NSW Public Health Bulletin

Volume 16, Number 1–2
January–February 2005

NSW HEALTH
Working as a Team

ISSN 1034 7674
State Health Publication PH 050052

THE BIGGEST YET: THE 2004 REPORT OF THE NSW CHIEF HEALTH OFFICER

Greg Stewart
Chief Health Officer
(October 2001 – February 2005)

The 5th edition of the *Health of the people of NSW: report of the Chief Health Officer* was released at the end of 2004. The series of reports began in 1996 and provides an overview of the health of the people of NSW that is accessible to a wide variety of users. This edition is the most extensive, containing around 250 indicators.

The 5th edition is indeed a broad reference. It contains updated information on indicators of health determinants, burden of disease, health inequalities and health priority areas. The report also contains a new chapter on refugee health and new indicators on diverse topics including water quality, housing in Aboriginal communities, drink driving, the health of young people in custody, international health comparisons, colonoscopy, congestive heart failure, diabetes complications, and psychological distress in teenagers. This information will help health planners, policy makers and clinicians build strategies to improve the health status of people living in NSW.

Most readers are already familiar with the series of Chief Health Officer reports and probably also with some parts of the extensive infrastructure which makes the production of the reports possible. The cornerstones of that infrastructure are the NSW Health Survey Program and HOIST (Health Outcomes Information Statistical Toolkit), a population health data 'warehouse' containing major population health datasets in a standardised format.

An electronic copy of the report is available on the website of the NSW Department of Health, at www.health.nsw.gov.au/public-health/chorep/, and this will be updated online as new data become available. It will also contain a growing number of analyses of indicators according to the new health area boundaries, with smaller geographic areas included in the future. I encourage you to refer frequently to the electronic copy of the report to find out about these updates.

The printed hard copy will be published, as before, every 2 years. Gradually, if the readers agree, it may change and contain a limited number of key indicators and feature new and emerging

continued on page 2

CONTENTS

issues. Copies of this edition can be obtained from the Better Health Centre; telephone (02) 9816 0452 or fax an order to (02) 9816 0492.

I am very proud of this report and delighted that its release coincided with the end of my tenure as the Chief Health Officer. This was the second Chief Health Officer's report released during my tenure. The first, in 2002, my first year, confirmed my long-standing view that the population health infrastructure of NSW was world class, and that NSW Health population health practitioners were immensely capable.

The report reflects the health surveillance and intelligence capacity in its broadest aspects. But my observation applies just as firmly to capacity in health protection, health promotion and other aspects of population health planning and service provision. It has been a source of great pride and pleasure that I have been allowed the privilege of contributing to that capacity over the last 3½ years.

From a personal perspective, the release of the 5th edition of the Chief Health Officer's report at the end of my time as Chief Health Officer is a wonderful point to mark my transfer to another type of population health activity, back in operational management in the Sydney South West Area Health Service.

I will keenly observe the continuing growth and sophistication of the Chief Health Officer's Report when the 6th edition is published next year.

THE NATIONAL PUBLIC HEALTH PERFORMANCE PROJECT: HOW DO WE KNOW WHETHER AUSTRALIAN PUBLIC HEALTH SERVICES ARE PERFORMING?

Tim Owen*
Gippsland Regional Office
Victorian Department of Human Services

Louisa Jorm
Centre for Epidemiology and Research
NSW Department of Health

This article describes the Public Health Performance Project, an initiative of the National Public Health Partnership, which set out to develop a set of key performance indicators for public health practice in Australia.

BACKGROUND

Public health in Australia can boast success stories in many areas, including immunisation,[1] tobacco control,[2,3] cervical cancer screening,[4] prevention of HIV–AIDS,[5] and prevention of SIDS.[6,7] However, these successes have not been translated into increased investment in the public health sector. Expenditure on preventive and promotional services, as a proportion of total health expenditure, has remained static over the last 30 years. There has been only a minor increase in the 'community health' category, a classification that includes some public health activities but also a range of personal care services.[8]

One reason for the failure of the public health sector to attract increasing investment may be its lack of clearly articulated measures of performance. The current National Public Health Expenditure Project[9] and work on returns on investment in public health commissioned by the Australian Government Department of Health and Ageing[10] are contributing to the evidence base regarding expenditure on public health and its cost-effectiveness. However, those responsible for public health services lag behind their clinical counterparts in developing and implementing national and local systems for performance monitoring and improvement.[11]

'What gets measured gets done', a corollary of the Hawthorne effect,[12] describes the increase in internal commitment to performance improvement that can result from external observations of performance. Harnessing this effect relies on using appropriate measures of performance. Although the public health community has made great advances over the last decade in surveillance and reporting of indicators of health status, health outcomes, and determinants of health,[3,13] these often have major limitations as performance measures. In general, they do not respond quickly to changes in public health practice, and it is difficult to quantify or control for influences outside the control of the health system.

The National Public Health Partnership (NPHP), which was established in 1996, coordinates national public health activities and provides a vehicle through which major initiatives, new directions, and best practice can be assessed and implemented. It operates through the NPHP Group—made up of representatives of federal government, state and territory health departments, the Australian Institute of Health and Welfare (AIHW), and the National Health and Medical Research Council

(NHMRC)—which reports to health ministers through the Australian Health Ministers' Advisory Council (AHMAC). The NPHP does not fund public health programs directly, although its member organisations do, and it has strong links with the non-government sector through an advisory group.

The memorandum of understanding that underpins the NPHP sets out responsibilities of its members to monitor, evaluate, and report on the performance of public health functions. The Public Health Performance Project represents the most recent stage in the NPHP's ongoing work in this area, and grew out of its involvement in the development of a new National Health Performance Framework, which was led by the National Health Performance Committee (NHPC), a subcommittee of the AHMAC. The framework was designed to support performance monitoring across all sectors of health.[14] The NHPC uses the framework to: provide a structure for organising and presenting information on health sector performance; support benchmarking for health system improvement;[15] and provide AHMAC with regular comparative analysis and information on the national health system.

The Public Health Performance Project set out to develop a set of key performance indicators for public health practice in Australia, to report against the framework. Along the way, it explored the context for performance measurement in public health in Australia and some of the key issues and challenges.

THE CONTEXT OF THE PUBLIC HEALTH PERFORMANCE PROJECT

Current mechanisms for reporting on the performance of public health activities at the national level include the NHPC's annual reports on health sector performance, reports against the Public Health Outcome Funding Agreements (PHOFAs), reporting of indicators developed to support action in the National Health Priority Areas, and reporting as part of government budget-setting processes. The NHPC's 2001 report on health sector performance present 8 measures of health status and outcomes, 11 measures of determinants of health, and 19 indicators of system performance covering acute, community health, general practice, and public health services.[15] The indicators of system performance for public health services were limited to the areas of immunisation, breast cancer screening, and cervical cancer screening.

PHOFAs are in place for a range of public health programs, including breast and cervical cancer screening, immunisation, drugs, and HIV–AIDS.[16] A key feature of these PHOFAs is a set of performance indicators, on which states and territories are required to report each year.

Programs for the 7 national health priority areas—currently cardiovascular health, cancer control, mental health, asthma, diabetes mellitus, injury prevention and control, and arthritis and musculoskeletal conditions[17,18]—operate across the spectrum of health care, including the acute and community and public health sectors. Sets of indicators have been developed for these priority areas over the past 6 years, and a subset of these indicators is reported in regular reports of the AIHW.[3] However, these indicators focus on health outcomes, and only a few are more immediate indicators of system performance.

Varying sets of indicators relating to public health services are also reported as part of the budget-setting processes of both the federal and state governments. Many of these indicators are measures of activity as opposed to performance measures and few are supported by good information systems.

METHODS

The Public Health Performance Project developed indicators through a 2-stage consultation process. For the first stage, meetings were convened in each state and territory health department, and with the Australian Government Department of Health and Ageing and the AIHW.

Attendees participated in an indicator rating exercise. They were provided with a list of indicators currently being used in Australia. These were compiled from a range of sources, including PHOFA agreements, budget papers, annual reports, and various national strategies. The indicators were 'mapped' to the NPHP's 9 core functions of public health in Australia (Table 1). These core functions were developed through a Delphi study of public health opinion leaders,[19] and were endorsed by health ministers in 2000.[20] Participants were also provided with a set of criteria to use for assessing indicators, based on those proposed by the NHPC.[14]

Participants were asked to rate indicators for inclusion in a national set, on a 5-point scale from lowest to highest priority. Comments on specific indicators were invited, as well as ideas for new indicators.

For the second stage of consultation, a discussion paper summarising the outcomes of the meetings was circulated.[21] The paper sought comment on a range of issues associated with the development of indicators for public health including:

- how to decide on priorities for performance monitoring;
- structures and processes for reporting and monitoring of indicators;
- classification of public health services for the purpose of performance monitoring;
- utility of the National Health Performance Framework for performance measurement in public health.

TABLE 1

CORE FUNCTIONS FOR PUBLIC HEALTH PRACTICE IN AUSTRALIA, ENDORSED BY HEALTH MINISTERS, 2000

- Assess, analyse, and communicate population health needs and community expectations.
- Prevent and control communicable and non-communicable diseases and injuries through risk factor reduction, education, screening, immunisation, and other interventions.
- Promote and support healthy lifestyles and behaviours through action with individuals, families, communities, and wider society.
- Promote, develop, and support healthy public policy including legislation, regulation, and fiscal measures.
- Plan, fund, manage, and evaluate health gain and capacity building programs designed to achieve measurable improvements in health status, and to strengthen skills, competencies, systems and infrastructure.
- Strengthen communities and build social capital through consultation, participation, and empowerment.
- Promote, develop, support and initiate actions that ensure safe and healthy environments.
- Promote, develop and support healthy growth and development throughout all life stages.
- Promote, develop and support actions to improve the health status of Aboriginal and Torres Strait Islander people and other vulnerable groups.

Note: The term 'core functions' refers to the total public health effort and not just to those activities that government public health authorities are responsible for carrying out or funding.

Source: National Public Health Partnership, 2000.[20]

Comments were also invited on proposed sets of indicators and steps for further development of indicators.

The paper was circulated to all participants in the consultation meetings, members of the NPHP Group, NPHP subcommittees, and other key national committees including the NHPC and National Health Priorities Action Council.

RESULTS

A total of 152 people participated in the consultation meetings. Participants represented a range of public health program areas, or were specialists in performance measurement in the health sector. Around 350 hard copies of the discussion paper were circulated. Electronic copies were circulated via email and made available on the NPHP website. In all, 36 written responses were received, with most of these representing the consolidated comments of groups or organisations.[21]

TABLE 2

INDICATORS RECOMMENDED TO THE NATIONAL HEALTH PERFORMANCE COMMITTEE FOR INCLUSION IN REPORTS ON HEALTH SECTOR PERFORMANCE

- Breast cancer screening rates for women within the national target groups
- Cervical screening rates for women within the national target groups
- Number of children fully immunised at 12 months and at 24 months of age
- Percentage of adults aged 65 years and over who received an influenza vaccination for the previous winter
- Percentage of injecting drug users, participating in surveys carried out at needle and syringe programs, who report recent sharing of needle and syringes
- Percentage of teenager smokers who personally purchased their most recent cigarette.

Source: National Public Health Partnership, 2002.[21]

Few of the indicators provided to meeting participants as part of the indicator rating exercise proved to be suitable for inclusion in national indicator sets. Many were indicators of activity (for example, the number of calls received by the Quitline, rather than performance (for example, the proportion of callers to the Quitline that remain smoke-free after 6 months), some represented areas of little investment, and many were too poorly described to be of value. Some of the indicators related to activities that did not occur nationally, or were based on jurisdiction-specific standards or guidelines.

Discussion at the consultation meetings focused on indicators considered to be of value for national reporting and monitoring. Discussion was dominated by suggestions for improving indicators, ideas for new indicators and identifying areas of public health action requiring indicator development.

Two sets of indicators were proposed in the discussion paper and then refined as a result of the comments received. The first set of indicators was proposed for reporting by the NHPC in its future reports on health sector performance (Table 2).[21] This set includes 3 indicators not previously reported by the NHPC in the areas of influenza immunisation, effectiveness of needle and syringe exchange programs, and cigarette sales to minors. These indicators were subsequently adopted by the NHPC and incorporated in its 2003 report.[21]

The NHPC reports to health ministers on the performance of the whole health system, and hence its reports offer limited space for indicators for each sector. Accordingly, the project proposed that the NPHP, and national and state health agencies, consider mechanisms that monitor and report a broader set of indicators for system performance

for public health. This broader set is too lengthy to publish here, but the areas of practice covered are summarised in Table 3.[22] The broader set includes indicators that are more developmental in nature and some indicators that compare the public health sector with other sectors of the health system. Indicators were not limited to areas where data collections are already available, and many of the indicators require new systems for collection and reporting.

Finally, the project identified areas of public health practice for which indicator development is urgently required, as follows:

- primary prevention for non-communicable diseases (in particular public health nutrition, physical activity, injury prevention, and mental health);
- communicable diseases surveillance and response;
- primary prevention for illicit and licit drugs;
- system capacity and infrastructure.[22]

DISCUSSION

Monitoring performance is an essential part of the cycle of 'Plan–Do–Check–Act' for quality improvement (Figure 1), first developed in the 1920s by Walter Shewhart and popularised later by W. Edwards Deming.[23] Performance monitoring allows analysis of how public health practice (the 'do' step) is achieving what was planned (the 'plan' step) and is critical to the final 'act' step in the cycle where decisions are made on how to proceed.

Apart from contributing to quality improvement, additional benefits in monitoring performance and reporting national performance measures for public health include:

- increased awareness of the nature and scope of public health services;
- promoting agreement on what constitutes effective public health practice and focusing activity on these best practice approaches;
- improving documentation of the key achievements of public health activity;
- improving the credibility of public health by publicly demonstrating performance against recognised standards.

Despite these benefits, the Public Health Performance Project highlighted several challenges in establishing a mechanism for national monitoring of the performance of public health services in Australia. Perhaps foremost among these was the absence of an overarching national public health strategy, which would identify priorities for performance monitoring. In the United States, the objectives of *Healthy people 2010* serve this purpose, and its objectives are supported by a comprehensive strategy for monitoring progress.[24,25] Among Australian states, only NSW has developed an overarching public health strategy,[26] but this is not linked to a system of performance measurement.

TABLE 3

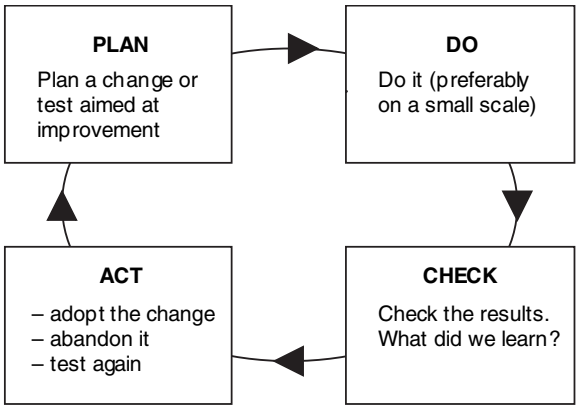
AREAS OF PUBLIC HEALTH PRACTICE COVERED BY INDICATORS PROPOSED FOR MONITORING BY THE NATIONAL PUBLIC HEALTH PARTNERSHIP AND/OR FEDERAL AND STATE HEALTH AGENCIES

- Health protection
- Water fluoridation
- Drinking water quality
- Hepatitis C among injecting drug users
- Timeliness and completeness of notifications of Salmonellosis
- Legionella disease control
- Recreational pool water quality·
- Skin penetration services compliance
- Emergency response preparedness
- Physical activity in older persons for falls prevention
- Antenatal visits
- Quitline calls
- Local public health planning
- Health impact assessments
- System capacity
- Funding for public health research
- Public health expenditure
- Quality assessment programs for surveillance systems
- Health behaviour monitoring
- Population health data reporting
- Public health legislation
- Aboriginal environmental health workers
- Jurisdictional strategic and implementation plans to support national strategies
- Postgraduate public health training

Source: National Public Health Partnership, 2002.[21]

FIGURE 1

THE PLAN–DO–CHECK–ACT CYCLE



Source: Shewhart, 1931.

In the absence of a national public health strategy, the project used the NPHP's statement of core functions of public health as a framework for ensuring that indicators were considered for a range of public health activities.[20] However, the statement does not provide a means for prioritising programs for performance measurement, nor does it set any goals or targets on which to base performance measures. To assist in selecting indicators, the project used a modified version of the NHPC's criteria for selection of health performance indicators.[14] However, even with uniform criteria, the selection of indicators remained a subjective process.

A second challenge was in defining the scope of the indicators to be included. Many public health activities are carried out by organisations other than government public health agencies. The NPHP's statement of core functions of public health refers to the public health effort,[20] which is broader than those activities that government public health authorities are responsible for carrying out or funding. The Public Health Performance Project recommended the reporting of indicators of performance for public health activities undertaken by agencies other than government-funded health agencies. This system-wide approach is particularly important in areas such as environmental health, food safety, and health promotion, where a range of other providers are critical to public health service delivery.[27] However, it could be argued that this makes the sets of indicators less directly relevant to the accountability of those government-funded agencies that have designated responsibility for public health.

A third challenge was in defining system 'performance' as it applies to public health activities. Much public health activity aims to reduce the prevalence of risk factors for ill-health, such as tobacco smoking and physical inactivity. However, indicators that measure determinants of health and the associated health outcomes may not be sensitive to changes in practice, and hence may be poor measures of performance.

The project addressed this by considering the degree to which factors outside the control of the health system influenced the health determinant or outcome in question. To be considered as a performance indicator, an indicator measuring a health determinant or outcome needed to satisfy two criteria. First, modifying the health determinant or outcome should be the specific purpose of a public health activity. Second, factors within the control of the health system should have a dominant influence on the determinant or outcome, or external influences should be able to be estimated and adjusted for. Where these criteria were not met, more immediate indicators of performance were sought.

A final challenge was the identification of appropriate indicators to capture the complexity of public health practice. Indeed, the utility of performance measures in health promotion practice has been challenged because of the difficulty in attributing change to the intervention and difficulty in identifying responsible agencies.[28] In general, the project identified good performance indicators for public health activities involving intervention delivered to individuals in clinical settings (for example, immunisation, screening), but not for areas of public health practice that rely on community-based activity or are focused on partnerships with other sectors.

Standards-based approaches have potential utility for performance improvement in these areas of practice. In the United States, the Public Health Performance Standards Program provides detailed assessment tools, which are used by state and local public health services to determine compliance with model standards for the United States 10 Essential Services of Public Health.[29–31] A performance standards approach allows for the assessment of both capacity and process elements of service delivery—sometimes referred to as 'preparedness'—as well as taking a system-wide rather than a program-specific view of public health. One limitation of this approach is its reliance on self-assessment and self-report of data, which makes it less useful where accountability is a prime purpose for performance measurement.

