

# Outcome in Schizophrenic and Similar Paranoid Psychoses

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## Abstract

A 5-year followup study of patients with schizophrenic or paranoid psychoses was performed using standardized instruments. Less than half of the patients had a poor global outcome. Several findings from other recent outcome studies were replicated. Besides data on occupational history and psychiatric hospitalization, psychopathological characteristics assessed at discharge by psychiatrists' ratings and patients' self-ratings proved to have predictive value.

A large number of studies investigating the outcome of schizophrenia have been carried out. Although these studies have generated many hypotheses about variables that are important predictors of outcome, methodological shortcomings have limited confidence in their findings. Most studies used retrospective evaluation techniques or nonstandardized instruments which may have introduced significant bias. Some more recent studies, however, have avoided such methodological problems by studying patients prospectively. Unfortunately, these excellent studies have evaluated patients over short periods of time, generally from 1 to 2 years (e.g., Schooler et al. 1967; Astrachan et al. 1974; Hogarty et al. 1974; Strauss and Carpenter 1974; Wittenborn, McDonald, and Maurer 1977; World Health Organization 1979). Only the 5-year followup study of patients in the International Pilot Study of Schizophrenia (IPSS) covers a longer time period. Thus far, data from this 5-year followup study have only been published by the Wash-

ington field center of the IPSS (Hawk, Carpenter, and Strauss 1975; Strauss and Carpenter 1977). Because we have also carried out a 5-year followup study, using standardized instruments and documenting similar variables, we decided to compare our results (Möller et al. 1981a, b, in press a, b) with the 2-year (Strauss and Carpenter 1974; World Health Organization 1979) and 5-year (Hawk, Carpenter, and Strauss 1975; Strauss and Carpenter 1977) results of the IPSS followup.

## Methods

Psychopathological characteristics of all psychiatric inpatients treated at the Max Planck Institute of Psychiatry (MPIP) are well documented through the use of standardized rating instruments (Barthelmes and von Zerssen 1978). For the followup investigation reported here, we selected 103 out of the 225 inpatients diagnosed as suffering from a schizophrenic<sup>1</sup> or paranoid psychosis who were admitted for treatment during 1972-74. The 103 patients met the following project criteria: availability of complete psychiatric documentation and residence in Munich or surrounding area at time of admission. This sample was representative of all 225 inpa-

<sup>1</sup> Patients with schizoaffective psychoses (ICD 295.7) were excluded because recent studies suggest that they should be classified with affective psychoses.

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tients with regard to sex, marital status, diagnostic subgroup, and global psychopathological state at discharge.

At followup, 5–6 years after discharge, seven patients had died, five by suicide. Apart from self-ratings, complete followup data could be obtained from 78 patients. In three other cases, we received extensive information by interviewing relatives. These 81 patients were representative of the original sample with regard to sex, age, diagnostic subgroup, marital status, and global psychopathological state at discharge.

Seventy-seven percent of patients were diagnosed as schizophrenics (ICD 295) and 23 percent as suffering from other types of paranoid psychoses (ICD 297, 298.2, 298.3, 298.9). Diagnoses were made by ward psychiatrists using ICD criteria (World Health Organization 1978). Diagnoses were discussed in weekly conferences under the supervision of the Head of the Department (von Zerssen) or his representative (Mombour). Agreement between clinical and computer-derived diagnoses (DiaSiKa program; von Zerssen, in preparation) was very high—88 percent for the diagnosis of schizophrenia, for example.

Sixty percent of the patients had never previously been admitted to a psychiatric hospital. The sample was almost equally divided between men (49 percent) and women (51 percent). Sixty-six patients (82 percent) were 40 years old or younger, and only one patient was over age 60. Treatment consisted of neuroleptics (mostly haloperidol, in individualized but not high dosages) and sociotherapy. Hospitalization was no longer than 3 months for 92 percent of patients,

with only 8 percent staying for more than 4 months. Usually 1 to 2 weeks before discharge, the oral neuroleptic medication was changed to an intramuscular depot neuroleptic.

