

## Medical Outcomes Study Social Support Index

<b>Age Cohorts</b>	Younger and Mid-age
<b>Surveys</b>	2 and 3
<b>Derived Variables</b>	MNEMIGP
<b>Definition</b>	MOS emotional/informational support
<b>Source Items (Index Numbers)</b>	MOSOC 2, 3, 7, 8, 12, 15, 16 & 18 (FAMF-065, -066, -070, -071, -075-, 078,- 079 & -081)
<b>Statistical Form</b>	Categorical variable
<b>Index Number</b>	FAMF-163
<b>Derived Variables</b>	MNAFFPOSGP
<b>Definition</b>	MOS affectionate support/positive social interaction
<b>Source Items (Index Numbers)</b>	MOSOC 5, 6, 9, 10, 17 & 19 (FAMF-068, -069, -072, -073, -080 & -082)
<b>Statistical Form</b>	Categorical variable
<b>Index Number</b>	FAM-164
<b>Derived Variables</b>	MNTANGP
<b>Definition</b>	MOS tangible support
<b>Source Items (Index Numbers)</b>	MOSOC 1, 4, 11 & 14 (FAMF-064, 067, 074, 077)
<b>Statistical Form</b>	Categorical variable
<b>Index Number</b>	FAMF-166
<b>Derived Variables</b>	SOCSUPGP6
<b>Definition</b>	MOS 6 item social support score
<b>Source Items (Index Numbers)</b>	MOSOC 1, 4, 15, 16, 17 & 19 (FAMF-064,- 067, -078,-079, -080 & -082)
<b>Statistical Form</b>	Categorical variable
<b>Index Number</b>	FAMF-165
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<b>Endorsed</b>	7 August 2002

## **Background<sup>1</sup>**

The role of interpersonal relationships in social support is complex. Research on measuring social support has focussed on 2 dimensions: functional and structural support. The perceived availability of functional support is believed to be the most essential component, with structural support also contributing.

*Functional support* is the degree to which interpersonal relationships serve particular functions. Functions most often identified are:

- Emotional support – the expression of positive affect, empathic understanding, the encouragement of expressions of feelings;
- Informational support – the offering of advice, information, guidance or feedback that can provide a solution to a problem;
- Tangible (instrumental) support – the offering of material aid or behavioural assistance;
- Positive social interaction – companionship or the availability of others persons to share leisure and recreational activities;
- Appraisal support – the provision of information relevant to self-evaluation; and
- Affectionate support – expressions of love and affection.

*Structural support* refers to interpersonal relationships and is generally measured in terms of quantity. Aspects of structural support are the existence and number of social relationships (such as a partner, friend or group membership) and the degree of interconnectedness in social relationships/networks. The Duke Social Support Index is an example of a structural support measure.

## **The MOS Social Support Index**

The MOS social support index<sup>1</sup> measures functional support and is derived from a 19-item, multi-dimensional, self-administered survey. Results of multi-trait scaling analysis supported an overall index based on 19 items and 4 functional support subscales: emotional/informational support (8 items); tangible support (4 items); affectionate support (3 items); and positive social interaction (3 items).

The index was developed among 2 987 patients aged 19 to 98 years, with common, treatable chronic conditions (hypertension, diabetes, coronary heart disease and depression).

### Source items

The 19 items forming the MOS social support index and the response codes for each item are shown below.

### People sometimes look to others for companionship, assistance, or other types of support. How often is each of the following kind of support available to you if you need it

MOSOC1	a	Help you if you are confined to bed <sup>b</sup>
MOSOC2	b	Count on to listen to you when you need to talk <sup>a</sup>
MOSOC3	c	Give you good advice about a crisis <sup>a</sup>
MOSOC4	d	Take you to the doctor if you need it <sup>b</sup>
MOSOC5	e	Show you love and affection <sup>d</sup>
MOSOC6	f	Have a good time with <sup>c</sup>
MOSOC7	g	Give you information to help you understand a situation <sup>a</sup>
MOSOC8	h	Confide in or talk to about yourself or your problems <sup>a</sup>
MOSOC9	i	Hug you <sup>d</sup>
MOSOC10	j	Get together with for relaxation <sup>c</sup>
MOSOC11	k	Prepare your meals if you are unable to do it yourself <sup>b</sup>
MOSOC12	l	Advice you really want <sup>a</sup>
MOSOC13	m	Do things with to help you get your mind off things
MOSOC14	n	Help with daily chores if you are sick <sup>b</sup>
MOSOC15	o	Share your most private worries and fears with <sup>a</sup>
MOSOC16	p	Turn to for suggestions about how to deal with a personal problem <sup>a</sup>
MOSOC17	q	Do something enjoyable with <sup>c</sup>
MOSOC18	r	Understand your problems <sup>a</sup>
MOSOC19	s	Love and make you feel wanted <sup>d</sup>

<sup>a</sup>Emotional/Informational Support (EMI)

<sup>b</sup>Tangible Support (TAN)

<sup>c</sup>Positive Social Interaction (POS)

<sup>d</sup>Affectionate Support (AFF)

Code	Response
1	None of the time
2	A little of the time
3	Some of the time
4	Most of the time times
5	All of the time answer

### *Subscale and Index Calculations*

A complete description of subscale and index scoring used by Sherbourne and Stewart can be found at the RAND Corporation website<sup>2</sup>. Briefly,

- For each of the 4 functional support subscales, calculate the average of the scores for each item in the subscale.
- To obtain an overall support index, calculate the average of all 19 items in Table 1.
- To compare with means published by Sherbourne and Stewart, subscale scores should be transformed to a 0 - 100 scale using the following formula:

$$\text{transformed score} = \frac{100 * (\text{observed score} - \text{minimum possible score})}{(\text{maximum possible score} - \text{minimum possible score})}$$

Higher scores for subscales and the index indicate more social support.

### **Scale Evaluation**

The MOS Social Support Index was first included in the full version of the the second survey of the Mid-age cohort.