Recent efforts in the United States have focused on measuring the preparedness of public health services for responding to bio-terrorism and other emergencies, using self-assessment tools and simulation and gaming methods.[32–34] Such approaches may be applicable in the Australian context, and may also be generalisable to a broad range of public health activities.

CONCLUSIONS

The Public Health Performance Project developed a set of indicators for national reporting that reflect a wider range of public health activities than those previously reported to Australian health ministers. Much work remains to be done to further improve this set of indicators, and to develop indicator definitions, technical specifications, and in some cases new datasets.

Additionally, there is a pressing need to explore mechanisms for monitoring performance for those public health activities not conducive to performance indicators. Overseas experience suggests that development of model standards and tools for assessing compliance with these, and simulation exercises to assess preparedness, are promising approaches.

The development of an overarching national public health strategy would greatly facilitate performance monitoring of public health activities in Australia. Such a strategy would need to clearly articulate the respective roles and responsibilities of national, state, and local

agencies—failure to do this has been a major criticism of the United States *Healthy people 2010* initiative.[35] Agreeing on our priorities for what we want public health services in Australia to 'do' would make it easier to define our priorities for what we need to 'check'.

Information about the work of the National Public Health Partnership, including reports from the National Public Health Performance Project, and information about ongoing projects of the National Public Health Information Working Group, can be found online at **www.nphp.gov.au**.

ACKNOWLEDGMENTS

The Public Health Performance Project was funded by the National Public Health Partnership. The reference group for the project comprised Louisa Jorm (Chair), Michael Ackland, Peter Woodley, Paul Currall, Paul Jelfs, Gerard Fitzsimmons, Helen Moore, Jackie Steele, Tony Woollacott, Cathy Mead, and Tim Owen (Secretariat). *Tim Owen was a trainee on the NSW Public Health Officer Training Program when he worked on the project.

REFERENCES

1. McIntyre P, Gidding H, Gilmour R, Lawrence G, Hull B, Horby P, Wang H, Andrews R, Burgess M. Vaccine preventable diseases and vaccination coverage in Australia, 1999 to 2000. *Commun Dis Intell* 2002 May; Suppl: i–xi, 1–111.
2. Australian Institute of Health and Welfare and Australasian Association of Cancer Registries. *Cancer in Australia 1998*. AIHW Catalogue no. CAN 12. Canberra: AIHW, 2001.
3. Australian Institute of Health and Welfare. *Australia's health 2002: the eighth biennial health report of the Australian Institute of Health and Welfare*. Canberra: AIHW, 2002.
4. Australian Institute of Health and Welfare. *Cervical screening in Australia 1997–1998*. AIHW Catalogue no. CAN 9. Canberra: AIHW, 2000.
5. National Centre in HIV Epidemiology and Clinical Research. *HIV/AIDS, viral hepatitis and sexually transmissible infections in Australia annual surveillance report 2001*. Sydney: NCHECR, 2001.
6. Dwyer T, Ponsonby A-L. The decline in SIDS: a success story for epidemiology. *Epidemiology* 1996; 7: 323–325.
7. Al-Yaman F, Bryant M, Sargeant H. *Australia's children: their health and wellbeing 2002*. AIHW Catalogue no. PHE 36. Canberra: AIHW, 2002.
8. Deeble J. *Resource allocation in public health: an economic approach*. Melbourne: National Public Health Partnership, 1999.
9. Australian Institute of Health and Welfare. *National public health expenditure report 1999–00* (Health and Welfare Expenditure Series). Canberra: AIHW, 2002.
10. Applied Economics. *Returns on investment in public health: an epidemiological and economic analysis*. Canberra: Commonwealth Department of Health and Ageing, 2003.
11. Handler A, Issel M, Turnock B. A conceptual framework to measure performance of the public health system. *Am J Public Health* 2001; 91: 1235–1239.
12. Roethlisberger FJ, Dickson WJ. *Management of the worker*. Cambridge, MA: Harvard University Press, 1947.
13. Population Health Division. *The health of the people of NSW: report of the Chief Health Officer 2002*. Sydney: NSW Department of Health, 2002.
14. National Health Performance Committee. *National health performance framework report*. Brisbane: Queensland Health, 2001.
15. National Health Performance Committee. *National report on health sector performance indicators 2001*. Brisbane: Queensland Health, 2002.
16. Australian Government Department of Health and Ageing. Public health outcome funding agreements. Available online at www.health.gov.au/pubhlth/about/phofa/phofa.htm. Accessed 7 January 2004.
17. Australian Institute of Health and Welfare and Commonwealth Department of Health and Family Services. *First report on national health priority areas 1996*. AIHW Catalogue no. PHE 1. Canberra: AIHW and DHFS, 1997.
18. Commonwealth of Australia. *National asthma action plan 1999–2002*. Canberra: Commonwealth of Australia, 2001.
19. National Public Health Partnership. *National Delphi study on public health functions in Australia*. Melbourne: NPHP, 2000. Available online at www.dhs.vic.gov.au/nphp/publications/phpractice/delphi-body.pdf. Accessed 7 January 2004.
20. National Public Health Partnership. *Public health practice in Australia today: a statement of core functions*. Melbourne: NPHP, 2000. Available online at www.dhs.vic.gov.au/nphp/publications/phpractice/phprac.pdf. Accessed 7 January 2004.
21. National Health Performance Committee. *National report on health sector performance indicators 2003*. AIHW cat. No. HWI 78. Canberra: Australian Institute of Health and Welfare, 2004.
22. National Public Health Partnership. *Public health performance project: report to the National Public Health Partnership Group*. Melbourne: NPHP, 2002. Available online at www.dhs.vic.gov.au/nphp/publications. Accessed 7 January 2004.
23. Shewhart WA. *Economic control of quality of manufactured product*. New York, NY: Van Nostrand Co Inc, 1931.
24. United States Department of Health and Human Services. *Healthy people 2010*. 2nd edition. Washington, DC: United States Government Printing Office, 2000.
25. United States Department of Health and Human Services. *Tracking healthy people 2010*. Washington, DC: United States Government Printing Office, 2000.
26. New South Wales Department of Health. *Healthy people 2005: new directions for public health in New South Wales*. Sydney: New South Wales Department of Health, 2000.
27. Roper WL, Mays GP. Performance measurement in public health: conceptual and methodological issues in building the science base. *J Public Health Manage Pract* 2000; 6: 66–77.
28. Buck D, Godfrey C, Morgan A. *Performance indicators and health promotion targets*. Discussion paper 150, Centre for Health Economics. York: University of York, 1996.

29. Centers for Disease Control and Prevention. *National public health performance standards program: state public health system performance assessmenti*. Atlanta, GA: CDC, 2001. Available online at www.phppo.cdc.gov/nphpsp/Documents/State_v_1_OMB_0920-0557.pdf. Accessed 7 January 2004.
30. Centers for Disease Control and Prevention. *National public health performance standards program: local public health system performance assessment instrument*. Atlanta, GA: CDC, 2001. Available online at www.phppo.cdc.gov/nphpsp/Documents/Local_v_1_OMB_0920-0555.pdf. Accessed 7 January 2004.
31. Davis RM. Measuring the performance of public health agencies. Government, like doctors and hospitals, should meet quality standards. *BMJ* 1999; 318: 889–890.
32. Centers for Disease Control and Prevention. State public health preparedness and response capacity inventory. Version 1.1. Atlanta, GA: CDC, 2002. Available online at www.phppo.cdc.gov/od/inventory/index.asp. Accessed 7 January 2004.
33. Davis LM, Blanchard JC. Are local health responders ready for biological and chemical terrorism? RAND Document No: IP-221-OSD. Santa Monica, CA: RAND Center for Domestic and International Health Security, 2002. Available online at www.rand.org/cgi-bin/Abstracts/ordi/getabbydoc.pl?doc=IP-221-OSD. Accessed 7 January 2004.
34. O'Toole T, Mair M, Inglesby TV. Shining light on 'dark winter'. *Clin Infect Dis* 2002; 34: 972–983.
35. Davis RM. Healthy people 2010: objectives for the United States. *BMJ* 2000; 320: 818–819.

DEVELOPMENT OF A STANDARDISED REGIONAL REPORT FROM THE NSW HEALTH SURVEY PROGRAM

Maria Torres
NSW Public Health Officer Training Program
NSW Department of Health

David Muscatello
Program for Enhanced Population Health Infostructure
NSW Department of Health

Margo Eyeson-Annan
NSW Health Survey Program
NSW Department of Health

The area health services require population health data at the local level, to monitor the health of their populations, plan services, and develop policy. The NSW Health Survey Program is one of the main sources of population health data in New South Wales. In 2002, as part of the program's reporting strategy, a standardised regional report was developed to meet local reporting needs. This article describes the process of developing a template for a standardised form of regional report for each area health service.

BACKGROUND

NSW Health provides health services through area health services that plan, deliver, and coordinate local health services within their regions. This service model aims to strengthen local commitment to disease prevention and population health.[1]

The Health Survey Program is one of the main sources of population health information in NSW. Since its inception in 1996 until 2001, 2 adult health surveys were conducted,[2] which had adequate numbers to provide estimates for each area health service.[3] From 2002, a continuous health survey was implemented, with a yearly sample of approximately 800 adults from each area health service.[4]

Population health information at the local level is necessary for areas to monitor the health of their populations and to support policy development and planning. Areas vary in their capacity to access health survey data and using that data to develop their own reports. Formal and informal consultation with area staff by the Centre for Epidemiology and Research highlighted the need for summaries of local level data to be made available to the areas in both printed and electronic form,[5,6] with access to downloadable graphics and data tables so that areas could prepare their own reports. Our aim was to develop a standardised regional report for each area that would meet state and local reporting needs.

METHOD

First, we developed a draft template for a regional report and a questionnaire for consultation. Second, using the draft template and the questionnaire, we consulted with the areas to determine the appropriateness of the regional report to meet their population health information needs. Finally, we used the feedback to finalise the regional report template.

Development of the regional report draft template and questionnaire

The regional report draft template was developed by considering data available from previous surveys, data limitations, the resources required to produce the reports, ease of interpretation, and previous consultations with

the areas regarding their information needs. The NSW Department of Health had identified a series of key indicators for surveillance and planning purposes.[1] Key indicators available from the Health Survey Program from 1997, such as self-reported health status and health risk factors, were included in the draft template (Table 1).

The regional report draft template included an introduction page that described the aims of the reports and gave a list of possible indicators, and an example page showing how the graphs and tables for each indicator would be presented for males and females and for different age groups.

The self-completed questionnaire included the following questions:

- How easy to understand do you find the sample report?
- In your experience with health service planning and development staff in your area, how easy to understand would they find the sample report?
- In your experience with policy development staff in your area, how easy to understand would they find the sample report?
- How do you think the presentation of the information could be improved in order to make it easier to understand?
- What other topics from the Survey would you like reported at the area level?
- In your opinion, how useful would these reports be for monitoring the health of the population in your area?
- In your opinion, how useful would these reports be for planning and development of health services in your area?
- In your opinion, how useful would these reports be for development of population health policy in your area?
- Do you have any other comments?

Consultation with the area health services

We sent the regional report draft template and the questionnaire to 22 people who were nominated by the areas as contacts because of their role within the service and/or their experience. All 17 area health services were represented in this sample. Area contacts included people in a variety of positions such as: the directors of public health units and divisions of population health; epidemiologists; and planning, statistics, research, and health promotion professionals.

Development of the final regional report template

The responses to the questionnaire were collated and considered by a team that consisted of the Health Survey Program Manager, an epidemiologist, a systems developer and a biostatitician. Suggestions were assessed and, where appropriate, incorporated into the final regional report template.

TABLE 1

POTENTIAL INDICATORS FOR THE AREA HEALTH SERVICE REGIONAL REPORTS

Indicators suggested in the draft template available from 1997, 1998, and 2002 health surveys

- alcohol risk drinking behaviour
- fruit intake
- vegetable intake
- physical activity
- smoking
- self-rated health status
- diabetes
- overweight and obesity
- psychological distress
- health services utilisation

Additional indicators requested and available from 1997, 1998, and 2002 health surveys

- smoke-free households
- asthma
- oral health (no natural teeth missing)
- difficulty getting care when needing it
- emergency department care rating
- hospital care rating

Additional indicators requested and available from 2002 and 2003 health surveys

- influenza immunisation
- pneumococcal immunisation
- attended a community event
- trust most people
- visit neighbours

Source: NSW Health Survey Program, Centre for Epidemiology and Research, NSW Department of Health.

RESULTS

Survey results

Eighteen completed questionnaires were returned. Some areas that had nominated more than one contact returned a single questionnaire by collating the views of their contacts. In other areas each contact returned a questionnaire. Questionnaires were received from 16 area health services, a response rate of 94 per cent.

Ease of understanding

Most respondents indicated that the draft template was 'very easy to understand'. However, only 7 indicated that, in their experience, health service planning and development staff would find the reports 'very easy to understand' and only 3 area contacts thought that policy development staff would find the reports 'very easy to understand' (Table 2). A minority of respondents thought the reports would be hard to understand for any category of staff.

Indicators required

In addition to the 10 indicators listed for inclusion in the regional report, all respondents requested the inclusion of at least 1 from a list of 7 possible additional topics.

TABLE 2

EASE OF UNDERSTANDING THE WAY THE INFORMATION WAS PRESENTED IN THE REGIONAL REPORT DRAFT TEMPLATE BY DIFFERENT TYPES OF STAFF AS PERCIEVED BY THE NOMINATED AREA CONTACTS

Ease of understanding	Area contact respondent		Health service planning and development staff		Policy development staff	
	n	%	*n*	%	*n*	%
Very easy to understand	15	83	7	39	3	17
Easy to understand	3	17	10	56	14	78
Hard to understand	0	0	1	5	1	5
Very hard to understand	0	0	0	0	0	0
Total	**18**	**100**	**18**	**100**	**18**	**100**

Source: NSW Health Survey Program, Centre for Epidemiology and Research, NSW Department of Health.

Over a third of respondents (7) requested that all 7 possible additional topics be included. The topics in highest demand were an asthma indicator (15 respondents), followed by an indicator of influenza immunisation in older people and a social capital indicator (14 respondents each). Over half of the respondents requested the inclusion of an oral health indicator, an environmental tobacco smoke indicator, a indicator of pneumococcal immunisation in older people, and a food security indicator.

The additional topics of asthma and environmental tobacco smoke requested for inclusion in the regional report were assessed as suitable for inclusion by the panel from 2002 onwards. Social capital indicators, and influenza and pneumococcal immunisation indicators, could be included in the reports from 2003 onwards.

Usefulness of the report

All respondents said the regional reports would be of some use in monitoring the health of their populations and developing population health policy (Table 3). One respondent added that the reports would be useful for planning population and community health services.

Suggestions

There were several comments and suggestions for improving the presentation of information in the reports. All suggestions were considered by the panel and adopted, if possible (Table 4).

The final template of the regional report includes an introductory page, which lists the indicators in the report. Each indicator is presented in graphic and tabular form over 2 pages (Figure 1). NSW Health staff can access the regional reports on the NSW Department of Health intranet at http://internal.health.nsw.gov.au/public-health/research/surveys_and_monitoring/health_survey_program/ahs_report.html.

DISCUSSION

The regional reports were perceived as easy to understand and useful, in particular when monitoring the health of populations and supporting the development of population health policy. Respondents provided useful suggestions to improve the regional reports.

The high response rate suggests that there is interest in the NSW Health Survey Program. However, as the responders are a small sample of the potential users of health survey data in the areas, their views may not be representative of a broader spectrum of potential users.

As much as possible, suggestions made to improve the reports were incorporated. Those suggestions that were unable to be incorporated were related to sample size rather than presentation of the reports, including the provision of prevalence estimates for local government area and specific population groups. The Health Survey Program understands the importance of having data for regional requirements[7] and annually collects sufficient data to report at the area health service level. Reporting by local government area and specific population groups may be possible over several years, and these variables are currently available on the Health Outcomes Information Statistical Toolkit (HOIST), which is maintained by the Centre for Epidemiology and Research within the NSW Department of Health.[8]

CONCLUSION

Consultation with the areas helped us develop a standardised regional report that provides areas with timely, useful, and understandable population health data. Further feedback from the areas about the published reports will also assist us to further improve their access to, and use of, survey data to support population health.

ACKNOWLEDGMENTS

We would like to thank the area contacts for the NSW Health Survey Program for their feedback during the consultation process.

REFERENCES

1. Jorm L, Puech M. *Strategy for population health surveillance in NSW*. Sydney: Epidemiology and Surveillance Branch, NSW Department of Health, 1997.

TABLE 3

USEFULNESS OF INFORMATION PROVIDED IN THE REGIONAL REPORT DRAFT TEMPLATE FOR EACH OF ITS INTENDED PURPOSES, AS REPORTED BY THE NOMINATED AREA CONTACTS

Usefulness	Monitoring the health of populations		Planning and development of health services		Development of population health policy	
	n	%	*n*	%	*n*	%
Very useful	9	50	4	22	8	44
Quite useful	5	28	7	39	5	28
Somewhat useful	4	22	7	39	5	28
Not useful	0	0	0	0	0	0
Total	**18**	**100**	**18**	**100**	**18**	**100**

Source: NSW Health Survey Program, Centre for Epidemiology and Research, NSW Department of Health.

TABLE 4

SUMMARY OF RESPONDENTS' SUGGESTIONS AND ACTION TAKEN

Suggestions for improvement	Addressed in final template	Details
Include confidence intervals in graphs	Partially	Confidence Intervals included in tables
Provide an explanation of what confidence intervals are as levels of experience and training in epidemiology vary among staff	Yes	Explanation provided on introduction page
Include a comparison with NSW in the graph of the indicator by age group	Yes	Changes template to 2 pages per indicator to accommodate change
Label all items in tables and graphs more clearly	Yes	Increased size of labels and changed template to 2 pages per indicator to improve clarity
Include an explanation about the calculation of estimated numbers	No	Self-explanatory
Include the wording of the questions	Yes	Question wording included in note below graph and table
List the responses that define the indicators	Yes	Indicator defined in note below graph and table
Include age-standardised prevalence rates	No	Data weighted to age–sex structure of the area population.
Ensure timely dissemination of the reports	Yes	Automated process and disseminated as internal electronic reports
Provide information at the local government area level within the area	No	Sample not large enough
Provide information on Aboriginal people within the area	No	Sample not large enough, and not representative
Ensure timely access to area data and data analysis tools and programs	Yes	Datasets including indicator variables and analysis tools provide through HOIST. Health survey SAS programs available on request

Source: NSW Health Survey Program, Centre for Epidemiology and Research, NSW Department of Health.