Our sample is comparable to the schizophrenic population of university clinics, but not to that of county hospitals where chronic patients are overrepresented. It also appears comparable to the IPSS sample, which excluded chronic patients (with psychotic symptoms of more than 2 years' duration in the 5 years before index admission, or hospitalized more than 3 years).

The principal part of the study is prospective: psychopathological data were obtained on admission and discharge through the use of well-standardized instruments. A global rating of psychopathological state at discharge and sociodemographic data of several types were also routinely collected. Only the anamnestic data had to be gathered from records. At followup, the same instruments were used to assess psychopathology, and in addition, a differentiated rating of social adjustment was made. Psychopathological characteristics and social adjustment were rated not only by psychiatrists, but also by the patients themselves and their relatives. Thus, as has been recommended by a number of investigators, multiple outcome criteria (Keniston, Boltax, and Almond 1971; Strauss and Carpenter 1972) and sources of information (Baumann and Seidenstucker 1977; Seidenstucker and Baumann 1978) were used.

The following data sources were included:

- Inpatient Multidimensional

Psychiatric Scale (IMPS; Lorr 1974)—filled out by psychiatrists; documents schizophrenic and depressive symptoms.

- Clinical Self-Rating Scales (KSbS; von Zerssen 1976)—filled out by patients; document depression, paranoid tendencies, and somatic complaints.

- Scales for Rating Social Adjustment (Wüschner-Stockheim, in preparation).

- Global Assessment Scale (GAS; Spitzer, Endicott, and Fleiss 1976)—measures global level of functioning.

- Sociodemographic information.

- Hospital records concerning premorbid adjustment, impairment of working ability during the year before index admission, personality change before index admission, onset characteristics, duration of occupational problems (inability to work or unemployment) during the 5 years before index admission.

- Followup data concerning employment problems, duration of psychiatric hospitalization, and duration of paranoid-hallucinatory symptoms during the followup period; impairment of working ability in the year before followup, personality change at followup, and global psychopathological state at followup.

**Statistical Analysis.** The frequency distribution of the global outcome criterion (GAS) was first calculated. To analyze the relationships among the different outcome criteria, product-moment correlations between the GAS score and the other variables were calculated. For these and the following calculations, only syndrome scores of the IMPS and the

KSBS were taken into account. For the IMPS, instead of the original 12 factors (Lorr 1974), five super-factors (von Zerksen and Cording 1978) were used. The ratio of amelioration of these scores was calculated using the following formula: score at admission minus score at discharge divided by score at admission. To evaluate the relationships between predictor and outcome variables, product-moment correlations were calculated between each potential predictor variable and several outcome criteria. Similar to the World Health Organization (1979) study, stepwise multiple regression analyses were performed to optimize the prognosis of global outcome by a combination of predictors. These analyses were performed for all predictor variables together (without self-rating data), for the IMPS data alone, and for the IMPS and KSBS data.

## Results

Forty-four percent of the patients studied showed marked signs of psychopathology and disturbances in social adjustment on the GAS (table 1). In 31 percent, these disturbances were so pronounced (according to the GAS definition) that hospitalization would be expected (Spitzer, Endicott, and Fleiss 1976).

The strong correlation between the GAS and other important outcome measures (table 2) indicates that the GAS accurately reflects the global ratings of psychopathology or social adjustment at follow-up ( $r = .84-.88$ ). Its correlation with more specific measures of psychopathology—for example, the “paranoid-hallucinatory syndrome”—is weaker, but generally

**Table 1. Level of functioning (GAS score) at followup**

Level of functioning	Information from			
	Patients <sup>1</sup>		Relatives <sup>2</sup>	
	No.	%	No.	%
100-91 No symptoms	8	10	5	10
90-81 Transient symptoms	8	10	0	0
80-71 Minimal symptoms	4	5	5	10
70-61 Some mild symptoms	14	18	11	23
60-51 Moderate symptoms	8	10	1	3
50-41 Any serious symptomatology	10	13	6	13
40-31 Major impairment	15	19	11	24
30-21 Unable to function	9	12	8	17
20-11 Needs some supervision	0	0	0	0
10-1 Needs constant supervision	0	0	0	0
Not classifiable	2	3	0	0

<sup>1</sup> $n = 78$ .

