

## TAKING ACTION TO PREVENT CANCER IN NSW

### GUEST EDITORIAL

*Lesley King*

*Director, Community Cancer Control Services  
NSW Cancer Council*

This issue of the *NSW Public Health Bulletin* is the first in a five-part series that will examine cancer in NSW. This first issue focuses on the need and opportunity for prevention, and features the role of diet as a preventable risk factor and a priority for action.

Cancer is the most significant cause of premature death in NSW, yet a number of cancers are preventable. With the information we currently have available, we could do more to prevent cancer. We have good information about the role of specific risk factors and their distribution across the population, and generally sufficient information about effective interventions to guide action. If we are to realise the potential for prevention, we need to apply this information and pursue the concerted implementation of comprehensive policy and program initiatives. In general, NSW is in a strong position to take action, as there are sound, strategic policies and frameworks to guide public health action.

This issue begins with information describing the key behavioural risk factors that contribute to different cancers: smoking, diet, physical activity, sun exposure, alcohol. These risk factors can be modified through individual behaviours, and through creating environments that both reduce exposure to risk and support healthier choices. We have up-to-date information about the health of the people of NSW in relation to these risk factors, and the first article summarises data from *The Health of the People of NSW—Report of the Chief Health Officer, 2000*. Of particular concern is the unequal distribution of risk within the NSW population, with all reported modifiable risk factors found to be more prevalent in more socioeconomically disadvantaged groups.

The 'hot' topic in cancer prevention is diet. There is now an accumulating body of evidence describing the potential for reducing

*continued on page 2*

## CONTENTS

- 1 **Guest Editorial: Taking action to prevent cancer in NSW**
- 2 **Measuring risk factors that can be modified to prevent cancer**
- 7 **Cancer Prevention by Diet and Exercise**
- 9 **Increasing the Consumption of Vegetables and Fruit: A national public health call to action**
- 12 **Informal Caring in Central Sydney**
- 14 **Vision 2020: The Right to Sight—Australia**
- 15 **From the Ground Up: A Conference on Aboriginal Health in the 63rd Millennium**
- 16 **EpiReview: Notifiable Sexually Transmissible Diseases, NSW 1991–1999**
- 19 **FactSheet: Psittacosis**
- 20 **Communicable Diseases: January 2001**
- 20 Trends
- 20 Six additional conditions become notifiable in NSW

cancer incidence through dietary factors. In a compelling second article, Mitchell and Armstrong outline five guidelines for diet and exercise that will minimise cancer risk. Increasing consumption of vegetables and fruit is the most significant way this can be achieved, and thus cancer prevention alone is sufficient reason for renewed and substantial public health nutrition initiatives.

The third article, by Vita, Moxon and Macoun, argues that there is now a real opportunity for concerted action to promote vegetable and fruit consumption. To guide

effective public health action we have in place sound policy frameworks at a national level (*Eat Well Australia, 2000–2010*) and at a state level (*Eat Well NSW, 2001–2005*).

The imperatives for cancer prevention, and the additional salience this gives to nutrition messages, provides a strong rationale for collaborative action to improve nutrition across the population. In diet and cancer, as well as other areas of cancer prevention, the key challenge remains one of taking action—of applying what we know and putting it into practice. ❏

## MEASURING RISK FACTORS THAT CAN BE MODIFIED TO PREVENT CANCER

**Helen Moore and Louisa Jorm**  
*Epidemiology and Surveillance Branch*  
*NSW Department of Health*

**Philip Vita**  
*Health Promotion Branch*  
*NSW Department of Health*

Cancer is a diverse group of diseases characterised by the proliferation and spread of abnormal cells. Different forms of cancer can share common risk factors; however, often a unique set of risk factors are responsible for the onset of a particular cancer.<sup>1</sup> Risk factors for cancer are both inherent, such as the inherited APC gene that predisposes individuals to develop colorectal cancers; and environmental, such as excessive sun exposure, particularly in childhood, which increases the risk of developing melanoma. Some risk factors are, theoretically at least, easier to modify than others (for example, quitting smoking as compared with inheriting the APC gene). This article deals with measuring the population prevalence of risk factors for which exposure can be modified to prevent the development of cancers.

Health promotion interventions, designed to reduce exposure to these risk factors, can be targeted at:

- individuals, by encouraging healthy lifestyles;
- health services, by ensuring the availability and effectiveness of preventive services;
- healthy environments, by ensuring that the physical, economic, social and political environment supports health.<sup>2</sup>

The following information is summarised from *The Health of the People of New South Wales: Report of the Chief Health Officer, 2000*.<sup>3</sup> It represents the key population health indicators of modifiable cancer risk factors, including:

- physical activity
- nutrition
- sun exposure
- exposure to tobacco smoke
- alcohol consumption.

These indicators are intermediate measures of the effectiveness of a range of health promotion interventions aimed at encouraging healthy lifestyles, and establishing effective preventive health services and healthy environments. The details of the methods used to analyse and present data reported can be found in the Report.<sup>3</sup>

### PHYSICAL ACTIVITY

Physical inactivity has been estimated to contribute almost seven per cent to the total burden of disease in Australia, and in this regard it is second only to smoking.<sup>4</sup> There is substantial evidence that physical activity can protect the large bowel against the development of cancer of the colon and of precancerous polyps, and some evidence that physical activity has a protective effect against breast cancer, particularly in younger women.<sup>5</sup>

*Active Australia* recommends that every adult in NSW should accumulate at least 30 minutes of moderate-intensity physical activity on most days of the week to confer a general health benefit.<sup>6</sup> Whether this level of activity, or a greater level, is sufficient to prevent some cancers remains controversial (see article by Mitchell and Armstrong in this issue). The results of the 1997 NSW Health Survey indicated that in 1997, 67 per cent of men and 46 per cent of women expended enough energy on leisure time physical activity to gain a health benefit. This represents an apparent increase in physical activity levels from 1996, when 59 per cent of men and 42 per cent of women reported adequate levels of energy expenditure.

Figure 1 shows the rates of 'adequate' physical activity in NSW by health area and sex (a definition of 'adequate' accompanies the figure). In men, rates of adequate physical activity ranged from 61 per cent in Western Sydney Area Health Service to 75 per cent in Central Coast Area Health Service. Among women of the same age, rates of adequate physical activity varied from 39 per cent in South Western Sydney Area Health Service to 57 per cent in Mid North Coast Area Health Service. Inadequate levels of physical activity are more prevalent among NSW adults who are married (rather than single), have not finished high school,

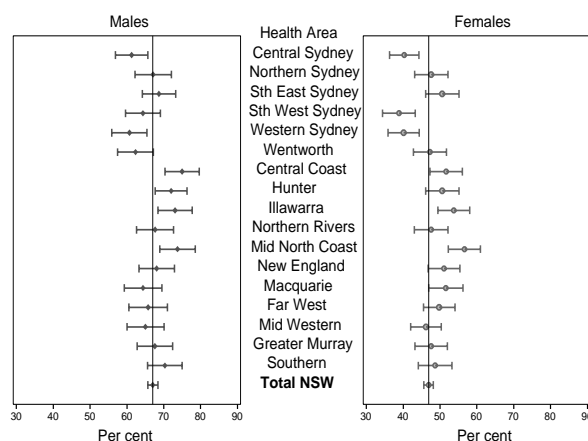
live in urban areas or economically disadvantaged areas, or who speak a language other than English at home.<sup>7</sup>

## NUTRITION AND FOOD HABITS

Diet is linked to a variety of cancers including colorectal and prostate cancers.<sup>8</sup> Eating adequate amounts of foods such as fruit, vegetables and fibre may be protective, while excessive amounts of other foods, such as fats, may be harmful. Figure 2 presents data on a range of dietary indicators from the 1997 and 1998 NSW Health Surveys. NHMRC guidelines recommend that diets should include

**FIGURE 1**

### ADEQUATE PHYSICAL ACTIVITY BY HEALTH AREA AND SEX, PERSONS AGED 16 YEARS AND OVER, NSW, 1997



Note: Classification of energy expenditure: 'sedentary' 0–100 kCal/fortnight, 'low' 100–1600 kCal/fortnight, 'medium' 1600–3200 kCal/fortnight or 1600 kCal/fortnight but did not engage in at least two hours of vigorous activity, 'high' >1600 kCal/fortnight and participated in at least two hours of vigorous activity. 'Adequate' physical activity is 'medium' or 'high' energy expenditure. LL/UL95% CI = lower–upper limits of 95 per cent confidence interval for the point estimate.

Source: 1997 NSW Health Survey (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

**FIGURE 2**

### USUAL FOOD INTAKE BY SEX, PERSONS AGED 16 YEARS AND OVER, NSW, 1997 AND 1998



Note: Recommended daily quantity of fruit=300 grams or more. Recommended daily quantity of vegetables=300 grams or more. Recommended daily quantity of bread and cereal=210 grams or more. (NHMRC, 1995).

Source: NSW Health Surveys 1997 and 1998 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

plenty of breads and cereals (preferably wholegrain), vegetables (including legumes) and fruits.<sup>9</sup>

In NSW in 1997 and 1998, only 17 per cent of men ate the recommended quantity of vegetables, and 40 per cent ate the recommended quantity of fruit. Women ate more of these foods, with 21 per cent and 52 per cent reporting eating adequate amounts of vegetables and fruit respectively. In contrast, men (24 per cent) were more likely to report eating the recommended quantity of bread and cereals than women (11 per cent).

Milk is a major dietary source of saturated fat as well as an excellent source of calcium. Encouragingly, consumption of low- and reduced-fat milks appears to have increased. In NSW in 1997 and 1998, 38 per cent of men and 53 per cent of women reported usually or always using these milks. This compares with 33 and 46 per cent for men and women respectively in 1994.<sup>10</sup>

### SUN EXPOSURE

Australia has the highest rate of skin cancer in the world. Most skin cancer is caused by unprotected exposure to the sun and most sun-related skin damage occurs in the early years of life. Living in Australia during the first 15 years of life contributes about two-thirds to the risk of melanoma of a lifelong resident.<sup>11</sup>

Figure 3 shows that at the 1997 and 1998 NSW Health Surveys, women were much more likely than men to report usually or always using sunscreen, staying in the shade or avoiding being in the sun between 11.00 a.m. to 3.00 p.m. Men were more likely to report wearing protective

clothing or a hat. Comparisons between the 1994 NSW Health Promotion Survey and the 1997 and 1998 NSW Health Surveys should be made with caution due to variations in the questions used and the timing of the surveys. Encouragingly, however, there was a substantial increase in the 1997 and 1998 surveys in the proportion of both males and females who reported staying out of the sun between 11.00 a.m. and 3.00 p.m.

