Theme: 1.INDEPTH @ 10: Achievements, Prospects and Challenges

Role of Demographic Surveillance System in filling-up the Millennium Development 'Holes': Evidence from rural Bangladesh

Mr. Karar Zunaid
Matlab, Bangladesh

Background: Valid up-to-date information on MDG status is not readily available for most of the developing countries. In this article, Bangladesh's progress towards MDG is tracked for last 17 years using various sources and the potential role of HDSS in monitoring this progress is discussed.

Methods: In order to track Bangladesh's MDG progress in 48 indicators under 18 targets over the period of 1990-2007, a number of information sources are used. Whenever possible, government sources (e.g. Bangladesh Bureau of Statistics, etc.) are used along with periodic Demographic and Health Surveys (BDHS). In some cases, data from UN agencies are also used though the World Bank indicators (e.g. World Development Indicators) are incongruent with the government statistics for most of the time points. Lack of uniformity and coordination among the sources hinders tracking progress towards MDGs. In order to solve this problem of 'holes' or lack of valid, consistent data related to MDGs, DSS can play a vital role in the developing setup. Except some national level statistics, a number of MDG indicators (under goals 2-7) can be observed using DSS data. The existing Matlab HDSS data collection module (and the periodic Socio-economic Censuses) already covers 13 progress indicators and enables us to monitor MDG indicators including youth literacy (goal 2); sex ratio in education levels (goal 3); child mortality rates and immunization (goal 4); maternal mortality ratio and proportion of delivery by skilled personnel (goal 5); contraceptive prevalence rate; prevalence of death rates associated with TB (goal 6); and population with access to improved water and sanitation (goal 7).

Conclusions: The scope of HDSS can be broadened to cover most of the MDG indicators. For INDEPTH Network sites, a special MDG module can be administered in addition to existing DSS activities so that the DSS can play an important role to fill up the gaps of information regarding MDG and serve as a source of reliable information in monitoring MDG progress in the future. The unique nature of DSS setup will also enable researchers/policy makers to carry out targeted evaluation studies to assess the impact of various interventions.

Achieving health for all in sub-Saharan Africa: what has DSS got to do with it?

Cornelius Debpuur
Navrongo, Ghana

Background: Achieving health for all has been a long cherished goal of the international community, albeit one that continues to elude many countries. Despite the availability of low cost, effective health technologies, providing health to all remains a major challenge, especially in sub-Saharan Africa. Consequently, rigorous field trials of strategies for health service delivery, especially in impoverished rural communities remain a priority. But even when such trials are successfully conducted it is often a difficult task to translate the results of such trials into policies of health reform. Ghana's Community-based Health Planning and Services (CHPS) initiative represents one of the few attempts in sub-Saharan Africa to translate findings of a field trial into a national health reform program. This bold and innovative initiative was informed by results of an experimental trial implemented in the Kassena-Nankana district by the Navrongo Health Research Centre. The trial known as the Navrongo Community Health and Family Planning Project (CHFP), was launched in 1993 to identify ways to improve access to health care delivery in rural

communities. By 1998 preliminary evidence from the trial was so impressive that the Navrongo system was seen as a national model for community-based health care. In 1999, the ministry of health adapted the Navrongo model and launched the CHPS initiative as a national policy. This paper reviews the CHFP project and how it informed the national CHPS initiative. We also review the role of demographic surveillance in the effective implementation of CHFP and its subsequent translation into health policy in Ghana.We argue that the CHPS in Ghana demonstrates the vital role of DSS in achieving health for all.

Theme: 2.Health Systems Experiments using HDSS

What are the technical and allocative efficiencies of public health centres in Ghana?

James Akazili

Navrongo, Ghana

Background: Health systems in developing countries including Ghana are faced with critical resource constraints in pursuing the goal of improving the health status of the population. The constrained ability to adequately meet health care needs is exacerbated by inefficiency in the health care systems, especially within public health centres.

Methods: The study used Data Envelopment Analysis (DEA) method, to calculate the technical and allocative efficiency of 113 randomly sampled health centres. A logistic regression model was also applied on whether a health centre was technically efficient or not to determine the factors that significantly influence the efficiency of health centres.

Results: The findings showed that 78% of health centres were technically inefficient and so were using resources that they did not actually need. Eight-eight percent were also allocatively inefficient. The overall efficiency, (product of the technical and allocative efficiency), was also calculated and over 90% of the health centres were inefficient. The results of a logistic regression analysis shows that newer health centres and those which receive incentives were more likely to be technically efficient compared to older health centres and those who did receive incentives.

Conclusions: The results broadly point to grave inefficiency in the health care delivery system of the health centres and that lots of resources could be saved if measures were put in place to curb the waste. Incentives to health centres were found to be major motivating factors to the promotion of efficiency.

Theme 3: Using longitudinal HDSS platforms to understand demographic and health transitions

The Kintampo population-based case register for mental and neurological disorders: 2002-2008

Victor Doku

Kintampo, Ghana

Background: Basic epidemiological data on the prevalence and distribution of mental and neurological disorders is still lacking for many low-income countries. Reliable data is also lacking for particular age groups, such as children and youth, and for particular health problems such as substance abuse and epilepsy. Without valid databases it will be impossible to gauge the magnitude of these problems, the adequacy of existing mental health services and the groups at higher risks. Clinic and population-based epidemiological research studies are needed to fill the information gap. Data from statutory services modelled on western medical systems of practice if systematically collected and analysed are also important in addressing the need for information. Case registers if carefully designed and setup have a potential in addressing this need. A case register is a list of longitudinal contacts with patients within specified geographical areas, organised in a predetermined format, which allows the clinician to gain information from the list for education, research, service utilization, planning or administration

Methods: Since, 2002, several population-based studies in mental health nested in the KHDSS formed the basis of the population-based case register for mental and neurological disorders. The studies are: 1. The population-based case control study assessing risk factors for schizophrenia and related psychoses (epidemiological) 2. The risk factor study for post partum depression (epidemiological) 3. The study of psychiatric morbidity among the elderly (epidemiological) 4. The sources of healing for mental illness (anthropological) 5. The experience of mental illness (anthropological) The cases were identified by trained, community based surveillance volunteers, fieldworkers and research clinicians using a variety of assessments based on the ICD-10 diagnostic classificatory system

Results: The register has 143 adult subjects with a diagnosis of non-affective psychosis, 83 adult subjects with acute convulsive epilepsy and 5 subjects with very severe complications of alcohol dependency. A more detailed breakdown by age, gender, geographical distribution, migration, and mortality and follow-up data will be presented

A new estimate of lung cancer deaths in Africa and Asia

Ng Nawi

Purworejo, Indonesia

Objective: Reliable cancer burden estimates are rarely available from most developing countries where cancer registration is lacking. This study aimed to provide estimates on the current and future number of deaths from lung cancer based on detailed smoking prevalence in Ethiopia, Vietnam and Indonesia, and Africa at large.

Methods: Three cross-sectional surveys were conducted among 2000-4000 rural individuals aged 25-74 years selected using random sampling from demographic surveillance sites in each country. Data on smoking habit, including age at start smoking and number of cigarettes smoked, were collected. Additional data on smoking prevalence in Africa was also used. A new method to estimate lung cancer deaths based on smoking prevalence data and on lung cancer rate estimates in non-smokers is developed and applied.

Results: Our best estimate for lung cancer deaths in Sub-Saharan Africa is 44076 in the year 2005. This is 190% higher than the most recent WHO estimate in 2003 (17000). A similar ratio is found for the country-specific estimate in Ethiopia. For Indonesia and Vietnam, our estimates are only slightly higher that the WHO estimates. . The attributable risk of smoking among women was 2.8% in Vietnam and Ethiopia and 3.9% in Indonesia. The corresponding figures among men were 39% in Ethiopia, 80% in Indonesia and 85% in Vietnam. Assuming a stable smoking prevalence and using available predictions on population size and age distribution, we expect the annual number of lung cancer deaths to double by 2025.

Conclusions: WHO estimates on lung cancer deaths in Asia appear to be slightly lower than our estimates, however, in Africa it appears to largely underestimate the burden of the disease. The lack of representative national estimates on the burden of cancer underlines the importance of developing simple and more economic methods to estimate lung cancer burdens using the reliable data on smoking prevalence and doses that does exist. Such estimates can provide essential guidance for the core elements of cancer prevention and control.

The paradox continues: evidence of coexisting under- & over-nutrition in rural South Africa

Elizabeth Kimani-Murage, K. Kahn, J. Petiffor, S. Tollman, X. Gomez and S. Norris

Agincourt, South Africa

Background: Despite the high levels of undernutrition in South Africa, high levels of overnutrition have been documented. This nutritional paradox calls for more context-specific studies to document the magnitude in an attempt to develop effective interventions to resolve it. In this regard, we describe the age and sex patterns of under- and over-nutrition in children living in rural South Africa.

Methods: A growth survey targetting 4000 children aged 0-20 years, in Agincourt, South Africa was conducted in 2007. Anthropometric measurements were taken including height and weight. HIV testing was done for children 0-5y. HIV positive children <5y were excluded from analysis. Stunting levels (haz-scores <-2) for children <5y and overweight and obesity for adolescents 11-17y were determined. Haz-scores were generated with the WHO reference using the WHO Anthro program. Overweight and obesity were determined using the international cut-off points recommended by the International Obesity Taskforce for youths 11-17y while adult cut-off points of BMI >25 and >30 for overweight and obesity respectively were used for young adults 18-20y.

Results: Results show high levels of stunting for children <5y (17%), higher in males (19%) than females (15%). The prevalence was highest in children aged 1 year (32%) and reduced with age. Prevalence of combined overweight and obesity was 8% for younger adolescents 11-14y, 10% for older adolecents 15-17y and 15% for young adults 18-21y. Overnutrition was about 4 times higher in girls than in boys for younger and older adolescents; 3% versus 12% for the younger adolecents and 4% versus 15% for the older adolescents while it was 6 times higher in girls than in boys for young adults 18-21y.

Conclusions: This study indicates relatively high prevalence of stunting at early age comparable to the findings of the National Food Consumption Survey. Despite the persisting high levels of undernutrition, the study indicates relatively high levels of overnutrition in adolescents and young adults aged 11-20y. Agincourt is in a transitional process between rural and urban but showing more of an urban profile, and interventions to address both under- and over-nutrition are needed.

Remaining life expectancy among older people in a rural area of Vietnam: trends and socioeconomic inequalities during a period of multiple transitions

Le Hoi

Filabavi, Vietnam

Background: As a result of rapid economic, demographic and epidemiological changes, the population of people aged 60 and over in Vietnam is increasing rapidly, from 6.7% in 1979 to 9.2% in 2006. Better understanding the trends and the disparities in health at old age in terms of life expectancy will help to provide appropriate responses to the growing needs of health and social care for the older population in limited resources. This study assesses the trends and the disparities in a rural area in an effort to highlight this vulnerable group and to anticipate their future health and social needs.