<sup>2</sup> $n = 47$ .

exceeds  $r = .60$ . The correlation between the GAS outcome score and such followup period variables as duration of occupational disintegration, hospitalization, and paranoid-hallucinatory symptoms tends to be lower ( $r = .43-.60$ ), suggesting that the global state at followup does not necessarily reflect characteristics of the followup period.

Another finding of note is that global ratings of psychopathology and social adjustment at followup are rather closely correlated (table 2). But ratings of more specialized aspects of psychopathology and social adjustment showed only a weak correlation. Further analyses demonstrated that there are different patterns of relationship between specific aspects of psychopathology and specific aspects of social adjustment. For example, inactivity during leisure time is more closely correlated to a depressive-apatetic syndrome ( $r = .41$ ) than to a paranoid-hallu-

cinatory syndrome ( $r = .23$ ) at followup. The respective durations of paranoid-hallucinatory symptoms, occupational disintegration, and psychiatric hospitalization during the followup period are weakly correlated ( $r = .25-.46$ ).

Among approximately 40 potential predictor variables tested in a product-moment correlation analysis, a number of variables proved to be statistically significant ( $p < .05$ ) predictors of global outcome, measured by the GAS (table 3). The best predictors ( $r \geq .35$ ) were duration of occupational disintegration during the 5 years preceding index admission, impairment of working ability in the year before index admission, personality change before index admission, poor psychopathological state on discharge, and self-rating factor of paranoid tendencies at discharge. High scores on these variables were correlated with a poor global outcome.

Analysis of correlations between

Table 2. Product-moment correlations of outcome criteria ( $n = 74-78$ )

	Paranoid-hallucinatory syndrome	Global psychopathological state	Personality change	Impairment of work ability	Impairment of social adjustment (GAS)	Impairment of level of functioning (GAS)	Duration of occupation disintegration	Duration of psychiatric hospitalization	Duration of paranoid-hallucinatory symptoms
Paranoid-hallucinatory syndrome	1.00								
Global psychopathological state	0.72 <sup>1</sup>	1.00							
Personality change	0.37 <sup>1</sup>	0.68 <sup>1</sup>	1.00						
Impairment of social ability	0.27 <sup>1</sup>	0.54 <sup>1</sup>	0.79 <sup>1</sup>	1.00					
Impairment of social adjustment	0.50 <sup>1</sup>	0.79 <sup>1</sup>	0.69 <sup>1</sup>	0.63 <sup>1</sup>	1.00				
Impairment of level of functioning (GAS)	0.59 <sup>1</sup>	0.88 <sup>1</sup>	0.73 <sup>1</sup>	0.64 <sup>1</sup>	0.84 <sup>1</sup>	1.00			
Duration of occupational disintegration	0.26 <sup>1</sup>	0.39 <sup>1</sup>	0.55 <sup>1</sup>	0.62 <sup>1</sup>	0.42 <sup>1</sup>	-0.43 <sup>1</sup>	1.00		
Duration of psychiatric hospitalization	0.41 <sup>1</sup>	0.53 <sup>1</sup>	0.51 <sup>1</sup>	0.52 <sup>1</sup>	0.46 <sup>1</sup>	-0.53 <sup>1</sup>	0.46 <sup>1</sup>	1.00	
Duration of paranoid-hallucinatory symptoms	0.56 <sup>1</sup>	0.59 <sup>1</sup>	0.36 <sup>1</sup>	0.28 <sup>1</sup>	0.51 <sup>1</sup>	-0.59	0.25 <sup>1</sup>	0.24	1.00

<sup>1</sup> =  $p < .05$ .

