2007 National Survey of Mental Health and Wellbeing: methods and key findings

Tim Slade, Amy Johnston, Mark A. Oakley Browne, Gavin Andrews, Harvey Whiteford

Objective: To provide a description of the methods and key findings of the 2007 Australian National Survey of Mental Health and Wellbeing.

Method: A national face-to-face household survey of 8841 (60% response rate) community residents aged between 16 and 85 years was carried out using the World Mental Health Survey Initiative version of the Composite International Diagnostic Interview. Diagnoses were made according to ICD-10. Key findings include the prevalence of mental disorder, sex and age distributions of mental disorders, severity of mental disorders, comorbidity among mental disorders, and the extent of disability and health service use associated with mental disorders.

Results: The prevalence of any lifetime mental disorder was 45.5%. The prevalence of any 12 month mental disorder was 20.0%, with anxiety disorders (14.4%) the most common class of mental disorder followed by affective disorders (6.2%) and substance use disorders (5.1%). Mental disorders, particularly affective disorders, were disabling. One in four people (25.4%) with 12 month mental disorders had more than one class of mental disorder. One-third (34.9%) of people with a mental disorder used health services for mental health problems in the 12 months prior to the interview.

Conclusions: Mental disorders are common in Australia. Many people have more than one class of mental disorder. Mental disorders are associated with substantial disability, yet many people with mental disorders do not seek help for their mental health problems.

Key words: Comorbidity, ICD-10, epidemiology, mental disorder, prevalence.

Tim Slade, Senior Research Fellow (Correspondence); Amy Johnston, Research Associate

National Drug and Alcohol Research Centre, University of New South Wales, Sydney, NSW 2052, Australia. Email: tims@unsw.edu.au

Mark A. Oakley Browne, Professor

Discipline of Psychiatry, University of Tasmania, Hobart, Tasmania, Australia

Gavin Andrews, Scientia Professor

Clinical Research Unit for Anxiety and Depression, University of New South Wales and St Vincent's Hospital, Sydney, New South Wales, Australia

Harvey Whiteford, Kratzmann Professor

Queensland Centre for Mental Health Research, School of Population Health, University of Queensland, Brisbane, Queensland, Australia

Received 1 March 2009; accepted 19 March 2009.

Accurate population estimates of the prevalence of mental disorders are vital to understanding the size and nature of the health challenges posed by these disorders. Combined with information about mental disorder-related disability, such prevalence estimates provide policy-relevant information on the burden of mental disorders at the population level [1]. Equally important are population estimates of the extent and type of health service utilization by people with mental disorders. Such estimates inform policy decisions about the optimal organization of a mental health-care system.

The 1997 National Survey of Mental Health and Wellbeing (NSMHWB) was the first nationally representative survey of mental disorders carried out in Australia [2]. It represented a landmark study in the epidemiology of mental disorders in Australia and yielded a number of findings that have been integral to both mental health policy and research endeavours for the past 10 years. In 1997 one in five Australians met criteria for mental disorders in any given year [3]; the extent of health service use among people who met criteria for mental disorders was low [4]; general practitioners were the primary provider of mental health services [5]; mental disorders were associated with significant disability [6]; and mental disorders co-occurred more often than would be expected by chance [7]. These findings have led to innovative reforms in the Australian mental health-care system including recent programmes to provide better access to psychiatrists, psychologists and general practitioners for help with mental health problems [8].

Acknowledging the importance of epidemiological data in understanding the population challenges posed by mental disorders in Australia, a second national survey of mental disorders was carried out in 2007. The aims of the 2007 NSMHWB were to provide up-to-date and internationally comparable descriptive epidemiological information regarding the prevalence of the common mental disorders, the impairment and severity associated with mental disorders and to allow for a detailed and novel exploration of the relationship between the experience of mental disorders and the use of health care services. This latter aim received considerable attention in the 2007 NSMHWB, with a much expanded service use module included in the survey interview.

The aim of the current paper was to provide a detailed description of the methodology used in the 2007 NSMHWB as well as to provide the key findings from the 2007 NSMHWB. More comprehensive results are presented in the remaining papers contained in this issue of the journal.

Methods

Sample

The 2007 NSMHWB was commissioned by the Department of Health and Ageing and conducted by the Australian Bureau of Statistics (ABS) under the *Census and Statistics Act, 1905*. All interviews were carried out between August and December 2007. Respondents were selected at random from a stratified, multistage area probability sample of private dwellings. The population in scope for selection was persons aged 16–85 years who were usual residents of private dwellings across Australia. Household information was provided by any householder aged over 17 years, and from all eligible respondents an algorithm randomly selected a householder to complete a personal interview. At this point, the youngest (16–24 years) and oldest (65–85 years) age groups had a higher probability of being selected. This was to ensure that sufficient samples sizes were achieved to improve the reliability of estimates for these groups. Further methodological detail can be found elsewhere [9]. Sampling procedures generated an initial sample of 17 352 dwellings. Following loss of ineligible dwellings, due to all household members being out of scope or vacant dwellings, the effective sample size was 14 805. Of these, 8841 respondents completed the interview, representing a 60% response rate. Of the 5964 non-responders 61% were full refusals, 21% did not complete the full survey despite the provision of household information by a member of the household (who may or may not have been the selected respondent), and the remaining 12% provided partial or incomplete information. The achieved sample of 8841 represents an estimated population count of 16 015 000 Australian adults. Table 1 shows the total sample counts (with associated unweighted percentages) and estimated population counts (with associated weighted percentages) split by different demographic characteristics.

Non-response follow-up study

Due to the lower than expected response rate a purposive sample of fully non-responding households in two metropolitan areas, Sydney and Perth, was followed up with a short-form interview to gain a qualitative assessment of non-response bias. The interview consisted of demographic information and the Kessler 10 Psychological Distress Scale (K10) [10], included as an indicator of mental health status. The non-response follow-up study achieved a response rate of 40% (n=151). The study indicated the impact of non-response to be small at the aggregate level, but possible underestimation of the prevalence of mental disorders may exist for men, young persons and the Perth population. Due to the small, non-random nature of the non-response follow-up sample the results were not incorporated into the survey estimation strategy.