Methods: Abridged life table adjusted for small area data was used to estimate cohort life expectancies at old ages and the corresponding 95% confidence intervals from a longitudinal data collected by FilaBavi DSS during 1999-2006. Differences in life expectancy were examined by socioeconomic factors, including socio-demographic characteristics, wealth, poverty and living arrangements.

Results: Life expectancies at old ages have increased approximately one year between four-year periods during 1999-2006. The increase is mainly among females and contributed by the improvements in ethnic majority and less poor groups. However, life expectancy tends to decrease in the most vulnerable groups. There is wide gap in the life expectancy according to poverty status and patterns of living arrangement. The gap by poverty status has widened over the time of observation. The gender gap in life expectancy, with women living 3-7 years longer than men, is consistent across all socioeconomic groups.

Conclusions: There is a trend of increasing life expectancy among older people in rural areas of Viet Nam. Inequalities in the life expectancy exist between socioeconomic groups and should be further addressed by appropriate social and health policies with stronger targeting to the poorest and the most disadvantaged groups.

Impact of Social Class on Labour Force Age Health Outcome: A Multinomial Analysis from KDSS, Thailand

Sawangdee Yothin

Kanchanaburi, Thailand

Background: Thailand is facing with labor shortage situation due to the declining of fertility and an increasing of number of the elderly. For this reason, it is important to measured impact of social class that may have effect on health outcome of labor force age person.

Methods: This research examines impact of social class which is measured by level of education, type of occupation, and residential area on labor force age health outcome. The study employs data from first round of Kanchanaburi Demographic Surveillance System (KDSS) in which conducted in 2000. The unit of analysis is individual age between 15 - 64, and there are 22,876 persons as sample size. Health outcome are divided into 3 categories, based on self report during survey such as 1) healthy 2) have some chronic diseases and 3) have some illness. Likewise, covariate factors are gender, age cohort, smoking behavior, and alcohol consumption.

Results: The analysis reveals that differential in level of education has produced differential in health outcome. For example, people who have higher level of education i.e. university or higher, probabilities to have high risk of chronic disease are higher than any other level of education such as secondary, primary, and no education levels. Similarly, when look at occupation, those who are no job they have high risk or probabilities to have some chronic diseases higher than other comparison groups. Importantly, social class under place of resident context has revealed empirical evidence that those who live in cash crops area are more likely to have high risk to get some chronic diseases than those who live other places such as upland, rice, mix, and urban areas.

Conclusions: As a result, it is reasonable to conclude that inequality of place of resident, education attainment, and occupation classes have impact on individual who were in labor force age health outcome in KDSS areas.

Theme 4: Using longitudinal HDSS to understand the impact of HIV/AIDS interventions at the individual and population level

Spatial Analysis of HIV/AIDS mortality in rural South Africa during 2000-2006

Elias Namosha

Wosera, Papua New-Guinea

Background: HIV/AIDS is a major health problem in rural South Africa, and at the Africa Centre for Demographic Information Surveillance (ACDIS), it is the leading cause of death among the adult population (males and females). For successful interventions to be carried out, knowledge of the spatial distribution of mortality is required, as many diseases are related to location. Cluster detection analysis may be an appropriate approach to identify critical HIV/AIDS mortality locations.

Methods: In this study we use geographic information systems (GIS) and a spatial scan statistic to investigate significant geographical clusters of cause of deaths to detect or identify areas of significantly high or low mortality rates at the household level. A spatial scan statistic implemented in a software program, SaTScan, was used to test for the presence of mortality spatial clusters and to identify their approximate locations. This was done by gradually scanning a window across time and/or space, noting the number of observed and expected observations inside the window at each location using a Poisson model. A population-based longitudinal cohort study was employed that describe the population-based HIV/AIDS cohort mortality during 2000-2006. Data from the ACDIS mortality (demographic surveillance) were aggregated by local area within MapInfo program and exported to SatScan for spatial statistical analysis.

Results: The calculated results from SaTScan were then imported into MapInfo for visualization. The results suggest that there were several identified statistically significant clusters ($P<0.05$) of high and low mortality rates comprising different sets of households (homestead) in the ACDIS. The study may be regarded as a first step in prioritizing areas for follow-up and public health effort.

Magu DSS & a Community-based HIV Cohort Study

Mark Urassa

Magu, Tanzania

Background: To provide reliable, policy-relevant information on evolution of HIV epidemic in N. Tanzania, to describe its social and demographic consequences, and to measure coverage, uptake and impact of national prevention, treatment and care programmes

Methods: Coverage: total population of Kisesa ward (an administrative area of Magu district in Mwanza region) Dates: from 1994 to present. Cohort size: grown from 19,000 to 28,000 Data collection: demographic surveillance of total population about twice a year (21 rounds); serological and behavioural survey of adults every three years (5 rounds); district wide unlinked ante natal clinic (ANC) surveillance (3 rounds); continuous monitoring of VCT and ART referral since 2005 (totals to mid 2007: VCT 3,900; HIV positive referred 560; receiving ART 210) Biological samples: dry blood spots (DBS) from sero-surveys; DBS from ANC surveillance; serum from 2006-07 VCT tests Funding: major funder is GFATM; small grants UNAIDS, WHO, UNICEF, DfID, EDCTP; new Wellcome Trust application in the pipeline

Results: Age specific incidence patterns • Female incidence peak earlier than male, overall male incidence higher • Secondary peaks at older ages, probably a re-marriage effect, has since been found in other HIV cohorts. Median survival time and age at infection • Age at infection is most important survival determinant • Overall median survival of 11.2 yrs as long as developed countries; sex effect marginally significant. Year of first ART need in HIV+ adults in • Overall female ART need higher than male because of higher female prevalence • Short-term need for males almost as high as females because males infected at older ages and in earlier calendar years. Gender bias in non-marital sexual partner reporting in a closed population • Single females under-report non-marital sexual partnerships • Females over-report partnership duration; males under-report extra-marital married women partners; females more likely to report a partnership as a marriage.

Estimating need for Anti-Retroviral Treatment: a new method developed using data from Magu DSS

Mark Urassa

Magu, Tanzania

Background: Predictions of national ART needs are generally made using UNAIDS epidemiological projection and demographic analysis packages, EPP and SPECTRUM. These tools rest on complex assumptions derived from external populations, need long time series of prevalence data and are not easily adapted for sub-national populations or for scenario building.

Objective: To describe a simple tool for estimating ART need based on current age-specific prevalence patterns that makes the most of locally generated HIV mortality data.

Methods: Magu DSS has measured age-specific mortality rates (ASMR) for all HIV infected persons, duration-specific mortality rates (DSMR) for sero-converters, and age-specific patterns of HIV incidence and prevalence for males and females. The ASMRs observed in HIV-infected persons are applied to observed age-specific HIV prevalence patterns to estimate deaths in the next 13 years among those already infected in 2004 (the year before ART became available in the area). The incidence pattern is applied to the distribution of uninfected persons in 2004 to predict new infections in the following 13 years, and the DSMR are applied to predict deaths among the

newly infected. Assuming ART need starts 3 years before the expected date of death in the absence of treatment, we predict treatment need in the next 10 years by backdating expected deaths by 3 years.

Results: In 2004 in the Magu DSS area 1,314 persons (7.9% of total population aged 15+) were estimated to be infected with HIV, and 216 (16.5% of infected) needed to start treatment immediately, as they were expected to die within 3 years. Ten years later 1,163 (88.5%) should have started ART. However by this time another 372 persons infected after 2004 (24.2% of the total), would also need treatment. The proportion needing treatment immediately is higher in older age groups, the proportion of newly infected persons requiring treatment ten years later is higher at younger ages.

Conclusions: Since national and regional estimates of HIV prevalence are available for Tanzania from the DHS survey in 2004, this method could be used to estimate national and regional ART need, assuming mortality amongst infected persons is similar to that in Magu.

Trends in HIV Prevalence and Incidence in Magu DSS, 1994-2007

Mr. Raphael Isingo

Magu, Tanzania

Background: To use high quality data from Tanzania's only community-based HIV cohort study to examine trends in HIV prevalence and incidence since 1994.

Methods: Magu DSS conducted 21 rounds of household based demographic surveillance and 5 rounds of HIV sero-survey (adults 15+) between 1994 and 2005. HIV testing was anonymous, based on informed consent without result disclosure. HIV status, demographic and socio-behavioural data were linked using coded numerical identifiers. Voluntary counselling and testing was offered as a separate, unlinked service. Prevalence change in adults aged 15-44 is broken down into components: epidemiological changes (new infections and deaths); mobility (in- and out- movement of infected and uninfected individuals into the DSS area); and demographic change due to ageing (attaining ages 15 and 45). As well as presenting conventional confidence intervals that depend only on the size of the population under surveillance (with the usual assumptions underlying random sampling), we also calculate uncertainty bounds to allow for possible non-participation bias. Interval censoring methods are used to allow uncertainty in dating sero-conversions between surveys. Survival analysis is used to compute cumulated probability of infection based on incidence rates for comparison with observed prevalence.

Results: 19,105 adults participated in at least one of the five serological surveys, participation rates ranged from 67% to 75%. HIV prevalence for both sexes increased from 6.0% (5.3 to 6.4) in 1994, to 6.7% (6.4 to 6.9) in 1997, and 8.3% (7.8 to 9.3) in 2000, steadied at 8.2% (7.7 to 8.8) in 2004, before falling to 7.3% (6.7 to 7.9) in 2007. Prevalence remains higher in women than men, and higher in the trading centre than in remote rural areas, but the differentials are narrowing. Incidence peaked between 1997 and 2000, at 1.2% (1.1 to 1.3) slightly earlier

for women than men, and the ensuing decline has been much stronger in the trading centre than in the remote rural areas.

Conclusions: Cohort data provide solid evidence for dating prevalence and incidence trends broken down by social, behavioural and demographic factors. Incidence measures are particularly useful in the era of Anti-retroviral treatment to aid the interpretation of prevalence trends.

A Population-based Evaluation of ART Rollout at Five INDEPTH Sites

Nyovani Madise

University of Southampton

Background: Antiretroviral therapy (ART) rollout is the largest therapeutic public health initiative in developing countries, yet little is known about its effects at a population level, as most studies of ART follow selected cohorts identified at clinics. Because ART is lifelong treatment of a chronic disease and because HIV affects communities at many levels – individual health, family wellbeing, and the healthcare system – it is important to understand, over time, the effects of ART on individuals, populations, and health systems.