#### *Item Responses*

The distribution of responses to the 19 items of the MOS Social Support Index is shown in Table 1. Women reported high levels of support for all items with support available 'all the time' between 28% for item m and 56% for item e. Means scores for individual items ranged from 3.5 (item a) to 4.2 (item e). The highest mean scores were mostly from items within the Affectionate Support and Positive Social Interaction subscales.

There were low levels of missing data for all items (Table 1); the maximum percent missing was 2.6% for item a. Most women (91%) completed all items.

#### *Scale reliability*

Inter-item correlations are shown in Table 2. The strong internal consistency for the 19 items (Cronbach's alpha 0.97) may indicate redundancy of some items. High correlations with item totals were maintained when individual items were deleted (Table 3); all exceed 0.6, meeting the ALSWH criteria of 0.5.

**Table 1 Distribution (%) and mean (SD) of responses and percent missing for 19 MOS social support items (n = 11 648)**

	How often is each of the following kind of support available to you if you need it	Percent					Mean (SD)	Percent missing
		None	Little	Some	Most	All		
<b>Emotional/Informational Support (EMI)</b>								
b	Count on to listen to you when you need to talk	4.2	10.7	15.5	32.6	37.1	3.9 (1.1)	1.6
c	Give you good advice about a crisis	7.3	10.7	18.1	33.5	30.5	3.7 (1.2)	2.5
g	Give you information to help you understand a situation	4.8	9.1	19.2	37.0	30.0	3.8 (1.1)	1.8
h	Confide in or talk to about yourself or your problems	5.7	10.7	15.8	32.0	35.8	3.8 (1.2)	1.6
l	Advice you really want	7.8	12.1	18.6	31.6	29.9	3.6 (1.2)	2.1
o	Share your most private worries and fears with <sup>a</sup>	10.5	12.6	13.8	27.2	35.9	3.7 (1.4)	1.7
p	Turn to for suggestions about how to deal with a personal problem <sup>a</sup>	7.1	13.3	16.8	30.5	32.3	3.7 (1.2)	1.7
r	Understand your problems	6.0	11.8	18.8	32.2	31.2	3.7 (1.2)	1.6
<b>Tangible Support (TAN)</b>								
a	Help you if you are confined to bed <sup>a</sup>	12.4	13.2	15.5	28.4	30.5	3.5 (1.4)	2.6
d	Take you to the doctor if you need it <sup>a</sup>	5.5	7.6	10.2	30.6	46.2	4.0 (1.2)	1.9
k	Prepare your meals if you are unable to do it yourself	8.4	12.6	15.2	27.0	36.7	3.7 (1.3)	1.8
n	Help with daily chores if you are sick	8.5	15.0	16.8	27.8	31.9	3.6 (1.3)	1.8
<i>Continued next page</i>								
<b>Positive Social Interaction (POS)</b>								
f	Have a good time with	3.2	8.4	15.8	29.9	42.7	4.0 (1.1)	1.8
j	Get together with for relaxation	4.0	9.9	18.1	29.9	38.2	3.9 (1.1)	1.6
q	Do something enjoyable with <sup>a</sup>	3.0	9.2	17.4	32.4	38.1	3.9 (1.1)	1.9

	Percent					Mean (SD)	Percent missing
	None	Little	Some	Most	All		
How often is each of the following kind of support available to you if you need it							
<b>Affectionate Support (AFF)</b>							
e	2.7	6.5	10.2	24.9	55.8	4.2 (1.0)	2.0
i	5.4	9.4	13.8	23.6	47.9	4.0 (1.2)	2.2
s	5.5	8.0	11.7	24.8	50.0	4.1 (1.2)	1.5
<b>Not Included in a Subscale</b>							
m	6.0	13.1	21.5	31.0	28.4	3.6 (1.2)	2.0

<sup>a</sup> 6- items included on the second survey of the Younger cohort as an abbreviated form of the MOS Social Support Index

**Table 2 Pearson Correlations for MOS Social Support Items, by subscale**

	<i>Tangible Support</i>				<i>Affectionate Support</i>			<i>Positive Social Interaction</i>		
	a	d	k	n	e	i	s	f	j	q
a		0.67	0.65	0.68	0.48	0.44	0.44	0.47	0.47	0.48
d			0.65	0.66	0.57	0.50	0.51	0.56	0.55	0.56
k				0.82	0.60	0.59	0.60	0.61	0.62	0.63
n					0.59	0.59	0.60	0.61	0.62	0.65
e	0.48	0.57	0.60	0.59		0.80	0.82	0.76	0.67	0.69
i	0.44	0.50	0.59	0.59			0.81	0.72	0.71	0.70
s	0.44	0.51	0.60	0.60				0.75	0.70	0.74
f	0.47	0.56	0.61	0.61	0.76	0.72	0.75		0.80	0.83
j	0.47	0.55	0.62	0.62	0.67	0.71	0.70			0.83
q	0.48	0.56	0.63	0.65	0.69	0.70	0.74			
b	0.56	0.59	0.51	0.55	0.54	0.49	0.50	0.58	0.61	0.60
c	0.53	0.59	0.50	0.54	0.52	0.48	0.49	0.57	0.60	0.59
g	0.50	0.59	0.58	0.59	0.60	0.58	0.59	0.68	0.68	0.67
h	0.45	0.54	0.52	0.55	0.58	0.56	0.56	0.65	0.69	0.67
l	0.49	0.56	0.62	0.62	0.59	0.59	0.61	0.67	0.71	0.70
o	0.45	0.53	0.58	0.62	0.62	0.62	0.65	0.68	0.71	0.73
p	0.47	0.55	0.58	0.61	0.59	0.58	0.62	0.66	0.70	0.72
r	0.46	0.54	0.57	0.61	0.61	0.61	0.66	0.69	0.72	0.75
m	0.52	0.58	0.65	0.68	0.61	0.63	0.64	0.73	0.78	0.79
<i>Emotional/Informational Support</i>										
	b	c	g	h	l	o	p	r	m	
a	0.56	0.53	0.50	0.45	0.49	0.45	0.47	0.46	0.52	
d	0.59	0.59	0.59	0.54	0.56	0.53	0.55	0.54	0.58	
k	0.51	0.50	0.58	0.52	0.62	0.58	0.58	0.57	0.65	
n	0.55	0.54	0.59	0.55	0.62	0.62	0.61	0.61	0.68	
e	0.54	0.52	0.60	0.58	0.59	0.62	0.59	0.61	0.61	
i	0.49	0.48	0.58	0.56	0.59	0.62	0.58	0.61	0.63	
s	0.50	0.49	0.59	0.56	0.61	0.65	0.62	0.66	0.64	
f	0.58	0.57	0.68	0.65	0.67	0.68	0.66	0.69	0.73	
j	0.61	0.60	0.68	0.69	0.71	0.71	0.70	0.72	0.78	
q	0.60	0.59	0.67	0.67	0.70	0.73	0.72	0.75	0.79	
b		0.82	0.67	0.78	0.67	0.68	0.72	0.70	0.66	
c			0.74	0.76	0.73	0.68	0.74	0.71	0.66	
g				0.76	0.76	0.69	0.74	0.73	0.71	
h					0.76	0.79	0.82	0.80	0.73	
l						0.76	0.80	0.78	0.77	
o							0.88	0.83	0.75	
p								0.85	0.76	
r									0.76	
m	0.66	0.66	0.71	0.73	0.77	0.75	0.76	0.76		

