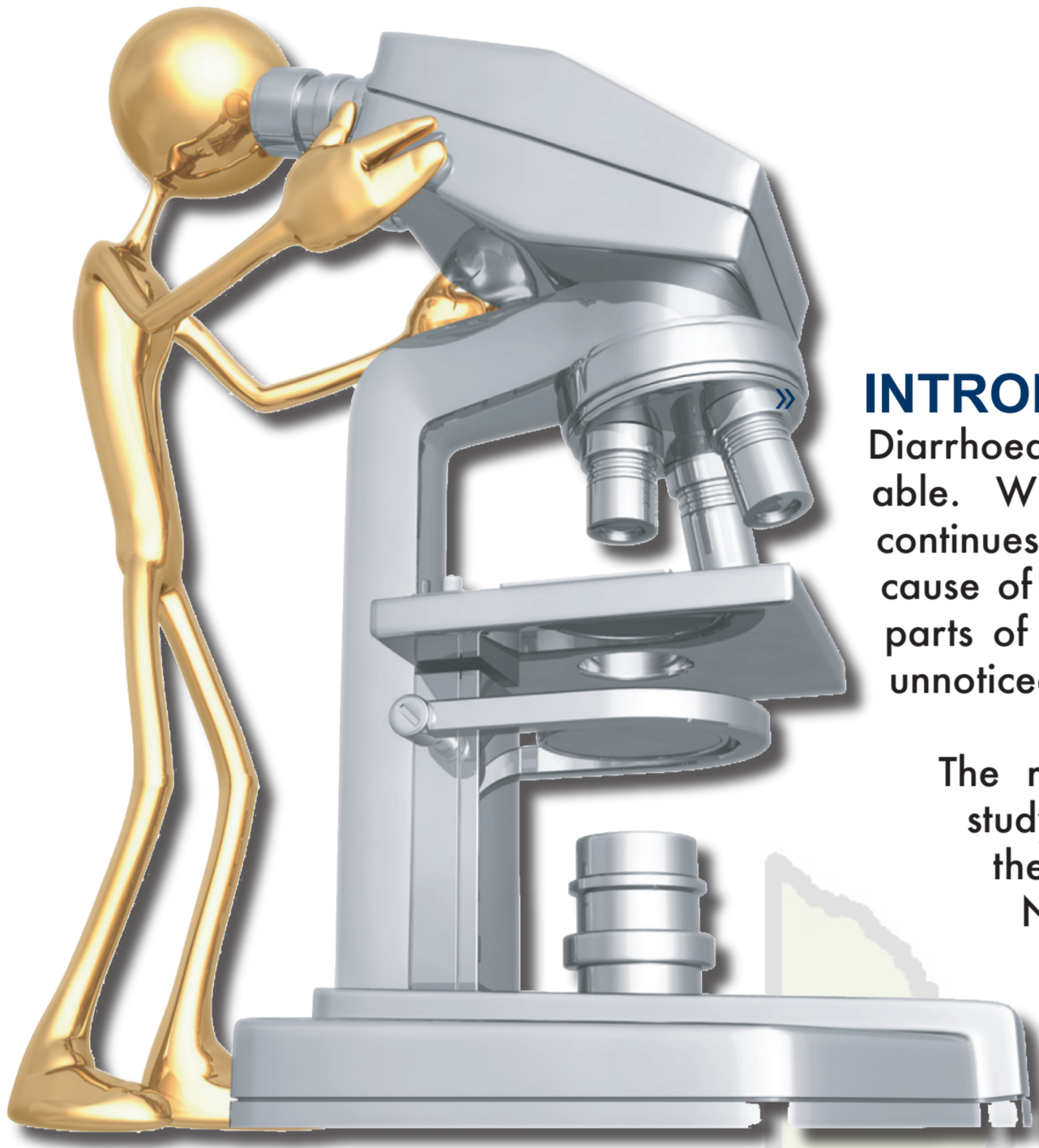


# The change in diarrhoea trends and the increasing importance of microbiological water quality due to HIV/AIDS in South Africa