Methods: This study will use the ability of the demographic surveillance systems at five participating INDEPTH sites in four countries (Kenya, Guinea-Bissau, South Africa, and Tanzania) to track populations over time to answer important questions on ART rollout. It will examine the effect of ART rollout on: 1) individuals under treatment and their families; 2) the communities in which they live; and 3) the local health systems. The four countries have different epidemiological profiles and are at different stages of ART rollout.

Perceptions of Comprehensive Care Needs among Households Affected by HIV in Nairobi's Informal Settlements

Chi-chi Undie

African Population & Health Research Center

Background: Prior to an endline study that will be conducted in 2008 to evaluate a set of HIV comprehensive care interventions, a baseline qualitative evaluation of households infected or affected by HIV/AIDS was conducted in the context of two demographic surveillance areas (DSA) sites in Nairobi, Kenya by the African Population and Health Research Center (APHRC) in 2006. The two DSA sites involved in the study are situated within two of Nairobi's informal settlements. The baseline evaluation focused on experiential issues, including: 1) households' discovery of HIV infection and their general experiences thereafter; 2) the greatest needs/concerns of households affected/infected by HIV/AIDS in the slums; 3) the kind of care, services, or support received by, or available to, households; and 4) households' motivations for continuing to live positively. This paper summarizes the comprehensive care needs of the HIV infected/affected from the perspective of study respondents.

Methods: A total of 100 individuals, representing various household types, were interviewed for the evaluation using in-depth interviewing techniques. Respondents were selected based upon purposeful sampling procedures in collaboration with community-based organizations involved in HIV/AIDS work. All interviews were tape recorded, translated, and transcribed verbatim. Interview transcripts were then analyzed according to methods developed by Spradley (1979), involving the creation of syntactical structures, which were developed into codes. The latter were compared and contrasted codes so that a taxonomy of similar syntactical statements was formed. The data were then organized by similar and contrasting patterns to represent the overarching themes that are reported in this paper.

Conclusions: The study indicates that although conventional HIV comprehensive care models tend to emphasize particular clinical and non-clinical care/support mechanisms, an exclusive intervention focus on these conventional models of comprehensive care is unlikely to be effective in the informal settlement context, and is susceptible to failure unless the most basic of human needs are attended to and integrated into programs of care.

Trends in initiation of sexual activity in Magu DSS, 1994-2004

Doris Mbata

Magu, Tanzania

Background: The interval between first sex and first marriage is thought to be a high risk time for acquiring HIV if young people have many partners during this time. Measurement problems have been widely reported with respect to reporting of age at first sex, but there has been little investigation of consistency of reporting of age at marriage.

Objectives: To describe recent trends and relationships between age at first sex and age at first marriage allowing for consistency of reporting.

Methods: Sexual behaviour data were collected at 3 year intervals between 1994 and 2007 in village-based surveys of adults aged 15 and over. Consistency of reporting was checked for those attending two or more surveys. Median ages at first sex and first marriage were estimated using lifetable methods, and compared across 10-year birth cohorts by sex and by reporting consistency.

Results: Median age at first sex declined from 18.1 to 17.5 years for males born in 1950-59 compared to those born in 1980-89, whereas for women there was a rise in the median age from 16.0 to 16.9 years between the same birth cohorts. 39% of men and 52% of women who attended more than one survey gave consistent reports (to within +/- 1 year). Median age at first sex based on consistent reports differed by less than 0.2 years from inconsistent reports. Male median age at first marriage for men was around 24.5 for men, fluctuating but showing little consistent change between birth cohorts. For women it rose steadily from 17.0 years in the earliest born cohort to 19.2 in the most recent. Age at first marriage was reported consistently by 42% of males and 46% of females, but there was a systematic difference between consistent and inconsistent reports, median ages based on inconsistent reports averaged out over one year younger for males, half a year younger for females compared to consistent reports.

Conclusions: The gap between age at first sex and age at first marriage has increased over time for both sexes. Age at first marriage is less consistently reported than age at first sex.

Theme 5: Role of HDSS in supporting malaria control programmes in Africa

Community reported fever incidence and health facility malaria diagnoses in the Ifakara DSS between 2005 and 2007

Sandra Alba, Manuel Hetzel, Angel Dillip, Iddy Mayumana, Christian Lengeler, Mathew Alexander, Rose Nathan, Brigit Obrist, Alexander Schulze, Flora Kessy, and Hassan Mshinda

Ifakara, Tanzania

Background: The ACCESS Programme aims at understanding and improving access to prompt and effective malaria treatment and care in a rural Tanzanian setting with a set of integrated interventions. Objectives To evaluate the programme's impact on reported incidence of fever and severe malaria disease at both the community and health facility levels, and to investigate the value of community-based reporting for routine malaria control programme monitoring.

Methods: This work was implemented within the Ifakara Demographic Surveillance System (DSS) which comprises 25 villages in southern Tanzania (total population 80,000). The DSS staff collected routinely data on reported incidence of fever (2 week recall) and severe malaria disease in the community. In parallel we collected in-patient and out-patient diagnoses data from the 15 health facilities in the area.

Results: Reported fever rates in the community decreased from 47.2 to 41.4/1000 person weeks (IRR=0.94, $p<0.001$) between 2005 and 2007. The rates of malaria diagnoses decreased slightly from 13.5 to 12.6/1000 person-weeks between 2005 and 2007 (IRR=0.96, $p<0.001$). A good temporal and quantitative relationship was found between community- reported fever and health facility malaria diagnoses, suggesting that the former could be used for routine monitoring.

Conclusions: The trend of fever cases and malaria cases indicate a reduction in malaria risk. This conclusion is strengthened by the great consistency of the collected data between two independent sources.

Evaluation of knowledge and attitude to artesunate-amodiaquine using the Kintampo Health and Demographic Surveillance System

Abubakari Sulemana, Charles Zandoh, Robert Adda, Emmanuel Mahama, and Seth Owusu-Agyei

Kintampo, Ghana

Background: Malaria is endemic in 91 countries with about 40% of the world's population at risk. It remains a major public health problem in sub-Saharan Africa. It is hyper-endemic in Ghana. The malaria treatment policy for Ghana was changed from chloroquine to artesunate-amodiaquine as the first line treatment for uncomplicated malaria in 2005. This study evaluates the knowledge and attitude towards the new line drug in the middle belt of Ghana. The objective was to examine the knowledge and attitude to artesunate-amodiaquine in the Kintampo Districts.

Methods: A total of 6,472 households were involved. The Kintampo North and South Districts were divided into urban and rural areas. Data collection is on going and expected to end in June. However data for this abstract was collected between January and March 2008. Household heads or any knowledgeable adult member of the household from the Kintampo Health and Demographic Surveillance System (KHDSS) were interviewed. The data

collected was linked to the KHDSS datasets. KHDSS maintains a longitudinal database of individuals, households, and residential units. Updates on pregnancies, birth, deaths and migrations are done every six months. All questionnaires were checked and corrected for completeness and consistency. Data analysis was done using Stata 10. Frequencies, cross-tabulations as well as tests like the chi-square test were used to identify relationships between variables.

Results: Knowledge about the new drug was generally quite low (14.8%) and (14%) community members had used the drug. Knowledge of the new drug is much better in the urban (65.9%) compared to the rural community (34.1%). The new drug was mostly obtained from the health facility (86.3%) compared to chemical shops (13%). There is a positive attitude towards the new drug as most respondents (90.5%) expressed willingness to use the new drug the next time they have malaria again or administer it to their sick child.

Conclusions: There is lots of hope for the new drug policy once over 90% of the community members expressed the desire to use the drug whenever they or their children go down with malaria. However, knowledge about the drug was quite low.

Home management of fevers (malaria and pneumonia) in children under-five: a cluster randomized controlled trial in southern Ghana

Margaret Amanua Chinbuah

Dodowa, Ghana

Background: Many deaths in children under-five in developing countries are attributable to only five infectious diseases or a combination namely Acute Respiratory Infections (foremost pneumonia), malaria, diarrhoea, measles and HIV/AIDS. Despite advances in interventions for these diseases, initial declines in child mortality have slowed down. In Ghana, mortality in children under five mortality increased from 108/1000 live births to 111/1000 live births between 1999 – 2003 (2003 DHS). Fever is a common symptom for at least two of these major causes of death, malaria and pneumonia. Caregivers □ecognize fever early and initiate treatment which is often inadequate. Appropriate health seeking behavior is late; the transition from severe illness to death is often rapid and occurs at the home/community level. Efforts at community level are necessary to achieve a sustained impact on child survival. The Home Based management of Fever (HBMF) strategy designed to provide prompt effective care at the community level is used in this study to provide early effective treatment. The impact of HBMF on morbidity (parasite density, anaemia, behaviour change) or mortality in children under-five years will be assessed in this trial.

Methods: This study, implemented in the Dangme-West district uses data from the Demographic surveillance system to cluster communities into groups of approximately 100 children, randomizing them into 3 arms: standard-care, Artesunate-Amodiaquine only and Artesunate-Amodiaquine with Amoxicillin in the first year of the intervention. After a year, clusters in the standard-care arm were randomized into the intervention arms. Mortality is captured through the Demographic Surveillance System and the Community Key Informant system and morbidity data captured through surveys. Community Based Agents selected from communities and trained using IMCI material. Caregivers bring children U5 with a fever to the CBAs who assess children, counsel, treat uncomplicated fever and refer where indicated. Drugs are free and dispensed according to the intervention arm the cluster belongs to. CBA-caregiver consultations are captured on simple semi-pictorial forms and referrals on referral forms. *Conclusions:* The DSS provides a framework within which children can be followed up to evaluate outcome of illness, adverse reactions or compliance. The intervention is ongoing. Almost 2000 children have been managed by CBAs.

Theme 6:.Technological innovations in health and demographic surveillance

Development of spatial health data infrastructure (SHDI) at Vadu Health and Demographic Surveillance Site (HDSS, Vadu) using open source technologies

Anand Akmanchi, Vivek D. Gaikwad, Somnath Sambhudas, Sanjay Juvekar

Vadu, India

Background: Analysis of georeferenced public health information in Geographic Information Systems (GIS) is an important and exciting development. However, usage of commercially available GIS softwares is often unfeasible due to their prohibitive cost and restrictions on modifications to the source. There is a large collection of mature open source technologies available to build spatial data infrastructures. In this paper we present the development of prototype spatial health data infrastructure (SHDI) using open source technologies.

