

# Chapter 4

## The Use of the HoNOS in the Treatment of Patients

M.A. Nugter, V.J.A. Buwalda, A.D.F. Dhondt, S. Draisma  
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### Abstract

*Background:* In order to use outcome scores for making decisions on treatment, practitioners need to know the course of scores of several groups of patients.

*Aim:* To test the applicability of methods for computing cut-off scores and individual changes.

*Method:* Using Health of the Nation Outcome Scales (HoNOS), we analyzed repeated assessments of 699 adults and 414 elderly patients in different treatment settings.

*Results:* Mean HoNOS scores and cut-off scores differentiated between patient groups reasonably well. Scores and threshold values for elderly patients were relatively high. The reliable change index showed few individual changes even for groups where change was expected. The effect size and the standard error of measurement were found to be more sensitive to change.

*Conclusion:* More research is needed before the findings can be generalized.

**Keywords:** cut-off score – effect size – HoNOS – standard error of measurement – reliable change index – treatment decisions

### Introduction

Outcome measures can be used to support treatment decisions, such as the decision to intensify treatment when a patient does not improve clinically and retains a high score on the scales that measure symptoms. In order to interpret these scores, normative data are required to compute cut-off scores and indices of clinically relevant changes.

This issue is mainly addressed in research on the effects of psychotherapy (Jacobson & Truax, 1991). Familiar concepts are *clinically significant change* (CSC) and *'reliable change* (RC). In CSC, cut-off scores that distinguish between clinical populations and healthy populations are used. With RC, score changes are corrected for the unreliability of the instrument that is used. The usability of these statistical methods for other patient groups and for observer-rating scales remains the subject of discussion. It is questionable whether a comparison with the general population is relevant for patients with severe psychiatric illnesses (Eisen et al., 2007). In addition, little data is available on the general population for observer-rating scales (Burgess et al., 2009; Parabiaghi et al., 2005). This problem applies to both versions of the Health of the Nation Outcome Scales (HoNOS, HoNOS 65+) used in The Netherlands (Aartsen et al., 2010; Mulder et al., 2004).

Parabiaghi et al. (2005) calculate the CSC for the HoNOS by defining severity based on scores on individual items and then calculating cut-off values between groups that differ in severity. Prowse and Coombs (2009) calculate cut-off values based on scores of patients in various treatment settings.

Because the RC on the HoNOS shows little individual change, alternatives are suggested, such as the use of inter-rater reliability instead of internal consistency (Broersma & Sytema, 2010) and alternative methods of measuring individual change, such as the *standard error of measurement* (SEM) or a moderate *effect size* (ES) (Burgess et al., 2009; Eisen et al., 2007).

In this chapter, we examined the applicability of cut-off values among different patient groups and of three methods to define individual change.

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### Method

#### *Patients*

We used data from three groups:

- the first group consisted of 1,677 elderly patients (> 65 years)
- the second group consisted of 1,456 adults (< 65 years) undergoing long-term treatment and care
- the third group consisted of 346 Adults (< 65 years) who had been referred for outpatient treatment.

Data from the first two groups were extracted from a ROM database. The third group participated in a ROM effectiveness study by one of the authors (V.J.A.B.). A minimum of two measurements was available from 536 elderly patients (31%), 851 adult patients in long-term treatment and care (58%), and 172 outpatients (50%). Follow-up measurements were missing in the first two groups due to the phase of the ROM implementation project, when teams had performed only one measurement or were not yet working systematically with ROM. In the third group, measurements were missing because patients did not show up for follow-up measurements, or because they got treatment elsewhere.

We analyzed whether patients with follow-up measurements at baseline differed from patients with only one initial measurement. A significant difference was found only in the elderly; the group with follow-up measurements scored one point higher ( $t=3.28$ ;  $df=1658$ ;  $p<.01$ ), on average.

Among the elderly, there were four treatment groups: short-term outpatient treatment (<1 year), long-term outpatient treatment (>1 year), admission, and residential care.

The two adult groups could be divided into five groups: (short) outpatient treatment, community care, community care with a multidisciplinary and temporary intensification of care (assertive community treatment, ACT), admission, and residential care.

For analysis, we used data on patients with two measurements within one single treatment group. The sample comprised 414 elderly and 699 adults.

### *Instruments*

The HoNOS (65+) consists of 12 items on a five-point scale, ranging from 0 (no problem) to 4 (very serious problem). Other relevant data were extracted from patient records.

### *Procedure*

Patients in long-term treatment and care were assessed with the HoNOS once a year, on average. In short-term outpatient and inpatient treatments, baseline and end measurements were mainly available. Trained clinicians (psychiatrists, clinical psychologists, nurses) scored the HoNOS (65+).

### *Analysis*

Cut-off values were calculated using the formula of Parabiaghi et al. (2005). To calculate change formulae for the effect size (ES) (Eisen et al., 2007), the standard error of measurement (SEM)(Burgess et al., 2009), and the reliable change index (RCI)(Jacobson & Truax, 1991) were used.

