

ENVIRONMENTAL CARCINOGENS IN NEW SOUTH WALES

GUEST EDITORIAL

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In 1974, an issue of *Newsweek* entitled 'What causes cancer?' suggested that 'At least 60 per cent, and as much as 90 per cent of human cancer is caused by environmental factors, probably chemicals'. This widely-accepted belief was a factor in establishing the United States National Toxicology Program, through which hundreds of chemicals were subjected to chronic toxicity testing in rodents. The goal was to identify those otherwise 'unknown' carcinogens that accounted for a significant proportion of human cancer.

This goal has not been realised. Rather, the intervening years have witnessed the development of a clearer understanding of what 'environmental factors' means. Such factors are now recognised to include not only a number of specific chemicals encountered in an occupational, medicinal or dietary context, but also complex mixtures encountered in foodstuffs, tobacco smoke, pollutants and workplace conditions. There is also a range of carcinogenic factors that do not readily, if at all, qualify as chemicals. These include ionising and non-ionising radiation, certain infections, chronic inflammatory states, some behaviours, reproductive status, and the competence of the immune system. All of that said, the term 'environmental carcinogen' is still often employed to categorise chemicals. It is in this limited sense that the term is used as the focus of this issue of the *NSW Public Health Bulletin*.

Implicit in the identification of any cancer-causing agent is the possibility of developing interventions for cancer prevention.

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Prevention may be achieved by reducing or eliminating exposure to the agent in question. The scope for cancer preventive measures is broad, as illustrated through the following examples:

- solar radiation causes skin cancer; prevention may be achieved by avoiding intense sun exposure, taking advantage of shade, wearing protective clothing, and using sunscreens. A major challenge lies in facilitating widespread adoption of preventive behaviour and discouraging deliberate exposure (such as sunbaking);
- the brewing of beer may result in the formation of dimethylnitrosamine, a compound that is proven to be carcinogenic in a dozen animal species, including the non-human primates. It is metabolised by the human liver and by other tissues in humans. A marked reduction in the amount of dimethylnitrosamine in beer has been achieved by modifying brewing conditions.

Within the spectrum of cancer preventive measures, a recognised method of prevention is the adoption and implementation of regulatory measures; an option that often concerns (but is not restricted to) government departments and statutory authorities.

It is the prevention of cancer caused by environmental carcinogens that is addressed in the articles contained in this issue. The first three articles describe options for establishing that a hazard exists. Andrew Penman discusses the development of strategies that respond to the distribution of disease and which might lead to an increased understanding of those diseases. The means of identifying hazardous agents are considered by Bernard Stewart, while John Beard and Kathy Jong describe the means of emerging molecular epidemiological methods to elucidate the effect of pesticides. Julie Billett describes how here in NSW recognised hazards are addressed through regulatory action. In the articles that follow, two recognised hazards are discussed in detail. Benzene causes leukaemia and Julia Brotherton outlines control of exposure to this solvent by action through NSW and Commonwealth authorities. In their article, Elayne Mitchell and John Sanders concern themselves with one aspect of tobacco control, controlling exposure to tobacco smoke in the environment, and describe the NSW Tobacco Action Plan 2001–2004.

Determining which environmental carcinogens warrant regulatory action is a challenge; however, it is certain that, in specific contexts, cancer can be prevented through regulatory means. ☒