Methods: MySQL, which is a popular open source relational database management system with support for geographic features, is used to store spatial data in addition to HDSS Vadu data. It acts like a data warehouse and gives remote access to most current spatial and HDSS data. The SHDI houses census maps at village level containing approximately 200 demographic, amenities and land use parameters, detailed road maps for accessibility, household locations and associated HDSS data. In addition, a wealth of field collected location data for number of environmental variables like industries and their types, source of water, sanitary, medical, utility, waste disposal facilities that are not available in census are stored in the database. A custom user interface is developed to input the field collected location data using a global positioning receiver (GPS) as geographic features into the database. KosmoGIS, an open source GIS application developed by Sistemas Abiertos de Informacion Geografica (SAIG), Spain is used to view and analyze GIS and HDSS data stored in MySQL database. It gives freedom to choose information or layers/maps to see and synthesize maps on demand as per user requirements. It is also able to retrieve maps from remote web mapping service (WMS) servers to include in current view. The architecture of SHDI permits to visualize GIS-HDSS data as soon as it is input into the database, thus ensuring access to most current data. Another advantage is that MySQL database as well as KosmoGIS conform to OpenGIS standards thus allowing interoperability with other GIS and database applications in case need may arise.

Conclusions: We thus demonstrate a successful convergence of open source technologies for building a spatial health and demographic surveillance data infrastructure at Vadu site. This exercise would bring about dramatic change in the management of HDSS data from the field level for spatial analysis in particular.

The use of PDAs in longitudinal data collection

Dorean Nabukalu

Iganga/Mayuge, Uganda

Background: DSS sites usually conduct several rounds of longitudinal data. Most of this data is collected using paper forms. However, data collected using paper is associated with high costs of running the forms, bigger storage space, lack of on spot checks and editing among others. To limit these challenges, we have pioneered the use of PDAs as a cost effective tool for collection of longitudinal data.

Objectives: To investigate the potential of using PDAs for collection of longitudinal data in a DSS setting.

Methods: Updated data (HRB) was downloaded on each PDA through synchronisation between the server and the PDA. The PDA was then given to a trained interviewer ready for the routine DSS update round.

Results: Currently evaluation is ongoing, however preliminary data shows the following. The PDA introduction comes with many changes to the project organogram and composition of employee's e.g. There is no need for data entry clerks and new positions like PDA trouble shooters, computer based editors etc will be introduced. There will be need for additional training to PDA users. Battery life and data transfer from field to main server pause a big danger to PDA based system. The PDA system requires high initial investment, but it seems to be more economical over time as costs drastically drop. During the pre-test both the respondents and interviewers enjoyed the data collection exercise with very few respondent and interviewer related problems. Recommendations The PDA data collection systems are the way to go because the advantages seem to outweigh the disadvantages of using PDA/handheld computers. There is timely production of results; data collection is done with better and stricter field validations in place, which reduces on the call back rate.

Conclusions: The users and respondents preferences indicate that PDA based collection is acceptable and welcome in the DSS communities.

Scanning of DSS forms and use of PDA for special module: Matlab experience

Mr. A.H.M. Mustafa

Matlab, Bangladesh

Objective: A number of automation has been introduced to Matlab HDSS. In this article the authors discussed how technical innovations streamline HDSS data collection activities. The objective of this study are 1) to use DSS event forms for scanning, and 2) to use PDA for health data with more structured questionnaire.

Methods: During September-October 2006 we tested scanning technology for DSS data capture and Personal Digital Assistant (PDA) for Health data collection. First, the DSS data collection forms have been re-designed according to the formats of Form Reader Technology. Field workers were trained about how to fill up the forms. The scanner model is Kodak i40/1200 Duplex series, which can scan 35 PPM. The form reader software is ABBYY 6.5. A field-test has been done before going to implement in HDSS. Secondly, for PDA the data entry screen was developed for health data collection. Data collectors were trained about handling and entering data. The PDA model is hp iPAQ rx 1955 and the database is HandBase 3.0 Intervention: All DSS forms are now being scanned and data captured by data capture program. Data are collected by the CHRWs working in the DSS area, a total of 29000 forms are filled up annually by them. Moreover, a team of 5 CHRWs collect information on child morbidity using PDAs from selected samples.

Results: All the forms are scanned, read and verified within short period. There are three types or errors in reading data from forms by Intelligent Character Reader (ICR), namely warning errors, real errors and data definition errors. Only from 1% to 9% errors were detected. Most of the errors are in alphabet reading. This data was matched with oracle database to pick other information of the respondents. After the data collection the PDA are synchronized directly with PC to upload the collected data.

Conclusions: Scanning data capture system is faster, fewer errors and less human intervention is required. Digital image of the questionnaires now archived, which save the physical storage of storing forms. Also the image can be searched for verification using by a search engine developed by us. This system produce cleaned data for analysis with less cost of manpower and time. For PDA data collection no extra data entry personnel are needed. Data analysis can be done after few hours of data collection. PDA saves both time and cost of data management. Very few errors occur.

Transition from HRS2 to OPENHRS

Henry Mwanyika, Beno Narcis, Advocatus Kakorozya

Ifakara, Tanzania

Introduction: OpenHRS is an abbreviation for Open Household Registration System. For almost two decades the Household Registration System (HRS) has been used in most of the INDEPTH to assist researchers collecting household information from HDSS. This system enables researchers and all users in general to collect, store, manipulate and produce dynamic reports. To improve the performance of HRS, we are proposing OpenHRS, a system that we believe will transform the way researchers collect and analyze data in their respective demographic areas.

Objective: To develop an improved dynamic data model that will be implemented by using open source software's which will be flexible, easy to adopt and use. By using of metadata the system will have ability to create dynamic documentation of a data dictionary. Also to implement analysis files that will enable researchers to query history report of any household member.

Methods: From the collected user requirements in Rufiji and Ifakara DSS on the existing HRS, a new dynamic data model has been developed after reviewed the existing system. This will assist users in storing different types of information without having to require changes to the Data Model, any change that might occur in the study of household survey in future might not require users to migrate to a new data model. Change the application from Foxpro desktop application to Web based PHP, MySql platform. This will increase the remote system accessibility and Data centralization hence other developers might as well be able to access actual code for further development, Quality Assurance and Quality Control. Create an improved searching of information, a modified printing of Household Registration Books and a friendlier format for reporting of demographic rates. OpenHRS will affect both the Data Model and Front-End User Interface. OpenHRS will be simple to use, easy to learn and keep an audit trail of the changes made to the existing data. Implementation of the new dynamic Data Model will make the system more flexible to addition of new special studies and documentation of metadata for the studies. The new system will be a web based application using open source software's to develop and it will be based on open source application to reduce cost and also other developers can modify the code and contribute to any changes or customization.

Theme 7: Clinical trials and strengthening health and demographic research capacity in developing countries

Modeling the potential impact of pneumococcal conjugate vaccine on mortality in a rural district in Kenya

Jennifer Moisi

Kilifi, Kenya

Background: Pneumococcal conjugate vaccines (PCV) are safe and effective against childhood pneumonia and invasive pneumococcal disease. Moreover, PCV9 reduced 3-29 month-old mortality by 16% in a vaccine trial in the Gambia. Kenya has applied to GAVI for introduction of PCV7. The impact of the vaccine on mortality will depend on whether children most at risk of pneumococcal disease and death are adequately reached by immunization services.

Methods: We created an age- and location-stratified model of PCV impact on mortality in Kilifi District, Kenya, a poor, rural district typical of sub-Saharan Africa. The age distribution of pneumococcal deaths (¦Â(k)) was obtained from Kilifi District Hospital. The Kilifi Demographic Surveillance System (DSS) provided the geographic distribution of all 3-29 month-old deaths (¦Ã(L)). Age and location-specific coverage with 1 and ¡Ý2 doses of pentavalent vaccine (C1(k, L) and C2(k, L)) were estimated from a 2007 immunization coverage survey including 2128 children. Individual direct efficacy of PCV7 (VE) against 3-29 month-old mortality was assumed equal to 9% for one dose and 12% for two or more doses. Vaccine impact was calculated as: VI = ¦²k ¦²l {¦Â(k) ¦Ã(L) [0.09 C1(k, L) + 0.12 C2(k, L)]}

Results: Of 105 observed IPD deaths in 3-29 month-olds, 23.8% occurred before 6 months of age and 61.9% before 12 months of age. Location-specific vaccine coverage ranged from 91-100%, 95-100% and 95-100% at ages 3, 6 and 12 months, respectively, for 1 dose; and from 54-95%, 89-98% and 94-99% for 2 doses. Depending on the location, vaccine impact on mortality attained 11.4-11.8%. Vaccine impact for the DSS was estimated at 11.6%.

Conclusions: Coverage with pentavalent vaccine had limited geographic variability in the Kilifi DSS. Most children were vaccinated early in life, maximizing the potential impact of pneumococcal conjugate vaccine on child mortality.

Marked decline in childhood mortality in the western Kenya DSS: Evidence from longitudinal data, 2003-2007

Kubaje Adazu, Mary Hamel, Daniel Feikin, Peter Ofware, David Obor, Shiela Ogwang, Vincent Orimba, John Vulule,Laurence Slutsker, Kayla Laserson

Kisumu, Kenya

Background: For over a decade, the high child mortality rates in western Kenya declined only modestly, from 257 deaths among children less than 5 years per 1,000 live births in the early 1990s to 227 deaths per 1,000 live births in 2002. Recent data, however, have shown a remarkable decline in both infant and under-five mortality since 2003. We investigated yearly changes in all-cause and cause-specific child mortality from 2003 to 2007.

Methods: We used data on births, deaths, verbal autopsy, and duration of residence from the KEMRI/CDC Demographic Surveillance System (DSS) from 2003 to 2007 and life table techniques to compute annual infant death rates, under-five survival probabilities, and life expectancy at birth. We then used the period rates to assess trends in all-cause and cause-specific mortality.

Results: The data showed a sharp decline in childhood mortality. The overall infant mortality rate for the area dropped from 131 deaths per 1,000 live births in 2003 to 74 deaths per 1,000 in 2007, a 43.5% drop in five years. Both neonatal and post-neonatal mortality declined, from 26 and 105 in 2003 to 19 and 58 deaths per 1,000 live births in 2007, respectively Similarly, under-5 mortality declined by 42.7%, from 239 to 137 deaths per 1,000 live births during the same period. Consequently, life expectancy at birth increased from 38 years (36 for males and 40 for females) in 2003 to 49 years (48 for males and 51 for females) in 2007. Although verbal autopsy data showed malaria and pneumonia remained leading causes of death among children age 1-59 months throughout these years, there was a decline of 16% and 58% in the cause-specific rates of mortality for these diseases, respectively. There was however 23% increase in the cause-specific mortality rates for neonatal sepsis, the leading cause of neonatal mortality, from 11 to 13 deaths per 1,000 in the period under review.

