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BRIEF COMMUNICATION

The course and outcome of depression in different cultures: 10-year follow-up of the WHO Collaborative Study on the Assessment of Depressive Disorders

GRAHAM THORNICROFT[1] AND NORMAN SARTORIUS (on behalf of the collaborating investigators[2])

From the World Health Organization, Geneva, Switzerland

SYNOPSIS The World Health Organization's study on depressive disorders in different cultures began in 1972. Cohorts of depressed patients were identified in Basle, Montreal, Nagasaki, Teheran and Tokyo. The patients were assessed using standardized measures of social and clinical functioning. Ten-year follow-up data on clinical course, service contact, suicidal acts and social function outcomes were available for 439 (79%) patients. Over one-third (36%) were re-admitted at least once in the follow-up period, half of whom (18%) had very poor clinical outcome. Twenty-four per cent suffered severe social impairment for over half the follow-up period, and over one-fifth (21%) showed no full remissions. The best clinical course (one or two reasonably short episodes of depression with complete remission between episodes) was experienced twice as frequently in patients with a diagnosis of endogenous (65%) as in those diagnosed as suffering from psychogenic depression (29%). Among all patients, a fifth (22%) had at least one episode lasting for more than 1 year, and 10% had an episode lasting over 2 years during follow-up. Death by suicide occurred in 11% of patients, with a further 14% making unsuccessful suicide attempts.

INTRODUCTION

The WHO Collaborative Study on the assessment of depressive disorders (SADD) began in 1972 with three objectives: (*a*) to develop and test simple reliable and valid instruments for the assessment of depressive states in different cultures; (*b*) to use these instruments and obtain a description of the form which depression may have in these different cultures; and (*c*) to establish a network of field centres for follow-up and therapeutic intervention studies (Sartorius *et al.* 1983). Subsequent follow-up studies were conducted at 5 and 10 years after baseline assessment. This paper reports the 10-year findings. The validity and reliability of the screening instrument and of the schedule for the Standardized Assessment of Depressive Disorders have been reported elsewhere (Sartorius *et al.* 1980, 1983; Jablensky *et al.* 1986). The study was part of the WHO Mental Health Programme (Sartorius, 1989).

The ten-year follow-up study was undertaken for the following reasons: (i) to explore the predictive value of diagnoses for the outcome of depressive illness in different settings; (ii) to establish the usefulness of the instruments in assessing symptoms with a predictive value; (iii) to obtain data on mortality of patients with depression, and (iv) to investigate the feasibility of long-term follow-up studies of patients with depression in different countries.

METHOD

Five sites participated in the baseline study: they were academic departments or teaching hospitals in Canada (Montreal), Iran (Teheran), Japan (Nagasaki and Tokyo), and Switzerland (Basle). The characteristics of the sites have been described in detail by Sartorius *et al.* (1983).

[1] Address for correspondence: Dr Graham Thornicroft, PRISM, Institute of Psychiatry, De Crespigny Park, London SE5 8AF.

[2] See p. 1031.

Practical considerations limited the extent to which the ten-year follow-up in Teheran was possible. For this reason some of the tables contain data from four rather than five sites.

In the baseline study patients were included if they met the following criteria: (i) 10–70 years old; (ii) living within 80 km of each study centre; (iii) not suffering from a clear physical disease, toxic disorder or cerebral damage or disease; (iv) being of normal intelligence (IQ 70 or higher); (v) absence of severe hearing or language disability; (vi) absence of other non-affective functional psychosis including schizophrenia; and (vii) the presence of at least two of the following symptoms at screening – depressive mood, feelings of worthlessness, hopelessness, hypochondriasis, anxiety, suicidal thoughts, feelings of diminution of ability, self-reproach, or guilt, and inability to feel or enjoy. Using a screening form to apply these criteria, 573 depressed patients were identified in the five centres.

The main study instrument, the Schedule for Standardized Assessment of Depressive Disorders (WHO/SADD), was developed to satisfy five requirements: to be clinically relevant, to have cross-cultural applicability, to have standardized content and rating rules, to be useful to clinicians and researchers, and to be acceptable to patients. All patients were interviewed by a psychiatrist using the SADD. Additional information was obtained from interviews with relatives and from patients' case records.

