HoNOSCA:
HEALTH OF THE NATION OUTCOME SCALES (CHILD & ADOLESCENT MENTAL HEALTH)

Brief Report on Research and Development
September 1995 - March 1997

S.G. Gowers, R.C. Harrington, A. Whitton, A.S. Beevor, P. Lelliott, J.K. Wing

University of Liverpool

College Research Unit

HoNOSCA: Brief Report on Research and Development

Contents **Page Nos.**

Introduction and Acknowledgements

About this Report

This report is a summary of the Report on the Research and development of HoNOSCA (Health of the Nation Outcome Scales for Children and Adolescents) to the Department of Health. It is one of a range of HoNOS materials, outlined below.

Report on the Research and Development of HoNOSCA

The report to the Department of Health on the construction and testing of HoNOSCA has three parts. The first is the Executive Summary (the content of this report).

The second part consists of three chapters detailing the design criteria specified by a panel of consultants, two phases of testing and modification, and the final conclusions.

The third part contains the Appendices which include the other materials needed for the use of HoNOSCA: the Glossary, the Score Sheet, and Trainer's Guide. The Glossary and Score Sheet and an outline of the principles for rating HoNOSCA form the Rater's Pack.

Trainer's Guide

This is a training manual specifically for those who are responsible for training and supervising Raters. Apart from a detailed description of the purpose, structure and principles of HoNOSCA, it provides advice on rating items illustrated by examples, suggestions for running a training course, and a discussion of the uses to which data (whether for a single patient or aggregated from a series of patients) can be put. Raters may find the Trainer's Guide useful for background detail and sections may be photocopied if necessary.

Rater's Pack

This includes answers to a list of common questions and copies of the Glossary, Chart and Score Sheet. The Rater's Pack is not intended to provide training sufficient in itself to qualify a Rater. Skill is relatively easy to acquire in a single session of instruction, but the trainer should also be a supervisor able to offer help and answer queries during the first month or so of use and be alert to the problem of 'drift' thereafter.

Acknowledgements

The project was completed through a partnership between the project team in Manchester, the Royal College of Psychiatrists Research Unit and The Department of Health. The College Research Unit team provided valuable guidance based on their experience of the development of HoNOS. Professor John Wing, Ms Anne Beevor and Mr Roy Curtis also provided assistance in training field site clinicians and provided unremitting support throughout the project. Dr. Bob Jezzard, Senior Medical Officer, Department of Health co-ordinated the meetings of the Steering Group. Professor Graham Dunn provided statistical advice. Mrs Sue Marland and Mrs Linda Rhodes provided secretarial and administrative assistance and prepared the figures and tables. We are indebted to the following contributors to:

Steering Group meetings:

Professor Elena Garralda
Dr Gyles Glover,
Dr M Thompson
Dr Alan Rushton
Mrs Anne Richardson
Professor John Pearce
Mr Michael Little
Professor Peter Hill
Dr Rachel Jenkins
Dr A Nikapota
Dr Scott Thorley
Mr Peter Goldblott
Dr Peter Baruch
Dr Irene Hunt
Dr Bob Jezzard
Dr Paul Stallard
Dr Dilys Jones
Ms Margaret Adcock
Mr Azin Lakhani
Dr Roger Bullock
Dr Jennifer Hunter
Dr Keith Lloyd

Field Site Co-ordinators:

Mr R Symington *Manchester*
Dr P Miller *Nottingham*
Dr P Blacker *Derby*
Dr L Hackett *Oldham*
Mr P Tipper *Halifax*
Dr A Horne *London*
Dr K Lawson *Berkshire*
Dr M Perkins *Oxford*
Dr L Thornton *Chester*
Mr D Postlethwaite *Huntingdon*
Dr L Kroll *Stockport*
Dr Parmar/Mr Enser *Warwick*
Dr S Kingsbury *Hoddesdon*
Dr A Wood *S. Manchester*
Northampton
Mrs H Lewis *Birmingham*
Dr Prosser *Newcastle*
Dr A Nikapota *Brixton*
Dr C Blair *Edinburgh*
Dr T Thornton *Manchester*
Dr A Weaver *Macclesfield*
Mr G Bourne *Tameside*
Mr Parker *Bala*
Dr M Thompson *Southampton*
Mr R Squire *London*
Dr C Roberts *London*
Dr K Dwivedi *Northampton*
Mrs S Whitehead *Surrey*
Ms Jo Broadey *West Sussex*
Dr P Ainsworth *Lancaster*
Dr R Glaze *Staffordshire*
Dr P Stallard *Bath*
Ms J Buckingham-Shum
Dr I McKenzie *Leeds*
Dr P Tayler *Newcastle*
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Dr M Morton *Dumfries*

