



Onsite Testing of Water: A Field Trial

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BACKGROUND

Western Australia has about 260 discrete Aboriginal Communities recorded by the Western Australian government.



Fig 1: Kalumburu Community in the Western Australia's far North

Many of these have satellite communities, which are often called outstations. In 1997 The Aboriginal and Torres Strait Islander Commission recorded 367 communities, including seasonal camps and outstations. A community is often either a large mission, or a government run settlement, town or fringedweller camp as well a self determined stations or homeland centres (Anda 1998). Of all of these communities, 56 have regular bacteriological testing carried out at least once a month by the service provider. There are three such service providers in Western Australia, (Cowell Electric in the Pilbara, Kimberley Regional Service Provider in the Kimberley, Ngaanyatjarra Services in the Ngaanyatjarra Lands and Goldfieds). These companies are contracted to do such testing however they can employ a person based at the community to provide the services. Due to the vastness and differences between the areas in Western Australia (WA) three different service providers are needed. WA covers 2,500,000 sq km and had an estimated population of 1,805,400 in 1997. Of these 42,000 were Indigenous people (Daube 1994).

On-site testing of water in remote areas offers the communities a quick, accurate and low cost method of testing their water for contamination at any time. This project implemented a test for presence/absence of total coliforms and thermo-tolerant coliforms. The methods however do not test for the number of indicator organisms present. The presence and absence is displayed by a colour change, due to the enzymes produced by the coliform bacteria. The test has also been verified by laboratories and was found to be a good indicator of coliforms

The ability of the community to conduct on site water testing is not affected by geographical or demographical or monetary circumstances. However there are some restrictions to completing on site testing such as the need for a 24hr supply of electricity and the need for the consumables to conduct the test. The success of the program depends on the implementation of the kit and the training that occurs.



The samples are tested for coliforms and *E.Coli*, which are indicators of faecal contamination of drinking water supplies. However coliforms are not harmful themselves, but if they are present in drinking water supplies, the water may have been contaminated with faeces of a warm blooded animal. Often there are also germs that can cause disease present. Some diseases that can be present are *Campylobacter spp.*, *Salmonella spp.*, *Shigella spp.*, *Vibrio spp.*, *Cryptosporidium parvum*, *Giardia intestinalis*, as well as Adenovirus, Enterovirus, Hepatitis and Rotavirus.

INTRODUCTION

Microbial contamination of water in remote Aboriginal communities is a frequent cause of ill health and is the primary health risk associated with drinking water. Often this low quality of drinking water is continually consumed. The low quality is only detected and acted upon when an outbreak of disease occurs. Isolation and severe unpredictable weather patterns as well as distance from laboratories effects the frequency of which tests are conducted. The routine testing of water is a public health requirement and it is recommended that water be tested for it's microbial constituents as least once a month, preferably fortnightly as recommended by The National Health and Medical Research Council. Unfortunately this is not the case for communities who do not have the levels of infrastructure, population and co-ordination, which is required before testing will be funded.

On-site methods also allow communities access to information, which effects their livelihood and quality of life. Epidemics of diseases can occur due to contamination of water supplies, these can include all types of gastro-intestinal diseases present in the communities

Prevention of these diseases is of great importance because they can spread among a community rapidly and have the potential to effect the entire community. On a world wide scale diarrhoea was estimated to have killed 2 million children and to have caused 900 million episodes of illness annually (World Development Report 1992), and in Western Australia it has been reported that Aboriginal children who are under five years of age are hospitalised for gastroenteritis at a rate seven times higher than that of non Aboriginal children (EHNCC 1997). As well, diarrhoeal and respiratory diseases are the major causes of morbidity in Aboriginal children in their first three years of life (Healthabitat 1999).

WHY TEST WATER?

Safe and clean water is vital for healthy living practises as well as for consumption and is one of the primary requisites for healthy human life (World Development Report 1992). The Uwankara Palyanylu Kanintjaku (UPK) environmental review in 1987 identified nine healthy living practises which were aimed at changing the specific health problems that faced in remote and rural Aboriginal communities (Pholeros 1993). These nine healthy practises, in order of priority were:

1. Washing people
2. Washing clothes
3. Removing waste
4. Improve nutrition
5. Reducing crowding
6. Separating dogs and children
7. Controlling dust
8. Controlling temperature
9. Reducing trauma

The three practises with the highest priority all involve water (Pholeros 1993). Therefore having a water supply that is not contaminated is of great importance for healthy living practises as well as for consumption.