Who is identified when screening for depression is undertaken in general practice? Baseline findings from the Diagnosis, Management and Outcomes of Depression in Primary Care (*diamond*) longitudinal study

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ABSTRACT

Objectives: To report the baseline characteristics of the Diagnosis, Management and Outcomes of Depression in Primary Care (*diamond*) study cohort and discuss the implications for depression care in general practice.

Design: A prospective longitudinal study beginning in January 2005.

Participants and setting: Adult patients with depressive symptoms identified via screening with the Center for Epidemiologic Studies Depression Scale (CES-D ⩾ 16) in 30 randomly selected Victorian general practices.

Main outcome measure: Depression status on the Patient Health Questionnaire (PHQ).

Results: 789 patients form the cohort (71% women). At baseline, 47% were married, 21% lived alone, 36% received a pension or benefit, 15% were unable to work, 23% reported hazardous drinking, 32% were smokers, 39% used antidepressants and 19% used sedatives. 27% satisfied criteria for current major depressive syndrome (MDS) on the PHQ, while 52% had "persistent" depressive symptoms, and 22% had "transient" depressive symptoms, lasting at most a few weeks. Of those satisfying criteria for MDS, 49% were also classified with an anxiety syndrome, 40% reported childhood sexual abuse, 57% reported childhood physical abuse, 42% had at some time been afraid of their partner, and 72% reported a chronic physical condition; 84% were receiving mental health care (either taking antidepressants or seeing a health practitioner specifically for mental health care) compared with 66% of those with persistent depressive symptoms and 57% with transient depressive symptoms.

Conclusion: This method of screening for depressive symptoms in general practice identifies a group of patients with substantial multiple comorbidities — psychiatric, physical and social problems coexist with depressive symptoms, raising challenges for the management of depression in general practice.

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Depression is the largest cause of disability burden in Australia[1] and worldwide, and is managed mainly in general practice.[2] Ensuring an effective primary care response to this disabling condition has proven challenging,[3] despite substantial investment by the Australian Government in general practice reform.[4]

Early cross-sectional research found that general practitioners often failed to diagnose depression.[5] An obvious response was to consider depression screening programs, yet evidence shows that screening alone is unlikely to be a cost-effective way to improve population mental health.[6] Nevertheless, screening programs are recommended in the United States,[7] the United Kingdom,[6] and by some in Australia.[8]

Despite considerable international efforts to improve care for people experiencing depression, only small long-term gains have been demonstrated.[9] Our recent systematic review identified a lack of data for depression service planning in areas such as the phase and severity of depression seen in general practice, and factors associated with service and treatment use over time.[10] Only two cohort studies of depression have been undertaken in Australian general practice, neither for longer than 1 year.[11,12] Most primary care research focuses on major depressive disorder, yet the more prevalent conditions, such as minor and subsyndromal depression and dysthymia, may place a greater burden on the health care system.[13]

The Diagnosis, Management and Outcomes of Depression in Primary Care (*diamond*) study is documenting the experiences, health outcomes, treatment and service use of a cohort of general practice patients identified by a depression screening process. Here, we report baseline findings and discuss the implications for depression care in general practice.

METHODS

diamond is a prospective, longitudinal cohort study of patients with depressive symptoms from 30 metropolitan and rural general practices in Victoria, that began in January 2005. Ethics approval was granted by the University of Melbourne's Human Research Ethics Committee.

Sample size estimation

Results of our pilot study in two practices indicated we needed to invite about 18 000 patients from 30 general practices to participate in screening using the Center for Epidemiologic Studies Depression Scale (CES-D) to achieve a sample of 730 participants with depressive symptoms at baseline. Allowing for a 30% attrition rate over 3 years, and taking into account the intracluster correlation (ICC) and exposure ratio of 2 : 1 (exposed : unexposed), this sample size allows us to examine a 15% difference in the proportion of those who meet criteria for recovery from depression (ICC = 0.01) between exposed and unexposed groups (eg, abused v non-abused) and an effect size of 0.5 of one standard deviation in the CES-D score (ICC = 0.02) between groups, with at least 80% power and a significance level of 5% for a two-sided test.

