urban ecosystems for malaria transmission contribute to the complexity of the malaria epidemiology in urban areas.

METHODS: The study was designed to identify the determinants of malaria transmission estimated by the prevalence of anti-circumsporozoite (CSP) antibodies, the prevalence and density of Plasmodium falciparum infection, and the prevalence of malarial disease in areas of Ouagadougou, Burkina-Faso. Thick blood smears, dried blood spots and clinical

status have been collected from 3,354 randomly chosen children aged 6 months to 12 years using two cross-sectional surveys (during the dry and rainy seasons) in eight areas from four ecological strata defined according to building density and land tenure (regular versus irregular). Demographic characteristics, socio-economic information, and sanitary and environmental data concerning the children or their households were simultaneously collected. Dependent variables were analysed using mixed multivariable models with random effects, taking into account the clustering of participants within compounds and areas.

RESULTS: Overall prevalences of CSP-antibodies and *P. falciparum* infections were 7.7% and 16.6% during the dry season, and 12.4% and 26.1% during the rainy season, respectively, with significant differences according to ecological strata. Malaria risk was significantly higher among children who i) lived in households with lower economic or education levels, iii) near the hydrographic network, iv) in sparsely built-up areas, v) in irregularly built areas, vi) who did not use a bed net, vii) were sampled during the rainy season or ii) had traveled outside of Ouagadougou.

CONCLUSION: Malaria control should be focused in areas which are irregularly or sparsely built-up or near the hydrographic network. Furthermore, urban children would benefit from preventive interventions (e.g. anti-vectorial devices or chemoprophylaxis) aimed at reducing malaria risk during and after travel in rural areas.

J Theor Biol. 2009 Mar 2.

The effects of human movement on the persistence of vector-borne diseases.

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With the recent resurgence of vector-borne diseases due to urbanization and development there is an urgent need to understand the dynamics of vector-borne diseases in rapidly changing urban environments. For example, many empirical studies have produced the disturbing finding that diseases continue to persist in modern city centers with zero or low rates of transmission.

We develop spatial models of vector-borne disease dynamics on a network of patches to examine how the movement of humans in heterogeneous environments affects transmission. We show that the movement of humans between patches is sufficient to maintain disease persistence in patches with zero transmission. We construct two classes of models using different approaches: (i) Lagrangian models that mimic human commuting behavior and (ii) Eulerian models that mimic human migration. We determine the basic reproduction number $R(0)$ for both modeling approaches. We show that for both approaches that if the disease free equilibrium is stable ($R(0) < 1$) then it is globally stable and if the disease free equilibrium is unstable ($R(0) > 1$) then there exists a unique positive (endemic) equilibrium that is globally stable among positive solutions.

Finally, we prove in general that Lagrangian and Eulerian modeling approaches are not equivalent. The modeling approaches presented provide a framework to explore spatial vector-borne disease dynamics and control in heterogeneous environments. As an example, we consider two patches in which the disease dies out in both patches when

there is no movement between them. Numerical simulations demonstrate that the disease becomes endemic in both patches when humans move between the two patches.

HIV/AIDS

J Acquir Immune Defic Syndr. 2009 Feb 12.

Challenges for Scaling up ART in a Resource-Limited Setting: A Retrospective Study in Kibera, Kenya.

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OBJECTIVE: To determine levels of dropout and adherence in an antiretroviral treatment (ART) program in sub-Saharan Africa's largest urban informal settlement, Kibera, in Nairobi, Kenya.

METHOD: Retrospective cohort study.

RESULTS: Of 830 patients that started ART between January 2005 and September 2007, 29% dropped out of the program for more than 90 days at least once after the last prescribed dose. The dropout rate was 23 per 100 person-years, and the probability of retention in the program at 6, 12, and 24 months was 0.83, 0.74, and 0.65, respectively. Twenty-seven percent of patients had an overall mean adherence below 95%. Being a resident of Kibera was significantly associated with 11 times higher risk of dropout.

