

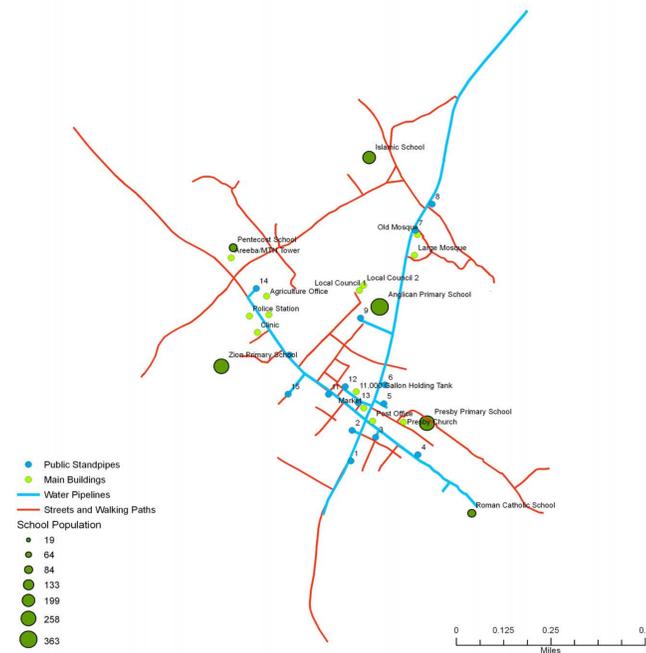
Development of GIS Data Layers for Kwabeng, Ghana

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Background: Urinary schistosomiasis, caused by *Schistosoma haematobium*, is a parasitic disease that affects primarily children and adolescents in rural, tropical regions of the developing world. The disease is spread through skin contact with contaminated surface water bodies. Lack of access to clean water is a major risk factor for developing the disease. In 2007, I collected and tested urine samples from 1,152 children in the town of Kwabeng, Ghana to characterize individual infection status. A map of Kwabeng's pipe distribution system, which supplies water to public standpipes, was obtained in hard copy from Ghana Water Company, Ltd. A paper map of town landmarks was created via an iterative, interactive process that involved a number of community members, and was supplemented by transect walks through the town. The location of each child's house was determined via interviews.

Objective: Develop GIS data layers for Kwabeng, Ghana for the purpose of understanding the spatial distribution of urinary schistosomiasis and associated risk factors.

Number of Children at Each School



Methodology:

An orthophoto of Kwabeng was obtained via Google Earth and georeferenced in ArcGIS.

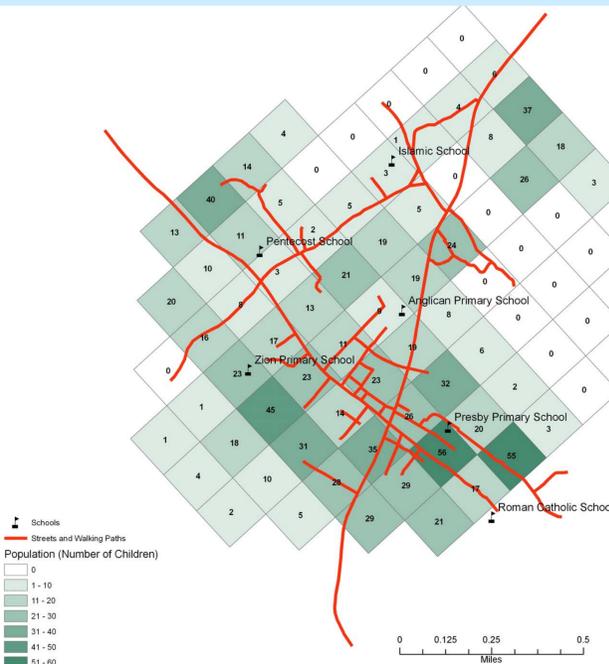
- Roads and walking paths were digitized to create a layer file
- Schools and major town buildings were digitized to create two separate layer files
- The water distribution system was digitized based on a paper map of the same
- Locations of standpipes (public water sources) were digitized
- A grid was constructed to function as a set of polygons for the purpose of aggregating and mapping population-based attributes

Attribute tables were created for a number of layer files and contain the following types of data:

- Demographic data for children
- Infection status of children
- School enrollment
- Functionality of standpipes