### EXPOSURE TO TOBACCO SMOKE

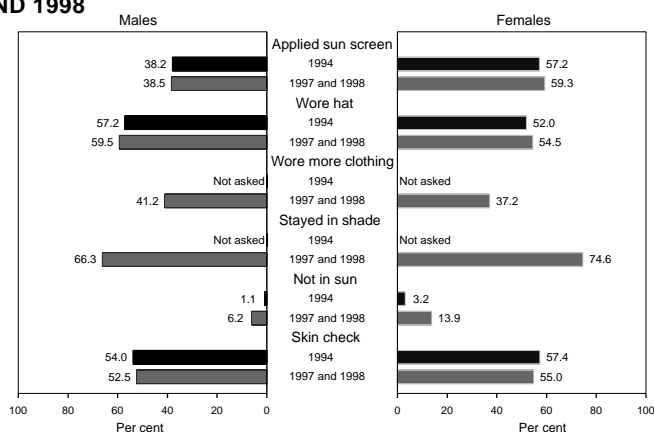
Tobacco smoking is the risk factor causing the greatest burden of disease in Australia. It is responsible for about 12 per cent of the total burden of disease in males and seven per cent in females.<sup>4</sup> Tobacco smoking was a significant cause of six of the 20 most common types of cancer diagnosed or causing death in NSW in 1997. These were cancers of the lung, bladder, pancreas, stomach, kidney and oesophagus.<sup>12</sup>

Most tobacco users begin, develop and establish their behaviour during adolescence, so preventing smoking in this group is key to reducing tobacco-related illness and death in the long-term. In 1996, among NSW secondary school students aged 12–17 years, 19 per cent of boys and 21 per cent of girls reported having smoked during the previous week.<sup>13</sup> The prevalence of current smoking increased with age among both sexes, peaking at 27 and 30 per cent among boys and girls, respectively. In 1996, at all ages after 13 years, the prevalence of current smoking among girls exceeded that among boys.<sup>3</sup>

Among adults in NSW in 1997 and 1998, 26.8 per cent of men and 21.4 per cent of women reported current tobacco

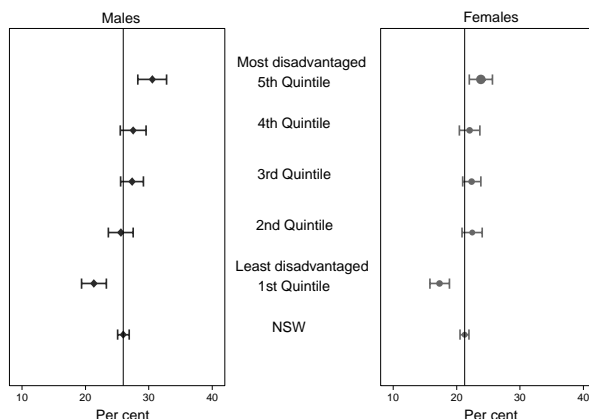
**FIGURE 3**

#### SUN PROTECTION BEHAVIOUR BY SEX, PERSONS AGED 18 YEARS AND OVER, NSW, 1994, 1997 AND 1998



Note: All responses refer to usual behaviours from the pre-survey summer between the hours of 11.00 a.m. and 3.00 p.m. The survey defined: 'Sun Screen' as when a broad spectrum 15+ sunscreen (no less) was applied to at least half of all exposed skin; 'Wore protective clothing' as wore more clothing to protect yourself from the sun; 'Wore a Hat' as wearing a wide-brimmed hat or cap with a flap; 'Skin check—past 12 months' as deliberately checking the skin for changes during the past 12 months. 'Not asked' refers to questions not asked or not asked in a comparable format.

Source: NSW Health Surveys 1997 and 1998, NSW Health Promotion Survey 1994 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

**FIGURE 4****CURRENT SMOKING BY SOCIOECONOMIC DISADVANTAGE SCORE FOR POSTCODE OF RESIDENCE AND SEX, NSW, 1997 AND 1998**

Note: Current smoking includes daily or occasional smoking. Postcode areas were classified into quintiles by scores based on the ABS Index of Relative Socioeconomic Disadvantage (IRSD). LL/UL95%CI = lower and upper limits of the 95 per cent confidence interval for the point estimate.

Source: NSW Health Surveys 1997 and 1998, ABS census data and SEIFA index (HOIST), Epidemiology and Surveillance Branch, NSW Department of Health.

smoking. Data on smoking from recent population surveys suggest that smoking rates in NSW have declined by around four per cent among both men and women since 1989–90, but has levelled out in recent years.

In NSW in 1997 and 1998, reported current smoking rates varied widely among health areas. In men, the rates for current smoking varied from 21 per cent in the Northern Sydney Area Health Service to 35 per cent in the Far West Area Health Service. In women, these rates ranged from 17 per cent in the Northern Sydney Area Health Service to 26 per cent in the Central Coast Area Health Service. Variations in smoking rates among health areas reflect the distribution of underlying social determinants of health. They also reflect the differential effect among socioeconomic groups of influences such as health publicity and changes in cigarette price.<sup>14</sup> Figure 4 shows that there was a strong association between the likelihood of a man or a woman currently smoking in 1997 and 1998 in NSW and increasing socioeconomic disadvantage. The proportion of males currently smoking was greater than the proportion of female smokers in each quintile.

Some of the socioeconomic differences may be explained by variations in smoking rates by indigenous status and country of birth. In the NSW Health Surveys, 41.0 per cent of indigenous people aged 16 years and over reported smoking on a daily or occasional basis. This was 17.2 per cent higher than in the non-indigenous population.<sup>3</sup> Reported rates of current smoking by country of birth show that in men, rates ranged from 17.5 per cent among the Italian-born, to 43.6 per cent among the Vietnamese-born. In women, current smoking rates ranged from less than one per cent among women born in China and Vietnam, to 35.5 per cent among the New Zealand-born.<sup>3</sup>

## ALCOHOL

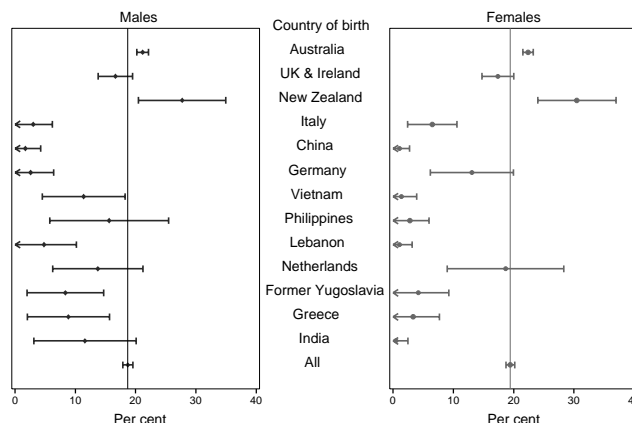
Harm caused by alcohol consumption accounts for 4.9 per cent of the total disease burden in Australia.<sup>4</sup> Excessive alcohol use contributes to many causes of death and illness, including cancers of the liver, mouth, throat, oesophagus and female breast.<sup>12</sup>

In the 1997 and 1998 NSW Health Surveys, more women (30 per cent) than men (16 per cent) reported that they did not drink any alcohol. However, similar proportions of men (19 per cent) and women (20 per cent) reported drinking at hazardous or harmful levels. In men, rates of hazardous or harmful alcohol use varied from 15 per cent in the Northern Sydney Area Health Service to 32 per cent in the Far West Area Health Service. In women, rates of hazardous or harmful alcohol use ranged from 17 per cent in the South Western Sydney Area Health Service to 25 per cent in the Far West Area Health Service. The reported rates in the indigenous population were higher, with 28.2 per cent of indigenous people reporting alcohol consumption at a hazardous or harmful level. The most socioeconomically disadvantaged men and women were more likely to consume alcohol at hazardous or harmful levels than those in less disadvantaged groups. This was particularly shown for men compared to women.

Figure 5 shows that, at the 1997 and 1998 NSW Health Surveys, NSW residents born in many overseas countries were less likely than the Australian-born to report hazardous or harmful alcohol consumption. Among men, reported rates of hazardous or harmful alcohol consumption ranged from less than two per cent among the Chinese-born, to 27.7 per cent among the New Zealand-born. Among women, rates ranged from one per

**FIGURE 5**

**HARMFUL OR HAZARDOUS ALCOHOL CONSUMPTION BY COUNTRY OF BIRTH AND SEX, PERSONS AGED 16 YEARS AND OVER, NSW, 1997 AND 1998**



Note: Respondents were asked: 'How often do you have an alcoholic drink of any kind?' and 'On a day that you have alcoholic drinks, how many "standard" drinks do you usually have?'. Hazardous-harmful alcohol use = Current drinker who usually consumes three or more (females) or five or more (males) drinks on a day when he or she consumes alcohol. LL/UL95%CI=lower/upper limits of 95 per cent confidence interval for the point estimate.

Source: NSW Health Surveys 1997 and 1998 (HOIST). Epidemiology and Surveillance Branch, NSW Department of Health.

cent or less among women born in China, Lebanon and India, to 30.5 per cent among the New Zealand-born.

**CONCLUSION**

Health promotion programs coordinated at the state level in the areas of physical activity, skin cancer control, nutrition, smoking and alcohol consumption aim to reduce the incidence of cancer and other major causes of morbidity and mortality in NSW. *The Health of the People of New South Wales: Report of the Chief Health Officer, 2000* provides a means of monitoring progress towards achieving the intermediate outcomes of these programs: that is, the reduction of risk factors in the population. The Report presents data on trends in standard indicators that have been defined by experts in the field, and thus provide a means of comparing progress in NSW with that elsewhere in Australia.

