



**African Population and  
Health Research Center**

Transforming lives in Africa through research

# **Demographic surveillance as a tool to promote urban health and socio-economic wellbeing**

# Outline

1. HDSS intro & history
2. Geographic coverage
3. Nairobi Urban HDSS
4. Opportunities for air pollution & health focused work
5. Final thoughts

# What are HDSS?

Population of study within clearly defined boundaries- the DSA

Regular surveillance e.g. once every 4 months or annually

Across INDEPTH member sites, standardised methodologies are applied- comparable datasets

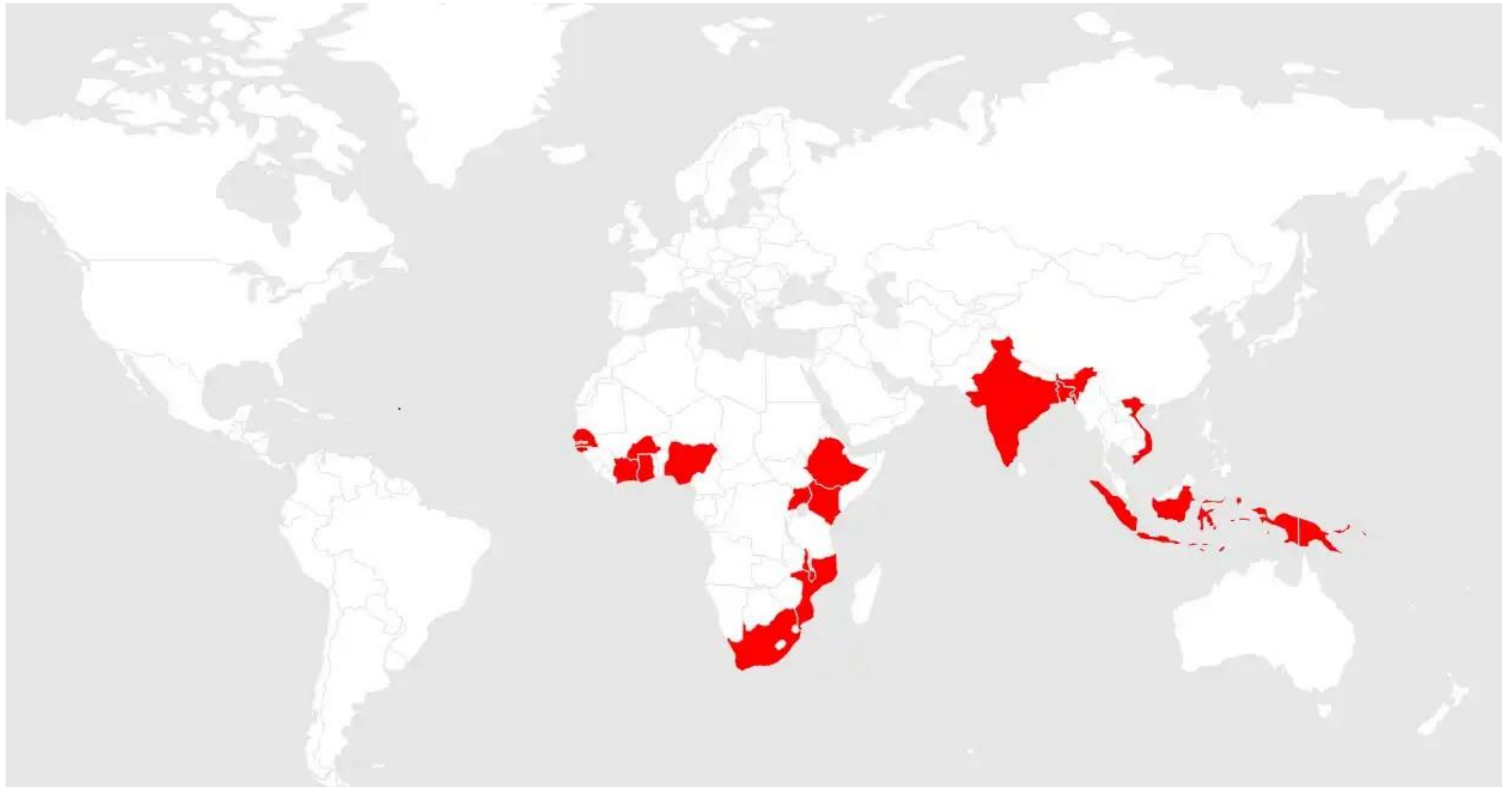
Spread across (as of 2018):

