

Does Outpatient Treatment Reduce Hospital Stay in Schizophrenics?

Wolfram an der Heiden and Bertram Krumm

Zentralinstitut für Seelische Gesundheit (Head: Prof. Dr. Dr. H. Häfner), D-6800 Mannheim J5, Federal Republic of Germany

Summary. The implementation of community mental health care for psychiatric patients in Mannheim, an industrial city of approximately 300,000 inhabitants, poses questions concerning the impact of outpatient treatment on the probability of rehospitalization. For this purpose the use of extramural facilities by a group of 148 patients with a diagnosis of schizophrenia was studied over a period of 18 months. Based on a model of utilization that allows for the removal of confounding effects the statistical analysis reveals that outpatient contacts with psychiatrists in practice or with an outpatient clinic indeed reduces time in hospital and also improves the psychopathological status of the patients.

Key words: Community mental health care – Schizophrenia – Model of utilization – Model based causal analysis – Impact of outpatient treatment on rehospitalization

1. Introduction

One of the ideas leading to community mental health care policy arose from empirical findings in the past about the impact of social understimulation characterizing the situation in most of the large psychiatric hospitals. Wing and Brown (1970) were able to demonstrate that disabilities and symptomatology in schizophrenic patients were to a large extent attributable to the milieu in the hospital. As a consequence shifting treatment from hospital to the community was thought to save the patients from the debilitating effects of institutionalization.

In 1975 in a report on the state of psychiatry in the FRG (Deutscher Bundestag, 1975) the conclusion was drawn that psychiatric patients' need of care should be satisfied by ambulatory and complementary services in order to prevent hospital admissions. Locating services as near as possible to residential homes and work places, accessibility and availability should facilitate coordination and continuity of care. As a prerequisite sufficient numbers of institutions serving the different needs of psychiatric patients must exist. In a community mental health care system the psychiatric hospital is no longer the center of care but just one institution among others.

2. Outcome Criteria in Evaluating Community Mental Health Services

The idea that services formerly provided by psychiatric hospitals can be successfully substituted, at least to some extent, by

extramural institutions was consequently followed by strategies to evaluate the effectiveness of alternative treatment modalities and facilities by examining how far they were able to prevent or to shorten hospital stays, to lower readmission rates or to lengthen stay in the community (Erickson, 1975). Readmission statistics are used, as Rosenblatt and Mayer (1974) noted, because of certain of their methodological characteristics: they are easy to obtain and are routinely collected by most hospital administrations; the data are highly reliable and it is very easy to quantify the material obtained.

The restriction to these outcome criteria in evaluating community mental health care causes some problems. Readmission rates can vary to a considerable extent depending on how the granting of a leave (trial visit) is considered in the administrative data. The planned readmission of a schizophrenic patient in the course of treatment must be rated differently from an unplanned readmission as a final point of a crisis. It is also evident that a low readmission rate is not necessarily an indication of well-being of the patients. The same arguments apply to criteria such as 'length of stay in the community'.

Hence it is necessary to evaluate extramural care within a theoretical framework that allows control of confounding factors known to influence that outcome criteria as well as the inclusion of variables appropriate to qualify outcome in its content.

3. Factors Influencing Outcome

Findings reported by earlier studies (Rosenblatt and Mayer, 1974; Häfner and an der Heiden, 1983) emphasize the relationship between previous admissions and readmissions: patients with a greater number of previous admissions were more likely to return to hospital than those with fewer. One would also expect the patterns of readmission to be a function of pathology, i.e. the "sicker" patients have a greater probability of return.

The implication of the family in community mental health care has directed attention to the role the family plays in the exacerbation of psychotic behavior in chronic patients (Brown et al. 1958, 1962, 1972; Vaughn and Leff 1976a,b) and rehospitalization. In their 1958 study Brown et al. presented data indicating that schizophrenic patients were rehospitalized more frequently if they were returned to the family setting as opposed to other settings in the community.

We conclude that a study on the consequences of community mental health care has to take into consideration previous admissions of the patient, psychopathological status and environmental factors.

