



CASE-CONTROL STUDY ON DIARRHOEA.....

The case-control study aims to investigate the causation and risk factors for diarrhoea in children under 5 in two low income settlements in Nairobi. The study is nested in a long-term cohort called NUHDSS (Nairobi Urban Health Demographic Surveillance System) run by the African Population and Health Research Centre (APHRC).

Children reporting diarrhoea within the last 3 days are selected as cases as well as 2 matching controls who do not have diarrhoea.

Data on socio-demographic characteristics of the household, livestock keeping and contact, access to water and sanitation, hygiene practices, nutritional and breast-feeding status of the children in both groups are collected by trained field interviewers.

Two clinical officers are part of the team. They assess the severity of the diarrhoea for each case included and are also involved in the treatment of any sick children.



Stool samples from each child included in the study are also collected and sent to the lab at KEMRI (Kenya Medical Research Institute) for parasitological, virological and bacteriological analyses.

In addition, drinking water and food is sampled from each household and are sent to the lab at the University of Nairobi for analysis.

The study, which was piloted in July, started in earnest in early September and 63 cases and 127 controls have been included so far.

We would like to thank all our partners for their commitment and great work in the field.



By: Laure
Madé

Partner profiles.....



The Royal Veterinary College is one of the world's leading specialist veterinary institutions. Founded in 1791, the RVC has a unique heritage of innovation in veterinary and biomedical sciences, clinical practice and education. <http://www.rvc.ac.uk>

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IIED is one of the world's most influential international development and environment policy research organisations. <http://www.iied.org>



The African Population and Health Research Center (APHRC) is a non-profit, non-governmental international organization committed to conducting high quality and policy-relevant research on population and health issues facing sub-Saharan Africa. <http://www.aphrc.org/>

The University of Nairobi, a body corporate established by an Act of Parliament Cap 210 of the Laws of Kenya is the pioneer institution of University education in Kenya and the region. <http://www.uonbi.ac.ke>



ILRI is a non-profit-making and non-governmental organization with headquarters in Nairobi, Kenya, and a second principal campus in Addis Ababa, Ethiopia. <http://www.ilri.org>

The Kenya Medical Research Institute (KEMRI) is a state corporation established through the Science and Technology (Amendment) Act of 1979, as the national body responsible for carrying out health research in Kenya. <http://www.kemri.org/>



The University of Liverpool is a member of The Russell Group of 24 UK research-led universities and is ranked in the top 1% of higher education institutions worldwide. <http://www.liv.ac.uk>

The University of Edinburgh, founded in 1583, is the sixth-oldest university in the English-speaking world and one of Scotland's ancient universities. It is a member of both the Russell Group, and the League of European Research Universities, a consortium of 21 research universities in Europe. <http://www.ed.ac.uk/>



University College London (UCL), founded in 1826, is a public research university located in London, the oldest and largest constituent college of the federal University of London. <http://ucl.ac.uk/>

Observations from the Field Coordinator..

Challenges in the field and how they have been overcome!!!



The Urban Zoonoses project is a highly collaborative research project, involving many partners with a wide variety of training and experience. Therefore, field work presented a perfect opportunity for interacting and learning from each other given our diverse backgrounds. Even though different organisations have different working styles which could have been a big challenge, this diversity has only proved to be a uniting factor for the urban zoo team since we play to the strengths of each partner.

Our strong and competent field teams have managed to collect quality data despite the challenges that we have faced in the field. Below are some of the challenges that we faced in the value chain component of the project:

Language barrier: This was a problem in some markets where participants were unable to understand either English or Kiswahili; we had to use interpreters to translate to the local language (e.g. Burji in Kiamaiko and Maasai in Kiserian) during focus group discussions and individual interviews. The use of interpreters leads to longer duration of interviews and some times to misinterpretation that needed to be corrected.

High expectations: People expected us to offer some intervention; especially after discussing with them their challenges, benefits and aspirations. The previous activities carried out at the abattoirs by organisations like Safaricom, which offered money to participants made them to expect some payment from us. Also people in the market are very busy with their business. Having a two hour focus group is a long time in the middle of the working day. Especially, traders can make a lot of money during the day. Transporters need to move animals /meat and might lose money by staying with us for two hours. In addition, some research has failed to communicate their results. In consequence, some people did not see the benefit of research. One abattoir did not want to participate because of this.

