African health seen through spatial lens

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Objective

- Discuss the advantages of utilizing spatial approaches during planning, implementation, monitoring, and evaluation phases of a malaria control program.

- Dar es Salaam, Tanzania
The scale of challenge

> 610,000 people
56 km²
3 municipalities
15 wards
67 Mitaa
3,243 TCUs
Mosquito breeding habitats

- ~ 33,500 habitats monitored on a weekly basis
Household Surveys

Every 6 months ~ 10,000 people are interviewed and a blood sample for malaria parasite examination is collected.
How did GIS, RS, and spatial analytical approaches improve the UMCP?
“Spatial UMCP”

- GIS - Participatory mapping
- Spatial sampling
- GPS
  - Linked spatial databases on entomology, parasitology and individual characteristics
- Remote sensing
- Spatial analysis
Participatory mapping

Dongus et al, 2007
Participatory mapping

Dongus et al, 2007
Spatial sampling

- Sample agriculture areas for monitoring (seasonality)
- Sample houses adjacent to drains selected for a pilot environmental management intervention
Spatial sampling

Urban Agriculture

Month 1
Remote sensing

- Unplanned housing development
- Upper scale housing
- Middle scale housing
- Peri-urban

Distance (meters)

Gamma
Spatial Analysis

Spatial autocorrelation in the percentage of pupae and/or Anopheles larvae presence in water habitats
Dar es Salaam, UMCP targeted wards, 2005

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In summary...

- **Pros**
  - Optimize planning, implementation, monitoring and evaluation
  - Improve cost-effectiveness of interventions
    - Targeted interventions

- **Cons**
  - Large datasets, computer intensive

- **Challenges**
  - Confidentiality
  - Scale