Conclusions: Child mortality decreased markedly and significantly between 2003 and 2007, mostly due to a decline in deaths associated with pneumonia and malaria. Further analysis is ongoing to assess factors contributing to this decline

Trends in child mortality in the era of HIV in Magu DSS, Tanzania

Ms. Milly Marston

Magu, Tanzania

Background: Between 1994 and 2004 in Magu DSS, HIV prevalence rose from 6% to 8%. HIV affects child mortality in two main ways: biologically through mother to child transmission and socially, through the welfare consequences of illness and death of a parent. Children and parents can be linked in the Magu DSS database, allowing investigation of the influence of parental factors on child survival.

Objective: To analyse trends in child mortality over time and by basic background characteristics such as sex, place of residence, age of mother at birth, HIV status of the mother at birth and subsequent survival of mother, allowing for possible measurement biases due to variable interval length between DSS rounds.

Methods: Lifetable methods were used to calculate child mortality. Poisson regression was used to look at the differences in hazard rates adjusting for background characteristics. Intervals between DSS rounds were divided into long and short intervals and modeled to assess possible biases in the estimation of infant mortality. Results There was a steep and continuous decline in child mortality between 1994 and 1999 with child mortality (probability of dying between first and fifth birthday) falling from 6.8% to 4.8%. Subsequently child morality remained fairly stable, by 2005 it was 4.4%. However mortality of children whose mothers were not infected with HIV at the time of their birth continued to fall, reaching 3.4% by 2005. A Poisson regression model gave an adjusted hazard ratio of

2.6 when comparing the mortality of children whose mothers were infected with HIV at the time of their birth compared to those of uninfected mothers. With respect to infant mortality, there was some evidence of measurement bias, with higher mortality seen in time periods in which DSS rounds were more frequent. Mother's survival had a stronger impact on infant mortality than on child mortality.

Conclusions: The maturing HIV epidemic has halted the secular decline in child mortality that was evident up to 1999. Antiretroviral treatment has only become available in Magu from 2005 therefore gains from decreased mother to child transmission or longer survival of parents have not yet been observed.

Childhood mortality: Progress towards MDG4 – Ifakara 11 years estimates

Rose Nathan, Angelina Lutambi and Mathew Alexander

Ifakara, Tanzania

Background: Reduction of Childhood mortality is currently among the most critical issues in the national and international agenda. Countries are striving to achieve the set millennium Development Goal of reducing underfive mortality by two thirds by 2015.The reference year is 1990, in that year Tanzania had UMR of 141 deaths per 1000 live births. HDSS sites have unique potential to monitor progress on that particular gaol on annual basis. We present here the trend of under-five mortality over a period of 10 years in the Ifakara HDSS population and attempt to predict whether the goal will be attained in 2015.

Method: We used data from the HDSS to estimate annual under-five mortality rates (5q0) for a period of eleven years (1997-2007). We estimated trends in under-five mortality from 1997 to 2007 by fitting Lowess regression of the natural log of under-five mortality with bandwidths ranging from 0·25 (high sensitivity to recent data) to 0.50 (low sensitivity) and forecasted this trend for mortality from 2007 to 2015 with the same range of bandwidths.

Results: Under- five mortality rate (5q0) in Ifakara HDSS site in 1997 was 141 per 1000 live births and 99 per 1,000 live births in 2007, thus a reduction of 30%. However, gains from year to year were very variable and in some years negative gains were observed. The most recent trend showed an accelerated decline, between 2003 and 2007, reduction was 34%. The plots of smoothed regressions of the mortality data with extrapolation to 2015 indicated that the Ifakara HDSS population will be some few years behind the attainment of MDG4 if the current rate remains the same.

Conclusion: Ifakara HDSS population is unlikely to achieve MDG4 if the current trend is not accelerated.

Surviving chances of neonates: Does place of delivery matter?

Rose Lema

Ifakara, Tanzania

Background: In recent years health of a newborn has increasingly received renewed focus as a critical issue in child survival. It has become clearly evident that a large proportion of child deaths occur during neonatal period and thus the goal of reducing underfive mortality by two thirds by 2015 is unlikely to be achieved if neonatal survival chances do not improve. Delivery by trained personnel has shown to have an impact in improving newborn survival. We are using DSS longitudinal data to examine the role of the place of delivery in neonatal survival where about 60% of all deliveries happen at health facilities.

Methods: We used the DSS database to identify live births that happened between 2005 to 2007 to calculate neonatal mortality and some associated factors. Cross tabulations and logistic regressions were used to examine associations. We controlled for confounders by adding such factors into the logistic model. The factors controlled for included, age of the mother, parity, maternal education, household socio-economic status and pregnancy status (multiple or single) and sex of the child.

Results: A total of 2952, 2992 and 2925 live births were recorded in the DSS population in 2005, 2006 and 2007 respectively. Of all the live births 5310 (59.9%) were born in health facilities. Over 40% of all neonatal deaths occurred within the first day of life. Neonatal mortality rates were 35.2, 34.1 and 31.8, per 1,000 live births in 2005, 2006 and 2007 respectively. Comparison of yearly neonatal rates between children born at health facilities (HF) and those born elsewhere (EW) showed that they were statistically similar (in 2005, 36.8 (HF) and 32.9(EW), $p>0.05$; in 2006, 35.6 (HF) and 31.9 (EW), $p>0.05$ and in 2007, 33.3 (HF) and 29.4 (EW), $p>0.05$). Adjusted odds ratios indicated that children born at health facilities were 1.1 times more likely to die at neonatal period compared to those born elsewhere (OR=1.1, 95% CI 0.7-1.7). Only two factors appeared as predictors for neonatal death, multiple births and parity of over 6 children.

Conclusions: Neonatal mortality is still very high in the study area. Neonates born at health facilities are equally likely to die just as those born elsewhere. These findings are contrary to the expectations and findings from other similar settings and rise questions about quality of services provided at the health facilities.

Sex-differential effect on infant mortality of oral polio vaccine administered with BCG at birth in Guinea-Bissau. A natural experiment

Dr. Benn Christine

Bandim, Guinea-Bissau

Background: The policy to provide oral polio vaccine (OPV) at birth was introduced in low-income countries to increase coverage. The effect of OPV at birth on overall child mortality was never studied. During a large trial of vitamin A supplementation (VAS) at birth in Guinea-Bissau, OPV was not available in several periods. We took advantage of this "natural experiment" to test the effect on mortality of receiving OPV at birth.

Methods: Between 2002 and 2004, the VAS trial randomised normal-birth-weight infants to 50,000 IU VAS or placebo administered with BCG. Provision of OPV at birth was not part of the trial, but we noted whether the infants received OPV or not. OPV was missing during several periods in 2004. We used Cox proportional hazards models to compute mortality rate ratios (MRR) of children who had received or not received OPV at birth.

Results: A total of 962 (22.1%) of the 4345 enrolled children did not receive OPV at birth; 179 children died within the first year of life. Missing OPV at birth was associated with a tendency for decreased mortality (adjusted MRR=0.69 (95% CI=0.46-1.03)), the effect being similar among recipients of VAS and placebo. There was a highly significant interaction between OPV at birth and sex ($p=0.006$). Not receiving OPV at birth was associated with a weak tendency for increased mortality in girls (1.14 (0.70-1.89)) but significantly decreased mortality in boys (0.35 (0.18-0.71)). Interpretation OPV at birth had a sex-differential effect on mortality. Poliovirus is almost eradicated and OPV at birth contributes little to herd immunity. A randomised study of OPV at birth on overall mortality in both sexes is warranted.

Thirty five years trend in Infant Mortality Rate, Ballabgarh DSS: lessons learned and future strategies.

Kapil Yadav and K. Anand Palanivel

Ballabgarh, India

Backgound: India has set a target of IMR less than 28 per 1000 by year 2015 as per MDG goals. Current IMR is 57 per thousand (2007) and looking at trends from past India is unlikely to meet its MDG goal. Ballabgarh DSS has historically had a lower IMR as compared to rest of Rural India. IMR has halved from 100.9 in 1972 to 49.5 in 2006. But in recent year this decline in IMR for Ballabgarh DSS has plateaued and has hovered around 50 per thousand for last 15 yrs. Moreover, the gap between national IMR levels and Ballabgarh IMR has been narrowing.

Objective: Inability to reduce IMR further at Ballabgarh DSS for last one decade. This stagnation may be reflective of threshold of reduction in infant mortality that can be achieved by health system/or socio-economic development alone. Moreover this stagnation in reducing IMR at Ballabgarh may portend similar trend nationally in future. Thus there is need to identify the determinants of this stagnation and explore innovative strategies to overcome them.

Methods: Surveillance for Demographic, Environment and Health Information (SUDEHI) was introduced in year 2001-2002 to collect information on behaviour related to health with maternal and child health (MCH) as one of the domains.

All households in DSS were covered and the annual birth cohort of 1900 children was taken for MCH section. The results of first survey were that only 45% took Iron & Folic acid during pregnancy, 74% children were given pre-lacteal feeds, in 49% cases breast feeding initiated after 4 hrs and 27% children were still bottle fed. All deaths are registered and verbal autopsy carried out to ascertain cause of death. Interventions undertaken: Ballabgarh DSS initiated several new measures focusing on community participation, Information, Education and Communication (IEC) strategies targeting behaviour change. The strategies included Community outreach programmmes and organizing periodic Village health days, constituting and operationalising Village health committees. Newly married couples, pregnant and lactating women were specifically targeted. In future additional steps like involvement of unqualified rural medical practioners (RMPs) in health care delivery, use of information technology is also planned. The effectiveness of interventions will be measured by monitoring behaviour change and by observed decline in IMR levels and causes.

Conclusions: Behaviour change and enhanced community involvement and not mere socio-economic development and up-gradation of health care delivery system might be required to achieve further reduction in IMR.

Does place of delivery affect neonatal mortality in Rufiji in rural Tanzania?

Justice Ajaari, Honorati Masanja and Renay Weiner

Kintampo, Ghana

Background: The fourth MDG calls for a reduction of child mortality. While there has been significant progress in reducing deaths among children less than five years of age over the past decade, there has been little or no progress in neonatal mortality. Neonatal mortality accounts for almost 40% of under five mortality. It is therefore extremely important to make available the much needed epidemiological information regarding the time and place of neonatal deaths which will enable greater attention to be given to policies regarding child health. Objective: To investigate the relationship between neonatal mortality and place of delivery in Rufiji in rural Tanzania.

Methods: Data from the Rufiji Demographic Surveillance System (RDSS), Tanzania, was used for the analysis. A total of 5,124 live births and 166 neonatal deaths were recorded from 1st January, 2005 to 31st December, 2006. Place of delivery and place of death was categorized as either health facility or outside health facility. Neonatal

mortality rates were calculated by dividing the number of neonatal deaths to the total number of live births and multiplied by 1,000.Univariate and Multivariate Logistic Regression models were also used to assess the association between neonatal mortality and place of delivery and maternal risk factors while adjusting for potential confounders.