**Table 3 Correlation with item-total and Cronbach's alpha for standardised variables with deletion of individual items**

Deleted Item/Item	Correlation with Total	Cronbach's Alpha	Communality Estimates
None		<b>0.97</b>	<b>15.11</b>
<b><i>Tangible Support</i></b>			
a	0.63	0.97	0.80
d	0.70	0.97	0.73
k	0.74	0.97	0.79
n	0.76	0.97	0.80
<b><i>Affectionate Support</i></b>			
e	0.77	0.97	0.78
i	0.75	0.97	0.81
s	0.77	0.97	0.78
<b><i>Positive Social Interaction</i></b>			
f	0.82	0.97	0.81
j	0.83	0.97	0.78
q	0.85	0.97	0.81
<b><i>Emotional/Informational Support</i></b>			
b	0.77	0.97	0.77
c	0.77	0.97	0.80
g	0.81	0.97	0.73
h	0.82	0.97	0.84
l	0.84	0.97	0.78
o	0.84	0.97	0.80
p	0.85	0.97	0.85
r	0.85	0.970	0.84
<b><i>Not Included in a Subscale</i></b>			
m	0.85	0.97	0.76

#### *Factor Analysis*

Factor analysis was performed on responses from 10 617 mid-age women completing all 19 items. There were 3 factors with eigenvalues greater than one (Table 4) and they explained approximately 67%, 7% and 6% of the variance respectively. Three factors were also suggested by parallel analysis. A strict interpretation of the MAP test, based on minimum average squared correlation, suggests 5 factors, however 3 or 4 factors are equally plausible with only small differences for these 3 steps.



**Table 4 Results of Factor Analysis**

Factor	Eigenvalue	Difference	Proportion	Simulated Eigenvalue <sup>a</sup>		Average <sup>b</sup>
				Mean	95 <sup>th</sup> Percentile	Squared Correlation
1	<b>12.65</b>	11.33	<b>0.67</b>	1.07	<b>1.09</b>	0.049
2	<b>1.32</b>	0.17	<b>0.07</b>	1.06	<b>1.07</b>	0.036
3	<b>1.15</b>	0.56	<b>0.06</b>	1.05	<b>1.06</b>	0.027
4	0.59	0.15	0.03	1.04	1.05	0.025
5	0.44	0.09	0.02	1.04	1.04	<b>0.025</b>
6	0.36	0.03	0.02	1.03	1.04	0.031
7	0.33	0.04	0.02	1.02	1.03	0.043
8	0.29	0.04	0.02	1.01	1.02	0.053
9	0.25	0.02	0.01	1.01	1.01	0.060
10	0.23	0.03	0.01	1.00	1.01	0.074
11	0.20	0.00	0.01	0.99	1.00	0.093
12	0.20	0.02	0.01	0.99	1.00	0.117
13	0.17	0.02	0.01	0.98	0.99	0.147
14	0.16	0.00	0.01	0.97	0.98	0.180
15	0.15	0.01	0.01	0.97	0.97	0.267
16	0.15	0.01	0.01	0.96	0.96	0.364
17	0.14	0.01	0.01	0.95	0.96	0.538
18	0.13	0.02	0.01	0.94	0.95	1
19	0.11	0.01	1	0.93	0.94	

<sup>a</sup> Parallel Analysis<sup>b</sup> Velicer's MAP test

For the principal components solution, loadings on the second and third factor were weak (<0.4) for almost all items (Table 5). Factor loadings from varimax (orthogonal) and promax (oblique) rotations more strongly suggest 3 factors, with the oblique solution showing the lowest levels of cross-loading. Correlations between factors are: 1 & 2 : 0.65; 1 & 3: 0.58; 2 & 3: 0.56.

The factors extracted are generally consistent with the findings of Sherbourne and Stewart, although the data from these middle-aged women support the combination of 2 of the original subscales. All 8 items from emotional/informational support subscale load strongly (>0.7) onto factor 1 and weakly onto the other 2 factors. Six items, 3 each from the affectionate support and positive social interaction subscales, load strongly onto factor 2 and weakly onto factor 3, with some cross-loading of items q and j onto factor 1. The 4 tangible support items load strongly onto factor 3 and weakly on to the other 2 factors. Item m (not a component of any subscale in the Sherbourne and Stewart analysis) loads most strongly onto the first factor.