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# CANCER PREVENTION BY DIET AND EXERCISE

**Julie Anne Mitchell**  
Cancer Prevention Unit  
NSW Cancer Council

**Bruce Armstrong**  
Cancer Research and Registers Division  
NSW Cancer Council

This article describes dietary factors for which there is strong evidence of an effect on cancer risk, and introduces the NSW Cancer Council's dietary guidelines for the prevention of cancer.

## BACKGROUND

Environmental factors are thought to be responsible for some 70 per cent of human cancers. Several lines of evidence support this position. Variation in cancer risk around the world is such that if the risk of each cancer in all populations were equal to that in the lowest rate population the world burden of cancer would fall by about 70 per cent. That risk of cancer reduces in people who migrate from high-rate areas to low-rate areas also suggests that much of the worldwide variation in cancer rates is environmental in origin. Studies of Scandinavian twins are congruent in suggesting that less than 30 per cent of cancer risk is solely genetic in origin.

In a 1981 review, Doll and Peto estimated—very approximately—that 35 per cent of cancer deaths in the United States were potentially avoidable by diet modification.<sup>1</sup> They thus suggested that diet is the major contributor to cancer caused by environment. Since that time, understanding of the relationship between diet and cancer has grown, but estimates of the contribution of diet to the burden of cancer have remained about the same. In 1997 and 1998 expert reviews concluded that about one-third of cancer deaths could be prevented by dietary change.<sup>2-3</sup>

## WHAT CAN WE BE REASONABLY CERTAIN ABOUT?

Dietary factors for which there is the strongest evidence of an effect on cancer risk are:

- insufficient intake of vegetables, fruit, and wholegrain cereals
- high intake of alcohol
- factors related to energy balance.

The last category does not relate to high-energy intake, but to large body size, and to lack of exercise.

### Vegetables and Fruit

Of all dietary factors that contribute to cancer risk, a low intake of vegetables and fruit is the best established and probably the most important. There is convincing evidence that diets high in fruit and vegetables protect against cancers of the mouth, pharynx, oesophagus, stomach and

lungs, and they probably also protect against cancers of the larynx, pancreas, breast and bladder. There is convincing evidence too that a diet high in vegetables reduces colorectal cancer risk.<sup>2</sup>

On the whole, the evidence for a protective effect of vegetables is stronger than that for a protective effect of fruits. This may reflect the greater amounts of vegetables in most diets and, perhaps, the limited range of fruits available in some populations. On a global scale, increasing intake of vegetables and fruit to optimal levels could reduce cancer incidence by about 20 per cent.<sup>2</sup> In Australia, it has been estimated that insufficient fruit and vegetable consumption—less than five serves a day—accounts for about nine per cent of cancer deaths.<sup>4</sup>

### Cereals

Epidemiological evidence that wholegrain cereals reduce cancer risk is less persuasive than that for vegetables and fruit. Their potential to decrease bowel cancer risk, however, continues to receive attention. Components of wholegrain cereals that are thought to be protective include dietary fibre, resistant starch, antioxidants and phytoestrogens. In 1997 the World Cancer Research Fund concluded: 'diets high in wholegrain cereals *possibly* decrease the risk of stomach and colon cancer'.<sup>2</sup>

Part of the complexity in determining the beneficial effect of cereals relates to problems of definition. In 1970, Burkitt proposed that fibre-rich diets offered protection against numerous gastrointestinal diseases including cancer of the large bowel. Subsequent studies failed to confirm this suggestion and, in response, attention was turned to investigating key components of dietary fibre and their effect on the bowel. This has yielded valuable information on the soluble and insoluble elements of non-starch polysaccharides as well as the specific actions of resistant starch. However, it has also highlighted that all forms of dietary fibre may not be equally protective against colorectal cancer. Further to this, there is concern that in searching for the 'magic bullet' of dietary fibre, the protective effect of wholegrain cereals has not been adequately examined.<sup>5</sup> NHMRC guidelines advise that although vegetables provide more consistent protection against colorectal cancer than cereals, patients should include poorly soluble cereal fibres in their diet, especially if they are at high risk of colorectal cancer.<sup>6</sup>

### Alcohol

Alcohol consumption is a well-established cause of cancers of the upper aero-digestive tract (mouth, pharynx, larynx and oesophagus), especially in people who also smoke tobacco. It also causes cancer of the liver, probably through causing cirrhosis, and cancer of the breast.<sup>2</sup>

Risk of cancer caused by alcohol consumption increases with increasing intake right from the lowest levels. There is, therefore, no 'safe level' of alcohol intake when it comes

to cancer risk. In contrast, risk of coronary heart disease initially falls as alcohol intake increases but then rises with further increase in intake. The relationship of death from all causes with alcohol intake reflects this pattern with the mortality rate in drinkers reaching that in non-drinkers at about four standard drinks a day in men and two in women.

### **Physical Activity**

There is convincing evidence that physical activity reduces the risk of colon cancer, and it may reduce the risk of lung and breast cancers.<sup>2</sup> The evidence is strongest for the equivalent of moderate exercise (for example, brisk walking or cycling) for an hour a day or vigorous exercise (for example, running or swimming) for half an hour a day.

### **Body weight**

The prevalence of obesity in Australia is increasing at one per cent a year. High-risk groups are men 25–40 and women 45–55 years of age, people on a low-income, and sedentary workers.<sup>7</sup> Evidence that obesity increases endometrial cancer is convincing. It may also contribute to renal cancer and postmenopausal breast cancer.<sup>2</sup> To avoid obesity it is recommended that we reduce our intake of energy dense foods and nutrients (for example, fat) and increase physical activity.

## **DIETARY GUIDELINES**

The NSW Cancer Council has developed five guidelines for a diet that will minimise cancer risk. These guidelines are designed for adults of all ages in reasonably good health. They may be changed or modified in the light of new research findings. However, while they offer no guarantee against cancer to an individual, there is strong evidence that their widespread adoption would reduce cancer incidence and mortality rates.

By way of explanation, several supporting statements are made under each guideline.

### **Enjoy a balanced diet rich in vegetables and fruits**

The level of protection fruit and vegetable consumption provides is dependent on dose. The World Cancer Research Fund recommended five or more serves (about 400 grams) of fruit and vegetables a day for a sizeable cancer protective effect. The Cancer Council supports the NSW Health *Charge through your day* initiative by recommending that adults should aim to eat five serves of vegetables and two serves of fruit every day. A serve is roughly half a cup.

While some studies have suggested that particular groups of vegetables or fruits—for example, cruciferous (cabbage, broccoli, brussels sprouts), allium (onions, leeks, garlic), and green leafy vegetables; and citrus fruits—are particularly beneficial, there is insufficient evidence to support recommendations regarding specific vegetables.

Evidence that diets high in carotenoids and Vitamin C protect against certain cancers should not be taken as evidence that supplements of these or other micronutrients will reduce cancer risk. In the case of beta-carotene, intervention trials have shown that short-term use in high-risk individuals can increase risk of lung cancer. The emphasis of this and other guidelines is on the importance of whole foods rather than individual micronutrients.

### **Eat a variety of wholegrain cereals, breads and pastas**

Adults should eat a minimum of seven and preferably more serves of cereals each day. A serve is equivalent to a bread roll or a cup of wholegrain cereal.

At this time there is insufficient evidence to suggest that phytoestrogens found in cereal grains can reduce the risk of breast or prostate cancers.

### **Maintain a healthy weight and be physically active**

Body Mass Index is a measure of body mass in relation to height (weight divided by the height squared). A Body Mass Index of 20–25 is considered healthy.

Ideally, one should aim for an hour's moderate or half an hour's vigorous exercise a day, but any increase in exercises is likely to be beneficial in proportion to the size of the increase. Brisk walking constitutes moderate exercise, running vigorous exercise.

### **Drink alcohol in moderation if at all**

Any alcoholic drink irrespective of type or concentration increases the risk of cancer. However, in light of the beneficial effects small amounts of alcohol have on risk of cardiovascular disease, the Cancer Council supports prudent public health guidelines on alcohol consumption, namely no more than four standard drinks a day for men and two standard drinks a day for women. A standard drink contains 10 grams of alcohol.

### **Select foods low in salt and fat**

Diets high in salt increase the risk of stomach cancer. Many processed foods are high in salt with consumption rates particularly high among young men.

Diets high in fat increase the risk of obesity and this increases the risk of endometrial cancer.

Diets high in saturated fats possibly increase the risk of colorectal, lung and prostate cancers, although the evidence is not at all conclusive.

For good health and to reduce the risk of obesity it is advised that people limit their saturated fat intake and opt for limited use of mono- and polyunsaturated fats.

There is a strong correlation between intake of saturated fat and intake of meat. While there is some evidence that eating red meat *per se* may increase the risk of colorectal cancer, no certain conclusion can be drawn about this association, or the possibility that eating 'browned' (that is, chargrilled) meat increases the risk of colorectal cancer.



## POTENTIAL EFFECT ON CANCER OF IMPROVED DIET AND INCREASED EXERCISE

The Australian Institute of Health and Welfare has estimated that 9.2 per cent of cancer deaths in 1996 were attributable to an intake of less than five servings a day of fruit and vegetables, 6.6 per cent were due to lack of any vigorous physical activity, 3.0 per cent were due to having a body mass index of 25 or more, and 3.6 per cent were due to intake of alcohol at any level.<sup>2</sup> Since these estimates were generally conservative and do not include all possible sources of dietary or energy balance impact on cancer risk, the resulting total estimate, 22 per cent of cancer deaths attributable to diet or lack of exercise, is probably a minimum estimate.

This estimate accords reasonably well, therefore, with other estimates of 30–40 per cent of cancer deaths being preventable by dietary and related means.

## CONCLUSION

Dietary and related energy balance factors have an important effect on cancer incidence and mortality in Australia. While the estimated effect is not as great as that of tobacco smoking (26 per cent of cancer deaths in 1996 due to smoking, as estimated by the Australian Institute of Health and Welfare),<sup>2</sup> the real effect may be as great or greater. Therefore, effective implementation of the Cancer Council guidelines for prevention of cancer by diet and exercise, or similar guidelines, would be expected to yield substantial benefit.