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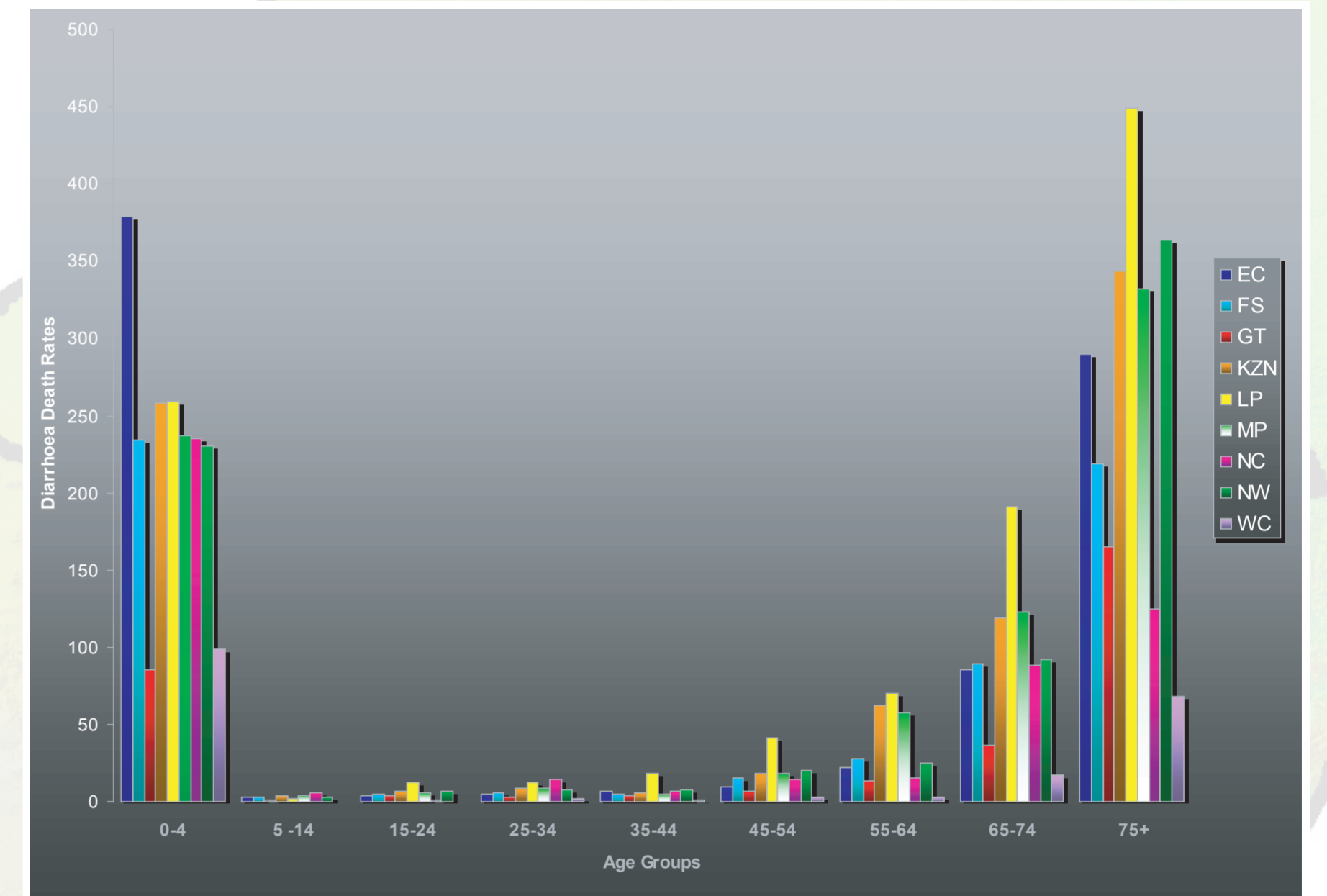