Photo taking: Most people were not comfortable to allow us take photos around the slaughterhouse to capture the public health risks and to generally document our activities.

Power groups: This was a big problem in one abattoir where we failed to interview the group that is in charge of the livestock market due to competing interests with the abattoir owners. It was not easy to have a neutral facilitator who could mobilise people from different power groups.

Timing and Participants: Planning of our field activities was dependent on the convenience of the participants.

We were unable to work during some days in one of the abattoirs because of busy schedules of the participants. We also had to suspend field work for two weeks due to competing interests between the different power groups in one market and it was not possible to interview more than one group per day in one abattoir while this was possible in the others. Some groups of participants like the livestock transporters were not easy to interview, due to their limited time in the markets and business pressures.

The case control study also had a few challenges such as: traffic jams on the outer ring road and Jogoo roads causing delays while accessing the field sites, insecurity within Korogocho and Viwandani necessitated the arrangement for the locals to accompany our clinical officers and provide security (and the suspension of field activities one day due to riot- unrelated to the project), accessing the households during the rainy season is a challenge due to open drainage, mud and poor waste disposal creating an occupational risk of contamination for our staffs. Finding the mothers within their houses during the day is a challenge, so the community field workers usually carry out their field activities very early in the morning or late in the evening with such mothers, but clinical officers find it difficult to work at these early or late hours. Co-ordination between the different institutions (KEMRI, APHRC, UoN and ILRI) was a challenge during the first week of our project, but this was quickly resolved by good communication, consultations and meetings between the partners.

For the case control study, the challenges have not affected our data collection due to the valuable support given by APHRC and their experience and skills in working within the study area. I also attribute our success to our committed field staffs and the leadership of this study for our success in the very complex study site. The livestock value chain analysis would not have been possible without the massive support we received from the office of the Director of Veterinary Services (DVS), the inspecting officers, abattoir owners, determined and hard working staff and guidance from our project leaders.

In conclusion, we have collected quality data, we have done a good job and we are determined to continue to the end. Thank you to all who have offered their contributions to bring us this far!



James Miser Akoko has been the Field coordinator for the Urban Zoonoses project since 1st October 2012

Selected staff/student Profiles



Nduhiu Gitahi,

MSc Immunology (KU),
Diploma in Project Management (KIM)

Expertise in bacteriology and molecular immunology. Currently the Chief Technologist, Department of Public Health, Pharmacology and Toxicology, University of Nairobi and working with Urban-zoo project.

Tom Turbine Ouko



MSc, Medical Microbiology

Currently the Principle Medical Laboratory Technologist, KEMRI and with Supervisory duties of the ESEI Microbiology and microbial genetics thread



Dr Stella G. Kiambi (BVM, MSc Applied Epidemiology)

Currently working for the Ministry of

Livestock, in the Veterinary Epidemiology and Economics Unit in charge of Zoonotic diseases. Previously worked in the Zoonotic Disease Unit, Kenya's One Health office.

Currently involved in the Urban zoonoses project; focusing on "Mapping the Dairy value chains; to understand interactions, risks, chains governance and exploring into opportunities for mitigation of zoonotic diseases and antibiotic residues.



Dr. Mercy Cianjoka Gichuyia (BVM)

Currently an MSc Student at the University of Nairobi and attached to the ESEI project looking at the "Prevalence and antimicrobial resistance of salmonella isolated from food, livestock and the environment in Korogocho and Viwandani slums in Nairobi"

Economic Thread

Investigation of Livestock Value Chains



The Economic Thread has two aims: (1) To describe, map and understand the livestock value chains operating in

the city of Nairobi and (2) to explore the possible hazards for emergence of foodborne zoonotic pathogens existing on those chains and peoples' perception towards risks. Data are being collected for a qualitative analysis (through focus groups or interviews with key people in the chain) and quantitative analysis (individual interview with a sample of people of each group, such as transporters). Field work has been conducted by Maurice Karini (research assistant), Patrick Muinde (research assistant), James Akoko (field coordinator), Matilda Brink (MSc student from Uppsala, Sweden), Dishon Mwongela (MSc student), Greg Awanda (MSc student), Stella Kiambi (PhD student) and Pablo Alarcon (post-doctoral research fellow). Tools for data collection were created in collaboration with Dr. Ruth Rushton (psychologist), Professor Eric Fevre (epidemiologist and PI of the Urban Zoo project) and Professor Jonathan Rushton (economist and PI of the economic thread).