Moreover, these guidelines generally sit well with more general dietary advice, which is designed to reduce the risk of cardiovascular disease and diabetes as well. It is time that improved diet and increased exercise were more consistently and effectively promoted by public health agencies in Australia.

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## INCREASING THE CONSUMPTION OF VEGETABLES AND FRUIT: A NATIONAL PUBLIC HEALTH CALL TO ACTION

*Philip Vita, Jane Moxon and Edwina Macoun*  
Health Promotion Branch  
NSW Department of Health

There is a need for national public health action to increase fruit and vegetable consumption for the protection and prevention of chronic disease, including many cancers. There has never been a better time to advance public health nutrition in Australia. The impetus has been provided by the Strategic Inter-Governmental Nutrition Alliance (SIGNAL) through the National Public Health Partnership, which has developed a national framework for action in public health nutrition *EAT WELL Australia: An agenda for action for public health nutrition 2000–2010*. As part of this, SIGNAL has developed a National Action Plan to promote the consumption of vegetables and fruit.<sup>1</sup> This article outlines the key components of the National Action Plan, and the role of the NSW Department of Health to increase vegetable and fruit

consumption to ensure that the effect of diet-related disorders, including cancer, is reduced.

## BACKGROUND

There is compelling evidence that consumption of vegetables and fruit offers protection against many cancers, including colorectal and stomach cancers.<sup>2</sup> The challenge for public health is to develop effective and sustainable initiatives. Dietary behaviour is very complex and not well understood. Diet is influenced by a myriad of individual, social, economic and environmental factors. Moreover, it is inherently difficult to monitor—and consequently to assess—change. To improve population health through dietary interventions it is important to consider the supply–demand balance for food products in our community (Figure 6). It is crucial that policies and programs concurrently increase consumer demand for healthier foods, as well as address structural barriers to access and supply.<sup>3</sup>

### Strategic Inter-Governmental Nutrition Alliance (SIGNAL)

The Strategic Inter-Governmental Nutrition Alliance (SIGNAL) is a national partnership with representatives from the Commonwealth, State and Territory Health Departments, National Health and Medical Research Council (NHMRC), Australian Institute of Health and Welfare (AIHW), and the Australian and New Zealand Food Authority (ANZFA), together with external experts and Aboriginal and Torres Strait Islander representatives. It was formed by the National Public Health Partnership in 1997 to coordinate action to improve the nutritional health of Australians. The primary goal of SIGNAL is to provide strategic direction and coordination of national nutrition initiatives. These initiatives are described fully on the Web site [www.dhs.vic.gov.au/nphp/signal](http://www.dhs.vic.gov.au/nphp/signal). SIGNAL has developed *Eat Well Australia: An Agenda for Action in Public Health Nutrition, 2000–2010*. Key initiatives for health gain include:

- improving nutrition for vulnerable groups and Aboriginal and Torres Strait Islander peoples;
- promoting vegetable and fruit consumption; healthy weight; and good nutrition for mothers, infants and school-aged children.

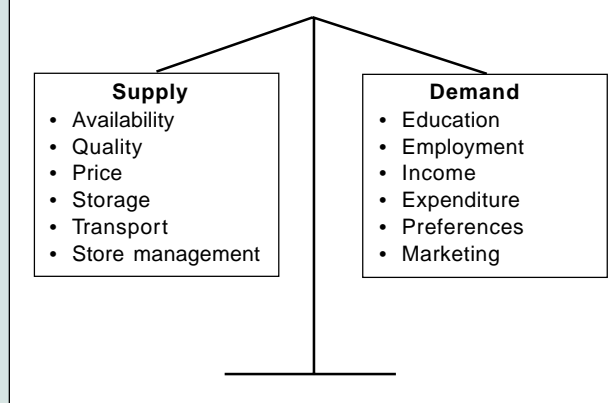
SIGNAL has several working groups, including the Vegetable and Fruit Working Party, which has developed a National Action Plan for increasing the consumption of vegetables and fruit.

#### National Action Plan to increase consumption of vegetables and fruit 2000–2005

The National Action Plan to increase the consumption of vegetables and fruit 2000–2005 was developed through a rigorous process that utilised current evidence of the benefits of increased consumption of vegetables and fruit; and strategies to increase consumption.<sup>5</sup> Consultation with the vegetable and fruit industry, and non-government organisations, resulted in an iterative process that was able to incorporate potential opportunities for future collaborative work.

FIGURE 6

#### THE FOOD SUPPLY—DEMAND BALANCE



An evidence-based portfolio of interventions was developed that describes effective, realistic and comprehensive approaches to promoting increased consumption of vegetables and fruit.<sup>6</sup> The portfolio comprises policy interventions, program interventions and infrastructure support mechanisms. A summary of the priority areas in the National Action Plan is displayed in Table 1. The main components identified in the three portfolio areas are briefly outlined below.

#### POLICY INTERVENTIONS

The policy interventions identified include a range of national position statements and consumption guidelines for the population, as well as position papers on vegetable and fruit consumption and the prevention of disease. In addition, a study of the effect of government policies, other than health, on consumption of vegetables and fruit; and also feasibility studies on a tax rebate–incentive system for suppliers and transport operators in rural and remote areas were suggested. Food policy programs, such as Aboriginal Community Store policies in rural and remote areas have already improved the availability, quality and pricing, and led to increased sales of vegetables and fruit.<sup>7</sup>

#### PROGRAM INTERVENTIONS

Key settings for program interventions include:

- schools
- childcare
- health providers
- point of sale
- institutional and commercial food services.

The scope of interventions is wide and includes:

- social marketing, such as media advertising, public relations and point of sale promotion;
- food supply initiatives, such as actions and policies by suppliers, transport companies and retailers to increase access to quality vegetables and fruit;
- community interventions, such as a ‘vegetables and fruit week’ and other community based promotions;
- school programs and primary health care interventions.

#### INFRASTRUCTURE SUPPORT

The strategies identified to underpin the program and policy interventions focused on system development and building the capacity of the public health workforce. Many of the programs require effective partnerships with other sectors, the food industry, non-government organisations and community groups. An inter-governmental approach is also needed, to work collaboratively with the education and agriculture sectors. Public health nutrition infrastructure needs building in all states, and particularly in NSW, if a significant effect is to be achieved on the public health consequences of poor and inadequate nutrition. The capacity building framework, and indicators developed for health promotion, are useful

**TABLE 1**

**SUMMARY OF THE NATIONAL ACTION PLAN TO INCREASE THE CONSUMPTION OF VEGETABLES AND FRUIT 2000–2005<sup>1</sup>**

Priority Area	Priority actions	Examples of action
National Promotion	Establish a collaborative partnership with industry and develop and implement a national communication strategy.	<ul style="list-style-type: none"> <li>• position statement;</li> <li>• consumption guidelines;</li> <li>• develop promotional strategies (that is, market research social marketing, point of sale advertising).</li> </ul>
Food Supply	Map the vegetable and fruit supply and develop strategies to overcome supply issues particularly for vulnerable groups.	<ul style="list-style-type: none"> <li>• Establish a monitoring system;</li> <li>• strategies developed and implemented.</li> </ul>
Community	Collect and disseminate effective programs.	<ul style="list-style-type: none"> <li>• Best practice guidelines for the promotion of vegetables and fruit.</li> </ul>
Schools	Provide funding for demonstration community programs.  A coordinated integrated approach to the promotion of vegetables and fruit in schools involving curriculum, the school environment and the community.	<ul style="list-style-type: none"> <li>• grant program funding is investigated.</li> <li>• resources identified or developed and disseminated;</li> <li>• a health promoting schools framework is used to guide school based initiatives.</li> </ul>

tools to assist this with this.<sup>8</sup> Working in a coordinated way; and advocating strongly for organisational development, workforce development and adequate public health nutrition investment, are paramount. The establishment of the NSW Centre for Public Health Nutrition, based at Sydney University, is one example of improved infrastructure that is contributing to better planning, research, information and monitoring in public health nutrition.<sup>9</sup>

**WHERE TO NEXT?**

The NSW Department of Health is making a significant contribution, and is about to disseminate a toolkit of tasting events to guide public health nutritionists in promoting vegetable and fruit consumption in community settings.<sup>10</sup> A nutrition strategy *Eat Well NSW 2001–2005*,<sup>11</sup> currently being developed in line with *Healthy People 2005*,<sup>12</sup> is defining the action areas for public health nutrition investment in NSW, and focuses on the promotion of vegetable and fruit consumption. The NSW Centre for Public Health Nutrition is supporting the implementation of state nutrition initiatives through: planning advice; research; workforce development, and monitoring in public health nutrition. Taken as a whole, these factors provide opportunities to facilitate and extend the partnerships between governments, non-government organisations and private industry to ensure that evidence-based strategies are implemented, that vegetable and fruit consumption is increased, so that the effect of diet-related disorders, including cancer, is reduced.

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# INFORMAL CARING IN CENTRAL SYDNEY

**David Muscatello \***

*NSW Public Health Officer Training Program  
NSW Department of Health*

**Peter Sainsbury**

*Social Health Research Unit  
Central Sydney Area Health Service*

**Chris Rissel**

*Health Promotion Unit  
Central Sydney Area Health Service*

This article describes the prevalence of informal caring in the Central Sydney Area Health Service (CSAHS) compared to that observed Australia-wide. Using data from the 1997 NSW Health Survey, we demonstrate that the prevalence of informal caring in the CSAHS is similar to that observed in larger Australia-wide surveys; and that, based on this limited sample, carers have similar sociodemographic characteristics and health status as non-carers. While this information is useful for health services planning, the analysis highlights some of the difficulties of examining conditions with low prevalence in small-area population surveys.