ES measures change at a group level, but is also used to express change at an individual level; an ES of 0.50 (half the standard deviation) is the most frequently used. The SEM is based on the reliability coefficient and standard deviation of an instrument and is an estimate of reliability at an individual level. The RCI is based on the SEM and it is tested to assess whether the change score is statistically reliable. We used the internal consistency as reliability index.

## **Outcomes**

### *Patients*

The adults were, on average, 44 years old (SD: 11.65), and the majority were male (58%). The elderly were, on average, 74 years old (SD=7.29) and mostly female (69%). The main diagnoses of the adult patients were most often psychotic disorders (50.3%) or mood disorders (29.3%).

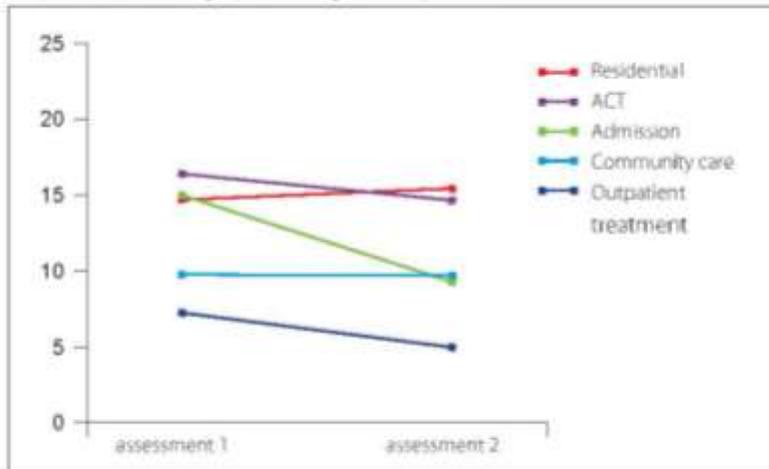
Elderly patients suffered most often from mood disorders (36.1%), followed by adjustment disorders (14.7%), psychotic disorders (13.4%), and anxiety (12.1%).

### *Changes at the group level*

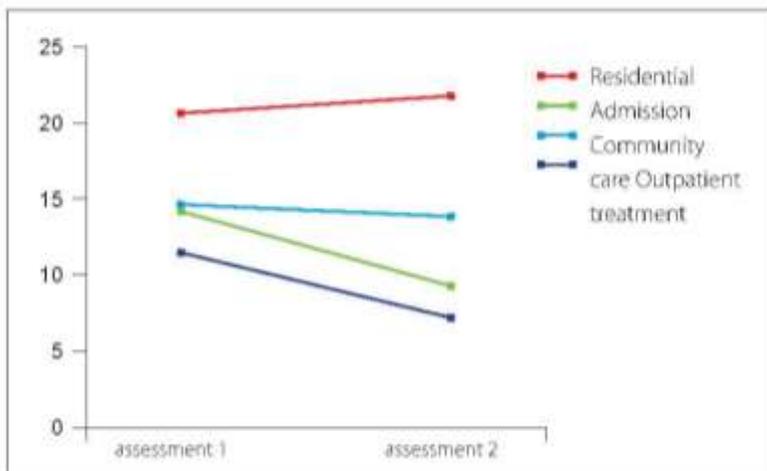
Graphs 1 and 2 show the course of the scores of the various groups. The scores of patients receiving community care and those in residential care did not change noticeably. The ES of these groups was lower than 0.2. In patients receiving outpatient treatment or for whom treatment was temporarily intensified with

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ACT or admission, the ES varied from small (0.35 with ACT) to large (0.95 for admitted adults).



Graph 1. Mean change per setting – adult patients.

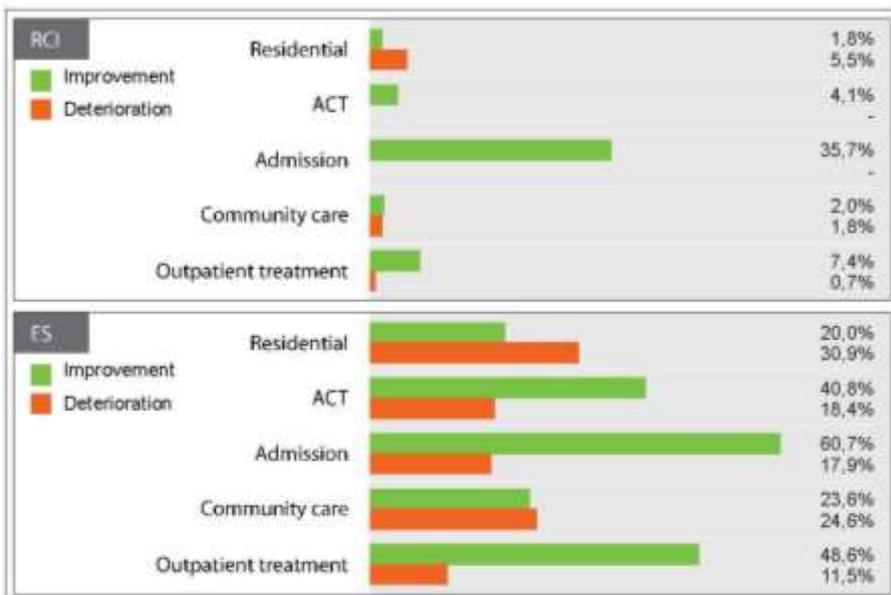


Graph 2. Mean change per setting – elderly patients.

