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## **Health anxiety in Australia: prevalence, comorbidity, disability, and service use**

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## **ABSTRACT**

**Background:** Health anxiety is associated with high distress, disability, and increased health service utilisation. However, there are relatively few epidemiological studies examining the extent of health anxiety or the associated socio-demographic and health risk factors in the general population.

**Aims:** The current study aims to provide epidemiological data on health anxiety in the Australian population.

**Methods:** Lifetime and current prevalence estimates, associations between comorbid disorders, psychological distress, impairment, disability, and mental health service utilisation were generated using the Australian 2007 National Survey of Mental Health and Wellbeing.

**Results:** Health anxiety affects approximately 5.7% of the Australian population across the lifespan and 3.4% currently met criteria for health anxiety at the time of the interview. Age, employment status, smoking status, and comorbid physical conditions were significantly related to health anxiety symptoms. Health anxiety was associated with significantly more distress, impairment, disability, and health service utilisation than respondents without health anxiety.

**Conclusions:** Health anxiety is non-trivial; it affects a significant proportion of the population and further research and clinical investigation of health anxiety is required.

**Declaration of interest:** None.

## **INTRODUCTION**

Health anxiety refers to the broad diagnostic construct that encompasses persistent worries about illness that extend from mild to severe forms, including DSM-IV defined hypochondriasis and illness phobia (1). Hypochondriasis is a 'preoccupation with fears of having, or the idea that one has, a serious disease based on the person's misinterpretation of bodily symptoms' coupled with the persistence of the belief despite appropriate medical evaluation and/or reassurance (disease conviction). In a prospective case control study of hypochondriasis among US medical outpatients, Barsky (2) reported that two thirds of people still met criteria four or five years later and that the disorder carried a substantial long-term burden of morbidity, functional impairment, and personal distress. The economic effects are considerable, with increased health care utilisation in primary care, pathology testing, inpatient services, secondary care services, and pensions (3-7). Fink et al (5) argued, on the basis of excess health care costs alone, that hypochondriasis and the related concept of severe health anxiety must be taken seriously, and diagnosed and treated as a routine. Despite the apparent seriousness and large economic cost of health anxiety, there are relatively few epidemiological studies examining the extent of the symptoms or the associated socio-demographic and health risk factors in the general population (8). The lack of evidence on health anxiety limits the greater understanding of this condition in the population and restricts the ability for health policy makers to properly plan and fund treatment and prevention services to reduce the overall disease burden (9-10). The current study aims to address the paucity of epidemiological data on health anxiety in Australia by investigating data from the 2007 National Survey of Mental Health and Wellbeing (NSMHWB).

## **METHODS**

### **Sample**

The sample comprised of 8,841 respondents aged between 16 and 85 from the Australian 2007 NSMHWB, representing a response rate of 60%. The survey was conducted between August and December of 2007 and administered by trained lay-interviewers from the Australian Bureau of Statistics (ABS). The survey generated representative estimates of non-institutionalised Australian private households (excluding remote or sparsely populated areas) utilising a stratified, multi-stage area sampling design. These data were weighted for the sex and age distribution of the Australian population and the younger (16-24) and older (65-85) age groups were over-sampled (higher probability of being selected for the interview) to ensure reliable estimates amongst these under-represented age groups. The sample characteristics of the 2007 NSMHWB have been described in detail previously (11). Briefly, the ratio of male to female was approximately equal and 33.5% aged between 16 and 34, 37% aged between 35 and 54, and 29.5% aged 55 and over. The majority of the population were married, employed, possessed no higher education qualification, and were born in Australia.

### **Assessment**

The core diagnostic assessment was conducted using the World Mental Health version of Composite International Diagnostic Interview (WMH-CIDI; 12), a comprehensive lay-interviewer administered structured diagnostic interview. In addition to the assessment of common mental disorders, the 2007 survey contained brief questions to assess the possible presence of health anxiety (see Appendix for assessment items). The questions were not designed to directly assess each DSM-IV criterion required for a diagnosis of hypochondriasis. However, they were designed to match the diagnostic construct of severe and persistent anxiety about serious illness or health problems despite professional reassurance. Lifetime information on health anxiety was collected by enquiring about whether the respondent ever worried a lot about serious illness, despite having reassurance from a doctor or medical specialist. If endorsed, the respondents were asked whether they

ever had a period of worry like this that lasted for six months or longer. They were then asked if they have experienced a period of worry in the past 12 months and if they were currently experiencing a period of worry about serious illness. For the current study, if the respondent indicated that they experienced a period of worry and that it lasted for at least six months, they were defined as having a history of health anxiety. Criteria for current health anxiety were met if the respondent indicated that they were currently experiencing persistent worry about serious illness/health at the time of the interview.<sup>1</sup>