CONCLUSION: Despite free drugs and low associated costs, dropout probabilities in this study are higher and adherence to ART is lower compared with other studies from sub-Saharan Africa. Our results illustrate that ART programs in resource-limited settings, such as Kibera, risk low adherence and retention rates when expanding services. Specific and intensified patient support is needed to minimize the risk of dropout and nonadherence causing future significant health threats not only to individuals but also to public health.

Sex Transm Dis. 2009 Feb; 36(2):102-7.

Alcohol abuse, sexual risk behaviors, and sexually transmitted infections in women in Moshi urban district, northern Tanzania.

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BACKGROUND: To assess the covariates of alcohol abuse and the association between alcohol abuse, high-risk sexual behaviors and sexually transmitted infections (STIs).

METHODS: Two thousand and nineteen women aged 20 to 44 were randomly selected in a 2-stage sampling from the Moshi urban district of northern Tanzania. Participant's demographic and socio-economic characteristics, alcohol use, sexual behaviors, and STIs were assessed. Blood and urine samples were drawn for testing of human

immunodeficiency virus, herpes simplex virus, syphilis, chlamydia, gonorrhoea, trichomonas, and mycoplasma genitalium infections.

RESULTS: Adjusted analyses showed that a history of physical (OR = 2.05; 95% CI: 1.06-3.98) and sexual violence (OR = 1.63; 95% CI: 1.05-2.51) was associated with alcohol abuse. Moreover, alcohol abuse was associated with number of sexual partners (OR = 1.66; 95% CI: 1.01-2.73). Women who abused alcohol were more likely to report STIs symptoms (OR = 1.61; 95% CI: 1.08-2.40). Women who had multiple sexual partners were more likely to have an STI (OR = 2.41; 95% CI: 1.46-4.00) compared to women with 1 sexual partner. There was no direct association between alcohol abuse and prevalence of STIs (OR = 0.86; 95% CI: 0.55-1.34). However, alcohol abuse was indirectly associated with STIs through its association with multiple sexual partners.

CONCLUSIONS: The findings of alcohol abuse among physically and sexually violated women as well as the association between alcohol abuse and a history of symptoms of STIs and testing positive for STIs have significant public health implications. In sub-Saharan Africa, where women are disproportionately affected by the HIV epidemic screening for alcohol use should be part of comprehensive STIs and HIV prevention programs.

Trop Med Int Health. 2009 Feb; 14(2):204-12.

Implementing family-focused HIV care and treatment: the first 2 years' experience of the mother-to-child transmission-plus program in Abidjan, Côte d'Ivoire.

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OBJECTIVES: To describe a family-focused approach to HIV care and treatment and report on the first 2 years experience of implementing the mother-to-child transmission (MTCT)-plus program in Abidjan, Côte d'Ivoire.

PROGRAM: The MTCT-plus initiative aims to enroll HIV-infected pregnant and postpartum women in comprehensive HIV care and treatment for themselves and their families.

MAIN OUTCOMES: Between August 2003 and August 2005, 605 HIV-infected pregnant or postpartum women and 582 HIV-exposed infants enrolled. Of their 568 male partners reported alive, 52% were aware of their wife's HIV status and 30% were tested for HIV; 53% of these tested partners were found to be HIV-infected and 78% enrolled into the program. Overall only 10% of the women enrolled together with their infected partner. On the other hand, the program involved half of the seronegative men who came for voluntary counselling and testing (VCT) in the care of their families. Of 1624 children <15 years reported alive by their mothers (excluding the last newborn infants of the most recent pregnancy systematically screened for HIV), only 10.8% were brought in for HIV testing, of whom 12.3% were found to be HIV-infected.

LESSONS LEARNED AND CHALLENGES: The family-focused model of HIV care pays attention to the needs of families and household members. The program was successful in enrolling HIV women, their partners and infants in continuous follow-up. However engaging partners and family members of newly enrolled women into care involves

numerous challenges such as disclosure of HIV status by women to their partners and family members. Further efforts are required to understand barriers for families accessing HIV services as strategies to improve partner involvement and provide access to care for other children in the households are needed in this West African urban setting.