Survey interview

The World Mental Health Survey Initiative version of the Composite International Diagnostic Interview (WMH-CIDI) [11] was used as the base interview. This interview has undergone extensive methodological development and testing and has been used in household surveys in at least 28 countries around the world. This version of the instrument collects both diagnostic information on a broad range of mental disorders and information on risk factors, impacts, patterns and treatment of mental disorders.

Modifications were made to the WMH-CIDI for the specific purpose of the 2007 NSMHWB. First, some diagnostic and demographic sections were removed to reduce respondent burden and meet the target average interview length of 90 min. The post-traumatic stress disorder (PTSD) section was edited to remove

Table 1. Survey respondent characteristics: 2007 NSMHWB

	Sample Count	Unweighted %	EPC ('000)	Weighted %
Sex				
Male	4025	45.5	7949.8	49.6
Female	4816	54.5	8065.5	50.3
Age (years)				
16–24	1471	16.6	2545.4	15.9
25–34	1290	14.6	2811.8	17.6
35–44	1638	18.5	3070.3	19.2
45–54	1264	14.3	2858.6	17.8
55–64	1273	14.4	2323.8	14.5
65–74	1104	12.5	1434.3	9.0
75–85	801	9.1	971.1	6.1
Marital status				
Married/De facto	4328	49.0	9136.1	57.0
Widowed/Separated/Divorced	1868	21.1	2160.6	13.5
Never married	2645	29.9	4718.6	29.5
Labour force status				
Employed	5499	62.2	10 447.8	65.2
Unemployed	216	2.4	413.5	2.6
Not in the labour force	3126	35.4	5154.0	32.2
Education				
No qualification	4808	54.4	8631.1	53.9
School qualification only	1116	12.6	2233.5	13.9
Post-school qualification	2917	33.0	5150.7	32.2
Country of birth				
Australia	6533	73.9	11 671.4	72.9
Other English-speaking country	1028	11.6	1801.7	11.2
Other non English-speaking country	1280	14.5	2542.2	15.9
Total	8841		16 015.3	

EPC, estimated population count; NSMHWB, National Survey of Mental Health and Wellbeing. EPCs are rounded to the nearest 100.

symptom questions relating to the respondent's worst traumatic event. This was carried out to ensure greater brevity with minimal loss of critical information. Second, the instrument was tailored to the Australian context. This involved some minor language edits throughout the instrument, adoption of the ABS standard demographics section and development of an Australian service use and medications section. To ensure close comparability with the 1997 NSMHWB the substance use section in the 2007 NSMHWB interview was expanded to allow collection of drug-specific diagnostic information with regard to four separate classes of drugs (cannabis, sedatives, stimulants and opioids). Sequencing problems in earlier versions of the WMH-CIDI substance use section were also resolved [12–14]. Third, the Part I/II structure in the standard WMH-CIDI interview, in which some diagnostic sections are asked only of a subsample of the total sample, was removed. See Table 2 for a full list of the sections included in the 2007 NSMHWB.

The content of the 2007 NSMHWB was developed in consultation with a reference group that consisted of academic experts, patient, carer and government representatives as well as survey methodologists within the ABS. The survey development process also involved cognitive testing, pilot testing and dress rehearsal phases with reporting, consultation and amendments made at each stage.

Diagnostic assessment

The WMH-CIDI produces diagnostic information according to DSM-IV and ICD-10. Only ICD-10 diagnoses are reported here. The WMH-CIDI uses a lifetime time frame. Questions on experiences of symptoms in the previous 12 months and 30 days in combination with lifetime diagnoses were used to establish 12 month and 30 day diagnoses, respectively. Diagnoses were derived using standard WMH-CIDI diagnostic algorithms. Modifications were made where necessary and extensive validation was undertaken by the ABS in consultation with two of the authors, TS and AJ. Additional harmful use/abuse and dependence diagnostic algorithms were devised for the four separate drug categories, based on existing WMH-CIDI algorithms.

Organic exclusion criteria (whether the symptoms of a given mental disorder were a direct result of substances or general medical conditions) were coded as open text responses in the interview. These

Table 2. Content of the interview used in the 2007 NSMHWB

Section number	Content
1.	Household form§
2.	Demographics§
3.	Chronic conditions§
4.	K10 plus‡
5.	Functioning‡
6.	Mini Mental State Examination§
7.	Screener†
8.	Depression†
9.	Mania†
10.	Panic disorder†
11.	Social phobia†
12.	Agoraphobia†
13.	Generalized anxiety disorder†
14.	Substance use‡
15.	Suicidality†
16.	Post-traumatic stress disorder‡
17.	Obsessive compulsive disorder†
18.	Psychotic experiences§
19.	Main problem§
20.	Service utilization§
21.	Medications§
22.	Social networks‡
23.	Caregiving‡

NSMHWB, National Survey of Mental Health and Wellbeing. †Sourced from World Mental Health Survey Initiative version of the Composite International Diagnostic Interview (WMH-CIDI), minor language edits made; ‡sourced from WMH-CIDI, major edits or sequencing changes made; §devised for 2007 NSMHWB or sourced from elsewhere.

open text responses were reviewed in consultation with a psychiatrist to determine whether or not the organic exclusion criteria were met. For certain disorders the algorithms produced diagnoses both with and without the hierarchy rules. Diagnoses are reported here with the hierarchy rules applied, with the exception of diagnoses of harmful use, which are reported without hierarchy (i.e. harmful use regardless of dependence). In order to capture the true extent of co-occurring disorders the 'without hierarchy' diagnoses are used when exploring comorbidity.

