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## Instrument Review

### SF-36<sup>®</sup> Health Survey (Version 1.0)

<b>Title:</b>	SF-36 <sup>®</sup> Health Survey (Version 1.0) for use in Australia <i>(also known as the Medical Outcomes Study (MOS) 36-Item Short Form Health Survey).</i>
<b>Abbreviations:</b>	SF-36
<b>Author(s) Name:</b>	John E. Ware, Jr.
<b>Author(s) Address:</b>	QualityMetric Incorporated 640 George Washington Highway Lincoln, RI 02865 USA  <a href="http://www.qualitymetric.com">www.qualitymetric.com</a>
<b>Supplied by:</b>	QualityMetric Incorporated 640 George Washington Highway Lincoln, RI 02865 USA
<b>Cost:</b>	An annual license fee applies for the use of the SF-36 <sup>®</sup> Health Survey.  Survey users are required to register with QualityMetric Incorporated and obtain a quote for the annual license fee that applies to their project.  The license charge will depend upon whether users require a commercial or research license.  Register online at <a href="http://www.qualitymetric.com">www.qualitymetric.com</a> . Information of the SF group of instruments can also be found at <a href="http://www.sf-36.com/">http://www.sf-36.com/</a>



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For technical questions about using the SF-36<sup>®</sup> Health Survey in Australia (including latest developments and research advice) contact Jan Sansoni at [jansan@netspeed.com.au](mailto:jansan@netspeed.com.au) or by telephone on 02 6291-7271 or 02 6205-0869.

<b>Training requirements:</b>	Nil training is required for those professionals with qualifications and experience in psychometrics and statistics. For those professionals without these qualifications basic training is required in survey administration and the characteristics of the SF-36 <sup>®</sup> Health Survey. The AHOC provides training workshops for the SF-36 and other instruments.
<b>Purpose:</b>	The SF-36 <sup>®</sup> Health Survey is a generic outcome measure designed to examine a person's perceived health status.
<b>Administration time:</b>	5 – 10 minutes.
<b>Instrument Type:</b>	Self-report Questionnaire.
<b>Structure:</b>	<p>The SF-36<sup>®</sup> Health Survey includes one multi-item scale measuring each of the following eight health concepts:</p> <ol style="list-style-type: none"><li>(1) physical functioning;</li><li>(2) role limitations because of physical health problems;</li><li>(3) bodily pain;</li><li>(4) social functioning;</li><li>(5) general mental health (psychological distress and psychological well-being);</li><li>(6) role limitations because of emotional problems;</li><li>(7) vitality (energy/fatigue); and</li><li>(8) general health perceptions.<sup>1</sup></li></ol> <p>The SF-36 also includes a single-item measure of health transition or change.<sup>2</sup> The SF-36 can also be divided into two aggregate summary measures the Physical Component Summary (PCS) and the Mental Component Summary (MCS).<sup>3</sup> (In the standard version of the SF-36 all scale questions refer to a 4 week time period.)</p>
<b>Scoring:</b>	<p>The SF-36<sup>®</sup> Health Survey items and scales were constructed using the Likert method of summated ratings.<sup>4</sup> Answers to each question are scored (some items need to be recoded). These scores are then summed to produce raw scale scores for each health concept which are then transformed to a 0 – 100 scale. Scoring algorithms can then be applied to produce the PCS and MCS scores.<sup>5</sup> (These two summary scores have the major advantage of being norm based. They also have reduced floor and ceiling effects.)</p>



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### Developed for:

The SF-36<sup>®</sup> Health Survey developed out of work on the Medical Outcomes Study or RAND Health Insurance Experiment.<sup>6,7</sup> It is a short-form derived from a larger 149-item instrument and is more precise than its predecessor the SF-20.<sup>7,8</sup>