Each patient was given an ICD-9 diagnosis by the examining psychiatrist, and a diagnosis according to the system usually employed in the centre if the ICD-9 was not used regularly. For the purposes of the analysis presented here, diagnoses were dichotomized. The 'endogenous' category ($N = 325$, 56·7%) included clinical diagnoses of unipolar (or periodic) depression, late (or involutional) depression, and manic-depressive depression. 'Psychogenic' depression ($N = 213$, 37·2%) included neurotic, reactive, and exhaustion depressions. The small residual group (6·1% of the baseline sample) which brought together schizo-affective, and unclassified depression, was excluded from the follow-up analysis. The characteristics of the patients given that diagnosis are described in the report of the study (Sartorius *et al.* 1983).

For the 10-year follow-up, patient interviews were conducted wherever possible, and are indicated in Table 1 as 'complete follow-up data'. Where patients were not available for interview, information on their clinical and social functioning, and on their service contacts over the follow-up period was retrieved from case notes, and this is indicated in Table 2 as 'incomplete follow-up data'. To address the complexity of outcomes experienced by patients 10 years after the index episode, and to be directly comparable with previous similar studies, several different measures of outcome were used, including residual level of social function, course of the disorder, and suicidal acts. The results presented here are derived from aggregated data from the five centres and do not allow the development of predictive models which use individual patient data. The number of cases given for items is not the same because not all centres were able to complete each item. Univariate analyses were carried out to compare means and proportions (using SAS software), and multivariate analyses were conducted to measure the independent and interactive effects of site and diagnosis using logistic regression modelling under the assumptions of the binomial distribution (using GLIM software).

RESULTS

The clinical, social, demographic and family history characteristics of the patient group have been reported (Sartorius *et al.* 1980: Jablensky *et al.* 1981). There were considerable differences across sites in treatment setting: at baseline 62·8% of all subjects were in-patients, with a range from 30·7% in Tokyo to 100% in Basle.

The degree of completeness of the 10-year follow-up is given in Table 1. Overall, complete data were available for 46% of all patients, incomplete data for a further 33% and data were missing for 21% of the series. Some long-term follow-up data were available, therefore, for about four-fifths of the cohort. The completeness rates varied between 94% in Basle and 59% in Teheran. There are special factors which are likely to prevent any full follow-up in Teheran (Davidian & Naraghi, 1978). In spite of these and the war conditions prevailing in the country, investigators have nevertheless obtained 10-year follow-up data on 57 patients

Table 1. *Completeness of follow-up by site, and by endogenous and psychogenic depression subtypes* (%)

	Endogenous					Psychogenic					
	Basle	Montreal	Nagasaki	Teheran	Tokyo	Basle	Montreal	Nagasaki	Teheran	Tokyo	Total
Complete follow-up data	83 (74)	26 (54)	63 (66)	0 (0)	31 (28)	10 (55)	36 (61)	6 (50)	0 (0)	2 (100)	257 (46)
Partial follow-up data	23 (21)	18 (38)	9 (9)	31 (61)	48 (43)	6 (33)	20 (34)	1 (8)	26 (58)	0 (0)	182 (33)
No 10-year follow-up data	6 (5)	4 (8)	24 (25)	20 (39)	32 (29)	2 (11)	3 (5)	5 (42)	19 (42)	0 (0)	115 (21)
Total	112	48	96	51	111	18	59	12	45	2	554

Table 2. *Ten-year outcome classified by social and clinical function* (%), *diagnostic subtype and site*

	Endogenous				Psychogenic				All			
	Basle	Nagasaki	Tokyo	All	Basle	Nagasaki	Tokyo	All	Basle	Nagasaki	Tokyo	All
N	98	68	33	199	15	7	2	24	113	75	35	223
Very good outcome* (95% CI)	43	34	55	42 (35–49)	13	28	0	16 (5–37)	39	33	51	39 (33–46)
Moderate outcome (a)† (95% CI)	27	25	15	24 (18–30)	33	29	100	38 (19–59)	27	25	20	26 (20–31)
Moderate outcome (b)‡ (95% CI)	18	10	21	16 (11–21)	40	0	0	25 (7–42)	21	9	20	17 (13–24)
Very poor outcome§ (95% CI)	12	31	9	18 (13–23)	13	43	0	21 (7–42)	12	32	9	18 (13–23)

* At least 3 of the following: less than four episodes of major depression; no time lost from work with psychiatric disability; no other psychiatric disorder; less than one year of psychotropic medication.

† Not readmitted during follow-up period, not satisfying criteria for very good outcome.