The diagnoses covered in the 2007 NSMHWB were categorized into three classes of mental disorder: (i) affective disorders: depression, dysthymia, bipolar affective disorder; (ii) anxiety disorders: agoraphobia, social phobia, panic disorder, generalized anxiety disorder (GAD), obsessive–compulsive disorder, PTSD; and (iii) substance use disorders: harmful use and dependence derived separately for alcohol, cannabis, sedatives, stimulants and opioids.

Interview procedure

Interviews were carried out by ABS interviewers with extensive prior experience in conducting household surveys. All interviewers completed a comprehensive 4 day training programme. In addition to the skills required for household surveys generally, the programme provided sensitivity training, question-by-question instructions and an understanding of the survey concepts and definitions. The programme trainers had undertaken the official WMH-CIDI training programme delivered by staff from the United States CIDI Training and Reference Centre based at the University of Michigan. Interviews were conducted in the respondent's households using a Computer-Assisted Personal Interview (CAPI) questionnaire and took an average of 90 min to complete. Survey participation was voluntary and not remunerated. Due to the sensitive and personal nature of the information collected, interviews were conducted in private, and proxy and foreign language interviews were not conducted.

Weights

Data were initially weighted according to the inverse of the probability of being selected in the survey. These initial weights were then calibrated against known population estimates derived from other data sources or benchmarks (such as census data). In addition to the standard ABS procedures of calibration of initial weights to the benchmarks of state, part of state, age and sex, weights were further calibrated against benchmarks for household composition, educational attainment and labour force status.

Sociodemographic characteristics

The sociodemographic characteristics of age at interview and sex were collected as part of the standard demographics section and are presented in the current paper. Further sociodemographic characteristics such as marital status, labour force status, education, country of birth, income (both personal and household), family composition and socioeconomic status were also collected but are not presented here. 'Rurality' (a measure of the geographic location of survey respondents) is also a key sociodemographic characteristic and, although not presented in the current paper, the 2007 NSMHWB is able to provide information on the prevalence of mental disorders according to the Australian Standard Geographical Classification's Accessibility/Remoteness Index of Australia, which is based on estimates of access to goods, services and social interaction. It has been argued, however, that these existing rurality categories have limited ability to address the sociocultural, economic, and environmental characteristics that characterize non-metropolitan regions [15,16]. Furthermore, the 2007 NSMHWB is limited in its representation of people from remote and very remote areas. For this reason a longitudinal survey, entitled the Australian Rural Mental Health Study (ARMHS), commenced in 2006 with the aims of investigating the determinants and outcomes of common mental disorders in rural and remote communities, with specific reference to individual, family/household and community factors. The diagnostic sections contained in the ARMHS survey interview are identical to those found in the 2007 NSMHWB survey interview, enabling direct comparisons to be made between the two surveys. The first wave of data collection for this survey is now complete. More information on this survey can be found at http://www.crrmh.com.au/research/current/armhs.html.

Functioning and disability

Functioning and disability were assessed with a range of measures. The World Health Organization Disability Assessment Schedule 12-item version [17] and the ABS Short Form Disability Module reflect the concept of disability as described in the International Classification of Functioning, Disability and Health [18], and provide comparability with international and national surveys. Disability was also assessed using a composite of two survey questions, reflecting the impact of health problems on people's ability to carry out their usual day-to-day tasks (called 'days out of role'). Respondents were asked how many days in the previous 30 they were totally unable to perform and days that they had to cut down on their normal activities as a result of health problems. Only these total or partial days out of role are presented in the current paper.

Severity

All individuals with 12 month mental disorders were classified into one of three severity categories: mild, moderate, or severe. Severity was defined according to an adapted algorithm originally developed by the World Mental Health Survey Initiative team. Severity is attributed to an individual, not to a mental disorder, and reflects the total impact of all 12 month mental disorders experienced by that individual, thus taking into account comorbidity. When the severity of a given mental disorder is reported this provides an indication of the average severity of individuals with that disorder. For example, the severity of depressive episode refers to the average severity of all people with depressive episode and takes into account the impact of the depressive episode together with the impact of all disorders that are comorbid in people with depressive episode.

To be classified as severe, in addition to having a 12 month mental disorder, one of the following must have occurred in the previous 12 months: an episode of mania; a suicide attempt; at least two areas of severe role impairment on the disorder-specific Sheehan Disability Scales [19] or overall functional impairment at a level equivalent to a Global Assessment of Functioning score of ≤ 50 [20]. Classification as moderate requires a 12 month mental disorder and moderate role impairment for one domain on the Sheehan Disability Scales. The remaining cases of 12 month mental disorder were categorized as mild. It should be noted that, unlike in earlier versions of the WMH-CIDI, Sheehan Disability Scales were included in the Australian modification of the WMH-CIDI substance use disorders section. This means that substance use disorders were treated the same way as all other mental disorders in the calculation of severity.

Interference with life

Interference with life, on the other hand, is attributed to a given mental disorder and summarizes the impact of a given mental disorder on different domains of life (home responsibilities, work and study, close relationships and social life). Interference with life was assessed using the Sheehan Disability Scale, which is contained at the end of each and every diagnostic section (including the substance use disorders section) and asks respondents to rate, on a scale from zero to 10, impairment in each of the four domains during the worst month in the past 12 months. The scale contains verbal descriptors for no interference (0), mild interference (1–3), moderate interference (4–6), severe interference (7–9) and very severe interference (10). Data on interferences with life are not reported in the current paper.

Health service use

Health service use was a major component of the 2007 NSMHWB and a detailed health service use section was constructed. This included questions on lifetime and 12 month hospitalizations and consultations with a range of health professionals: general practitioners, psychiatrists, psychologists, other mental health professionals (including mental health nurses and other professionals providing specialist mental health services), and other health professionals (including specialist medical practitioners, other professionals providing general services and complementary/alternative therapists). For each health professional a range of questions were asked to fully characterize the type and nature of the consultation. For this paper, service use was defined as at least one consultation specifically for mental health problems with any of these health professionals in the 12 months prior to the interview. The perceived needs for care questionnaire [21] was also included in the health service use section.