### Normative Data:

Australian data for the SF-36<sup>®</sup> Health Survey is provided by Stevenson (1996)<sup>9</sup> and from the Australian Bureau of Statistics (1997),<sup>10</sup> 1995 National Health Survey. *(These are the accepted norms for use in Australia.)* Additional population health data using the SF-36 can be found in the 1996 Australian Longitudinal Study on Women's Health (Women's Health Australia),<sup>11</sup> the 1999-2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab),<sup>12</sup> the 1998 National Drug Strategy Household Survey,<sup>13</sup> the 1991 – 2003 South Australian Health Omnibus Surveys,<sup>14</sup> the 2002 National Study of Health, Intimacy and Social Relations.<sup>15</sup> (Key questions from the SF-36 were also used in the 1997 + 1998 NSW Health Surveys<sup>16</sup> and the 1999 NSW Older People's Health Survey.)<sup>17</sup>

US Data for the SF-36 can be found in Ware, Kosinski & Keller (1994)<sup>18</sup> and Ware, Kosinski, Bayliss, McHorney, Rogers & Raczek (1995).<sup>3</sup>

UK Data for the SF-36 can be found at Jenkinson, Coulter & Wright (1993)<sup>19</sup> and Bowling, Bond, Jenkinson & Lamping (1999).<sup>20</sup>

World Data for the SF-36 in order to make cross country comparisons can be found at Ware, Gandek, Kosinski, Aaronson, Apolone, Brazier et al. (1998).<sup>21</sup>

### Clinical Data:

A few clinical studies are listed below:

Arthritis: Hill, Parsons, Taylor & Leach (1999).<sup>22</sup>

Asthma: Adams, Wakefield, Wilson, Parsons, Campbell, Smith et al. (2001).<sup>23</sup>

Cardiac Rehabilitation: Jette & Downing (1994).<sup>24</sup>

Chronic Fatigue Syndrome: Komaroff, Fagioli, Doolittle, Gandek, Gleit, Guerriero, et al. (1996).<sup>25</sup>

Chronic Pain: Elliott, Renier & Palcher (2003).<sup>26</sup>

Constipation: Tuteja, Talley, Joos, Woehl & Hickam (2005).<sup>27</sup>

Crohn's Disease: Lichtenstein, Yan, Bala & Hanauer (2004).<sup>28</sup>

Dry Eye: Mertzanis, Abetz, Rajagopalan, Espindle, Chalmers, Snyder et al. (2005).<sup>29</sup>



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Geriatrics: Weinberger, Nagle, Hanlon, Samsa, Schmader, Landsman et al. (1994),<sup>30</sup> Cohen, Feussner, Weinberger, Carnes, Hamdy, Hsieh et al. (2002)<sup>31</sup> and Inaba, Goecke, Sharkey & Brennenman (2003).<sup>32</sup>

Growth Hormone Deficiency: McMillian, Bradley, Gibney, Russell-Jones & Sonksen (2003).<sup>33</sup>

Hip or Knee Replacement for Osteoarthritis: March, Cross, Lapsley, Brnabic, Tribe, Bachmeier et al. (1999).<sup>34</sup>

Intensive Care: Cuthberston, Scott, Strachan, Kilonzo & Vale (2005).<sup>35</sup>

Kidney Diseases: Kurtin, Davies, Meyer, DeGiacomo & Kantz (1992)<sup>36</sup> and Chow, Briganti, Kerr, Chadban, Zimmet & Atkins (2003).<sup>12</sup>

Kidney Donors: Smith, Trauer, Kerr, Chadban (2003).<sup>37</sup>

Knee Replacement: Bombardier, Melfi, Paul, Green, Hawker, Wright et al. (1995).<sup>38</sup>

Lumbar Discectomy: Sun, Wang, Endow & Delamarter (2004).<sup>39</sup>

Mental Health: Sherbourne, Wells & Ludd (1996)<sup>40</sup> and Goldney, Fisher, Wilson & Cheok (2001),<sup>41</sup> Feld, Colantonio, Yoshida & Odette (2003),<sup>42</sup> and Sciolla, Patterson, Wetherell, McAdams, Jeste (2003).<sup>43</sup>

Multiple Sclerosis and Parkinson's Disease: Riazi, Hobart, Lamping, Fitzpatrick, Freeman, Jenkinson et al. (2003).<sup>44</sup>