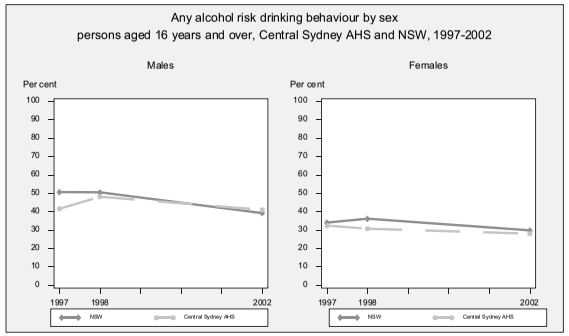
2. Public Health Division. Electronic Report on the 1997 and 1998 NSW Health Surveys. Sydney: NSW Department of Health, 2000. Available online at www.health.nsw.gov.au/public-health/nswhs/hsindex.htm.
3. Williamson M, Baker D, Jorm L. The NSW Health Survey Program: overview and methods, 1996–2000. *N S W Public Health Bull* 2001; 12(S-2).
4. Eyeson-Annan M. Continuous data collection under the NSW Health Survey Program: What will it mean? *N S W Public Health Bull* 2001; 12(8): 235–237.
5. Banks C, Eyeson-Annan M. Uses of NSW Health Survey Program data: a survey of users. *N S W Public Health Bull* 2001; 12(8): 214–220.
6. Muscatello D. Program for Enhanced Population Health Infostructure (PEPHI): a report of responses to the November 2000 discussion paper. *N S W Public Health Bull* 2002; 13(S-2).
7. Australian Institute of Health and Welfare. *Issues and priorities in the surveillance and monitoring of chronic diseases in Australia*. Canberra: AIHW, 2002.
8. Population Health Division. Health Outcomes Information Statistical Toolkit (HOIST). Sydney: Centre for Epidemiology and Research, NSW Department of Health. Available online at www.health.nsw.gov.au/public-health/epi/hoist.html.

FIGURE 1

SAMPLE PAGES OF THE FINAL REGIONAL REPORT TEMPLATE, INCLUDING INDICATOR INFORMATION

Report of the New South Wales Health Survey Program

Any alcohol risk drinking behaviour by sex



Area	Year	Males (95% CI)	Males (est. no.)	Females (95% CI)	Females (est. no.)	Persons (95% CI)	Persons (est. no.)
Central Sydney AHS	1997	41.6 (37.2-46.1)	79,000	32.4 (28.5-36.3)	62,000	37.0 (34.0-40.0)	141,000
	1998	48.2 (42.5-53.8)	90,000	30.8 (26.7-35.0)	60,000	39.4 (35.8-42.9)	150,000
	2002	41.0 (34.6-47.4)	81,000	28.1 (23.5-32.7)	56,000	34.5 (30.5-38.5)	138,000
NSW	1997	50.7 (49.3-52.2)	1,174,000	34.1 (32.9-35.4)	817,000	42.3 (41.3-43.3)	1,991,000
	1998	50.5 (49.0-52.1)	1,140,000	36.2 (34.9-37.5)	855,000	43.2 (42.2-44.2)	1,995,000
	2002	39.3 (37.4-41.3)	949,000	29.9 (28.3-31.4)	747,000	34.5 (33.3-35.8)	1,696,000

Note: Estimates are based on the following numbers of respondents:
1997 - 1199 (Central Sydney AHS) and 17141 (NSW). 1998 - 1006 (Central Sydney AHS) and 16627 (NSW). 2002 - 802 (Central Sydney AHS) and 12475 (NSW).
Any alcohol risk drinking behaviour was defined as one or more of the following: consuming alcohol every day, consuming on average more than [4 if male/2 if female] standard drinks, consuming more than 6 if male/4 if female on any one occasion or day. Questions used to define the 2002 indicator were: How often do you usually drink alcohol? On a day when you drink alcohol, how many standard drinks do you usually have? In the past four weeks have you had more than [4 if male/2 if female] drinks in a day? In the past four weeks how often have you had [11 or more if male/7 or more if female] drinks in a day?. Questions used to define the 1997 and 1998 indicator were: How often do you have an alcoholic drink of any kind? On a day when you have alcoholic drinks, how many standard drinks do you usually have? On the last occasion that you had more than [4 if male/2 if female] drinks in a day, how many drinks did you actually have?

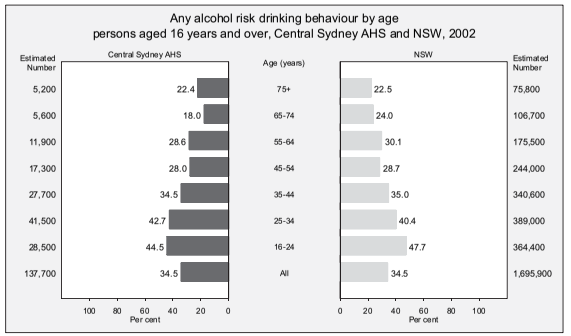
Source: NSW Health Survey 1997, 1998 and 2002 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

Produced by: Centre for Epidemiology and Research (http://www.health.nsw.gov.au/public-health/epi/), Public Health Division (http://www.health.nsw.gov.au/public-health/), NSW Department of Health (http://www.health.nsw.gov.au/).

Last updated on: 8 May 2003

Report of the New South Wales Health Survey Program

Any alcohol risk drinking behaviour by age



Area	Age (years)	Males (95% CI)	Males (est. no.)	Females (95% CI)	Females (est. no.)	Persons (95% CI)	Persons (est. no.)
Central Sydney AHS	All	41.0 (34.6-47.4)	81,200	28.1 (23.5-32.7)	56,500	34.5 (30.5-38.5)	137,700
	16-24	55.2 (38.3-72.1)	16,600	35.1 (22.6-47.5)	11,900	44.5 (33.8-55.3)	28,500
	25-34	48.7 (35.0-62.5)	24,000	36.6 (25.0-48.1)	17,500	42.7 (33.6-51.9)	41,500
	35-44	40.0 (25.4-54.5)	16,500	28.8 (18.0-39.5)	11,200	34.5 (25.2-43.8)	27,700
	45-54	31.9 (16.4-47.4)	10,000	24.0 (14.5-33.6)	7,300	28.0 (18.9-37.2)	17,300
	55-64	36.5 (20.7-52.3)	7,800	20.3 (10.1-30.4)	4,100	28.6 (19.0-38.2)	11,900
	65-74	21.6 (8.6-34.6)	3,300	14.5 (5.5-23.4)	2,300	18.0 (10.1-25.8)	5,600
	75+	32.2 (10.6-53.8)	3,000	16.0 (4.3-27.8)	2,300	22.4 (11.0-33.9)	5,200
NSW	All	39.3 (37.4-41.3)	948,800	29.9 (28.3-31.4)	747,100	34.5 (33.3-35.8)	1,695,900
	16-24	48.0 (42.3-53.6)	183,200	47.4 (42.2-52.6)	181,300	47.7 (43.8-51.5)	364,400
	25-34	46.3 (41.1-51.5)	222,700	34.5 (30.6-38.5)	166,300	40.4 (37.1-43.7)	389,000
	35-44	37.7 (33.3-42.1)	182,700	32.3 (28.5-36.0)	157,800	35.0 (32.1-37.9)	340,600
	45-54	33.5 (29.4-37.5)	142,900	23.9 (20.7-27.1)	101,000	28.7 (26.1-31.3)	244,000
	55-64	36.7 (32.5-41.0)	107,500	23.5 (20.4-26.6)	68,000	30.1 (27.5-32.8)	175,500
	65-74	29.5 (25.8-33.2)	62,600	19.0 (15.8-22.2)	44,200	24.0 (21.6-26.5)	106,700
	75+	35.3 (29.5-41.0)	47,200	14.1 (11.0-17.2)	28,600	22.5 (19.4-25.6)	75,800

Note: Estimates are based on 802 respondents in Central Sydney AHS and 12475 in NSW. For this indicator 10 (1.23%) were 'not stated' (Don't know or Refused) in Central Sydney AHS and 147 (1.16%) were 'not stated' (Don't know or Refused) in NSW.
Any alcohol risk drinking behaviour was defined as one or more of the following: consuming alcohol every day, consuming on average more than [4 if male/2 if female] standard drinks, consuming more than 6 if male/4 if female on any one occasion or day. Questions used to define the 2002 indicator were: How often do you usually drink alcohol? On a day when you drink alcohol, how many standard drinks do you usually have? In the past four weeks have you had more than [4 if male/2 if female] drinks in a day? In the past four weeks how often have you had [11 or more if male/7 or more if female] drinks in a day?.

Source: NSW Health Survey 2002 (HOIST). Centre for Epidemiology and Research, NSW Department of Health.

Source: NSW Health Survey Program, Centre for Epidemiology and Research, NSW Department of Health.

MONITORING HEALTH BEHAVIOURS AND HEALTH STATUS IN NSW: RELEASE OF THE *ADULT HEALTH SURVEY 2003*

Deborah Baker and Margo Eyeson-Annan
Centre for Epidemiology and Research
NSW Department of Health

In 2002, the NSW Department of Health, in conjunction with the 17 area health services, completed the first year of the New South Wales Continuous Health Survey, an ongoing survey that uses computer-assisted telephone interviewing. The main aims of the Continuous Health Survey are to provide detailed information on the health of the people of NSW, and to support the planning, implementation, and evaluation of health services and programs. Following on from previous health surveys conducted in 1997, 1998, and 2002, this is the fourth survey that has collected data on the health of adults in NSW. This article announces the release of the *New South Wales Adult Health Survey 2003* and highlights changes in health behaviour, health status, and satisfaction with health services that occurred between 1997 and 2003 (Tables 1–4).

The content of the New South Wales Continuous Health Survey was developed in consultation with the Health Survey Program Steering Committee, area health services, other government departments, and a range of experts. The survey content covers the 8 priority areas outlined in *Healthy People 2005: New Directions for Public Health in New South Wales*. The survey questionnaire was translated into 5 languages: Arabic, Chinese, Greek, Italian, and Vietnamese. Data were collected on a range of health behaviours, health status, use of and satisfaction with health services, social capital, and demographic information.

The target population for the *New South Wales Adult Health Survey 2003* was all NSW residents aged 16 years and over living in households with private telephones. Households were sampled using list-assisted random digit dialling. When a household was contacted, one person was randomly selected for interview. Information was collected on a total of 13 088 adults.

HEALTH BEHAVIOURS

Between 1997 and 2003 the prevalence of some health behaviours changed (Table 1). The proportion of smoke-free households (69.8 per cent to 82.5 per cent), and the proportion of homes with a smoke alarm or detector (58.2 per cent to 72.7 per cent) increased significantly. There was a significant decrease (42.3 per cent to 35.7 per cent) in the proportion of people who participated in any alcohol risk drinking behaviour. There was a significant decrease between 1997 and 2002 in the proportion of people who were current smokers (24.0 per cent to 21.4 per cent). However, in 2003 the proportion increased to 22.5 per cent, which was not significantly different from the previous years.

Overall, there was a significant increase between 1997 and 2003 in the proportion of people eating the recommended daily vegetable intake (16.3 per cent to 19.3 per cent). Between 1997 and 2002, there was a significant decrease in the proportion of people who consumed reduced- or low-fat milk (45.7 per cent to 43.4 per cent). However, in 2003 the proportion increased to 44.0 per cent, which was not significantly different from the previous years.

Between 1997 and 2003, the proportion of people aged 65 years and over who were immunised against influenza in the previous 12 months increased significantly (57.1 per cent to 75.8 per cent). Similarly, between 2002 and 2003 the proportion of people aged 65 years and over who were immunised against pneumococcal disease in the last 5 years also increased significantly (39.4 per cent to 46.8 per cent).

Overall, there was a significant decrease in the proportion of people who undertook adequate physical activity in 2003 (45.0 per cent) compared to 1998 (47.6 per cent).

Several health behaviours remained unchanged. The proportion of people eating the recommended daily serves of fruit (45.8 per cent) was unchanged, as was high-risk drinking in the last 4 weeks (14.7 per cent).

In 2003, a new indicator on hand washing when preparing raw meat was reported for the first time and trends in this additional indicator will continue to be monitored.

HEALTH STATUS

Monitoring the health status of a population helps to detect emerging patterns of illness and disease and provides information to inform policy and planning of health services. There have been some changes in the health status of the population between 1997 and 2003 (Table 2).

Over the period 1997 to 2003 there were significant increases in the proportion of people who had been diagnosed with diabetes (4.7 per cent to 6.2 per cent), ever diagnosed with asthma (16.6 per cent to 21.0 per cent), and who were overweight or obese (42.2 per cent to 48.3 per cent). Between 1997 and 2002, there was also a significant increase in the proportion of people who reported high and very high physiological stress as measured by the Kessler 10 score (10.5 per cent to 12.2 per cent). However, in 2003, the proportion decreased to 11.1 per cent, which was not significantly different from previous years.

The proportion of people who rated their health status as excellent, very good, or good declined significantly between 1997 (84.9 per cent) and 2003 (80.8 per cent). The proportion who reported all their natural teeth missing declined significantly between 1998 and 2003 (8.3 per cent to 5.8 per cent).

The only indicator of health status to remain unchanged between 1997 and 2003 was current asthma (10.3 per cent to 11.0 per cent).

For the first time, information on adult incontinence, falls in people 65 years and over, and additional health status

TABLE 1

TRENDS IN INDICATORS OF HEALTH BEHAVIOURS, BY SEX, NSW, 1997–2003

Indicator	Year	Males (95% CI)	Females (95% CI)	Persons (95% CI)
Alcohol risk drinking (Guideline 1)	1997	50.7 (49.3–52.2)	34.1 (32.9–35.4)	42.3 (41.3–43.3)
	1998	50.5 (49.0–52.1)	36.2 (34.9–37.5)	43.2 (42.2–44.2)
	2002	39.2 (37.3–41.1)	29.7 (28.1–31.2)	34.4 (33.1–35.6)
	2003	41.3 (39.4–43.2)	30.3 (28.9–31.8)	35.7 (34.5–36.9)
High risk drinking in the past 4 weeks	2002	16.7 (15.0–18.4)	11.7 (10.3–13.1)	14.4 (13.3–15.5)
	2003	17.9 (16.2–19.6)	10.9 (9.7–12.2)	14.7 (13.6–15.7)
Use public water as usual source of water	2002		81.1 (79.5–82.7)	
	2003		81.1 (80.2–82.0)	
Vaccinated against influenza in the last 12 months	1997	55.8 (52.3–59.2)	58.2 (55.3–61.0)	57.1 (54.9–59.3)
	1998	61.9 (58.5–65.3)	64.5 (61.8–67.2)	63.3 (61.2–65.5)
	2002	75.3 (72.4–78.3)	75.7 (73.0–78.3)	75.5 (73.5–77.5)
	2003	76.1 (73.0–79.1)	75.6 (73.2–78.1)	75.8 (73.9–77.8)
Vaccinated against pneumococcal disease in the last 5 years	2002	36.7 (33.3–40.1)	41.5 (38.5–44.4)	39.4 (37.2–41.6)
	2003	45.1 (41.6–48.6)	48.2 (45.4–51.1)	46.8 (44.6–49.1)
Homes with a smoke alarm or detector	1997		58.2 (57.2–59.1)	
	1998		64.0 (63.0–65.0)	
	2002		72.9 (71.8–74.0)	
	2003		72.7 (71.6–73.9)	
Recommended daily fruit intake	1997	37.8 (36.4–39.2)	51.1 (49.8–52.4)	44.5 (43.6–45.5)
	1998	38.0 (36.5–39.5)	49.2 (47.9–50.5)	43.7 (42.7–44.7)
	2002	40.3 (38.4–42.2)	50.1 (48.4–51.7)	45.3 (44.0–46.5)
	2003	39.0 (37.1–40.9)	52.4 (50.8–54.0)	45.8 (44.6–47.1)
Recommended vegetable intake	1997	10.8 (10.0–11.7)	21.7 (20.6–22.7)	16.3 (15.6–17.0)
	1998	9.8 (8.9–10.6)	20.5 (19.5–21.6)	15.2 (14.5–15.9)
	2002	9.2 (8.2–10.3)	22.9 (21.6–24.2)	16.2 (15.3–17.0)
	2003	11.8 (10.7–12.9)	26.7 (25.3–28.0)	19.3 (18.4–20.3)
Usual use of low-fat, reduced fat or skim milk	1997	37.5 (36.0–38.9)	53.8 (52.4–55.1)	45.7 (44.7–46.7)
	1998	38.8 (37.3–40.3)	52.4 (51.1–53.8)	45.7 (44.7–46.7)
	2002	35.8 (34.0–37.6)	50.7 (49.0–52.4)	43.4 (42.1–44.6)
	2003	37.1 (35.2–38.9)	50.8 (49.2–52.4)	44.0 (42.8–45.3)
Food insecurity last 12 months	2002	5.2 (4.4–6.0)	6.1 (5.3–6.9)	5.7 (5.1–6.2)
	2003	5.3 (4.5–6.2)	6.9 (6.1–7.6)	6.1 (5.5–6.7)
Adequate physical activity	1998	52.2 (50.7–53.7)	43.1 (41.8–44.4)	47.6 (46.6–48.6)
	2002	50.4 (48.4–52.3)	42.9 (41.2–44.5)	46.6 (45.3–47.8)
	2003	49.5 (47.6–51.5)	40.6 (39.0–42.1)	45.0 (43.7–46.2)
Current daily or occasional smoking	1997	27.2 (25.9–28.5)	21.0 (20.0–22.0)	24.0 (23.2–24.9)
	1998	26.2 (24.8–27.5)	21.3 (20.2–22.4)	23.7 (22.9–24.6)
	2002	23.9 (22.2–25.6)	18.9 (17.6–20.2)	21.4 (20.3–22.4)
	2003	25.0 (23.3–26.8)	20.0 (18.7–21.3)	22.5 (21.4–23.6)
Smoke-free households	1997		69.8 (68.9–70.6)	
	1998		73.2 (72.3–74.1)	
	2002		81.0 (80.0–82.0)	
	2003		82.5 (81.6–83.4)	
Hand washing when preparing raw meat	2003	56.3 (54.2–58.5)	64.4 (62.9–65.9)	60.8 (59.5–62.0)

Source: NSW Health Survey 1997, 1998, 2002, and 2003 (HOIST), Centre for Epidemiology and Research, NSW Department of Health

information covering limitation of daily activities, and bodily pain experienced in the previous 4 weeks, was collected. These indicators will continue to be monitored.

HEALTH SERVICES

As part of the continuing commitment to monitoring satisfaction with health services in NSW, questions were asked about the use of and satisfaction with a range of services. These included difficulties with getting health care when needed, admission to hospital, attending an emergency department, using community health centres, and using public dental services.

Overall, there was a significant increase in the proportion of people who reported having difficulties getting health care when needing it between 1997 and 2003 (10.0 per cent to 13.3 per cent) (Table 3).