Data analysis

Due to the fact that unit record file information was not available at the time of writing, all results are based on aggregate descriptive tables, which contain point estimates as well as associated standard errors. All data were weighted to account for the differential probability of selection as well as the calibration to population benchmarks described here. Standard errors (SE) were estimated using the jackknife method of replication [22]. These standard errors were used to construct 95% confidence intervals using the standard formula: estimate $\pm 1.96 \times$ SE(estimate). Estimates with non-overlapping confidence intervals were considered statistically significantly different from one another. This is a conservative approach to assessing differences [23].

Results

Prevalence

Data from the 2007 NSMHWB showed that nearly half of the Australian population (45.5%, 95% confidence interval (CI) = 44.1–46.9%) met criteria for an anxiety, affective and/or substance use disorder at some stage in their lifetime (Table 3). One in five Australians experienced a mental disorder in the past 12 months (20.0%, 95%CI = 18.9–21.0%) and one in 10 in the past 30 days (10.0%, 95%CI = 9.3–10.8%). Anxiety disorders (14.4%, 95%CI = 13.4–15.3%) were the most common class of 12 month

Table 3. Lifetime, 12 month and 30 day prevalence of mental disorders

	Lifetime		12 month		30 day	
	EPC ('000)	% (95%CI)	EPC ('000)	% (95%CI)	EPC ('000)	% (95%CI)
Any affective disorder	2405.3	15.0 (14.1–16.0)	995.9	6.2 (5.5–6.9)	381.6	2.4 (1.9–2.8)
Any anxiety disorder	4205.0	26.3 (24.9–27.6)	2303.0	14.4 (13.4–15.3)	1239.2	7.7 (7.0–8.5)
Any substance use disorder	3960.3	24.7 (23.5–26.0)	819.8	5.1 (4.5–5.8)	285.2	1.8 (1.4–2.1)
Any mental disorder	7286.6	45.5 (44.1–46.9)	3,197.8	20.0 (18.9–21.0)	1608.3	10.0 (9.3–10.8)

CI, confidence interval; EPC, estimated population count. EPCs are rounded to the nearest 100.

mental disorder, followed by affective disorders (6.2%, 95%CI = 5.5–6.9%) and substance use disorders (5.1%, 95%CI = 4.5–5.8%).

Overall, there was a difference in the prevalence of 12 month mental disorders between male and female respondents, with male respondents less likely to experience a 12 month mental disorder than female respondents (male: 17.6%, 95%CI = 15.7–19.5% vs female: 22.3%, 95%CI = 21.0–23.6%; Table 4). Female respondents had a higher prevalence of 12 month anxiety disorders (female: 17.9%, 95%CI = 16.6–19.2% vs male: 10.8%, 95%CI = 9.4–12.3%). This was driven by significant sex differences in the prevalence of social phobia, GAD and PTSD. The prevalence of

12 month affective disorders was 7.1% (95%CI = 6.1–8.1%) in female respondents compared to 5.3% (95%CI = 4.3–6.3%) in male respondents. Male respondents had a higher prevalence of 12 month substance use disorders (male: 7.0%, 95%CI = 5.8–8.2% vs female: 3.3%, 95%CI = 2.6–3.9%). Male respondents had a higher prevalence of all individual substance use disorders except for any drug dependence where there was a trend for higher prevalence in male respondents.

The prevalence of 12 month mental disorders was highest in young adults aged 16–24 and declined with age. This pattern of declining prevalence with age was consistent for both genders

Table 4. Prevalence of individual 12 month mental disorders vs sex

	Male % (95%CI)	Female % (95%CI)	Total % (95%CI)
Affective disorders			
Depressive episode	3.1 (2.3–3.9)	5.1 (4.2–5.9)	4.1 (3.5–4.6)
Dysthymia	1.0 (0.6–1.4)	1.5 (1.1–2.0)	1.3 (1.0–1.6)
Bipolar affective disorder	1.8 (1.2–2.4)	1.7 (1.3–2.2)	1.8 (1.4–2.2)
Any affective disorder	5.3 (4.3–6.3)	7.1 (6.1–8.1)	6.2 (5.5–6.9)
Anxiety disorders			
Panic disorder	2.3 (1.6–3.0)	2.9 (2.2–3.5)	2.6 (2.1–3.0)
Agoraphobia	2.1 (1.4–2.9)	3.5 (2.8–4.1)	2.8 (2.4–3.3)
Social phobia	3.8 (2.8–4.7)	5.7 (4.9–6.5)	4.7 (4.2–5.3)
Generalized anxiety disorder	2.0 (1.3–2.6)	3.5 (2.7–4.3)	2.7 (2.2–3.3)
Post-traumatic stress disorder	4.6 (3.7–5.6)	8.3 (7.2–9.3)	6.4 (5.8–7.1)
Obsessive–compulsive disorder	1.6 (1.1–2.2)	2.2 (1.7–2.6)	1.9 (1.5–2.3)
Any anxiety disorder	10.8 (9.4–12.3)	17.9 (16.6–19.2)	14.4 (13.4–15.3)
Substance use disorders			
Alcohol harmful use	3.8 (3.0–4.6)	2.1 (1.5–2.7)	2.9 (2.5–3.4)
Alcohol dependence	2.2 (1.5–2.9)	0.7 (0.4–0.9)	1.4 (1.1–1.8)
Cannabis harmful use	0.8 (0.5–1.2)	0.3 (0.1–0.4)	0.6 (0.4–0.7)
Cannabis dependence	0.7 (0.3–1.1)	0.2 (0.0–0.3)	0.4 (0.2–0.6)
Any drug harmful use	1.3 (0.9–1.6)	0.5 (0.2–0.7)	0.9 (0.6–1.1)
Any drug dependence	0.9 (0.5–1.3)	0.4 (0.2–0.6)	0.6 (0.4–0.9)
Any substance harmful use	4.7 (3.8–5.7)	2.4 (1.7–3.0)	3.5 (3.0–4.1)
Any substance dependence	2.6 (1.9–3.4)	1.0 (0.7–1.4)	1.8 (1.5–2.2)
Any substance use disorder	7.0 (5.8–8.2)	3.3 (2.6–3.9)	5.1 (4.5–5.8)
Any mental disorder	17.6 (15.7–19.5)	22.3 (21.0–23.6)	20.0 (18.9–21.0)

CI, confidence interval.

