

## General Health Questionnaire (GHQ)

General Health Questionnaire-12				
Study	Identification tool	Comparator / caseness	Population	Results
<b>Consultation</b>				
Evans & Katona, 1993  Quality assessed: +	GHQ-12	Geriatric Mental State (GMS)	N = 408, Mean age = 73 years (SD - 8.4) , 38% male  N = 136 randomly selected for analysis of GHQ  Older adults attending primary care, London  <u>Prevalence of depression - 52/136</u>	<b>Depression</b>  <b>GHQ</b> Sensitivity = 0.7692 Specificity = 0.7619
Goldberg <i>et al.</i> , 1997  Quality assessed: +	GHQ-12  GHQ-28	CIDI (DSM-IV/ICD-10)	N = 5438  Consecutive primary care patients in 15 countries	<b>Common mental health problems</b>  <b>GHQ-12</b>  <b>Ankara - threshold 1/2:</b> Sensitivity = 70.6% Specificity = 82.3% PPV = 55.7%  <b>Athens - threshold 2/3:</b> Sensitivity = 80.6% Specificity = 84.7% PPV = 62.4%

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				<p><b>Bangalore - threshold 6/7:</b> Sensitivity = 86.7% Specificity = 88.9% PPV = 71.2%</p> <p><b>Berlin - threshold 2/3:</b> Sensitivity = 72.6% Specificity = 75.0% PPV = 47.8%</p> <p><b>Groningen - threshold 2/3:</b> Sensitivity = 80.3% Specificity = 86.4% PPV = 65.1%</p> <p><b>Ibadan - threshold 1/2:</b> Sensitivity = 77.8% Specificity = 79.4% PPV = 54.4%</p> <p><b>Mainz - threshold 2/3:</b> Sensitivity = 73.5% Specificity = 81.2% PPV = 55.2%</p> <p><b>Manchester - threshold 3/4:</b> Sensitivity = 84.6% Specificity = 89.3% PPV = 71.4%</p> <p><b>Nagasaki - threshold 1/2:</b> Sensitivity = 76.2% Specificity = 85.9% PPV = 63.1%</p> <p><b>Paris - threshold 1/2:</b> Sensitivity = 78.2% Specificity = 79.4% PPV = 54.3%</p> <p><b>Rio de Janeiro - threshold 1/2:</b> Sensitivity = 70.2% Specificity = 77.3% PPV = 49.4%</p> <p><b>Santiago - threshold 2/3:</b> Sensitivity = 84.8% Specificity = 82.2% PPV = 60.0%</p>

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				<p><b>Seattle – threshold 1/2:</b> Sensitivity = 82.1% Specificity = 76.5% PPV = 52.4%</p> <p><b>Shanghai – threshold 1/2:</b> Sensitivity = 80.6% Specificity = 84.7% PPV = 62.4%</p> <p><b>Verona – threshold 1/2:</b> Sensitivity = 75.8% Specificity = 65.3% PPV = 40.6%</p>
Hahn <i>et al.</i> , 2006  Quality assessed: +	GHQ-12	CIDI (DSM-IV/ICD-10)	<p>N = 204, age range 18-80, mean age = 49.6, 52% male</p> <p>13 rehabilitation inpatient clinics in Germany, chronically ill inpatients: 5.9% cardiovascular diseases, 8.8% orthopaedic diseases, 5.4% cancer, 18.6% endocrinologic disease, 53.4% pneumological disease</p> <p><u>Prevalence of depression – 35/204</u></p>	<p><b>Affective disorder</b> (single episode or recurrent major depression, dysthymia)</p> <p><b>Optimal cut-off <math>\geq 7</math> - GHQ</b> AUC = 0.779 (0.716-0.834) Sensitivity = 77.1% Specificity = 69.2% PPV = 34.2%</p>
Harter <i>et al.</i> , 2001  Quality assessed: +	GHQ-12	M-CIDI	<p>N=206, mean age = 48 years</p> <p>Neck and back pain (70%), arthropathies (14%), rheumatic disorders (6%), other musculoskeletal disorders (10%)</p> <p><u>Prevalence of depression – 10/206</u></p>	<p><b>AUC = 0.65 (0.57, 0.72)</b></p> <p><b>Cut-off <math>\geq 5</math>:</b> Sensitivity = 75% Specificity = 51.7% PPV = 17.3%</p>
Harter <i>et al.</i> , 2006  Quality assessed: +	GHQ-12	M-CIDI	<p>N= 569, age range 22-83, mean age 54, 50% male</p> <p>36% musculo-skeletal diseases; 29% CVD and 35% cancer</p> <p><u>Prevalence of depression – 59/130</u></p>	<p><b>Any depression</b></p> <p><b>GHQ</b> AUC = 0.72 (0.68, 0.76)</p> <p><b>Cut-off <math>\geq 8</math> GHQ</b> Sensitivity = 52.5% Specificity = 77.9% PPV = 22.1%</p>