## BACKGROUND

Approximately five per cent of Australian households have at least one person who is the principal informal carer for someone with a long-term health problem or disability,<sup>1</sup> and most carers are middle-aged women.<sup>2,3</sup> There is, however, uncertainty about the association between caregiving and the physical and mental health of the caregiver,<sup>2,4,5</sup> and little is known about the needs of carers. Also, there are no data concerning caring within individual area health services in NSW. To assist health services planning, and to allow us to judge how confidently we could rely on information generated by larger Australian surveys, we sought to identify the prevalence of informal caring and the basic sociodemographic characteristics and health status of informal carers in CSAHS.

## METHOD

We analysed data for residents of CSAHS from the 1997 NSW Health Survey. Respondents aged 16 years and over residing in a household with a private telephone participated in a computer-aided telephone interview.<sup>6</sup> All NSW respondents ( $n=17,531$ ) were asked core sociodemographic, risk factor, and health status questions.<sup>6</sup> English speaking residents of CSAHS ( $n=1070$ ) were asked additional questions relating to caring.

Carers were identified through a screening question which defined a carer as 'someone who looks after a person who is mentally or physically disabled, or who is limited in

what they can do by illness or old age'. Of 49 respondents identified as carers, 11 (22 per cent) reported being paid a salary or wages for caring and were excluded. The remaining informal carers (that is, those who were unpaid or received a carer's allowance) were asked how many persons they cared for, their relationship to the care receivers, and the age and physical, mental and emotional condition of the persons being cared for. Prevalence estimates were weighted for the probability of selection based on household size, age and sex to the resident population of CSAHS based on 1996 Census data.<sup>6</sup>

## RESULTS

The response rate to the statewide component of the survey was 68.1 per cent in Central Sydney, resulting in 1,234 completed interviews.<sup>6</sup> Because area-specific questions were asked only in interviews conducted in English, 1070 (86.7 per cent) respondents were asked the carer screening question. These respondents were slightly, but significantly, more likely to be female, middle-aged and be born in Australia than the overall CSAHS population.

Overall, 3.5 per cent of the Central Sydney population was engaged in informal caring, with most caring being done by persons aged 55 years or over. Slightly more men (3.6 per cent) than women (3.3 per cent) reported being engaged in caring, with the greatest difference appearing in the over 55 age group (7.2 per cent of men, 3.6 per cent of women), although these differences were not statistically significant (see Table 2). Of carers, 83.3 per cent (95 per cent CI 70.8 to 95.9) cared for one person, and 16.7 per cent (95 per cent CI 4.1 to 29.2) cared for two. Two-thirds of care recipients (or oldest recipient if more than one) were aged 55 years or more (65.2 per cent, 95 per cent CI 49.1 to 81.2). Almost one-third of care recipients were the mother of the carer (30.2 per cent, 95 per cent CI 14.7 to 45.6), 18.7 per cent (95 per cent CI 5.6 to 31.9) were the partner, and 15.8 per cent (95 per cent CI 3.5 to 28.0) were a friend.

We found no statistical association between informal caring and the carer's sex, age, marital status, education, home ownership, social security benefit status, employment status, psychological distress, self-reported health and functioning, smoking status, alcohol intake or physical activity.

Table 3 summarises the major categories of health problems of the 44 care receivers, as identified by their carers. Twenty-eight (63.6 per cent) of the care receivers had one health problem, 13 (29.5 per cent) had two, and three (6.8 per cent) had three or four.

## DISCUSSION

Although our sample of informal carers was small, the prevalence of informal caring in CSAHS is consistent with that reported in other Australian studies.<sup>1,3</sup> This is reassuring for area-based service planners who can now

\* *Currently Manager, Program for Enhanced Population Health Infrastructure, Epidemiology and Surveillance Branch, NSW Department of Health.*

**TABLE 2**

**PREVALENCE OF INFORMAL CARING BY AGE AND SEX IN CENTRAL SYDNEY AREA HEALTH SERVICE, 1997 \***

Age group	Males		Females		Persons	
	%	(95% CI)	%	(95% CI)	%	(95% CI)
16–29 years	3.4	(0.0–7.0)	2.9	(0.2–5.7)	3.1	(0.9–5.4)
30–54 years	2.3	(0.4–4.2)	3.4	(1.2–5.7)	2.9	(1.4–4.3)
55+ years	7.2	(2.3–12.1)	3.6	(0.5–6.8)	5.3	(2.5–8.2)
Total	3.6	(1.8–5.4)	3.3	(1.8–4.8)	3.5	(2.3–4.7)

\* Results weighted to the Central Sydney Health Area population.

rely on the more detailed and more statistically robust results of national studies with greater confidence. Also consistent with larger studies, carers in CSAHS were not different from non-carers on the sociodemographic and health factors measured, and carers were observed to be a heterogeneous group.<sup>2</sup> Our finding of a similar prevalence of caring among men and women was unexpected but this study differed from others in that principal and secondary caregivers were not differentiated and there was no definitional minimum on the number of hours spent caring each week.

Our analyses suggest that as carers, care recipients and their social contexts are not homogeneous, future research should focus on the difficulties and needs of specific categories of carers, such as those from disadvantaged backgrounds and those caring for people with different physical and psychiatric disorders. This study does, however, highlight the difficulties of doing this with small-area population surveys. To enable sub-group analyses to be performed an initial sample of 10,000–20,000 would have been needed—a project well beyond the financial and other resources of most area health services.

CSAHS has a very culturally diverse population (at the 1996 Census 43.7 per cent of the population over five

years old spoke a language other than English at home),<sup>7</sup> and it is possible that people from non-English speaking backgrounds (NESB) have different patterns of caring to people of English speaking background. Our results do not relate to adults who required an interpreter to complete the survey (13.3 per cent of the sample) and it is likely that these are the NESB people who are most different in their caring patterns.

Finally, the study highlights the importance of clarifying, either in the screening question or subsequently, whether individuals who care for another person are receiving payment for their caring role. Almost a quarter of the people who answered ‘yes’ to our screening question were receiving a salary or wages for their caring role.

In summary, the results of area-specific questions in the NSW Health Survey suggested that the prevalence of informal caring in CSAHS is similar to that found in larger surveys that have focused on this issue. However, our experience highlights the difficulties of examining conditions with low prevalence in small-area population surveys.

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**TABLE 3**

**MAJOR HEALTH PROBLEMS, IDENTIFIED BY THEIR CARERS, OF 44 CARE RECEIVERS, CENTRAL SYDNEY AREA HEALTH SERVICE, NSW, 1997**

Health problem	First problem identified	Additional problems identified	Total
Musculoskeletal	6	4	10
Neurological	9	0	9
Cardiovascular	6	2	8
Psychiatric (excluding dementia)	5	3	8
‘Old age’	5	3	8
Respiratory	4	0	4
Dementia	3	0	3
Miscellaneous	4	6	10
Uncodeable	2	3	5
Total	44	21	65

# VISION 2020: THE RIGHT TO SIGHT—AUSTRALIA

**Kylie Evans and Brien Holden**

*Cooperative Research Centre for Eye Research and Technology, University of New South Wales*

**Carley Nicholls**

*Vision 2020: The Right to Sight—Australia*

This article describes *Vision 2020: The Right to Sight—Australia*, a initiative that supports increased public awareness of, and greater access to, the services and treatments that are available to improve the visual health of all Australians.

## BACKGROUND

Many thousands of Australians are needlessly blind or visually impaired. Almost 50 per cent of legal blindness and 70 per cent of visual impairment are caused by conditions that are preventable or treatable. Among indigenous Australians blindness and visual impairment is significantly higher than in other populations. Services and treatments for blindness and visual impairment are among the most successful and cost-effective of any health

### **SOME KEY OBJECTIVES OF VISION 2020: THE RIGHT TO SIGHT—AUSTRALIA**

#### **To support and promote**

- protective behaviour, including smoking cessation and reducing exposure to ultraviolet light;
- improved detection of those with cataract through vision tests;
- research into new treatment strategies;
- optimal rehabilitation for all those with vision loss.

#### **To encourage**

- all Australians to have their vision tested on a regular basis;
- every person with diabetes to have their eyes examined at least every two years;
- early detection in all people with glaucoma, research into the genetic basis of glaucoma, and improved glaucoma treatment;
- greater awareness of the general public and health care professionals in the eye care needs of those with low vision, and greater access to appropriate low vision services and treatments for all Australians;
- adequate screening programs within indigenous communities, and an integrated primary health care approach to visual health within these communities.

interventions. It is important to ensure that these services and treatments reach all those who need them.

## THE VISUAL HEALTH OF AUSTRALIANS

Blindness and visual impairment:

- have enormous personal, social and economic costs;
- limit the activities of otherwise healthy people;
- are associated with an increase in mortality;
- are a significant burden on the individual, the family, and the community.

The Centre for Eye Research Australia cites the principle causes of preventable blindness and visual impairment as:

### **Cataract**

Cataract is a disease of the eye in which the lens becomes clouded causing loss of sight. High exposure to ultraviolet light and smoking increases the risk of cataract. The prevalence of cataract increases with the age of the population. At present 122,000 cataract operations are performed in Australia each year, and 29,800 people have visual impairment due to cataract. Because of Australia's ageing population, the need for cataract surgery will increase.

### **Uncorrected and under-corrected refractive error**

It is estimated that 15,100 Australians are legally blind, and 212,000 Australians have some visual impairment, due to under-corrected refractive error that could be eliminated with the appropriate glasses. The reasons for this include: lack of awareness of services and treatments; the remoteness of some population groups; and the lowered visual health expectations of older Australians.

### **Diabetes**

In Australia, there are 400,000 known diabetics, each of whom is at increased risk of blindness or visual impairment due to diabetic retinopathy. Many diabetics do not have regular examination of their eyes, even though with early and appropriate treatment, up to 98 per cent of severe vision loss can be prevented. The major impediments to diabetics receiving appropriate eye care are lack of awareness and poor communication.

### **Macular degeneration**

As the age of the general population increases, two out of every three older Australians will develop age-related macular degeneration (AMD), and one in four will lose their sight because of AMD. AMD is a degenerative retinal eye disease that causes the progressive loss of central vision. Unfortunately, there is no effective treatment or prevention for AMD.