(Figure 1). The largest decline in prevalence was evident in the difference between the 45–54 year age group (female: 24.2%, 95%CI = 19.1–29.3%; male: 18.7%, 95%CI = 13.0–24.5%) compared to the 55–64 year age group (female: 16.3%, 95%CI = 13.7–19.0%; male: 10.9%, 95%CI = 8.3–13.6%).

Severity

All cases of any 12 month mental disorder were divided into three mutually exclusive categories of severity (Table 5). Just under half of all cases of any mental disorder were classified as mild (46.3%, 95%CI = 41.5–51.2%), one-third as moderate (33.2%, 95%CI = 29.9–36.4%) and one-fifth as severe (20.5%, 95%CI = 17.6–23.5%). Affective disorders were associated with the greatest severity with 51.0% (42.6–59.5%) of all people with affective disorders classified as severe.

Disability

On average, people with a 12 month mental disorder experienced nearly 4 days out of the previous 30 days when they were totally unable or had to cut down on their usual activities (Table 6). People with an anxiety disorder experienced 4 days out of role. People with a substance use disorder experienced, on average, 3 days out of role, while people with an affective disorder experienced 6 days out of role. This is in comparison to people without a 12 month mental disorder who experienced approximately 1½ days out of role in the previous 30 days. The mismatch in time frames for disorder (past 12 months) and disability (past 30 days) means that there may be some people reporting 30 day disability who experienced 12 month but not 30 day disorder. This may lead to an underestimation of disability, particularly for those people who experienced episodic disorders such as depression.

Comorbidity

The three main classes of 12 month mental disorder (affective, anxiety and substance use disorder) often occurred together (Table 7). One-quarter of all people with a mental disorder experienced more than one class of mental disorder. Just over one in five people with any class of mental disorder (21.9%, 95%CI = 19.3–24.5%) experienced two different classes of mental disorder during the same 12 month period. A small yet important proportion of people with any mental disorder (3.5%, 95%CI = 2.3–4.7%) experienced all three classes of mental disorder.

Service use for mental health problems

One in three people with a 12 month mental disorder (34.9%, 95%CI = 31.3–38.5%) used health services for mental health problems in the 12 months prior to the interview (Table 8). Service use was greatest in those with affective disorders (58.6%, 95%CI = 49.9–67.4%) and least in those with substance use disorders (24.0%, 95%CI = 16.5–31.4%).

Service use for mental health problems was higher among women compared to men, particularly in the 16–24 year age group (Figure 2). Two-fifths of women with a mental disorder (40.7%, 95%CI = 36.0–45.3%) used services compared to just over one-quarter of men (27.5%, 95%CI = 21.0–34.0%). Service use was lowest among the youngest and the oldest age groups, with particularly low service use among men aged 16–24 years old. Only 13.2% of men aged 16–24 with a mental disorder (95%CI = 6.0–20.5%) had used services for mental health problems in the previous 12 months.

Discussion

Summary of findings

Findings from the 2007 National Survey of Mental Health and Wellbeing show that mental disorders affect a substantial portion of the Australian population. Almost half (45.5%) of the total population met criteria for a mental disorder at some time in their entire lifetime prior to interview, with one in five
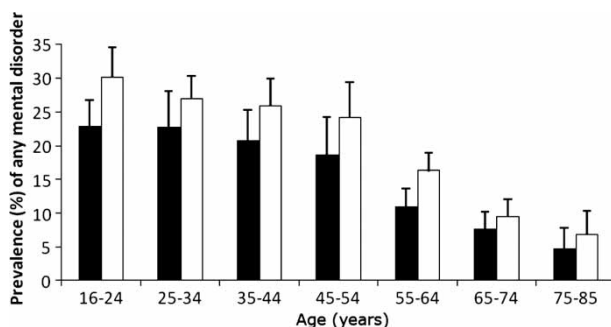

Figure 1. Prevalence of any 12 month ICD-10 mental disorder vs age and sex in the Australian population, 2007. Error bars represent 95% confidence intervals (i.e. 1.96 × SE). (■) Male; (□) female.
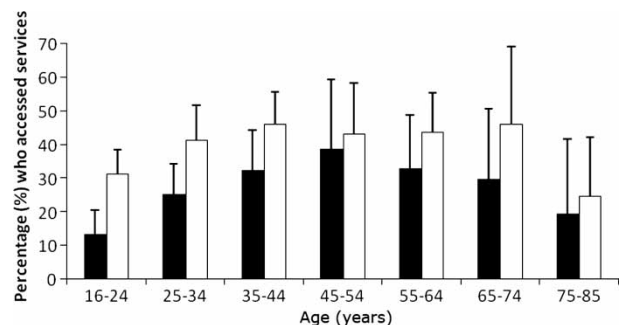

Figure 2. Percentage of the Australian population with any 12 month ICD-10 mental disorder who used health services for mental health problems, vs age and sex, 2007. Error bars represent 95% confidence intervals (i.e. 1.96 × SE). (■) Male; (□) female.