Items loading strongly onto these three factors satisfy the ALWH criteria.

Table 5 Factor loadings from rotated and un-rotated analyses

	Un-Rotated			Varimax			Promax		
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3
<b>Emotional/Informational Support</b>									
h	<b>0.85</b>	-0.35	-0.08	<b>0.83</b>	0.33	0.21	<b>0.90</b>	0.06	-0.05
p	<b>0.87</b>	-0.29	-0.10	<b>0.81</b>	0.39	0.23	<b>0.84</b>	0.15	-0.04
c	<b>0.79</b>	-0.39	0.14	<b>0.81</b>	0.16	0.36	<b>0.90</b>	-0.18	0.18
b	<b>0.79</b>	-0.34	0.15	<b>0.77</b>	0.18	0.38	<b>0.83</b>	-0.14	0.21
r	<b>0.88</b>	-0.22	-0.14	<b>0.76</b>	0.45	0.21	<b>0.77</b>	0.25	-0.06
o	<b>0.86</b>	-0.19	-0.14	<b>0.74</b>	0.46	0.21	<b>0.73</b>	0.28	-0.06
l	<b>0.86</b>	-0.21	-0.034	<b>0.73</b>	0.40	0.29	<b>0.72</b>	0.17	0.06
g	<b>0.83</b>	-0.20	0.002	<b>0.70</b>	0.37	0.32	<b>0.69</b>	0.14	0.10
<b>Not in a subscale</b>									
m	<b>0.87</b>	-0.05	-0.04	<b>0.62</b>	<b>0.51</b>	0.34	<b>0.53</b>	0.34	0.12
<b>Affectionate Support</b>									
s	<b>0.80</b>	0.37	-0.25	0.29	<b>0.83</b>	0.25	-0.009	<b>0.91</b>	0.02
i	<b>0.78</b>	0.38	-0.24	0.27	<b>0.82</b>	0.26	-0.04	<b>0.90</b>	0.04
e	<b>0.79</b>	0.37	-0.17	0.28	<b>0.78</b>	0.32	-0.03	<b>0.84</b>	0.12
<b>Positive Social Interaction</b>									
f	<b>0.85</b>	0.22	-0.21	0.43	<b>0.74</b>	0.26	0.20	<b>0.74</b>	0.02
q	<b>0.87</b>	0.15	-0.19	0.50	<b>0.70</b>	0.27	0.30	<b>0.66</b>	0.03
j	<b>0.86</b>	0.11	-0.19	<b>0.52</b>	<b>0.67</b>	0.26	0.34	<b>0.61</b>	0.01
<b>Tangible Support</b>									
a	<b>0.65</b>	0.15	<b>0.60</b>	0.27	0.16	<b>0.84</b>	0.05	-0.10	<b>0.91</b>
d	<b>0.73</b>	0.12	0.43	0.36	0.28	<b>0.73</b>	0.16	0.05	<b>0.72</b>
n	<b>0.78</b>	0.24	0.36	0.31	0.42	<b>0.72</b>	0.05	0.25	<b>0.70</b>
k	<b>0.77</b>	0.29	0.34	0.27	0.45	<b>0.72</b>	-0.02	0.31	<b>0.69</b>

Cronbach's alphas for items loading most strongly on each factor is high – factor 1 (b,c,g,h,i,o,p,r) 0.96; factor 2 (e,f,i,j,q,s) 0.95; factor 3 (a,d,k,n) 0.90. Community estimates are high (>0.7) for all items (Table 3), exceeding the criteria for ALSWH evaluation procedure.

The 19 MOS social support items in the Mid-age cohort data from Survey 2 meet ALSWH criteria for 3 factors.

**Table 6 Standardised Scoring Coefficients for 3-Factor Solution based on Varimax and Promax rotations**

Item	Varimax			Promax		
	Factor 1	Factor 2	Factor 3	Factor 1	Factor 2	Factor 3
<b><i>Emotional/Informational Support</i></b>						
h	0.25	-0.09	-0.10	0.17	-0.03	-0.05
p	0.22	-0.05	-0.10	0.15	-0.002	-0.05
c	0.25	-0.21	0.04	0.17	-0.100	0.05
b	0.22	-0.19	0.06	0.16	-0.08	0.07
r	0.18	0.0004	-0.12	0.13	0.03	-0.06
o	0.17	0.01	-0.11	0.13	0.04	-0.06
l	0.16	-0.04	-0.04	0.13	0.01	-0.003
g	0.15	-0.05	-0.01	0.12	-0.003	0.02
<b><i>Not in a subscale</i></b>						
m	0.08	0.04	-0.01	0.08	0.06	0.02
<b><i>Affectionate Support</i></b>						
s	-0.14	0.32	-0.08	-0.05	0.23	-0.03
i	-0.15	0.32	-0.06	-0.05	0.23	-0.02
e	-0.15	0.29	-0.02	-0.05	0.21	0.02
<b><i>Positive Social Interaction</i></b>						
f	-0.06	0.24	-0.08	0.001	0.18	-0.03
q	-0.02	0.19	-0.07	0.02	0.15	-0.02
j	0.002	0.17	-0.08	0.03	0.14	-0.03
<b><i>Tangible Support</i></b>						
a	-0.10	-0.17	0.50	-0.01	-0.06	0.39
d	-0.07	-0.11	0.37	0.01	-0.03	0.30
n	-0.12	-0.02	0.35	-0.03	0.03	0.28
k	-0.15	0.01	0.34	-0.04	0.05	0.28

## Derived Variables

### Scores

The properties of factor scores and summed scores were investigated for women with complete data. Three factor scores were calculated for each rotation method as the total of item scores, weighted by the standardised scoring coefficients from the factor analysis (Table 6). Factors were labelled as emotional/informational support, tangible support and affectionate support/positive social interaction. Summed scores were calculated as the mean of unweighted item scores for each of the 4 subscales identified by Sherbourne and Stewart, for the combined affectionate support and positive social interaction subscales, for the 19-item Index and for the 6-items included in the second survey of the Younger cohort as an abbreviated index of social support (items a, d, o, p, q and s, see Table 1). Mean substitution for missing values was not considered at this stage. The transformed scores derived by Sherbourne and Stewart and described previously (range 0-100) were calculated for the 4 subscales and the 19-item Social Support Index.