Scoliosis: Schwab, Dubey, Pagala, Gamez & Farcy (2003).<sup>45</sup>

Seizure Disorders: Szaflarski & Szaflarski (2004).<sup>46</sup>

Sexual Health: Patel, Boselli, Cairo, Barnett, Price & Wulf (2001).<sup>47</sup>

Sleep Problems: Manocchia, Keller & Ware (2001).<sup>48</sup>

Stroke: Anderson, Laubscher & Burns (1996),<sup>49</sup> Anderson, Rubenach, Mhurchu, Clark, Spencer & Winsor (2000)<sup>50</sup> and Middleton, Donnelly, Harris, Lusby & Ward (2002).<sup>51</sup>

Substance Abuse and Treatment: Ryan & White (1996),<sup>52</sup> McGregor, Machin & White (2003),<sup>53</sup> Morgan, Morgenstern, Blanchard, Labouvie & Bux (2003)<sup>54</sup> and Freeman (2003).<sup>55</sup>

Transplant Patients: Beilby, Moss-Morris & Painter (2003).<sup>56</sup>



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Upper Respiratory Tract Infection: Linder & Singer (2003).<sup>57</sup>

Venous Disease: Kaplan, Criqui, Denenberg, Bergan & Fronck (2003).<sup>58</sup>

*The ACT Care Continuum and Health Outcomes Project<sup>59</sup> is a useful source of Australian clinical data for hospitalised patients.*

### Applications:

Outcome studies using the SF-36<sup>®</sup> Health Survey are not restricted to the Doctor's waiting room, but can be also administered via mail-out survey or telephone interview.<sup>60-62</sup> The SF-36 can also be used in a computerised format.<sup>63</sup>

Interpretation guidelines and cautions are also available.<sup>48,64-68</sup> One clear recommendation from the literature is that SF-36 Summary Scores (PCS + MCS) should be compared with the eight SF-36 Scale Scores before interpretation.<sup>69</sup>

An acute (1 week) version of the SF-36<sup>®</sup> Health Survey is also available.

Rasch Analysis, a form of Item Response Theory, has also been applied to the SF-36 10-item Physical Functioning Scale (PF-10) with good result and future application<sup>70-72</sup> (especially for the use of computerised adaptive testing with patients).<sup>73</sup>

Recently, QualityMetric Incorporated has developed an improved version of the SF-36<sup>®</sup> Health Survey known as the SF-36v2<sup>™</sup> Health Survey (Version 2).<sup>74</sup> This new version of the SF-36 has refinements to layout, item wording and response categories,<sup>75</sup> as well as norm based scoring for all of the eight SF-36 health concept scales (not just for the summary scores: PCS + MCS). The SF-36 Version 2 also uses new norms – 1998 general US population. Interim norms for Australia will shortly be available for this instrument from the 2004 South Australian Health Omnibus Survey and those interested should contact Professor Graeme Hawthorne at [graemeeh@unimelb.edu.au](mailto:graemeeh@unimelb.edu.au) or by telephone on 03 9496-4031.

Finally, a new paper by Walters (2004) analyses four different methods for calculating sample size and power estimates for studies using the SF-36.<sup>76</sup>

See also the Instrument Review of the SF-12<sup>®</sup> Health Survey.



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<b>RELIABILITY</b>	<b>Studies reported</b> Yes / No	<b>References</b>	<b>Adequacy</b> Weak / Adequate / Good	<b>Comment</b>
<b>Internal consistency</b>	Yes	McHorney et al. (1994) <sup>2</sup>  Ware, Kosinski & Keller (1994) <sup>18</sup>  McCallum (1995) <sup>7</sup>  Stevenson (1996) <sup>9</sup>  Gandek et al. (1998) <sup>77</sup>  Sanson-Fisher & Perkins (1998) <sup>78</sup>  Gandek et al. (2004) <sup>79</sup>	Good	
<b>Test – retest</b>	Yes	Ware, Kosinski & Keller (1994) <sup>18</sup>  Bowling (1995) <sup>80</sup>  Sanson-Fisher & Perkins (1998) <sup>78</sup>  Kagee (2001) <sup>5</sup>  Hopman et al. (2004) <sup>81</sup>	Adequate	More information could be published on this aspect of the SF-36's reliability.  (Cronbach's Alpha is used to construct the SEM for the SF-36 Summary scores. Cronbach's Alpha: PCS = 0.92; MCS = 0.91)
<b>Inter – rater</b>	NA	NA	NA	The SF-36 is a self-report measure.