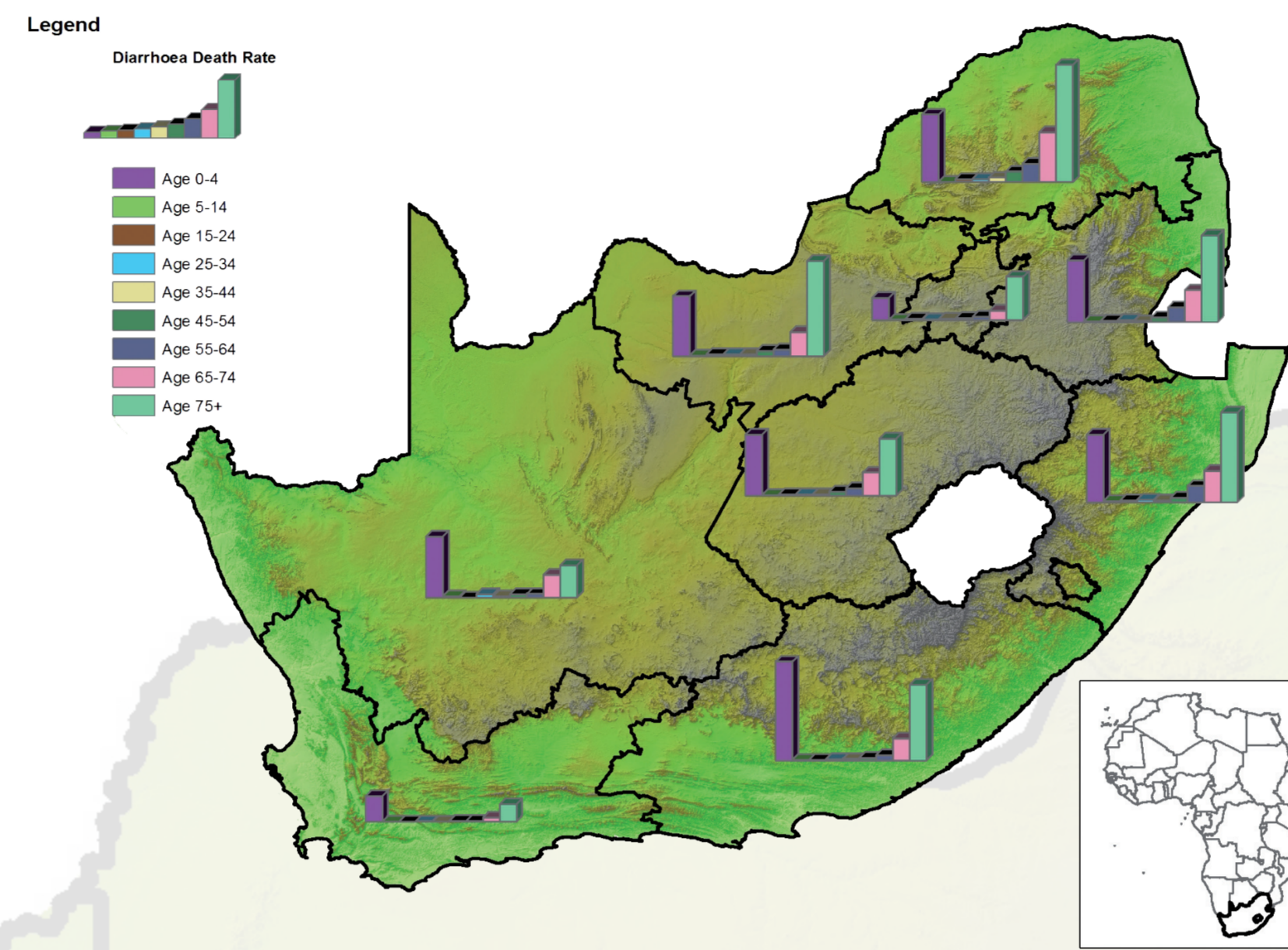
## INTRODUCTION