Additional psychiatric diagnoses were made by systematically addressing each DSM-IV criterion for the particular disorder under examination. The disorders that were assessed in the 2007 survey included: major depression, dysthymia, bipolar, agoraphobia, panic disorder, social phobia, generalised anxiety disorder (GAD), obsessive-compulsive disorder (OCD), and post-traumatic stress disorders (PTSD). The hierarchical exclusion criteria were applied for a diagnosis of major depression, dysthymia, and GAD. The criteria were assessed using a lifetime timeframe, meaning that all questions were prefaced using “have you ever...” or “in your lifetime...”, and a 12 month or 30 day point prevalence estimate was made by determining whether the symptoms endorsed over the respondent’s lifetime were present in the past 12 months or in the past 30 days. The diagnostic validity of the WMH-CIDI modules has been examined previously using clinical-reappraisal studies, which found that the WMH-CIDI exhibited satisfactory validity when compared to diagnoses made using a semi-structured clinical interview (13). In addition to the individual diagnoses, aggregate diagnoses were also estimated by combining major depression, dysthymia, and bipolar to form the diagnosis of any affective disorder, whilst agoraphobia, panic disorder, social phobia, GAD, OCD, and PTSD were combined to form any anxiety disorder. Finally the aggregate

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<sup>1</sup> The nature of the design and administration of the 2007 NSMHWB prevented the lay interviewers from making a DSM-IV diagnosis of hypochondriasis, as they were unable to assess differential diagnoses. That is, they were unable to assess whether the illness worries were better accounted for by other disorders such as Generalised Anxiety Disorder (Criterion F, DSM-IV) and whether the beliefs were delusional intensity (Criterion C, DSM-IV).

diagnosis of depression and anxiety was formed by combining depression (MDD only) and/or any anxiety disorder.

The 2007 NSMHWB also contained additional screening questions/questionnaires for physical disorders, psychological distress, functional impairment, days out of role, and mental health service utilisation. Physical disorders assessed included: asthma, cancer, stroke, gout, rheumatism, arthritis, diabetes, heart or circulatory condition, hayfever, sinusitis, emphysema, bronchitis, anaemia, epilepsy, oedema, hernias, kidney problems, migraine, psoriasis, stomach ulcer, thyroid trouble, tuberculosis, and back or neck problems.

Psychological distress was measured using the Kessler 10 item Psychological Distress scale (K10; 14). This questionnaire measures non-specific psychological distress in the past 30 days with scores that can range from 10 to 50, higher scores indicating higher distress. The K10 has previously exhibited excellent psychometric properties and significant associations with DSM-IV anxiety and affective disorders (15-18).

Functional impairment or activity limitation was measured using the 12 item World Health Organisation Disability Assessment Schedule (WHODAS). The WHODAS measures activity limitation that could be associated with physical illness, mental illness or a combination of both, whereas the K10 measures distress primarily related to mental illnesses such as depression and anxiety. The WHODAS ranges from 1-100 with higher scores indicating higher functional impairment/activity limitation. Studies have previously indicated that the WHODAS possesses excellent psychometric properties (19). Days out of role was measured by asking people to nominate the total number of days in the past 30 that they were unable to work or carry out their normal activities because of their health. Finally, mental health service utilisation was measured by asking respondents to indicate whether they sought help for a mental health problem in the last 12 months from their general practitioner and/or a mental health specialist.

## **Analysis**

Estimates for the total population and stratified by age and sex were calculated for both lifetime and current point prevalence of health anxiety. Multivariate logistic regression was used to assess the socio-demographic and health risk factors associated with health anxiety. The frequency of individual comorbid conditions was calculated for those with and those without health anxiety. Lifetime comorbid conditions were matched to the lifetime presence of health anxiety and 30 day comorbid conditions were matched to the current presence of health anxiety. Univariate logistic regression was used to estimate the odds of having a comorbid condition given that a respondent had health anxiety compared to a respondent who did not. The mean number of comorbid conditions was estimated and compared between those with and without health anxiety using Poisson regression, as suggested for the analysis of highly skewed count data. Finally, mean levels of distress, impairment, days out of role, and health service utilisation were compared between those with and those without health anxiety using Poisson regression and  $\chi^2$  analysis. To account for the bias associated with the complex sampling design, all point estimates were weighted and variance estimates were adjusted using a balanced repeated replication technique (20). The SUDAAN statistical software package was used for all analyses (21).