There were no changes in the proportion of people who gave positive ratings of hospital inpatient care (91.2 per cent) and emergency department care (78.9 per cent) between 1997 and 2003. While the proportion of people giving positive ratings of public dental care increased between 2002 and 2003 (81.2 per cent to 85.4 per cent), the increase was not significant.

Emergency department attendance in the previous 12 months (13.5 per cent) and hospital admission in the previous 12 months (13.5 per cent) both remained unchanged between 1997 and 2003, as did public dental service attendance in the previous 12 months (4.3 per cent) between 2002 and 2003. The proportion of people attending a comunity health centre in the previous 12 months decreased between 2002 and 2003 (6.9 per cent to 5.1 per cent).

TABLE 2

TRENDS IN INDICATORS OF HEALTH STATUS, BY SEX, NSW, 1997–2003

Indicator	Year	Males (95% CI)	Females (95% CI)	Persons (95% CI)
Excellent, very good, or good self-rated health status	1997	84.9 (83.9–85.8)	85.0 (84.1–85.9)	84.9 (84.3–85.6)
	1998	84.9 (83.9–85.9)	83.0 (82.1–83.9)	83.9 (83.2–84.6)
	2002	81.8 (80.3–83.3)	79.7 (78.5–81.0)	80.7 (79.7–81.7)
	2003	81.9 (80.5–83.3)	79.8 (78.5–81.0)	80.8 (79.9–81.7)
Ever diagnosed with asthma	1997	14.9 (13.9–16.0)	18.1 (17.1–19.2)	16.6 (15.8–17.3)
	1998	15.4 (14.3–16.5)	18.0 (17.0–19.0)	16.7 (16.0–17.5)
	2002	18.3 (16.8–19.9)	20.9 (19.6–22.3)	19.6 (18.6–20.7)
	2003	19.4 (17.8–21.0)	22.7 (21.4–24.0)	21.0 (20.0–22.1)
Current asthma	1997	8.7 (7.9–9.5)	11.9 (11.0–12.8)	10.3 (9.7–10.9)
	1998	8.9 (8.0–9.8)	10.9 (10.1–11.7)	9.9 (9.3–10.5)
	2002	9.1 (8.0–10.2)	12.0 (11.0–13.0)	10.6 (9.8–11.3)
	2003	9.2 (8.0–10.3)	12.7 (11.7–13.7)	11.0 (10.2–11.7)
Diabetes or high blood sugar	1997	5.2 (4.6–5.8)	4.3 (3.8–4.8)	4.7 (4.3–5.1)
	1998	4.9 (4.2–5.5)	4.0 (3.5–4.5)	4.5 (4.0–4.9)
	2002	6.6 (5.8–7.4)	5.7 (5.0–6.4)	6.1 (5.6–6.7)
	2003	6.9 (6.1–7.8)	5.5 (4.9–6.2)	6.2 (5.7–6.7)
High and very high psychological distress	1997	9.2 (8.4–10.0)	12.9 (12.0–13.8)	11.1 (10.5–11.7)
	1998	9.0 (8.1–9.9)	12.0 (11.1–12.8)	10.5 (9.9–11.1)
	2002	10.5 (9.3–11.6)	14.0 (12.8–15.1)	12.2 (11.4–13.1)
	2003	9.3 (8.2–10.4)	12.9 (11.8–14.0)	11.1 (10.3–11.9)
All natural teeth missing	1998	5.8 (5.2–6.4)	10.7 (10.0–11.4)	8.3 (7.8–8.8)
	2002	5.2 (4.6–5.9)	8.6 (7.8–9.4)	6.9 (6.4–7.5)
	2003	4.2 (3.6–4.8)	7.4 (6.8–8.0)	5.8 (5.4–6.2)
Overweight and obesity	1997	49.7 (48.3–51.2)	34.5 (33.3–35.8)	42.2 (41.2–43.1)
	1998	50.3 (48.7–51.8)	34.5 (33.2–35.7)	42.5 (41.4–43.5)
	2002	53.9 (52.0–55.9)	38.5 (36.9–40.1)	46.3 (45.0–47.6)
	2003	55.6 (53.7–57.6)	41.0 (39.4–42.6)	48.3 (47.1–49.6)
Obese	1997	11.1 (10.2–12.0)	11.5 (10.7–12.3)	11.3 (10.7–11.9)
	1998	12.6 (11.6–13.6)	11.6 (10.8–12.4)	12.1 (11.5–12.7)
	2002	14.8 (13.4–16.2)	14.4 (13.3–15.6)	14.6 (13.7–15.5)
	2003	15.5 (14.2–16.8)	16.5 (15.4–17.7)	16.0 (15.1–16.9)
Fall in the last 12 months	2003	18.7 (16.0–21.5)	27.5 (24.9–30.1)	23.5 (21.7–25.4)
Incontinence in the last 4 weeks	2003	11.2 (9.8–12.6)	31.9 (30.1–33.7)	21.8 (20.6–23.0)

Source: NSW Health Survey 1997, 1998, 2002, and 2003 (HOIST), Centre for Epidemiology and Research, NSW Department of Health

TABLE 3

TRENDS IN INDICATORS OF USE AND SATISFACTION WITH HEALTH SERVICES, BY SEX, NSW, 1997–2003

Indicator	Year	Males (95% CI)	Females (95% CI)	Persons (95% CI)
Difficulties getting health care when needing it	1997	8.9 (8.1–9.7)	11.1 (10.4–11.9)	10.0 (9.5–10.6)
	1998	8.6 (7.8–9.4)	11.9 (11.1–12.6)	10.3 (9.7–10.8)
	2002	10.9 (9.7–12.0)	14.2 (13.1–15.3)	12.6 (11.8–13.4)
	2003	11.3 (10.2–12.5)	15.1 (14.0–16.2)	13.3 (12.5–14.0)
Emergency department attendance in the previous 12 months	1997	15.7 (14.7–16.7)	11.9 (11.1–12.7)	13.8 (13.1–14.4)
	1998	13.9 (12.9–14.9)	12.0 (11.2–12.8)	12.9 (12.3–13.6)
	2002	14.7 (13.4–16.0)	13.8 (12.8–14.9)	14.3 (13.4–15.1)
	2003	13.9 (12.6–15.2)	13.1 (12.1–14.1)	13.5 (12.7–14.3)
Emergency department care rated as excellent, very good, or good	1997	80.5 (77.7–83.4)	79.9 (77.0–82.9)	80.3 (78.2–82.3)
	1998	82.6 (79.5–85.6)	78.6 (75.7–81.5)	80.7 (78.6–82.8)
	2002	79.8 (75.9–83.7)	73.2 (69.3–77.0)	76.5 (73.8–79.3)
	2003	80.2 (76.1–84.3)	77.6 (74.0–81.3)	78.9 (76.2–81.7)
Hospital admission in the previous 12 months	1997	11.3 (10.4–12.2)	14.7 (13.8–15.5)	13.0 (12.4–13.6)
	1998	11.5 (10.6–12.4)	15.4 (14.5–16.3)	13.5 (12.8–14.1)
	2002	11.3 (10.1–12.4)	16.3 (15.1–17.6)	13.8 (13.0–14.7)
	2003	12.1 (10.9–13.3)	14.8 (13.7–15.9)	13.5 (12.7–14.3)
Hospital care rated as excellent, very good, or good	1997	90.3 (87.9–92.7)	89.9 (87.9–91.9)	90.1 (88.5–91.6)
	1998	92.5 (90.3–94.6)	90.0 (88.1–91.9)	91.0 (89.6–92.5)
	2002	93.5 (90.7–96.2)	89.3 (86.4–92.2)	91.0 (88.9–93.0)
	2003	92.9 (90.2–95.6)	89.9 (87.6–92.3)	91.2 (89.5–93.0)
Community health centre attendance in the previous 12 months	2002	4.8 (4.0–5.6)	8.9 (8.0–9.9)	6.9 (6.3–7.5)
	2003	3.6 (3.0–4.3)	6.5 (5.8–7.2)	5.1 (4.6–5.6)
Community health centre care rated as excellent, very good, or good	2002	91.6 (86.8–96.3)	93.7 (91.0–96.4)	92.9 (90.5–95.4)
	2003	94.2 (90.0–98.4)	93.3 (90.6–96.1)	93.6 (91.3–96.0)
Public dental service attendance in the previous 12 months	2002	3.9 (3.1–4.6)	5.2 (4.4–5.9)	4.5 (4.0–5.0)
	2003	3.8 (3.2–4.4)	4.8 (4.1–5.4)	4.3 (3.8–4.8)
Public dental service care rated as excellent, very good, or good	2002	81.7 (74.4–89.1)	80.7 (75.1–86.4)	81.2 (76.7–85.6)
	2003	85.9 (80.4–91.3)	85.0 (80.1–90.0)	85.4 (81.7–89.1)

Source: NSW Health Survey 1997, 1998, 2002, and 2003 (HOIST), Centre for Epidemiology and Research, NSW Department of Health

SOCIAL CAPITAL

The term 'social capital' refers to the institutions, relationships, and norms that shape social networks, foster trust, and facilitate coordination and cooperation for mutual benefit. The New South Wales Continuous Health Survey included questions on social reciprocity and neighbourhood connection, feelings of trust and safety, and participation in the local community. Between 2002 and 2003 there was no change in any of the indicators of social capital (Table 4).

THE FUTURE

There are a number of changes for the 2004 Continuous Health Survey. In the health status section, an expanded module on diabetes (focusing on complications and screening) will be included. Under health behaviours, cancer screening (mammographic, bowel, and cervical) will be included again along with rate of hysterectomy. In addition a module on summer sun protection and shade policy will be included.

In addition to these changes, there are new modules on interpersonal safety and violence in young adults aged 18–25 years, and on sight and hearing.

The New South Wales Continuous Health Survey provides information that will assist health professionals, health planners and those involved in policy development to plan, implement and evaluate health programs and initiatives within the community and within population and target groups.

TABLE 4

TRENDS IN INDICATORS OF SOCIAL CAPITAL, BY SEX, NSW, 1997–2003

Indicator	Year	Males (95% CI)	Females (95% CI)	Persons (95% CI)
Attended a community event at least once in the last 6 months	2002	52.9 (51.0–54.9)	60.5 (58.9–62.1)	56.8 (55.5–58.0)
	2003	54.1 (52.2–56.0)	62.0 (60.4–63.5)	58.1 (56.9–59.3)
Helped out any local group or organisation at least once in the past 3 months	2002	30.5 (28.7–32.2)	35.7 (34.1–37.3)	33.1 (32.0–34.3)
	2003	31.2 (29.4–33.0)	32.9 (31.4–34.4)	32.1 (30.9–33.2)
Active member of a local organisation, church or club	2002	45.5 (43.6–47.5)	42.3 (40.7–43.9)	43.9 (42.6–45.1)
	2003	45.4 (43.5–47.4)	41.7 (40.1–43.3)	43.5 (42.3–44.8)
Most people can be trusted	2002	69.0 (67.2–70.8)	62.9 (61.3–64.6)	65.9 (64.7–67.2)
	2003	71.5 (69.7–73.2)	67.9 (66.3–69.4)	69.6 (68.5–70.8)
Feel safe walking down their street after dark	2002	78.0 (76.4–79.5)	55.8 (54.2–57.5)	66.8 (65.6–67.9)
	2003	80.2 (78.8–81.7)	56.6 (55.1–58.2)	68.3 (67.2–69.4)
Area has a reputation for being a safe place	2002	75.2 (73.6–76.9)	71.6 (70.1–73.1)	73.4 (72.3–74.5)
	2003	76.5 (74.8–78.1)	73.1 (71.7–74.5)	74.8 (73.7–75.9)
Visit neighbours	2002	68.7 (66.9–70.5)	63.2 (61.6–64.8)	65.9 (64.7–67.1)
	2003	67.0 (65.2–68.9)	63.8 (62.3–65.4)	65.4 (64.2–66.6)
Able to ask for neighbourhood help to care for a child	2002	73.3 (71.5–75.1)	68.0 (66.4–69.6)	70.6 (69.4–71.8)
	2003	74.2 (72.4–76.0)	71.9 (70.5–73.4)	73.0 (71.9–74.2)
Run into friends and acquaintances when shopping in local area	2002	80.4 (78.8–82.0)	83.7 (82.4–84.9)	82.0 (81.1–83.0)
	2003	80.3 (78.8–81.9)	82.8 (81.6–84.1)	81.6 (80.6–82.6)
Sad to leave neighbourhood	2002	71.2 (69.4–73.0)	75.7 (74.3–77.2)	73.5 (72.4–74.7)
	2003	69.4 (67.5–71.2)	76.8 (75.4–78.2)	73.1 (72.0–74.3)

Source: NSW Health Survey 1997, 1998, 2002, and 2003 (HOIST), Centre for Epidemiology and Research, NSW Department of Health

Printed copies of the *New South Wales Adult Health Survey 2003* are available from the NSW Health Survey Program on (02) 9424 5707. Electronic copies can be downloaded in PDF format from the NSW Department of Health's website at **www.health.nsw.gov.au/public-health/phb/phb.html**, and in HTML format from **www.health.nsw.gov.au/public-health/survey/hsurvey.html**.

DELIVERING SMOKING CESSATION INFORMATION IN THE WORKPLACE USING QUIT ONLINE

Sue Hailstone
NSW Public Health Officer Training Program
NSW Department of Health

Amy Wyndham and Elayne Mitchell
Centre for Chronic Disease Prevention and Health Advancement
NSW Department of Health

The Tobacco and Health Branch and Online Service Development at the NSW Department of Health have developed a web-based smoking cessation tool, Quit Online, for the use of NSW Health employees. This article introduces Quit Online, describes its main features and discusses the evidence supporting the electronic delivery of smoking cessation information.

BACKGROUND

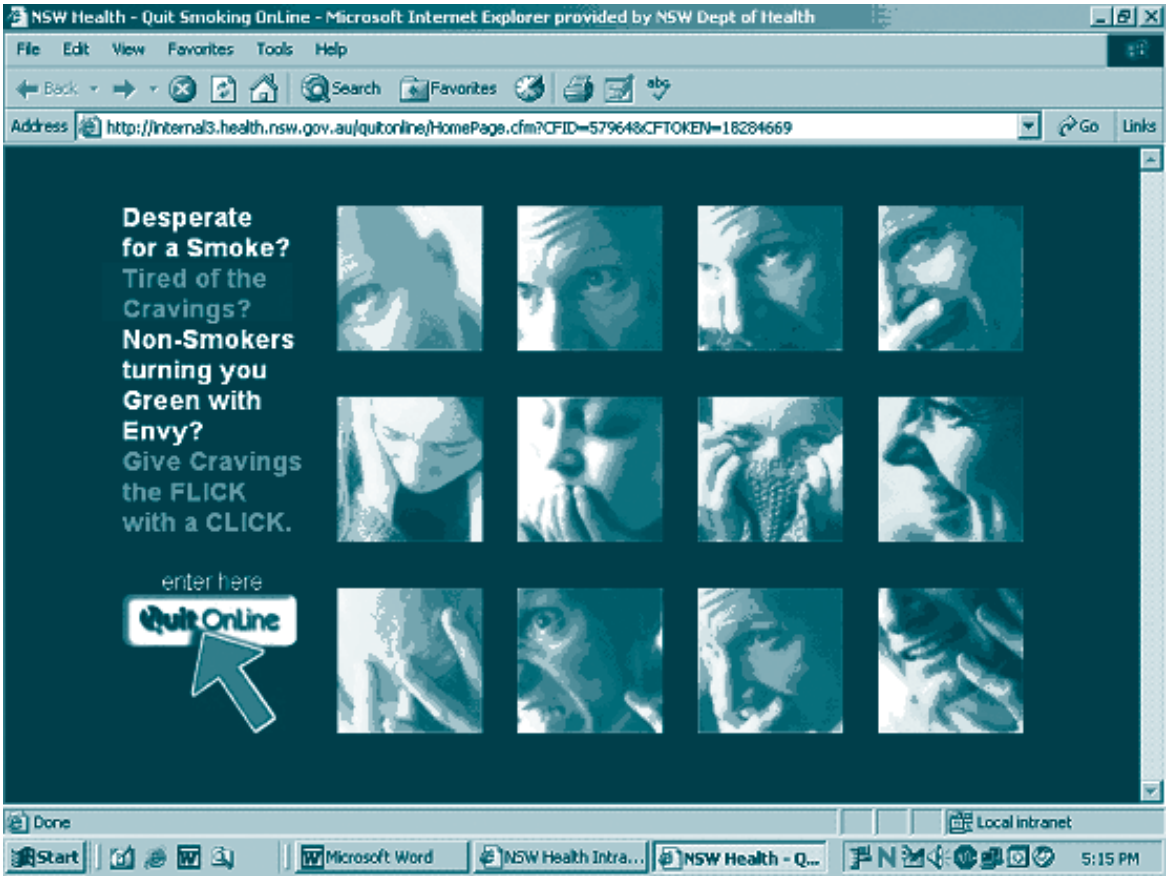
NSW Health is the largest health service in the southern hemisphere, with approximately 100 000 employees.[1] In 2005 it implemented a Smoke Free Workplace Policy.[2] There is evidence that providing assistance to smokers who wish to quit doubles their chance of success, compared to those who attempt to quit on their own.[3] One strategy of the Smoke Free Workplace Policy is to provide assistance to all NSW Health employees who wish to quit smoking. Quit Online is an example of an initiative that provides smoking cessation support to employees via the NSW Health intranet.

Applying routinely collected data for smoking to the NSW Health employee data suggests that there are approximately 22 000 current smokers, 22% of the workforce.[4] Of these, 7333 (33%) wish to quit in the next 6 months and an additional 3080 (14%) wish to quit in the next 30 days.

A pilot version of Quit Online was tested with NSW Health employees in 2 area health services and at the Department of Health central office from November 2003. A 4-month technical trial was chosen to accommodate the 3-month smoking relapse curve that has been described in smoking

FIGURE 1

QUIT ONLINE HOMEPAGE



cessation literature[5] and allowed for a month's delay in employees registering for the service. Following feedback and revision, Quit Online was launched on World No Tobacco Day, 31 May 2004 (Figure 1).

WEBSITE DESCRIPTION

The Quit Online website has 2 parts. The first provides general information about quitting smoking and the second provides information personalised to the user.

Part 1

The general quit smoking information available includes:

- fact sheets
- Quit Stories, footage from the NSW Health employee quit smoking video
- Quit Stories testimonials
- NSW Quitline, contact information for the telephone counselling service
- Quit Kit registration
- *Quit because you can* booklet
- bulletin board
- dependence calculator.

Users can access these features without registration. Navigation is easy as users click on the tabs across the top of the page and select information from drop-down menus.

For example, Figure 2 illustrates the nicotine dependence calculator, which is based on the 6-item Fagerstrom test for nicotine dependence.[6] A score out of 10 identifies a low, medium or high level of dependence. The score is graphically represented along the length of a burning cigarette. Additional tailored quitting information is provided, based on the level of nicotine dependence. Fourteen fact sheets provide information about tobacco and health (see Box 1). A bulletin board moderated by staff of the Tobacco and Health Branch is available for users to post questions or make comments about their quit experiences.