‡ At least one readmission, and not satisfying criteria for very poor outcome.

§ Unnatural death, or emergence of chronic or sub-chronic schizo-affective disorder or schizophrenia, or incapacitated throughout follow-up, or more than two-thirds of follow-up period affected by admission to hospital, or three or more of the following: leucotomy with residual disability; poor function for over 65% of follow-up period; more episodes of depression than years of follow-up; more than one-third of follow-up years affected by admission to hospital; episodes of major depression lasting longer than 2 years.

from case-notes for a number of the follow-up outcome criteria.

The social and clinical outcomes are summarized in Table 2. Over one-third (35%) had at least one readmission in the follow-up period, about half of whom (18%) experienced very poor outcome, while a further quarter had moderately good outcome without readmission. Over twice as many endogenous as psychogenic depressed patients had a very good outcome as defined in the Table. The differences between the diagnostic groups in terms of outcome did not reach significance at the 0·05 level.

A further important estimate of outcome is the proportion of the follow-up period during which illness prevented normal social functioning (see Table 3). Approximately one-third of the patients (36%) showed normal functioning for over 95% of the follow-up period. Moderate outcome, that is impairment of social functioning for 6–50% of the follow-up period, was demonstrated by almost 43% of patients, while 24% came into the worst outcome category suffering impairment for over half of the follow-up period.

The course of illness was further classified by the number of readmissions and by the completeness of remissions between episodes (Table 4). Again, about a fifth of the patients (21%) showed the worst outcome with no full

Table 3. *Ten-year outcome classified by loss of social function* (%), *diagnostic subtype and site*

	Endogenous					Psychogenic					All				
	Basle	Montreal	Nagasaki	Tokyo	All	Basle	Montreal	Nagasaki	Tokyo	All	Basle	Montreal	Nagasaki	Tokyo	All
N	106	25	71	31	233	16	36	6	2	60	122	63	77	33	293
Illness prevented normal functioning for 5% of follow-up period	31	44	31	48	35	19	39	17	0	30	30	40	30	46	34
(95% CI)					(29–41)					(19–43)					(28–39)
6–50% of follow-up period	45	48	38	39	43	50	44	33	50	45	46	46	38	39	43
(95% CI)					(36–49)					(32–58)					(38–49)
> 50% of follow-up period	24	8	31	13	23	31	17	50	50	25	25	14	33	15	24
(95% CI)					(17–28)					(15–38)					(19–28)

Table 4. *Ten-year outcome classified by course of depression* (%), *diagnostic subtype and site*

	Endogenous					Psychogenic					All				
	Basle	Teheran	Nagasaki	Tokyo	All	Basle	Teheran	Nagasaki	Tokyo	All	Basle	Teheran	Nagasaki	Tokyo	All
N	98	26	69	30	223	16	17	7	2	42	114		76	32	248
1 or 2 episodes with complete remission between	69	35	46	57	65	44	24	14	0	29	65	30	68	53	63
(95% CI)					(59–72)					(16–44)					(57–69)
2 or more episodes with incomplete remission between	18	19	9	13	15	38	29	0	0	26	21	23	8	13	15·3
(95% CI)					(10–20)					(9–45)					(11–21)
No remission during follow-up period	12	46	17	30	20	19	47	86	100	45	13	46	24	34	21
(95% CI)					(9–19)					(18)					(15–26)

Table 5. *Ten-year outcome classified by course of depression and diagnostic subtype*

	Endogenous	Psychogenic	Total
Mean no. of episodes of affective disorder per patient in 10-year period	2·4	2·7	2·7
(S.E.)	(3·2)	(2·8)	(2·9)
N	208	55	263
Mean duration (weeks) of episodes of affective disorder in 10-year period	81·1	82·5	81·2
(S.E.)	(174·8)	(349·5)	(248·0)
N	231	61	292
Mean total time (weeks) in depressive episode(s) in 10-year period	137·2	163·9	143·3
(S.E.)	(92·9)	(173·1)	(124·4)
N	228	61	289
Patients receiving psychiatric treatment at 10-year follow-up (%)	43·2	50·3	41·3
(S.E.)	(7·7)	(19·0)	(9·4)
N	211	62	273

remissions during follow-up. Over twice as many endogenous as psychogenic depressives showed the most favourable course, with either no more episodes or no more than one relapse after the first episode and full remission after each episode, a difference that did reach the 0·05 significance level. Further details of the course of illness after the index episode reveal no clear differences between the two diagnostic groups, each of which showed very considerable heterogeneity in patterns of subsequent service use. Both remained ill for a total of about three of the ten follow-up years, and went on to have one or two further episodes (Table 5).