### **Glaucoma**

Glaucoma is a disease of the eye marked by increased pressure within the eyeball and loss of eyesight. It is estimated that over 126,000 Australians have glaucoma,

and half of those with glaucoma are undiagnosed. One person in seven will develop glaucoma, but if detected early and treated effectively the loss of vision can be prevented or delayed.

#### **Low vision**

Of the approximately 400,000 Australians with impaired vision, only one-third access rehabilitation services. The effect of impaired vision can lead to loss of confidence, self-esteem and independence; and people with impaired vision are at an increased risk of injury such as from falls.

#### **Trachoma and Trichiasis**

Trachoma is a painful and contagious inflammation of the inner surface of the eyelids. Many indigenous communities have the same incidence of trachoma as they did 20 years ago, with 50–70 per cent of children in some indigenous communities experiencing active trachoma. The eyelid scarring caused by trachoma can cause trichiasis, which is a condition where eye lashes turn inwards and cause corneal scarring and blindness. In some communities one in five elderly people have trichiasis.

#### **VISION 2020 AUSTRALIA**

In November 1999, the 6th General Assembly of the International Agency for the Prevention of Blindness was held in Beijing, China. The focus of the assembly was *Vision 2020: The Right to Sight*, a global campaign to eliminate avoidable blindness established by an alliance of the World Health Organization, the International Agency for the Prevention of Blindness, and the Partnership Committee of the International Non-Government Development Organisations. At the assembly, representatives of several Australian organisations involved in the prevention of blindness

and sight restoration met to coordinate an Australian response to the global campaign.

In October 2000, *Vision 2020: The Right to Sight—Australia* was launched. It is a partnership that brings together a wide range of Australian organisations involved in service provision, research, education and community work to promote sight as a basic human right, and to build the capacity of services to respond to the public health problem of blindness and visual impairment. The principal goals of *Vision 2020: The Right to Sight—Australia* are to:

- advocate for the visual health of all Australians;
- increase awareness of blindness and visual impairment as a major public health issue;
- address the problems and conditions that affect the sight of all Australians;
- target education and service provision to the community, particularly to aged and indigenous Australians;
- control the major causes of preventable blindness and visual impairment;
- train eye care personnel to provide appropriate eye care;
- coordinate eye care efforts;
- create an infrastructure to build capacity to manage visual health.

*Vision 2020: The Right to Sight—Australia* is an opportunity to advance Australian eye care. All health care professionals, researchers and service providers of eye care are encouraged to support its activities. For further information contact the Secretariat, *Vision 2020: The Right to Sight—Australia* by mail at PO Box 328, Randwick, New South Wales 2031; by telephone at (02) 9385 7435; by facsimile at (02) 9385 7436; by email at [V2020-a-sect@cclru.unsw.edu.au](mailto:V2020-a-sect@cclru.unsw.edu.au); or by visiting the Web site at [www.vision2020australia.org](http://www.vision2020australia.org).

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*Hosted by the Aboriginal Health & Medical Research Council of NSW (ABN 66085654397)*

## NOTIFIABLE SEXUALLY TRANSMISSIBLE DISEASES, NSW 1991–1999

*Jeremy McAnulty, Valerie Delpech and Mohammad Habib*  
*Communicable Diseases Surveillance and Control Unit,*  
*NSW Department of Health*

Sexually transmissible diseases (STDs) have been on the public health agenda for a long time. In addition to personal suffering, some STDs have been linked to the increased transmission of other infections such as HIV, and to physical complications, including pelvic inflammatory disease, infertility and cancer.<sup>1</sup> STDs are highly preventable, however, and:

- condom use
- case identification and treatment
- partner notification and screening;

as well as more traditional methods of prevention such as:

- abstinence
- long-term monogomy,

have all been advocated to curb transmission.

The monitoring of progress towards the control of STDs has in part relied on public health surveillance. However, the interpretation of STD surveillance data remains difficult because:

- new infections are under-reported as a large proportion of infections are asymptomatic;
- complicated algorithms based on laboratory results and treatment history are required to classify syphilis infections;

- there is a reluctance to notify these sometimes stigmatised conditions.

Under the NSW Public Health Act, laboratories have been required to notify diagnoses of gonorrhoea and syphilis since 1991. In August 1998, *Chlamydia trachomatis* infections, chancroid, granuloma inguinale, and lymphogranuloma venereum were included as notifiable conditions. In addition, doctors and hospitals are required to notify diagnoses of syphilis. Here we summarise surveillance data on STDs for the nine-year period 1991 to 1999.

### METHODS

For each notification, public health unit staff record case details including age, sex, postcode, diagnosis, and date of specimen collection, on the confidential statewide Notifiable Diseases Database (NDD). Data on gonorrhoea and syphilis were available on NDD for the years 1991–1999. Details of Aboriginality, sexuality or ethnicity of cases are not notified by laboratories. For syphilis, cases were grouped by whether they were classified by the treating doctor as:

- congenital
- infected within the past year
- infected more than a year before or diagnosed as latent
- not reported.

Analysis of data on chlamydia was restricted to 1999, which was the first full year of reporting. Incidence rates were calculated using the estimated 1997 mid-year population from the Australian Bureau of Statistics.

**TABLE 4**

#### NOTIFICATIONS OF SYPHILIS, GONORRHOEA, 1991–1999 AND CHLAMYDIA, 1999 NSW

Year of onset	Syphilis				Total	Gonorrhoea Total	Chlamydia* Total
	Congenital	<1 year	>1 year latent	Unknown			
1991	1	1	1	584	587	395	
1992	1	2	3	874	880	494	
1993	0	6	7	728	741	382	
1994	2	29	21	928	980	357	
1995	7	136	31	666	840	428	
1996	3	71	37	553	664	522	
1997	4	57	26	426	513	636	
1998	0	45	24	536	605	1051	
1999	1	89	99	333	522	1288	2464

\* Not notifiable until August 1998



## RESULTS

### Syphilis

During 1991–1999, there were 6,332 cases of syphilis notified in NSW. The greatest number of notifications were received in 1994 and the least in 1997 (Table 4). Very few cases were notified by doctors (less than one per cent), the remainder were laboratory notifications of markers for syphilis infection, which alone provide insufficient data to determine whether or not the infection was recent. The proportion of cases reported by clinical classification improved in 1999, largely due to improved follow up by public health units, however 64 per cent of cases remained unclassified in that year. The number of cases infected within one year of notification (that is, new cases) is therefore likely to be vastly under-reported.

For the nine-year period, case rates for all notifications were highest among persons living in the Sydney area, males, and young adults (Table 5). Compared with the other STDs under surveillance, there were relatively high rates for notifications of people over 35 years of age, suggesting old, rather than recent infections. When analysed by clinical classification:

- 95 per cent of the 19 individuals born with congenital syphilis were born outside the Sydney area;
- recent infections were more likely to be in residents of rural areas, women and younger people;
- persons with unclassified infections were more likely to be resident in the Sydney area, men and older people (Table 5).

In 1999, the mean age of cases where infection was acquired in the previous year was 28.9 years, compared with 47.9 years for those whose infections were acquired more than one year before notification, 44.3 years for other latent cases, and 44.7 years for unclassified cases.

### Gonorrhoea

During 1991 to 1999, there were 5,553 cases of gonorrhoea notified in NSW. Notifications increased steadily from 1991 to 1997, and dramatically so from 1998 (Table 4). In 1999 the case rate was 20.5 per 100, 000.

For the nine-year period, the highest notification rates were among residents of the Sydney area, men, and young adults (Table 5). In 1999, the mean age of cases was 32.6 years. South Eastern Sydney Area accounted for over 40

**TABLE 5**

**CHARACTERISTICS OF PATIENTS NOTIFIED WHO HAD SYPHILIS OR GONORRHOEA, 1991–1999 OR CHLAMYDIA, 1999, NSW**

Case characteristic	Syphilis* 1991–1999				Gonorrhoea 1991–1999		Chlamydia 1999			
	Congenital	<1 y	>1y	Unknown	Total (%)	Rate#	Total (%)	Rate#	Total (%)	Rate#
<b>Residence*</b>										
Sydney area	1	76	131	4153	4361 (69)	12.9	4337 (78)	13.0	1175 (48)	31.8
Other NSW	18	359	119	1474	1970 (31)	8.3	1055 (19)	4.6	1272 (52)	49.4
<b>Sex*</b>										
Male	9	156	112	3255	3532 (56)	12.6	4779 (86)	17.1	1113 (45)	35.8
Female	9	272	136	2208	2626 (41)	9.3	731 (13)	2.6	1335 (54)	42.3
<b>Age group</b>										
0–9	18	5	0	217	240 ( 4)	3.0	108 ( 2)	1.4	29 ( 1)	3.3
10–14	0	5	1	23	29 (<1)	0.7	23 (<1)	0.6	24 ( 1)	5.5
15–19	0	97	25	329	451 ( 7)	11.5	482 ( 9)	12.5	498 (20)	116.3
20–24	0	126	21	565	713 (11)	17.5	1093 (20)	26.8	714 (29)	157.8
25–34	0	116	56	1361	1532 (24)	17.6	2336 (42)	26.8	819 (33)	84.6
35–44	0	53	57	1162	1273 (20)	14.7	1098 (20)	12.6	265 (11)	27.4
45–54	0	16	31	850	897 (14)	12.4	312 ( 6)	4.3	83 ( 3)	10.3
55–64	1	5	18	442	466 ( 7)	9.5	55 (<1)	1.1	19 ( 1)	3.5
65+	0	12	41	676	729 (12)	10.2	44 (<1)	0.6	13 ( 1)	1.6
<b>Total</b>	<b>19</b>	<b>435</b>	<b>250</b>	<b>5627</b>	<b>6332</b>	<b>11.2</b>	<b>5553</b>	<b>9.8</b>	<b>2464</b>	<b>39.1</b>

\* excludes missing–other

# average annual notification incidence based on 1997 population estimates

+ see Table 1 for complete headings

per cent of all NSW notifications. A NSW Health case study in 1999 (unpublished) found that the majority of these cases were likely to be men who have sex with men and who live in the eastern- and inner-Sydney area. Where the site of infection was specified, anal-rectal infections accounted for 13 per cent of NDD notifications in 1999. However, the site of infection was unspecified for 42 per cent of cases.