Distributional properties of these scores are shown in Table 7. All scores were highly skewed and none conformed to a normal distribution. Mean scores ranged 1 to 5 and there was a strong ceiling effect, with between 11% and 42% of women scoring 5 (support available 'all of the time' for all items). The transformed mean scores are similar to those reported by Sherbourne and Stewart (Table 8).

Since the correlations between mean scores and the factor scores from the promax rotation were high ( $>0.7$ ) for all factors (Table 9) and since unweighted sum-based scores are more readily compared with other populations, the use of mean scores is recommended. So, the 3 subscales of social support that can be measured separately are: mean emotional/informational support; mean affectionate support/positive social interaction; and mean tangible support.

**Table 7**      **Distributional properties of Mean and Factor Scores**

<b>Score</b>	<b>Mean</b>	<b>(SD)</b>	<b>Median</b>	<b>Skewness</b>	<b>Percent at Ceiling</b>	<b>Range</b>
<i>Mean Scores</i>						
Emotional/informational support	3.76	(1.07)	4.00	-0.723	17.1	1 to 5
Affectionate support	4.12	(1.07)	4.67	-1.178	42.4	1 to 5
Positive social interaction	3.97	(1.03)	4.00	-0.892	31.6	1 to 5
Affectionate support/ positive social interaction	4.04	(1.00)	4.33	-1.002	29.3	1 to 5
Tangible support	3.74	(1.12)	4.00	-0.739	20.4	1 to 5
Social Support Index – Full	3.84	(0.97)	4.00	-0.746	11.1	1 to 5
Social Support Index - Abbreviated	3.84	(1.00)	4.00	-0.773	16.1	1 to 5
<i>Factor Scores - Varimax</i>						
Emotional/informational support	2.54	(1.20)	2.77	-0.824		-2.69 to 6.98
Affectionate support/ positive social interaction	2.98	(1.12)	3.35	-0.728		-1.88 to 6.80
Tangible support	0.72	(0.72)	0.73	0.039		-2.59 to 4.32
<i>Factor Scores - Promax</i>						
Emotional/informational support	7.83	(2.26)	8.30	-0.656		1.56 to 10.94
Affectionate support/ positive social interaction	4.24	(1.34)	4.54	-0.983		0.34 to 6.35
Tangible support	4.00	(1.28)	4.29	-0.713		0.24 to 6.42

**Table 8**      **Transformed social support scores for the Mid-age ALSWH cohort and subjects with chronic conditions in Sherbourne and Stewart**

<b>Transformed Mean Score</b>	<b>ALSWH – Mid-age Survey 2</b>		<b>Sherbourne &amp; Stewart</b>
	<b>Mean (SD)</b>	<b>Median</b>	<b>Mean (SD)</b>
Emotional/informational support	68.9(26.8)	75.00	69.6(25.5)
Affectionate support	78.0(26.7)	91.67	73.3(28.3)
Positive social interaction	74.2(25.9)	75.00	69.8(26.0)
Tangible support	68.6(27.9)	75.00	69.8(28.5)
Social Support Index - Full	71.0(24.2)	75.00	70.1(24.2)

**Table 9 Correlation of factor scores and mean scores**

<b>Mean Score</b>	<b>Correlation with Varimax Factor Score</b>	<b>Correlation with Promax Factor Score</b>
<b><i>Emotional/informational support</i></b>		
Emotional/informational support	0.87	0.90
<b><i>Affectionate support/positive social interaction</i></b>		
Affectionate support/positive social interaction	0.82	0.99
Affectionate support	0.84	0.96
Positive social interaction	0.72	0.92
<b><i>Tangible support</i></b>		
Tangible support	0.49	0.99

However, the non-normality of the mean score distributions suggests these variables need to be categorised before statistical analysis. Categories have been defined to reflect the original item scoring (Table 10).

**Table 10 Score categories and codes**

<b>Time that support is available</b>	<b>Mean Scores</b>	<b>Code</b>
All of the time (Reference category)	> 4 and ≤5	1
Most of the time	> 3 and ≤4	2
Some of the time	> 2 and ≤3	3
None or a little of the time	≤ 2	4

The distribution of missing items with each of the 3 subscales and the 2 forms of the index are shown in Tables 11a & b. The average of the mean scores tends to reduce with increasing numbers of missing items, so that mean substitution for missing items will introduce lower scores overall. On an arbitrary basis, the number of missing values replaced by mean substitution within each subscale/index were: none for tangible support (3 items); 1 for affectionate support/positive social interaction and for the abbreviated social support index (6 items each); 2 for emotional/informational support (8 items); and 4 for the full social support index (19 items). The percentage of women in the resulting categories is shown in Tables 12a&b.

