

ABSTRACT

Nationals of Trinidad and Tobago are required to provide evidence that they are vaccinated against Yellow Fever Virus (YFV) before they can enter several countries. In order to ensure that any YFV outbreaks are rapidly identified and mitigated, the Veterinary Public Health Unit (VPHU) of the Ministry of Health in Trinidad and Tobago routinely conducts surveillance in Trinidad and Tobago. The surveillance efforts of the VPHU can be bolstered with the use of Geographic Information Systems (GIS) and mobile application technology.

OBJECTIVES

The objective of this research is to design a feasible, cost-effective GIS for Yellow Fever Virus surveillance in Trinidad and Tobago.

METHODS

Data collection will include mosquito vector locations, data from outbreaks, genomic sequencing data from surveys of arboviruses and mosquito abundance around residences gathered from routine activities.

A mobile application will be used to input field data on sightings of ill, dead or dying Howler and Capuchin monkeys by members of the public such as hunters, hikers and residents of communities that are close to forested areas.

Human cases and climate data will also be included. High risk areas will be identified for more intense surveillance. Predictive spatial and temporal analyses will be conducted in the GIS. Information based on analyses will be disseminated to stakeholders. It is expected that the output of this design will be a schema of the proposed GIS.

RESULTS

The design includes data collected from various sources (Figure 1). Quantum GIS (QGIS), a free and open source software, will be used to create maps and to analyse data. Client web requests (Figure 2) will be made through HTTP.