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Offprint requests to: W. an der Heiden at the above address

4. Questions

In detail we want to answer the following questions:

1. Is there any empirical evidence that more psychiatric outpatient care will reduce the necessity of readmission to inpatient care?
2. Does a more intensive psychiatric outpatient treatment have an impact on symptomatology of the patients?

5. Sample and Operationalization of Variables

To answer these questions we studied utilization of extramural services by a cohort of psychiatric patients. The cohort consisted of all the residents of Mannheim, an industrial city with about 300,000 inhabitants, who were admitted to an inpatient facility serving the Mannheim area between October 1st 1977 and September 30th 1978 with a clinical diagnosis of schizophrenia. Of the total number of 195 patients admitted with this diagnosis 148 were followed-up over the whole period of observation. A total of 47 had to be omitted because of death (10 patients), moving out of the catchment area (24 patients) or refusal (7 patients), and 6 foreign patients could not be interviewed because of language barriers. Once in the sample the patients were assessed three times at equal intervals of 6 months, resulting in an observation period of one and a half year for each patient.

The interviews at follow-up consisted of a semistructured psychiatric interview the 'Present State Examination' (PSE; Wing et al. 1974), an inquiry into sociodemographic variables and questions concerning type and duration of treatment before inclusion in the sample. Additionally with the help of a special record system (an der Heiden and Klug, 1980) the demand for aftercare of different facilities was registered for the whole period of observation.

The record system (Fig. 1) had two dimensions, the period of observation subdivided into 2-week intervals, and nine different categories to describe the type of treatment at every point in time. The grid thus contained most of the information necessary for the follow-up analysis:

1. INPAT: number of 15-day intervals in inpatient treatment.
2. OUTPAT: number of intervals with contact to the outpatient department of the Central Institute of Mental Health, to a private psychiatrist, or to a general practitioner. Contact

with a general practitioner was counted as a psychiatric outpatient contact only in the case of treatment for schizophrenia.

3. TREAT: number of intervals with inpatient or outpatient psychiatric care. ($TREAT = INPAT + OUTPAT$).

4. SHARE: percentage of outpatient care in total psychiatric care ($SHARE = OUTPAT/TREAT * 100$).

5. INTENS: number of intervals outside hospital with outpatient psychiatric contacts ($INTENS = OUTPAT / (\text{total number of intervals} - INPAT)$).

In addition we derived the following indices:

6. DAH: subscore of the PSE 'delusional and hallucinatory syndromes'.

7. BSO: subscore of the PSE 'behavior, speech and other syndromes'. Symptoms that contributed to the BSO score were: mannerisms, catatonic movements, incoherent speech, blunted affect, agitation etc.

8. LIVCOND: living conditions of the patient during the first year, broken down into three categories: living alone, living in family/with parents/children/friends, living in a sheltered home/sheltered apartment.

9. PAST: total length of time (in months) in inpatient treatment before inclusion in the cohort.

6. Model-Based Analysis of the Utilization Data

Random assignment of patients to different treatment modalities is one approach to causal modelling in the evaluation of community mental health care. It is a well-known prerequisite of experimental design (Bredenkamp, 1969). In this way one ensures that unknown influences are distributed by chance to the different experimental conditions, the patients differ systematically only in the design variables.

The following study analyzes the effects of outpatient psychiatric care. In clinical practice, the decision for a certain amount of medical care is not a random choice but will be determined at least partly by attributes of the patient such as present psychopathological status, living conditions or chronicity of illness. Not only the decision for a certain kind of treatment but also the effects of the treatment are influenced by the variables mentioned above.

These facts are evident in clinical practice but they may distort the interesting intercorrelations when examining the effects of a modality of treatment. As we were not able to eliminate these disturbing influences in a randomized design, we had to control them with the following model (Fig. 2):

The whole period of observation was divided into two periods of 12 and 6 months respectively, so that the variables describing the psychopathological status and use of services appear twice (INPAT. I, INPAT. II, OUTPAT. I, OUTPAT. II etc.).

Our main concern was the influence of outpatient treatment on subsequent need for inpatient treatment. The division into two parts allowed us to interpret a significant association between e.g., OUTPAT. I and INPAT. II as empirical evidence for an influence of OUTPAT. I on INPAT. II and to exclude an influence directed reversely.