**Table 3. Predictors of global outcome<sup>1</sup>**

Predictors of global outcome (GAS)	Correlation coefficient
(-) Higher socioeconomic status of the parents	.25
(-) Premorbid working dysfunction	.27
(+) More advanced age at first manifestation	.28
(+) More advanced age at first hospitalization	.23
(+) Precipitating factors before first manifestation	.28
(-) Duration of psychiatric hospitalization (5 years before index admission)	.27
(-) Duration of occupational disintegration (5 years before index admission)	.38
(+) Lasting heterosexual relationship	.28
(-) Impairment of working ability (1 year before index admission)	.39
(-) Personality change (1 year before index admission)	.42
(-) Diagnosis of schizophrenia	.25
(-) Poor psychopathological state at discharge	.35
(-) IMPS super-factor of organic syndrome at discharge	.30
(-) IMPS super-factor of depressive-apatetic syndrome at discharge	.24
(+) Ratio of amelioration of the IMPS super-factor of psychotic excitement	.28
(-) Self-rating factor of paranoid tendencies at discharge	.39
(+) Ratio of amelioration of the self-rating factor of paranoid tendencies	.40

<sup>1</sup>*n* = 74-78; for self-rating factors, *n* = 45-50. (+) = good prognosis; (-) = poor prognosis

the predictor variables and other outcome criteria revealed that the prognostic significance of one variable for the GAS did not necessarily apply to other outcome criteria. Likewise, a variable that is a good predictor for one outcome criterion may not be predictive of outcome score on the GAS. The inclusion of variables that are predictive for other outcome criteria, but not for the GAS, expands the number of predictors.

Global or more specialized psychopathological predictors tended to correlate more closely

with psychopathological variables at followup than with variables concerning social adjustment or duration of hospitalization. An analysis of three predictors and the corresponding outcome variables (table 4)—duration of occupational disintegration, duration of psychiatric hospitalization, and global rating of psychopathological state—revealed that each predictor variable correlates most closely with the corresponding outcome variable. There was only one exception: The duration of occupational disintegration correlates

equally closely with the duration of psychiatric hospitalization during the followup period. As for psychopathological predictors, although the five IMPS syndromes on admission do not predict global outcome, the "depressive-apatetic syndrome" and the "organic syndrome"<sup>2</sup> measured at discharge are significantly correlated with global outcome (table 5). The prognostic value of psychopathology at discharge is enhanced when differentiated outcome ratings of psychopathology are considered—for example, the five IMPS syndromes (table 5). There are syndrome-specific links between the five IMPS syndromes at discharge and the five IMPS syndromes at followup; that is, the closest correlations exist between each syndrome at discharge and the same syndrome at followup.

To find a combination of predictors with the highest predictive value for global outcome (GAS), stepwise multiple regression analyses were performed on four sets of data: sociodemographic data, biographical and premorbid adjustment data, psychiatric history data, and index hospitalization data. The stepwise multiple regression analyses were performed for each data set alone and then for the five best predictors of each data set together (a procedure similar to that used in World Health Organization 1979). The best predictors of global outcome are (in hierarchical order) impairment of working ability during the year before index admission, age at first hospitalization, psychopathological state at discharge, duration of

<sup>2</sup>This super-factor consists of the original factors of "retardation and apathy" and "disorientation."

**Table 4. Product-moment correlations between predictor variables and outcome variables concerning psychopathology and social adjustment<sup>1</sup>**

	Global psychopathological state at followup	Duration of psychiatric hospitalization during followup period	Duration of occupational disintegration during followup period
Global psychopathological state at discharge	.37 <sup>2</sup>	.15	.11
Duration of psychiatric hospitalization before index admission	.23	.35 <sup>2</sup>	.21
Duration of occupational disintegration before index admission	.32 <sup>2</sup>	.52 <sup>2</sup>	.47 <sup>2</sup>

<sup>1</sup>n = 74-78.