## **RESULTS**

### **Prevalence**

Of the total Australian sample studied, 5.7% (SE=0.31) have met criteria for health anxiety at some point in their life, as determined by the screening questions. A total of 4.2% (SE=0.24) have experienced health anxiety in the past 12 months and 3.4% (SE=0.25) were currently experiencing health anxiety at the time of the survey. Approximately 60% of people who experienced health anxiety at some point in their life were currently suffering from health anxiety at the time of the survey. The lifetime and current point prevalence estimates



for health anxiety stratified by age and sex are presented in Table 1 and Table 2, respectively. The prevalence of health anxiety appears to peak in middle age at 7.4% before declining by approximately a half in old age. Female respondents had, on average, slightly higher albeit non-significant lifetime and current prevalence estimates in comparison to male respondents.

### **Socio-demographic and health risk factors**

The multivariate logistic regressions examining socio-demographic and health risk factors for lifetime and current health anxiety are presented in Table 3. Age was a significant predictor in the model for both lifetime and current prevalence; however the individual pairwise comparisons of the age bands (using 16-24 as the reference) resulted in no significant differences, as evidence by the inclusion of 1.00 in the 95% confidence intervals around the odds ratios. There were few other significant socio-demographic predictors of lifetime and current health anxiety except for employment status, with those not in the labour force having a greater probability of experiencing health anxiety in comparison to those currently employed. Of the health factors, comorbid physical conditions and smoking status were strong predictors of health anxiety. As demonstrated in Table 3, respondents who experience at least one physical illness were 4.67 times more likely to meet criteria for current health anxiety in comparison to respondents who were relatively healthy.

### **Comorbidity, distress, impairment, and health service use**

The associations between health anxiety and other comorbid mental conditions are presented in Table 4. The univariate logistic regressions indicated that respondents with health anxiety were significantly more likely to experience any comorbid condition in comparison to respondents without health anxiety. Indeed, bipolar disorder, agoraphobia, panic disorder, and GAD were some of the more likely disorders to be experienced with health anxiety. Additionally, respondents with lifetime history of health anxiety were approximately 6 times more likely to experience at least one other physical or mental

condition at some point in their life in comparison to respondents without health anxiety. As demonstrated in Table 5, levels of non-specific psychological distress, functional impairment/activity limitation, disability days, and mental health service use are all significantly elevated in respondents with health anxiety. Respondents with health anxiety evidenced a mean K10 score of 22.67, a score that is consistent with high to severe levels of psychological distress (15, 22). Indeed, respondents with health anxiety indicated that they were unable to work or conduct their normal activities for approximately 8 days in the past 30, which represents a four-fold increase when compared to the remainder of the population.

## **DISCUSSION**

The results of the current study provide an impression of how health anxiety affects the Australian general population. Approximately 6% of the population has experienced health anxiety at some point in the life and 3.6% were experiencing health anxiety at the time of the interview. The prevalence rate of health anxiety is non-trivial considering that this rate is similar to the lifetime prevalence of GAD, panic disorder, and post-traumatic stress disorder (11, 23). There appears to be a significant trend across age with the lowest prevalence observed in the young and old age groups whilst the prevalence rate peaked in middle age. The peak of health anxiety in middle age could be explained by the onset of many chronic conditions at this time. This is further supported by strong association between comorbid physical illness and health anxiety as evidenced by odds ratios of 4.67. Consistent with a previous study by Bleichhardt and Hiller (8), there were few other significant socio-demographic and health predictors with only employment status, comorbid physical conditions, and smoking status significantly predicting a diagnosis of health anxiety. One of the more compelling findings of the current study was that levels of comorbidity, distress, functional impairment, disability days, and mental health service use were all significantly higher amongst respondents with health anxiety. This finding further confirms the conclusion

drawn by Fink, et al., (5) that health anxiety concerns must be taken seriously, and diagnosed and treated as a routine in order to reduce the unacceptable level of disease and economic burden.

