

# **The Application of Geographical Information Systems (GIS) in Public Health Management: A Case of HIV/AIDS.**

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## **Introduction**

The public health sector in South Africa has, for some time now, widely used GIS and researched on how it can be applied. The Ministry of Health and the Medical Research Council are well known users of this technology in this sector. The Ministry of Health has focussed a lot on using GIS to capture Health Service Infrastructure whereas more of the analytical research in terms of accessibility to health services has been conducted by the Medical Research Council. Despite the millions of Rand that have been spent on trying to address public health management related issues in South Africa, the application of GIS to benefit our society has not been optimised. Very little work has put sufficient emphasis on accurately revealing what the spatial dimension of public health problems actually looks like at the community level, especially in the rural areas. Furthermore, limited work has attempted to demonstrate how resources can efficiently be distributed to problem areas. The impact this has on our society is that, firstly, it makes it very difficult for decision-makers to accurately know where public health problems are high, moderate or low in terms of their prevalence at the provincial, district municipality, local municipality and community/village level. This in turn makes it difficult for them to know how best to manage them, distribute resources which are allocated to address them and determine which problems should be given priority over others, in an objective/ scientific manner.

## **Focus of the Research**

This research focuses on the use of GIS for HIV/AIDS management in the public health sector in South Africa. The research aims to investigate and demonstrate how GIS technology can be optimized for the management of HIV/AIDS in South Africa and how the distribution of resources can be made efficient. This will be done by:

1. Determining the kind of spatial data support infrastructure (hardware/ software) that needs to be in place for efficient HIV/AIDS management in South Africa
2. Determining the kind of data that needs to be collected from health institutions to effectively determine the prevalence of HIV/AIDS in South Africa
3. Determining how this information should be collected and stored with respect to appropriate legislation
4. Demonstrating how this information can be synthesised to support the planning and decision-making needs of the public health sector
5. Determining the training requirements for users of the data
6. Determining how this information can be made available to the public
7. Recommending how this strategy can be piloted and implemented in South Africa

This research will enable decision-makers in South Africa to more accurately determine:

1. Where people living with HIV/AIDS reside in South Africa in terms of their village, local/district municipality and provincial location
2. The areas where there appears to be an increase/decrease in infections
3. The socio-economic group which is mainly infected and the relationships that exist between the groups and the infection rate
4. In which areas resources mainly needed, what resources and how much e.g. condoms, marketing campaigns, education, drugs (Anti-Retrovirals (ARVs)), campaigns, services etc.

This will enable focussed and direct intervention where most mileage will be gained. The proper exploitation of this tool will also lead to effective allocation of resources targeting social upliftment.

## **Conclusion**

It is a forgone conclusion that we live in a society where the resources that we use to address the multitude of problems we face are limited. It is imperative therefore that we explore all the possibilities information technology can offer us in enabling us to use our resources in an efficient and sustainable manner. As an information technology, The World Health Organization describes GIS as, "an excellent means of analysing epidemiological data, revealing trends, dependencies and inter-relationships that would be more difficult to discover..." using traditional tabular approaches. Moreover, it is "a powerful tool for monitoring and management of disease and other public health programmes". Its optimised implementation can only be of tremendous good to our society.