Table 5.   Severity of 12 month mental disorders

	Mild % (95%CI)	Moderate % (95%CI)	Severe % (95%CI)
Any affective disorder	10.2 (6.0–14.3)	38.8 (32.0–45.5)	51.0 (42.6–59.5)
Any anxiety disorder	43.8 (37.8–49.8)	34.0 (30.1–37.9)	22.2 (18.4–26.0)
Any substance use disorder	54.6 (44.8–64.4)	25.0 (19.4–30.6)	20.4 (14.1–26.7)
Any mental disorder	46.3 (41.5–51.2)	33.2 (29.9–36.4)	20.5 (17.6–23.5)

CI, confidence interval.

(20.0%) experiencing symptoms in the past 12 months. Mental disorders are experienced with different levels of severity.

Mental disorders, particularly affective disorders, are disabling. People with 12 month mental disorders report being totally unable to carry out their normal activities during 4 out of the past 30 days. This is in comparison to people without a mental disorder who report approximately 1½ days out of role in the past 30 days. Comorbidity among the mental disorder classes was common. Among the estimated 3.2 million Australians with any mental disorder, one-quarter experience mental disorders from two or more different classes. Around two-thirds of all people with a 12 month mental disorder did not seek help from health professionals for their mental health problems in the 12 months prior to the survey. Service use among young men aged 16–24 years was particularly low (13.2%), which is in contrast to the relatively high prevalence of mental disorders in this age group (22.8%). Thus, despite the substantial impact of mental disorders on people's well-being and functioning, the majority of people with a mental disorder do not receive care for mental health problems from any health professional.

Table 6.   Days out of role in the last 30 vs presence of 12 month mental disorders

	Days out of role in the last 30 Mean (95%CI)
No mental disorder	1.4 (1.3–1.6)
Any affective disorder	6.2 (5.1–7.2)
Any anxiety disorder	4.4 (4.0–4.9)
Any substance use disorder	3.3 (2.4–4.3)
Any mental disorder	3.9 (3.5–4.4)

CI, confidence interval. Days out of role in the last 30 includes days in which the respondent was totally unable to carry out their usual activities and days in which they had to cut down on their usual activities because of their health.

Comparison with 1997 National Survey of Mental Health and Wellbeing

It is of benefit to compare and contrast the findings of the 2007 NSMHWB with those of the 1997 NSMHWB. These comparisons, however, should be made only after careful consideration of the similarities and differences between the methodologies used in the two surveys. With regard to the similarities, at the broadest level both surveys were designed to ensure nationally representative samples of respondents and thus both surveys are able to draw conclusions about the Australian general population as a whole. Both surveys assessed mental disorders according to the criteria set out in ICD-10, thus ensuring a standard definition of mental disorder. Both surveys focused on the same set of common mental disorders.

While both surveys used the ICD-10 diagnostic criteria to define mental disorders the operationalization of these criteria (i.e. the way in which the criteria were translated into interview questions) was somewhat different in the two surveys. The interview used in the 1997 NSMHWB was based on version 2.1 of the CIDI, while the interview used in the 2007 was based on the WMH-CIDI (also known as version 3.0 of the CIDI). A number of modifications took place in the revision of the CIDI from version 2.1 to 3.0. These modifications included changes to the number and content of questions used to tap the diagnostic criteria; changes to the structure of the interview, specifically with regard to placement of diagnostic screener questions in a separate section early in the interview; and changes to the occurrence and nature of 'skip-outs' (i.e. questions that, if answered negatively, result in the interview jumping to later questions). Other differences in the age ranges of the two surveys, enumeration periods and response rates could also contribute to observed differences between the 1997 and 2007 NSMHWB.

Table 7.   12 month mental disorder comorbidity

	EPC ('000)	Total Australian population % (95%CI)	People with 12 month disorder % (95%CI)
No disorder	12 817.6	80.0 (79.0–81.1)	–
One disorder class	2385.6	14.9 (13.9–15.9)	74.6 (69.7–79.5)
Two disorder classes	700.7	4.4 (3.9–4.9)	21.9 (19.3–24.5)
Three disorder classes	111.6	0.7 (0.5–0.9)	3.5 (2.3–4.7)

CI, confidence interval; EPC, estimated population count. EPCs are rounded to the nearest 100.

A further major difference between the 1997 and 2007 NSMHWB interviews relates to the time frame used to assess the diagnostic criteria for each mental disorder. The 1997 NSMHWB was based on a 12 month time frame while the 2007 NSMHWB was based on a lifetime time frame. The data reported in this paper as well as the other papers in this issue are largely based on 12 month case identification. The most ideal estimate of 12 month prevalence would be one derived from a comprehensive assessment of all criteria in the critical 12 month time frame (as in the 1997 NSMHWB). In this context an estimate of 12 month prevalence of mental disorder derived from a lifetime interview is, at best, an approximation of the true 12 month prevalence. The extent to which this derived 12 month prevalence estimate is an under- (or over-) estimate of true 12 month prevalence estimate is unknown.

Within the context of these similarities and differences both the 1997 and 2007 NSMHWB showed that around one in five people have experienced a mental disorder in the past 12 months, with anxiety disorders the most prevalent class of mental disorder. It would appear that the 12 month prevalence of any anxiety disorder is higher in the 2007 NSMHWB (14.4%) compared to the 1997 NSMHWB (9.7%, [3]). Although this may reflect a true change in prevalence over time, it may also be explained, at least in part, by differences in the two instruments used in the two surveys. For example, both the social phobia and agoraphobia sections of the WMH-CIDI include a greatly expanded number of candidate situations. This gives respondents greater opportunity to progress further in each of these sections, potentially increasing the likelihood that full diagnostic criteria will be met. Similarly, the number of candidate PTSD events (i.e. events that could lead to the development of PTSD) has increased from 10 in the 1997 NSMHWB to 29 in the WMH-CIDI, potentially widening the scope of the PTSD diagnosis. In fact, the prevalence of PTSD in the 2007 NSMHWB at 6.4% represents the highest individual disorder prevalence.