The prevalence rate of health anxiety in this study is consistent with past findings from population and primary practice samples (e.g., 7.7%; 24), but are higher than other estimates from population based studies (e.g., 0.58%; 25). The discrepancies in prevalence estimates across studies may have been influenced by various methodological differences, including interviewer type (lay versus clinically trained interviewers), assessment measures, and differing definitions of health anxiety. In the current study, health anxiety was defined as experiencing illness worries lasting for at least six months that persisted despite appropriate (self-reported) medical reassurance. This construct closely concords with broader definitions of health anxiety used in the literature (see Asmundson et al., (1)). Commonly used terms include “abridged form of hypochondriasis,” “subthreshold hypochondriasis,” and “illness worry” (see Gureje et al., (26)), and are more prevalent than DSM-IV defined hypochondriasis, which appears relatively rare and difficult to diagnose due to strict inclusion criteria (26-28).

Indeed, the broader definition of health anxiety used in this study potentially identified cases with DSM-IV defined hypochondriasis, as well as sub-threshold or less severe cases that may fail to meet all the criteria yet remain significantly distressed and impaired. Kessler et al. (29) defended the recognition and diagnosis of mild or sub-threshold mental disorders stating that they can be early signs of psychopathology that further develop into severe disorders with multiple comorbidities. However at this stage there is no conclusive evidence suggesting that subthreshold cases of health anxiety progress further to the more severe concept of hypochondriasis. The current study provides evidence of validity of the broader health anxiety diagnostic construct since those who experienced health anxiety

were significantly more distressed and impaired in comparison to those who did not meet criteria and therefore may benefit from treatment. Indeed, the mean level of psychological distress identified in respondents with health anxiety was consistent with previous mean K10 scores found in respondents with a DSM-IV diagnosis of affective and anxiety disorders (30). Patients with health anxiety reported significantly more days out of role due to disability, totalling approximately 8 in the past 30, which denotes significant disability and loss of quality of life. This important finding was identified previously by Bleichhardt and Hiller (8), who concluded that severe health anxiety (observed in 6% of their sample) considerably reduced health-related quality of life and increased health service utilisation. These findings suggest that further research is required to examine the validity of this construct and determine whether classification and recognition of hypochondriasis or severe health anxiety can be improved for the upcoming revision of the DSM.

Those with current health anxiety were shown to utilize mental health services at a significantly higher rate than those without health anxiety, as approximately one quarter of health anxiety patients reported seeing a GP in the past 12 months for a mental health problem. This finding indicates that many people with health anxiety are more likely to seek help and treatment for their disorder or a related condition. Unfortunately this result also indicates that the same proportion of current cases have failed to receive effective treatment or satisfactory professional help and therefore may remain in various health services for a long time without significant improvement. Conradt et al (31, p. 137) wrote “the disorder has a major impact on interpersonal relationships, in general, and on the doctor patient relationship in particular... resulting in consultations that are experienced by both doctor and patient as frustrating and unsatisfactory” (c.f. 6, 30-31). The current study was not able to examine the effectiveness of treatments received by respondents with health anxiety nor was it able to examine the number and length of time spent in various health services. In addition,

it is hypothesised that many respondents with health anxiety will seek treatment pertaining to a physical rather than a mental condition but the specific detail regarding physical consultations was not available and hence the current results perhaps represent an underrepresentation of total health service utilisation. Future research must examine these issues if any significant improvements in treatment and prevention of health anxiety are to be made.

The interpretation of the findings should be made while considering some limitations of the current study. Despite examining a representative sample of the Australian population, the current study analysed retrospective self-report to estimate the prevalence of lifetime health anxiety. Previous studies have demonstrated that recall bias can significantly influence the prevalence estimates generated from retrospective designs and therefore caution must be taken when interpreting the current results (32-33). However, data from longitudinal prospective studies on health anxiety, which are theoretically free from recall bias and could provide some indication of over- or under-estimation of prevalence, are currently unavailable. Further research is required to investigate the influence of self-report and recall bias on the prevalence estimates reported in the current study.