**Table 11a Number of missing items in subscales of the MOS Social Support Index**

Number of Items Missing	Number	Percent	Mean of non-missing items in the subscale			
			Mean	SD	Minimum	Maximum
<i>Social Support Index – Full</i>						
0	10 617	91.2	3.84	0.97	1	5
1	643	5.5	3.49	0.98	1	5
2	134	1.2	3.42	1.01	1.18	5
3	41	0.4	3.36	1.07	1.31	5
4	22	0.2	3.65	1.06	1.80	5
5	10	0.1	3.83	0.80	2.50	4.86
6	4	0.0	3.37	0.79	2.54	4.15
7	9	0.1	2.95	0.97	1.92	4.25
8	10	0.1	3.55	0.95	2.27	5
9	5	0.0	3.56	1.42	1.30	5
10	5	0.0	3.33	1.18	1.89	5
11	2	0.0	2.50	1.24	1.63	3.38
12	3	0.0	3.24	1.36	1.86	4.57
13	3	0.0	3.67	1.04	2.50	4.5
14	2	0.0	1.10	0.14	1	1.2
15	1	0.0	3.75		3.75	3.75
16	5	0.0	2.93	1.46	1	5
17	2	0.0	1.50	0.71	1	2
18	9	0.1	2.44	1.81	1	5
19	121	1.0				
<i>Social Support Index – Abbreviated</i>						
0	11 135	95.6	3.82	1.00	1	5
1	295	2.5	3.54	1.10	1	5
2	49	0.4	3.49	1.30	1	5
3	10	0.1	3.47	1.18	1.33	5
4	20	0.2	2.80	1.20	1	4.5
5	14	0.1	2.50	1.70	1	5
6	125	1.1				
<i>Emotional/Informational Support</i>						
0	11 120	95.5	3.74	1.07	1	5
1	294	2.5	3.33	1.11	1	5
2	42	0.4	3.51	1.12	1.17	5
3	21	0.2	3.33	1.13	1.4	5
4	12	0.1	3.21	1.07	2	4.75
5	11	0.1	3.27	1.01	1	5
6	8	0.1	2.44	1.12	1	4
7	10	0.1	2.20	1.75	1	5
8	130	1.1				

**Table 11b Number of missing items in subscales of the MOS Social Support Index**

Number of Items Missing	Number	Percent	Mean of non-missing items in the subscale			
			Mean	SD	Minimum	Maximum
<i>Affectionate Support/ Positive Social Interaction</i>						
0	11 160	95.8	4.03	1.01	1	5
1	286	2.5	3.48	1.07	1	5
2	44	0.4	3.43	1.03	1.5	5
3	10	0.1	3.10	1.28	1.33	5
4	5	0.0	3.00	1.22	1	4
5	8	0.1	2.63	1.51	1	5
6	135	1.2				
<i>Tangible Support</i>						
0	11 191	96.1	3.72	1.12	1	5
1	259	2.2	3.40	1.16	1	5
2	45	0.4	3.36	1.42	1	5
3	18	0.2	2.89	1.41	1	5
4	135	1.2				

**Table 12a Number and percent in support categories**

Time that support is available	Emotional/ informational		Affectionate/ positive interaction		Tangible	
	Number	Percent	Number	Percent	Number	Percent
All	4 899	42.8	6 232	54.5	4 746	42.4
Most	3 544	30.9	3 000	26.2	3 349	29.9
Some	1 884	16.5	1 485	13.0	1 758	15.7
None/little	1 129	9.9	729	6.4	1 338	12.0
<i>Missing</i>	192		202		457	

**Table 12b Number and percent in support categories**

Time that support is available	Index - Full		Index - Abbreviated	
	Number	Percent	Number	Percent
All	5 499	48.0	5 345	46.8
Most	3 442	30.0	3 418	29.9
Some	1 830	16.0	1 794	15.7
None/little	686	6.0	873	7.6
<i>Missing</i>	191		218	



Finally, the abbreviated index appears to provide an adequate overall measure of social support. Among the women responding to all items, there is a strong correlation (0.98) between the mean of 19 items and the mean of 6 items and there was strong agreement for the categorical variable (kappa: 0.80, 95% CI: 0.79-0.81; weighted kappa: 0.86, 95% CI: 0.86-0.87). The table for agreement is in Table 13.

**Table 13 Agreement between the full and abbreviated MOS Social Support Indexes**

Full Index	Abbreviated Index				Total
	All	Most	Some	None/Little	
All	4 820	399	1		5 220
Most	262	2 599	303		3 164
Some		158	1 240	225	1 623
None/Little			49	561	610
<b>Total</b>	<b>5 082</b>	<b>3 156</b>	<b>1 593</b>	<b>786</b>	<b>10 617</b>

*Recommendation for usage*

Categorical variables based on mean scores are recommended for:

- emotional/informational support
- tangible support
- affectionate support/positive social interaction and
- the abbreviated social support index.

**Scale Evaluation – Abbreviated MOS Social Support Index: Younger Cohort**

An abbreviated form of the MOS Social Support Index (6 items) was first included on the second survey of the Younger cohort. Two items (o and p from the Full Index) are from the emotional/informational support subscale; two items (items a and d from the Full Index) are from the tangible support subscale; and items q and s are from the positive social interaction and affectionate support subscales respectively.

*Item Responses*

The distribution of responses to the 6 MOS Social Support Index items is shown in Table 14. Women reported high levels of support for all items with support available ‘all the time’ between 36% for item a and 56% for item f. Means for individual items were similar for items b to f, but lower for item a.

There were low levels of missing data for all items (Table 14); the maximum percent missing was 2.1% for item a. Almost all women (97%) completed all items.

**Table 14** Distribution of responses to 6 social support items, among women from the Younger cohort completing the full Survey 2 (9 598)

	Availability of someone to:	Time that support is available					Mean (SD)	Percent Missing
		None	Little	Som e	Most	All		
a	Help you if you are confined to bed	9	11	14	30	36	3.7 (1.3)	2.1
b	Take you to the doctor if you need it	5	9	11	31	44	4.0 (1.2)	1.2
c	Share worries and fears with	4	10	12	27	47	4.0 (1.2)	0.8
d	Turn to for suggestions about how to deal with a personal problem	3	9	13	28	48	4.1 (1.1)	0.7
e	Do something enjoyable with	1	6	14	34	45	4.1 (1.0)	0.6
f	Love and make you feel wanted	4	8	11	22	56	4.2 (1.1)	0.8

*Scale reliability*

Inter-item correlations are strongest for items taken from the same MOS social support subscales (Table 15). There was strong internal consistency for the 6 items (Cronbach's alpha 0.89) and high correlation with item totals with the deletion of individual items (Table 16) meeting ALSWH criteria for reliability.

