Score Range for the SF-36v2® & SF-12v2® Health Surveys
Standard & Acute Versions

JAKOB BUE BJORNER, 1 FEBRUARY 2022

This FAQ response describes the score range for the SF-36v2® and SF-12v2® Health Surveys' Standard and Acute versions when scored according to norms from QualityMetric's 2009 norm study.

SF-36v2® Health Survey (SF-36v2)

In the original scoring of the SF-36, the eight subscales (PF, RP, BP, GH, VT, SF, RE, MH) were scored from 0 (worst health) to 100 (best heath). These scores are still provided by QualityMetric's scoring software. However, more than twenty-five years ago, QualityMetric started providing so-called norm-based scoring (NBS), where the mean score in the US general population is set to 50 and the standard deviation (SD) is set to 10. The rescaling from the old (0-100) to the new (mean=50, SD=10) scoring is done by a linear transformation. QualityMetric recommends reporting norm-based scores.

When using NBS, the minimum is not 0 and the maximum is not 100. Therefore, the score range is not 100. Table 1 below shows for each SF-36v2 subscale the minimum and maximum score, as well as the score range.

TABLE 1. SCORE RANGE FOR NORM-BASED SCALE SCORES FOR THE SF-36V2 STANDARD AND ACUTE VERSIONS, BASED ON 2009 NORMS

Scale	STANDARD VERSION			ACUTE VERSION		
	Min[1]	Max[2]	Range	Min[1]	Max[2]	Range
PF	19.3	57.5	38.3	19.0	57.6	38.6
RP	21.2	57.2	35.9	21.9	57.1	35.2
BP	21.7	62.0	40.3	21.4	60.9	39.5
GH	19.0	66.5	47.5	21.3	65.4	44.1
VT	22.9	70.4	47.5	25.6	69.1	43.5
SF	17.2	57.3	40.1	17.2	56.7	39.5
RE	14.4	56.2	41.8	9.8	55.6	45.8
MH	11.6	63.9	52.3	13.1	62.7	49.6

[1] Worst health, [2] Best health

For the SF-36v2 subscales, the score range is the same whether you have missing data or not. This is different for the other two scores of the SF-36v2: the Physical Heath Component (PCS) and Mental Health Component (MCS).

The summary health components PCS and MCS are derived from the eight subscales mentioned above. Both summary health components summarize information from all eight subscales but with different weights. These weights were derived from a principal components analysis. For PCS, highest weights are given to the physical subscales (such as PF and RP) while some mental subscales (such as MH and RE) are given negative weights. For MCS, highest weights are given to the mental subscales (such as MH and RE) while some physical subscales (such as PF and RP) are given negative weights. This makes

the calculation of the theoretically possible highest and lowest scores more complex. Also, unlike the subscales, the highest and lowest possible scores for PCS and MCS will depend on whether you have missing data or not. QualityMetric's scoring software permits estimation of the PCS in the case of one missing subscale–as long as it is not the PF subscale. Similarly, the MCS can be estimated even with one missing subscale–as long as it is not the MH subscale. Missing data (scale level) may, in rare circumstances, have an impact on score range. The score ranges for SF-36v2 PCS and MCS are shown in Table 2.
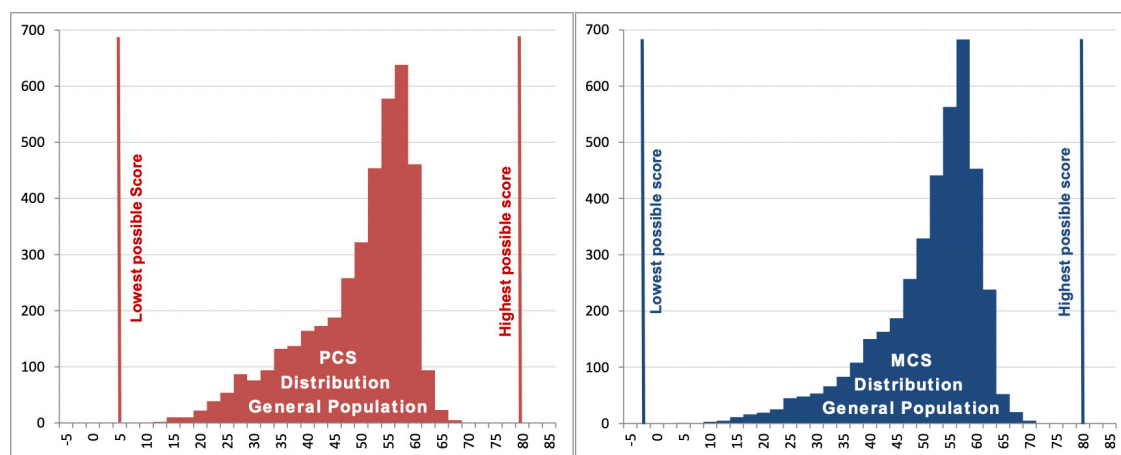
TABLE 2. SCORE RANGE FOR THE PHYSICAL AND MENTAL HEALTH COMPONENT SCORES FOR THE SF-36V2 STANDARD AND ACUTE VERSIONS, BASED ON 2009 NORMS