### **Chlamydia**

In 1999, there were 2,464 cases of chlamydial infection notified in NSW: the highest annual case rate for any of the notifiable STDs (Table 1). The highest rates of notifications of chlamydia were among women, people living outside the Sydney area, and people in the 20–24 year old age group (Table 5). The mean age of cases was 26.5 years.

Diagnosis of chlamydia by nucleic amplification techniques increased in recent years and accounted for 38.7 per cent of notifications in 1999.

### **Other bacterial STDs**

Only one case of chancroid, which was acquired overseas, was reported in NSW in 1999. No cases of granuloma inguinale or lymphogranuloma venereum have been notified.

## **DISCUSSION**

These data indicate that some bacterial STDs continue to be a major problem in New South Wales. Curiously, different pathogens, while sharing common routes of transmission, seem to affect different communities. Recently, gonorrhoea has become more common among men who have sex with men in the eastern- and inner-Sydney area, while chlamydia is relatively more commonly notified in people who are younger, women, and reside in rural areas. There are insufficient clinical data collected describing syphilis cases to reliably distinguish between recent and past infections. However, the available data indicates a strikingly disproportionate burden of congenital and recent infections in rural areas.

Clearly, these surveillance data do not provide a complete picture of the burden of STDs in NSW for a number of reasons. First, more common STDs such as venereal warts

and herpes are not notifiable in NSW, in part because of the difficulty in discerning incident cases. Second, there is substantial under-reporting of those diseases that are notifiable: many people with infections do not present to health care workers, some health care workers do not make the diagnosis (especially if the patient has few or no symptoms) and some laboratories and doctors do not notify diagnosed cases to public health units. Third, screening programs targeted at certain high-risk groups, such as men who have sex with men, and women of child bearing age, may lead to relative over-representation of these groups in surveillance data.

Nonetheless, STD surveillance has provided important data that were used to inform the recent gonorrhoea-prevention campaign for eastern- and inner-Sydney men who have sex with men.<sup>2</sup> The data on chlamydia will be similarly useful for targeting better prevention programs across the State. Historical data for syphilis has suffered from a lack of clinical detail that has limited its usefulness for tracking trends in new infections. The reason for the relatively high proportion of congenital and recent syphilis infection in non-Sydney areas requires further assessment. It may reflect better investigation of cases by public health units in rural areas. However, it may also reflect limited access to prenatal care in some communities. In addition, information on the Aboriginality of patients has not been available for most STDs. In recognition of these limitations, in 2000, the NSW Department of Health recommended that public health units actively seek from doctors the clinical details of patients diagnosed with syphilis and notified by laboratories. Better quality of information describing the demographic characteristics, including Aboriginality, would also be useful for the planning and implementation of prevention programs.

## **REFERENCES**

1. Chin J (editor). *Control of Communicable Diseases Manual*. 17th edition. Washington, DC: American Public Health Association, 2000.
2. NSW Department of Health. Year in Review: Communicable Disease Surveillance, 1999. *NSW Public Health Bulletin* 2000; 11(9–10):161–168. ☒

## PSITTACOSIS

### WHAT IS PSITTACOSIS?

- Psittacosis is an uncommon disease that is usually transmitted to humans from birds. It is caused by a bacteria called *Chlamydia psittaci*.

### HOW IS IT SPREAD?

- Infection usually occurs when a person inhales the bacteria, usually from dried bird droppings from infected birds. People can also become infected by mouth-to-beak contact (kissing) with birds or by handling the feathers or tissues of infected birds. Psittacosis has not been proven to be spread from person to person.
- All birds are susceptible to infection, but pet birds (for example: parrots, parakeets, cockatiels); and poultry (turkeys and ducks) are most frequently involved in passing the infection to humans.
- People most at risk of infection with psittacosis are those who come into contact with birds through their work or hobbies. For example: bird owners, pet shop employees, vets, or people who process poultry.

### WHAT ARE THE SYMPTOMS OF PSITTACOSIS?

- The time from between human exposure to the bacteria and the development of symptoms varies from about four to 15 days.
- People with psittacosis often develop a flu-like illness, with a sudden onset of fever, chills, headache, weakness and muscle aches. They may also have a dry cough, chest pain and feel breathless. In severe cases, pneumonia develops.

### HOW IS PSITTACOSIS DIAGNOSED AND TREATED?

- If a doctor thinks someone has psittacosis, blood tests can be done to help confirm the diagnosis. Chest X-rays often show pneumonia.

- Psittacosis is treated with antibiotics. These need to be continued for two weeks.
- It is important to try to determine where the infection came from. Other people who may have been exposed to an infected bird should be made aware of the symptoms of infection. The bird should be treated and its environment cleaned with disinfectant to prevent further infections being spread to other people or to other birds.

### HOW DO I KNOW IF A BIRD IS INFECTED?

- In birds, symptoms of the infection can vary from nothing at all to a fatal illness. Sick birds may have symptoms such as diarrhoea, weakness, ruffled feathers, not eating and runny eyes or nose. If in doubt, a vet should examine your bird. Infected birds need to be isolated, treated with antibiotics and have their cages disinfected.
- As it can be difficult to tell if a bird is infected, ensure strict hygiene, including hand washing, when handling pet birds. Avoid kissing (mouth-to-beak contact with) pet birds.
- Birds should be housed in clean cages of ample size that are lined with newspaper that is changed frequently. Faecal material must not accumulate, dry up and allow infected faecal dust to become airborne. Dampen any bird droppings or cages prior to cleaning.
- Birds should only be obtained from a licensed pet store or aviary.

*For more information please contact your local public health unit, community health centre, or doctor. ☒*

# COMMUNICABLE DISEASES, NSW: JANUARY 2001

## TRENDS

**Pertussis** continues to be a problem in NSW, with 456 case notifications received in November 2000, and 3229 for the year to the end of November 2000 (Table 6). The greatest number were again received from the Hunter Area. Fewer than 10 per cent of cases were children under five years of age (Figure 7).

## SIX ADDITIONAL CONDITIONS BECOME NOTIFIABLE IN NSW

After careful consideration, the NSW Infectious Diseases Advisory Committee and directors of public health units have agreed that the list of NSW notifiable conditions should be amended in alignment with national guidelines. Laboratories will be required to report five additional conditions, and hospitals will be required to report one new condition. However, mycobacteria infections other than tuberculosis will no longer be notifiable.

From 29 December 2000, under the Public Health Act 1991, **laboratories** have to report:

### **Anthrax**

Anthrax is an acute bacterial disease usually affecting the skin. It is primarily a disease of herbivores; humans and carnivores are incidental hosts. There is sporadic human infection in most industrialised countries. Infection is caused by:

- contact with tissues of animals dying of the disease
- contaminated wool, hair, hides, or products made from them, such as drums or brushes
- contact with soil associated with infected animals or contaminated bonemeal (used in gardening).

Animal cases occur in some parts of the State and prompt immediate agricultural controls. Notification of human disease would alert NSW Health and NSW Agriculture to identify and control the source, and therefore minimise the risk of further exposures.

### **Invasive Pneumococcal Infection**

This is a common bacterial infection of humans that causes a range of diseases including pneumonia, septicaemia and meningitis. Serious disease is more common in indigenous communities. A vaccine is recommended for all persons aged over 65, and for indigenous Australians over 50 years of age. A new vaccine to protect babies from serious infections is likely to be available in Australia in the next few years. Identification of cases, and the bacterial serogroups involved in infection, will be useful in

planning and evaluating effective immunisation programs.

### **Psittacosis**

This is an acute generalised bacterial disease of humans with variable clinical presentations including fever, headache, rash, myalgia, chill and upper or lower respiratory tract infection. It is acquired from birds and outbreaks of human disease have been linked to household pets, and to exposure to birds from pet shops, aviaries, zoo exhibits and pigeon lofts. The infection is transmitted by inhalation of the bacteria from droppings, secretions and dust from feathers of infected birds. Notification of cases will allow identification and control of possible sources of infection.

### **Influenza**

Influenza is an acute viral disease of the respiratory tract characterised by fever, myalgia, prostration, coryza, sore throat and cough. Influenza can develop into an epidemic very quickly with widespread morbidity and potentially has serious complications, most notably viral and bacterial pneumonia. During major epidemics deaths can occur, usually in the elderly and people suffering from immunosuppressive illnesses. Identification of demographic characteristics and time of the onset of illness with influenza-like infections, and the specific strain of influenza involved, provides useful data for planning management and prevention strategies including immunisation.

From 29 December 2000, under the Public Health Act 1991, both laboratories and hospitals have to report:

### **Lyssavirus**

In Australia, lyssavirus infection is a rare and fatal viral infection of humans. Two fatal cases have been reported in Queensland since 1996. The virus is closely related to rabies and is frequently carried by bats. Notification of cases will contribute to our understanding of this emerging disease and assist to control the risks posed to humans.

From 1 February 2001, **laboratories** will have to report:

### **Shigellosis**

This is an acute bacterial disease characterised by bloody diarrhoea. Shigella infections are spread by the faecal-oral route from person to person but may result from ingestion of contaminated food or water. Recent outbreaks (1998–1999 and 2000) have occurred among Sydney men who have sex with men. Notification of the condition

will permit NSW Health to monitor the condition among high-risk groups, identify potential outbreaks and facilitate control and prevention measures.

However, from 29 December 2000 laboratories will no longer be required to notify:

#### **Mycobacteria other than tuberculosis**

Mycobacteria other than tuberculosis are not communicated from person-to-person and there is no public health response that follows the notification of a case. Infections have been notifiable as part of 'all mycobacterial infection', which aggregated cases of tuberculosis and non-tuberculous mycobacterial infections. This was thought necessary in the past in order to detect cases of tuberculosis, which require prompt attention. With the requirement for both clinical and

laboratory notification of tuberculosis, and with the advances in microbiological diagnosis of *Mycobacterium tuberculosis*, it is no longer necessary to notify non-tuberculous mycobacterial infection.