Diarrhoea should be easily preventable. Why then, is it that diarrhoea continues to be such an important cause of death and disease in many parts of the world, yet almost goes unnoticed by others?

The researchers involved in the study used diarrhoea data from the Department of Health's National Information System (1997 - 2003) and National Census results from Statistics South Africa (2003) to assess the current trends in diarrhoeal death and disease in South Africa.

The study was conducted to assess the availability and accessibility of such data as well as to investigate implications for policy-makers, describe trends and identify potential problems areas in South Africa.

Despite major efforts and considerable improvements in recent years, 2.11 million people in South Africa still lack access to any water infrastructure and more than 6 million people do not have access to a private supply of water. Even more discouraging is the fact that of the 49.8 million people in South Africa, more than 12 million still lack access to any form of sanitation (DWAf, 2009).



Diarrhoeal death rates for all ages, South Africa

As expected, the highest death rates were recorded for the vulnerable age groups (children under 5 and the elderly). However, there also seems to be an increase in adult deaths from diarrhoea in each province. The trend is particularly visible for the age groups 45 - 55 and 55 - 64. This might be due to the growing prevalence of HIV.

This is an important phenomenon, yet no policy change has taken place to record the prevalence of diarrhoea among adults in South Africa. Recording the prevalence of diarrhoea for all age groups could act as an early warning system to allow for proper planning and managing of the incidence of diarrhoeal disease and the prevention of unnecessary deaths from diarrhoea.

## POLICY IMPLICATIONS FOR SOUTH AFRICA

**The question is:** Are we measuring the right indicators?

Merely providing people with access to good quality water is not enough. People with compromised immune systems can easily become infected, contract diarrhoea and die. It is important to note that people should be provided with private access to a good quality water supply, either in their yards or in their homes, to minimise the potential risk of contamination and subsequent infection.

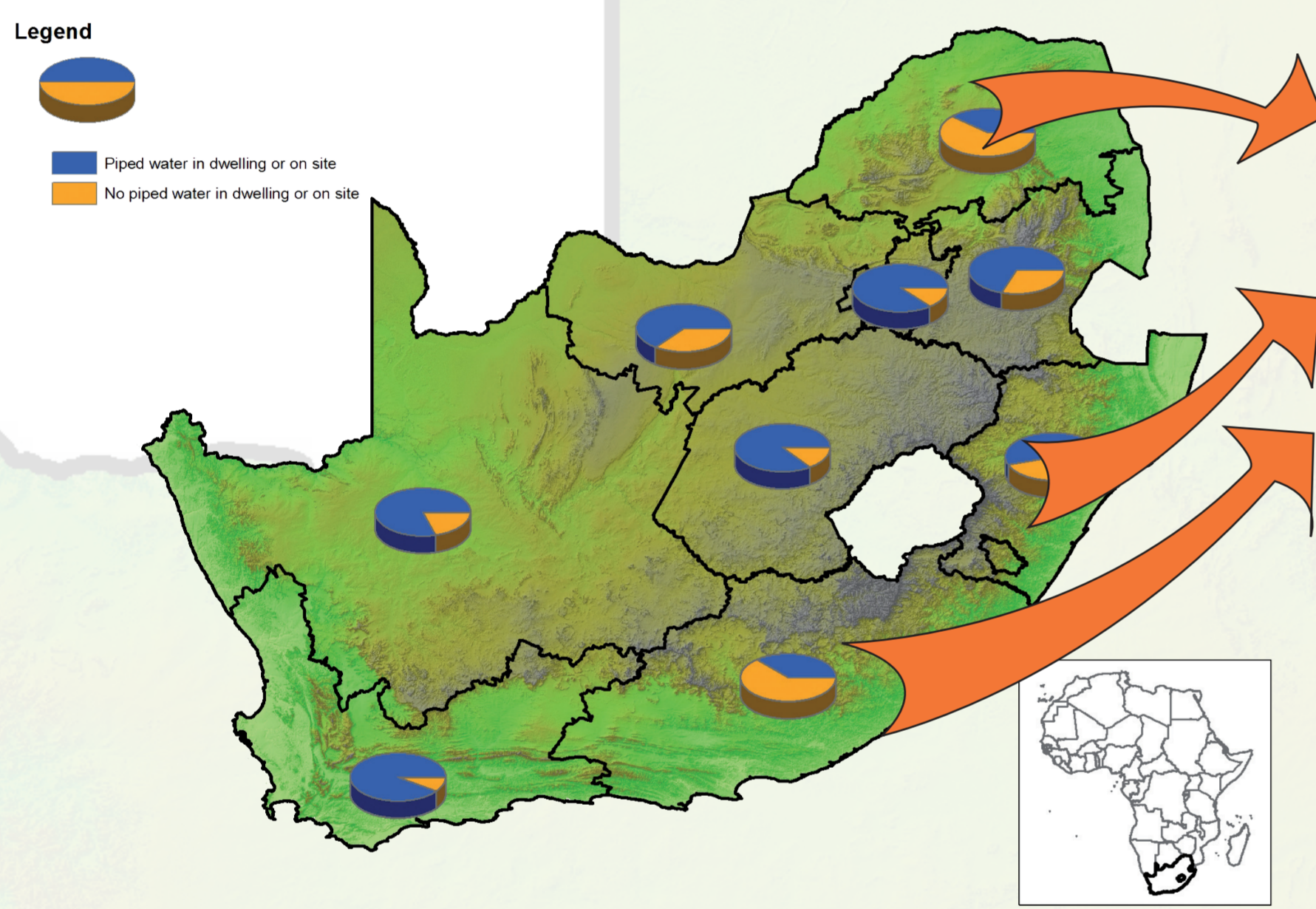
There is a noticeable increase in the prevalence of adult deaths from diarrhoea in South Africa. Changes in policy are therefore needed to also record adult diarrhoeal disease in South Africa. This data will clearly indicate a change in trends in death and disease and could allow for improved planning and prioritisation of health and water interventions as well as spending financial resources to improve the quality of peoples' lives.

