



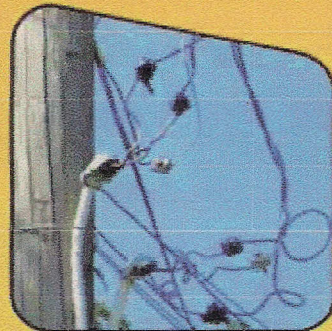
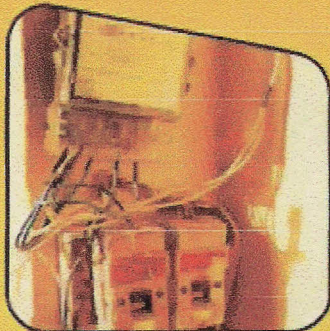
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Environmental health hotspots in

South Africa *by Caradee Wright, PhD, Environmental Health Research Group, Natural Resources and the Environment, CSIR*

The interface between communities and the environment is what determines environmental health. Poor environmental conditions, such as stagnant and polluted water, coupled with poverty-ridden communities relying on available resources to meet their basic needs leads to adverse health outcomes, for example, diarrhoea. Poorly informed individuals and subsequent risky behavioural factors – infrequent hand washing, incomplete water boiling, etc – may exacerbate these circumstances. To untangle the complexities associated with environmental health, information on environment, health, demographics and vulnerability is needed for a holistic view to finding a solution.

In South Africa, Environmental Health Practitioners (EHPs) operate at grassroots level among the communities most at risk. The Health Systems Trust Annual Health Report¹ and the Demographic Household Surveys^{2,3} by Statistics South Africa give us some insight into the status of environmental health in South Africa. However, no single source gives a complete snapshot to pinpoint environmental health risk hotspots in South Africa.

In a preliminary exercise, using multiple sources and a crude, rudimentary scoring system (see Table 1), environmental health hotspots were estimated for District Municipalities (DM, n=52) across the country. The state of air, water, land and soil was gauged. An attempt to factor in environmental change, especially climate change, was made. Health outcomes considered were respiratory tract infections, malaria, cholera, diarrhoea, HIV/AIDS, food poisoning and pesticide poisoning. A multiple deprivation index comprised the socio-economic factor included in the exercise. Governance, as a mitigation measure and possible response to risk, was considered using number of EHPs per capita and expenditure.

Results showed that the top three (riskiest) positions were held by Capricorn, Vhembe and Waterberg DMs in the Limpopo Province. Of those DMs ranked in the top five positions (several positions were shared by more than one DM), there were five DMs from the Eastern Cape, four from Limpopo Province, three from Mpumalanga and two from KwaZulu-Natal. The snapshot view becomes clearer when these results are mapped, as indicated in Figure 2 showing total scores. It is still not known which of the parameters are most responsible for pulling a DM into one of the top five positions; however, it would appear that environmental factors are important.

Biases, shortcomings, limitations and planning for future work

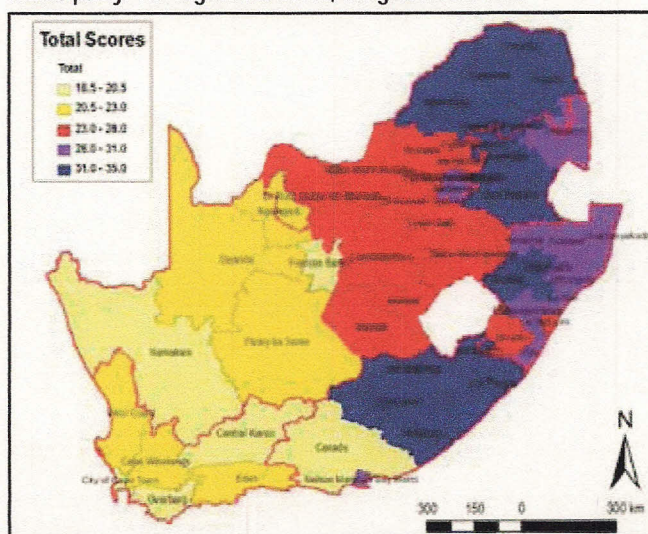
- These preliminary results may provide extremely valuable information for decision-making.
- Population weighting for DMs, or even provinces, were not applied because population data for the year with available data were not always available.
- Maps and tables were used in most cases to prepare a final (preliminary) product.

- An equal weighting was applied for a score of 3 (worst off / highest risk), 2 and 1, between each other and between indicators.
- When searching for data to fulfil the required indicators, data from reputable sources and as recent as possible were selected. However, no checking for validity and reliability of selected data was made. As discussions continue, improved, more recent and reliable data is coming to light and will be applied in future iterations.
- No formal process of ground truthing has been carried out to consider what might be influencing results, for example, what might be causing poor environmental health conditions in Limpopo.
- A process to overlay land use and activity type as well as information from pollution inventories and other useful databases will be done to get a more complete understanding of high-risk areas.