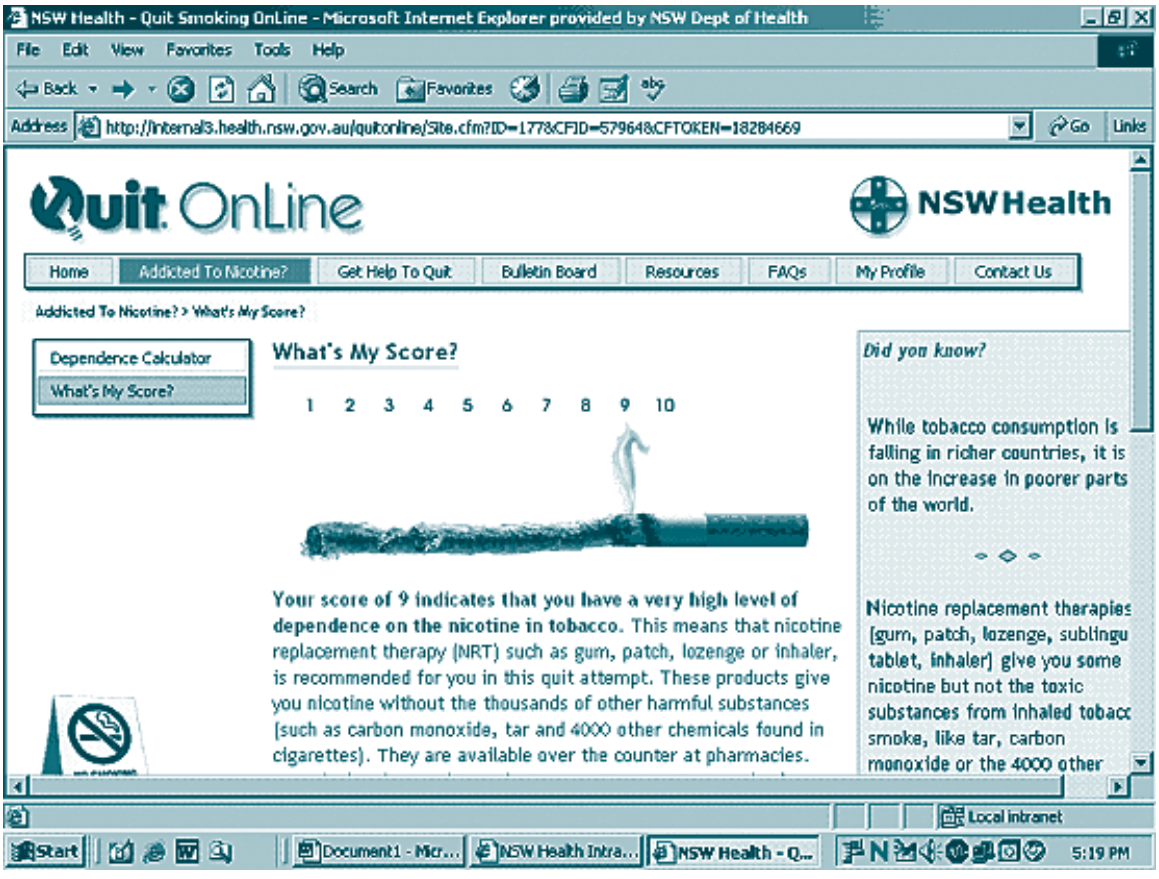
Part 2

The personalised quit smoking information provided includes the 'My Quit Counsellor' questionnaire and optional email and/or short messaging system (SMS) support.

The 'My Quit Counsellor' questionnaire contains 20 smoking-related questions on level of nicotine

FIGURE 2

QUIT ONLINE DEPENDENCE CALCULATOR



dependence, motivation for quitting, smoking history, use of pharmacotherapy and nominated quit date. Seven background questions include age group, sex and occupational grouping. After completing the questionnaire the user enters a username and selects a password, and approximately 2 pages of personalised quitting information are delivered in a matter of seconds. The information provided is both timely and tailored to personal characteristics, but is nonetheless an intervention at a single point in time.

As an adjunct to the tailored quitting information, users may subscribe to email and/or SMS support based around the 3-month smoking cessation relapse curve.[5] The majority of the automated generic messages are scheduled around the quit date. All emails have the Quit Online uniform resource locator (URL) embedded in the message, enabling users to return to the Quit Online homepage in one click.

Three messages are scheduled in the 2 weeks before quitting. For example, messages sent in the 2 weeks before quitting advise users that they may wish to purchase nicotine replacement therapies such as patches, gum, lozenges or an inhaler or see a doctor to assess whether the medication bupropion is appropriate for them. If a prescription for bupropion is obtained, the user starts taking the medication a week before quit day.

Seven messages are scheduled during the quit attempt. Emails sent on days 7, 14, 28 and 90 of the quit attempt request users to reply to Quit Online and advise whether they have remained a non-smoker. If a user has returned to smoking, a message containing relapse information is sent and remaining messages are cancelled. This capacity within the website acknowledges that several quit attempts may be required before the user achieves long-term cessation.[5,7,8] Registration in this part of the website enables users to update their profile at their convenience, including the nomination of a new quit date if they have returned to smoking.

ENSURING EQUITY OF ACCESS

The variety of work undertaken by NSW Health employees means that not all employees have consistent access to a computer and the intranet in the workplace. To facilitate easier access to the personalised quitting information of the website, users first register using the intranet and all subsequent access can be via the internet. This flexibility enables users to access their personalised information during and outside working hours from a range of locations. Quit Online is not currently available to the general public via the internet. However, some of the general quitting information available in part 1 of the website, including the fact sheets, the *Quit because you can* booklet and Quitline contact information, can be accessed by the general public through the NSW Health internet website.

BOX 1

FACT SHEETS AVAILABLE AT QUIT ONLINE

Health effects of smoking
Smoking and pregnancy
Cardiovascular disease and smoking
Nicotine and other poisons
Light cigarettes
Benefits of quitting smoking
Getting ready to quit
Quitting smoking—the first few days
Nicotine dependence and withdrawal
Remaining a non-smoker
Products to help you quit smoking
Car and home smoke-free zone
Supporting someone to quit
So you've returned to smoking

EVIDENCE SUPPORTING QUIT ONLINE

Personalised quitting information

Treatments are more effective if the needs of clients are matched to the treatment.[9] Clients complete a baseline questionnaire about personal characteristics so that computer programs can provide individualised feedback. Computer-generated individualised feedback is known as an 'expert system', and these systems have been evaluated in large smoking cessation studies since the 1990s.[9–16] More recently, meta-analysis has demonstrated the effectiveness of personalised computer-generated materials for smoking cessation against generic quitting materials.[17]

Tailored smoking cessation materials have also been shown to be effective for a range of smokers, including smokers with a low readiness to change,[18] smokers with low-level nicotine dependence[19] and smokers in general.[20] The effectiveness of tailored materials lies in their brevity and focus.[21]

Using nicotine replacement therapy approximately doubles the likelihood of quitting successfully.[22] Combining nicotine therapy (a pharmacological approach) with tailored self-help materials (a behavioural approach) has been recommended,[17,23] and the randomised control trials have demonstrated the effectiveness of combining nicotine therapy with tailored quitting information.[20,21] Accordingly, messages such as 'using nicotine replacement therapy is a smart move' and general advice on the effective use of therapy were included in Quit Online's fact sheets, in personalised quitting information and in email and SMS messages to highlight the benefits of combining the 2 modes of treatment.

Computer-based smoking cessation programs have now migrated to the web. This overcomes problems observed

in similar projects when participants experienced delays between when they contacted a quit smoking telephone counselling service about their smoking behaviour and when they received their personalised quitting advice by surface mail. Not only do web-based expert systems deliver timely and tailored information, but the low cost of delivery allows for a greater population health benefit due to wide scale and effective distribution.[24]

Email and SMS support

The scheduling of email and SMS messages is consistent with evidence indicating a dose–response relationship: multiple contacts result in higher abstinence rates than a single contact.[25] For example, 3 messages are sent in the first week of quitting, which is the peak period for self-reported withdrawal symptoms.[5] The relapse-sensitive scheduling of messages takes into account that the probability of relapse is greater in the initial stages of quitting than later on.[25] In a recent study, the scheduling of timed educational messages more than doubled the odds for quitting at 30 days as the intervention prompted smokers to plan quit attempts and undertake them more frequently.[24]

EVALUATION OF USER CHARACTERISTICS

One aim of the Quit Online technical trial was to identify characteristics of the first users of a workplace electronic smoking cessation tool. De-identified data from 43 'My Quit Counsellor' questionnaires were analysed. The process evaluation demonstrated that 67 per cent of users were women and 60 per cent of users were aged 30 to 49 years. Sixty-two per cent of users had previously quit for 3 months or less, and women were more likely to report low or very low levels of nicotine dependence than men (40 per cent vs. 7 per cent). A majority of users had their own computer at work (60 per cent) and more users subscribed to email support (77 per cent) than to SMS support (42 per cent).

The evaluation of personal characteristics was conducted with the initial users of the website during the 4-month technical trial. At this time, NSW Health was comprised of 21 units (17 area health services, Corrections Health, the Children's Hospital at Westmead, the Ambulance Service, and the Institute for Clinical Excellence). Participants in the trial were largely drawn from 2 area health services which employ smaller numbers of staff. A small number of respondents were also from the Department of Health central office. There was little promotion of Quit Online before the technical trial, but there were 1483 visits to the website by 1130 unique users.

CONCLUSION

NSW Health employees responded positively to Quit Online. The service uses immediate communication tools including email, SMS and the internet to support employees who wish to quit smoking. Quit Online also combines a range of evidence-based smoking cessation strategies into one product: tailored self-help materials, technologies for immediate communication, and advice on the use of nicotine replacement therapy and the Quitline. An evaluation of user characteristics suggested that the current format was suitable for use in the workplace. Key informant interviews and focus group meetings are proposed with NSW Health staff from all area health services in the latter half of 2005 and will assist in determining future directions for the project. Quit Online may then become available to other government departments and to the general public.

ACKNOWLEDGMENTS

The authors would like to thank Richard Shepherd and Ed Kazic, Online Service Development, Communications Branch, NSW Department of Health, for their assistance in developing Quit Online.

For more information about Quit Online contact Amy Wyndham at the Centre for Chronic Disease Prevention and Health Advancement, phone (02) 9391 9788, email awynd@doh.health.nsw.gov.au.

Some Quit Online resources are also available to the general public: quit smoking fact sheets, NSW Quitline contact information and the *Quit because you can* booklet. The resources are available at www.health.nsw.gov.au/public-health/health-promotion/tobacco/quitting/index.html:

The Quitline 131 848 is a free confidential telephone service to help smokers quit smoking. The Quitline 131 848 can also provide assistance to the family and friends of smokers and others requesting information about smoking. An interpreter service is available for those who are not fluent in English.

Smokers can contact the Quitline 24 hours a day, seven days a week, every single day of the year to receive a free Quit Kit.

REFERENCES

1. NSW Department of Health. *Annual report 03/04*. Sydney: NSW Department of Health, 2004.
2. NSW Department of Health. *NSW tobacco action plan 2001–2004*. Sydney: NSW Department of Health, 2001.
3. Zhu S, Melcer T, Sun J, Rosbrook B, Pierce JP. Smoking cessation with and without assistance: a population-based analysis. *Am J Prev Med* 2000, 18: 305–311.

4. Population Health Division. *The health of the people of New South Wales: report of the Chief Health Officer, 2004*. Sydney: NSW Department of Health, 2004.
5. Hughes JR, Keely J, Naud S. Shape of the relapse curve and long-term abstinence among untreated smokers. *Addiction* 2004; 99: 29–38.
6. Fagerström KO, Heatherton TF, Kozlowski LT. Nicotine addiction and its assessment. *Ear Nose Throat J* 1990; 69: 763–765.
7. Lindstrom M, Isacsson SO, Malmö Shoulder–Neck Study Group. Smoking cessation among daily smokers aged 45–69 years: a longitudinal study in Malmö, Sweden. *Addiction* 2002; 97: 205–215.
8. West R, McEwen A, Bolling K, Owen L. Smoking cessation and smoking patterns in the general population: a 1-year follow-up. *Addiction* 2001; 96: 891–900.
9. Velicer WF, Prochaska JO, Bellis JM, DiClemente CC, Rossi JS, Fava JL, Steiger JH. An expert system intervention for smoking cessation. *Addict Behav* 1993; 18: 269–290.
10. Borland R, Balmford J, Segan C, Livingston P, Owen N. The effectiveness of personalized smoking cessation strategies for callers to a Quitline service. *Addiction* 2003; 98: 837–846.
11. Borland R, Balmford J, Hunt D. The effectiveness of personally tailored computer-generated advice letters for smoking cessation. *Addiction* 2004; 99: 369–377.
12. Etter JF, Perneger TV. Effectiveness of a computer-tailored smoking cessation program: a randomized trial. *Arch Intern Med* 2001; 161: 2596–2601.
13. Prochaska JO, Velicer WF, Fava JL, Rossi JS, Tsoh JY. Evaluating a population-based recruitment approach and a stage-based expert system intervention for smoking cessation. *Addict Behav* 2001; 26: 583–602.
14. Prochaska JO, Velicer WF, Fava JL, Ruggiero L, Laforge RG, Rossi JS, Johnson SS, Lee PA. Counselor and stimulus control enhancements of a stage-matched expert system intervention for smoking in a managed care setting. *Prev Med* 2001; 32: 23–32.
15. Curry SJ, McBride C, Grothaus LC, Louie D, Wagner EH. A randomized trial of self-help materials, personalized feedback, and telephone counseling with nonvolunteer smokers. *J Consult Clin Psychol* 1995; 63: 1005–1014.
16. Prochaska JO, DiClemente CC, Velicer WF, Rossi JS. Standardized, individualized, interactive, and personalized self-help programs for smoking cessation. *Health Psychol* 1993; 12: 399–405.
17. Lancaster T, Stead LF. Self-help interventions for smoking cessation. *Cochrane Database Syst Rev* 2002; (3): CD001292.
18. Dijkstra A, De Vries H, Roijackers J. Targeting smokers with low readiness to change with tailored and nontailored self-help materials. *Prev Med* 1999; 28: 203–211.
19. Strecher VJ, Kreuter M, den Boer DJ, Kobrin S, Hospers HJ, Skinner CS. The effects of computer-tailored smoking cessation messages in family practice settings. *J Fam Pract* 1994; 39: 262–270.
20. Shiffman S, Paty JA, Rohay JM, Di Marino ME, Gitchell J. The efficacy of computer-tailored smoking cessation material as a supplement to nicotine polacrilex gum therapy. *Arch Intern Med* 2000; 160: 1675–1681.
21. Shiffman S, Paty JA, Rohay JM, Di Marino ME, Gitchell JG. The efficacy of computer-tailored smoking cessation material as a supplement to nicotine patch therapy. *Drug Alcohol Depend* 2001; 64: 35–46.
22. Silagy C, Lancaster T, Stead L, Mant D, Fowler G. Nicotine replacement therapy for smoking cessation. *Cochrane Database Syst Rev* 2001; (3): CD000146.
23. Fiore MC, Bailey WC, Cohen SJ, Dorfman SF, Goldstein MG, Gritz ER. Treating tobacco use and dependence: a clinical practice guideline. Rockville, MD: US Department of Health and Human Services, Public Health Service; 2000.
24. Lenert L, Muñoz RF, Perez JE, Bansod A. Automated e-mail messaging as a tool for improving quit rates in an internet smoking cessation intervention. *J Am Med Inform Assoc* 2004; 11: 235–240.
25. Zhu SH, Stretch V, Balabanis M, Rosbrook B, Sadler G, Pierce JP. Telephone counseling for smoking cessation: effect of single-session and multiple-session interventions. *J Consult Clin Psychol* 1996; 64: 202–211.

TOBACCO AND HEALTH FACT*SHEET*

NICOTINE AND OTHER POISONS

WHAT'S IN TOBACCO SMOKE?

There are more than 4000 chemicals in tobacco smoke.[1,2] Nicotine, tar and carbon monoxide are well known. Nicotine is the addictive drug that keeps you coming back for more. Tar is the black, sticky substance that damages your lungs. Carbon monoxide is the gas that hitches a ride on your red blood cells and takes the place of some of the oxygen in your bloodstream.

Some of the other chemicals found in cigarettes (and some of their other uses) are: [1,2]

- ammonia (household cleaning agent);
- acetone (nail polish remover);
- naphthalene (mothballs);
- methanol (rocket fuel);
- formaldehyde (which preserves the dead);
- phenol (disinfectant);
- hydrogen cyanide;
- metals (76 metals including arsenic, cadmium, nickel);
- radioactive compounds (polonium-210 and potassium-40);
- acetic acid (vinegar);
- toluene (industrial solvent);
- pesticides.

WHAT'S NICOTINE?

Nicotine is a chemical substance found in tobacco leaves. Addiction to nicotine is what keeps you smoking. Nicotine is as addictive as heroin or cocaine.[3]

HOW DOES NICOTINE WORK?

From the moment that you inhale tobacco smoke, it takes four seconds for the nicotine to reach your blood stream and about 10 seconds to reach the brain.[4] Once the nicotine has attached itself to special sites in the brain, many relaxing chemicals are released. But this effect only lasts for a short time and then the addicted smoker needs to 'top up' their nicotine. One of the reasons people continue to smoke is because they enjoy the effect of these relaxing chemicals being released by the brain.[5]

WHY IS NICOTINE A PROBLEM FOR HEALTH?

The worst problem for health caused by nicotine is that it is so addictive. Most regular smokers would prefer not to smoke and only continue because they are addicted to nicotine. Smoking tobacco accounts for the largest proportion of preventable illness and death in Australia. Immediate effects of nicotine on the body include increased heart rate and blood pressure and constriction of blood vessels. Over time, ingestion of nicotine from smoking combines with carbon monoxide to damage the lining of blood vessels and make blood platelets stickier. In combination, these effects contribute to the development of heart disease.[5]

Although nicotine is among the most toxic and fast acting of all poisons, the dose from smoking is too low to cause acute poisoning (smoking poisons you slowly). However, there is a serious risk for children who ingest cigarettes and care should be taken with cigarettes and extinguished butts, which contain concentrated nicotine. Before developing a tolerance to nicotine, the smoker may experience mild effects of nicotine toxicity.[6] The nicotine in nicotine replacement therapy (NRT) products, such as the patch, gum, lozenge, sublingual tablet or inhaler, is safe if used according to the product directions. The average dose of nicotine from NRT is about one-third to one-half of that obtained from smoking.[7,8,9] A person who is dependent on nicotine is extremely unlikely to experience any toxic effect from using NRT.