## FUTURE RESEARCH

The recording of health statistics in South Africa is a tedious process and problems exist with the accessibility of these statistics. Attention should be given to the design and implementation of improved innovative mobile technology to improve the reporting of the incidence of disease data, especially from remote areas in developing countries. Disease incidence data such as diarrhoea should be easily recordable and downloadable to a central database that also links with data on related factors such as the results of tests to determine the quality of treated drinking water.

This innovative technology should be designed to record and send health data and other health-related data such as water quality results to a central data base via mobile technology. The central database should be designed to operate as an early warning system by flagging any above average incidence of diarrhoea as calculated based on previous annual trends and seasonal patterns. Simultaneously, any above average incidence of diarrhoea should trigger input from water quality testing facilities to monitor compliance.

Reporting disease incidence in this manner will also assist in decreasing the work-load associated with diarrhoea reporting per age group and the manual capturing of data in a central database on a weekly-to-monthly-to-annual basis. Not only will it speed up the process, but it could add to quality control of the data since there is less opportunity for human input errors between the different departments (e.g., Local Municipalities to Provincial Department of Health).



Access to private water supplies in South Africa

These provinces in South Africa have the lowest percentage of access to private water supplies in the country, and therefore the highest potential risk for microbiological contamination of treated water supplies and associated diarrhoeal disease burden.