Africa (37 member sites and 4 associate sites)

Asia (11 member sites and 2 associate sites )

Oceania (1 member site and 1 associate site)

# Where are HDSS?



# A bit of history

Gwembe HDSS (Zambia), established in 1956- to assess impact of Lake Kariba on communities

Niakhar HDSS (Senegal) established in 1962- initially for vital registration of rural population, but later hosted clinical trials for measles and pertussis vaccines

Farafenni HDSS (The Gambia), established in 1981 to assess primary healthcare; later host for malaria clinical trials

Butajira HDSS (Ethiopia), established in 1986- close links to Addis Ababa University- for epidemiological and laboratory research and capacity building

# Routine HDSS data

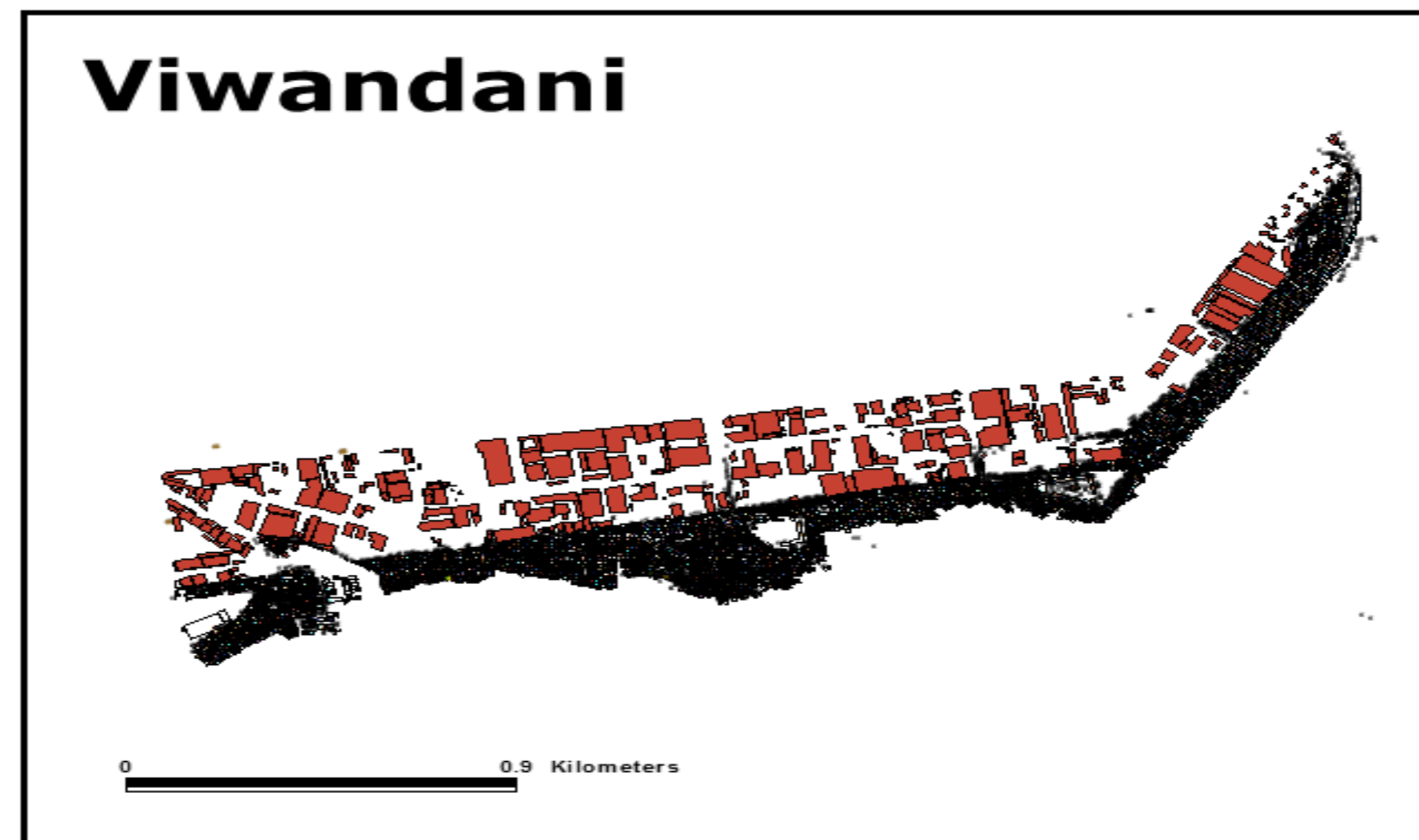
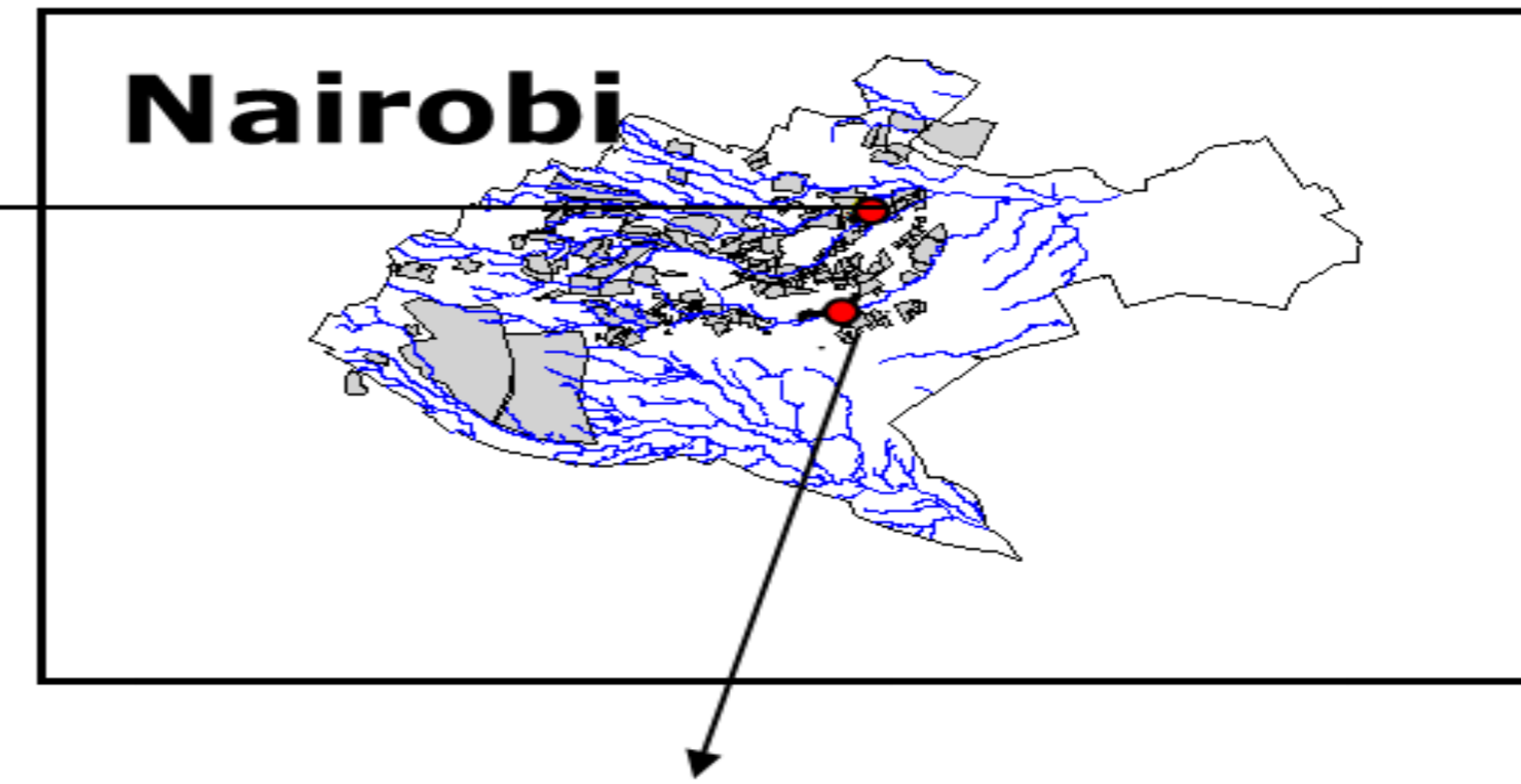
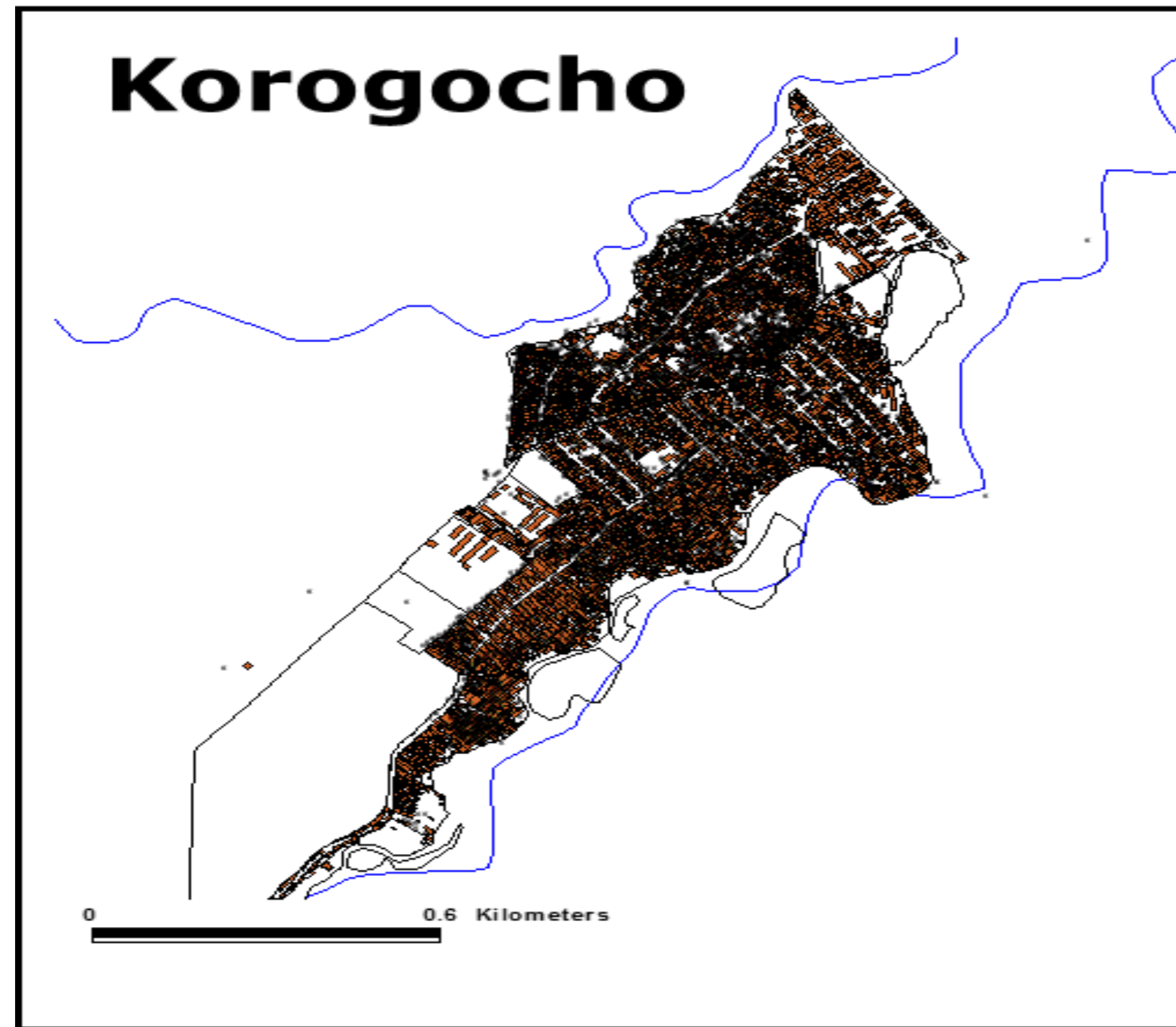
Demographic data