#### **New notification forms**

The laboratory and hospital notification forms for all infectious diseases on the NSW Notifiable Diseases Schedule will be updated to include the additions and deletion.

The notification forms can be accessed from the NSW Health Web site at [www.health.nsw.gov.au](http://www.health.nsw.gov.au). Go to the link 'GPs Info' and then 'Infectious Diseases Notification Forms'. Notification forms can also be obtained from your local public health unit. ☒

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The *NSW Public Health Bulletin* is a publication of the NSW Department of Health. The editor is Dr Lynne Madden, Manager, Public Health Training and Development Unit. Dr Michael Giffin is managing editor.

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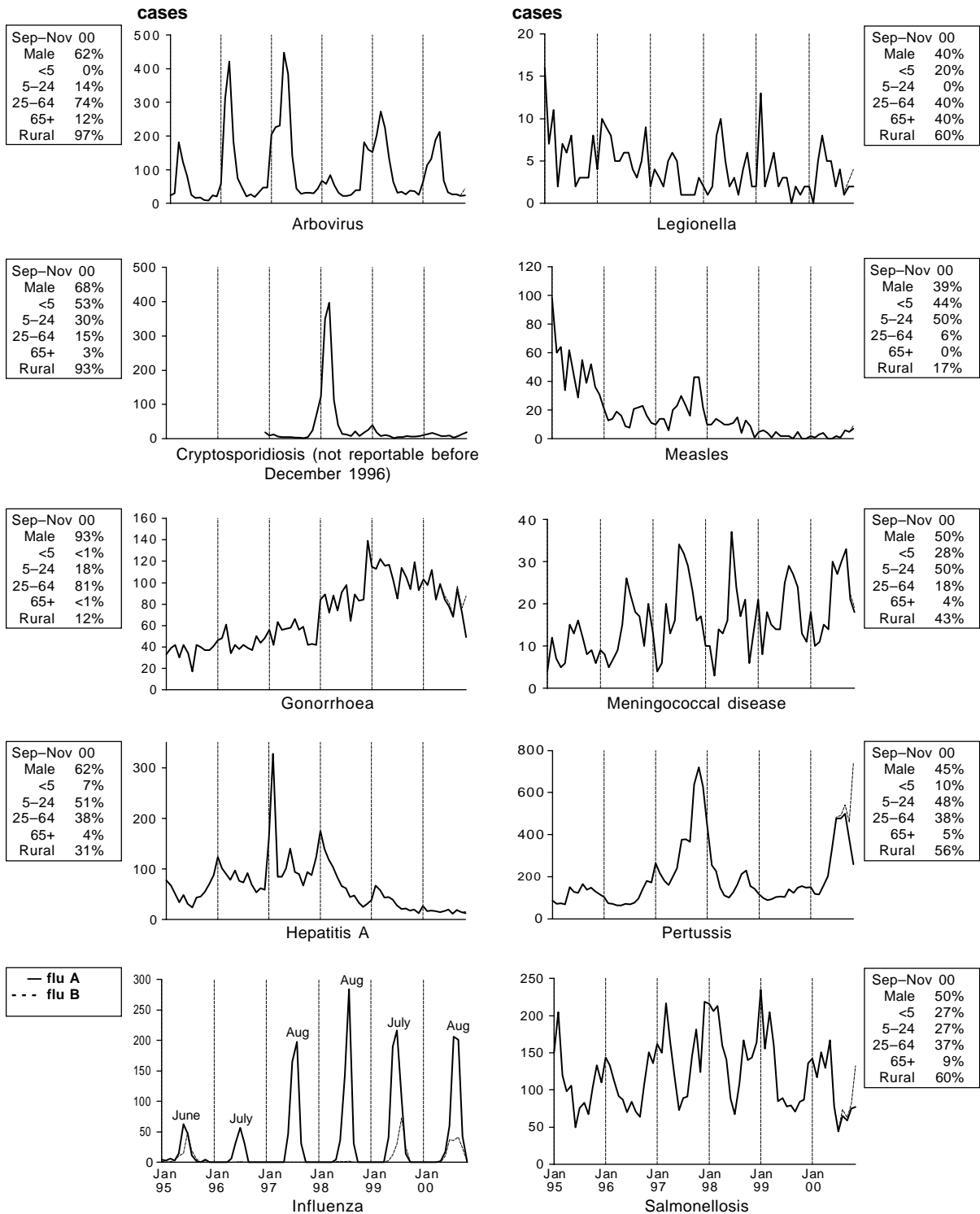
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**FIGURE 7**

**REPORTS OF SELECTED COMMUNICABLE DISEASES, NSW, JANUARY 1995 TO NOVEMBER 2000, BY MONTH OF ONSET**

These are preliminary data: case counts for recent months may increase because of reporting delays. Laboratory-confirmed cases, except for measles, meningococcal disease and pertussis — actual — predicted after adjusting for likely reporting delays

NSW population	
Male	50%
<5	7%
5-24	28%
25-64	52%
65+	13%
Rural*	42%



\* For definition, see NSW Public Health Bulletin, April 2000

**TABLE 6** REPORTS OF NOTIFIABLE CONDITIONS RECEIVED IN NOVEMBER 2000 BY AREA HEALTH SERVICES

Condition	Area Health Service (2000)																		Total	
	CSA	NSA	WSA	WEN	SWS	CCA	HUN	ILL	SES	NRA	MNC	NEA	MAC	MWA	FWA	GMA	SA	CHS	for Nov†	To date†
<b>Blood-borne and sexually transmitted</b>																				
AIDS	1	-	1	-	6	-	-	1	-	-	-	-	-	-	-	1	4	-	14	117
HIV infection*	1	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	3	277
Hepatitis B - acute viral*	2	-	-	-	1	-	-	-	1	1	-	1	1	-	-	-	-	-	7	89
Hepatitis B - other*	52	60	15	19	123	7	6	7	63	1	1	5	1	2	8	3	3	4	382	3,968
Hepatitis C - acute viral*	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	2	4	115
Hepatitis C - other*	54	44	1	49	79	52	62	48	117	43	32	13	4	18	2	17	15	46	697	7,813
Hepatitis D - unspecified*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Hepatitis, acute viral (not otherwise specified)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Chancroid*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlamydia (genital)*	22	40	44	13	19	5	30	15	84	10	15	21	6	9	6	12	7	1	359	3,096
Gonorrhoea*	4	7	5	3	3	1	-	2	28	3	-	-	-	-	1	-	-	-	58	992
Syphilis	5	2	6	4	8	1	-	1	11	6	1	3	1	1	-	1	-	3	54	497
<b>Vector-borne</b>																				
Arboviral infection (BFV)*	-	-	-	-	-	-	3	2	-	3	11	-	-	-	-	-	1	-	20	186
Arboviral infection (RRV)*	-	1	-	-	-	-	5	-	-	-	1	1	1	-	-	1	-	-	10	714
Arboviral infection (Other)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	27
Malaria*	-	3	2	-	-	-	1	-	2	2	1	-	-	1	-	-	-	-	12	218
<b>Zoonoses</b>																				
Brucellosis*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Leptospirosis*	-	1	-	-	-	-	3	-	-	-	3	5	-	-	-	-	-	-	12	53
Q fever*	-	1	-	-	2	-	2	-	-	1	2	-	1	-	-	-	-	-	9	112
<b>Respiratory and other</b>																				
Blood lead level*	2	1	-	4	5	-	3	3	5	1	-	-	1	-	-	-	1	-	26	924
Legionnaires' Longbeachae*	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	9
Legionnaires' Pneumophila*	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	25
Legionnaires' (Other)*	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1	3
Leprosy	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	3
Meningococcal infection (invasive)	1	1	4	-	3	1	-	2	1	1	-	-	-	-	-	1	-	-	15	226
Mycobacterial tuberculosis	1	2	9	2	8	-	3	-	14	-	-	1	-	-	1	-	-	-	42	392
Mycobacteria other than TB	10	4	-	1	-	-	3	2	-	-	5	-	-	1	-	1	-	-	27	326
<b>Vaccine-preventable</b>																				
Adverse event after immunisation	2	-	-	-	-	-	-	-	1	-	-	-	1	-	1	-	-	-	5	25
H.influenzae b infection (invasive)*	-	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-	2	9
Measles	3	-	1	1	1	-	-	-	-	-	1	-	-	-	-	-	-	-	7	30
Mumps*	1	2	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	5	92
Pertussis	10	66	47	28	39	15	108	8	40	4	20	13	5	23	2	21	7	-	456	3,229
Rubella*	-	2	1	-	1	2	37	2	1	-	5	1	-	-	-	-	-	-	52	164
Tetanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
<b>Faecal-oral</b>																				
Botulism	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cholera*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cryptosporidiosis*	-	-	1	-	-	-	1	-	-	3	3	9	1	-	-	-	-	-	18	119
Giardiasis*	4	12	14	3	1	2	4	2	12	17	4	5	-	4	-	3	2	-	89	903
Food borne illness (not otherwise specified)	-	-	-	-	-	-	-	-	9	-	-	-	2	-	-	-	-	-	11	159
Gastroenteritis (in an institution)	-	-	23	-	-	-	58	-	-	-	-	-	-	-	-	-	-	-	81	530
Haemolytic uraemic syndrome	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Hepatitis A*	7	3	-	-	1	1	2	-	3	-	-	-	-	-	-	-	-	-	17	194
Hepatitis E*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Listeriosis*	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	2	12
Salmonellosis (not otherwise specified)*	1	8	-	6	4	3	12	5	14	20	5	4	3	2	-	7	2	-	96	1,158
Typhoid and paratyphoid*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	42
Verotoxin producing Ecoli*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1

\* lab-confirmed cases only

† includes cases with unknown postcode

CSA = Central Sydney Area  
NSA = Northern Sydney Area  
WSA = Western Sydney AreaWEN = Wentworth Area  
SWS = South Western Sydney Area  
CCA = Central Coast AreaHUN = Hunter Area  
ILL = Illawarra Area  
SES = South Eastern Sydney AreaNRA = Northern Rivers Area  
MNC = North Coast Area  
NEA = New England AreaMAC = Macquarie Area  
MWA = Mid Western Area  
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