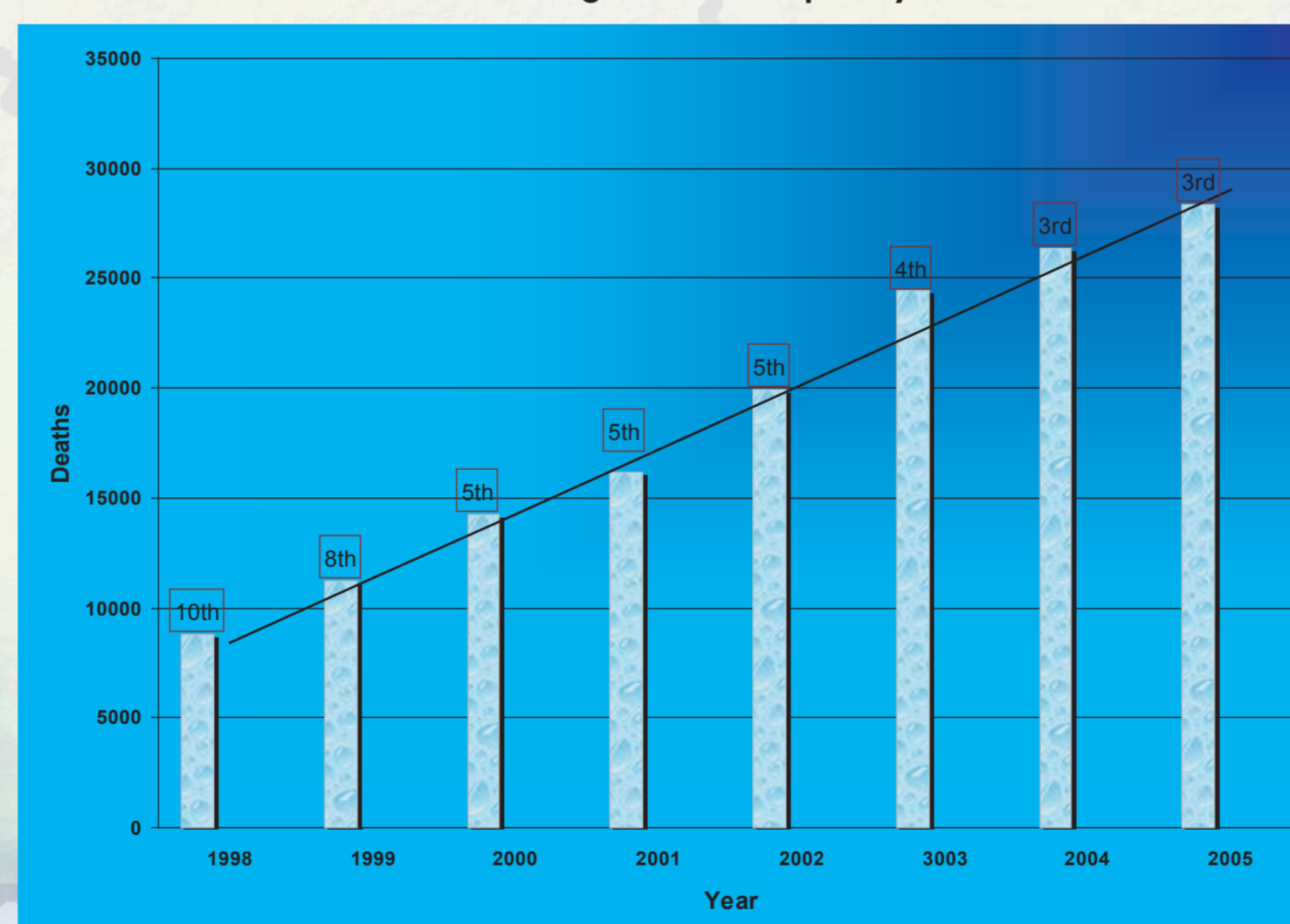
Not surprisingly, comparative risk studies recently found that 84% of all diarrhoeal disease in South Africa is attributable to unsafe water, sanitation and hygiene (Lewin *et al.*, 2007). In 2000, diarrhoea was responsible for 3.1% of total deaths (521,028) in South Africa. The burden was especially high in children under 5 years, accounting for 9.3% of total deaths in this age group.

The Council for Scientific and Industrial Research (Genthe *et al.*, 2007) conducted research and compared factors potentially contributing to diarrhoeal disease in order to identify high risk priority areas for research in the country. Statistical analyses of these factors indicated the strongest correlation between the number of people with HIV/AIDS and people not having access to a private water supply (Table 1). This finding supports the World Health Organisation (WHO, 2002) policy that deals with managing water in the home and focuses on the considerable health benefits that are the result of having an improved supply of water.