Figure 1. Sources of data for use in the Geographic Information Systems database

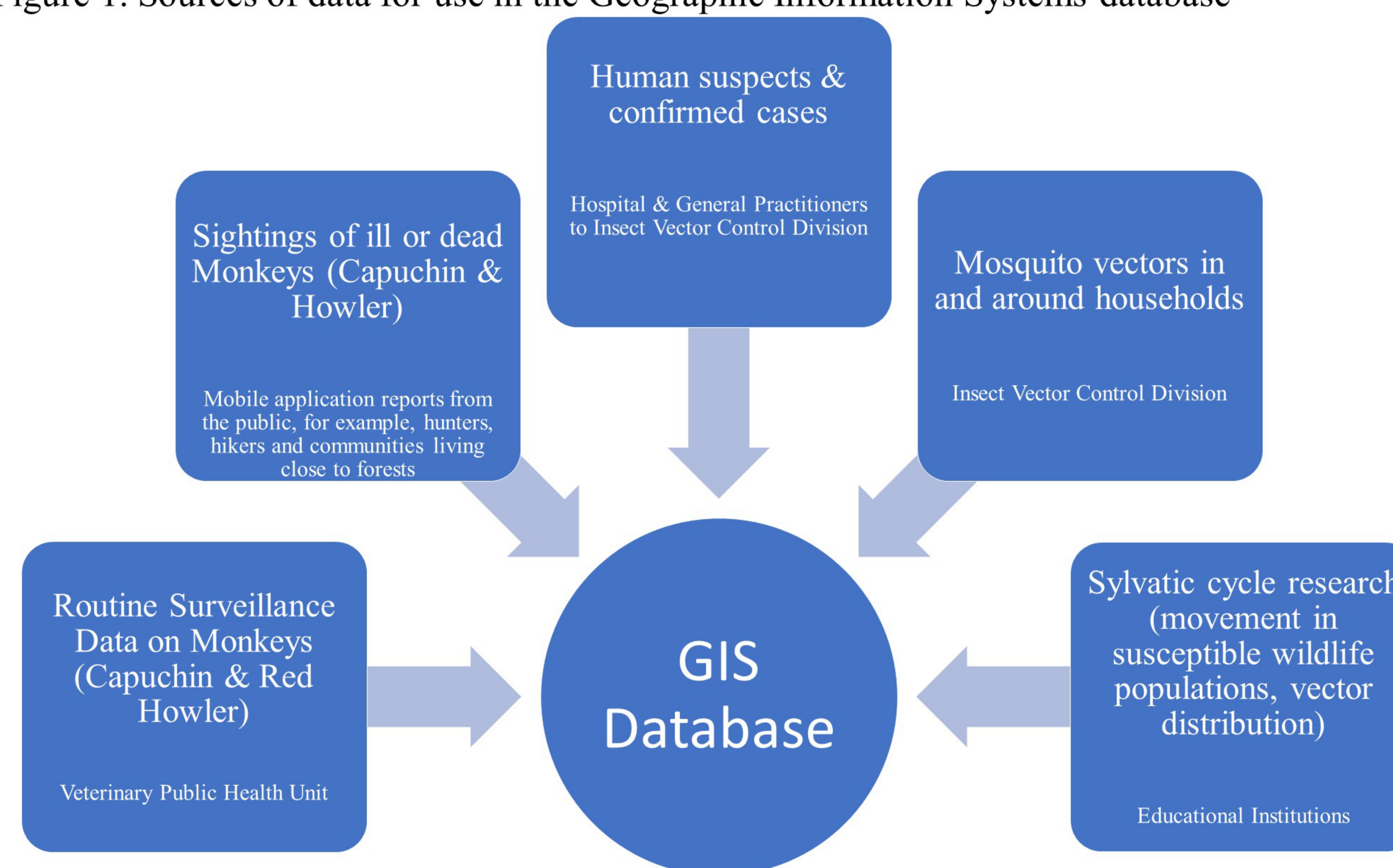
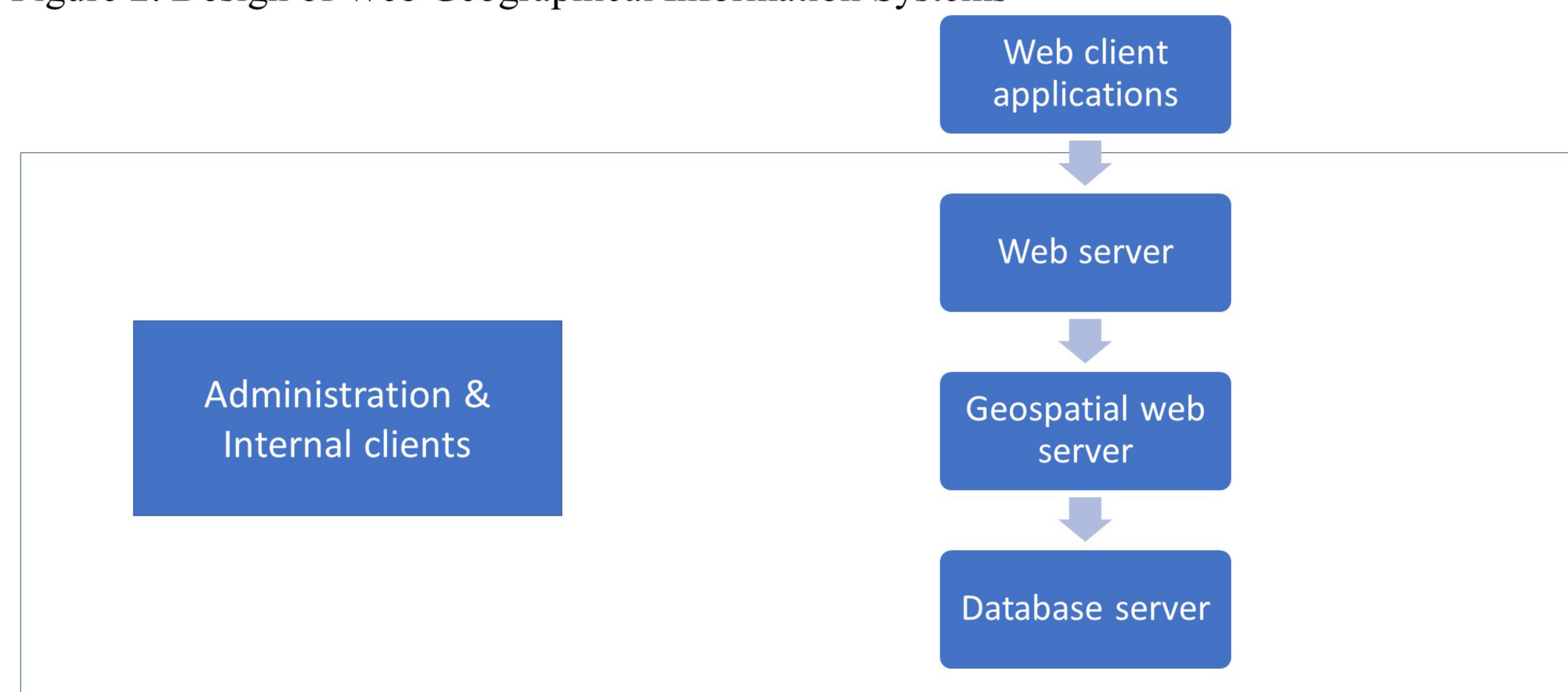


Figure 2. Design of Web Geographical Information Systems



DISCUSSION

Aedes aegypti and *Aedes albopictus* transmit YFV to humans around households and *Haemagogus spp*, also a mosquito vector, transmits YFV in the sylvatic cycle which occurs in the forests with hosts such as Red Howler monkeys. Humans who venture into forested areas, (*Alouatta sp*) such as hunters, can be infected with YFV when bitten by mosquitoes carrying the virus. In Trinidad, recorded cases of Yellow Fever Virus (YFV) have been attributed to spill overs from the sylvatic cycle¹. A recent study reported that residences located within 1 km of forests were at greater risk for encountering *Haemagogus* than those at further distances². It is apparent that surveillance of mosquito disease vectors in human communities near to forests is important.

A mobile application can be used for reports of sightings of dead and dying monkeys originating from members of the public such as hunters and hikers. This data can be used to rapidly identify high risk areas so that appropriate resources can be allocated to these areas. Overall, this big data approach can be of benefit to any unit with limited staffing as it has the potential to increase the area from which data is received and the frequency with which data is collected.

REFERENCES

References available from the author on request.