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The "URBAN ZOO" Newsletter

Quarterly Newsletter on "Epidemiology, Ecology and Socio-Economics of Disease Emergence in Nairobi"

Prof. Julio D Dávila

Co PI's Letter

The Planning and Policy Team primarily aims to contribute to the Urban Zoo project by tackling the following questions: Are there links between social-environmental and spatial conditions and the microbial diversity that people are exposed to in urban and peri-urban areas? What is the planning, economic development and institutional context in which zoonotic diseases develop in Nairobi? How is this shaped by social and spatial fragmentation?

The Team contributes to the development of methods for gathering and processing primary and secondary data on spatial and social trends across selected localities and income groups in Nairobi, to map relevant urban development and environmental trends, and outline the changing institutional landscape in the city as pertains to the policy and planning dimensions of the research.

With these aims and objectives in mind, Dr. Sohel Ahmed recently tested some participatory community mapping tools in a dense informal settlement in Nairobi (Mathare Valley) in co-operation with the Muungano wa Wanavijiji, a federation of Kenyan slum-dwellers' associations, with support from the local NGO Muungano Support Trust (MuST). They mapped the location of street vendors' activities in relation to infrastructure (for example, footpaths and roads; public and private toilets) and environmental hazards (for example, areas subject to flooding, open sewage, solid waste dumpsites, places where animals roam). This data was collected using participatory community-led mapping techniques where Focus group discussions (FGDs) were coupled with cognitive mapping, and other mapping tools were also used along transect walks (e.g. balloon mapping and participant observation using paper maps and mobile phone apps). Details of the methodology can be found in a recently published IIED policy briefing paper at http://pubs.iied.org/17218IIED.html.

These methods, along with other innovative base-mapping techniques like OpenStreetMapping platform, will soon be used in the two informal settlements selected for this project, Viwandani and Korogocho, where the case-control studies are being conducted by the Public Health and Demography Team led by Dr. Catherine Kyobutungi, of APHRC and Prof. Eric Fèvre , University of Liverpool, in conjunction with the University of Nairobi, KEMRI and the University of Edinburgh. The Planning and Policy Team is also actively devising, collecting and preparing data and information to feed into the selection process of the sample of 99 households based on socio-economic status, neighbourhood characteristics and data such as access to infrastructure (e.g. water and sanitation) in different localities within Nairobi. Data will continue to be collected at the level of the community around these sites as well. The team is also working collaboratively with other teams in the project, for instance by helping to map value chain data collected through colleagues in the Economic Thread.

The Team comprises Professor Julio D. Dávila, Dr Adriana Allen and Dr Sohel Ahmed from the Development Planning Unit(DPU), UCL, Professor Muki Haklay, from the Department of Civil, Environment & Geomatic Engineering, UCL, and Dr Cecilia Tacoli, from the Human Settlements Group, International Institute for Environment and Development (IIED), UK.

This issue.....

Special points of interest:

Urban Zoo is an inter disciplinary programme focused around the role of urbanization in the emergence of zoonotic pathogens. We are funded by the Environmental and Social Ecology of Human Infectious Diseases initiative (ESEI), a joint UK Research Council initiative which is part of the Living With Environmental Change Programme.

The Urban Zoo Team with other stakeholders during a GIS training held at ILRI in Feb, 2014.

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MAPPING OF THE DIFFERENT POULTRY VALUES CHAINS WITHIN THE PERI-URBAN AREAS OF NAIROBI CITY

Commercial Layer production: Viwandani.

The Kenyan poultry industry has been described to be characterized by dualism, comprising both smallholder and large-scale poultry producers. The industry is described by two main production systems: (i) commercial hybrid poultry production system and (ii) indigenous poultry production system.

The commercial hybrid production system is exclusively market oriented, and it relies on exotic parent and grandparent stock which are imported into the country. On the basis of level of biosecurity, farms found in this production system fall under sector 1-3 of the classification used by the Food and Agriculture Organization of the United Nations, to classify poultry systems around the world. This production system is further divided into layer and broiler sub-systems. The commercial hybrid production system is concentrated around major urban centres including Nairobi, Nakuru, Mombasa and Kisumu.

Indigenous poultry production: Korogocho

The indigenous production system is the dominant poultry system in Kenya, and it is mainly concentrated in rural areas. However, this system is becoming widespread within the peri-urban setting around Nairobi and other major towns due to an increasing preference for their meat by some urban dwellers. This production system is characterized by unconfined birds that scavenge around homesteads and they often interact with wild birds, besides other domestic and wild animals.

Kenchic is the biggest producer of day old chicks which are supplied in the Kenyan market, but other hatcheries also exists. According to a key informant from the poultry breeders association, about 25% of Kenchic's day old chicks are distributed along an integrated chain (i.e. contracted farmers who will eventually sell the birds to Kenchic slaughterhouse). However, about 75% of the day old chicks from Kenchic are also sold directly to growers or appointed agents around the country.

Furthermore, based on reports of focus group discussions with poultry farmers within the peri-urban areas of Nairobi, majority of birds produced from these smallholder farms are sold through informal chains which comprises slaughtering of mature birds at the farms backyard or in local poultry slaughter slabs, and their meat distributed to hotels/kiosks and other markets within the urban centres and also to the city market in Nairobi. The by-products from these birds including heads, intestines, livers, gizzards and feet are also sold to people who supply them to informal settlements (slums) around Nairobi and in other small urban centres where there is an established market for them. However, there is no established market for some by-products e.g. feathers, although a few farmers are reportedly using them for preparing dancing costumes for school children.