## FINDINGS

Much attention is given to the recording of the incidence of diarrhoea among children under the age of 5. This is used as an indicator of the health of the community since diarrhoea historically has a more profound effect on children and elderly people. The incidence of diarrhoea among children under the age of 5 is noted at each health facility (e.g., hospital or clinic) and is available on a national database. Almost no attention has been paid to determining the prevalence of diarrhoea among adults.

Statistics depicting death as a result of diarrhoea in South Africa show a steady increase over the last 12 years. Diarrhoea as the underlying natural cause of death for all ages has increased from being the 10th leading cause (1998) to becoming the 3rd leading underlying natural cause of death for two consecutive years (2004 - 2005). In addition, diarrhoea is the overall 8th leading cause of death in the country, while it is ranked 5th for contributing to Disability Adjusted Life Years (DALYs).



Diarrhoea as underlying natural cause of death for people of all ages 1997 - 2005 (Data sourced from STATS SA, 2007)

	# diarrhoea episodes in < 5 yrs
Number of diarrhoea episodes in children under 5 yrs	1.000
Surface Water Quality	0.185
Water supply backlog	0.131
Total number HIV+	0.683
Deprivation Index	0.202
No access to piped water	-0.068
No access to private water supply	0.669
<b>Access to private water supply AND HIV+</b>	<b>0.785</b>

Correlation of factors potentially contributing to diarrhoeal disease in South Africa

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## REFERENCES

- [1] NDHIS (National Department of Health Information System). 2000 - 2007. Diarrhoea incidence and death database. Department of Health. Pretoria (Signed users agreement between CSIR and DoH, 2008).
- [2] DWAf (Department of Water Affairs and Forestry). 2009. Water Services National Information System. Last accessed 20 May 2009 [http://www.dwaf.gov.za/dir\\_ws/wsnis/default.asp?nStn=wsnisindex](http://www.dwaf.gov.za/dir_ws/wsnis/default.asp?nStn=wsnisindex)
- [3] Genthe, B., Claassen, M., Maherry, A., Oberholster, P., and Steyn, M. 2008. State of the Nation: Assessing Water and Health Related Research Priorities. Natural Resources and the Environment, CSIR.
- [4] Lewin, S., Norman, R., Nannan, N., Thomas, E., Bradshaw, D and the South African Comparative Risk Assessment Collaborating Group. 2007. Estimating the burden of disease attributable to unsafe water and lack of sanitation and hygiene in South Africa in 2000. *S Afr Med J* 2007; **97**: 755-762.
- [5] Statistics South Africa. Census 2001: Census in Brief. Pretoria: Statistics South Africa, 2003.
- [6] StatsSA (Statistics South Africa). 2007. Causes of death 2005: Statistics South Africa. Mortality and causes of death in South Africa, 2005: Findings from death notification. Statistical release P0309.3. Pretoria: Statistics South Africa. [http://www.statssa.gov.za/Local copy: http://www.hst.org.za/indicators/StatsSA/mortality/P03093\\_2005.pdf](http://www.statssa.gov.za/Local%20copy%20of%20http://www.hst.org.za/indicators/StatsSA/mortality/P03093_2005.pdf) Calculated from valid causes of death reports adjusted for estimated data completeness (89%) per 1 000 estimated population.
- [7] StatsSA (Statistics South Africa). 2008. Community Survey 2007: Various reports and online databases. Statistics South Africa. [http://www.statssa.gov.za/Local copy: http://www.hst.org.za/indicators/StatsSA/CommSurvey/](http://www.statssa.gov.za/Local%20copy%20of%20http://www.hst.org.za/indicators/StatsSA/CommSurvey/)
- [8] WHO (World Health Organisation). 2002. Managing Water in the Home: Accelerated Health Gains from Improved Water Supply. Water, Sanitation and Health, Department of Protection of the Human Environment, World Health Organization, Geneva. WHO/SDE/WSH/02.07.