Controlling the variables influencing the impact of outpatient care relies on the following consideration: for each combination of 'psychopathological status', 'length of illness', and 'living condition' of a patient in the first 12 months an 'average' amount of treatment may be expected. This is also true for months 13 to 18. The hypothesis is that a deviation from

RECORD SYSTEM

PATIENT No.:

INTERVALS

TYPE OF SERVICE	1	2	3	4	5	6		34	35	36
INPATIENT										
DAY HOSPITAL										
SHELTERED HOME										
SHELTERED WORKSHOP										
PSYCHIATRIC OUTPATIENT CLINIC										
PRIVATE PSYCHIATRIST										
GENERAL PRACTITIONER										
OTHER										
NO AFTERCARE										

Fig. 1. Registration of inpatient and outpatient contacts with help of a record system: example

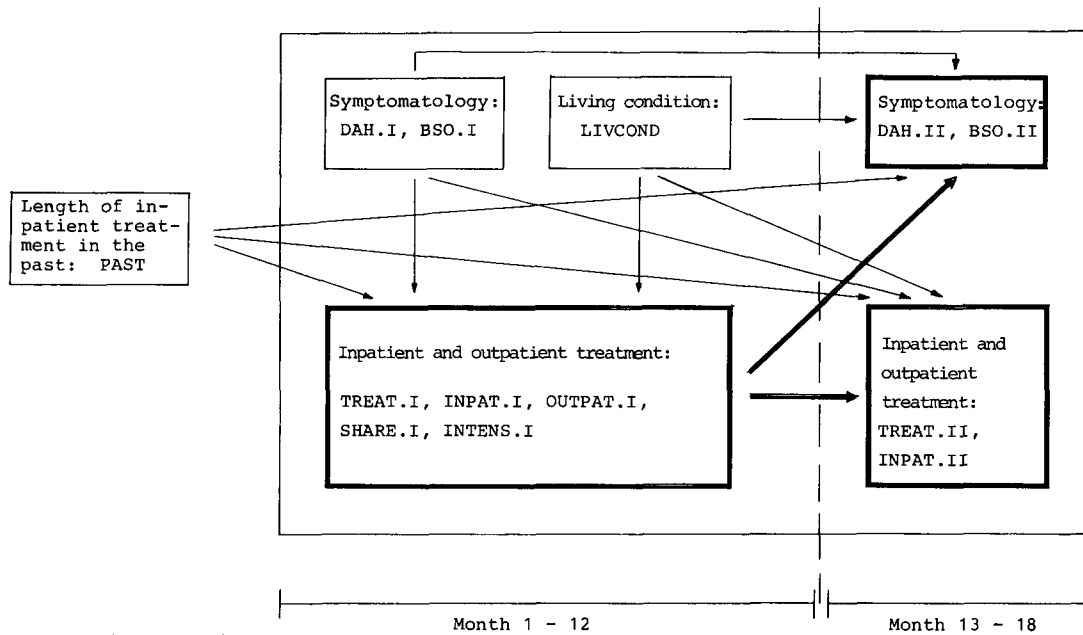


Fig. 2. Model of analysis

this average treatment in the first period, e.g. with respect to the amount of outpatient care, will lead to a decrease or an increase of treatment in the second period and also to a change in psychopathological status.

We calculated the average value of TREAT. I, INPAT. I, OUTPAT. I, SHARE. I, INTENS. I, TREAT. II, INPAT. II, DAH. II, BSO. II by regression with LIVCOND, DAH. I, BSO. I and PAST as predictor variables. In order to investigate the unbiased impact of outpatient care we eliminated the influences of psychopathology, length of illness and living condition from the variable 'treatment' by subtracting the expected average values from the observed values. The resulting variables, the so-called residuals, were used in the further computations (Fig. 3).

7. Results and Interpretation

Table 1 displays the correlation matrix of the variables (residuals) described in section 6, with the effects of DAH. I, BSO. I, PAST and LIVCOND removed. The matrix displays extent and direction of the influence exercised by the indices of care from the first year of observation on those from the second interval. Only patients with a complete set of variables were used in the following analysis; this condition reduced the cohort to 125 persons.