GP recruitment and eligibility

The Health Insurance Commission provided a randomly selected list of 200 Victorian GPs, stratified by population distribution (to

1 *diamond* study instruments

Survey instrument/items*	Screening survey	Baseline		3, 6, 9 months	12 months		24 months		36 months	
		Survey	CATI	Surveys	Survey	CATI	Survey	CATI	Survey	CATI
Canadian Problem Gambling Index (CPGI)								♦		♦
Center for Epidemiologic Studies Depression Scale (CES-D)	♦	♦		♦	♦		♦		♦	
Child Maltreatment History Self-Report (CMHSR)		♦								
Community and social participation		♦		♦	♦		♦		♦	
Composite Abuse Scale (CAS)		♦			♦		♦		♦	
Composite International Diagnostic Interview (CIDI) – Auto 2.1. Depressive, alcohol, and substance use disorders			♦					♦		♦
Ever been afraid of any partner/afraid of current partner	♦	♦			♦		♦		♦	
Exercise		♦		♦	♦		♦		♦	
Fast Alcohol Screening Test (FAST)	♦				♦		♦		♦	
General Practice Assessment Questionnaire (GPAQ)	♦				♦		♦		♦	
Life events		♦		♦	♦		♦		♦	
International Personality Item Pool (IPIP) neuroticism items									♦	
Oslo Social Support Scale									♦	
Primary Care Evaluation of Mental Disorders Patient Health Questionnaire (PHQ)		♦		♦	♦		♦		♦	
Psychosis Screening Questionnaire (PSQ)								♦		♦
Screening questions for repetitive and intrusive thoughts and compulsions		♦			♦		♦		♦	
Self-harm								♦		♦
Short Form Health Survey (SF-12)		♦		♦	♦		♦		♦	
Short Form of the Social Support Questionnaire		♦			♦		♦		♦	
Standardised Assessment of Personality – Abbreviated Scale (SAPAS)								♦		♦
Trust in Physician Scale	♦						♦		♦	
World Health Organization Quality of Life (WHOQOL-BREF)		♦		♦	♦		♦		♦	

CATI = computer-assisted telephone interview. * A complete list of references for these instruments is available from the authors. *diamond* study items also collected include demographics, number of cigarettes smoked per day, self-reported chronic conditions, days out of role, service utilisation and treatment, medication use, history and experience of depression, and social attitudes towards depression. ♦

ensure a representative rural and metropolitan sample), who had provided 1500 consultations or more in the previous year. GPs were eligible to participate if they: had seen at least 600 patients aged 18–75 years in the past year; were able to generate a computerised list of patients' details; agreed to complete the study survey; and no other GP in their practice was already in the study. Practices received $350 for participating and GPs received $50 for survey completion.

Participant selection and screening procedures

A research assistant helped practice staff to generate a random list of patients seen in the previous year. Each GP then checked that patients on the list met inclusion criteria for the study. Patients were eligible if they: were able to read English; were not terminally ill; were aged 18–75 years; and did not reside in a nursing home. Between January and December 2005, patients were sent a plain-language statement about the study, a screening survey, a resource card displaying mental health and related services, and a reply-paid envelope. A reminder letter was sent 2 weeks later.

Due to ethics requirements, the names and contact details of patients who were sent a screening survey were not held by the researchers; however, a de-identified record of age and sex was available. Patients who completed the screening survey were contacted if they declared an interest in hearing more about the study and had provided their first name and telephone number. Those identified through the screening as having current depressive symptoms (ie, CES-D $\geqslant 16$)[14] and who then completed a baseline survey form the cohort.

Baseline and follow-up procedures

Computer-assisted telephone interviews (CATIs) were undertaken with participants at baseline, 12 months and 24 months, and follow-up postal surveys were sent at 3, 6, 9, 12 and 24 months. Participants will also be followed up at 36 months. Baseline measures were taken at least 2 weeks after screening. The instruments used in the surveys and CATIs are shown in Box 1.

The Composite International Diagnostic Interview (CIDI) – Auto, version 2.1 assessed whether participants satisfied criteria for major depressive disorder in the past year.[15] The CIDI was administered by telephone, as in other large-scale studies of psychiatric morbidity,[16-18] to allow recruitment from a wide geographical area at reasonable cost. Interviewers were at least university graduate level, had interviewing experience, and received training in the use

of the CIDI in accordance with the interviewers' manual. Five per cent of interviews were audiotaped and reviewed for quality control.

The Patient Health Questionnaire (PHQ) identified participants with current major depressive syndrome (MDS), and is validated for use in primary care as part of routine clinical care.[19] The CES-D assesses severity of depressive symptoms.[14]

The CES-D, PHQ and CIDI all measure depressive symptoms but do so over different time frames (1 week, 2 weeks, and at least 2 weeks of consecutive symptoms in the past year, respectively), allowing a comprehensive picture of depressive symptoms to be described.