The 2007 NSMHWB reinforced the finding from the 1997 NSMHWB that mental disorders are associated with significant disability. As was evident in the 1997 NSMHWB, rates of mental disorder comorbidity were again higher than would be expected by chance, strengthening the notion that when mental disorders occur they are concentrated in a sizable proportion of the population. Additional more detailed comparisons between the 1997 NSMHWB and the 2007 NSMHWB are in preparation and will be carried out when access to the full unit record file is made available.

Comparison with other recent surveys

Comparisons are also possible between the 2007 NSMHWB and nationally representative surveys carried out in other countries around the world. In recent years a suite of mental health surveys have been conducted in both developed and developing countries throughout the world. Collectively, these surveys form the World Mental Health Survey Initiative [24]. All of these surveys use, as the basis of the interview, the WMH-CIDI, thus enhancing the ability to perform cross-national comparisons of the prevalence and impact of mental disorders

Table 8.   Use of health services for mental health problems in the previous 12 months vs presence of 12 month mental disorder

	Any service use % (95%CI)
No mental disorder	6.1 (5.3–7.0)
Any affective disorder	58.6 (49.9–67.4)
Any anxiety disorder	37.8 (33.1–42.6)
Any substance use disorder	24.0 (16.5–31.4)
Any mental disorder	34.9 (31.3–38.5)

CI, confidence interval.

throughout the world. The results of the 2007 NSMHWB place Australia as a country with one of the highest rates of 12 month mental disorder worldwide, in line with other developed countries such as the USA (26.2%, [25]) and New Zealand (20.7%, [26]). As was found in the 2007 NSMHWB, anxiety disorders were the most common class of 12 month mental disorder in both the US (18.1%, 95%CI = 16.7–19.5%) and New Zealand surveys (14.8%, 95%CI = 13.9–15.7). The prevalence of any affective disorder, however, was lower in the 2007 NSMHWB (6.2%, 95%CI = 5.5–6.9%) compared to both the US (9.5%, 95%CI = 8.7–10.3%) and the New Zealand surveys (8.0%, 95%CI = 7.4–8.6%). In contrast, the prevalence of any substance use disorder was higher in the 2007 NSMHWB (5.1%, 95%CI = 4.5–5.8%) compared to both the US (3.8%, 95%CI = 3.2–4.4%) and New Zealand surveys (3.5%, 95%CI = 3.1–4.0%). It should be noted that the US and New Zealand figures are based on DSM-IV diagnoses and both did not assess dependence if no symptoms of abuse were ever reported.

Limitations and strengths of the 2007 NSMHWB

With regard to the limitations of the 2007 NSMHWB, the survey interview does not attempt to detect low-prevalence and difficult-to-assess mental disorders, such as schizophrenia, personality disorders and dementia. Surveys with tailored sampling strategies and in some cases clinician or other specifically skilled interviewers are required to obtain reliable information on these mental disorders. Interview length and consequent factors, particularly respondent burden, also restricted the number of mental disorders that could be included.

Because the 2007 NSMHWB was a household survey, homeless people, people resident in nursing homes, hostels, and hospices and those in prison or other corrective service facilities were not surveyed. This has little impact at the population level because these subgroups comprise a small proportion of the total population, but estimates for subgroups such as the elderly may be affected [27].

The lower than expected response rate (60%) should also be noted because the response rate has implications for the validity of any estimates derived from the survey. As mentioned here, an intensive non-response follow-up study was conducted as part of the NSMHWB, in which it was found that any

mis-estimation is likely to be small at the aggregate level. Additionally, the response rate for the 2007 NSMHWB is around the midpoint of the range of response rates for other surveys that have used the WMH-CIDI in community surveys throughout the world (these response rates range from 46% in France to 88% in Colombia). It is also important to note that declining response rates in epidemiological surveys are an example of a wider global phenomenon of declining participation in epidemiological studies [28]. Reasons for this decline include an increase in the number of requests to participate in such research; an increase in marketing surveys that, to a participant, are often indistinguishable from scientific study; a reluctance to take part in surveys that are not salient or relevant for an individual; and the general time and energy demands placed on people participating in surveys.

Despite these limitations there are a number of notable strengths of the 2007 NSMHWB. First, use of the WMH-CIDI as the base instrument for the survey capitalized on the extensive methodological testing and development invested in this instrument [11]. It also facilitates international comparability with geographically and economically diverse countries.

Second, adaptations to the base WMH-CIDI interview were built in to the interview used in the 2007 NSMHWB to improve the fit with the Australian context. For example, in recognition of the important overlap between mental and physical disorders [29], a series of questions were included to ask about chronic physical health conditions. These questions were tailored so as to ensure coverage of the Australian National Health Priority Areas, a list of health conditions identified as contributing significantly to the burden of disease in Australia. Standardized scales and sets of questions were also included to allow comparisons with other Australian national surveys such as the National Health Survey and the Survey of Disability, Ageing and Carers. Questions were also included on such diverse topics as experiences of homelessness, history of incarceration, veteran's status, self-reported height and weight, amount of contact with family and friends, status as a caregiver for a relative with a chronic health problem, smoking status and levels of physical activity. The inclusion of these questions allowed for the collection of information on mental disorders not previously available at the population level.

The WMH-CIDI instrument assesses mental disorders within a lifetime time frame. While this aspect of the survey hampers comparisons between the 2007 NSMHWB and the 1997 NSMHWB, it allows for the novel exploration of age of onset of mental disorders, when symptoms were last experienced and the age at which certain life events occurred. This facilitates examination of the chronology of mental disorders and their temporal relationships to life events across the lifetime of an individual. These data were not available for analysis, yet will be extensively examined in future analyses.

