

## 5. METHODS

### Introduction

In 2004, the NSW Department of Health, in conjunction with the 8 area health services, completed the third year of the New South Wales Population Health Survey, an ongoing survey of the health of the people of New South Wales using computer assisted telephone interviewing (CATI). The main aims of the survey are to provide detailed information on the health of the people of New South Wales, and to support planning, implementation, and evaluation of health services and programs in New South Wales.

Prior to the introduction of the New South Wales Population Health Survey in 2002, the Centre for Epidemiology and Research conducted adult health surveys in 1997 and 1998, an older people's health survey in 1999, and a child health survey in 2001.

This section describes the methods used for the *2004 Report on Adult Health from the New South Wales Population Health Survey*, which reports on the health of residents aged 16 years and over.

### New South Wales Population Health Survey

#### Survey instrument

The survey instrument for the New South Wales Population Health Survey was developed by the Health Survey Program in consultation with key stakeholders, area health services, other government departments, and a range of experts.

The survey instrument included: questions used in previous surveys, new questions developed specifically for 2004, and questions developed specifically for some of the area health services. All new questions that had previously not been used were submitted to the Ethics Committee of the NSW Department of Health for approval prior to their use. New questions were also field tested prior to inclusion in the survey.

The final survey instrument covered the 8 priority areas outlined in *Healthy People 2005: New Directions for Public Health in New South Wales*,<sup>1</sup> and included questions on:

- social determinants of health;
- environmental determinants of health;
- individual or behavioural determinants of health;
- major health problems;
- population groups with special needs;
- settings;
- partnerships;
- infrastructure.

The survey instrument was translated into 5 languages: Arabic, Chinese, Greek, Italian and Vietnamese.

#### Survey sample

In 2004, the target population for the New South Wales Population Health Survey was all residents living in households with private telephones. The target sample

comprised approximately 1,500 people in each of the 8 area health services (total sample of 12,000).

The sampling frame was developed as follows. Records from the Australia on Disk electronic white pages (phone book) were geo-coded using MapInfo mapping software.<sup>2,3</sup> The geo-coded telephone numbers were assigned to statistical local areas and area health services. The proportion of numbers for each telephone prefix by area health service was calculated. All prefixes were expanded with suffixes ranging from 0000 to 9999. The resulting list was then matched back to the electronic phone book. All numbers that matched numbers in the electronic phone book were flagged and the number was assigned to the relevant geo-coded area health service. Unlisted numbers were assigned to the area health service containing the greatest proportion of numbers with that prefix. Numbers were then filtered to eliminate contiguous unused blocks of greater than 10 numbers. The remaining numbers were then checked against the business numbers in the electronic phone book to eliminate business numbers. Finally, numbers were randomly sorted.

Households were contacted using random digit dialling. One person from the household was randomly selected for inclusion in the survey.

#### Interviews

In 2004, interviews were carried out continuously between February and December. Selected households that had addresses in the electronic phone book were sent a letter describing the aims and methods of the survey 2 weeks prior to initial attempts at telephone contact. An 1800 freecall contact number was provided for potential respondents to verify the authenticity of the survey and to ask any questions regarding the survey. Trained interviewers at the Health Survey Program CATI facility carried out interviews. Up to 7 calls were made to establish initial contact with a household, and 5 calls were made in order to contact a selected respondent.

#### Call outcomes and response rates

During the survey, 63,433 telephone numbers were called. The outcome for these telephone numbers is shown in Table 1. Only 21,855 (34 per cent) of the numbers called yielded an eligible household. The remaining numbers were not answered (despite 7 call backs); or were disconnected; or were business, fax, or interstate numbers.

In total, 11,830 interviews were conducted, with at least 1,288 interviews in each area health service and 9,786 with people aged 16 years or over. The overall response rate was 61.2 per cent (completed interviews divided by completed interviews and refusals). Response rates varied by health area, from 53.5 per cent in Sydney West Area Health Service to 66.7 per cent in Greater Southern Area Health Service (Table 2). Most respondents (99 per cent) were interviewed in English. The remaining interviews were conducted in Arabic, Chinese, and Greek (Table 3).

## Data analysis

For analysis, the survey sample was weighted to adjust for differences in the probabilities of selection among subjects. These differences were due to the varying number of people living in each household, the number of residential telephone connections for the household, and the varying sampling fraction in each health area.