Statistical analysis

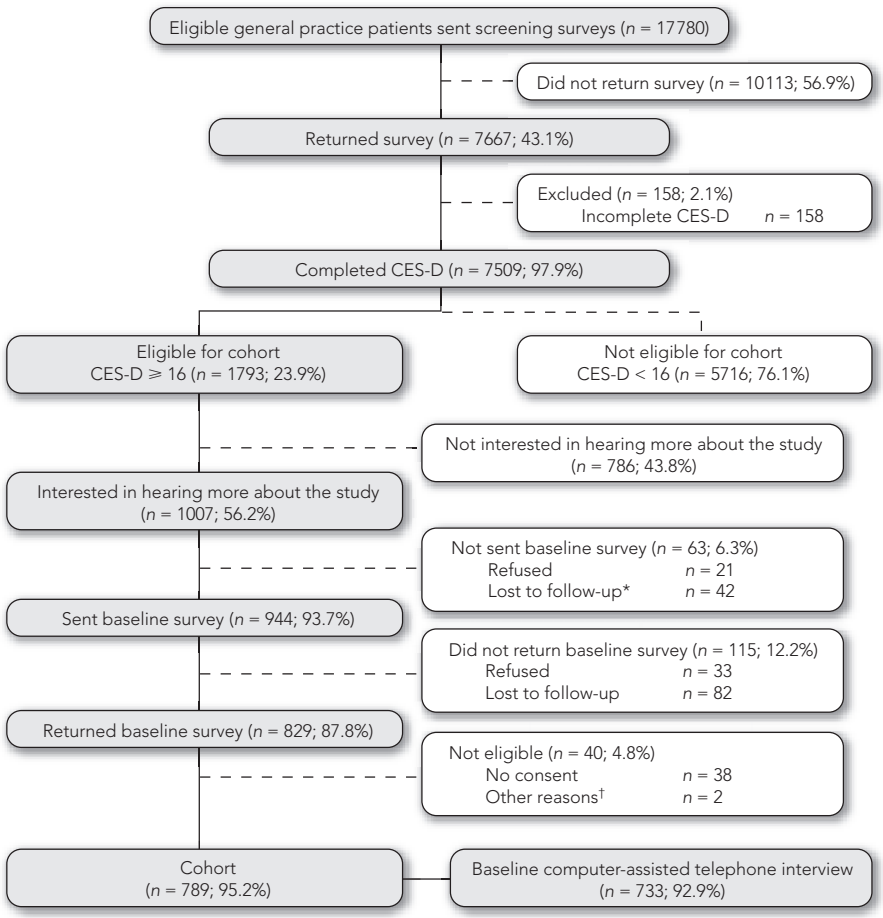
Data were summarised using frequencies and percentages for categorical data, and means and standard deviations for continuous data. Statistical analysis allowed for the clustering effect resulting from recruiting patients from the same general practice.

Marginal linear regression and logistic regression models fitted using generalised estimating equations with robust standard errors, and multinomial logistic regression with robust standard errors were used to compare patient characteristics between the patients who agreed to participate and those who declined.

Cohort participants were categorised into three groups based on severity of depressive symptoms: current MDS as measured by the PHQ; "persistent" depressive symptoms, if they maintained a CES-D score ≥ 16 at baseline but did not satisfy criteria for MDS; or "transient" depressive symptoms, if patients no longer scored ≥ 16 on the CES-D at baseline and did not satisfy criteria for MDS. Multinomial logistic regression with robust standard errors was used to examine the association between depressive symptoms groups and patient characteristics and comorbidities. Results are reported as odds ratios (ORs) with 95% confidence intervals, comparing the odds of being in each of the persistent and transient depressive symptoms groups relative to the odds of being in the current MDS group (base outcome). *P* values summarise the strength of association between depressive symptoms status and patient characteristics and comorbidities. Multiple multinomial logistic regression was used to adjust for age, sex and GP location where indicated.

Data were analysed using Stata, version 9.2 (StataCorp, College Station, Tex, USA).