**Table 15** Pearson Correlations for Items a to f

	b	c	d	e	f
a	0.78	0.44	0.45	0.44	0.40
b		0.49	0.50	0.48	0.43
c			0.86	0.66	0.61
d				0.67	0.58
e					0.66

**Table 16** Correlation with item-total and Cronbach's alpha for standardised variables with deletion of individual items

Deleted Item	Correlation with Total	Cronbach's Alpha
None		<b>0.89</b>
a	0.61	0.88
b	0.66	0.87
c	0.77	0.85
d	0.77	0.85
e	0.73	0.86
f	0.66	0.87

*Factor Analysis*

Factor analysis was performed on responses from 9 316 younger women completing all 6 items. This analysis (Table 17) suggests a 1-factor solution, with that factor explaining 64% of the variance. However, the second factor has an eigenvalue close to 1 and a 2-factor solution was also

investigated. Factor loadings for an analysis forcing 2 factors, with and without rotation are shown in Table 18.

**Table 17 Results of Factor Analysis**

Factor	Eigenvalue	Difference	Proportion	Cumulative
1	<b>3.83</b>	2.86	<b>0.64</b>	0.64
2	0.97	0.46	0.16	0.80
3	0.51	0.19	0.09	0.89
4	0.33	0.11	0.05	0.94
5	0.22	0.08	0.04	0.98
6	0.14	0.02		1.00

**Table 18 Factor loadings from analysis forcing 2 factors- varimax rotated and unrotated solutions**

Item	Un-rotated		Varimax Rotation	
	Factor 1	Factor 2	Factor 1	Factor 2
d	<b>0.86</b>	-0.26	<b>0.87</b>	0.27
c	<b>0.86</b>	-0.28	<b>0.86</b>	0.25
e	<b>0.82</b>	-0.23	<b>0.81</b>	0.27
f	<b>0.77</b>	-0.27	<b>0.79</b>	0.21
b	<b>0.75</b>	<b>0.56</b>	0.24	<b>0.89</b>
a	<b>0.72</b>	<b>0.62</b>	0.31	<b>0.91</b>

The analysis without rotation suggests a single factor, with high loadings for all items. In this analysis items c, d, e and f have weak negative loadings onto the second factor and items a and b have strong loadings onto the second factor, although these latter items load less strongly onto the second than the first factor. The varimax rotation strongly suggest a 2-factor solution, with items c, d, e and f forming the first factor and items a and b forming the second. The amplification of factor 2 on rotation may be caused by the underlying distribution of item responses, with a strong preference in all items for the responses indicating regular access to support. While these items load onto different factors when all 19 items are included, when responses to only 6 items are available a single factor is preferable.

Table 19 contains a summary of the 1-factor solution, including communality estimates and scoring coefficients.

ALSWH criteria for a single factor are met by the analysis of these 6 items.

**Table 19 Summary of the 1-Factor Solution**

Item	Communality Estimates	Factor Loading	Standardised Scoring Coefficients
d	0.74	0.86	0.22
c	0.74	0.86	0.22
e	0.68	0.82	0.21
f	0.59	0.77	0.20
b	0.57	0.75	0.20
a	0.51	0.72	0.19

**Derived Variables***Scores*

For each woman with complete data, a composite factor score and a summed score were calculated. The factor score is the total of item scores, weighted by the standardised scoring coefficients from the factor analysis. The summed score was the total of the unweighted item scores. Mean substitution for missing values was not considered appropriate as the mean for item a was lower than for other items. The correlation between the factor score and the summed score was 0.99 and the plot of the scores showed a strong linear relationship. Since the summed score was demonstrated to be valid, it was selected in preference to the factor.

The summed score ranged from 6 to 30, with mean 24.2 and standard deviation 5.4. There was a strong ceiling effect with 20% (1 859) of women who completed all items having the maximal score of 30 (support available 'All of the time' for all 6 items). An alternative based on mean score is also shown. This approach has the advantage that it reflects the original response categories, and better separates those with low and high levels of support. Tables 20a & b show the distribution of both scores.

**Table 20a Distribution of Total scores**

Code	Category	Total scores	Number	Percent
1	Quartile 1	Less than 20 (6 to19)	1 808	19.4
2	Quartile 2	20 to 23	1 605	17.2
3	Quartile 3	24 to 26	1 945	20.9
4	Quartile 4	27 to 29	2 099	22.5
5	Quartile 5	30	1 859	20.0

**Table 20b Distribution of Mean scores**

Code	Category	Mean Scores	Number	Percent
1	All of the time (Reference)	> 4 and ≤5	5 175	55.6
2	Most of the time	> 3 and ≤4	2 639	28.3
3	Some of the time	> 2 and ≤3	1 136	12.2
4	None or a little of the time	≤ 2	366	3.9

### Recommendation for usage

A categorical variable based on the mean score is recommended as the most appropriate form for statistical analysis. Support available 'all the time' is the optimal reference category.

### Comparison of the Abbreviated MOS Social Support Index in the Mid-Age and Younger Cohorts

The full 19 item MOS Social Support Index was included on the second Mid-age survey. Six of these items also appeared on the second Younger cohort survey. This comparison is based on responses from 9 316 younger women and 11 135 mid-age women completing all 6 of these items.

### Item Responses

There were statistically significant differences between the 2 age cohorts in the response distributions of all 6 items ( $p < 0.0001$ ). Generally there were lower levels of support among mid-age women. Responses were strongly skewed towards more support in both age groups (Table 21).

