### Vulnerability and Adaptive Behavior of Low Income Communities in Flood Management and Planning Regimes in Kampala City, Uganda

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The rapid expansion of populations in cities and worsening economic inequality has shifted the balance of disaster risk from rural to urban areas. People must survive in a money economy and must contend everyday with many socio-economic and environmental hazards. This paper addresses three specific issues: (1) quantifying the vulnerability to flood stresses in low income areas; (2) identifying energies and synergies that exist among poor communities to reduce vulnerability to floods; and (3) what flood governance regimes and initiatives exist to make Kampala a livable city.

Results indicate that people living in the poor areas of Kampala are exposed to multiple stresses and vulnerabilities coming from a combination of heavy rainfall and poor planning systems especially housing, infrastructure, and drainage management. In their poor state, small weather events have serious consequences. All infrastructure systems have reached their full capacity. Small downpours have led to massive disruption of the lives of the poor and subsequently the whole urban economy due to the poor maintenance, inadequate income, few assets, inadequate shelters, lack of early warning systems, and total absence of safety nets. City authorities should not wait for the next disaster to happen, and yet, local communities are not flexible enough to cope with the frequent "closures" of their livelihoods. A better understanding and recognition of the multiple deprivations that contribute to increasing exposure of local communities to such threats must be considered in the development of city strategies and hazard/disaster management regimes.

**Keywords:** floods; infrastructure; low-income; urban planning; vulnerability
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## *Session 2*

*Chairs: M. Hoejenbos; Knut-Ole Sundnes*

### Epidemiological Evidence for the 2005 Niger Nutritional Crisis

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**Background:** Niger faces recurrent food shortages. Prevalence of global acute malnutrition (GAM) among children under five years of age remains >10%. Since 2001, Médecins Sans Frontières (MSF) has operated a nutritional program in the Maradi region (2,500,000 inhabitants). In April 2005, MSF documented a significant increase in admissions and sounded an alarm. Difficulties in interpreting existing data led to a debate among all of the involved agencies as to the scale and severity of the crisis. A retrospective description of all available data for 2005 was conducted.

**Methods:** Admissions of children under five years of age with severe, acute malnutrition (SAM) in 74 nutritional centers supported by MSF/Ministry of Health (MOH) by week and by district were described. Also, the United Nations Children's Fund (UNICEF) compilations of yearly admissions from 18 relief agencies were reviewed by the UNICEF, along with the results of 10 nutritional surveys estimating the GAM and SAM prevalence among children under five years of age. A child with GAM is defined as one having weight-for-height ratio > 2Z scores (SAM: 3Z scores) below the reference population median and/or the presence of bilateral edema.

**Results:** In January, the prevalence of GAM reported from World-Food-Programme for Maradi and Zinder was 13% (SAM: 2–3%). During April–October, 5 surveys in these regions indicated GAM of 15–20% (SAM: 2.4–5.4%). In Maradi, the MSF admitted 39,200 children with an episode of SAM (6–10 times more than previous years).

**Conclusions:** The 2005 nutritional crisis was extremely severe and particularly impacted the regions of Maradi and Zinder, which are considered to be the most fertile and populated regions of Niger. The use of nutritional surveys helped to assess the situation; however, the conduct of the surveys are limited to region and time. Establishing surveillance and alert thresholds is essential for early detection and timely delivery of aid.

**Keywords:** food aid; food shortages; malnutrition; Niger; nutritional crisis
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### Pre-Existing Health Conditions, Injuries Sustained, and Ongoing Health Problems in Evacuees Participating in the 11 September 2001 World Trade Center Evacuation Study

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**Introduction:** Modern engineering has enabled the construction of larger and taller buildings. However, these high-rise structures present a challenge in terms of security and safety. Such was the case on 11 September 2001 when the World Trade Center (WTC) was destroyed. On this day, more than 20,000 persons were successfully evacuated; however, in the process, many were injured. The pre-existing health conditions, injuries sustained, and on-going health problems of evacuees participating in the larger Columbia University WTC Evacuation study were identified.

**Methods:** A convenience sample of 1,444 WTC evacuees from Towers 1 and 2 completed a survey.

**Results:** The prevalence of reported pre-existing health conditions was 37%. These included respiratory (27%), mental health (16%), cardiac conditions (12%), vision/hearing problems (8%), and other problems (7%). Injury during the evacuation was reported by 531 (37%) of the study participants. The most common injury reported was psychological injury (24.7%), followed by surface trauma (11.9%), inhalation injury (11.4%), orthopedic injury (7.2%), and eye