A secondary caveat of the current study was that the diagnostic status of health anxiety was evaluated utilising brief screening questions rather than systematically addressing each diagnostic criterion required by the DSM-IV, therefore precluding the ability to strictly examine DSM-IV defined hypochondriasis. The screening questions did not allow for an assessment of whether differential diagnoses (e.g., GAD) better accounted for participants' illness concerns (Criterion C and Criterion F; DSM-IV). Therefore, the prevalence rates found in this study may reflect in part "true" primary DSM-IV Axis I diagnoses of hypochondriasis, as well as hypochondriacal concerns that are better accounted for by other Axis I disorders. Regardless of whether the illness concerns are attributed to a

primary disorder of hypochondriasis, subthreshold hypochondriasis, or secondary to other Axis I disorders, our results indicate that these symptoms are prevalent, debilitating, and associated with high mental health service use indicating the need for treatment and recognition of this condition.

Third, the assessment of DSM-IV Criterion B for hypochondriasis; illness worries persisting “despite appropriate medical reassurance” was based solely on participants’ subjective and retrospective self-report, and not validated by a health professional. This may have potentially over-inflated the prevalence estimate of health anxiety by encouraging positive responses, suggesting the estimates should be interpreted with caution.

The current study represents the first population based epidemiological data for health anxiety in the Australian population. The main findings of the study suggest that the prevalence of health anxiety is non-trivial, there are few socio-demographic predictors, and only comorbid conditions and current smoking status are significant health predictors of health anxiety. Respondents with health anxiety are at higher risk for many comorbid anxiety and affective disorders and they exhibit significantly more distress, functional impairment, disability, and mental health service utilisation. In short, health anxiety is a disabling condition and requires further research and clinical attention.

## References

1. Asmundson GJ, Abramowitz JS, Richter AA, Whedon M. Health anxiety: current perspectives and future directions. *Curr Psychiatry Rep* 2010; 12: 306-312.
2. Barsky AJ, Fama JM, Bailey ED, Ahern DK. A prospective 4- to 5-year study of DSM-III-R hypochondriasis. *Arch Gen Psychiatry* 1998; 55: 737-744.
3. Barsky AJ, Ettner SL, Horsky J, Bates DW. Resource utilization of patients with hypochondriacal health anxiety and somatization. *Med Care* 2001; 39: 705-715.
4. Barsky AJ, Wyshak G, Klerman GL. Hypochondriasis: an evaluation of the DSM-III criteria in medical outpatients. *Arch Gen Psychiatry* 1986; 43: 493-500.
5. Fink P, Ornbol E, Sparle C. The outcome of health anxiety in primary care. A two-year follow-up study on health care costs and self-rated health. *PLoS One* 2010; 5: e9873.
6. Katon WJ, Walker EA. Medically unexplained symptoms in primary care. *J Clin Psychiatry* 1998; 59: 15-21.
7. Mykletun A, Heradstveit O, Eriksen K, Glozier N, Overland S, Maeland JG, Wilhelmsen I. Health anxiety and disability pension award: the HUSK study. *Psychosom Med* 2009; 71: 353-360.
8. Bleichhardt G, Hiller W. Hypochondriasis and health anxiety in the German population. *Br J Health Psychol* 2007; 12: 511-523.
9. Andrews G, Issakidis C, Sanderson K, Corry J, Lapsley H. Utilising survey data to inform public policy: comparison of the cost-effectiveness of treatment of ten mental disorders. *Br J Psychiatry* 2004; 184: 526-533.
10. Jenkins R. Making psychiatric epidemiology useful: the contribution of epidemiology to government policy. *Acta Psychiatr Scand* 2001; 103: 2-14.