2 Flowchart of patient participation in the *diamond* study from 30 general practices



CES-D = Center for Epidemiologic Studies Depression Scale. * Patients who were interested in hearing more about the *diamond* study but who could not be contacted in at least six telephone attempts or because their phone number was disconnected. † One patient felt survey questions no longer applied to him/her and withdrew; one patient was unable to complete surveys or interviews as a result of multiple strokes and was removed from the study. ◆

RESULTS

GP response rate

From the list of 200 GPs, 21 could not be contacted (details had changed), 32 were ineligible (< 600 patients seen in past year, retired, or overseas) and 35 were from geographical areas where the recruitment quota had been reached, leaving a sample of 112 GPs; 30 of these (26.8%) agreed to participate.

Patient response rate

Of the 17 780 patients sent a screening survey, 7667 (43.1%) returned it (Box 2). Of the 1793 patients (23.9%) scoring CES-D ≥ 16, 1007 (56.2%) were interested in hearing more about the *diamond* study, and, of these, 789 (78.4%) completed a baseline survey and consented to participate, forming the *diamond* cohort. Of these 789 participants, 733 (92.9%) also completed a baseline CATI.

Representativeness of study participants

The mean age of patients who were sent a survey was 46.2 years (SD, 15.3) and 60.7% were women. Patients who returned the survey were on average older (50.9 years; SD, 14.2) and more likely to be female (66.5%).

A comparison between eligible patients who agreed to participate and those who returned a survey with CES-D ≥ 16, but declined to enter the cohort, is shown in Box 3. Participants were more likely to have been told by a doctor that they had depres-

sion; self-report depression or anxiety; have more severe depressive symptoms; have a chronic illness; and have been afraid of a partner.

Participant characteristics

Around a third (249, 31.6%) of participants live in rural settings. At baseline, 211 participants (26.7%) satisfied criteria for current MDS, while 408 (51.7%) had persistent depressive symptoms, and 170 (21.6%) had transient depressive symptoms. Fifty-one (30.0%) of those who experienced transient symptoms stated they had never experienced feeling down, depressed or hopeless for more than 2 weeks.

Depressive symptom group was not associated with sex, but participants satisfying criteria for current MDS were more likely to be younger and live in rural areas (Box 4). After adjusting for age, sex and GP location, participants were more likely to satisfy criteria for current MDS if they were unable to work, received a pension or benefit, found it difficult to manage on their available income, or smoked.

Cohort participants reported a high level of social, physical and psychological comorbidity (Box 5). After adjusting for age, sex and GP location, the odds of experiencing current MDS were greater for those with somatic symptoms, psychiatric comorbidity, and childhood physical and sexual abuse. Of participants satisfying criteria for MDS, 178 (84.4%) were receiving mental health care (taking antidepressants or seeing a mental health professional or GP specifically for the purpose of mental health care) compared with 268 (65.7%) of those with persistent depressive symptoms and 96 (56.5%) of those with transient depressive symptoms.

3 Comparison of patients with depressive symptoms (CES-D ⩾ 16) who consented to participate in the cohort with those who declined to participate

