

# Measuring environmental health status in Oukasie, 1987

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## Summary

This article reports on some aspects of the physical environment and on environmental health services at Oukasie. The data were collected over a weekend in August 1987 by an interview and by direct inspection of the environment using a standard schedule.

We had a 100% response rate on the interviews. There was

a mean of  $2,2 \pm 1,6$  persons per room in the households, with brick houses being less crowded than non-brick houses.

Private yards were generally kept very clean. Bucket latrines were unhygienic and used by an average of 4 families. No latrine was built to accepted standards. Garbage collection and emptying of the bucket latrines by the municipality seemed to be unsatisfactory.

Our overall impression was that where responsibility for maintenance of hygiene is either undefined, such as the collection chambers of bucket latrines, or a responsibility of the public authorities, such as garbage collection and water drainage, there is an unsatisfactory state of hygiene. Where maintenance of cleanliness is clearly a private responsibility, such as the maintenance of the cleanliness of private yards, the general status of hygiene is good.

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Oukasie is a 60-year-old black township adjoining Brits, Transvaal. It has a population of about 7000 people. In 1986 the government disestablished the township, citing poor health conditions because of an unhygienic environment as the primary reason. Residents were requested to move to an alternative site. This site was perceived as unacceptable. Residents also disagreed fundamentally with the reasons given by the government and decided to challenge them. They approached the Transvaal Rural Action Committee (TRAC), and through the TRAC and after legal consultations they approached the



Department of Community Health of the University of the Witwatersrand with a request for assistance in the assessment of the health status of Oukasie.

Together with the ancillary authors, in consultation with TRAC and the Brits Action Committee, the two principal authors collected four sets of urban ecological health indicators: (i) demographic information; (ii) socio-economic information; (iii) information on health services; and (iv) information on the physical environment and on environmental services.

Here we report on some aspects of the physical environment and on environmental services. The data presented here are the result of two different surveys conducted on the same day. The other data are published elsewhere.<sup>1-3</sup>

## Methods

Faced with the need to collect information on the physical environment with a minimum of manpower requirements, we developed a rapid, inexpensive and scientifically sound survey technique.

This technique allowed us to collect information on roads, general cleanliness of the township, water supplies, the sanitation system and garbage disposal as well as other potential hazards in the environment. We also collected data on resource utilisation (vegetable gardens, fruit trees, and domestic animals).

Data were collected using a standard schedule that required direct inspection of the environment as well as questioning of the inhabitants of randomly selected households.

The inspection schedule was developed after two visits to the township by the principal researchers. There was also consultation with some members of the Action Committee and a review of some publications of relevance.<sup>4-7</sup>

After developing the schedule the areas for inspection were selected by taking a systematic 1 in 4 sample of all the 200 households being used for the socio-economic survey.<sup>1</sup> The 50 households so identified were used as a basis on which to collect information on sanitation and garbage and to inspect the household in terms of cleanliness of the yard, domestic animals, vegetable gardens, fruit trees and observable hazards.

The road in front of the main entrance to the yard of the household was selected to collect information on taps and water supplies, quality of the roads, and cleanliness of public areas. Because of the need to limit the length of road to inspect, we inspected the tract of road limited by the first cross-road distal and the first cross-road proximal to the household selected.

If the household selected was either not found or fell on a portion of the road already inspected, the following household in the complete list of randomly selected 200 households was selected and the road in front of this new household was inspected. The actual survey was conducted over a weekend in August 1987.

On the morning of the first day the two principal researchers conducted one inspection together to standardise the way of collecting information. Photographic documentation was also carried out. Each researcher was accompanied by a community member, who acted as guide, translator and assistant in identifying the selected households.

Some information on housing quality, overcrowding and sanitation obtained in the socio-economic survey described by Orkin *et al.*<sup>1</sup> is also reported in this article.

## Results

The response rate for both surveys was 100%. The physical environment in Oukasie is characterised by destroyed homes

that remain as heaps of rubble on empty plots between inhabited ones.

The number of inhabited plots per section of street inspected varied from 3 to more than 20.

Seventy per cent of the 50 plots inspected had more than one household (median 2, range 1 - 8). On a scale of 1 - 5 (where 1 is a very dirty environment and 5 a spotless environment) half of the plots were graded 4 (clean) and only 3 were graded 1 (very dirty).

Thirty-four per cent of 200 households surveyed during the socio-economic survey had only one room (median 2, range 1 - 8). In 56% of the households there was only one room for sleeping at night (median 1, range 1 - 6). The corresponding number of people per room and per sleeping room is shown in Table I. Brick houses, with a mean of  $2,1 \pm 1,5$  persons per room, appeared to be less crowded than non-brick houses (with  $2,3 \pm 1,6$  persons per room).

TABLE I. ROOM AND SLEEPING ROOM OCCUPANCY IN HOUSEHOLDS IN OUKASIE

Occupancy	Room		Sleeping room	
	No.	%	No.	%
0 - 1	56	28	29	15
1,1 - 2	77	39	50	25
2,1 - 3	30	15	48	24
3,1 - 4	15	8	35	18
4,1 - 5	11	6	19	9
5,1 - 6	4	2	6	3
6,1 - 7	6	3	10	5
> 7	1		3	
Mean $\pm$ SD	2,2 $\pm$ 1,6		3,3 $\pm$ 4,0	

Garbage was mostly disposed of in large tin drums (80% of households), although other types of containers were also used. Twenty-six (33%) of the containers were either full or overflowing at the time of inspection and only 2 (3%) were empty. In 25 cases (36%) the environment around the containers was graded as either clean or spotless; it was very dirty only in 3 cases (4%). No container was fixed to prevent its being overturned by animals. There were no municipal bulk containers anywhere in the township.