Scale		STANDARD VERSION			ACUTE VERSION		
		Min[1]	Max[2]	Range	Min[1]	Max[2]	Range
PCS	*Theoretical – complete data*	5.0	79.8	74.8	6.1	79.7	73.6
	Theoretical – with missing	5.0	79.8	74.8	5.1	79.7	74.5
	In practice[3]	7.3	70.1	62.8	10.8	75.5	64.7
MCS	*Theoretical – complete data*	-3.3	80.1	83.4	-3.8	78.7	82.5
	Theoretical – with missing	-4.0	80.1	84.1	-4.0	79.7	83.6
	In practice[3]	5.8	69.9	64.1	5.6	69.7	64.0

[1] Worst health, [2] Best health, [3] General population survey [i] (n=4,024 standard version, n=2,056 acute version)

It should be emphasized that the theoretical ranges reported in Table 2 are not encountered in practice. While the subscale scores may often hit the ceiling (best possible score) and sometimes the floor (worst possible score), it would be very unusual to hit the theoretical ceiling or floor for PCS and MCS. These highest or lowest possible scores reflect response combinations that would be very unlikely to happen in practice. The observed score range is almost always smaller than the theoretical score range, as shown in the lines labeled "In practice." This is also illustrated in Figure 1, which shows the theoretical score range for the SF-36v2 Standard PCS and MCS scores as well as the score distribution in a large US general population study (the 2009 QualityMetric Norm Study[i]).

FIGURE 1. DISTRIBUTION OF SF-36V2 PCS AND MCS SCORES IN THE 2009 QUALITYMETRIC NORM STUDY

SF-12v2® Health Survey (SF-12v2)

Despite having a lower number of items, the SF-12v2 has the same conceptual structure and number of scores and subscales as the SF-36v2. Norm-based scoring is similarly recommended for the SF-12v2. While QualityMetric generally recommends presenting SF-12v2 results in the form of PCS and MCS rather than subscale scores, we also present the score ranges for the SF-12v2 subscales (Table 3). For most scales, the score range for the SF-12v2 subscale is smaller than for the equivalent SF-36v2 subscale.

TABLE 3. SCORE RANGE FOR NORM-BASED SCALE SCORES FOR THE SF-12V2 STANDARD AND ACUTE VERSIONS, BASED ON 2009 NORMS

Scale	STANDARD VERSION			ACUTE VERSION		
	Min[1]	Max[2]	Range	Min[1]	Max[2]	Range
PF	25.6	57.1	31.5	25.7	57.3	31.6
RP	23.6	57.5	33.9	23.3	57.1	33.7
BP	21.7	57.7	36.1	19.0	57.0	38.0
GH	23.9	63.7	39.8	24.7	63.6	38.9
VT	29.4	68.7	39.4	31.1	67.9	36.8
SF	21.3	56.9	35.6	19.1	56.2	37.0
RE	14.7	56.3	41.6	9.6	55.5	45.9
MH	18.3	64.2	45.9	18.9	63.0	44.1

[1] Worst health, [2] Best health

Table 4 shows the score ranges for SF-12v2 PCS and MCS. As for the SF-36v2, the theoretical ranges reported in Table 4 are not encountered in practice. The line labeled "In practice" shows the score range observed in a large US general population survey.

TABLE 4. SCORE RANGE FOR THE PHYSICAL AND MENTAL HEALTH COMPONENT SCORES FOR THE SF-12V2 STANDARD AND ACUTE VERSIONS, BASED ON 2009 NORMS

Scale		STANDARD VERSION			ACUTE VERSION		
		Min[1]	Max[2]	Range	Min[1]	Max[2]	Range
PCS	*Theoretical – complete data*	9.9	76.0	66.1	9.6	76.5	66.9
	Theoretical – with missing	9.9	76.0	66.1	9.6	76.5	66.9
	In practice[3]	11.1	69.4	58.2	11.1	71.8	60.7
MCS	*Theoretical – complete data*	3.2	77.9	74.7	1.2	76.9	75.7
	Theoretical – with missing	2.9	77.9	75.1	1.2	77.8	76.6
	In practice[3]	7.4	73.2	65.8	11.3	68.2	56.9

[1] Worst health, [2] Best health, [3] General population survey [ii] (n=6,012 standard version, n=2,054 acute version)

Abbreviations: BP, Bodily Pain; GH, General Health; MCS, Mental Component Summary; MH, Mental Health; NBS, Norm-Based Scoring; PCS, Physical Component Summary; PF, Physical Functioning; RE, Role Emotional; RP, Role Physical; SD, Standard Deviation; SF-12v2; SF-12v2® Health Survey; SF-36v2, SF-36v2® Health Survey; SF, Social Functioning; VT, Vitality

i. Maruish ME (Ed.) (2011): User's Manual for the SF-36v2 Health Survey. QualityMetric Inc. 3rd ed. Lincoln, RI: QualityMetric Inc.
ii. Maruish ME (Ed.) (2012): User's Manual for the SF-12v2 Health Survey. QualityMetric Inc. 3rd ed. Lincoln, RI: QualityMetric Inc.