In terms of the chronicity of depression, two criteria were used: episodes lasting longer than one and longer than 2 years (Table 6). Among all patients, a fifth (22%) had at least one episode lasting for more than 1 year, and 10% had an episode lasting over 2 years during follow-up. Consistent with other outcome indicators, the psychogenic group included in this study went on to a chronic course twice as often as endogenous depressives.

The final major measure of outcome used refers to suicide. Table 7 shows that 11% of all patients completed suicide during follow-up, with slightly more (14%) making unsuccessful attempts during the same period. It is notable that patients in the psychogenic group were significantly more likely to attempt, but not to complete, suicide.

The majority of patients followed up (59·9%) were no longer in contact with psychiatric services (Table 5). Those in contact did not differ by diagnostic group, and the proportions varied with centre: Basle 61%; Montreal 21%; Nagasaki 31%; and Tokyo 52%. Slightly more than a fifth (21·3%) changed their marital status during follow-up.

In Teheran, case-note information was collected on 57 patients (29 male and 28 female), 34 of whom had maintained contact with the hospital over the entire follow-up period, and the remainder had been identified in the previous 3- and 5-year follow-up studies. The following results emerged at 10-year follow-up: (i) 5 had died (2 from physical causes, 1 from suicide and in 2 cases the cause of death was not known), (ii) in terms of overall social function, 37% were within normal limits, remarkably similar to the figures of 39% and 34% for the best functional outcome categories in Tables 2 and 3 for the other centres.

Logistic regression models were applied to the items in which values were expressed as proportions. Using a 5% significance level for iterations which significantly improved the variance explained by the model, the following points emerged: (i) on no item was there a

Table 6. *Ten-year outcome classified by duration of longest episode in follow-up period (%), diagnostic subtype and site*

	Endogenous					Psychogenic					All				
	Basle	Montreal	Nagasaki	Tokyo	All	Basle	Montreal	Nagasaki	Tokyo	All	Basle	Montreal	Nagasaki	Tokyo	All
N	108	26	68	31	233	16	36	7	2	61	114	62	75	33	294
Patients with at least one episode of affective disorder lasting longer than 1 year in the 10-year period	20	31	18	6	19	31	39	14	0	33	29	36	17	6	22
(95% CI)					(14–24)					(21–46)					(17–27)
Patients with at least one episode of affective disorder lasting longer than 2 years in the 10-year period	7	19	3	10	7	6	28	0	0	18	9	24	3	9	10
(95% CI)					(4–11)					(9–30)					(6–14)

Table 7. *Ten-year outcome classified for suicidal acts (%) by diagnostic subtype and site*

	Endogenous					Psychogenic					All				
	Basle	Montreal	Nagasaki	Tokyo	All	Basle	Montreal	Nagasaki	Tokyo	All	Basle	Montreal	Nagasaki	Tokyo	All
Patients making unsuccessful suicide attempts in 10-year period	9	27	7	6	10	19	33	43	0	30	11	31	11	6	14
(95% CI)					(6–14)					(19–43)					(10–18)
N					231					61					292
Patients completing suicide in 10-year period	11	15	7	9	10	5	19	14	0	14	10	18	8	9	11
(95% CI)					(6–14)					(7–25)					(7–15)
N					237					63					300

difference in the results which was statistically explained by diagnosis and not by site; and (ii) the suicide rates (shown in Table 7) and the items on the extent of social functioning impairment (shown in Table 3) showed no significant variations by either site or diagnosis. All other items (shown in Tables 2, 4, 5, 6 and 8) differed significantly across sites and for the addition of diagnosis to the models added no further explanatory power, indicating that for these items any differences were accounted for by site and not by diagnostic group. The site differences were not consistent across all outcome measures. Nagasaki showed a higher proportion of patients who went on to very poor clinical and social outcome. By comparison, Montreal was the centre with the greatest proportion of patients who: (i) experienced no remissions during the follow-up period; (ii) whose episodes lasted longer than one year; and (iii) whose episodes lasted longer than 2 years.