Conclusions

In conclusion, the current paper provides an overview of the methodology and key findings from the 2007 NSMHWB. The following papers further explore the results of the 2007 NSMHWB to paint a more detailed picture regarding the epidemiology of mental disorders in Australia in 2007.

Acknowledgements

References

1. Eaton WW, Martins SS, Nestadt G, Bienvenu OJ, Clarke D, Alexandre P. The burden of mental disorders. *Epidemiol Rev* 2008; 30:1–14.
2. Andrews G, Hall W, Teesson M, Henderson AS. *Mental health of Australians*. Canberra: Mental Health Branch, Commonwealth Department of Health and Aged Care, 1999.
3. Henderson S, Andrews G, Hall W. Australia's mental health: an overview of the general population survey. *Aust N Z J Psychiatry* 2000; 34:197–205.
4. Parslow RA, Jorm AF. Who uses mental health services in Australia? An analysis of data from the National Survey of Mental Health and Wellbeing. *Aust N Z J Psychiatry* 2000; 34:997–1008.
5. Meadows G, Liaw T, Burgess P, Bobevski I, Fossey E. Australian general practice and the meeting of needs for mental health care. *Soc Psychiatry Psychiatr Epidemiol* 2001; 36:595–603.
6. Andrews G, Henderson S, Hall W. Prevalence, comorbidity, disability and service utilisation: overview of the Australian National Mental Health Survey. *Br J Psychiatry* 2001; 178:145–153.
7. Andrews G, Slade T, Issakidis C. Deconstructing current comorbidity: data from the Australian National Survey of Mental Health and Well-Being. *Br J Psychiatry* 2002; 181:306–314.
8. Whiteford HA, Doessel DP, Sheridan JS. Uptake of Medicare Benefits Schedule items by psychologists and other mental health practitioners. *Clin Psychol* 2008; 12:50–56.
9. Australian Bureau of Statistics. *National Survey of Mental Health and Wellbeing: user's guide, 2007*, Cat. No. 4327.0. Canberra: Australian Bureau of Statistics, 2009
10. Kessler RC, Barker PR, Colpe LJ et al. Screening for serious mental illness in the general population. *Arch Gen Psychiatry* 2003; 60:184–189.
11. Kessler RC, Üstün TB. The World Mental Health (WMH) Survey Initiative version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). *Int J Methods Psychiatr Res* 2004; 13:93–121.
12. Grant BF Compton WM Crowley TJ et al. Errors in assessing DSM-IV substance use disorders. *Arch Gen Psychiatry* 2007; 64:379–380; author reply 381–382.
13. Degenhardt L, Bohnert KM, Anthony JC. Case ascertainment of alcohol dependence in general population surveys: 'gated' versus 'ungated' approaches. *Int J Methods Psychiatr Res* 2007; 16:111–123.
14. Degenhardt L, Cheng H, Anthony JC. Assessing cannabis dependence in community surveys: methodological issues. *Int J Methods Psychiatr Res* 2007; 16:43–51.
15. Murray G, Judd F, Jackson H et al. Rurality and mental health: the role of accessibility. *Aust N Z J Psychiatry* 2004; 38:629–634.
16. Judd FK, Jackson HJ, Komiti A, Murray G, Hodgins G, Fraser C. High prevalence disorders in urban and rural communities. *Aust N Z J Psychiatry* 2002; 36:104–113.
17. Buist-Bouwman MA, Ormel J, De Graaf R et al. Psychometric properties of the World Health Organization Disability Assessment Schedule used in the European Study of the Epidemiology of Mental Disorders. *Int J Methods Psychiatr Res* 2008; 17:185–197.
18. Organization WH. *International classification of functioning, disability and health (ICF)*. Geneva: World Health Organization, 2001.
19. Buist-Bouwman MA, Ormel J, De Graaf R et al. Psychometric properties of the World Health Organization Disability Assessment Schedule used in the European Study of the Epidemiology of Mental Disorders. *Int J Methods Psychiatr Res* 2008; 17:185–197.
20. Kessler RC, Chiu WT, Demler O, Walters EE. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry* 2005; 62:617–627.
21. Meadows G, Harvey C, Fossey E, Burgess P. Assessing perceived need for mental health care in a community survey: development of the Perceived Need for Care Questionnaire (PNCQ). *Soc Psychiatry Psychiatr Epidemiol* 2000; 35:427–435.
22. Rust KF, Rao JN. Variance estimation for complex surveys using replication techniques. *Stat Methods Med Res* 1996; 5:283–310.
23. Schenker N, Gentleman JF. On judging the significance of differences by examining the overlap between confidence intervals. *Am Stat* 2001; 55:182–186.
24. Kessler RC, Üstün TB. *The WHO World Mental Health Survey: global perspectives on the epidemiology of mental disorders*. Geneva: Cambridge University Press, 2008.

25. Kessler RC, Wang PS. The descriptive epidemiology of commonly occurring mental disorders in the United States. *Annu Rev Public Health* 2008; 29:115–129.
26. Wells JE, Oakley Browne MA, Scott KM, McGee MA, Baxter J, Kokaua J. Prevalence, interference with life and severity of 12 month DSM-IV disorders in Te Rau Hinengaro: the New Zealand Mental Health Survey. *Aust N Z J Psychiatry* 2006; 40:845–854.
27. O'Connor DW. Do older Australians truly have low rates of anxiety and depression? A critique of the 1997 National Survey of Mental Health and Wellbeing. *Aust N Z J Psychiatry* 2006; 40:623–631.
28. Galea S, Tracy M. Participation rates in epidemiologic studies. *Ann Epidemiol* 2007; 17:643–653.
29. Scott KM, Oakley Browne MA, McGee MA, Wells JE. New Zealand Mental Health Survey Research Team. Mental–physical comorbidity in Te Rau Hinengaro: the New Zealand Mental Health Survey. *Aust N Z J Psychiatry* 2006; 40: 882–888.