<sup>2</sup>p < .05.

occupational disintegration during the 5 years before index admission, and precipitating factors before the first manifestation of psychosis. Together, these five

variables explain 36 percent of outcome variance (table 6).

In this analysis psychopathological data were supplanted as predictors by data on social adjust-

ment. To analyze the predictive value of psychopathological data alone, a stepwise multiple regression analysis of the psychopathological data on index hospitalization was performed. The five best predictors are psychopathological state at discharge, the IMPS super-factor "organic syndrome" at discharge, the IMPS super-factor "paranoid-hallucinatory syndrome" at admission, the clinical diagnosis of "schizophrenia," and the IMPS super-factor "depressive-apatetic syndrome" at discharge. These five variables explain only 20 percent of the outcome variance.

To examine whether the prognostic value of psychopathological data could be optimized by taking into account the self-rating data on paranoid tendencies and depression, the same analysis was per-

**Table 5. Product-moment correlations between the 5 IMPS super-factors from discharge and followup<sup>1</sup>**

IMPS super-factors at discharge	IMPS super-factors at followup				
	Psychotic excitement	Paranoid-hallucinatory syndrome	Depressive-apatetic syndrome	Phobic-compulsive syndrome	Organic syndrome
Psychotic excitement	.30 <sup>2</sup>	.11	.11	.12	.04
Paranoid-hallucinatory syndrome	.21	.36 <sup>2</sup>	.10	.12	.06
Depressive-apatetic syndrome	.02	.06	.32 <sup>2</sup>	.24 <sup>2</sup>	.28 <sup>2</sup>
Phobic-compulsive syndrome	.14	.08	.12	.19	.04
Organic syndrome	.14	.16	.39	.24 <sup>2</sup>	.37 <sup>2</sup>

<sup>1</sup>n = 74-78.

<sup>2</sup>p < .05.

**Table 6. Combination of the 5 best predictors of "level of functioning" (GAS)**

5 best predictors	Impairment of work ability (1 year before index admission)(-)	
	More advanced age at first hospitalization	(+)
	Poor psychopathological state at discharge	(-)
	Duration of occupational disintegration (5 years before index admission)	(-)
	Precipitating factors before first manifestation	(+)
Variance explained by 5 best:	36%	
Variance explained by all:	62%	

(+) = good prognosis, (-) = poor prognosis.

**Table 7. Best prediction of "level of functioning" (GAS) by psychopathological data**

Without self-rating			With self-rating		
Psychotic excitement	D	(-)	<i>Paranoid factor</i>	<i>D</i>	(-)
Depressive-apatetic syndrome	D	(-)	<i>Organic (= apathetic) syndrome</i>	D	(-)
Psychotic excitement	A	(+)	<i>Depression factor</i>	D	(-)
Depressive-apatetic syndrome	A	(-)	<i>Psychotic excitement</i>	D	(-)
Paranoid-hallucinatory syndrome	D	(-)	<i>Depression factor</i>	A	(-)
<b>Explained variance (in percent)</b>					
31%			42%		

*n* = 45; (+) = good prognosis; (-) = poor prognosis; A = admission; D = discharge; self-rating scale items are in italics

formed on the 45 patients for whom admission and discharge self-rating data existed. Initially, the analysis was performed without the self-rating factors, and subsequently these factors were included. The analysis without

self-rating factors yielded a different combination of best predictors for the reduced sample (table 7) than for the original sample. After inclusion of the self-rating factors in the analysis, these factors displaced some variables rated by

psychiatrists. The data set including self-rating factors explains a greater part of the variance than the one without them.

## Discussion

Our finding that 44 percent of patients with schizophrenic and paranoid psychoses had global outcome scores in the lower half of the 100-point GAS score range corresponds well with the findings of the Washington field center of the IPSS (Hawk, Carpenter, and Strauss 1975). In that 5-year followup study, 30 percent of the schizophrenic patients had scores lower than 50 percent of the maximal global outcome score. Thus, only a part of the schizophrenic population is characterized by poor outcome—a conclusion that is also supported by the findings of many other recent followup studies (e.g., Harris et al. 1956; Brown et al. 1966; Achte 1967; Bleuler 1972; Strauss and Carpenter 1972; Astrachan et al. 1974; Affleck, Burns, and Forrest 1976; Bland, Parker, and Orn 1978; Huber, Gross, and Schüttler 1979; Achte 1980).