11. Slade T, Johnston A, Oakley-Browne MA, Andrews G, Whiteford H. 2007 National Survey of Mental Health and Wellbeing: methods and key findings. *Aust N Z J Psychiatry* 2009; 43:594-605.
12. Kessler RC, Ustun TB. The World Mental Health Survey Initiative version of the World Health Organization Composite International Diagnostic Interview. *Int J Methods Psychiatr Res* 2004; 13: 93-121.
13. Kessler RC, et al. Clinical calibration of DSM-IV diagnoses in the World Mental Health version of the World Health Organization Composite International Diagnostic Interview. *Int J Methods Psychiatr Res* 2004; 13: 122-139.
14. Kessler RC, Andrews G, Colpe LJ, Hiripi E, Mroczek DK, Normand SLT, Walters EE, Zaslavsky AM. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychol Med* 2002; 32: 959-976.
15. Andrews G, Slade T. Interpreting scores on the Kessler Psychological Distress Scale. *Aust N Z J Public Health* 2001; 26: 494-497.
16. Furukawa TA, Kessler RC, Slade T, Andrews G. The performance of the K6 and K10 screening scales for psychological distress in the Australian National Survey of Mental Health and Well-being. *Psychol Med* 2003; 33: 357-362.
17. Kessler RC, et al. Screening for serious mental illness in the general population with the K6 screening scale: results from the WHO World Mental Health (WMH) survey initiative. *Int J Methods Psychiatr Res* 2010; 19: 4-22.
18. Sunderland M, Slade T, Stewart G, Andrews G. Estimating the prevalence of DSM-IV mental illness in the Australian general population using the Kessler Psychological Distress scale. *Aust N Z J Psychiatry* in press.
19. Andrews G, Kemp A, Sunderland M, Von Korff M, Ustun TB. Normative data for the 12 item WHO Disability Assessment Schedule 2.0. *PLoS One* 2009; 4: e8343.



20. Wolter KM. *Introduction to variance estimation*. Springer Science, 2007.
21. Shah BV, Barnwell BG, Biegler GS. *SUDAAN User's manual*. Research Triangle Park, 1997.
22. Australian Bureau of Statistics. *Information paper: use of the Kessler Psychological Distress Scale in ABS health surveys, Australia*. Australian Bureau of Statistics, 2001.
23. Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE. Prevalence, severity, and comorbidity of 12-month DSM-IV disorders in the National Comorbidity Survey Replication. *Arch Gen Psychiatry* 2005; 62: 593-602.
24. Noyes R, Happel RL, Yagla SJ. Correlates of hypochondriasis in a nonclinical population. *Psychosomatics* 1999; 40: 461-469.
25. Martin A, Jacobi F. Features of hypochondriasis and illness worry in the general population in Germany. *Psychosom Med* 2006; 68: 770-777.
26. Gureje O, Ustun TB, Simon GE. The syndrome of health anxiety: a cross-national study in primary care. *Psychol Med* 1997; 27: 1000-1010.
27. Creed F, Barsky A. A systematic review of the epidemiology of somatisation disorder and hypochondriasis. *J Psychosom Res* 2004; 56: 391-408.
28. Escobar JI, Gara M, Waitzkin H, Silver RC, Holman A, Compton W. DSM-IV hypochondriasis in primary care. *Gen Hosp Psychiatry* 1998; 20: 155-159.
29. Kessler RC, Merikangas KR, Berglund P, Eaton WW, Koretz DS, Walters EE. Mild disorders should not be eliminated from the DSM-V. *Arch Gen Psychiatry* 2003; 60: 1117-1122.
30. Slade T, Grove R, Burgess P. Kessler Psychological Distress Scale: normative data from the 2007 Australian National Survey of Mental Health and Wellbeing. *Aust N Z J Psychiatry* 2011; 45: 308-316.

31. Conradt M, Cavanagh M, Franklin J, Rief W. Dimensionality of the Whitely index: assessment of hypochondriasis in an Australian sample of primary care patients. *J Psychosom Res* 2006; 60: 137-143.
32. Streiner DL, Patten SB, Anthony JC, Cairney J. Has 'lifetime prevalence' reached the end of its life? An examination of the concept. *Int J Methods Psychiatr Res* 2009; 18: 221-228.
33. Patten SB. Accumulation of major depressive episodes over time in a prospective study indicates that retrospectively assessed lifetime prevalence estimates are too low. *BMC Psychiatry* 2009; 9: 19.

## **Appendix**

1. Have you ever worried a lot about serious illness despite reassurance from a doctor?
2. Has a period of worry like this ever continued for six months or more?
3. Did a period of worry like this include any of the time in the last 12 months?
4. Is this worry still going on?