	Consented ($n = 789$)*	Declined ($n = 1004$)*		
Patient characteristic	Mean (SD)	Mean (SD)	Difference (95% CI)†	*P*
Age in years	48.0 (13.1)	47.1 (15.1)	–0.99 (–2.33 to 0.34)	0.15
CES-D score	27.2 (9.4)	25.0 (8.3)	–2.15 (–2.97 to –1.33)	< 0.001
	No. (%)	No. (%)	Odds ratio (95% CI)‡	*P*
Female	563 (71.4%)	689 (68.8%)	1.13 (0.91–1.40)	0.27
Marital status§				
Never married	184 (23.5%)	272 (27.5%)	1.00	0.003
Widowed/divorced/separated	228 (29.1%)	225 (22.8%)	1.50 (1.15–1.96)	
Married	371 (47.4%)	492 (49.8%)	1.11 (0.88–1.41)	
Lives alone	167 (21.3%)	184 (18.5%)	1.18 (0.98–1.43)	0.09
Born in Australia	651 (82.7%)	801 (79.9%)	1.17 (0.97–1.40)	0.10
English is first language	754 (95.8%)	930 (93.0%)	1.54 (1.04–2.27)	0.03
Left school before Year 10	134 (17.0%)	185 (18.6%)	0.91 (0.70–1.19)	0.48
Pension/benefit is main source of income	281 (36.0%)	331 (33.6%)	1.11 (0.90–1.36)	0.34
Has health care card	334 (43.7%)	451 (46.1%)	0.91 (0.73–1.15)	0.44
Unemployed, looking for work	33 (4.2%)	34 (3.4%)	1.25 (0.80–1.96)	0.33
Unable to work due to sickness/ disability	114 (14.5%)	131 (13.1%)	1.12 (0.84–1.49)	0.44
Hazardous drinking in past 12 months	180 (23.0%)	214 (21.7%)	1.09 (0.88–1.34)	0.43
Current smoker	249 (31.7%)	273 (27.4%)	1.24 (1.03–1.50)	0.03
Long term illness/health problem/ disability	405 (52.5%)	442 (45.4%)	1.33 (1.19–1.49)	< 0.001
At least one chronic physical condition in past 12 months¶	542 (68.8%)	591 (59.3%)	1.52 (1.21–1.90)	< 0.001
Rated health as excellent	28 (3.6%)	27 (2.7%)	1.34 (0.81–2.21)	0.25
Ever afraid of partner	278 (36.8%)	258 (26.9%)	1.58 (1.27–1.96)	< 0.001
Ever told by doctor had depression	530 (70.5%)	473 (51.1%)	2.26 (1.83–2.79)	< 0.001
Self-reported depression in past 12 months	424 (53.8%)	389 (39.0%)	1.82 (1.46–2.28)	< 0.001
Self-reported anxiety in past 12 months	353 (44.8%)	336 (33.7%)	1.59 (1.26–2.01)	< 0.001
Currently taking depression medication	307 (39.3%)	252 (25.3%)	1.92 (1.58–2.32)	< 0.001
Currently taking sedatives	150 (19.2%)	159 (15.9%)	1.25 (1.01–1.54)	0.42

CES-D = Center for Epidemiologic Studies Depression Scale.
* Denominators vary due to missing data. † Difference in means, 95% confidence intervals and *P* values calculated using marginal linear regression using generalised estimating equations (GEEs) with robust standard errors. ‡ Odds ratios, 95% confidence intervals and *P* values calculated using marginal logistic regression using GEEs with robust standard errors. § Odds ratio, 95% confidence interval and *P* value calculated using multinomial logistic regression with robust standard errors. Base outcome was "Never married". ¶ Physical conditions in past 12 months based on top 12 conditions seen in general practice: asthma, emphysema, diabetes, arthritis, back problems, hypertension, chronic sinusitis, lipid disorder, heart disease, cancer, stroke, dermatitis. ◆

DISCUSSION

These baseline findings from the *diamond* study show that patients satisfying criteria for current MDS are more likely to live in rural areas, to smoke, and to have significant physical and psychological comorbidities, social problems, poor quality of life, and disadvantage. In addition, the results show that those with persistent or transient depressive symptoms also experience significant problems, many of which may benefit from medical attention. The quality of life ratings for the cohort are substantially lower than Australian population norms,[21] even for the transient depressive symptoms group.

The finding that 24% of screened patients had a CES-D score of 16 or above is consistent with the published literature for a general practice sample.[10] Importantly, 22% of the cohort who satisfied criteria for "probable depression" at screen-