Health data- morbidity and cause of death via verbal autopsy

Socio-economic data including housing and access to linked services (WASH, energy), economic participation etc.

Movement data- both internal (within site) and external movements

# The Nairobi Urban HDSS



# Health Data from the Nairobi DSS

Various health outcomes have been monitored through routine surveillance data as well as nested studies

Child health e.g. immunization, diarrheal disease, respiratory illnesses + health seeking

Maternal health outcomes (led to partnerships with local healthcare providers to upgrade clinics)

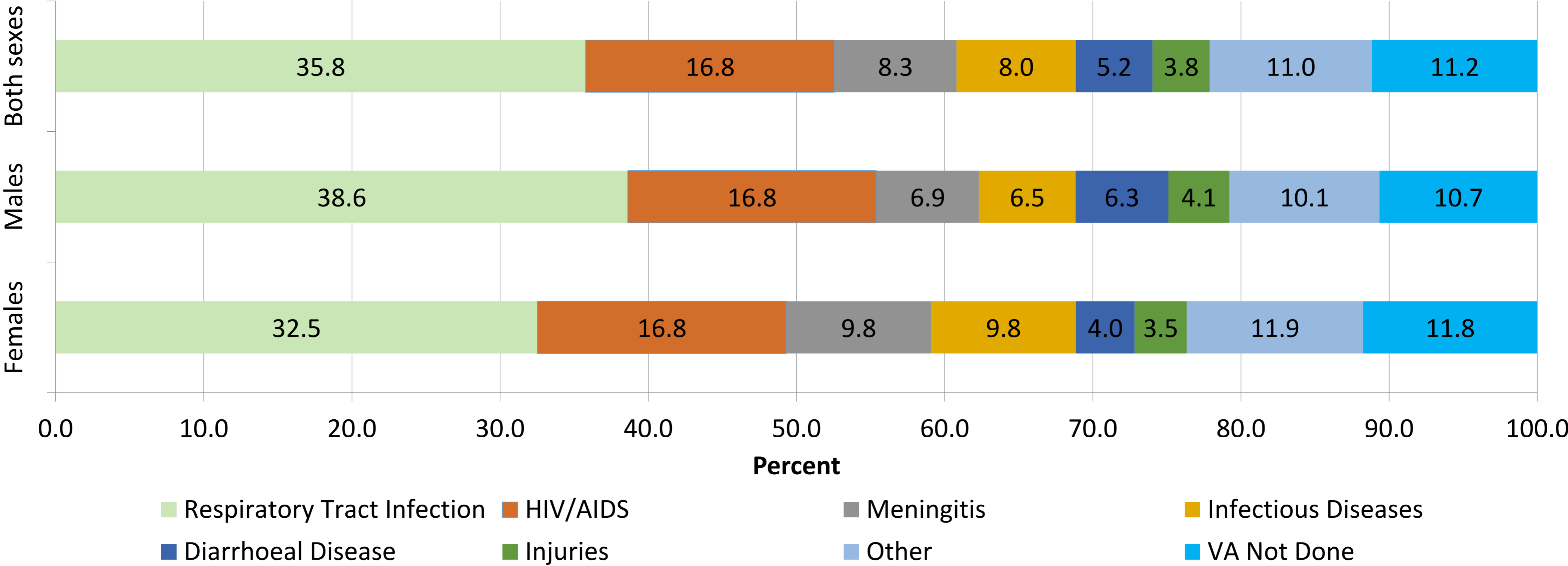
Cardiovascular outcomes (the CVD study) –assessed prevalence of diabetes and hypertension

AWI-Gen study- multi-site study on interplay between genomic and environmental risk factors for cardio-metabolic diseases in Africa (4 countries- South Africa, Kenya, Ghana, Burkina Faso)