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<p>Henkel <i>et al.</i> 2004a &amp; b</p> <p>Secondary paper Henkel <i>et al.</i>, 2003 – brief report</p> <p>Quality assessed: +</p>	GHQ-12	CIDI - ICD-10 (and DSM-IV research criteria for minor depression)	<p>N = 448, of which 431 had an independent clinical diagnosis, mean age = 48.98</p> <p>Primary care patients</p> <p><u>Prevalence of depression (any) - 82/431</u></p> <p><u>Prevalence of depression (major) - 50/431</u></p> <p><u>Prevalence of depression (dysthymia disorder) - 24/431</u></p> <p><u>Prevalence of depression (minor) - 54/431</u></p>	<p><b>Any depression</b></p> <p><b>GHQ-12</b> <b>Standard cut-off <math>\geq 2</math></b> Sensitivity = 85 % Specificity = 63 % PPV = 34 % NPV = 95 %</p> <p><b>Any depression according to ICD-10</b> <b>GHQ-12</b> AUC = 0.833</p> <p><b>Any depression according to ICD-10 including minor depression (per DSM-IV research criteria)</b> <b>GHQ-12</b> AUC = 0.817</p> <p><b>Types of depression according to ICD-10 and DSM-IV research criteria:</b></p> <p><b>Major depression</b> AUC = 0.874</p> <p><b>Dysthymia disorder</b> AUC = 0.832</p> <p><b>Minor depression</b> AUC = 0.755</p>
<p>The MaGPIe Research Group, 2005</p> <p>Quality assessed: +</p>	GHQ-12	CIDI	<p>N = 775</p> <p>1151 were selected for interview, with 788 completing interviews</p> <p><u>Prevalence of depression:- 136/775</u></p>	<p><b>Depression</b></p> <p><b>Cut-off <math>\geq 3</math></b> Sensitivity = 66.3 % Specificity = 71.8 % PPV = 34.0 % NPV = 90.7 %</p> <p><b>Cut-off <math>\geq 4</math></b> Sensitivity = 59.9 % Specificity = 80.5 % PPV = 40.2 % NPV = 90.2 %</p> <p><b>Cut-off <math>\geq 5</math></b> Sensitivity = 53.5 % Specificity = 85.1 %</p>

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				PPV = 44.1% NPV = 89.3%  <b>Cut-off <math>\geq 6</math></b> Sensitivity = 43.9% Specificity = 89.4% PPV = 47.4% NPV = 87.9%  <b>Cut-off <math>\geq 7</math></b> Sensitivity = 38.2% Specificity = 92.5% PPV = 52.6% NPV = 87.3%  <b>Cut-off <math>\geq 8</math></b> Sensitivity = 29.5% Specificity = 94.5% PPV = 54.1% NPV = 86.0%
Patel <i>et al.</i> , 2008  Quality assessed: ++	GHQ-12	Clinical Interview Schedule (Revised - CIS-R)	N = 598, mean age = 37.5 years (SD 14.2 years), 43.6% male  Participants attending 5 primary care clinics in Goa, India  <u>Prevalence of common mental disorders – 92/598</u>	<b>Common mental disorders</b>  <b>Threshold 5/6 - GHQ-12</b> Sensitivity = 73% Specificity = 90% PPV = 61.2%  <b>Threshold 6/7 - GHQ-12</b> Sensitivity = 60% Specificity = 93% PPV = 64.5%  <b>Threshold 7/8- GHQ-12</b> Sensitivity = 52% Specificity = 97% PPV = 77.1%  AUC = 0.8969
Schmitz <i>et al.</i> , 1999a  Schmitz <i>et al.</i> , 1999b – secondary study  Schmitz <i>et al.</i> , 2001 – secondary study	GHQ-12	DSM-III-R (SCID)	N = 572, mean age = 42.7 years (SD - 15.7), 31.3% male  Outpatients attending primary care practices in Dusseldorf, Germany. Of these 421 completed the GHQ-12  <u>Prevalence of common mental disorder – 36.8%</u>	<b>Common mental disorders</b>  <b>Cut-off 11/12</b> Sensitivity = 0.70 Specificity = 0.68 PPV = 0.56  <b>Cut-off 7/8</b> Sensitivity = 0.88 Specificity = 0.41