The State of the Environment Report⁴, the State of Air Report⁵ and the District Health Barometer⁶ Report for South Africa, as examples, give some indication of the status of environmental health outcomes, environmental conditions, implemented mitigation measures and past and current research. However, no "State of Environmental Health in South Africa Report" exists. The newly established Environmental Health Research Network (www.ehrn.co.za) is the first step to bringing together those with an interest in environmental health research and possibly working towards finding solutions to the environmental health issues we face in South Africa. The preliminary exercise described here shows that it is possible to identify potential environmental health hot spots using a series of available maps and data.

As this work continues, we will strive to answer the difficult questions: "Who needs help the most, where do they live, what are their most serious problems and can we work with them to find appropriate solutions?" ■

Figure 1. Snapshot of environmental health hotspots by District Municipality. The higher the score, the greater the risk.



Acknowledgements

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References

1. Health Systems Trust. 2008. South African Health Review 2008. Durban, Health Systems Trust.
2. Department of Health. 1999. South Africa Demographic and Health Survey 1998. Department of Health, Pretoria.
3. Department of Health. 2007. South Africa Demographic and Health Survey 2003. Department of Health, Pretoria.
4. Department of Environmental Affairs and Tourism. 2006. South African Outlook. A Report on the State of the Environment. Department of Environmental Affairs and Tourism, Pretoria.
5. Department of Environmental Affairs. 2009. State of Air Report 2005. Department of Environmental Affairs, Pretoria.
6. Day C, Barron P, Monticelli F, Sello E, Editors. 2009. The District Health Barometer 2007/08. Health Systems Trust, Durban.

Table 1. Indicators used to estimate environmental health risk 'hot spots' in South Africa. Scale of available data and scoring for worst off (3), intermediate (2) and least worst off (1) are shown.

	Indicator	Scale of available data	Worst off score = 3	Intermediate score = 2	Least worst off score = 1
Environmental factors Air	Air quality from DEA Source: Air Quality Rating of Metros and District Municipalities, Department of Environmental Affairs, 2007	DM	Poor	Potentially poor	Acceptable
Waste	Waste backlog (percent backlog) Source: Suzan Oelofse 2009	DM	54,8 to 92,6%	27,1 to 54,8%	4,8 to 27,1%
Water	Types of water quality problems Source: Dr Ashton, CSIR	regional	3 or more issues	2 issues	1 issue
Soil	Land degradation Source: State of Environment Report (online) 2009	DM	severe	moderate	light / insignificant
Socio-economic factors Composite	Multiple deprivation index, children under 5 years Source: The South African Index of Multiple Deprivation for Children 2007 at Municipality level	DM	Most deprived (5 on source map)	Moderately deprived (4,3,2 on source map)	Least deprived (1 on source map)
Governance Environmental Health Practitioners (EHPs)	EHPs/capita Source: Department of Health, Financing Environmental Health Services in South Africa 2004	PR	>30 000/EHP	20 001 to 30 000/EHP	0 to 20 000/EHP
Expenditure	Total expenditure for environmental health Source: Department of Health, Financing Environmental Health Services in South Africa 2004	PR	R0 to R50 000	R51 000 to R99 000	>R100 000
Health outcomes Respiratory	Percentage of children under 5 years with acute respiratory infections Source: South African Demographic and Health Survey 2003	PR	>10%	6 to 10%	0 to 5%
Malaria	Malaria cases reported in 2007 Source: Department of Health 2008	PR	>501	1 to 500	0
Cholera	Cholera cases reported between January and July 2003 Source: Department of Health 2003	PR	>551	1 to 550	0
Diarrhoea	Diarrhoea incidence in children under 5 years Source: District Health Barometer	DM	>500	300 to 499	0 to 299
HIV/AIDS	HIV prevalence (% of total population 15 to 49 years) – ASSA2003 model for 2009 Source: South African Health Review 2008	PR	>21%	11 to 20%	<10%
Food poisoning	Reported cases for 2002 Source: Department of Health 2002	PR	>5	1 to 5	0
Pesticide poisoning	Total number of pesticide poisoning cases between 2000 and 2008 Source: Department of Health 2008	PR	>10 000	201 to 10 000	0 to 200
Climate change risks	Dr F Engelbrecht, CSIR	regional	3 or more issues	2 issues	1 issue

Note. DM, District Municipality; PR, Province. In most cases, the scales used on the original maps were applied and graded 1, 2 or 3 for the purposes described here. Once each DM was scored, using either data for DM or for province (when data were not readily available at DM level), the scores were totalled and DMs were ranked by overall scores.