Results: Two third of neonatal deaths occurred during the first day of life 111 (66.9%).The highest neonatal mortality rate of 43.4/1000 live births also occurred in out-side health facility deliveries/births while the least neonatal mortality rate of 27.0/1000 live births occurred in health facility deliveries/births. The overall neonatal mortality rate was 32.4/1000 live births.Mothers who delivered out-side health facility were 1.6 times more likely to had experience neonatal mortality [unadjusted OR=1.6, P-Value = 0.002, 95%CI (1.2, 2.2)] compared to mothers who delivered in health facility and this was statistically significant. But after adjusting for maternal risk factors, mothers who delivered out-side health facility were 1.7 times more likely to had experience neonatal mortality [adjusted OR=1.7, P-Value = 0.002, 95%CI (1.2, 2.4)] compared to mothers who delivered in health facility and this was statistically significant.

Conclusions: Place of delivery is a significant predictor of neonatal mortality. Education is needed to encourage pregnant women to deliver at health facilities to reduced early neonatal deaths.

Theme 9: Measuring Health inequalities using HDSS data: challenges to achieving convergence

Socio-economic status of household as a correlate of under-five mortality in Rufiji DSS, rural Tanzania

Cornelius Nattey, Honorati Masanja and Kerstin Klipstein-Grobusch
Dodowa, Ghana

Background: Sub- Saharan African countries are confronted with myriads of problems in their efforts towards development. Prominent among them are diseases, poverty, illiteracy and armed conflict. Diseases like malaria, pneumonia, measles and diarrhoea are the major causes of under-five mortality in Sub Saharan Africa. The child mortality is good indicator of child health and survival. It can also be viewed as an indicator of overall development, since it reflects the social, economic, and environmental conditions in which children live, including their health care. Available evidence suggests a close association between household socio-economic status and under-five morbidity and mortality in Sub-Saharan Africa.

Objective: To investigate the relationship between household socio-economic status and under-five mortality at Rufiji DSS in year 2005

Methods: Data from Rufiji DSS, Tanzania was used for the analysis. A total of 11,189 children less than five years of age from 7298 households out of which 251 died in the year 2005, yielding a total of 9341.57 PYO for year 2005 were used in the analysis. Household wealth index was constructed by the use of principal component analysis, as a proxy measure of each household socio-economic status. From this index households were categorized into five quintiles. (i.e. , poorest, poorer, poor, less poor and least poor). Risk factors of child mortality were assessed using Poisson regression in the univariate model. Multivariate Poisson regression adjusted for maternal education, maternal age and maternal occupation.

Results: In univariate Poisson regression analysis, Children in the least poor households have 58% reduced risk of dying as compared to the poorest households [unadjusted RR=0.42, P < 0.001, 95% CI (0.27 - 0.62)]. The effect of household socio-economic status attenuated after adjusting for maternal education, maternal age and occupation. Children in the least poor households have 52% reduced risk of dying as compared to the poorest households [adjusted RR=0.48, P = 0.002, 95% CI (0.30 - 0.80)].

Conclusions: Results from this study suggest a strong relationship between household socio-economic status and under-five mortality. Reducing poverty and making essential health services more available to the poor are critical to improving overall childhood mortality.

Monitoring Equity in Health by Using HDSS: Experience from Chakaria, Bangladesh

Bhuiya Abbas

Chakaria, Bangladesh

Background: Quite often the monitoring of equity in health even in places with HDSS is dependent on periodic censuses when SES data are collected. This strategy is not very helpful to generate data to make programmatic interventions to tackle inequity in a timely fashion. In addition, HDSSs have a tendency of presenting only community based data not taking their advantage in monitoring equity in the utilization of the facilities situated in

the HDSS area. It has been found in the Chakaria HDSS that with some extra efforts HDSS can be very useful in generating yearly data on the status of equity in health and utilization of health care services.

Methods: This paper will present findings and experiences in monitoring equity in health and utilization of health care services as has been used in Chakaria HDSS.

Results: The findings from the household data revealed that child mortality has been moderately inequitable with more deaths among the poor compared to better off and fertility is relatively more equitable. The utilization of safe motherhood services has been persistently the most inequitable with almost 15 fold low utilization among the poorest compared to the richest. Findings from the monitoring of the utilization of the facilities revealed that the government facilities are used by the poorest more than the private facilities. It was found that the equity monitoring at the facility level can be done by using reasonably small sample sizes not exceeding 50 in most circumstances.

Evaluation of the impact of social-economic status on child mortality over time.

Francis Levira

Rufiji, Tanzania

Objective: The study has two specific objectives, first to investigate how the mortality burden distributed among the poorest and least poor household in the general population, and specifically on the infant and under five year's old children over time. Second, was to investigate the impact of changes in social economic status on the mortality rates over time.

Methods: Death events were collected from routine Rufiji HDSA on two time frame 1999-00 and 2003-04 and corresponding SES data at the end of each time frame. Routine DSS data was processed and analyzed using HRS software and principal component analysis (PCA) using Stata 9.0 to estimate an index as a proxy indicator for household social economic status. Concentration index and related curve was used to quantify the income related inequality on child mortality in a specific time frame. Trend test (logistic regret ion) was used to measure the significant of trend in mortality across social economic status and time frame.

Results: A total of 2003 and 1739 death events were collected during 163,373 and 184,045 person-years of observation between 1999-00 and 2003-04 respectively. In 1999-00 SES was significantly associated with general population mortality (p=0.0001), infant mortality (p=0.025) and under five mortality rates (p=0.044). In 2003-04 there were no significant association between SES and general population mortality (p=0.184), infant mortality (p=0.093) and significant association for under five mortality (p=0.004). Concentration index changes from -0.0627 to -0.0668 for infant mortality and from -0.0476 to -0.0845 for under five mortality between 2000 and 2003 respectively. This shows that the infant and under-five mortality burden has been increased to the poor over time. There were no significant deference in infant (p=0.44) and under-five (p=0.469) mortality between household move to higher quintile, remain in the same quintile and drop to lower quintile.

Conclusions: The findings show that mortality burden has been accelerated to the poor from time to time as a result of poor redistribution of resources and health intervention in the society. This calls for more proper allocation of recourses and health delivery system that will target the general population rather than those who are well off.

Theme 10: MIXED BAG - abstracts that dont fit 1-9 above

Seasonal pattern of pneumonia mortality among under five children in Nairobi informal Settlements

Yazoume Ye, Maurice Mutisya, Benedict Orindi, Jacques Emina, Alex Ezeh and Eliya Zulu

Nairobi, Kenya

Background: Acute Respiratory Lower Infection (ALRIs- pneumonia, bronchiolitis and bronchitis) are among the major killers of children below five years in SSA. Most of the deaths are due to pneumonia. However, little is known about the seasonal pattern of mortality due to pneumonia among children living in sub-Saharan Africa's urban informal settlements, characterized by poor and overcrowded living conditions.

Objectives: Using a longitudinal data generated by the Nairobi Urban Health and Demographic Surveillance System (NUHDSS) we investigate the seasonal pattern of mortality due to pneumonia among children less than five years living in Nairobi's informal settlements.

Methods: The NUHDSS collects data on core demographic events (birth, death, and migration) every four months among the population of two Nairobi slums since 01.01.2003. 17,787 children below five years resident in the NUHDSS from 01.01.2003 to 31.12.2005 were included in the analysis. A total of 436 deaths were observed during this period and cause of death was ascertained by verbal autopsy for 363 of these. Using Poisson regression and controlling for sex, age, and calendar year, we model the quarterly mortality risk for all causes and for pneumonia among children below five years.

Results: The overall person years (PYs) were 21,804.5 giving a death rate of 20.1 per 1000 PYs for study participants. Pneumonia was the leading cause of death contributing 26.7% of the total deaths with kwown cause of death. The all cause mortality was significantly higher in the second quarter of the year compared to the fourth quarter (RR=1.8, CI: 1.3-2.3). Similarly mortality due to pneumonia was particularly high in the second quarter (RR=2.3, CI: 1.2-4.2)

Conclusions: Reliable estimates of disease specific burden among disadvantage populations such as slum dwellers are essential for well targeted health interventions to achieve maximum impact. Unfortunately, such estimates are lacking where they are needed most. The study provides evidence of high mortality due to pneumonia among under-fives in Nairobi's slums. This mortality is particularly high during second quarter (April-June) of the year corresponding the rainy season and the beginning of the cold season (June-September). Interventions to tackle pneumonia should target children during this period.

Sexually transmitted disease prevention: knowledge, attitudes, and practices among school pupils in rural Ghana

Duong Le Quyen

Filabavi, Vietnam

Background: STD-prevention education programs for adolescents should take into account sex differences. However, limited data are available on how adolescent boys and girls differ in knowledge, attitudes, and practices regarding STD prevention. This study was conducted to examine sex differences in the Kassena-Nankana district, Ghana.

Methods: Secondary data analysis of a cross-sectional KAP survey of sexual and reproductive health conducted among junior secondary school pupils in the Kassena-Nankana district in 2005. Responses from 3,011 schoolboys and 3,214 schoolgirls aged 10 -19 years were analysed using StataTM version 9.0 software.

Results: The study found that all school pupils had unsatisfactory knowledge about STDs, although boys tended to be more knowledgeable than girls. In terms of attitude towards condom use, a higher percentage of boys (70%) felt confident about insisting on condom use whenever they have sex compared with girls (61%). However, boys were more likely to be involved in sexual risk behaviors than their female counterparts. Eighteen percent of boys and 8% of girls reported being sexually experienced. Boys started having sex earlier than girls (at 14.5 years compared with 15.1 years). Sixty-two percent of boys had ever had sex with two or more sexual partners compared with 32% of girls. The average number of lifetime sexual partners of boys and girls was 4.2 and 2.5 respectively. The percentage of youth reporting non-use of condoms during the last sexual intercourse was higher in boys (37%) than in girls (29%). Differences between boys and girls were observed in the association of knowledge and attitudes regarding STD prevention with sexual activities.

Conclusions: Results from the study show sex differences in knowledge, attitudes, and practices regarding STD prevention among school pupils. This underlines the need for specific STD-prevention education programs for each sex. Some suggestions on how to design these programs are provided.

Combating disease and promoting health through the incorporation of a social science approach in Demographic Surveillance Systems

Margaret Gyapong

Dodowa, Ghana

Background: Globalization and global movements of people over the last two to three decades have resulted in rapid demographic and social transformations. The implications of this on the general well being of individuals and the "community" are a challenge to monitor. However the ability to determine desirable outcomes and optimal policies to achieve these outcomes is hampered by the lack of understanding of the fundamental ways in which individuals within a given context, interact with their physical, social and cultural environments.