To date, data from four major informal markets have been collected. The market areas visited have been: Kiserian market; Dagoretti market; Kiamaiko market and Burma market

In total, 34 focus groups and 133 individual interviews have been conducted involving meat inspectors, pastoralists, livestock traders, meat traders, abattoir/market owners, city council officers, livestock transporters, meat transporters, fillet traders, skin traders, abattoir workers, offal traders and poultry traders. Qualitative data has been entered for its analysis and data sets, for the quantitative data, have been created. Currently, a report is being produced.

The next phase of the value chain investigation will begin in November. It includes visiting all the different types of retailers and livestock holders in the areas selected for the Urban Zoo project. Protocols for this phase will be piloted in Dagoretti and Korogocho area. In addition, contact with the major livestock and retailer companies will also be done. Finally, it is important to mention that a new PhD student (Stella Kiambi) has been recruited to investigate the Dairy value chain in Nairobi.

Overall good progress has been done and the value chain team look forward to present some of the results to the group in the next big project meeting in November.



Authors:

Pablo Alarcon, James Akoko, Maurice Karani, Patrick Muinde, Ruth Rushton, Jonathan Rushton

LAB REPORTS: KEMRI & University of Nairobi

SUMMARY REPORT : UNIVERSITY OF NAIROBI

From the ongoing case control study at both Korogocho and Viwandani study sites, a total of 327 samples have been analyzed {water 146; food 134 and surface swabs 47} at University of Nairobi, Department of Public Health, Pharmacology and Toxicology.

Of the samples analyzed 67% (219) had bacteria growth {97 water on Aqua 3M petri film plates, 96 food and 26 swab samples on 3M enterobacteriaceae petri film plates}. The study has so far isolated, identified and stocked *Escherichia coli* (109), *Salmonella spp*(8) and *Shigella spp*(6) from 108 samples.

Two hundred sixty seven (267) isolates have not been identified yet and will require the use of the 'API system'. Antimicrobial sensitivity tests for the identified isolates, at both phenotypic and genotypic levels are yet to be undertaken, due to delayed laboratory supplies. The isolates both identified and those waiting more tests are currently being stored in cryogenic vials at -20°C in glycerol/skimmed milk.

There has been recruitment of 4 Technologists with the retainment of three (3) after one moved for permanent employment elsewhere. The Technologists underwent hands-on training at University of Nairobi and KEMRI laboratories and currently handling laboratory samples and carrying out bacteria isolation and identification.

The project has three MSc students: -

Dr. Aondo Ezra Ochami : Prevalence and risk factors associated with pathogenic *Escherichia coli* infection of children in selected slum areas of Nairobi, Kenya

Dr. Mercy Cianjoka Gichuyia: Prevalence and antimicrobial resistance of *Salmonella* species isolated from food, livestock and the environment in Korogocho and Viwandani slums, Nairobi, Kenya.

Dr. Macharia ; A study of antimicrobial resistance of *Escherichia coli* isolated from livestock and the environment in Korogocho and Viwandani ,Nairobi, Kenya.

SUMMARY REPORT FROM KEMRI LAB

The stool samples are collected from children in Viwandani and Korogocho and brought to CMR/KEMRI Laboratory for Rotavirus, Parasitic and bacterial analysis. In summary, the processing of samples in the lab involves 1) parasitological 2) bacteriological and Rotavirus analysis. So far, 198 samples have been collected. For bacteriological tests, 88.9% are positive for *E. coli* while on parasitology tests, 18% are positive for *Giardia lamblia* and 13% positive for *Entamoeba histolytica* (cysts)

UPCOMING EVENTS:

- Epidemics4 - Fourth International Conference on Infectious Disease Dynamics, Netherlands. 19-22 Nov,2013 www.epidemics.elsevier.com
- The International Conference on Urban Health, Manchester, United Kingdom, March 4-7th 2014 www.icuh2014.com/
- Regional Conference on Zoonotic Diseases in Eastern Africa, Nairobi, Kenya. 26th - 30th May,2014 www.eazoonosis.org
- Ecohealth 2014 Conference. "Connections for health, ecosystems and society" Montreal, North America. August 11-15, 2014 ecohealth2014.uqam.ca