Post-stratification weights were used to reduce the effect of differing non-response rates among males and females and different age groups on the survey estimates. These weights were adjusted for differences between the age and sex structure of the survey sample and the Australian Bureau of Statistics 2003 mid-year population estimates (excluding people resident in institutions) for each area health service. Further information on the weighting process is provided elsewhere.<sup>4</sup>

Call and interview data were manipulated and analysed using SAS version 8.02.<sup>5</sup> The SURVEYMEANS procedure in SAS was used to analyse the data and calculate point estimates and 95 per cent confidence intervals for the estimates. A 95 per cent confidence interval contains the actual value 95 per cent of the time. The narrower the 95 per cent confidence interval, the higher the precision of the estimate; the wider the 95 per cent confidence interval, the lower the precision of the estimate. The SURVEYMEANS procedure calculates standard errors adjusted for the design effect factor or DEFF (the variance for a non-random sample divided by the variance for a simple random sample). It uses the Taylor expansion method to estimate sampling errors of estimators based on the stratified random sample.<sup>5</sup>

### The Kessler 10 measure of psychological distress

In 2004, the Kessler 10 (K10) scale was included in the New South Wales Population Health Survey as a measure of psychological distress.<sup>6,7</sup> The K10 is a 10-item questionnaire intended to yield a global measure of psychological distress. It includes questions about the level of anxiety and depressive symptoms in the most recent 4-week period. For each question, there is a 5-level response scale based on the amount of time—from none of the time through to all the time—during a 4-week period that the person experienced the particular problem.

When scoring responses to the questionnaire, between one and 5 points were assigned to each symptom with a value of one indicating that the person experiences the problem 'none of the time' and 5 indicating 'all of the time'. It follows that the total K10 score for each person ranges from 10 points (that is, all responses are 'none of the time') through to 50 (all responses are 'all of the time').<sup>8,9</sup>

The K10 scores calculated for the New South Wales Population Health Survey are a combination of actual and imputed scores. Where a respondent answered all 10 questions, the K10 score was simply the sum of the individual scores for each question. Where the respondent answered 9 questions, the score for the missing question was imputed as the mean score of the 9 answered questions.

TABLE 1

### OUTCOME OF TELEPHONE CALLS

Outcome	Number of telephone numbers
Unable to contact	11,636
Not connected	21,596
Business–institution telephone	4,259
Fax number	3,741
Not in NSW or holiday house	345
Respondent away	800
Respondents confused or deaf	742
Non-translated language	941
Refusal	7,543
Complete	11,830
<b>Total telephone numbers called</b>	<b>63,433</b>

TABLE 2

### COMPLETED INTERVIEWS AND RESPONSE RATES BY HEALTH AREA

Health area	Total respondents	Response rate (%)
Sydney South West	1,344	54.1
South Eastern Sydney & Illawarra	1,339	59.4
Sydney West	1,389	53.5
Northern Sydney & Central Coast	1,288	59.2
Hunter & New England	1,393	65.6
North Coast	1,529	64.8
Greater Southern	1,328	66.7
Greater Western	2,220	66.2
<b>Total</b>	<b>11,830</b>	<b>61.2</b>

TABLE 3

### COMPLETED INTERVIEWS BY LANGUAGE

Language	Number of respondents
English	11,767
Arabic	39
Chinese	13
Greek	11
<b>All</b>	<b>11,830</b>

### Indices of geographic remoteness and socioeconomic disadvantage: ARIA and SEIFA

The Accessibility–Remoteness Index of Australia Plus (ARIA+) is the standard Australian Bureau of Statistics endorsed measure of remoteness.<sup>10</sup> It is derived using road distances from populated localities to the nearest service centres across Australia. For each locality, the accessibility to services is expressed as a continuous measure from 0 (high accessibility) to 15 (high remoteness) and grouped into 5 categories: major cities, inner regional, outer regional, remote, and very remote.

The Socio-Economic Indexes for Areas (SEIFA) describe the socioeconomic aspects of geographical areas in Australia, using a number of underlying variables such as family and household characteristics, personal educational qualifications, and occupation.<sup>11</sup> The SEIFA index that is used to provide breakdowns of the New South Wales Population Health Survey data in 2004 is the Index of Relative Socio-Economic Disadvantage. This index is calculated on attributes such as low income and educational attainment, high unemployment, and people working in unskilled occupations. The SEIFA index values are grouped into 5 quintiles, with quintile one being the least disadvantaged and quintile 5 being the most disadvantaged.

Both the ARIA+ and SEIFA indexes were assigned to the results of the New South Wales Population Health Survey in 2004 based on respondents' postcode of residence. Rates for each SEIFA quintile were calculated for several health indicators included in this report to enable socioeconomic comparisons.

## References

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MAP OF NSW AREA HEALTH SERVICES