In general the use of facilities measured by the overall number of inpatient and outpatient contacts was characterized by some stability (TREAT. I, TREAT. II, $r = 0.70$). The high correlation reflected continuity of care especially with respect to the transition from inpatient to outpatient care and reverse.

7.1 Impact of Outpatient Treatment on Length of Stay in Hospital

The use of intra- and extramural services in total (TREAT. I) in the first year did not correlate with length of stay in hospital in the last 6 months (INPAT. II), but there were significant

RESIDUAL (TREAT. I) = OBSERVED VALUE (TREAT. I) - AVERAGE VALUE (TREAT. I)

$$= \text{TREAT. I} - (A + B \cdot \text{PAST} + C \cdot \text{BSO. I} + D \cdot \text{DAH. I} + E \cdot \text{LIVCOND})$$

Fig. 3. Formula. Elimination of disturbing influences due to chronicity, psychopathology, and living conditions exemplified by TREAT. I

Table 1. Correlation matrix after removing the effects of BSO. I, DAH. I, LIVCOND, and PAST

	TREAT. II	INPAT. II	DAH. II	BSO. II
TREAT. I	0.70***	-0.05	-0.17*	-0.15*
INPAT. I	0.23**	0.38***	-0.05	-0.06
OUTPAT. I	0.52***	-0.32***	-0.13*	-0.10 [†]
SHARE. I	0.30***	-0.35***	-0.14*	-0.14*
INTENS. I	0.63***	-0.24**	-0.17*	-0.15*

* $P \leq 0.05$; ** $P \leq 0.01$; *** $P \leq 0.001$; [†] $P \leq 0.10$

effects of the particular forms and characteristics of care on hospital use. There was a significant positive correlation between inpatient stay in the two time intervals (INPAT. I, INPAT. II, $r = 0.38$, $P = 0.001$) and there were significant negative correlations between outpatient treatment and intramural stay. Those patients, who had more contacts with the outpatient department, private psychiatrists, or general practitioners spent significantly less time in hospital during the last 6 months (OUTPAT. I, INPAT. II, $r = -0.32$, $P = 0.001$). The analysis also revealed that the higher the share of outpatient treatment in total care the less intramural care resulted in the follow-up (SHARE. I, INPAT. II, $r = -0.35$, $P = 0.001$). This effect was also true for the standardized amount of outpatient contacts during the time outside hospital (INTENS. I, INPAT. II, $r = -0.24$, $P = 0.01$). This means outpatient psychiatric treatment will reduce the length of stay in hospital.

These findings may be interesting from the political or economic point of view. But what about the consequences for the patients themselves?

Table 2. Correlation matrix after removing the effects of BSO. I, DAH. I, PAST, broken down by LIVCOND

		INPAT. II	DAH. II	BSO. II
Living alone (<i>n</i> = 32)	INPAT. I	0.47**	-0.15 [†]	-0.03
	OUTPAT. I	-0.31*	0.00	-0.01
	SHARE. I	-0.32*	0.05	-0.06
	INTENS. I	-0.12	-0.04	-0.02
Living in family (<i>n</i> = 68)	INPAT. I	0.42***	0.02	-0.06
	OUTPAT. I	-0.29**	-0.14 [†]	-0.08
	SHARE. I	-0.34***	-0.17*	-0.12 [†]
	INTENS. I	-0.23*	-0.15*	-0.10
Living in sheltered settings (<i>n</i> = 25)	INPAT. I	0.16	-0.08	-0.08
	OUTPAT. I	-0.40**	-0.35*	-0.27*
	SHARE. I	-0.42**	-0.38**	-0.33*
	INTENS. I	-0.42**	-0.45**	-0.40**

P* ≤ 0.05; *P* ≤ 0.01; ****P* ≤ 0.001; [†]*P* ≤ 0.10

7.2 Impact of Outpatient Treatment on Symptomatology

The correlation between the different indices of supply and the two PSE subscores DAH and BSO were all negative. The use of psychiatric aftercare facilities above-average was connected with a symptomatology sub-average.