The state of the containers reflects, to some extent, the answers to the question: 'How many days ago had garbage been collected from that part of the township by municipal workers?' Most households reported that garbage had been collected more than 6 days ago. In households where garbage had not been collected regularly, it was disposed of either by burning or by throwing it into the bushes around the township. The data on garbage collection obtained in this environmental survey is supported by data obtained independently during the socio-economic survey.<sup>1</sup> According to the socio-economic survey domestic solid waste is disposed of in most cases by putting garbage into a drum to be collected (97%). Seventy-eight per cent of respondents considered that the weekly collection of solid waste was regular, but 22% said that it was irregular.

In the socio-economic survey all 200 households reported use of the bucket system of sewage disposal.

It seems that servicing of the bucket latrines was done on a more regular basis than the collection of garbage. Thirty-seven (74%) of the buckets had been emptied at least once during the 2 days before the start of the weekend; 2 (4%) were reported as not having been emptied for more than 7 days. Most of the residents (66%) expected their buckets to be emptied again on



either the Monday or Tuesday following the weekend of the survey.

Most of the households shared the bucket latrine with some other family. Only 24% of 50 households had a bucket latrine for their exclusive use (median 4, interquartile range 4).

Most of the latrines had corrugated iron superstructures (72%). Seven (14%) had brick superstructures and 7 (14%) had wood superstructures. None of the superstructures, or any of the collection chambers, were insect- or rodent-proof. None of the superstructures inspected were light-proof and none of the collection chambers had a ventilation pipe.

In general, cleanliness of the toilet seat and of the collection chamber was very poor. Only 7 (14%) of the seats had covers and none of them were closed. None of the seats were appropriate for use by small children.

All the buckets were made of rubber and none had a handle. At the time of inspection very few of the buckets were full or overflowing. Inspection of the buckets was difficult. Because of the very dirty condition of the collection chambers it was not possible, in several cases, to move the buckets to look for leaks. At least 5 (10%) of the buckets had leaks, but this is certainly an underestimate (there was no information on 4 buckets (8%)). Overall it was apparent that there was no standard approach to building of toilets and generally no attempt to maintain the toilet structures.

All the roads were gravel roads. Forty (80%) of the streets inspected were of compacted soil and 28 of these were very poorly maintained. Eight roads (16%), mostly in the periphery of the township, were of loose soil and most of these were in a satisfactory condition (at least during the dry period, when the inspection was conducted). We have no information on 2 roads. None of the streets had street lights. Otherwise there is no electricity in the township. None of the roads had any formal system of rainwater drainage, although 31 (62%) had a gentle slope that promoted natural drainage of the rainwater into the periphery of the township.

The general cleanliness of the township along the streets varied. In most cases, environmental garbage was minor but indiscriminate.

In each street tract inspected we identified the number of taps per street. Thirty-two tracts (64%) had no taps, 15 (30%) had one tap and 2 (4%) had three taps (no information for 1 case). On the scale of 1 - 5 all the taps inspected (except for 3) were graded either 1, very dirty (67%), or 2, dirty (24%). There was no proper maintenance of the environment around each tap. Rocks, rubbish and offensive, stagnant water created an undesirable environment. In one case the water pooling around a tap was seen draining into the collection chamber of a bucket toilet.

Very few other hazards were identified in the yard. A pit for sillage disposal was seen only in one case. On several occasions we identified remnants of fires. On questioning it became apparent that open fires are an almost universal way of cooking, particularly in the evenings. Six households (12%) had fowls, 2 (4%) had vegetable gardens and 5 (10%) had fruit trees.

## Discussion

The overall impression obtained from the above results is that where responsibility for maintenance of hygiene is either

undefined (as in the case of collection chambers of bucket latrines) or a responsibility of the authorities (garbage collection, leaking buckets in latrines, water drainage from public taps or rainwater, maintenance of roads) the general state of hygiene is poor. Where the responsibility is clearly private (for example maintenance of the cleanliness of the private yards), the general status of hygiene is good. An interesting case is that of latrines: the state of hygiene was generally poor, and this raises the issue of cultural taboos associated with human excreta, perhaps emphasising that latrines should not be shared between different households.

There is no water-borne sewerage disposal system in the township, although this is available in a white residential area 150 m away. Despite the fact that health authorities worldwide acknowledge that bucket latrines are expensive to maintain, unhygienic and hazardous and should be used only under emergency conditions,<sup>6,7</sup> they are still used in Oukasié and in other townships of South Africa.

Gravel roads are poorly maintained and there is no proper water drainage. This leads to pooling of water, particularly in the rainy season, which contributes to the poor physical environment.

Lack of electricity contributes to poor security and increases the costs of cooking and refrigeration.

Rodent breeding is encouraged by rubble of destroyed buildings and an inadequate garbage collection system.

Although overcrowding still exists by international standards it is much less marked than in other black townships in South Africa.<sup>2</sup>

Sewerage, water supplies, personal hygiene and environmental conditions in general are important determinants of the health status of populations, but they are particularly important in urban and peri-urban populations. While in rural populations hygiene remains to a large extent a responsibility of the individual family, in urban areas the nature of the settlement places major responsibilities in the hands of local health authorities. In Oukasié these responsibilities seem to have been ignored and the result is an environment that is dilapidated, unhygienic and accordingly in urgent need of attention by a suitably constituted health authority.

Most certainly the environmental conditions described here are not unique to Oukasié, being common in many urban and peri-urban areas of South Africa and of the developing world. The rapid-assessment methodology described here should prove useful in these areas. Our findings and recommendations are likely to have national relevance and similar surveys need to be conducted elsewhere.

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