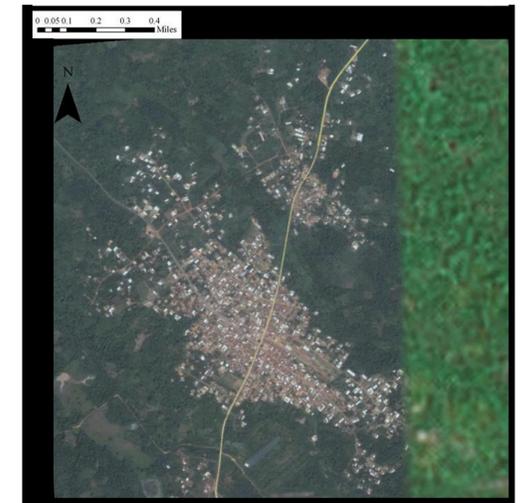
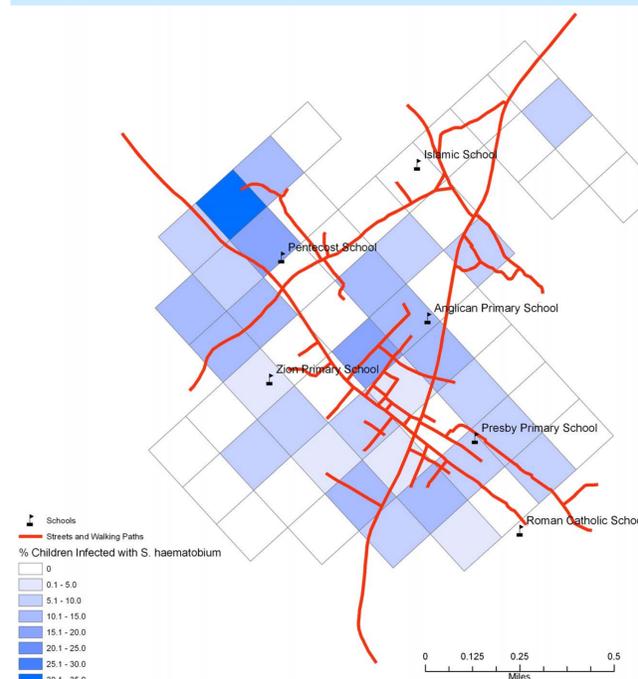
Results: A working map of Kwabeng was produced and will be brought to the field for fol-

Population Distribution of Children



low-up studies of schistosomiasis prevalence and distribution. A map of the percentage of children infected with *S. haematobium* [(infected children per grid square) / (total children per grid square)] was produced. There is a spatial component to infection;

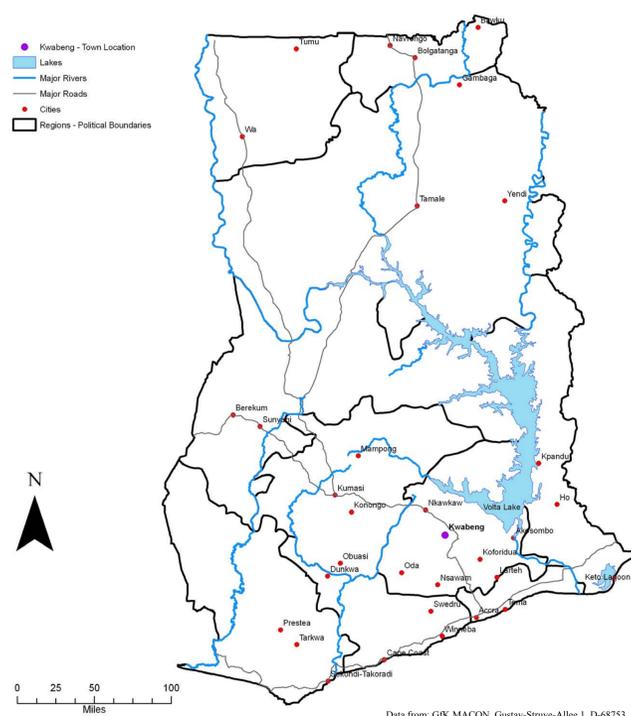
Percentage of Children with *S. haematobium* Infection



children in the northwestern section of Kwabeng have a higher prevalence of disease than their peers. A map of functional standpipes shows that children in this section of town are typically farther from an improved water source than their peers.

Conclusions: A working draft of GIS data layers for Kwabeng has been produced. Additional field work can be done to calibrate and improve the data layers and to collect additional data for the attribute tables.

GHANA



Functional Status of Public Standpipes