Detailed inspection of each cell of the matrix showed five out of six correlations, demonstrating the effects of outpatient treatment were significant at the 5% level. Outpatient psychiatric care correlated significantly with symptomatology at a later point in time: the more contacts with outpatient facilities in the first year of observation, the less symptoms in the last 6 months. This kind of effect was not true for inpatient treatment: that meant length of hospital stay was not an essential factor in reducing symptomatology.

7.3 Differential Effects of Living Conditions on the Efficiency of Ambulatory Treatment

In order to examine the differential effects of the patients setting in the community (Blumenthal et al. 1982) the cohort was subdivided into three groups corresponding to the type of living conditions. The evaluation method used above was then applied to each of the groups separately (Table 2).

While there was no significant association between the indices of extramural care and symptomatology for patients living alone, there was a trend towards an effect of length of hospital stay on reduction of delusional and hallucinatory syndromes (DAH; *P* = 0.10).

For patients living in "natural" groups there were negative correlations between care and psychopathology. Two of the six coefficients were significant at the 5% level. For schizophrenics living in sheltered settings the association was highest: intensification of extramural psychiatric treatment had a significant effect on reducing symptomatology.

In order to interpret these results we have to consider the following: the impact of ambulatory psychiatric care is not only based upon pure number of contacts but on the arrangements initiated during or as a consequence of treatment, e.g. with respect to medication. Parkes et al. (1962) found that more than 50% of the schizophrenic patients in their sample did not take their neuroleptics as prescribed. Affleck et al. (1976) showed that regular taking of neuroleptics correlated

significantly with better outcome. With respect to compliance we have to assume that living in a sheltered setting also means a better control of medication than living in a family. The taking of neuroleptics will be worst in patients living alone because of the limited amount of social control and correspondingly these patients will profit more from inpatient care.

7.4 Differential Effects of Chronicity on Effectiveness of Outpatient Care

Similar considerations are apt with respect to the correlation between ambulatory treatment and reduction of symptoms dependent on total length of illness as one aspect of chronicity. Therefore we subdivided the cohort into three groups according to the total length of time in hospital before starting the study: up to 3 months, more than 3 months up to 12 months, more than 12 months (Table 3).

Comparing the three matrices it is evident that the association between length/intensity of ambulatory treatment and length of inpatient care and symptomatology was highest for those patients with more than 1 year total hospital stay.

One possible explanation may be that there was a significant relationship between the total number of hospital stays in the past, as another indicator of chronicity and the number of intervals without any kind of care during the period of observation. The more hospital stays before the less time without care ($\chi^2 = 24.5$, *df* = 4, *P* = 0.001). It seems that 'continuity of care' operationalized as periodical contacts at regular intervals is an essential condition for effective extramural treatment. As far as ambulatory care will meet these requirements, it will also be successful in reducing hospital stays and symptomatology.

One interesting but unexplained detail was the significant correlation between the amount of extramural treatment and the reduction of symptoms in the scope of overt behavior (BSO) among the patients of the first group.

7.5 An Attempt to Quantify the Consequences of Extramural Treatment

In order to illustrate these results, we translated the information of the correlation matrices into more intuitive measures.

Table 3. Correlation Matrix after removing the effects of BSO. I, DAH. I, VIVCOND, broken down by PAST

		INPAT. II	DAH. II	BSO. II
Length of former inpatient treatment ≤ 3 months ($n = 43$)	INPAT. I	0.27*	-0.02	0.06
	OUTPAT. I	-0.13	-0.02	-0.25*
	SHARE. I	-0.12	-0.08	-0.31**
	INTENS. I	-0.12	0.00	-0.22*
Length of former inpatient treatment from 4 to 12 months ($n = 39$)	INPAT. I	0.24*	-0.32**	-0.17 [†]
	OUTPAT. I	-0.39**	0.09	0.19 [†]
	SHARE. I	-0.46***	0.10	0.07
	INTENS. I	-0.24*	-0.19 [†]	0.06
Length of former inpatient treatment > 12 months ($n = 43$)	INPAT. I	0.45***	0.21*	-0.01
	OUTPAT. I	-0.49***	-0.45***	-0.29**
	SHARE. I	-0.47***	-0.41***	-0.25*
	INTENS. I	-0.45***	-0.38**	-0.36**