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1. Remit

The Health of the Nation strategy (Department of Health 1992) identified a first target to "improve significantly the health and social functioning of mentally ill people". Subsequently the Royal College of Psychiatrists' Research Unit (CRU) was commissioned to develop a set of scales that would measure health and social functioning to be used in routine clinical practice by mental health practitioners. Following extensive field trials the Health of the Nation Outcome Scales (HoNOS) were developed. The HoNOS scales were intended to support an information gathering process that would indicate whether the health and social functioning of people with mental disorders did improve as measures set out in the Health of the Nation key area handbook were put into place. The scales were envisaged as a brief pen and paper instrument which could subsequently be incorporated into computerised mental health information systems as these were developed. It was assumed that the scales if successful would support "bottom up" clinical functions as well as public health functions such as commissioning and comparing outcomes across the nation. Full details of the background and rationale to the development of HoNOS are contained in the Health of the Nation Outcome Scales Report (Wing et al 1996). HoNOS was designed to be used in general mental health services and it was evident that the specific content and also the balance of scale items would not be appropriate for child and adolescent mental health services (CAMHS). A project team was thus established to devise a set of scales for use in Child and Adolescent Mental Health Services, to conduct field trials and address the following questions:

- Could HoNOS scales be used effectively in clinical practice in CAMHS given the fundamental differences between practices in childrens' services and those within general mental health services?

- Could one set of scales be applied to the whole age range covered by CAMHS (0 to 18 years)?

- Would a child and adolescent version of HoNOS demonstrate satisfactory sensitivity to change, reliability and validity characteristics and resemble the parent instrument HoNOS in its construction and performance?

- Would the child and adolescent version be acceptable to clinicians from a range of disciplines in routine clinical practice?

2. Stages of the work

The work was conducted in four stages: *(See Figure 1)*

i. *The consultation exercise.* Establishment of a steering group and literature search. Familiarisation with HoNOS and development of HoNOSCA drafts up to version 2.1 (September - November 1995).

ii. *Pilot study.* (N = 87 November - December 1995) Leading to formulation of HoNOSCA Versions 4 and 5.

iii. *Main field trials.* (N = 1276 March - November 1996) Recruitment of field sites and training, 36 field sites. Establishment of substantial and representative case series.

iv. *Data Analysis, feedback, debriefing, collation of results and development of HoNOSCA Version 6.* (December 1996 - March 1997).

3. Background to HoNOSCA

Following the success of the HoNOS project, The Department of Health commissioned The College Research Unit in conjunction with The University of Manchester, Department of Child and Adolescent Psychiatry to develop a version of HoNOS for use in child and adolescent mental health services (CAMHS).

HoNOSCA was developed as one of the second generation of HoNOS instruments based on the Health of Nation strategy for improving mental health (Department of Health 1993). Full details of the research strategy are provided in a report on the development of HoNOS (Wing et al 1996). The HoNOSCA project reported here ran for eighteen months between September 1995 and March 1997.

The aims were to provide a set of scales to measure health and social functioning comparable to those in HoNOS to be used by clinicians from a range of disciplines employed in child and

adolescent mental health services on a routine basis within the clinical context.

The scales were intended to support other information gathering processes to measure improvement in health and social functioning of children and adolescents with mental disorders in accordance with the Health of the Nation targets.

Like HoNOS the instrument needed to be brief and to cover the range of behavioural, symptomatic, social and impairment domains. It was important that HoNOSCA should resemble HoNOS and provide a quantitative score sensitive to change. It needed to be reliable in comparison with other instruments. It needed to fulfil similar administrative requirements to HoNOS in particular it needed to measure the national target identified in the Health of the Nation strategy and be useful to commissioners and purchasers of services, as well as to clinicians providing the services. However it needed also to be able to encompass the full age range and clinical spectrum encountered in diverse services.