4 Depressive symptom groups by patient characteristics and quality of life measures of the *diamond* cohort

Patient characteristic	Current MDS (*n* = 211)* No. (%)	Persistent DS (*n* = 408)* No. (%)	Transient DS (*n* = 170)* No. (%)	Persistent DS† OR (95% CI)	Transient DS† OR (95% CI)	*P*
General practitioner location						
Urban (RRMA 1, 2)	132 (62.6%)	287 (70.3%)	121 (71.2%)	1.00	1.00	0.03
Rural (RRMA 3–5)	79 (37.4%)	121 (29.7%)	49 (28.8%)	0.70 (0.52–0.95)	0.68 (0.49–0.93)	
Sex						
Male	67 (31.8%)	111 (27.2%)	48 (28.2%)	1.00	1.00	0.34
Female	144 (68.3%)	297 (72.8%)	122 (71.8%)	1.24 (0.92–1.69)	1.18 (0.81–1.73)	
Age group (years)						
18–34	45 (21.3%)	67 (16.4%)	28 (16.5%)	1.00	1.00	0.03
35–54	113 (53.6%)	212 (52.0%)	74 (43.5%)	1.26 (0.83–1.92)	1.05 (0.54–2.04)	
55–76	53 (25.1%)	129 (31.6%)	68 (40.0%)	1.63 (0.96–2.77)	2.06 (1.11–3.83)	
Marital status						
Never married	50 (23.9%)	97 (24.0%)	37 (21.9%)	1.00	1.00	0.40
Widowed/divorced/separated	61 (29.2%)	126 (31.1%)	41 (24.3%)	1.06 (0.68–1.66)	0.91 (0.48–1.73)	
Married	98 (46.9%)	182 (44.9%)	91 (53.9%)	0.96 (0.60–1.52)	1.25 (0.68–2.33)	
Born in Australia	182 (86.7%)	330 (81.1%)	139 (81.8%)	0.66 (0.38–1.15)	0.69 (0.38–1.25)	0.34
English is first language	203 (96.2%)	388 (95.3%)	163 (96.5%)	0.80 (0.31–2.12)	1.07 (0.31–3.73)	0.72
Lives alone	50 (23.8%)	87 (21.4%)	30 (17.7%)	0.87 (0.56–1.35)	0.69 (0.41–1.14)	0.34§
Employment						
Employed/student	111 (52.9%)	249 (61.3%)	115 (67.7%)	1.00	1.00	< 0.001¶
Not employed‡	48 (22.9%)	102 (25.1%)	50 (29.4%)	0.95 (0.58–1.53)	0.98 (0.60–1.62)	
Unable to work	51 (24.3%)	55 (13.6%)	5 (2.9%)	0.46 (0.31–0.68)	0.09 (0.03–0.25)	
Highest level of education						
Completed Year 12 or less	110 (52.1%)	235 (57.7%)	89 (52.7%)	1.00	1.00	0.19
Certificate or diploma	58 (27.5%)	97 (23.8%)	35 (20.7%)	0.78 (0.50–1.23)	0.75 (0.48–1.17)	
Bachelor degree or higher	43 (20.4%)	75 (18.4%)	45 (26.6%)	0.82 (0.58–1.14)	1.29 (0.90–1.85)	
Manage on available income						
Easily/not too bad	60 (28.4%)	178 (43.8%)	99 (58.9%)	1.00	1.00	< 0.001¶
Difficult some of the time	74 (35.1%)	161 (39.7%)	57 (33.9%)	0.73 (0.50–1.08)	0.47 (0.31–0.70)	
Difficult all of the time	77 (36.5%)	67 (16.5%)	12 (7.1%)	0.29 (0.19–0.46)	0.09 (0.05–0.19)	
Pension/benefit is main source of income	92 (43.8%)	147 (36.6%)	42 (24.9%)	0.74 (0.51–1.07)	0.42 (0.24–0.73)	0.008¶
Hazardous drinking in past 12 months	46 (22.1%)	89 (21.9%)	45 (26.6%)	0.99 (0.70–1.40)	1.28 (0.81–2.02)	0.44
Current smoker	94 (44.8%)	123 (30.4%)	32 (18.8%)	0.54 (0.40–0.72)	0.29 (0.15–0.55)	< 0.001¶
Quality of life (WHOQOL-BREF)						
Physical health	43.8 (17.3)**	55.8 (15.9)**	66.4 (15.0)**	1.04 (1.03–1.06)	1.09 (1.07–1.11)	< 0.001¶
Psychological health	32.7 (13.2)**	46.1 (11.8)**	59.7 (11.8)**	1.09 (1.08–1.11)	1.20 (1.17–1.23)	< 0.001¶
Social relationships	37.9 (24.7)**	48.2 (22.0)**	61.7 (19.7)**	1.02 (1.01–1.03)	1.05 (1.04–1.06)	< 0.001¶
Environment	52.5 (15.9)**	62.6 (12.9)**	71.0 (10.3)**	1.05 (1.04–1.06)	1.11 (1.09–1.14)	< 0.001¶

DS = depressive symptoms. MDS = major depressive syndrome. OR = odds ratio. RRMA = Rural, Remote and Metropolitan Areas classification.[20]
WHOQOL-BREF = World Health Organization Quality of Life.