Demographic Surveillance Systems which track populations over time are able to provide data for planning towards meeting the Millenium Development goals which have specific targets and are time bound. Three of the eight Millenium Development Goals relate directly to health but health inter connects with the other goals which focus on poverty and hunger, education, gender the environment, science and Technology and water and sanitation and it is necessary to address the complex social and economic and political issues if the MDG's are to be met on time.

Having a mix of the broad social science disciplines and the different data collection techniques they bring to bear can go a long way to enhance data collection and utilization in these sites which collect data from all populations in the Demographic surveillance area twice, thrice or four times a year. Questions that have been asked in the Dodowa DSS are as follows.

- What factors constrain people's access to medical knowledge and effective health care?
- How do publicly subsidized services interact with household coping mechanisms?
- What are the best strategies for the public sector to employ in scaling up cost-effective health interventions?
- How can people become informed consumers and citizens who take responsibility for their own health and exert a positive influence on health systems?
- What information do governments need about patterns of poor peoples illness and social economic and institutional circumstances to select the most appropriate arrangements to protect them from falling into extreme poverty.

Information derived from these questions has been disseminated and utilized at district level for planning for various health interventions and for Local government activities.

Factors conveying resilience in the context of urban poverty: the case of orphans and vulnerable children in the informal settlements of Nairobi, Kenya

Dr. Jean Christophe Fotso

Nairobi, Kenya

Background: One of the many crises caused by the soaring rates of HIV and AIDS prevalence in sub-Saharan Africa in the last decade is a sharp rise in the number of orphans and other vulnerable children (OVC). There have been relatively few studies in Africa on the impact of orphanhood on the more social and emotional and psychosocial aspects of well-being. The aim of this presentation is to provide evidence to inform current and future policy and practice initiatives for OVC welfare in poor urban areas.

Methods: From the Nairobi Urban Health and Demographic Surveillance System (NUHDSS), 1,202 orphan children aged 6-14 years were identified. A random sample of 1,202 non-orphan children was selected from the NUHDSS data, for a total sample of 2,404. The dependent variables are 1) The Index of Care: Measured by questions relating to treatment seeking behavior, discipline, guidance and protection issues. 2) The index of affect: Measured by questions relating to social relationships, emotions and general mood. The predictors are age, sex, orphan status (Non-orphan; Father-only orphan; Mother-only orphan; Double orphan), time since death of parent(s), household wealth, education of the household head, ethnicity, household amenities, number of children and siblings in the household, and geographical location. Multilevel linear models are used.

Results: Children who were double orphans had significantly lower Care index, but no differences were recorded in reported affect (social relationships or emotions and mood). Both indices were significantly associated with other childhood and household level characteristics, attesting to the sensitivity of the measurement instruments. The

most consistent association with outcome was with location of residence; with the experience of orphans varying by community.

Conclusions: Provision for support in aspects of care that include guidance and discipline for orphaned children living in the communities of interest should be targeted in the main at double orphans. Orphaned children display a relative resilience in regards to their emotional coping mechanisms. There is a pressing need to understand underlying differences between the two communities to understand the source of resilience experienced by orphans in Viwandani.

High Prevalence of Bidi (hand manufactured cigarette) use in a North-Indian Community

Gupta Vivek

Ballabgarh, India

Background: In India, the focus of tobacco control activities has been mainly on manufactured cigarettes. Other forms of tobacco have been largely ignored. We hypothesized that other forms of smoked and smokeless tobacco consumption might actually be more common, especially in rural areas, which is over 70% of India's total population. This was studied in a cross-sectional survey conducted using the WHO- STEPs protocol, in Ballabgarh Block, Haryana, India.

Methods: The survey was conducted on a sample of 7891 individuals between 15-65 years of age. Sample was stratified by age-groups, gender and residence (rural, urban slums and urban). The sample was selected using multistage systematic random sampling with approximately 250 respondents in each age-gender-residence group. Direct-standardization was done against the WHO Reference population.

Results: Among rural males, 52.6% were consuming tobacco daily in one form or another, compared to 48.3% of males in urban-slums and 35.5% of urban males (p value <0.05). Smoking was the common method of tobacco use in males: 25% daily smoking in urban, 41% in urban-slums and 47.9% in rural. Among rural females, 16.5 % were smoking tobacco daily, against 9.1% of urban-slum females and 2.2% of urban females. Bidi (tobacco wrapped in temburini leaf) emerged as the major smoked form of tobacco used by daily smoking males: urban 17.8% prevalence, urban-slums 36.7%, rural 44.6%. This was much higher than prevalence of manufactured cigarette use (males); urban 9.6%, urban-slums 6.3%, rural 2.9%. Females using smoked tobacco were almost exclusively using bidis (urban 1.7%, 7.9%, 11% in rural). Prevalence of daily chewed tobacco use had an urban - urban-slum - rural gradient in males: 12%, 10.5% and 6.8% respectively whereas its use was low in females.

Conclusions: These results have implications for the anti-tobacco policies of India and show that considerable more attention is required on bidis in anti-tobacco campaigns than is currently the case. The program activities must also find ways to reach the rural and slum populations in view of high prevalence observed in these groups.

Changes of Residential Distribution of Migrants in KDSS

Jampaklay Aree

Kanchanaburi, Thailand

Background: The influx of migrants to Thailand, especially from neighboring countries beginning in 1990s, has been a concern to the Thai government and to the Thai population. Levels of migration to Thailand are likely to increase and immigrants are inclined to settle for lengthy periods or permanently. Previous analysis suggests that economic prospects of migrants in Thailand do not progress at the same pace compared to the local Thais. With specific to KDSS, data indicates that migrants' residence is consequential on migrants' wellbeing and that migrants are better off when they mix with locals. While the proportion of migrants is remarkable in many communities, little is known about the distribution of migrants' residence and how it has been changed over time. Nor we know much about the nature of communities with high and low levels of international migrants. In order to develop appropriate policy for handling immigrants issue effectively, especially to mitigate left-behind economic prospects among migrants, we need to equip with understanding about migrants' settlement especially its change over time.

Methods: This paper uses KDSS data, annually collected in 100 villages throughout Kanchanaburi since 2000 to 2004, to examine changes of migrants residential distribution throughout 100 villages in KDSS, Thailand during 2000 to 2004.

Results: Preliminary results show that between 2000 and 2004, the proportion of migrants at village level ranges from 0% to 40% in 2000 and from 0% to 70% in 2004. More than one third of villages (37 from 100) in the study site experience an increase in the proportion of international migrants during 2000 to 2004. While the volume of migrants does not increase much (from 6% in 2000 to 7% in 2007), migrants may change their residence within the study site.

Conclusions: We further intend to explore differences in village characteristics of villages with low, moderate and high levels of migrants. Over 5-years period, we will also explore characteristics of villages that gain migrants, of villages that lose migrants, and of villages where the proportion of migrants remain the same. We hope that our findings will help local organizations responsible for residential planning well prepared in migration management.

Food security determination using HDSS: a case of Rufiji, Tanzania

Kim A. Kayunze, Eleuther A. Mwageni, and Gaspar C. Ashimogo

Rufiji, Tanzania

Background: There are various methods of determining food security, but there is scanty agreement on which of them is the best one.

Methods: Household self-appraisal, numbers of meals eaten per day, amounts of grains obtained per capita and per adult equivalent (through production, buying, and receiving grains freely), dietary energy consumed per capita per day (based on one week's data, 30 days' data and one year's data), and dietary energy consumed per adult equivalent per day (based on one week's data, 30 days' data and one year's data) were used to determine food security in Rufiji District Tanzania during the 2005/2006 agricultural season, with the objectives to: a) describe methods of food security determination, b) determine food security status and c) compare levels of food security obtained using various methods of food security determination.

Results: Results reveal that the method based on dietary energy consumed per adult equivalent per day based on 30 days' data gave the best results. Dietary energy consumed per capita per day based on any time duration could be the best method if the minimum consumption norm is very realistic.

Conclusions: It is recommended that food security determination based on dietary energy consumed per capita per day should be used more than other methods to determine food security since it is more objective as the number of individuals on which it is based (per capita) is more objective to measure, unlike using dietary energy consumed per adult equivalent per day, which relies on adult equivalents units, the determination of which is less objective.

The burden and incidence of invasive pneumoccocal disease among hospitalized adults in Kilifi, Kenya

Lena Matata, C. Ondieki, M. Mutinda, B. Mambo, R. Gachiri, E. Ohuma, H. Gatakaa, A. Mohammed, J. Jomo, J.A.G. Scott

Kilifi, Kenya

Background: Kenya will introduce pneumococcal conjugate vaccine into routine childhood immunization in the next year. In America this led to herd protection of adults against invasive pneumococcal disease (IPD). We estimated the hospital burden, serotype distribution and incidence of IPD among adults in Kilifi, Kenya

Methods: All acute adult patients underwent Bac-Tec blood cultures on admission. Patients with signs of meningitis underwent lumbar puncture. CSF and sub-cultures were done on 7% blood agar. Pneumococci were serotyped by Quellung. Incidences were calculated among residents of the Kilifi Demographic Surveillance Study.

Results: From January-April 2008 there were 2565 eligible patients and 1604 consented. 124 patients had positive blood cultures (84 from Kilifi DSS), 13 had positive CSF cultures. Of 455 patients with urine antimicrobial activity 35 (8%) had positive cultures. Twenty-five (20%) of patients had IPD; 11 were male. Commoner pneumococcal serotypes were 1 (n=3), 5 (3), 19F (3) and 38 (3). Twenty patients with IPD were from Kilifi DSS. 17 of the 20 were HIV seropositive. 7 of the 17 died; one of three HIV seronegative patients died. Of 84 patients with invasive bacterial disease, 46 were HIV seropositive and 24 died, 38 were HIV-seronegative and 8 died. Annual incidence of IPD per 100 000 people (adjusted for refusals) among HIV seropositive and seronegative admissions was 276.8 and 3 respectively (rate ratio=91.9). For IBD it was 747.2 and 38.3 respectively (rate ratio=19.6). Other organisms included 27 Staphylococcus aureus, 21 Escherichia coli, 14 beta-haemolytic Streptococci, 9 non-typhi Salmonella, 8 Salmonella typhi, 7 Klebsiella pneumoniae, 3 Pseudomonas aeruginosa, and 15 others.

Conclusions: Pneumococci cause 20% of invasive bacterial disease in adults and the mortality is 36%. Majority of cases occur among HIV positive individuals and most are caused by non-vaccine serotypes (68%).