DISCUSSION

The SADD study has several substantial advantages over previous long-term follow-up studies. First, as a multi-centre project which employed the same methods of assessment in all centres, it is able to examine data from five centres in four continents and so allows cross-cultural comparisons. Secondly, the successful 10-year follow-up of a rather large group of patients makes possible more precise estimates of outcome than is possible in smaller studies. Thirdly, the study used an instrument whose applicability in different cultures and reliability had been established. Fourthly, several measures of outcome were used in the clinical and social domains, and were categorized in ways that allow direct comparison with previous studies. Fifthly, the inclusion of patients considered to have 'endogenous' and 'psychogenic' depression allowed comparisons of outcome by those two diagnostic groups, and an examination of the predictive validity of these groupings.

Table 8. *Functional outcome* (%) *using the operational criteria of Lee and Murray* (1988) *as shown in Table* 2

	London ($N = 88$)	Sydney ($N = 133$)	WHO/SADD ($N = 208$)
Very good outcome	17	39	41
Moderate outcome 1	22	16	24
Moderate outcome 2	37	35	17
Poor outcome	25	11	20

Did loss to follow-up bias the results? Patients who were and who were not followed up were compared on a number of baseline clinical and socio-demographic characteristics. There were no overall significant differences (at the $P = 0{\cdot}05$ level) for age, location of treatment, marital status, employment, education, economic status, sadness during the previous week, family history of psychiatric disorder, separation in childhood, abnormal pre-morbid personality, precipitating stress, onset, severity, course, and duration of index episode, previous number of episodes, or diagnosis. There were only non-significant trends for the individuals lost to follow-up to be younger, more often male and to have had fewer previous episodes of depression. These findings led us to believe that the 21% of patients lost to follow-up were not generally different from those for whom data are reported in this paper.

The selection of patients gave a broad cross-section of patients suffering from both endogenous and psychogenic types of depression, and although the latter made up only 19·9% of the sample, there was a considerable range from 1·8% in Tokyo in 55% in Montreal. The blend of in-patients (62·8% of the whole at initial assessment and 100% of the Basle sample) and of out-patients (27·2% of all patients and 69·3% of Tokyo patients) makes the sample broadly representative of a wide range of clinical practices. It was notable in Montreal, for example, that 96·2% of patients had in-patient treatment although this centre had the highest proportion of patients with psychogenic depression, while the Japanese centres had most endogenous patients and most out-patients among all the centres. There was, therefore, no pattern across the four centres suggesting that, on clinical grounds, the endogenous patients were considered to be more severe cases. By comparison, other studies have often been limited to either in-patients (Murphy *et al.* 1974; Bland & Orn, 1982; Kiloh *et al.* 1988; Lee & Murray, 1988), or to out-patients (Nystrom, 1979).

The results from this work bear close com-

parison with other relevant work (Jablensky, 1987; Lewis, 1936). Using the operational criteria set out by Lee & Murray (1988), Table 8 compares the SADD outcomes with the London and Sydney (Kiloh *et al.* 1988) findings. The overall distribution of outcomes again indicates that about one-fifth of depressed patients come into the worst and over one-third into the best outcome categories, a pattern more consistent with the Sydney than the London results. Data for clinical outcome after the initial episode according to the categories proposed by Kiloh *et al.* (1988) were available for two of the centres (Table 9). A remarkably consistent pattern of outcomes emerges from these studies spanning three continents and 400 patients. About a fifth recovered completely without further episodes, a further fifth went on to a chronic course, and the remainder had periods of substantial recovery between further episodes.

Impairment of social and occupational functioning was measured by Nystrom (1979), who found that 8% were unable to continue in their previous work, 17% were on sick leave for over one year, and that depression affected work capacity in 29–32% of cases. These figures are paralleled by the results of this study (Table 3) that 22% had impairment for over 95% of the follow-up period, and a further 42·2% suffered for up to half the follow-up period.

Research findings on chronicity of depression have shown very considerable convergence. Earlier work (Robins & Guze, 1970) estimated that 1–28% went on to become chronic. In a small series of depressed in-patients, Murphy *et al.* (1974) found that 16% remained depressed after 5 years. Using somewhat different criteria, Lehman *et al.* (1984, 1988) defined chronicity as three or more admissions, or more than 12-months total time in hospital during the 5 year follow-up period and found that 9–11% of depressed in-patients met these criteria. Summarizing outcome studies since 1945, Bebbington (1982) bore out these findings, reporting that an average 16·4% of patients with affective disorder (range 8–36%) developed a chronic course, although the studies cited did not use common definitions of chronicity, or employ standard diagnostic criteria for manic-depressive psychosis.