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<b>VALIDITY</b>	<b>Studies reported</b> Yes / No	<b>References</b>	<b>Adequacy</b> Weak / Adequate / Good	<b>Comment</b>
<b>Discriminatory Power</b>	Yes	Komaroff et al. (1996) <sup>25</sup>  Shadbolt, McCallum & Singh (1997) <sup>59</sup>  Kagee (2001) <sup>5</sup>	Adequate	See also the references in the Construct Validity section.
<b>Correlation with other measures</b>	Yes	Beaton, Hogg-Johnson & Bombardier (1997) <sup>82</sup>  Prieto et al. (1997) <sup>83</sup>  Essink-Bot et al. (1997) <sup>84</sup>  Kagee (2001) <sup>5</sup>  Stewart et al. (2003) <sup>85</sup>  Calsyn et al. (2004) <sup>86</sup>	Good	
<b>Construct</b>	Yes	Tarlov et al (1989) <sup>6</sup>  McHorney et al. (1992) <sup>87</sup>  McHorney, Ware & Raczek (1993) <sup>8</sup>  McHorney et al. (1994) <sup>2</sup>  Ware et al. (1995) <sup>3</sup>  Keller et al. (1998) <sup>88</sup>  Ware et al. (1998) <sup>89</sup>  Jenkinson (1999) <sup>90</sup>	Good	



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<b>VALIDITY (Cont.)</b>	<b>Studies reported</b> Yes / No	<b>References</b>	<b>Adequacy</b> Weak / Adequate / Good	<b>Comment</b>
<b>Criterion</b>	Yes	Jenkinson, Wright, Coulter (1994) <sup>91</sup>  Kagee (2001) <sup>5</sup>  Elliott et al. (2003) <sup>26</sup>	Adequate	

<b>RESPONSIVENESS</b>	<b>Studies reported</b> Yes / No	<b>References</b>	<b>Adequacy</b> Weak / Adequate / Good	<b>Comment</b>
<b>Sensitivity to change</b>	Yes	Jenkinson, Peto & Coulter (1994) <sup>92</sup>  Jenkinson et al. (1995) <sup>93</sup>  Jenkinson et al. (1997) <sup>94</sup>  Sharples et al. (2000) <sup>95</sup>  Ferguson, Robinson & Splaine (2002) <sup>68</sup>  Beilby et al. (2003) <sup>56</sup>  Lichtenstein et al. (2004) <sup>28</sup>  Cuthbertson et al. (2005) <sup>35</sup>	Adequate	

### Cultural Applicability and Cultural Adaptations:

The SF-36<sup>®</sup> Health Survey has been translated into many languages<sup>96-97</sup> and its content examined cross culturally.<sup>98</sup> In Australia, the SF-36 has been utilised for people from a non-English speaking background in Western Sydney<sup>99</sup> and a large group of new Vietnamese migrants.<sup>100</sup> However, limited research has been reported with Aboriginal and Torres





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Strait Islanders. (A recent paper by Scott, Sarfali, Tobias & Haslett [2000]<sup>101</sup> may provide a useful template for future work in this area.)

**Gender Appropriateness:** Normative data is available for males and females.

**Age Appropriateness:** 14 years and over.

**Summary:** The SF-36 is a highly recommended measure with superior psychometric properties. It has been used extensively in Australia for both population health and clinical research.

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NB: Edited 3 May 2014 to remove AHOC contact details for purchasing SF-36® manuals in Australia.