Subjective quality of life and its correlates among older adults in rural Vietnam and Indonesia

Hoang Van Minh, Nawi Ng , Peter Byass and Stig Wall

Filabavi, Vietnam

Background: Subjective quality of life and its correlates among older adults in rural Vietnam and Indonesia Vietnam and Indonesia, two developing countries in Southeast Asia, are undergoing demographic transition and experiencing the aging of populations. To date, little attention has been paid to the measurement of SQOL in older adults in these countries. This paper, taking advantage of the WHO/INDEPTH study on global ageing and adult health aims to assess subjective quality of life at its correlated among older adults in rural communities of Vietnam and Indonesia.

Methods: The study was carried-out in the Bavi DSS (FilaBavi) in Vietnam and in Purworejo DSS in Indonesia. All the people aged 50 years old and over who lived within the two DSS areas were surveyed. Face-to-face household interviews were conducted by trained surveyors using standard WHO/INDEPTH questionnaire- summary version In this paper, the SQOL was treated as the outcome variable. It is a one-item question asking the respondents "How would you rate your overall quality of life?". The response set is a five-point scale where 1= Very bad, 2= Bad, 3= Fair, 4= Good, 5= Excellent. Socio-demographic conditions of study participants were estimated by sex, age, educational level, marital status of the individuals and economic status of their households.

Results: We found that the overall SQOL level was higher in the Indonesian compared to that of the Vietnamese. In both countries, the SQOL was reported to be higher in 1) men; 2) people with higher education; 3) people who were in marital partnership; 4) people who lived with other family member; and 5) those with higher economic status, compared to that in those of other category(ies) of the same characteristic. While increasing age had significantly positive effect on SQOL of the Vietnamese, it impacted negatively on SQOL of the Indonesian.

The incidence of low birth weight among different socioeconomic status demographic characteristics in a rural area: the case of Ulanga and Kilombero districts, South West Tanzania

Mathew Mwanyangala

Ifakara, Tanzania

Background: There are limited studies on the incidence of low birth weight in relation to socio economic status of the households and demographic characteristics of the mother particularly in rural settings in developing countries. The main objective of the current study is to provide; an estimate on the incidence rate, the seasonality and the relationship between socio- economic status, and demographic variables in relation to Low Birth Weight using longitudinal data collected in the DSS area in 2006.

Methods: Basic information including birth weight is collected for each child close to the date of birth. Data analysis was done using Stata version 10.

Results: According to data collected in year 2006, there were a total of 3041 newborns. About 1505 (49.5%) were weighted soon after birth. Among those weighted on the same day of delivery 184 (12%) were born home. The calculated incidence of low birth weight was 9%. Regression analysis showed that low birth weight was with statistically associated with socio-economic status of the households, children in the poorest households were 1.7 times more likely to have low birth weight compared to those in the least-poor households (OR=1.7, 95%CI 1.4-3.2, $p<0.05$). Age of the mother at birth showed a strong association with birth weight, a child born to a teenage mother was 2.6 times more likely to be underweight compared to those born to older women (OR=2.6, 95% CI . 1.7-3.9, p=0.000). But there was no statistical significance between place of delivery and low birth weight (p=0.523).

Conclusions: The study observed seasonality of low birth weight that coincides with the time intensive manual labour demand during pregnancies.

Spatial-temporal trends and risk factors for all cause and cause-specific infant mortality in rural South Africa - evidence from the Agincourt health and demographic surveillance system, 1992-2007

Mr. Sartorius Benn

Agincourt, South Africa

Background: A spatial temporal analysis was performed to identify factors associated with infant mortality risk in the Agincourt health and demographic surveillance site (AHDSS), to assess changes in infant mortality patterns within the site over time, and to produce cause-specific mortality maps to identify high risk areas within the site.

Methods: Period, gender, refugee status, maternal and fertility-related factors, household mortality experience, distance to health care facility, socio-economic status were examined as possible risk factors. The analysis was carried out by fitting a Bayesian hierarchical geostatistical negative binomial autoregressive model using Markov chain Monte Carlo simulation. Spatial correlation was taken into account using a village level random effect modeled by a multivariate Gaussian process.

Results: Infant mortality significantly increased over the study period, largely due to the impact of the HIV epidemic. The study also found that male gender, Mozambique refugee status, mother's death in first year, death of a previous sibling, no or primary level education status of mother, increasing mother's age at pregnancy, birth order, number of household deaths, and distance to health facility were significant risk factors for infant mortality in the AHDSS.

Conclusions: Spatial risk maps using Bayesian kriging predictions from the models have been developed to highlight high risk areas within the AHDSS by cause and various risk factors. For example, distance to health care facility (>10 km) as a risk factor for all cause mortality shows clear high risk areas within the AHDSS and indicates villages which require better access and targeting of health interventions. Other implications of the spatial-temporal findings are discussed in detail.

Tobacco consumption in Chakaria, Bangladesh: a study of its trend and determinants

Hanifi Sma

Chakaria, Bangladesh

Background: Consumption of tobacco is one of the risk factors for non-communicable diseases and causes premature deaths. In Bangladesh, the data on tobacco consumption is scanty. Data from a small area based study revealed that the econsumption of tobacco is high and the prevalence is higher among males than females. The prevalence is also higher among the poorest section of the population compared to the better off. There are anti-tobacco laws enacted which ban smoking in public places and advertisement for the promotion of smoking. However, little is known about the trend of tobacco use in general and across different societal groups.

Methods: This paper analyzed data collected through the Chakaria HDSS during 1994 and 2007 with an aim to examine the changes over time in the overall level of consumption by sex and among various SES groups. The study uses the dataset from the Chakaria Health and Demographical Surveillance System comparing tobacco use of 6,618 people aged over 15 years in 1994 to 24,533 people of the same age groups in 2007. Socioeconomic status of individual was classified combining the occupation of main earner and ownership of household-land.

Results: Between 1994 and 2007, the proportion of respondents reported to consume tobacco has declined from 43.4% to 34.8% respectively. The decline has been largest among people from the lowest SES group (from 75.5% to 42.1%) compared to 36.0% to 27.2% among the rich. The prevalence of tobacco use remained similar among the females (from 24.2% to 23.6%), and has decreased sharply among the males (from 63.2% to 45.5%).

Conclusions: It seems that the public awareness programme is having a substantial effect on the tobacco consumption in Bangladesh. However, the absence of decline among the women is an interesting phenomenon and deserves special attention.

Theme11: Spatiotemporal Pattern of HDSS Mortality Data

Clustering of Under-5 Mortality at Dodowa, Kintampo and Navrongo Health and Demographic Surveillance Sites in Ghana

Martin Adjuik, Ernest Kanyomse, Abraham Hodgson, Elizabeth Awini, Precious Mattah, Margaret Gyapong, Charles Zandoh, Sulemana Abukari, Robert Adda Seeba Amenga-Etego and Seth Owusu–Agyei

Background: Morbidity and mortality of Under-5s are high and continuously pose a major public health concern in sub-Saharan African (SSA) countries. To effectively address the menace of childhood mortality, it is important to know the spatial distribution of deaths so that health intervention programmes can strategically target these clusters. The objective of this paper is to determine the distribution of under-five deaths in Dodowa, Kintampo and Navrongo Health and Demographic Surveillance Areas and to identify possible significant clustering of deaths.

Methods: Data from Dodowa, Kintampo and Navrongo Health and Demographic Surveillance System (HDSS) sites in Ghana were analysed separately for all-cause under-5 mortality. Navrongo data cover an average population of 140,000 in 49 villages in the period 1997-2006. Dodowa's data cover an average population of 89,371 in 371 communities in seven area councils from 2005-2006. Data from Kintampo cover an average population of 126,042 in 129 communities from 2003-2006. Total under-5 mortality rates were calculated. The central point for each community or village was determined using that of the housing structures in the health demographic surveillance areas (HDSAs) and the geographical distribution of the mortality in each of the HDSA investigated. A spatial scan statistic was used to test for significant clustering of under-5 mortality in both space and time for Kintampo and Navrongo and only in space for Dodowa since that data cover a 2 year period.

Results: Under-5 mortality has been declining in the Navrongo HDSA during the period. However the data show a consistently significant clustering of childhood mortality over the period among villages mainly in the east of the district, which formed the control arm of the Community Health and Family Planning Project (CHFP), an experiment that tested a health delivery concept that offers health services at the door steps of the household. In Dodowa, though several clusters of high under-5 mortality were identified, there were only two significant clusters in two area councils. These are Ningo along the coast, south of the district and Osuwem, farming communities in the north-east of the district. Possible risk factors such as poverty, lack of full immunization, treated bed net, electricity connection, good source of water and health insurance could be attributed to the significant clustering in Osuwem area council, and these risk factors could not necessarily be attributed to the situation in Ningo area council. Further studies are therefore required to investigate the causes of the clustering, especially the Ningo area council. Clusters of high under-five mortality which were from different set of villages and were statistically significant were identified in Kintampo. Three of the villages were consistently found in these high clusters over a 3 year period. However, the clustering shifted from the north to the east during the last year.

Conclusion: The results confirm significant clusters of under-5 mortality at the three HDSS sites in Ghana. Hence there is need to investigate potential risk factors so that measures can be recommended for public health decision-making.

Research Using HDSS Framework

Health Research using the DSS platform – The case of Ifakara site

Rose Lema
Ifakara, Tanzania

Background: The potential of HDSS as a research and health intervention platform is well known. The platform offers an opportunity to implement a wide range of studies that aim at improving the health of the population by producing evidence for policy, including testing new health products. Ifakara HDSS is one among few in Tanzania, it has been running for 11 years. Since its inception several research studies and implementation programmes have been carried out. The main objectives of the Ifakara HDSS are:

- To provide a framework for population based health research which is relevant to the local health priorities and needs
- To provide framework for testing health and well being interventions

We present here a description of selected research activities that have been conducted in the Ifakara HDSS, some of which are still ongoing. Experience of Ifakara Health Institute in using evidence from research conducted on the HDSS to influence policy will be discussed.

Some selected studies:

Completed

1. Measuring the effect of socially marketed insecticide-treated nets on child survival and coverage
2. Multi-country evaluation of Integrated Management of Childhood Illness
3. Exploration of the impact of artemisinin-based combination therapy (ACT) on morbidity and mortality in a real world setting
4. Testing of new health products
5. Malaria Transmission Intensity and Mortality Burden Across Africa (MTIMBA) multi-country, multi-centre platform for evaluation of interventions and also allow longitudinal monitoring of changes in malaria transmission and resultant mortality burden in a number of very different populations across Africa.

Ongoing

1. Assessment of the impact of a new national malaria treatment policy (ACT) on morbidity and mortality
2. Description of maternal and newborn health - morbidity and mortality; and health care seeking behaviour during pregnancy, delivery and postpartum periods