Water supplies and sanitary facilities in rural Transkei

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Summary

Between October 1982 and September 1983, an outbreak of cholera occurred in Transkei. A total of 678 patients with clinical illness were reported in a review of positive laboratory results. Subsequent to each report, the health department personnel began a rigorous contact-tracing process during which data on the environment were collected. A total of 1157 standardised forms listing 6615 persons were returned to the Epidemiological Unit. Of these respondents, 87.2% reported having 'no sanitary facilities available' and 96.4% 'no refuse disposal site'. Rivers, wells, springs, streams, dams and stagnant pools were recorded as the main sources of water supply in the study area. Whether this situation will remain unchanged or improve can be determined only by continued surveillance.

Water supplies and sanitary facilities

Polluted water can transmit many diseases, including cholera and typhoid. Surface waters become polluted when people wash and bath in them and when rainwater running over polluted ground gets into streams and lakes. Before the introduction of cholera into Transkei in 1982, water, especially among rural communities, was not recognised as a major factor in diarrhoeal disease transmission, but during 1982-1983 two outbreaks of cholera were reported. Until recently, research activity in environmental epidemiology in Transkei was sparse, because of a lack of epidemiologists and the fact that water supply is the responsibility of the Department of Agriculture and Forestry. The present article is an indication of recent expansion of environmental action in the Department of Health. The data reported were obtained from a community surveillance programme applied during the second cholera outbreak in Transkei.

Subjects and methods

The community surveillance programme during the outbreak of cholera has been described previously. It encompassed the following districts: Elliotdale, Mqanduli, Ngqeleni, Port St Johns, Lusikisihi, Bizana, Umtata, Libode and Qumbu. Briefly, patients with diarrhoea typical of cholera who consulted any care facilities were defined as cholera cases and their homes were subsequently visited. A rigorous contact-tracing process was initiated, collecting information from close contacts. The methods of water purification and quality of water storage at home were unspecified on 24.2% and 8.1% of forms respectively. Of the 877 forms giving methods of water purification, 750 (85.5%) reported using no methods to purify water, 11.9% used Jik, Javel or chlorine, and 2.6% reported boiling the water. Among those using Jik, Javel or chlorine, 2.3% had their water supply centrally chlorinated by municipal plants. Storage of water at home as determined by visiting health personnel was found to be in an acceptable condition for use. Although response to the question about refuse disposal sites was the poorest, with 40.4% of forms incomplete, it was stated in 96.4% of the completed reports that there was no refuse disposal site.

Discussion

Nearly all surface waters (rivers, streams, dams and lakes) and ground waters in rural Transkei are used by man. A recent report shows that during the last decade typhoid, cholera, poliomyelitis and hepatitis A were the most common notifiable water-borne infections in Transkei, often resulting from unprotected water supplies, poor personal hygiene and insanitary practices among the rural communities. Although researchers have recognised the importance of surface water in the transmission of water-borne infections, the role of unprotected groundwater from deep boreholes in the transmission of the same diseases is not clear to the rural public. Generally, it is believed that groundwater from deep boreholes is not polluted because pathogenic micro-organisms are removed as water filters through the soil down to the water-table. However, if the soil is porous, enabling the water to drain rapidly through it, groundwater is likely to become polluted. Water from shallow boreholes and wells is even more likely to become polluted, and open wells can also be polluted if dirty buckets are dropped into the water. Thus, even those water sources which rural people consider safe may not in fact be free of disease-transmitting agents, and unclean containers used for collecting and carrying water create a further hazard.

Although the effectiveness of individual methods of water disinfection was not determined, the 9.6% of reports stating that use is made of batch chlorination, i.e. the chlorination of individual containers such as 20-litre buckets and 200-litre drums, can be regarded as the result of a successful health education campaign during the first cholera outbreak. This campaign probably also accounts for the 12.8% of respondents who reported using no methods to purify water, and the 11.9% who used Jik, Javel or chlorine.
Salmonella isolated from rooibos tea

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Summary
Various Salmonella serovars were isolated from rooibos tea, a natural, untreated agricultural product. The results of a study to identify the serovars is reported. The possibility of lizard origin is discussed and the low pathogenicity of the salmonellae isolated is highlighted.


The contamination of food from animal origin with Salmonella is well known and has been widely documented. The way in which these foods are contaminated is clearly understood and difficult to avoid because of the wide distribution of Salmonella among animals of all kinds and contamination of the environment, mainly water sources.

It is unusual, however, for untreated foods of vegetable origin to be contaminated with Salmonella or other enterobacteria. An exhaustive search of the literature yielded only a few relevant publications. In the environment enterobacteria are usually restricted to water supplies contaminated by faeces. Untreated foods of plant origin would naturally be contaminated with normal soil bacteria.

Materials and methods
From November 1984 to August 1985, 155 Salmonella cultures isolated from rooibos tea were received (Table I). Each culture was biochemically examined and serotyped.

Slide agglutination procedures were followed (M. L. Swanepoel — unpublished data) for the determination of both the O and H antigens, using either commercially available antisera (Difco and Wellcome Diagnostics) or antisera produced at the Veterinary Research Institute, Onderstepoort.

For the O-antigen typing each culture was inoculated onto blood agar plates for 18—24 hours at 37°C. For the H-antigen determination each culture was inoculated onto a swarm agar plate and incubated for not longer than 24 hours before typing. Each culture was tested for roughness in a 1/500 acriflavin saline solution.

Although the H antigens of subspecies III serovars were included in the Kauffman-White scheme, they are difficult to identify and serotyping of S. arizonae beyond O-antigen level was not undertaken.

Results
The various identified Salmonella serovars are given in Table I. The majority, 103/155 (66.5%) of the isolates were identified as subspecies I serovars, while only 50/155 (32.2%) belonged to subspecies III. Subspecies III organisms were identified twice only. No subspecies IV or V serovars were identified. A surprisingly small number, 9/155 (5.8%), of rough salmonellae were found, 7 of which belonged to subspecies I and 2 to subspecies II (Table I). An unexpectedly large variety of serovars, 49 different ones in fact, were identified. Three of them, S. II (grabouw), S. II (alsterdorf) and S. II 40a/26 were predominant, while the other 46 serovars were each found only infrequently.

Three isolates were biochemically identified as Salmonella (Table I), but were not completely serotyped since this laboratory does not have facilities for identifying all O antigens.