The Steering Group identified a number of areas in which HoNOS required modification for use with children and adolescents:

- The need to take a developmental perspective on each of the domains i.e. the ratings needed to be related to the norms for a child of any given age.

- The balance of the scales required adjustment to reflect the importance of family issues and education which in turn needed to address both attendance and achievement compared with ability.

- Within each scale the emphasis needed to reflect child and adolescent concerns.

- Modifications were therefore required to the balance of the instrument, the subject of each scale and the detail within the scales respectively. In the event the detail of each scale required greater attention than the broad headings which in turn were altered more than the basic balance and structure of the instrument .

4. Pilot Phase

Given that it was possible to by-pass a number of the stages in the development of HoNOS we were able to proceed to a limited pilot study at the end of 1995 at five sites in Greater Manchester

representing a range of community, hospital and in-patient services. In addition the services covered the full age span, one being a specialist adolescent service.

The limited time scale for the pilot study did not permit us to address the ability of HoNOSCA to measure change but served to test, (1) its structural characteristics, (2) its acceptability, and (3) enabled further input into the design stage resulting from its use in a clinical setting.

Each service aimed to rate twenty cases and in the event quantitative scores and feedback from clinicians were provided for 87 cases.

The pilot study confirmed the possibility of using HoNOSCA in field trials and demonstrated that a comparable pattern of scores could be obtained from each service.
The pilot confirmed the need for training if satisfactory reliability results were to be obtained. The pilot sites drew attention to the need for greater guidance in the glossary to each scale and at each of the scoring anchor points.

Finally several clinicians raised concern that the effect of some valued brief interventions may not show their true impact with HoNOSCA. The best example concerned morbidity arising from lack of knowledge within the family about the nature of the child's disorder, its likely course and opportunities for treatment. A number of clinicians believed that sharing of information in these areas was a therapeutic activity which in turn significantly reduced morbidity. Thus the fifth version of HoNOSCA to be used in the main field trials comprised thirteen main items broadly equating to the twelve contained in HoNOS with an additional two items relating to inadequate knowledge and information.

5. Field Trials

Recruitment of sites:

Like HoNOS, HoNOSCA was intended to be used, if suitable, in routine clinical practice in the range of child and adolescent mental health services. Given the diversity within CAMHS by age range, diagnostic group and setting and given the small size of clinical teams we aimed to recruit a large number of clinical sites each rating a small number of patients rather than a small number of sites rating large numbers.

36 sites were recruited in a variety of ways with good geographical distribution throughout the country (see Figures 2). Each site

nominated a co-ordinator and identified HoNOSCA raters for training in a number of training meetings held at the start of the study.

Data Collection and analysis:

Each site was asked to rate 40 patients near to the start of an episode of treatment and then to make a second rating at discharge from treatment or after a minimum time period of one month. Completed forms were returned to the HoNOSCA project team in Manchester for data cleaning and entry.

Statistical analysis was performed jointly by the project team in Manchester and the College Research Unit.
The final analysis was based on 1276 patients including 906 who were rated on two occasions. 12 of the field sites were based in in-patient units, whilst 24 were community and out-patient units.

Approximately one third of raters (34.5%) were psychiatrists with nurses based either in the community or hospital setting making up 28.3%. Clinical psychologists (8.4%), social workers (10.4%), occupational and other therapists (18.3%) all rated a significant number of cases.

Half the cases were aged between five and twelve years whilst 7% were younger than five.

Internal Structure:

The analysis of internal structure was based on that used in the HoNOS field trials. It consisted of a matrix of inter-correlation's between items carried out on the data at Time 1 and 2. Principal component analysis was applied to these matrices. The analyses showed that the internal structure of HoNOSCA was sound:-

1. The scale scores were not highly correlated with each other, each carried independent weight.

2. The factor structure remained close to that of the component sections and matched clinical observation.

3. The HoNOSCA total score provided a close representation of clinical severity as measured by individual item ratings.

4. The HoNOSCA total score was shown to provide a good quantitative measure of clinical severity when compared with a severity index (Table 2)

Sensitivity to change and comparison with clinical assessment of change:

HoNOSCA demonstrated satisfactory sensitivity to change with a mean overall reduction in total score of 38% between rating points. Symptoms and behaviours produced greater change than social and impairment scales.