**Table 21 Distribution (%) and mean (SD) of responses to 6 social support items included in the second survey of the Younger cohort**

Availability of someone to:	Cohort	Time that support is available					Mean (SD)
		None	Little	Some	Most	All	
Help you if you are confined to bed	Younger	9	11	14	30	36	3.7 (1.3)
	Mid-age	12	13	16	29	31	3.5 (1.4)
Take you to the doctor if you need it	Younger	5	9	11	31	44	4.0 (1.2)
	Mid-age	5	8	10	31	46	4.0 (1.2)
Share worries and fears with	Younger	4	10	12	27	48	4.0 (1.2)
	Mid-age	10	13	14	27	36	3.7 (1.3)
Turn to for suggestions about how to deal with a personal problem	Younger	3	9	13	28	48	4.1 (1.1)
	Mid-age	7	13	17	31	32	3.7 (1.2)
Do something enjoyable with	Younger	1	6	14	34	45	4.2 (1.0)
	Mid-age	3	9	17	32	38	3.9 (1.1)
Love and make you feel wanted	Younger	4	8	11	22	56	4.2 (1.1)
	Mid-age	5	8	12	25	50	4.1 (1.2)

### Factor Analysis

All aspects of the factor analysis of these 6 items were similar for both age groups (Tables 22-24). Both factor analyses support a single factor, explaining 64% and 67% of the variance in the Younger and Mid-age cohorts respectively (Table 23).

**Table 22 Correlation with item-total and Cronbach's alpha for standardised variables, with the deletion of individual items**

Deleted Item	Correlation with Total		Cronbach's Alpha	
	Younger	Mid-age	Younger	Mid-age
None			<b>0.89</b>	<b>0.90</b>
a	0.61	0.60	0.88	0.90
b	0.66	0.68	0.87	0.89
c	0.77	0.80	0.85	0.87
d	0.77	0.80	0.85	0.87
e	0.73	0.80	0.86	0.87
f	0.66	0.72	0.87	0.89

**Table 23 Results of Factor Analysis**

Factor	Younger		Mid-age	
	Eigenvalue	Proportion	Eigenvalue	Proportion
1	3.83	0.64	4.04	0.67
2	0.97	0.16	0.81	0.14
3	0.51	0.09	0.46	0.08
4	0.33	0.05	0.33	0.06
5	0.22	0.04	0.23	0.04
6	0.14		0.12	

**Table 24 Summary of Un-rotated Factor Solution**

Item		Communality Estimates		Factor Loading		Standardised Scoring Coefficients	
Y	M	Y	M	Y	M	Y	M
d	p	0.74	0.77	0.86	0.88	0.22	0.22
c	o	0.74	0.77	0.86	0.88	0.22	0.22
e	q	0.68	0.76	0.82	0.87	0.21	0.22
f	s	0.59	0.66	0.77	0.82	0.20	0.20
b	d	0.57	0.59	0.75	0.77	0.20	0.19
a	a	0.51	0.48	0.72	0.70	0.19	0.17

The SAS code defining MOS social support variables at Survey 2 is:

### Younger Cohort

```
/******  
Calculate mean abbreviated social support score.  
Allow mean-substitution for 1 item.  
******/;  
y2mnsocsup6 = . ;  
if y2survey = 1 and nmiss(of q89{*}) in (0,1)  
    then y2mnsocsup6 = mean(of q89{*}) ;  
/******  
Categorise mean scores.  
1 = 'All the time'      2 = 'Most'  
3 = 'Some'             4 = 'None/little'  
******/;  
if y2mnsocsup6 = . then y2socsupgp6 = . ;  
else if y2mnsocsup6 <= 2 then y2socsupgp6 = 4 ;  
else if y2mnsocsup6 <= 3 then y2socsupgp6 = 3 ;  
else if y2mnsocsup6 <= 4 then y2socsupgp6 = 2 ;  
else if y2mnsocsup6 <= 5 then y2socsupgp6 = 1 ;
```

### Mid-age Cohort

```
array emi {8}m2q82b m2q82c m2q82g m2q82h m2q82l m2q82o m2q82p m2q82r;  
array affpos {6} m2q82e m2q82f m2q82i m2q82j m2q82q m2q82s ;  
array tang {4} m2q82a m2q82d m2q82k m2q82n ;  
array sixitems {6} m2q82a m2q82d m2q82o m2q82p m2q82q m2q82s ;  
/******  
Calculate mean scores. Allow mean-substitution for:  
- no items: tangible support  
- 1 item: affectionate support/positive social interaction  
- 1 item: abbreviated social support score  
- 2 items: emotional/informational support  
******/;  
m2mnemi = . ;  
m2mnaffpos = . ;  
m2mntan = . ;  
m2mnsocsup6 = . ;  
  
if m2survey = 1 then do;  
if nmiss(of emi{*}) in (0,1,2) then m2mnemi = mean(of emi{*}) ;  
if nmiss(of affpos{*}) in (0,1) then m2mnaffpos = mean(of affpos{*});  
if nmiss(of tang{*}) = 0 then m2mntan = mean(of tang{*}) ;  
if nmiss(of sixitems{*}) in (0,1) then m2mnsocsup6 = mean(of sixitems{*}) ;  
end ;  
/******  
Categorise mean scores.  
1 = 'All the time'  2 = 'Most'  
3 = 'Some'         4 = 'None/little'  
******/;  
array mnscore {4} m2mnemi m2mnaffpos m2mntan m2mnsocsup6 ;  
array mngp {4} m2mnemigp m2mnaffposgp m2mntangp m2socsupgp6 ;  
do i = 1 to 4 ;  
if mnscore{i} = . then mngp{i} = . ;  
else if mnscore{i} <= 2 then mngp{i} = 4 ;  
else if mnscore{i} <= 3 then mngp{i} = 3 ;  
else if mnscore{i} <= 4 then mngp{i} = 2 ;  
else if mnscore{i} <= 5 then mngp{i} = 1 ;  
end ;
```

### References

1. Sherbourne CD & Stewart AL. The MOS social support survey. *Social Science and Medicine*. 1991;32(6):705-714
2. RAND Health Communications, Santa Monica, California. Available at [www.rand.org/health/surveys/mos.descrip.html](http://www.rand.org/health/surveys/mos.descrip.html)[Accessed 2 June 2002]