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Quality assessed: +				AUC = 0.76 (SD=0.026)
<b>Community</b>				
Costa <i>et al.</i> , 2006  Quality assessed: +	GHQ-12	ICD-10	N=126, age = 81 years, 36 male, 90 female  Elderly people, Brazil  <u>Prevalence of depression - 65/126</u>	Sensitivity = 0.661 Specificity = 0.623
Donath, 2001  Quality assessed: +	GHQ-12	ICD-10 or DSM-IV based on the CIDI	N = 10,641, 44% male  Part of the 1997 Australian National Survey of Health and Wellbeing, conducted on a community sample  <u>Prevalence of affective or anxiety disorder - 7.3%</u>	<b>Affective or anxiety disorder</b>  <b>Cut-off 0/1</b> Sensitivity = 75.4% (72.5 - 78.4) Specificity = 69.9% (69.5 - 70.3)  <b>Cut-off 1/2</b> Sensitivity = 58.8% (55.7 - 61.9) Specificity = 83.8% (83.0 - 84.5)  <b>Cut-off 2/3</b> Sensitivity = 48.0% (44.9 - 51.0) Specificity = 90.7% (89.9 - 91.4)  <b>Cut-off 3/4</b> Sensitivity = 38.6% (35.5 - 41.7) Specificity = 94.1% (93.2 - 94.9)  AUC = 0.78 (0.76-0.80)
Papassotiropoulos & Heun, 1999  Quality assessed: +	GHQ-12	ICD-10	N = 287, mean age = 76 years, 171 female, 116 male  Older people from the community, Germany  <u>Prevalence of depression - 10/287</u>	<b>Depression</b>  <b>Optimal cut-off <math>\geq 4</math></b> Sensitivity = 63% Specificity = 91% AUC = 0.794

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Viinamaki <i>et al.</i> , 1995  Quality assessed: +	GHQ-12	DSM-III-R	N=56, mean age = 48 years Employers from factory  <u>Prevalence of depression</u> – 23/56	<b>Depression</b> <b>Cut-off 2/3</b> Sensitivity = 70% Specificity = 75% PPV = 73% NPV = 72%

General Health Questionnaire-28				
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<b>Consultation</b>				
Goldberg <i>et al.</i> , 1997  Quality assessed: +	GHQ-28	CIDI (DSM-IV/ICD-10)	N = 5,438  Consecutive primary care patients in 15 countries	<b>Common mental health problems</b>  <b>GHQ-28</b>  <b>Ankara - threshold 3/4</b> Sensitivity = 74.6% Specificity = 77.1% PPV = 50.7%  <b>Athens - threshold 5/6:</b> Sensitivity = 89.5% Specificity = 82.8% PPV = 62.2%  <b>Bangalore - threshold 8/9:</b> Sensitivity = 93.4% Specificity = 85.0% PPV = 66.4%  <b>Berlin - threshold 5/6:</b> Sensitivity = 81.9% Specificity = 72.9% PPV = 48.8%  <b>Groningen - threshold 5/6:</b> Sensitivity = 84.9% Specificity = 81.9% PPV = 59.8%  <b>Ibadan - threshold 4/5:</b> Sensitivity = 80.8% Specificity = 75.6% PPV = 51.2%  <b>Mainz - threshold 5/6:</b> Sensitivity = 80.7% Specificity = 72.9%

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				<p>PPV = 48.5%</p> <p><b>Manchester - threshold 6/7:</b> Sensitivity = 84.4% Specificity = 86.2% PPV = 65.8%</p> <p><b>Nagasaki - threshold 3/4:</b> Sensitivity = 76.7% Specificity = 77.6% PPV = 51.9%</p> <p><b>Paris - threshold 3/4:</b> Sensitivity = 79.3% Specificity = 74.9% PPV = 49.9%</p> <p><b>Rio de Janeiro - threshold 3/4:</b> Sensitivity = 82.0% Specificity = 71.8% PPV = 47.9%</p> <p><b>Santiago - threshold 6/7:</b> Sensitivity = 89.0% Specificity = 85.8% PPV = 66.4%</p> <p><b>Seattle - threshold 3/4:</b> Sensitivity = 80.5% Specificity = 74.8% PPV = 50.2%</p> <p><b>Shanghai - threshold 7/8:</b> Sensitivity = 84.6% Specificity = 85.5% PPV = 64.8%</p> <p><b>Verona - threshold 5/6:</b> Sensitivity = 70.8% Specificity = 72.9% PPV = 45.2%</p>