*Denominators vary due to missing data. † ORs, 95% confidence intervals and *P* values calculated using multinomial logistic regression with robust standard errors. Base outcome was current MDS. Value of 1.00 indicates reference category. ‡ Includes home duties, unpaid work, retired, and maternity leave. § After adjusting for age, sex and GP location, MDS group were more likely than transient DS group to be living alone (adjusted OR, 0.57; 95% CI, 0.33–0.97). ¶ *P* <0.001 after adjusting for age, sex and GP location. ** Values are mean (SD) scores. ◆

ing no longer did so around 2 weeks later, highlighting the need to consider two assessments before making a diagnosis. We will track these 170 participants with transient depressive symptoms over the 3 years of follow-up — some may represent "false positives" for depressive symptoms on the initial screening test, while others may represent people at different phases of the

5 Depressive symptom groups by social, physical and psychological comorbidities of the *diamond* cohort

	Current MDS (*n* = 211)*	Persistent DS (*n* = 408)*	Transient DS (*n* = 170)*	Unadjusted analysis†			Adjusted analysis†‡		
				Persistent DS	Transient DS		Persistent DS	Transient DS	
Comorbidity	No. (%)	No. (%)	No. (%)	OR (95% CI)	OR (95% CI)	*P*	OR (95% CI)	OR (95% CI)	*P*
CIDI (12-month disorders)									
MDD	155 (77.9%)	160 (43.5%)	41 (25.8%)	0.22 (0.16–0.30)	0.10 (0.06–0.16)	<0.001	0.22 (0.16–0.30)	0.10 (0.07–0.17)	<0.001
Dysthymia	41 (20.6%)	31 (8.4%)	3 (1.9%)	0.35 (0.21–0.60)	0.07 (0.02–0.24)	<0.001	0.35 (0.21–0.60)	0.07 (0.02–0.24)	<0.001
Any substance misuse/dependence	56 (28.4%)	72 (19.7%)	25 (15.8%)	0.62 (0.44–0.86)	0.47 (0.27–0.82)	0.003	0.70 (0.50–0.99)	0.59 (0.34–1.04)	0.06
PHQ§ somatic symptom severity									
Minimal	4 (1.9%)	43 (10.5%)	45 (26.5%)	1.00	1.00	<0.001	1.00	1.00	<0.001
Low	42 (19.9%)	200 (49.0%)	86 (50.6%)	0.44 (0.15–1.29)	0.18 (0.05–0.64)		0.46 (0.16–1.34)	0.18 (0.05–0.67)	
Medium	100 (47.4%)	124 (30.4%)	34 (20.0%)	0.11 (0.04–0.35)	0.03 (0.01–0.10)		0.11 (0.03–0.35)	0.28 (0.01–0.10)	
High	65 (30.8%)	41 (10.1%)	5 (2.9%)	0.06 (0.02–0.20)	0.01 (0.001–0.04)		0.06 (0.02–0.21)	0.01 (0.001–0.03)	
PHQ disorders¶									
Panic syndrome	65 (31.7%)	63 (15.6%)	14 (8.2%)	0.40 (0.25–0.63)	0.19 (0.10–0.39)	<0.001	0.41 (0.25–0.65)	0.20 (0.10–0.41)	<0.001
Other anxiety syndrome	102 (49.0%)	51 (12.7%)	3 (1.8%)	0.15 (0.10–0.23)	0.02 (0.01–0.06)	<0.001	0.14 (0.09–0.22)	0.02 (0.01–0.06)	<0.001
PHQ eating disorders									
No eating disorder	160 (78.4%)	344 (84.3%)	149 (87.7%)	1.00	1.00	0.04	1.00	1.00	0.16
Binge eating	33 (16.2%)	55 (13.5%)	18 (10.6%)	0.78 (0.48–1.26)	0.59 (0.32–1.06)		0.79 (0.48–1.29)	0.60 (0.33–1.10)	
Bulimia nervosa	11 (5.4%)	9 (2.2%)	3 (1.8%)	0.38 (0.18–0.80)	0.29 (0.08–1.14)		0.45 (0.19–1.03)	0.35 (0.09–1.44)	
Repetitive thoughts**	95 (45.2%)	80 (19.6%)	7 (4.1%)	0.30 (0.20–0.44)	0.05 (0.02–0.11)	<0.001	0.30 (0.20–0.44)	0.05 (0.03–0.11)	<0.001
Repetitive compulsions††	51 (24.8%)	49 (12.2%)	6 (3.6%)	0.42 (0.28–0.64)	0.11 (0.05–0.25)	<0.001	0.44 (0.28–0.67)	0.12 (0.05–0.27)	<0.001
Childhood abuse									
Sexual abuse	83 (40.1%)	116 (28.7%)	34 (20.2%)	0.60 (0.43–0.84)	0.38 (0.23–0.62)	<0.001	0.59 (0.43–0.82)	0.38 (0.23–0.63)	<0.001
Physical abuse	119 (56.7%)	196 (48.8%)	65 (38.7%)	0.73 (0.53–1.00)	0.48 (0.33–0.70)	<0.001	0.74 (0.54–1.00)	0.48 (0.33–0.70)	<0.001
Ever afraid of any partner if ever had a partner (*n* = 271)	83 (41.7%)	145 (37.7%)	43 (26.4%)	0.79 (0.55–1.12)	0.43 (0.25–0.72)	0.005	0.82 (0.56–1.20)	0.47 (0.26–0.88)	0.06
Long-term illness, health problem, or disability limits daily activities	136 (66.0%)	207 (51.8%)	62 (37.4%)	0.55 (0.41–0.75)	0.31 (0.20–0.48)	<0.001	0.49 (0.36–0.66)	0.21 (0.13–0.35)	<0.001
At least one chronic physical condition in past 12 months‡‡	152 (72.0%)	275 (67.4%)	115 (68.1%)	0.80 (0.57–1.27)	0.83 (0.53–1.29)	0.44	0.79 (0.57–1.10)	0.78 (0.51–1.19)	0.03