A recent review, focused specifically on depressive disorders (Scott, 1988), has shown that the course of illness for 12–15% of patients was likely to last more than 2 years. Similarly, 17·6% of patients admitted to the NIMH Collaborative Programme on the Psychobiology of Depression had episodes at intake that exceeded 2 years in duration (Coryell *et al.* 1990). The findings of this study, (showing that 21·9 and 9·6% of patients experienced episodes lasting over 1 and 2 years respectively) are very much in accord with other data for chronicity.

An advantage of long-term follow-up studies is that they allow the opportunity to explore the predictive validity of diagnostic distinctions, in this case between the endogenous and psychogenic groups. Previous work has suggested that outcome for the former may be better initially but worse in the longer term (Lee & Murray, 1988), may show more early readmissions (Kiloh *et al.* 1988), while the balance of evidence is that chronicity is not clearly associated with diagnostic category (Scott, 1988). The SADD results here refer to a relatively few cases of psychogenic depression, so that large differences are required to show statistical significance. The endogenous group, for example, showed more favourable social and clinical outcomes (Table 2), and included significantly fewer patients who had one or two episodes with complete remission between (Table 4), supporting the view that the distinction between endogenous and psychogenic depression has predictive validity. The other measures of outcome showed no distinction between diagnostic groups. This is consistent with the data presented by Frank and her associates (1989) suggesting that clinical characteristics were not related to patients' survival time to a subsequent depressive episode. Indeed the consistency between groups for most measures of outcome was most striking. Further, where outcome differences did occur the logistic regression models indicate that these are attributable to site rather than to diagnostic differences, and suggest that they are more related to variations in service provision than any intrinsically different courses for the two groupings of depressive subtypes used in this study.

The suicide data emerging from this study (Table 7) show that a quarter of all patients attempted suicide during follow-up, of whom 11% completed suicide, and that the proportions were consistent across diagnoses and sites. While

Table 9. *Outcome* (%) *using operational criteria of Kiloh* (1988)

	London ($N = 88$)	Sydney ($N = 145$)	Nagasaki ($N = 69$)	Basle ($N = 98$)
Recovered and continuously well	18	20	28	21
Recovered with further episodes	63	63	55	57
Chronic incapacity or death by suicide	19	17	17	22

Basle data from Kurman (1987).

the Nystrom study unusually reported no suicides at follow-up, the Sydney study showed 7% after 15 years, and in the London series 10% went on to complete suicide over 18 years. These data, therefore, corroborate the clinicians' guideline that a tenth of depressed patients will take their own lives, but may be slightly less pessimistic than the view of Guze & Robins (1970) that 15% of such patients will eventually die unnatural deaths.

CONCLUSION

To what extent have the aims of this study been met? The data collected have strongly reinforced the outcome results of previous similar studies, and this convergence increases the confidence that we can accord to these findings. Indeed the suicide mortality data are again remarkably consistent with earlier work, and in aggregate the follow-up studies consistently show that in the order of 10–11% of clinically depressed will go on to commit suicide. The results do, however, allow us to be more precise in our understanding of the predictive value of the endogenous/psychogenic diagnostic distinction, which proved more valid in predicting outcome when expressed in terms of readmission or severe social disability (see Table 2). Finally, the study has quite clearly demonstrated the feasibility of long-term follow-up studies of patients with depression in different countries.

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The collaborating investigators are: *Basle* Dr P. Kielholz (Chief Collaborating Investigator), Dr M. Gastpar and Dr G. Hole; *Montreal* Dr H. Lehmann (Chief Collaborating Investigator), Dr F. Fenton, Dr R. Lajoie, Dr S. Ang and Dr R. Yassa; *Nagasaki* Dr R. Takahashi (Chief Collaborating Investigator), Dr I. Fujii, Dr N. Hirota, Dr Y. Sakurai and Dr T. Yuzuriha; *Teheran* Dr H. Davidian (Chief Collaborating Investigator) and Dr M. Naraghi; *Tokyo* Dr N. Shinfuku (Chief Collaborating Investigator), Dr K. Hasegawa and Dr M. Shimizu; *WHO Headquarters* Dr N. Sartorius (Principal Investigator), Dr A. Jablensky, Mr W. Gulbinat and Mrs G. Ernberg.

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