* $P \leq 0.05$; ** $P \leq 0.01$; *** $P \leq 0.001$; [†] $P \leq 0.10$

Table 4. Decrease of INPAT. II in the cohort as a whole and broken down by LIVCOND and PAST

Increasing OUTPAT. I by 1 month	causes a decrease of INPAT. II by ... days
Cohort	4.2
Living alone	0.0
Family etc.	0.4
Home	1.4
Past ≤ 3 months	1.2
4-12 months	5.4
More than 12 months	8.4
Increasing SHARE. I by 10%	causes a decrease of INPAT. II by ... days
Cohort	6.2
Living alone	5.9
Family etc.	5.6
Home	9.0
Past ≤ 3 months	1.7
4-12 months	8.6
More than 12 months	9.9
Increasing INTENS. I by 10%	causes a decrease of INPAT. II by ... days
Cohort	12.8
Living alone	6.9
Family etc.	11.1
Home	24.5
Past ≤ 3 months	4.4
4-12 months	14.4
More than 12 months	32.1

For this purpose we computed simple regressions with the residuals determined beforehand. Independent variables were the indices of extramural treatment (OUTPAT. I, SHARE. I, INTENS. I) from the first 12 months, the dependent variable was the time of inpatient care (INPAT. II) during the last 6 months (Table 4).

Extending extramural treatment (OUTPAT. I) by 1 month in the first year (that means three more contacts on average) effected a shortening of inpatient care by 4.2 days in the following 6 months.

An increase in the percentage of outpatient treatment in total psychiatric care (SHARE. I) of 10% for those patients with more than 1 year of inpatient treatment before the study resulted in a reduction of hospital stay of 9.9 days in the second interval.

Also the intensification of extramural treatment during time outside hospital (INTENS. I) within 1 year of 10% for patients living in sheltered settings theoretically reduced the hospital stay by 24.5 days.

8. Conclusions

The fate of mentally ill patients and the dramatically rising costs of public health in many countries of the western world have increased the public interest in questions concerning the effectiveness of psychiatric care. As a consequence in the USA the evaluation of federally funded programs is prescribed by law (Dowell and Ciarlo, 1983).

While analysis of the effectiveness of a single therapeutic procedure belongs to standard methodology of psychiatric research (Garfield and Bergin, 1978; Clark and Del Guidice, 1970), evaluation of psychiatric institutions and subsystems of care is rarely developed. This is due at least partly to methodological difficulties inherent in such an approach.

In the present evaluation study of community mental health care, an attempt has been made to improve statements within two problem areas and to reduce the plausibility of alternative interpretations. The analysis takes into account the time order of events and allows for the empirical evidence of directed effects as a basis for causal interpretations. Our method allows for removal of effects of preceding and concurrent influences in a nonrandomized observation study. The interesting effects are less distorted by other factors.

For a cohort of schizophrenic patients we demonstrated that continuous aftercare by outpatient psychiatric institutions and simultaneous use of complementary services are relevant factors in reducing the need for inpatient treatment, while at the same time reducing symptomatology.

Care for chronic psychotics has changed dramatically in the last three decades. Patients formerly forced to spend a long time in hospital are now able to live as outpatients owing to progress in pharmacotherapy and to the availability of ambulatory and complementary services in the community. We have to appreciate this development twofold: from a humanitarian point of view it has brought about an essential prerequisite of social rehabilitation. At the same time it seems that community mental health care is an economical alternative to long-term inpatient treatment (Bardens, 1984; Haefner et al. 1986; Ciompi, 1985). A cost analysis of utilization data of our cohort (Haefner et al. 1986) shows that costs of community care—in spite of multiple use of different services such as psychiatrists in practice, foster homes and sheltered workshops etc.—only amounts to 43% of the total cost of a stay in hospital for the same period.

The search for alternatives in psychiatric care and satisfactory solutions for the future will be successful only if we appreciate the consequences of a changed network of care for the patients themselves in full detail.

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