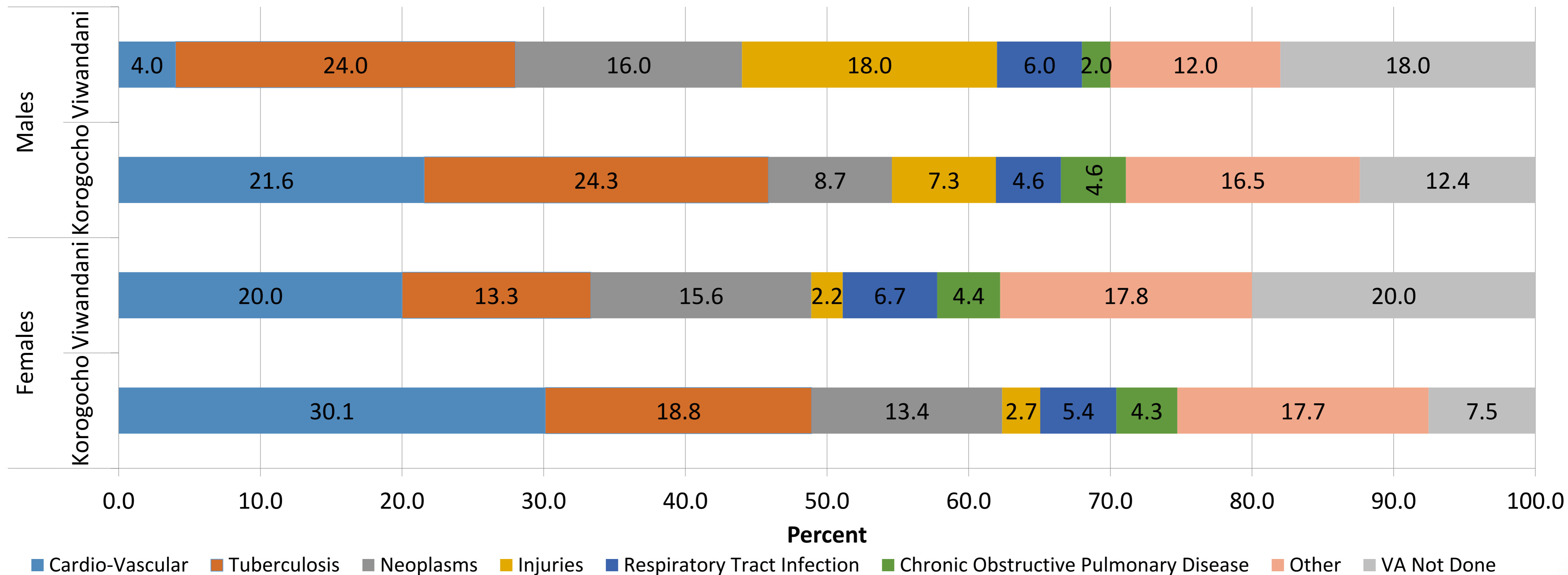
# Cause of Death: Under 5's (2013-2016)

Distribution of top six causes of death among under-5 year-old residents by gender, NUHDSS 2003-2016



# Cause of death among 60+

Distribution of top six causes of death among 60+ year-old residents by gender and by slum, 2003-2016



# Opportunities for air pollution and health

## Short term:

Some health data exist in most HDSS- could start some analysis focused work using satellite air pollution data

Collaboration with special interest groups/networks e.g. those focusing on CVD, AWI-Gen ; ANDLA (African Non-Communicable Disease Longitudinal Data Alliance)

## Longer term:

Propose a network on air pollution and health (may need fundraising)

# Final thoughts

Multi-site (in-country) and multi-country collaborations possible

Life-course approach - HDSS cover entire population within the study site (could observe health outcomes from conception to old age)

May only need to collect exposure data (e.g. install monitors/wearables to collect data) and additional objective measure of health outcomes

Routine HDSS data exists for most control variables

# Where are the data

The NUHDSS data are freely available for public use upon request

<http://aphrc.org/catalog/microdata/index.php/catalog>

# CONTACTS

## Kanyiva Muindi



+254 (20) 400 1000



[kmuindi@aphrc.org](mailto:kmuindi@aphrc.org)



[@Muindi\\_k](https://twitter.com/Muindi_k)