HOW DOES YOUR BODY GET RID OF NICOTINE?

Most of the nicotine (80 per cent) is broken down in the liver. Nicotine is also filtered from the blood by the kidneys and removed in urine.

WHAT IS TAR AND WHY IS IT A PROBLEM FOR HEALTH?

The word 'tar' describes the particulate matter which, generated by burning tobacco, forms a component of cigarette smoke.[10] Each particle is composed of a large variety of chemicals consisting mainly of nitrogen, oxygen, hydrogen, carbon dioxide, carbon monoxide, and a wide range of volatile compounds.[1,10]

In condensed form, tar is a sticky brown substance that is the main cause of lung and throat cancer in smokers.[10] Tar can also cause unsightly yellow-brown stains on fingers and teeth. Some tar is exhaled, some is coughed up, and some is absorbed by the lungs, which can cause lung cells to die. Cigarette smoke damages the 'cilia' (fine hairs that line the upper airways to protect against infection). When cilia are damaged, tar can penetrate further into the lungs.

WHAT IS CARBON MONOXIDE AND WHY IS IT A PROBLEM FOR HEALTH?

Carbon monoxide is a poisonous gas that competes with oxygen in the blood.[11] This is the same gas that is found in car exhaust fumes. Carbon monoxide binds to red blood cells, making it harder for the body to carry oxygen to the

muscles and organs.[12] In large quantities, carbon monoxide is rapidly fatal. Smokers can have up to 10 times the amount of carbon monoxide in their bloodstream than non-smokers.[1,13] Heavy smokers may have the oxygen carrying ability of their blood cut by as much as 15 per cent.[14] Smoking in pregnancy can lead to a dramatic reduction in the amount of oxygen available to the developing baby.

OTHER CHEMICALS AND ADDITIVES

As tobacco is not classified as a food or drug in Australia,[15] there are no standards or controls on what may be used in the growing and production of tobacco, including additives and agricultural chemicals.[16] Herbicides, insecticides, fungicides, fertilisers and other agricultural chemicals are routinely used in tobacco growing.[16,17]

Additives are added to cigarettes in the manufacturing process to:[11,17]

- add flavour, including sugar, honey, liquorice, cocoa, and chocolate liqueur to lessen the harshness of the smoke;[18]
- lessen the irritating effects of smoke. Menthol and eugenol numb the throat;[18]
- change the chemistry of nicotine. Ammonium salts and acetaldehyde (in burnt sugar) increase nicotine's addictive potential;[11,18]
- change the chemistry of smokers' brains to make them more receptive to nicotine.[18]

There are a number of problems with additives:

- Additives such as sugar and honey might seem harmless, because we are used to eating them, but when additives in cigarettes are burnt, they can change into different chemicals, some of which are toxic. For example, liquorice and sugar produce cancer-causing chemicals when burnt. Also, these substances are inhaled into the lungs, which are delicate and much more vulnerable to harm than the stomach and intestines.[18]
- The health effects of additives on smokers are not made public by the tobacco companies and many may not be known at all.[18]
- Some additives make tobacco smoke less harsh and taste better. It may make it easier for children to learn to smoke and make smoking more agreeable to smokers.[18]

There is no such thing as a 'safer' cigarette or 'healthier' tobacco. All tobacco smoke is damaging to health. The best way to prevent exposure to the chemicals in tobacco smoke is to avoid exposure to tobacco smoke.

REFERENCES

1. US Department of Health and Human Services. *Reducing the health consequences of smoking: 25 years of progress. a report of the Surgeon General*. Rockville, Maryland: US Department of Health and Human Services, Public Health Service, Centers for Disease Control, Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 1989.
2. US Environmental Protection Agency. *Respiratory health effects of passive smoking: lung cancer and other disorders.* Washington DC: Office of Health and Environmental Assessment, Office of Research and Development, US Environmental Protection Agency, 1992.
3. Royal College of Physicians. *Nicotine addiction in britain: a report of the tobacco advisory group of the royal College of Physicians.* London: Royal College of Physicians, 2000.
4. US Department of Health and Human Services. *Preventing tobacco use among young people: A report of the Surgeon General.* Atlanta, Georgia: US Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention, Office on Smoking and Health, 1994.
5. US Department of Health and Human Services. *The health consequences of smoking: nicotine addiction: a report of the US Surgeon General*. Rockville, Maryland: US Department of Health and Human Services, Office on Smoking and Health, 1988.
6. Winstanley M, Woodward S, Walker N. *Tobacco in Australia: facts and issues 1995.* Melbourne: Quit Victoria, 1995.
7. Benowitz NL. Nicotine replacement therapy during pregnancy. *JAMA* 1991; 266: 3174–3177.
8. McKendree E, McNabb MD, Richard V. et al. Plasma nicotine levels produced by chewing nicotine gum. *JAMA* 1982; 248: 865–868.
9. Pharmacia Consumer Healthcare Australia. *Product information* 2001.
10. US Department of Health and Human Services. *The health consequences of smoking: the changing cigarette*. Rockville, Maryland: US Department of Health and Human Services, Public Health Service, Office on Smoking and Health, 1981.
11. US Department of Health and Human Services. *The FTC cigarette test method for determining tar, nicotine and carbon monoxide yields of US cigarettes. Report of the NCI Expert Committee.* Smoking and Tobacco Control Monograph no. 7. Bethesda, Maryland: US Department of Health and Human Services, Public Health Service, National Institutes of Health, 1996.
12. US Department of Health and Human Services. *The health consequences of smoking: cardiovascular disease. a report of the US Surgeon General*. Rockville, Maryland: US Department of Health and Human Services, Office on Smoking and Health, Public Health Service, Department of Health Education and Welfare, 1983.
13. Rodrigo C. The effects of cigarette smoking on anesthesia. *Anesth Prog* 2000 (Winter); 47(4): 14350.
14. Royal College of Physicians. *Smoking or health.* London, Pitman, 1977.

15. Commonwealth Department of Health. *Tobacco is specifically exempted from the Uniform Poisons Schedule: Standard adopted by the National Health and Medical Research Council, 94th Session.* Canberra: Commonwealth Department of Health, 1982.
16. Chapman S. Come to where the flavour is: additives and pesticide residue in cigarettes. *Drug Alcohol Rev* 1992; 11: 3–6.
17. International Agency for Research on Cancer. *Tobacco smoking. IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Humans. Volume 38.* Geneva: World Health Organization, 1985.
18. Bates C, Jarvis M, Connolly G. *Tobacco additives: cigarette engineering and nicotine addiction*. London: Action on Smoking and Health, 1999.

NSW HEALTH Working as a Team

This fact sheet is one of a series on tobacco and health related issues produced by the Tobacco and Health Branch of the NSW Department of Health. The fact sheets respond to frequently asked questions and are designed to be used by both consumers and health professionals to help people to quit smoking.

The fact sheets can be accessed through the NSW Department of Health's website at **www.health.nsw.gov.au/public-health/health-promotion/tobacco/facts/index.html**.

NSW PUBLIC HEALTH BULLETIN

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 Branch. The *Bulletin* provides population health data and information to support effective public health action. The *Bulletin* is indexed by Medline and *Index Medicus*.

Submission of articles

A *Bulletin* article should be about 1500 words, not including tables and figures. News, comments and other reports should be 500–600 words. All articles should include a short introductory abstract that reflects the structure of the paper. References should be set out in Vancouver style (see www.nlm.nih.gov/bsd/uniform_requirements.html). Send submitted manuscripts on paper and in electronic form, either on disc (preferably Word for Windows) or by email. The paper copy must be accompanied by a letter signed by all the authors. Full instructions for authors are available on request from the editorial office.

Editorial correspondence

Please address all correspondence and contributions to

The Editor, *NSW Public Health Bulletin*
Locked Mail Bag 961
North Sydney, NSW 2059
Australia.
Send email to phbulletin@doh.health.nsw.gov.au.
Telephone (61 2) 9391 9241, fax (61 2) 9391 9232.

Distribution

To obtain copies of the *NSW Public Health Bulletin* please contact your local public health unit or telephone (61 2) 9391 9942. A form for new subscribers or changes of address is printed in most issues of the *Bulletin*. There is also an online subscription form on the *Bulletin*'s website. Copies of the current issue and all back issues can be downloaded in both PDF and HTML formats from **www.health.nsw.gov.au/public-health/phb/phb.html**. Back issues of the printed version are available from:

Public Health Training and Development Branch
NSW Department of Health
Locked Mail Bag 961
North Sydney, NSW 2059
Australia.

NSW HEALTH Working as a Team

EPIREVIEW

INVASIVE PNEUMOCOCCAL DISEASE, NSW, 2002

Robyn Gilmour
Communicable Diseases Branch
NSW Department of Health

BACKGROUND

Infection with the bacterium *Streptococcus pneumoniae* is a major cause of morbidity and mortality in both developed and developing countries. *Streptococcus pneumoniae* is often found in the upper respiratory tract and can spread directly from the nose and throat to cause invasive infections such as bacteraemia and bacterial meningitis.[1,2] Those at greatest risk of invasive disease are young children, the elderly, and people with underlying illness.[1] The rapid increase in the development of resistance to penicillin has raised concerns about the treatment and prevention of pneumococcal infections. With the impending release of the conjugate pneumococcal vaccine into the routine childhood vaccination schedule in 2005, there has been a strong emphasis on collecting information about those cases most at risk for invasive disease as well as baseline data so as to monitor the impact of pneumococcal vaccination in both children and the elderly.[3]

There are 90 different pneumococcal serotypes. The most common serotypes are represented by the 23-valent polysaccharide vaccine for adults. A second conjugate vaccine has been developed for infants, and this formulation contains polysaccharides of the 7 serotypes that commonly affect children.

Invasive pneumococcal disease is identified by the isolation of *Streptococcus pneumoniae* from the culture of any normally sterile site, including blood, cerebral spinal fluid, pleural fluid, joint fluid, and peritoneal fluid. Since January 2001, all laboratories in NSW have been required under the *NSW Public Health Act 1991* to notify cases of invasive pneumococcal disease to their local public health unit.[4]

This article describes the epidemiology of invasive pneumococcal disease in New South Wales, based on data collected from notifications and through enhanced surveillance in 2002.

METHODS

NSW microbiology laboratories notified cases of invasive pneumococcal disease to their local public health unit. Public health units entered the demographic information for each case onto the NSW Notifiable Disease Database, which is maintained by the Communicable Diseases Branch of the NSW Department of Health. Pneumococcal isolates were sent by the laboratories to the Microbiology Department at the Children's Hospital at Westmead for serotyping.

In 2002, metropolitan laboratories were audited by either the Children's Hospital at Westmead or by public health units to ensure the complete ascertainment of cases. However, laboratories in rural areas were not audited routinely and only those rural cases notified to the public health unit are presented and analysed here.

Enhanced surveillance for invasive pneumococcal disease in 2002

In 2002, NSW public health units undertook enhanced surveillance for invasive pneumococcal disease. This involved administering a standardised questionnaire to those involved in the notification of a case. Information about risk factors and immunisation status was collected from the treating clinicians, from hospital records, and through interviews with the cases. Predisposing conditions for invasive pneumococcal disease that were included on the questionnaire were: asplenia; a compromised immune system; chronic cardiac, renal, or pulmonary disease; diabetes; alcohol-related problems; chronic liver disease; premature birth; and congenital or chromosomal abnormalities.[5]

The data collected through this enhanced surveillance were mailed to the Communicable Diseases Branch, NSW Department of Health, and entered onto the NSW Enhanced Invasive Pneumococcal Disease Surveillance Database.

We analysed notifications of invasive pneumococcal disease in NSW for the year 2002 by age, sex, and area of residence. Direct age standardisation was used to compare rates of the disease in different geographical areas. Rates were calculated using Australian Bureau of Statistics estimated residential populations for 2001.[6]

Enhanced surveillance data were collected for notifications in people aged under 5 years and over 50. Crude rates were calculated for these groups. Enhanced surveillance was not undertaken for notifications in people aged 5 to 49 years.

Both the Hunter and Illawarra area health services were included within the Greater Sydney region so that direct comparisons could be made with data collected before 2002.[7,8]

RESULTS

During 2002, a total of 870 cases of invasive pneumococcal disease was reported in NSW, representing an annual crude rate of 13.5 per 100, 000 people.

Laboratories notified 851 cases directly to public health units. Seven hundred and forty-one (85 per cent) isolates were sent to the Microbiology Department of the Children's Hospital at Westmead by the laboratory that first made the diagnosis for confirmatory testing and serotyping.

TABLE 1

AGE AND SEX OF CASES OF INVASIVE PNEUMOCOCCAL DISEASE, NSW, 2002 (*n*=870)

Age group (years)	Cases *n*	Cases %	Incidence per 100,000
0–<1	60	6.9	70.3
1–<2	101	11.6	118.4
2–4	104	12.0	40.1
5–49	202	23.2	4.8
50–64	129	14.8	12.8
65–79	150	17.2	23.6
80 +	124	14.3	63.8
Sex			
Male	495	57.0	15.4
Female	375	43.0	11.5

Source: NSW Notifiable Diseases Database, Communicable Disease Branch, NSW Department of Health

Highest crude rates of notification were among: children aged 1–2 years; children aged less than 1 year; and adults aged more than 80 years (Table 1). The male-to-female ratio was 1.3:1. The majority of cases notified (87 per cent) were residents of the Greater Sydney region. Within the Greater Sydney region the Hunter Area Health Service had the highest overall age-standardised rate of invasive pneumococcal disease, and the lowest was reported in the South Western Sydney Area Health Service. The crude notification rate of the disease in rural NSW was generally lower than that for the Greater Sydney region (Table 2).

In 2002, the average number of cases reported each month was 72 (range 28–87). A seasonal pattern was identified, with the greatest incidence occurring from July to September in many area health services.

Enhanced surveillance data

Enhanced surveillance data were collected for 668 of the 870 notified cases (77 per cent); 265 of these cases were children aged less than 5 years and 403 of these cases were adults aged 50 years and over. Sixty-two per cent of the children were male (male:female ratio = 1.6:1), as were 53 per cent of adults (male:female ratio = 1.1:1). The Western Sydney Area Health Service had the highest crude rate among children under 5. The South Western Sydney

TABLE 2

NOTIFICATION OF INVASIVE PNEUMOCOCCAL DISEASE IN AREA HEALTH SERVICES, CHILDREN AGED UNDER 5 YEARS, ADULTS AGED OVER 50 YEARS, AND ALL AGES, NSW, 2002

Area health service	Age < 5 years *n*	Age < 5 years Crude rate*	Age ≥ 50 years *n*	Age ≥ 50 years Crude rate*	All ages *n*	All ages Standardised rate*
Greater Sydney region						
Central Coast	13	65.7	27	28.2	51	14.4
Central Sydney	18	60.7	41	31.3	74	15.7
Hunter	27	75.8	61	38.1	105	19.0
Illawarra	15	65.4	28	26.2	53	14.8
Northern Sydney	34	76.4	47	19.7	101	13.2
South Eastern Sydney	31	70.9	57	25.6	116	15.3
South Western Sydney	34	55.2	31	16.9	93	12.1
Wentworth	19	78.7	18	25.3	50	17.2
Western Sydney	46	88.5	33	19.5	113	16.6
Rural NSW						
Far Western	2	59.1	4	27.6	9	19.0
Greater Murray	5	27.5	19	25.4	26	9.8
Macquarie	3	37.8	6	20.0	13	12.3
Mid North Coast	6	39.3	5	5.3	14	5.5
Mid Western	7	60.5	12	24.4	22	12.9
New England	2	16.8	1	1.9	3	2.3
Northern Rivers	1	6.2	2	2.4	7	2.3
Southern	1	8.5	9	15.2	17	9.1
Other	1		2		3	
Total	**265**	**61.6**	**403**	**21.9**	**870**	

* Cases per 100, 000 people

Source: NSW Notifiable Diseases Database, Communicable Disease Branch, NSW Department of Health.

TABLE 3

RELATIVE RISK OF DEATH FROM INVASIVE PNEUMOCOCCAL DISEASE FOR ADULTS AGED 50 YEARS AND OVER WITH PREDISPOSING CONDITIONS COMPARED WITH ADULTS WITH NO PREDISPOSING CONDITIONS, NSW, 2002

Pre-existing condition	Relative risk	(95% CI)	*P* value
No predisposing condition	Referent		
Any predisposing condition*	2.1	(1.3–3.4)	<0.010
Cardiac disease	2.7	(1.5–4.7)	<0.001
Immunosuppression	2.3	(1.3–4.0)	<0.010
Renal disease	2.3	(1.0–5.5)	0.070
Respiratory disease	1.5	(0.7–3.1)	0.300
Diabetes	1.5	(0.7–3.3)	0.300
Alcohol	1.9	(0.5–6.7)	0.400
Asplenia	1.9	(0.3–10.8)	0.500

* as defined by NHMRC

Source: NSW Enhanced Invasive Pneumococcal Disease Surveillance Database. Communicable Disease Branch, NSW Department of Health

Area Health Service recorded the lowest crude rate in the Greater Sydney region in children under 5 years (Table 2).

Among adults aged over 50 years in the Greater Sydney region, crude rates of invasive pneumococcal disease were highest in the Hunter Area Health Service and lowest in the South Western Sydney Area Health Service (Table 2).

The most common clinical presentation among children was bacteraemia (66 per cent). Pneumonia was the most common presentation in adults (70 per cent). Meningitis was an uncommon presentation in children (7.1 per cent) and adults (3 per cent).

A predisposing condition, as defined by the National Health and Medical Research Council (NHMRC),[5] was reported in 14.3 per cent of children. An additional 1 per cent had other medical conditions that required regular review by a general practitioner. In adults aged 50 years and over, 64 per cent had predisposing conditions as defined by the NHMRC and a further 6 per cent had other medical conditions that required regular review by a general practitioner. Data for predisposing conditions were not reported for 7 per cent of adult cases and 3 per cent of children.

Among the 668 cases investigated through enhanced surveillance, 98 deaths (15 per cent) were reported. Four children aged under 5 years (1.5 per cent) died. Of these, 2 had predisposing conditions and none had received vaccination. Ninety-four (23 per cent) of the adults aged over 50 years died. Adults were more likely to die if they had a predisposing condition as defined by the NHMRC (RR 2.1, p=<0.01) (Table 3). Of those whose vaccination status was known (70 per cent), only 16 per cent had been vaccinated within the previous 5 years.

Indigenous status was reported for 94 per cent of cases. Fifteen cases (2.4 per cent of enhanced cases) were identified as being either Aboriginal or Torres Strait Islanders, and of these, 73 per cent were from rural NSW.

Vaccination data were complete for 229 (97 per cent) children aged under 5 years. Five children (2.2 per cent) are known to have received the vaccine. Of these 5, the isolate from 1 child matched the serotype represented in the vaccine. The serotypes from the other 4 children were unknown. Vaccination data for adults aged over 50 years were available for 281 (70 per cent) cases. Of these, 61 (22 per cent) were vaccinated within the last 5 years. Eighty per cent reported predisposing conditions.