An independent rating of clinical change on a five point scale was very significantly associated with change in HoNOSCA total score (Table 3).

Reliability and Validity:

A small inter rater reliability series (N = 20) - using 3 raters showed good results with intra class correlations ranging from 0.63 to 0.98 over the 13 scales (Table 4).

HoNOSCA performed satisfactorily in the tests of validity under which it was examined. HoNOSCA total scores increased with age (Table 5) and were higher in those treated as in-patients than out-patients. The gender profiles accorded with clinical expectations. The item profiles of cases also varied significantly with the main diagnosis assigned again in line with clinical expectations (Table 6). Thus for example where the primary diagnosis was of psychosis the highest scoring scale was that dealing with hallucinations and delusions, whilst the scale recording anti-social and aggressive behaviour scored the highest for those with a primary conduct disorder.

It was not the remit of this project to mount strict tests of performance against other scales but a brief series (N = 41) comparing HoNOSCA against the Children's Global Assessment Scale gave a correlation of -0.61.

6. Conclusions

Feasibility

HoNOSCA Version 5 was the result of several rounds of consultation. After extensive field trials together with tests of acceptability, structure and reliability we can conclude the following:-

- It has proven possible to develop HoNOS for use in a range of CAMHS. HoNOSCA is a brief, simple and generally clinically acceptable instrument for use in routine clinical practice.

- Its coverage is acceptable, though certain scales may be unsuitable for use with the pre-school age group.

- HoNOSCA can usually be rated by professionals from the range of disciplines working in CAMHS.

- HoNOSCA usually takes five to ten minutes to complete. This is a generally acceptable time which suggests that HoNOSCA could be incorporated into routine practice.

Scientific Merit

- HoNOSCA shows satisfactory coverage, internal structure and its total score relates well to case severity. HoNOSCA has good item - total score as well as inter-rater reliability.

- HoNOSCA has good face validity.

- HoNOSCA measures change over time in accordance with retrospective clinical judgement.

General

- HoNOSCA is relatively simple to explain and use. In order to maintain high quality ratings all raters should receive training. Quality assurance measures would be necessary to ensure that the level of competence of rating does not decline over time.

- There is a good probability that the total score can be used as an indicator to measure the Health of the Nation target once arrangements for training and supervision are in place.

- The information contained in HoNOSCA is of good quality as it is collected at the point of contact with patients by clinicians.

- HoNOSCA scores provide a record of clinical progress and a tool for clinical audit and research.

- Feedback from field sites resulted in minor modification to the wording of individual scales and guidance obtained in the glossary. These changes are contained in the final version (1998). These are unlikely to affect the instruments performance.

