INVESTIGATING HEALTH RISKS FROM RIVERINE BLOOMS OF BLUE GREEN ALGAE

In November 1991 the world's largest recorded riverine bloom of blue green algae occurred along 1000km of the Darling-Barwon river system (Figure 1). A state of emergency was declared to coordinate the provision of safe domestic water supplies for towns, Aboriginal communities and landholders.

After potable water supplies had been secured for these communities, there were three outstanding public health issues:

- how many individuals did not have access to an uncontaminated drinking water supply;
- does filtration eliminate the cyanobacterial toxins from potable water, and if not what health risks are associated with drinking filtered water; and
- what are the health risks of recreational exposure to water contaminated with algal blooms.

The NSW Blue Green Algae Task Force Final Report identified a number of environmental conditions which favour the development of these blooms — high nutrient levels, nitrogen:phosphate ratios less than 29, water temperature above 20°C, high pH, abundant zooplankton, low water flows and reduced water turbidity. The task force concluded that:

"The Australian environment is characterised by many of these environmental conditions ... (there is) an existing and increasing potential for algal problems throughout most of western NSW and in many coastal rivers."

The likelihood of further outbreaks in the Darling-Barwon river system and elsewhere in NSW underscores the need for better information about the likely health effects of exposure to blue green algae.

In late October 1992 algal blooms had reappeared in the river between Louth and Culpsulin. The most common species found was *Anabaena*. This paper presents an assessment of options for future surveillance of illness related to algal blooms and the feasibility of more detailed epidemiological investigations of this problem.
Blue green algae

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— test the feasibility of conducting a case control study based on attendances at a general practitioner or RFDS clinics;

• to obtain qualitative information from RFDS, hospital and community health staff, school principals and school nurses in Wilcannia about possible cases of cyanobacterial-related illness occurring in recent weeks in the community and about likely routes of exposure to contaminated water and high-risk groups;

• to determine the best methods for surveillance of disease associated with blue green algae, including refinement of the case definition;

• to investigate avenues for future epidemiological studies; and

• to enlist cooperation for any future investigations from the staff of the RFDS, Wilcannia Hospital and the local schools.

General practitioners in other communities affected by the algal bloom were contacted to request information on any recent illness that might be associated with the algal bloom and to assess their willingness to participate in a case control study.

OUTCOME

Reports from the Department of Water Resources document the rise in the number of cyanobacterial organisms in the river at Wilcannia, between October and December (Figure 2).

On October 17, two teenage girls with gastroenteritis and myalgia were seen at Wilcannia Hospital. One required admission. Symptoms had appeared after both girls had swum in the Darling River. The symptoms resolved after 48 hours. Heath professionals reported no apparent increase in the incidence of illness that might be associated with blue green algae, including those exposed to untreated town water used in the garden such as gardeners, and children who run under the sprinkler;

• all the townspeople who were exposed in the five-seven days between testing the river and the warnings given by the Department of Water Resources and the local shire;

• people in properties along the river that pump water directly from the river for consumption and bathing.

Many general practitioners in these remote communities expressed a reluctance to participate in a case control study because of time limitations and their perception that it was not a significant health problem.

CONCLUSION

The results of a pilot survey in Wilcannia would suggest that despite evidence of numerous opportunities for significant recreational exposure to algal contaminated water there was very little evidence of health problems occurring as a direct result of that exposure. There were two case reports of gastrointestinal illness in river swimmers. The only other reports of illness were some of minor skin irritation.

The information provided by this investigation may not give a complete picture of illness in the community and therefore cannot provide convincing evidence that blue green algae poses no significant health problems. Therefore concerns about the safety of water contaminated with blue green algae remain.

However, we concluded that a more detailed epidemiological study, such as a case control study of patients attending general practitioners, was not warranted or feasible at this time in the isolated communities along the Darling because:

• people living in remote areas may not seek medical advice for the minor ailments which exposure to blue green algae might cause; and

• some doctors and others in the community along the Darling River do not perceive illness related to blue green algae to be a health priority.
Blue green algae

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The most promising avenue for future epidemiological research would be school-based studies. Children living along the Darling swim frequently in the river. School nurses are in a unique position to monitor even minor illness among these children. The most appropriate option for future surveillance of this potential public health problem would be to monitor continuously trends in blue green algae-related illnesses reported to school nurses in areas regularly affected by riverine blooms of blue green algae. Increases in the incidence of blue green algae-associated illnesses during or following algal blooms would indicate the need for further epidemiological study.

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Mammographic screening

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The satisfaction of women with the service provided at the time of the first screen will be an important influence on their decision to have future screens. A survey of women attending the screening and assessment services in the Central and Hunter Area Health Services was begun in June 1992. The results of the survey will be taken into account in the planning of the new services to ensure that service provision meets the perceived needs of women.

Printed materials about mammographic screening have been written in consultation with consumer representatives, health providers and educators and will be distributed by the services.

Community education is a major issue in developing public knowledge and acceptance of the mammographic screening program and fostering recruitment of the target population. Strategies to involve health promotion personnel in the broadest sense will be developed through a series of seminars about breast cancer and mammographic screening. The seminars will be developed on a consultative basis by the State Planning and Co-ordination Unit.

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