## TABLES

**Table 1:** Lifetime prevalence estimates of health anxiety by age and sex in the Australian population

<b>Age</b>	<b>Male</b>		<b>Female</b>		<b>Total</b>	
	<b>%</b>	<b>SE</b>	<b>%</b>	<b>SE</b>	<b>%</b>	<b>SE</b>
<b>16-24</b>	1.84	0.60	5.73	1.20	3.75	0.67
<b>25-34</b>	3.41	0.87	6.23	1.00	4.81	0.66
<b>35-44</b>	7.83	1.55	7.04	1.26	7.43	0.97
<b>45-54</b>	6.54	1.50	7.96	1.67	7.26	1.20
<b>55-64</b>	5.89	0.99	7.21	1.17	6.55	0.76
<b>64-85</b>	3.39	0.85	4.62	0.72	4.04	0.52
<b>Total</b>	4.92	0.45	6.51	0.50	5.72	0.31

**Table 2:** Current prevalence estimates of health anxiety by age and sex in the Australian population

<b>Age</b>	<b>Male</b>		<b>Female</b>		<b>Total</b>	
	<b>%</b>	<b>SE</b>	<b>%</b>	<b>SE</b>	<b>%</b>	<b>SE</b>
<b>16-24</b>	1.29	0.56	2.52	0.65	1.89	0.41
<b>25-34</b>	2.00	0.63	4.15	0.90	3.07	0.50
<b>35-44</b>	4.60	1.16	4.26	0.95	4.43	0.68
<b>45-54</b>	3.71	1.07	5.02	1.29	4.37	0.84
<b>55-64</b>	3.38	0.79	4.31	0.92	3.84	0.60
<b>64-85</b>	2.56	0.75	2.91	0.62	2.75	0.46
<b>Total</b>	2.97	0.35	3.91	0.43	3.44	0.25

**Table 3:** Socio-demographic and health correlates of health anxiety

Variable		Lifetime Prevalence		Current Prevalence	
		Odds Ratio	95% CI	Odds Ratio	95% CI
Age	16-24	1.00	-	1.00	-
	25-34	1.07	0.66-1.76	1.28	0.70-2.36
	35-44	1.54	0.84-2.82	1.51	0.80-2.86
	45-54	1.49	0.83-2.69	1.48	0.79-2.75
	55-64	1.11	0.60-2.03	0.93	0.45-1.92
	65-85	0.53	0.26-1.06	0.48	0.22-1.05
	Wald <i>F</i> (p)	27.55 (p<0.001)		21.27 (p=0.001)	
Sex	Male	1.00	-	1.00	-
	Female	1.26	0.96-1.64	1.14	0.79-1.66
	Wald <i>F</i> (p)	2.95 (p=0.086)		0.52 (p=0.471)	
Marital Status	Married/Defacto	1.00	-	1.00	-
	Separated/Widowed/ Divorced	1.26	0.86-1.85	1.13	0.77-1.67
	Never married	1.17	0.79-1.72	1.03	0.66-1.60
	Wald <i>F</i> (p)	1.61 (p=0.447)		0.43 (p=0.807)	
Education	Post-school education	1.00	-	1.00	-
	Completed high school	1.26	0.86-1.85	0.80	0.50-1.25
	Completed less than high school	1.17	0.79-1.72	1.42	0.95-2.12
	Wald <i>F</i> (p)	1.07 (p=0.586)		5.62 (p=0.060)	
Employment status	Currently employed	0.69	0.51-0.92	0.52	0.36-0.75
	Not in the labour force	1.00	-	1.00	-
	Wald <i>F</i> (p)	6.78 (p=0.009)		12.77 (p<0.001)	
Country of Birth	Australian	1.00	-	1.00	-
	Other	0.93	0.62-1.40	1.34	0.77-2.34
	Wald <i>F</i> (p)	0.11 (p=0.738)		1.10 (p=0.293)	
SES	High	1.00	-	1.00	-
	Low	1.08	0.82-1.43	1.12	0.7-1.62
	Wald <i>F</i> (p)	0.32 (p=0.573)		0.34 (p=0.558)	
Physical conditions	One or more	4.34	2.84-6.64	4.67	2.73-7.98
	None	1.00	-	1.00	-
	Wald <i>F</i> (p)	48.03 (p<0.001)		32.99 (p<0.001)	
Smoking status	Current smoker	1.90	1.39-2.61	2.02	1.29-3.16
	Ex-smoker	1.27	0.89-1.81	1.43	1.01-2.01
	Never smoked	1.00	-	1.00	-
	Wald <i>F</i> (p)	16.63 (p<0.001)		10.07 (p=0.007)	
Body mass index	Underweight	0.90	0.48-1.70	0.71	0.20-2.54
	Normal weight	1.00	-	1.00	-
	Overweight/Obese	1.11	0.83-1.48	1.26	0.91-1.75
	Wald <i>F</i> (p)	0.82 (p=0.664)		2.58 (p=0.276)	

**Table 4:** Comorbidity of affective and anxiety disorders with and without lifetime or current health anxiety in the Australian population.