Figure 1

HoNOSCA Development Timetable

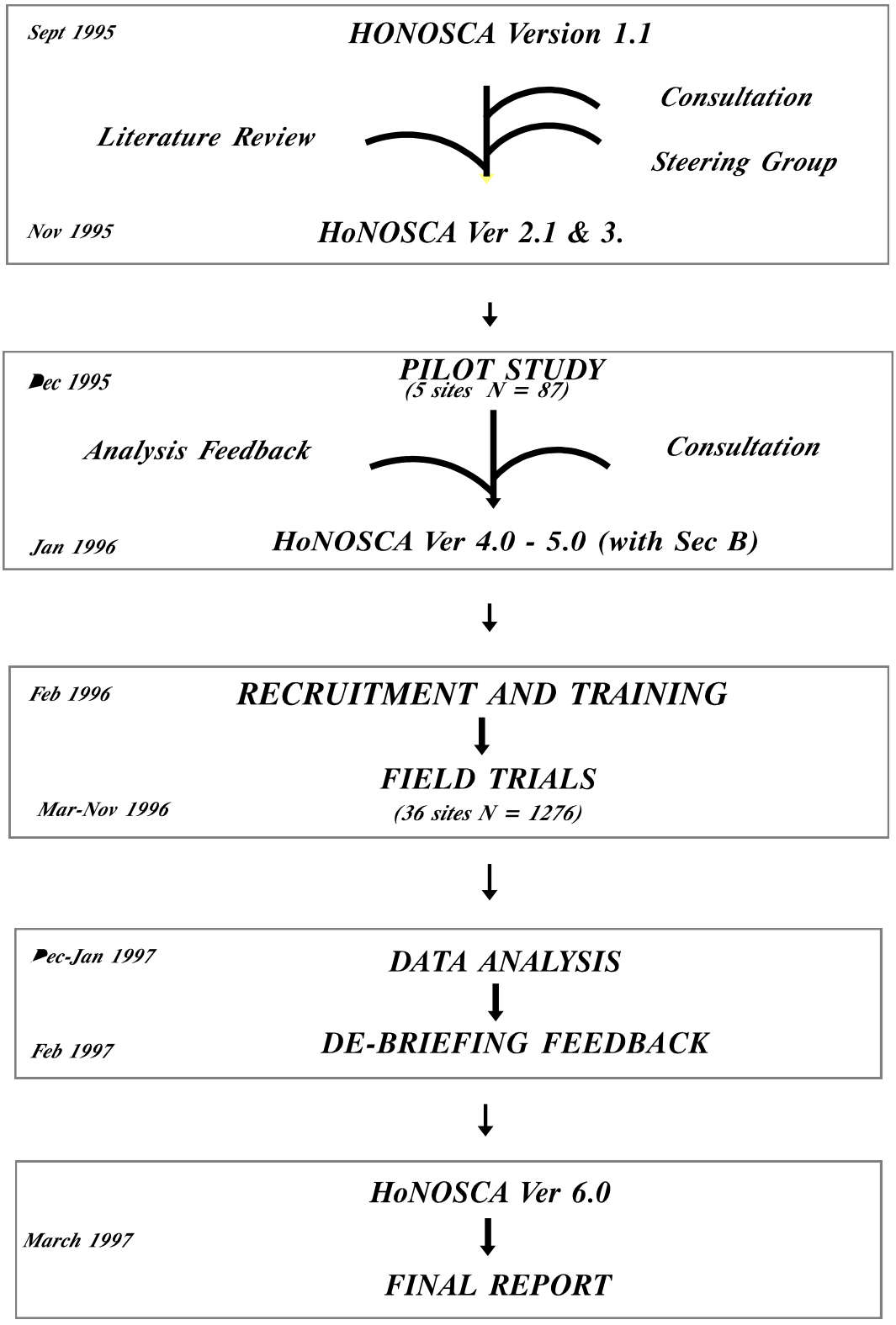

Table 1. HoNOSCA 5.1 Final Structure

(All Items Scored 0 - 4)

HoNOSCA Items
SECTION A
Subscore a: Behaviour Max 16 1. Aggression 2. Overactivity 3. Self-harm 4. Substance Misuse
Subscore b: Impairment Max 8 5. Cognitive dysfunction 6. Physical disability
Subscore c: Symptoms Max 12 7. Hallucinations & delusions 8. Non-organic somatic symptoms 9. Emotional & related symptoms
Subscore d: Social Max 16 10. Peer relationships 11. Self care & independence 12. Family life & relationships 13. Poor school attendance
Section A Total Score Max 52
SECTION B
Subscore e: Information Max 8 14. Lack of knowledge - nature of difficulties 15. Lack of information - services/management

Table 2
Item Severity Ratings at Time 1 by total HoNOSCA Score

Minimal Value	HoNOSCA Total Mean Score	Total N = 1276
4 or more 4s	28.17	24
3 x 4s	22.24	32
2 x 4s	18.2	83
1 x 4	14.31	278
4 or more 3s	17.52	45
3 x 3s	13.68	69
2 x 3s	11.34	140
1 x 3	8.27	240
4 or more 2s	13.29	126
3 x 2s	8.03	51
2 x 2s	6.67	73
1 x 2	4.66	84
4 or more 1s	4.77	11
3 x 1s	3.0	5
2 x 1s	2.0	8
1 x 1	1.0	5
Only 0s	2	2

Table 3
HoNOSCA 5.1: Changes in Total Score between Time 1 and Time 2 by Retrospective Judgement

CLINICIANS RATING	Mean CHANGE in HoNOSCA Score	Mean T1 HoNOSCA Score	Mean T2 HoNOSCA Score	N = 894*
0 Much better	7.74	11.24	3.5	168
1 Better	4.8	11.41	6.61	447
2 No change	1.62	12.9	11.29	243
3 Worse	-1.0	14.74	15.74	35
4 Much worse	-2.0	22.0	24.0	1