### *Cut-off values*

Clinical practice is the starting point for calculating cut-off values in which the intensification of outpatient treatment can lead to admission, while in community care an admission, ACT, or transfer to a department for residential care is possible.

For adults, a cut-off value of 10 was found between outpatient treatment and admission. This means that admission is an option for outpatients who score higher than 10. A cut-off value of 12 was found between community care and admission, 11 between community care and residential care and 13 between community care and ACT. This means that a score above 11 is high for outpatients receiving community care.



**Graph 3.** Percentage of change of adult patients using different models of change.

Intensifying care through ACT or 24-hour care (residential or inpatient treatment) may be considered.

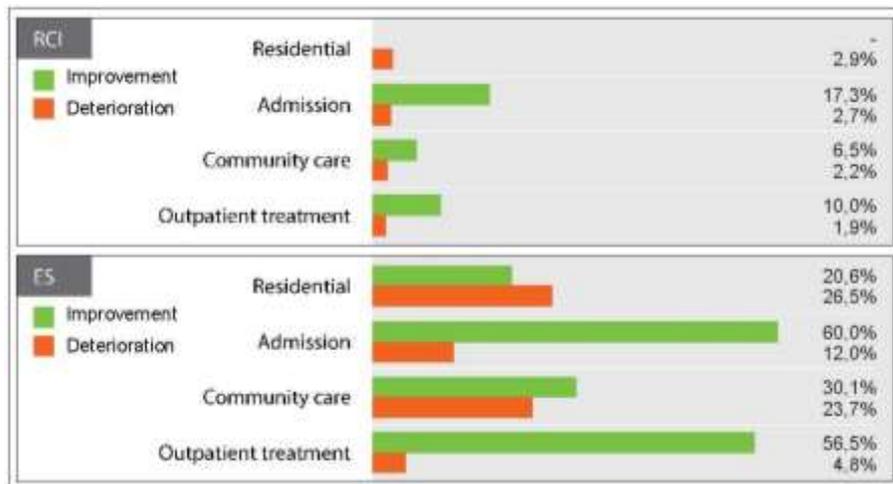
For the elderly, a cut-off value of 12 was found between short-term outpatient treatment and admission, and a value of 18 between community care and residential care. No significant distinction was found between patients who were admitted and those receiving community care.

*Individual measurements of change*

The RCI appears to be 12 for the elderly and 9 for adults. The ES was 3 points in the elderly and in adults, and the SEM was 4 for the elderly and 3 for adults. In Graphs 3 and 4, the percentages of change applying RCI and ES are shown. With the RCI the highest percentage of progress was 35 for adults who were admitted

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and received inpatient treatment. Using ES, there was more progress than deterioration in patients undergoing outpatient treatment or inpatient treatment; patients in community care progressed and deteriorated in equal numbers; and the percentage of patients who deteriorated in residential care was greater than the number of those who progressed.



Graph 4. Percentage of change of elderly patients using different models of change.

### Discussion

In this chapter, we examined measurements of change and cut-off values that distinguish patient groups with the intention of using these in routine clinical practice.

Group analyses show that the HoNOS and the HoNOS 65+ differentiate reasonably well between various outpatient groups and between outpatients and patients whose treatment was intensified. A change can be seen in groups where change is most expected. This is in accordance with earlier research (Mulder et al., 2004; Broersma & Sytema, 2010; Aartsen et al., 2010).

The cut-off values that were found differ from those of Parabiaghi et al. (2005), which are based on a previously determined classification of severity. This certainly applies to elderly patients whose scores and cut-off values were generally higher than those of adults. Further analysis is needed to consider

whether this is due to the measurement instrument differences or because the problems of the elderly are more severe. Cut-off values give an indication of the severity of the problems, and support caregivers in deciding whether or not care must be intensified. The policy of an organization, e.g., more or less focused on the prevention of admissions, and the background of a patient play a determining role for the type of intensification that is chosen. Further research is needed to test the general validity of these cut-off values, including data from other institutions. The RCI is a conservative measure of change. The percentage of patients in outpatient treatment that improves is lower than what is found with self-rating scales (Hansen et al., 2002). For short-term treatments, it is possible that this index for the HoNOS is too conservative, but even for longer treatment this measure shows little variation and is disputable. The alternatives, SEM and ES, give a differentiated picture of the change in individual patients, an image that corresponds to what one would expect in different settings. For these reasons, others chose for the ES (Pirkis & Burgess, 2008).

Research is needed that compares HoNOS with other measurement instruments, such as observer- and self-rating scales, in order to determine the most relevant measure of change in practice.

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