The objectives of poultry value chain study, which is part of the Urban Zoo project, includes:

1. Identification of the main stakeholders and the flow of poultry products along the value chains within the urban and peri urban areas in Nairobi;

Dr. Joshua Onono

2. the estimation of employment opportunities generated from the poultry sector along the different value chains within the peri-urban setting;
3. estimation of the costs and earning profiles and financial performance along the different value chains;
4. and the identification of key constraints and problems (including food safety challenges) which are impacting on different actors along the different poultry value chains.

Article written by: Dr. Joshua Onono (BVM, MSc, PhD) a postdoc in the ESEI "Urban Zoo" Project

CAMEL VALUE CHAIN IN KENYA

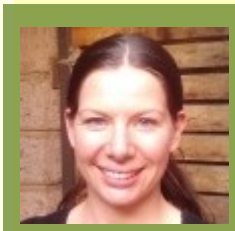
It was estimated that in 2013 Kenya had the third largest camel population in Africa with a population of 3.1M, behind Somalia (7M) and Sudan (4.7M). The total camel meat production in Kenya was estimated to be 700 tonnes per year, worth of around KES I billion. The total camel milk production was calculated in 200 million liters per year, worth approximately KSH 2 billion. Camels serve as financial assets and security against drought related losses and also play a key role in social eminence to the pastoralists.

Only 12% of the camel milk produced in Kenya is marketed. From these 12%, 10% is sold to rural consumers while the remaining 2% reaches urban consumers. It was projected that 38% of the milk produced is consumed directly by camel keeping households, with the remaining 50% going to waste. Most of the camel milk is consumed in raw form, either fresh or naturally fermented. This can expose consumers to infections from brucellosis and other milk borne infections.

As part of the Urban Zoonosis Project, this project involves mapping the camel value chain in Kenya and its food safety risks. The research is divided in two phases. The first phase aims at mapping the chain, understanding its governance, provide an economic evaluation and explore and identify the possible public health risks existing along the chains. The second phase aims at collecting biological samples to assess the prevalence of E.coli and brucellosis on the different chains identified. The outcome of this project will be important to inform policy formulation and food safety control.

Article written by: Dr. Dishon Muloi (MSc Student, UoN)

Selected staff/student Profiles



Laure Made is a PhD student registered with University of Liverpool and doing a study of the clinical and social epidemiology of diarrhoea in children under 5 in two urban settlements in Nairobi. Her particular focus on exploring the impact of contact with livestock and livestock products. http://www.zoonotic-diseases.org/home/people

Maurice Karani is a Veterinarian working as a Research Technician at ILRI, based with the"Urban Zoo" project. He is working on the economics thread part of the study which involves mapping and understanding livestock value chains operating in Nairobi. http://www.zoonotic-diseases.org/home/people

Patrick Muinde is a veterinarian working as a Research Technician at ILRI, and as part of the value chain team. He is working on the economics thread part of the study which involves mapping and understanding livestock value chains operating in Nairobi. http://www.zoonotic-diseases.org/home/people

Pablo Alarcon , a veterinarian by profession is a Research Fellow in Food Systems at the RVC. His research focus on the investigation of livestock food value chains in the city of Nairobi, Kenya, and in the risk of zoonotic disease emergence within these chains. http://www.rvc.ac.uk/Staff/

CASE CONTROL STUDY: UPDATE

The case-control study which was looking at causation and risk factors of diarrhoea in children under 5 in two low-income settlements in Nairobi came to en end last April.

Among the 637 children included in the study, 190 were cases (children with diarrhoea) and 447 were controls (children without diarrhoea). Stool samples from each child have been sent to the laboratory at KEMRI where parasitological and bacteriological analysis has been performed. Antimicrobial resistance is also currently being assessed.

In the mean time, 581 samples of food and 596 samples of water from each household have been collected and sent to the laboratory at the University of Nairobi for a total coliform count analysis.

In addition to initial questionnaires, 4 field interviewers have been trained on using ODK (Open Data Kit), a mobile data collection tool. They just finished to collect GPS coordinates from each household included in the case-control study, allowing us to later on perform spatial analysis.

Bacterial isolation at the laboratories

We are also about to map the movement of livestock in order to get a better understanding on exposure of children to animals in the two slums.

We would like to thank again all our partners for their commitment that led to such great achievement.

Article written by Laure Made (PhD student)

UPCOMING EVENTS:

- Phylogenetics workshop at ILRI: "From Faeces to Phylogeny" in conjunction with the Centre for Immunity, Infection and Evolution, University of Edinburgh. 16-17th June , 2014. Venue: JVC Room
- Ecohealth 2014 Conference. "Connections for health, ecosystems and society" Montreal, North America. August 11-15, 2014 http://ecohealth2014.uqam.ca
- 9th Biennial Scientific Conference and Exhibition of the Faculty of Veterinary Medicine, University of Nairobi. Venue: Faculty of Vet Medicine, Upper Kabete Campus, 3rd—5th September, 2014

VISITING STUDENTS:

- James Hassel - A University of Liverpool PhD student has joined the Nairobi Urban Zoo team for his PhD. He is working on the ecology of peri-domestic wildlife species (e.g. rodents, scavenging birds) in the city of Nairobi, Kenya, and their role in microbial movement through different ecological niches within the city.
- Joselyn Atuhairwe an MSc student at the Liverpool School of Tropical Medicine, is currently in Nairobi Assessing meat contamination by pathogenic bacteria transmitted by flies attracted to butcheries in Dagoretti South Nairobi, in collaboration with a commercial sector partner.

MRC Medical Research Council | BBSRC bioscience for the future | E·S·R·C Economic & Social Research Council | NERC | Living With Environmental Change LWEC