Of the 5 adult cases that were identified as being Aboriginal people, 3 had received vaccination. The serotype was unknown for 3 cases, and the remaining 2 cases had serotypes represented by the 23-valent vaccine. Of the 10 Aboriginal children under 5 years, 4 children had received the vaccine; however, only 3 were fully vaccinated for their age and information about serotypes for these cases was unavailable.

Serotyping was available for 535 (80 per cent) cases. Serotyping was not performed on most isolates from rural areas. Of children under 5 years whose serotype data were available, 197 (89 per cent) had serotypes that were represented by the 7-valent conjugate vaccine. In patients aged over 50 years whose serotype data were available, 288 (93 per cent) had serotypes included in the 23-valent polysaccharide vaccine (Table 4). There were 7 patients whose serotypes were not represented by the vaccine. The serotypes involved with vaccination failures were: 14, 4, 6B, 9V, 23F, 3, 22F, 9N, 10A, 12F, 17F, and 19F.

TABLE 4

PERCENTAGE OF ISOLATES FROM CASES OF INVASIVE PNEUMOCOCCAL DISEASE IN SELECTED AGE GROUPS THAT BELONG TO SEROTYPES AND SEROGROUPS COVERED BY CURRENT PNEUMOCOCCAL VACCINES, NSW, 2002

Age group (years)	Number of isolates	7-valent paediatric vaccine*		23-valent adult vaccine #	
		Percentage of isolates with the same serotype as the vaccine	Percentage of isolates with the same serogroup as the vaccine	Percentage of isolates with the same serotype as the vaccine	Percentage of isolates with the same serogroup as the vaccine
0–1	131	88	95	_	_
2–4	90	91	96	_	_
50–64	103	_	_	96	99
≥65	211	_	_	91	97

* Serotypes in the 7-valent conjugate vaccine are 4, 6B, 9V, 14, 18C, 19F and 23F.

Additional serotypes in the 23-valent vaccine are 1, 2, 3, 5, 7F, 8, 9N, 10A, 11A, 12F, 15B, 19A, 20, 22F and 33F.

Source: Microbiology Department, the Children's Hospital at Westmead.

DISCUSSION

Invasive pneumococcal disease causes a significant burden of disease in NSW. The data presented here show that children under 2 years and adults over 80 years are the most affected. The incidence of the disease demonstrates a seasonal variation, with the majority of cases occurring in the coldest months.

Before invasive pneumococcal disease became notifiable in NSW, the mechanisms for laboratory reporting were established only in the Greater Sydney region. While this limits data comparison to within this region, data from this region are accurate, as routine audits were conducted regularly.[7] Notifications by laboratories in rural regions of NSW may have been incomplete, as audits were not routinely carried out and underreporting may have occurred.

Within rural NSW, the incidence of invasive pneumococcal disease varied in different regions. Rates were higher in the Far Western and Mid Western area health services than in other rural areas. Rates were lowest in northern NSW, but because of the small numbers of notifications received in rural areas, it is difficult to draw conclusions about the incidence in rural NSW. Underreporting in some areas is a concern, as the incidence of disease may be higher than reported here. As the public health units implement regular laboratory audits, and laboratories forward isolates for serotyping at the Children's Hospital at Westmead, reporting of cases of invasive pneumococcal disease should improve.

Comparing data collected in 2001 and 2002 from the Greater Sydney region,[8] there was a 14 per cent increase in the number of cases aged under 5 and over 50 years. In 2002, there was an increase in invasive pneumococcal disease in children aged less than 1 year (from 93.0 to 118.4 per 100,000 population) and in adults aged 50 to 64 years (from 9.1 to 12.8 per 100,000 population). The Hunter Area Health Service had the largest increase, with notifications rising by 40 per cent; for children under 5 years of age there was an increase from 53.3 to 75.8 per 100,000 and for adults over 50 years an increase from 20.6 to 38.1 per 100,000 population. Even though the disease became notifiable in 2002, reporting mechanisms have remained relatively unchanged in the Hunter region. Over the past 4.5 years, the Hunter region has had an average disease incidence of 10.1 per 100 000 population.[7] Examination of data collected for 2003 will determine whether this is a real increase in disease incidence. In 2003, the Hunter encouraged general practitioners to vaccinate patients 65 years and over and subsequent data from 2003 indicates a lower rate of disease in this region.

Notifications are highest in children aged under 2 years. This may be related to the immaturity of their immune systems. Comparison with previous data for NSW shows an increase in disease incidence.[7,8] Currently, only a small proportion of children in this age group are vaccinated with the pneumococcal vaccine, as the 7-valent vaccine has only been available since late 2001. Notifications for invasive pneumococcal disease in adults aged 50–64 years remain low despite a small increase since 2001.

The distribution of serotypes in this surveillance period mirrors that previously reported for the Greater Sydney region.[7] The predominant serotype for both children under 5 and adults over 50 was serotype 14. Children were more likely to have a higher percentage of serotypes 19F and 6B, whereas in adults there were more cases with serotypes 4 and 23F. Infection with serotype 14 resulted in a higher percentage of cases with meningitis (44 per cent) in children aged under 5 years. In 2002, up to 97 per cent of patients with invasive pneumococcal disease in NSW have infections caused by *Streptococcus pneumoniae* serotypes contained in either the 7-valent or 23-valent vaccines.

A higher risk of death from invasive pneumococcal disease was associated with both increasing age and underlying illness.[10] Vaccination is currently recommended for adults with a pre-existing condition as defined by the NHMRC, all adults aged 65 years and over and Aboriginal people over 50 years.[5] Our data suggest that pneumococcal vaccine is under-used among those for whom it is recommended. Eighty-four per cent of cases that either had a pre-existing condition or were aged over 65 years were not vaccinated. Prevention of pneumococcal disease is important, and uptake of the vaccine should be encouraged in the elderly and people with pre-existing conditions.

Data describing Aboriginality was available for 94 per cent of patients aged under 5 years and over 50 years. Our data suggested a greater percentage of pneumococcal disease occurred in indigenous people in rural regions of NSW, with a rate of 13.5 per 100,000 compared with 4.5 per 100,000 for non-indigenous people. With pneumococcal vaccination available free of charge for many indigenous people, surveillance of disease will be important over the next few years to monitor vaccine failure and adequacy of vaccine coverage of serotypes isolated from Aboriginal people. It is difficult to draw any conclusions about trends in the incidence of invasive pneumococcal disease in Aboriginal people living in NSW because there are no previous data for comparison.

Conclusions that can be drawn from this review are limited by incomplete data for some important variables. Serotype data was not available for 20 per cent of cases and vaccination status for adults was not available for 30 per cent of cases. No data were available about the uptake of pneumococcal vaccine in NSW communities. In the United States, where the 7-valent vaccine has been available for 2 years, decreased rates of invasive pneumococcal disease have been documented.[9] Analysis of antibiotic sensitivity data of isolates is currently underway at the Children's Hospital at Westmead and this is likely to provide more useful information. As networks of rural laboratories are established, the quality of surveillance data for all rural cases should improve.

It appears that vaccination is poor among groups where vaccination is not provided free of charge, especially in children under 5 years. Our findings suggest that health care practitioners should encourage vaccination, especially for groups at highest risk for invasive pneumococcal disease. Assessment of the changing burden of the disease in NSW and the effects of pneumococcal immunisation will be possible using these data as a baseline.

ACKNOWLEDGMENTS

We appreciate the time and efforts from all the public health units and microbiology laboratories across NSW. We would also like to thank Michael Watson and his staff, Microbiology Department, the Children's Hospital at Westmead, for laboratory surveillance and serotyping.

REFERENCES

1. Gilbert GL. Retreat of the pneumococcus. *Med J Aust* 2000:173(Suppl): s20–s21.
2. McIntyre P, Gidding H, Gilmour R, Lawrence G, Hull B, Horby P, Wang H, Andrews R, Burgess M. *Vaccine preventable diseases and vaccination coverage in Australia, 1999 to 2000*. Canberra: Commonwealth Department of Health and Aged Care, 2002.
3. Mulholland EK. Conjugate pneumococcal vaccines: an overview. *Med J Aust* 2000: 173(Suppl): s48–s50.
4. Communicable Diseases Surveillance and Control Unit. *Notifiable disease manual: 5th edition*. Sydney: NSW Department of Health, 2000.
5. National Health and Medical Research Council. *The Australian immunisation handbook*. 8th ed. Canberra: Commonwealth Department of Health and Ageing, 2003.
6. Australian Bureau of Statistics. *2001 community profiles (HOIST)*. Sydney: Centre for Epidemiology and Research, NSW Department of Health.
7. McIntyre P, Gilmour R, Gilbert G, Kakakios A, Mellis, C. Epidemiology of invasive pneumococcal disease in New South Wales, 1997–1999. *Med J Aust* 2000: 173(Suppl): s22–s26.
8. McIntyre P, Gilmour R, Watson M. Differences in the epidemiology of invasive pneumococcal disease, metropolitan New South Wales 1997–2001. *N S W Public Health Bull* 2003:14(4–5): 85–89.
9. Black SB, Shinefield HR, Ling S, Hanan J, Firemas B, Spring D, Noyes J, Lewis E, Ray P, Lee J, Hackell J. Effectiveness of heptavalent pneumococcal conjugate vaccine in children younger than five years of age for prevention of pneumonia. *Pediatr Infect Dis J* 2002; 21: 810–15.
10. Gilmour R. Associated risk factors of death for pneumococcal disease in New South Wales. Proceedings of the Communicable Disease Control Conference, March 31 to April 1 2003, Canberra, Australia.

COMMUNICABLE DISEASES REPORT, NSW, FOR NOVEMBER AND DECEMBER 2004

For updated information, visit www.health.nsw.gov.au and click on Infectious Diseases.

TRENDS

Tables 4 and 5 and Figure 1 show reports of communicable diseases received through to November and December 2004 in NSW.

Reports of cryptosporidiosis increased in November (when 24 were received) and December (when 36 were received), mainly from rural areas. On investigation, no common links were identified among patients. Cryptosporidiosis is a diarrhoeal illness caused by infection with the parasite *Cryptosporidium parvum*. Cases tend to increase in summer time in NSW: see www.health.nsw.gov.au/data/diseases/cryptosporidiosis.html. While there are a number of risk factors for illness, outbreaks in NSW in recent years have been linked to swimming in pools contaminated by bathers, and to direct person-to-person contact.[1] To protect other bathers, patients with acute diarrhoea should not enter a swimming pool for at least 1 week after the illness has resolved. For more information see www.health.nsw.gov.au/public-health/cdscu/facts/pdf/CryptoNEWFS2001.pdf.

There were 6 notifications of patients with diarrhoea caused by infection with *Salmonella enterica* Paratyphi B biovar Java in November. This type of *Salmonella* is uncommon in Australia. Infection has been linked to contact with home aquariums.[2] Infected tropical fish, often imported from other countries, can appear healthy, but it is hypothesised that they contaminate aquariums when added to the tank. To avoid human infection, it is recommended that fish fanciers carefully wash their hands after feeding fish, cleaning the aquarium or other contact with the aquarium water.

References

1. NSW Health Department Communicable diseases report, NSW, for December 2003 and January 2004. *N S W Public Health Bull* 2004; 15(3): 44–53.
2. NSW Health Department. Communicable diseases report, NSW: October–December 2002. *N S W Public Health Bull 2002*; 13(11–12): 243–252.

GASTROENTERITIS OUTBREAK ASSOCIATED WITH A SPORTS CAMP, MID WESTERN NSW, APRIL 2004

Carlie Naylor
NSW Public Health Officer Training Program
NSW Department of Health

Gail Osborne, Jeannine Liddle, Therese Jones, and Elizabeth Stubbs
Mid Western Public Health Unit

In April 2004, staff from a Mid Western hospital notified the Mid Western Public Health Unit that 9 people who were attending a sports camp had presented to the emergency department with symptoms of gastroenteritis. Over the next 18 hours a further 31 people associated with the camp presented to the emergency department.

One hundred people from across NSW attended the camp. During the day, players and officials were based at the sports complex, where morning tea and lunch were provided. Accommodation was arranged in several hotels with breakfast and dinner provided at one of these hotels.

Response

To investigate the source and extent of the outbreak, Mid Western Public Health Unit conducted a cohort study among participants of the camp. A standardised questionnaire was administered to obtain information on participants' demographic characteristics, food history for the three days preceding the outbreak, onset and nature of symptoms, assignment to training teams, and accommodation.

A case was defined as any person who attended the camp with the onset of diarrhoea or vomiting between 12 and 16 April 2004. A site visit to the sports complex was conducted to interview people associated with the camp. This proved difficult, as the camp was over and the children were leaving. Potential cases were followed up in hospital and the organisers provided a list of all people associated with the camp so that telephone interviews could be carried out.

Food and drink residues (including red cordial and water samples from taps on the grounds of the sports complex) were collected and initially analysed for the presence of bacterial pathogens. NSW Food Authority staff assessed the food preparation areas of the sports complex and hotel premises against food safety standards and interviewed food handlers about food suppliers and food handling practices.

Stool and vomitus samples collected from 11 patients who attended the emergency department were sent to Central West Pathology Services for microscopy and culture and sensitivity tests. The specimens were then referred to the Institute of Clinical Pathology and Medical Research at Westmead Hospital for testing for norovirus using reverse transcriptase polymerase chain reaction.

Results

Forty-three of the 100 people attending the camp were interviewed. Of these, 25 (58%) met the case definition and 18 were well. The first case had onset of symptoms (vomiting, diarrhoea, fever and abdominal cramps) on 12 April 2004. The next known case presented to the emergency department 36 hours later. Nineteen (76%) of the cases were under 17 years of age compared with 15 (83%) of the non-cases. Five (20%) of the cases were female, as were 2 (11%) of the non-cases.

Among the 25 cases, the typical incubation period was between 36 and 48 hours. The most frequently reported

symptoms were: vomiting (20 people, 80% of cases) and diarrhoea (14 people, 56% of cases). The food choices available to people attending the camp were limited: evening meals for three days included sausages, lasagne and hamburgers. No statistically significant associations were found between foods consumed on the dinner menu for the 3 days before the outbreak and onset of symptoms. No association was observed between hotel of residence or training team and developing gastroenteritis.

Laboratory results from 11 stool specimens indicated 3 were positive and 4 samples equivocal for norovirus. Food and water samples from the sports complex were negative for bacterial pathogens.

Implications

Norovirus was identified as the causative organism in this outbreak. Symptoms and incubation periods were consistent with infection with this organism. As no contributing food or environmental factors could be identified, transmission was believed to be mainly from person to person.

In NSW, gastroenteritis among 2 or more people of any age in an institution is notifiable under the Public Health Act 1991.[1] Outbreaks of gastroenteritis in institutions can be caused by a range of organisms, most commonly viruses.[2] Generally, viral gastroenteritis is associated with one or more of the following symptoms: nausea, vomiting, non-bloody diarrhoea, abdominal pain, myalgia, headache, malaise, and low-grade fever.[3] More recently, there has been an increasing number of gastroenteritis outbreaks reported within institutions in NSW, caused by norovirus.[4] Transmission of norovirus typically occurs via the faecal–oral route, although contact or airborne transmission from fomites has been suggested to account for the rapid spread reported within institutions.[3]

After the outbreak, Mid Western Public Health Unit reviewed its procedures and developed standard operating procedures for managing gastroenteritis outbreaks. These procedures build on recently updated NSW Health response protocols for NSW public health units for both 'Gastroenteritis in an institution' and 'Foodborne illness outbreaks'.

References

1. NSW Public Health Act 1991.
2. BC Centre for Disease Control. Managing outbreaks of gastroenteritis 2003.Available online at www.bccdc.org/downloads/pdf/lab/reports/CDManual_GEGuidelines_sep2003_nov05-03.pdf
3. Chin J, editor. *Control of communicable diseases manual*. 17th ed. Washington, DC: American Public Health Association; 2000: 218–219.
4. NSW Department of Health. Infectious diseases report May 2004. Available online at www.health.nsw.gov.au/living/disupdate.html#gastro.

HIV INFECTIONS AND AIDS

In the first 9 months of 2004, there were 288 people notified with newly diagnosed HIV infection, 57 people notified with AIDS, and 22 people who died following AIDS diagnosis in NSW (Table 3). The proportion of the people notified with new HIV diagnoses so far in 2004 who were female (14%) is almost twice that for 2003 (8%). Among female HIV cases in 2004, however, the distribution of cases by country of birth, age group and exposure history was similar to that in previous years.

QUARTERLY REPORT: AUSTRALIAN CHILDHOOD IMMUNISATION REGISTER

Table 1 details the percentage of fully immunised children aged over 12 months to less than 15 months in each area health service, reported by all service providers. These data refer to children whose age was calculated 90 days before data extraction. The information in the report was extracted from the Australian Childhood Immunisation Register and may be underestimated by approximately 3 per cent, due to children being vaccinated late or to service providers failing to forward information to the register.

Table 2 details the percentage of fully immunised children identified as Aboriginal or Torres Strait Islander in NSW for the same cohort, reported by all service providers.