Scores of the GAS correlate well with the other global outcome ratings of psychopathology and social adjustment at followup. However, the GAS does not so well reflect the more differentiated ratings of state at followup or of state during the followup period. The correlations between these outcome criteria are relatively weak. Because concentration on any one outcome criterion is associated with a considerable loss of information, it has been suggested that multiple outcome criteria should be used (Keniston, Boltax, and Almond

1971; Strauss and Carpenter 1972). Outcome should be characterized not as a single entity but as an interrelationship of several, partly independent outcome functions.

Predictors of outcome have been extensively discussed in the literature dealing with the prognosis of schizophrenia (e.g., Langfeldt 1956; Vaillant 1962; Phillips 1966; Stephens 1970; Bleuler 1972; Astrachan et al. 1974; Astrup 1975; Ciompi and Müller 1976; Pokorny et al. 1976; Goldberg et al. 1977; Huber, Gross, and Schütler 1979; World Health Organization 1979). Among those variables that assumed the greatest prognostic significance in our own study, duration of occupational disintegration before index admission, as well as previous hospitalization, was a strong predictor in studies by Strauss and Carpenter (1974, 1977). The prognostic value of the psychopathological state at discharge was emphasized by Renton et al. (1965), Affleck, Burns, and Forrest (1976), and Wittenborn, McDonald, and Maurer (1977).

A personality change, especially in the sense of a loss of emotion, is another predictor that has been described by many authors (Vaillant 1964; Lindelius 1970; Stephens 1970; World Health Organization 1979). The present study is the first in which self-rating data on paranoid tendencies have emerged as prognostically important—perhaps reflecting the fact that self-rating scales have usually not been employed in followup studies of schizophrenic patients.

When outcome criteria other than GAS scores were considered, it was found that, in general, psychopathological variables were the best predictors of psychopath-

ological outcome, and data on social adjustment (occupational disintegration, hospitalization) before index admission were the best predictors of social adjustment at followup. But there also were prognostic relationships among these different areas. Thus, the model of an "open-linked system" among different areas of predictor variables and outcome variables, postulated by Strauss and Carpenter (1974, 1977), was supported.

In an analysis of the correlations between the five IMPS syndromes at admission and followup, as well as at discharge and followup, the psychopathological state at discharge proved to have much greater prognostic value than that at admission. Moreover, the relationships between the five IMPS syndromes at discharge and followup were syndrome-specific. The prognostic importance of differentiated psychopathological data at discharge was also noted by other authors (Mintz, O'Brien, and Luborsky 1976; Goldberg et al. 1977; Wittenborn, McDonald, and Maurer 1977). In the IPSS such relationships could not be detected because psychopathological state was assessed on an index day but not at discharge (Strauss and Carpenter 1974, 1977; World Health Organization 1979). In accord with our findings, Strauss and Carpenter (1977) observed that the psychopathological data at 2-year followup were closely correlated with those at 5-year followup.

The best prediction of global outcome could be made using a combination of five predictors, identified by a stepwise multiple regression analysis. Together, these five predictors explained 36 percent of the outcome variance. Within this combination, impair-

ment of working ability 1 year before index admission was the most important predictor. In contrast to the findings of the IPSS (World Health Organization 1979), psychopathological variables were included among the five best predictors. This discrepancy might be explained by the fact that in the IPSS psychopathological state at discharge—prognostically important in our study—was not recorded.

When only psychopathological variables were considered, the five best predictors could explain only about 20 percent of the outcome variance. The prognostic value of psychopathological variables could be optimized by inclusion of the self-rating factors concerning depression and paranoid tendencies.

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