* 12 missing values

Table 4
Intra-class Correlation Coefficients for HoNOSCA 5.1
Tests of Reliability in Manchester

HoNOSCA Items	Manchester n = 60	
	Means	I.C.C.
1. Aggression	2.6 (1.3)	0.89
2. Overactivity	1.6 (1.6)	0.91
3. Self Harm	0.7 (1.4)	0.96
4. Substance Misuse	0 (0)	-
5. Scholastic Skills	1.4 (1.4)	0.86
6. Physical	0.6 (1.1)	0.81
7. Hallucinations & delusions	0.1 (0.4)	0.77
8. Non-organic	0.9 (1.3)	0.67
9. Emotional	1.4 (1.5)	0.91
10. Peer relationship	2.6 (1.3)	0.77
11. Self care	0.3 (0.8)	0.90
12. Family life	2.3 (1.2)	0.63
13. School attendance	1.0 (1.7)	0.98

Table 5
HoNOSCA 5.1: Mean Item Scores by Age Group (Field Trials)

HoNOSCA 5.1	Age		
	< 5 yrs	5 - 12.11	13+
1. Aggressive	1.78	1.69	1.32
2. Overactivity	1.30	1.07	0.58
3. Self Harm	0.11	0.20	0.77
4. Substance Misuse	0.00	0.01	0.26
5. Scholastic Skills	0.75	1.06	0.90
6. Physical	0.24	0.33	0.49
7. Hallucinations & delusions	0.00	0.07	0.28
8. Non-organic	0.82	0.67	0.89
9. Emotional	0.86	1.41	2.12
10. Peer relationship	1.07	1.38	1.65
11. Self care	0.60	0.51	0.63
12. Family life	1.65	1.79	1.98
13. School attendance	0.13	0.42	1.41
14. Knowledge	1.18	1.04	1.09
15. Information	0.66	0.63	0.70

Table 6
HoNOSCA 5.1: Selected Mean Item Scores by Diagnosis in Field Trials

Diagnosis	HoNOSCA Item	Mean Item Score HoNOSCA 5.1
Conduct	Aggressive	2.4
Emotional	Emotional	2.4
Mixed conduct disorder	Family	2.2
Developmental disorder	Peers	2.8
Hyperactivity	Overactive	3.2
Eating disorder	Emotional	2.6
Psychosis	Hallucinations	2.5
Substance abuse	School Attendance	1.6

SUMMARY TABLE: HoNOSCA Project: Phases of Development

Phase of work	1. Start up	2. Pilot Phase	3. Field Trials
Dates	Aug - Oct 95	Oct 95 - Dec 95	Mar 96 - Oct 96
Version of HoNOSCA	1.1	4.1	HoNOSCA 5.1
No. of sites	-	5	36
No. of patients	-	87	1276
Nature of work	literature search consultation formation of Steering Group	acceptability structure	acceptability structure sensitivity reliability validity coverage
Report to DoH	Oct 95	Jan 96	Dec 96

HoNOSCA:

Health of the Nation Outcome Scales for Children and Adolescents

The scales were developed in response to the Department of Health's commission to provide a measure for the first target in the Health of the Nation strategy for mental health: "to improve significantly the health and social functioning of mentally ill people."

Following the development of HoNOS use in Adult Mental Health Services, these scales were modified for use in Child and Adolescent Mental Health Services.

There are 13 scales (plus 2 optional scales), completed in a few minutes by clinicians after routine assessment/clinical reviews etc.

They:

- are designed for use in secondary Child and Adolescent Mental Health Services;
- cover clinical and social areas relevant to child mental health;
- are practical for routine use in any setting;
- to provide a brief numerical record of the clinical assessment;
- have a variety of uses for clinicians, administrators and researchers.


Scotland
Edinburgh x 2
Dumphries
Newcastle x 2
Lancaster
Leeds
Halifax
Oldham
Manchester x 3
Stockport
Tameside
Macclesfield
Chester
Nottingham
Derby
Bala
Stafford
Birmingham
Warwick
Northampton x 2
Cambridge x 2
Hertfordshire
Oxford
London x 4
Bath
Redhill
Southampton
West Sussex