CIDI = Composite International Diagnostic Interview. DS = depressive symptoms. MDD = major depressive disorder. MDS = major depressive syndrome. OR = odds ratio. PHQ = Patient Health Questionnaire.

* Denominators vary due to missing data. † ORs, 95% confidence intervals and *P* values calculated using multinomial logistic regression with robust standard errors. Base outcome was current MDS. Value of 1.00 indicates reference category. ‡ Adjusted for age, sex and GP location. § PHQ measures current symptoms. ¶ Not mutually exclusive. ** "Over the past 4 weeks, how often have you been bothered by repetitive intrusive thoughts, ideas, doubts, images or impulses that distress you and that you regard as unwanted or senseless?" (> half the days). †† "Over the past 4 weeks, how often have you felt compelled to do or think certain things repeatedly, excessively or according to strict rules, in order to prevent something bad from happening or to make sure things are 'just right'?" (> half the days). ‡‡ Physical conditions in past 12 months based on top 12 conditions seen in general practice: asthma, emphysema, diabetes, arthritis, back problems, hypertension, chronic sinusitis, lipid disorder, heart disease, cancer, stroke, dermatitis. ◆

condition, and this finding is due in part to "regression to the mean".[22]

Eighty-four per cent of those with current MDS were receiving treatment for depression, supporting earlier findings that GPs identify and manage patients based on severity of symptoms.[23] Previous research may have overestimated the degree to which GPs miss major depression.

diamond is the largest longitudinal study of depressive symptoms in Australian general practice and one of the largest worldwide. The screening method and measures we used to identify patients with depressive symptoms have been validated for use in primary care and reduce the frequent attendance bias inherent in waiting room samples.[24] However, they represent only one of many possible screening processes, and the results should be interpreted with

this in mind. Our study methods enable us to report on the representativeness of our cohort in ways that have not been possible in earlier studies. Despite relatively minor demographic and morbidity differences between participants and non-participants, the *diamond* cohort represents a mix of patients with varying degrees of depressive symptoms that are seen in primary care.

This method of screening for depression in general practice results in the identification of patients with substantial multiple comorbidities — psychiatric, physical and social problems coexist with depressive symptoms. The cohort participants do not necessarily have psychiatric disorders, but represent various levels of emotional distress that commonly present to general practice. The levels of smoking, substance use, childhood abuse, social disadvantage, comorbid physical and psychiatric conditions, and fear of partners are particularly alarming and raise considerable challenges for the identification and management of depressive symptoms in general practice, which have been largely ignored in current management guidelines.

The complex and mixed nature of the population identified when screening with broad criteria may explain why depression screening programs alone have not resulted in better population mental health,[6] as such programs may have failed to recognise and respond to this complexity. The successful management of these comorbidities is likely to be closely connected with the successful management of depression, as patients with untreated depression attend primary care significantly more often than other primary care patients.[12]

Patients with milder depressive symptoms also experience substantial morbidity, yet we lack evidence on the benefits and risks of identifying this group. Documenting what happens to this group over time will contribute information to fill this evidence gap. Follow-up of the *diamond* cohort will allow us to explore the long-term outcomes for patients from the perspective of both "caseness" and severity of symptoms, and will inform the debate about the usefulness of categorical and dimensional measures of depression.[25,26]

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COMPETING INTERESTS

None identified.

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