Disorder	Lifetime health anxiety		Odds ratio	95% CI	Current health anxiety		Odds ratio	95% CI
	With % (SE)	Without % (SE)			With % (SE)	Without % (SE)		
Major depression	37.4 (3.42)	11.4 (0.48)	4.66	3.42-6.34	11.8 (3.09)	1.6 (0.19)	8.15	4.16-15.98
Dysthymia	6.7 (1.63)	1.4 (0.20)	5.06	2.57-9.96	5.4 (2.45)	0.5 (0.11)	10.87	3.03-38.98
Bipolar	9.1 (1.39)	0.9 (0.17)	11.38	6.75-19.20	5.7 (1.94)	0.2 (0.15)	40.00	14.43-110.88
Any Affective	46.8 (3.60)	12.4 (0.47)	6.20	4.59-8.37	17.5 (3.74)	1.9 (0.20)	11.12	6.11-20.22
Agoraphobia	10.5 (1.76)	1.8 (0.22)	6.46	4.40-9.50	5.2 (1.10)	0.4 (0.08)	13.38	6.73-26.60
Panic Disorder	12.2 (2.30)	3.0 (0.27)	4.45	2.80-7.07	4.6 (1.10)	0.5 (0.10)	10.62	5.25-21.51
Social phobia	29.1 (2.48)	7.1 (0.38)	5.35	4.13-6.93	14.0 (2.70)	1.9 (0.19)	8.26	5.17-13.19
Generalised anxiety disorder	23.8 (2.77)	5.0 (0.38)	5.89	4.12-8.44	5.9 (1.56)	0.7 (0.15)	9.32	4.52-19.21
OCD	11.4 (2.01)	3.3 (0.26)	3.77	2.45-5.80	6.7 (2.02)	2.0 (0.19)	3.57	1.70-7.49
PTSD	18.3 (1.96)	6.6 (0.36)	3.20	2.36-4.34	13.3 (2.46)	2.1 (0.22)	7.25	4.38-12.01
Any anxiety disorder	55.6 (2.57)	17.8 (0.64)	5.77	4.61-7.23	31.8 (3.21)	5.9 (0.35)	7.37	5.32-10.21
Depression and anxiety	68.4 (2.60)	23.3 (0.70)	7.12	5.57-9.11	36.7 (3.48)	6.8 (0.40)	7.90	5.67-11.01
Any Disorder	80.0 (2.06)	40.2 (0.86)	5.94	4.58-7.70	-	-	-	-
Mean number of Disorders	1.6 (0.08)	0.4 (0.01)	Wald F = 471.01, p < 0.001		0.6 (0.01)	0.1 (0.07)	Wald F = 215.02, p < 0.001	

Note: OCD = obsessive compulsive disorder, PTSD = post-traumatic stress disorder, 95% CI = 95% confidence intervals, SE = standard error; percentages were weighted for the Australian population; Mean number of disorders compared using Poisson regression. A diagnosis of Any disorder was made if at least one mental or physical disorder was present.

**Table 5:** Distress, impairment, and service utilisation associated with and without current health anxiety in the Australian population.

	With Current Health anxiety	Without Current Health anxiety		
	M (SE)	M (SE)	Wald F	p
<b>Distress (K10)</b>	22.67 (0.70)	14.19 (0.07)	220.24	<0.001
<b>Impairment (WHODAS)</b>	25.86 (1.99)	8.74 (0.55)	114.05	<0.001
<b>Days out of Role</b>	7.81 (0.75)	1.76 (0.08)	180.23	<0.001
<b>GP Mental Health consultations* (%)</b>	24.07 (3.14)	7.48 (0.37)	13.26	<0.001
<b>Specialist Mental Health consultations* (%)</b>	23.23 (3.59)	5.76 (0.37)	22.5	<0.001

Note: \* service use measured using binary (yes/no) variable indicating whether the respondents sought help from a GP or specialist mental health clinician for a mental illness in the past 12 months; frequencies of those who used services were calculated and compared using chi-square analysis. K10 = Kessler 10 psychological distress scale. WHODAS = World Health Organization Disability Assessment Schedule. GP = general practitioner