TABLE 1

PERCENTAGE OF FULLY IMMUNISED CHILDREN AGED 12 MONTHS TO LESS THAN 15 MONTHS BY AREA HEALTH SERVICE

Area health service	31 December 2004
Great Southern	94
Great Western	94
Hunter / New England	93
North Coast	86
Northern Sydney / Central Coast	91
South Eastern Sydney / Illawarra	91
South Western Sydney	90
Western Sydney	89
NSW	91
AUSTRALIA	**91**

TABLE 2

PERCENTAGE OF FULLY IMMUNISED CHILDREN IDENTIFIED AS ABORIGINAL OR TORRES STRAIT ISLANDER, AGED 12 MONTHS TO LESS THAN 15 MONTHS

	31 Dec 03	31 Mar 04	30 Jun 04	30 Sep 04	31 Dec 04
NSW	85	83	85	83	85
Australia	82	83	84	84	86

TABLE 3

CHARACTERISTICS OF NSW RESIDENTS REPORTED WITH HIV INFECTION, AIDS, OR WHO HAVE DIED FROM AIDS, 1981 TO SEPTEMBER 2004

Characteristic	All cases 1981–September 2003						Cases for 2003						Cases January–September 2004					
	HIV		AIDS		AIDS deaths		HIV		AIDS		AIDS deaths		HIV		AIDS		AIDS deaths	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
Gender																		
Female	680	5.3	224	4.1	132	3.6	32	7.7	2	1.6	2	4.9	40	13.9	4	7.0	2	9.1
Male	11848	92.5	5179	95.5	3535	96.2	371	89.8	123	96.9	39	95.1	245	85.1	52	91.2	20	90.9
Transgender	27	0.2	16	0.3	8	0.2	0	0.0	2	1.6	0	0.0	0	0.0	1	1.8	0	0.0
Not stated	252	2.0	5	0.1	1	0.0	10	2.4	0	0.0	0	0.0	3	1.0	0	0.0	0	0.0
Age																		
0–2	27	0.2	7	0.1	1	0.0	0	0.0	0	0.0	0	0.0	1	0.3	0	0.0	0	0.0
3–12	37	0.3	12	0.2	12	0.3	2	0.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
13–19	204	1.6	13	0.2	9	0.2	3	0.7	0	0.0	0	0.0	4	1.4	0	0.0	0	0.0
20–29	4047	31.6	781	14.4	377	10.3	95	23.0	7	5.5	0	0.0	67	23.3	3	5.3	0	0.0
30–39	4925	38.5	2230	41.1	1447	39.4	165	40.0	41	32.3	9	22.0	111	38.5	23	40.4	6	27.3
40–49	2417	18.9	1594	29.4	1206	32.8	88	21.3	38	29.9	24	58.5	71	24.7	15	26.3	5	22.7
50–59	784	6.1	593	10.9	460	12.5	45	10.9	33	26.0	6	14.6	23	8.0	11	19.3	8	36.4
60+	272	2.1	194	3.6	164	4.5	15	3.6	8	6.3	2	4.9	11	3.8	5	8.8	3	13.6
Not stated	94	0.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Exposure																		
Male homosexual–bisexual	7662	59.8	4365	80.5	3026	82.3	285	69.0	89	70.1	25	61.0	179	62.2	41	71.9	14	63.6
Male homosexual–bisexual and IDU**	328	2.6	229	4.2	160	4.4	9	2.2	9	7.1	5	12.2	6	2.1	2	3.5	4	18.2
Injecting drug use	423	3.3	117	2.2	60	1.6	12	2.9	8	6.3	3	7.3	12	4.2	4	7.0	2	9.1
Heterosexual	898	7.0	349	6.4	163	4.4	64	15.5	17	13.4	7	17.1	49	17.0	8	14.0	2	9.1
Haemophilia/Coagulation disorders	114	0.9	53	1.0	48	1.3	0	0.0	0	0.0	0	0.0	0	0.0	1	1.8	0	0.0
Blood or tissue recipient/NSI*	136	1.1	101	1.9	93	2.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Vertical	38	0.3	15	0.3	8	0.2	2	0.5	0	0.0	0	0.0	1	0.3	0	0.0	0	0.0
Undetermined	3167	24.7	50	0.9	28	0.8	38	9.2	3	2.4	1	2.4	40	13.9	1	1.8	0	0.0
Not stated	41	0.3	145	2.7	90	2.4	3	0.7	1	0.8	0	0.0	1	0.3	0	0.0	0	0.0
Residence																		
Greater Sydney***	7115	55.6	4478	82.6	74	2.0	320	77.5	89	70.1	22	53.7	223	77.4	39	68.4	14	63.6
Rest of New South Wales	845	6.6	734	13.5	30	0.8	63	15.3	23	18.1	12	29.3	40	13.9	9	15.8	5	22.7
Unknown	4847	37.8	352	6.5	3572	97.2	30	7.3	15	11.8	7	17.1	25	8.7	9	15.8	3	13.6
Total	12807	100	5424	102.58	3676	100	413	100	127	100	41	100	288	100	57	100	22	100

Source: NSW HIV–AIDS database, Communicable Diseases Branch, NSW Department of Health. Recent HIV data may contain duplicates.

Note: Excludes notifications where a previous diagnosis occurred outside NSW. Recent HIV data may contain duplicates.

* Needle-stick injury. ** Injecting drug use.

***Greater Sydney area health services include Central Sydney, North Sydney, Western Sydney, Wentworth, South West Sydney, and South East Sydney.

FIGURE 1

REPORTS OF SELECTED COMMUNICABLE DISEASES, NSW, JAN 1999 TO DEC 2004, BY MONTH OF ONSET

Preliminary data: case counts in recent months may increase because of reporting delays.
Laboratory-confirmed cases only, except for measles, meningococcal disease and pertussis
BFV = Barmah Forest virus infections,
RRV = Ross River virus infections
lab+ = laboratory confirmed

Men Gp C and Gp B = meningococcal disease due to serogroup C and serogroup B infection, other/unk = other or unknown serogroups.
NB: multiple series in graphs are stacked, except gastroenteritis outbreaks.
NB: Outbreaks are more likely to be reported by nursing homes and hospitals than from other institutions

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

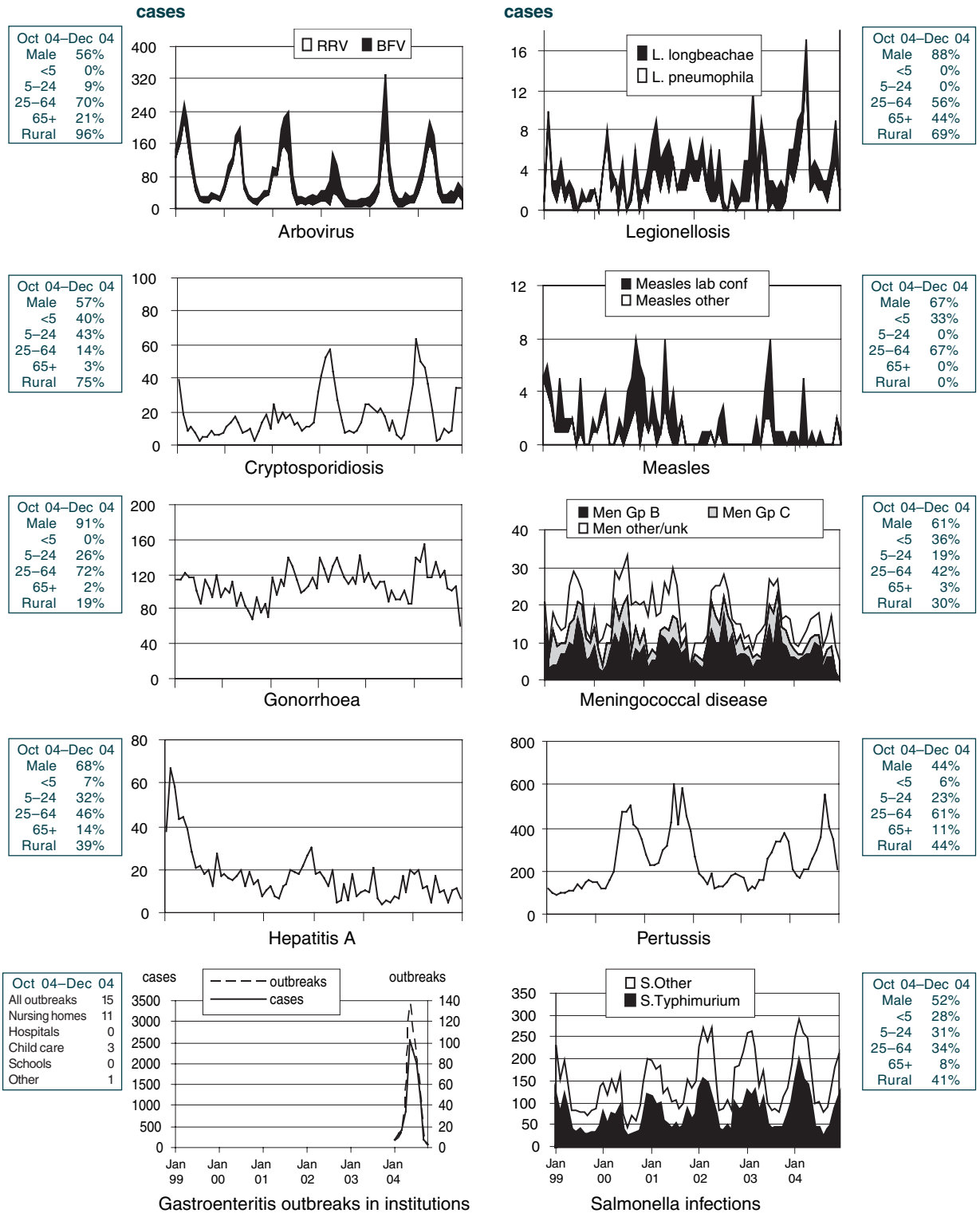


TABLE 4 REPORTS OF NOTIFIABLE CONDITIONS RECEIVED IN NOVEMBER 2004 BY AREA HEALTH SERVICES

Condition	Area Health Service																		Total	
	CSA	NSA	WSA	WEN	SWS	CCA	HUN	ILL	SES	NRA	MNC	NEA	MAC	MWA	FWA	GMA	SA	CHS	for Nov†	To date†
Blood-borne and sexually transmitted																				
Chancroid*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlamydia (genital)*	129	121	75	20	61	32	108	30	168	42	37	32	6	18	3	29	24	1	940	9431
Gonorrhoea*	62	21	12	-	11	3	5	6	61	6	-	1	-	1	-	2	2	-	194	1478
Hepatitis B—acute viral*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37
Hepatitis B—other*	45	40	38	8	70	2	7	5	51	3	2	2	-	-	-	2	1	-	276	3636
Hepatitis C—acute viral*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Hepatitis C—other*	43	21	51	31	74	32	49	38	66	36	29	19	8	15	2	12	9	5	549	6391
Hepatitis D—unspecified*	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	-	-	-	2	13
Syphilis	3	5	8	-	20	2	1	1	20	2	-	4	-	1	-	-	-	-	67	1026
Vector-borne																				
Barmah Forest virus*	-	-	-	-	-	1	5	-	-	11	10	3	-	-	-	3	1	-	34	364
Ross River virus*	-	-	-	-	-	-	4	1	-	3	2	5	-	-	2	2	4	-	23	666
Arboviral infection (Other)*	-	1	-	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	3	38
Malaria*	-	2	3	1	2	-	-	-	1	-	-	-	-	-	-	-	-	-	9	88
Zoonoses		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Anthrax*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brucellosis*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Leptospirosis*	-	-	-	-	-	-	-	-	-	1	-	2	-	-	-	-	-	-	3	35
Lyssavirus*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Psittacosis*	-	-	-	-	-	-	1	-	-	-	-	3	-	-	-	1	-	-	5	68
Q fever*	-	-	-	-	-	-	-	-	-	1	2	4	6	1	-	-	-	-	14	198
Respiratory and other																				
Blood lead level*	1	1	-	-	1	1	2	1	1	-	-	-	-	-	-	-	-	-	8	263
Influenza*	-	29	20	1	16	-	6	1	42	1	1	1	2	-	-	3	-	-	123	859
Invasive pneumococcal infection*	-	9	3	2	6	2	5	5	7	2	-	2	-	4	-	1	1	-	49	831
Legionella longbeachae infection*	-	-	-	-	1	-	1	1	-	-	-	-	-	-	-	-	-	-	3	26
Legionella pneumophila infection*	-	-	-	1	1	-	-	-	1	-	-	-	-	1	-	-	-	-	4	46
Legionnaires' disease (other)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Leprosy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Meningococcal infection (invasive)*	2	1	-	1	-	-	4	-	2	-	-	-	-	-	-	-	-	-	10	142
Tuberculosis	2	-	2	-	2	3	-	1	8	-	-	-	-	-	1	2	-	-	22	365
Vaccine-preventable																				
Adverse event after immunisation**	3	-	1	-	1	-	-	-	1	-	-	-	1	-	-	3	-	-	10	175
H. *Influenzae b* infection (invasive)*	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	4
Measles	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	10
Mumps*	-	4	1	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-	7	53
Pertussis	24	52	36	21	22	22	64	22	79	9	3	4	18	3	-	16	15	-	410	3218
Rubella*	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	17
Tetanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Enteric																				
Botulism	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cholera*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cryptosporidiosis*	-	1	1	-	1	-	-	4	2	-	2	3	8	1	-	1	-	-	24	290
Giardiasis*	-	20	8	2	7	3	4	4	23	-	2	2	1	4	2	-	1	-	85	1136
Haemolytic uraemic syndrome	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	1	-	-	3	9
Hepatitis A*	1	2	2	-	1	2	-	1	-	1	1	1	-	-	-	-	-	-	12	138
Hepatitis E*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Listeriosis*	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	28
Salmonellosis*	2	22	14	3	23	4	14	6	11	25	5	7	1	2	-	6	2	-	148	1910
Shigellosis*	1	2	2	-	1	1	-	-	1	-	-	-	-	-	1	-	-	-	9	92
Typhoid and paratyphoid*	-	-	-	-	2	-	-	-	2	-	-	1	-	-	-	-	-	-	5	29
Verotoxin producing *E. coli**	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	3
Miscellaneous																				
Creutzfeldt-Jakob disease	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	2	6
Meningococcal conjunctivitis			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2

* lab-confirmed cases only + includes cases with unknown postcode * * HIV and AIDS data are reported separately in the *NSW Public Health Bulletin* each quarter

** AEFIs notified by the school vaccination teams during the National Meningococcal C Program are not included in these figures. These notifications are reviewed regularly by a panel of experts and the results will be published quarterly in the *NSW Public Health Bulletin* in 2005

CSA = Central Sydney Area
NSA = Northern Sydney Area
WSA = Western Sydney Area
WEN = Wentworth Area
SWS = South Western Sydney Area
CCA = Central Coast Area
HUN = Hunter Area
ILL = Illawarra Area
SES = South Eastern Sydney Area
NRA = Northern Rivers Area
MNC = North Coast Area
NEA = New England Area
MAC = Macquarie Area
MWA = Mid Western Area
FWA = Far West Area
GMA = Greater Murray Area
SA = Southern Area
CHS = Corrections Health Service

TABLE 5 REPORTS OF NOTIFIABLE CONDITIONS RECEIVED IN DECEMBER 2004 BY AREA HEALTH SERVICES

Condition	Area Health Service																		Total	
	CSA	NSA	WSA	WEN	SWS	CCA	HUN	ILL	SES	NRA	MNC	NEA	MAC	MWA	FWA	GMA	SA	CHS	for Dec†	To date†
Blood-borne and sexually transmitted																				
Chancroid*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chlamydia (genital)*	54	87	78	18	57	25	80	49	154	37	24	29	10	16	7	32	17	3	784	10320
Gonorrhoea*	8	7	5	4	2	-	2	4	49	1	2	1	1	-	1	-	1	-	90	1634
Hepatitis B—acute viral*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37
Hepatitis B—other*	26	31	49	4	57	5	4	1	32	3	6	2	2	2	2	3	-	2	232	3929
Hepatitis C—acute viral*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14
Hepatitis C—other*	48	23	42	15	57	22	37	18	81	29	38	7	5	14	5	14	9	17	486	6964
Hepatitis D—unspecified*	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	1	14
Syphilis	27	8	6	1	17	-	2	1	19	3	-	2	1	1	7	-	-	-	95	1102
Vector-borne																				
Barmah Forest virus*	-	-	-	-	-	-	2	-	-	10	11	-	1	-	-	-	-	-	24	389
Ross River virus*	-	-	-	2	1	-	4	-	-	4	5	3	1	-	3	-	-	-	23	692
Arboviral infection (other)*	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	1	-	4	42
Malaria*	-	1	1	-	1	-	-	-	2	-	1	-	-	-	-	1	-	-	7	98
Zoonoses																				
Anthrax*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Brucellosis*	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1	-	-	2	8
Leptospirosis*	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	2	37
Lyssavirus*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Psittacosis*	-	-	-	-	-	-	2	-	-	1	1	-	-	-	-	-	-	-	4	73
Q fever*	-	-	-	-	-	-	3	-	-	4	5	3	3	1	-	1	-	-	20	221
Respiratory and other																				
Blood lead level*	1	1	-	-	11	-	2	-	-	1	1	-	2	-	-	-	-	-	19	286
Influenza*	-	11	20	-	14	1	1	1	33	-	-	-	5	-	-	2	-	-	88	954
Invasive pneumococcal infection*	4	7	3	2	2	2	3	4	6	2	-	-	-	3	1	2	3	-	44	886
Legionella longbeachae infection*	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	1	-	3	28
Legionella pneumophila infection*	-	-	1	-	-	1	-	2	-	-	-	-	-	-	-	-	-	-	4	50
Legionnaires- disease (Other)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Leprosy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Meningococcal infection (invasive)*	-	2	-	-	-	1	1	-	1	-	-	-	-	-	1	-	-	-	6	148
Tuberculosis	3	11	9	3	2	-	2	-	6	1	-	-	-	-	-	-	2	-	39	411
Vaccine-preventable																				
Adverse event after immunisation**	-	-	-	1	1	1	-	-	-	-	-	-	1	-	-	6	-	-	10	185
H. *Influenzae b* infection (invasive)*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4
Measles	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	12
Mumps*	1	3	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	6	60
Pertussis	22	28	47	19	26	12	40	20	41	17	10	6	22	7	2	14	8	-	341	3578
Rubella*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17
Tetanus	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Enteric																				
Botulism	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cholera*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Cryptosporidiosis*	-	-	2	2	1	-	4	1	2	1	6	2	9	2	-	4	-	-	36	328
Giardiasis*	8	16	13	3	6	4	2	3	12	-	2	2	2	3	1	3	1	-	82	1221
Haemolytic uraemic syndrome	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9
Hepatitis A*	-	1	4	-	-	-	-	-	1	1	1	-	-	-	-	-	-	-	8	146
Hepatitis E*	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	7
Listeriosis*	-	-	-	-	1	-	-	-	2	-	-	-	-	-	-	-	-	-	3	31
Salmonellosis*	16	29	38	2	28	10	8	11	31	17	8	8	-	7	2	-	2	-	217	2144
Shigellosis*	-	1	1	-	-	1	-	-	1	1	-	-	-	-	1	-	-	-	6	98
Typhoid and paratyphoid*	-	-	1	-	3	-	-	-	1	-	-	-	-	-	-	-	-	-	5	34
Verotoxin producing *E. coli**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3
Miscellaneous																				
Creutzfeldt-Jakob disease	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6
Meningococcal conjunctivitis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2

* lab-confirmed cases only + includes cases with unknown postcode * * HIV and AIDS data are reported separately in the *NSW Public Health Bulletin* each quarter

** AEFIs notified by the school vaccination teams during the National Meningococcal C Program are not included in these figures. These notifications are reviewed regularly by a panel of experts and the results will be published quarterly in the *NSW Public Health Bulletin* in 2005

CSA = Central Sydney Area
NSA = Northern Sydney Area
WSA = Western Sydney Area
WEN = Wentworth Area
SWS = South Western Sydney Area
CCA = Central Coast Area
HUN = Hunter Area
ILL = Illawarra Area
SES = South Eastern Sydney Area
NRA = Northern Rivers Area
MNC = North Coast Area
NEA = New England Area
MAC = Macquarie Area
MWA = Mid Western Area
FWA = Far West Area
GMA = Greater Murray Area
SA = Southern Area
CHS = Corrections Health Service