DETERMINANTS OF OUTCOME IN RESIDENTIAL HOMES FOR SPECIAL CARE

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IN
RESIDENTIAL HOMES FOR SPECIAL CARE

By

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ABSTRACT

This study is a partial evaluation of a program of foster care for chronic psychiatric patients (Residential Homes for Special Care) in 41 homes in Hamilton and surrounding area, Ontario.

A review of the development of foster care and of controversies over its value, as well as a review of the existing evaluative literature is included.

An attempt was made to use adequacy of neuroleptic maintenance in chronic schizophrenic residents as a tracer condition for evaluation of quality of care given by primary care physicians.

The objectives of the program were examined and operating definitions evolved for measures to evaluate some of these objectives. These included a field worker's rating of the quality of hostesses and an audit of prescriptions written by attending physicians for adequacy of neuroleptic maintenance, occurrence of drug interactions and prescribing frequency.

The cohort studied was all 178 residents first admitted to foster care in the area in the years 1966 to 1969. These residents were followed for a three year period using existing health records. Data were complete on every resident for all variables except some drug prescription measures.

Home factors such as rural location and inferior quality of hostesses were important determinants of rehospitalisation. Residents first placed in rural homes had many more rehospitalisations than those first placed in urban homes, although there were no significant differences in the age, sex, number and duration of previous psychiatric hospitalisation or diagnosis between these groups.

Resident factors such as younger age, female sex and shorter duration of previous psychiatric hospitalisation were significant determinants of discharges from the program.

The prescription audit measures did not predict outcome, but examination of the prescriptions did reveal 17 patients on prolonged tricyclic antidepressant therapy, 10 for more than four years.

PREFACE

This preface explains the origins of this study and acknowledges those who have helped complete it.

In the summer of 1973 two residents of Homes for Special Care in Haldimand County were readmitted acutely to the Hamilton Psychiatric Hospital. They were both chronic schizophrenic patients who needed maintenance neuroleptic therapy. The clinical impression was that a psychiatric evaluation and adjustment of their medication might have prevented their relapse.

An initial proposal called for a controlled trial of regular psychiatric assessment in the Residential Homes for Special Care in Haldimand County. This was not feasible in view of the current policy of the Ontario Department of Health on the delivery of medical care in these homes.

An analytic study of all the residential homes in the Hamilton area using existing health records appeared to be possible and was actually a necessary prerequisite for any controlled trial. Dr. Macpherson suggested a prescription

audit as a possible indirect measure of the quality of medical care.

Dr. F. Ellingham, Medical Consultant to the Extended Care Program, agreed to a revised proposal for such an analytic study and allowed the use of records in the Hamilton Homes for Special Care Office. Mr. F. Tohill, Senior Field Worker at the Hamilton Office gave me a good picture of the history and current status of the program in the Hamilton area. He and his staff were helpful in locating and explaining their records.

A year's part-time clinical work in Haldimand County gave the opportunity of discussing the Homes for Special Care program with community physicians and public health nurses and gave some contact with homes for special care and their residents. My clinical supervisor, Dr. B. Humphrey, was a helpful guide for these contacts.

Dr. M. Lemieux, Medical Director of Hamilton Psychiatric Hospital, gave permission to study pharmacy and medical records at that hospital. Mr. Garringer, Chief Pharmacist and his staff and Miss F. Austin, Medical Record Librarian and her staff were always helpful with locating the records involved. Similarly at Lakeshore Psychiatric Hospital

the Chief Pharmacist, Mrs. Balla, located prescriptions for four residents transferred to their area. Mrs. J. Best, Field Worker at Lakeshore Homes for Special Care Office tracked down movements of these residents.

Drs. D. Fitzgerald, P. Grof, D. MacCrimmon, B. Saxena and A. Singh provided useful consultations on evolving standards for neuroleptic maintenance and drug interactions. Drs. D. Sackett and W. Spitzer gave timely advice on methodology. Prof. R. Roberts and Dr. C. Goldsmith were of considerable help with the analysis of results.

My thesis supervisor, Dr. A. Macpherson facilitated many contacts and encouraged rethinking of the problem from many angles.

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Chapter 1

INTRODUCTION

During the 1960s most psychiatric hospitals in North America achieved very considerable reductions in their inpatient populations. Psychiatrists and social scientists discussed alleged effects of chronic hospitalisation as a cause of clinical deterioration in patients, and promoted care in the community as an alternative to hospitalisation, even for long term patients. Planners developed foster care programs with groups of chronic psychiatric patients living in supervised private homes. Critics questioned whether these foster homes were an improvement over the back wards of psychiatric hospitals. Chapter 2 examines the development of foster care programs and the controversies over their value.

Foster care programs were widely and rapidly implemented and attempts at systematic evaluation have been rare. Chapter 3 reviews the limited knowledge available from existing evaluative studies. In Ontario, the Residential Homes for Special Care program begun in 1965, grew to over

1,500 residents by 1970; yet no organised evaluation has been done on any aspect.

Chapter 4 outlines an attempt to apply tracer condition methodology to chronic schizophrenic patients in foster care. The use of an audit of prescriptions written by attending primary care physicians offerred promise as an additional way of evaluating foster care.

The method of the present study, reported in Chapter 5, involved following a cohort of chronic psychiatric patients, first discharged to residential homes for special care in Hamilton and the surrounding area for the years 1966 to 1969, for a three year period using existing health records. The objectives of the program were examined and operating definitions evolved for measures to evaluate some of these objectives.

Results of this partial evaluation are described in Chapter 6 and conclusions are drawn in Chapter 7. Several foster home factors were significant determinants of rehospitalisation, while resident factors were significant determinants of discharge. The operating definitions of adequacy of drug prescribing were not related to these outcomes but the prescription audit did reveal a large number of

residents on excessively prolonged tricyclic antidepressant therapy.

Chapter 2

DEVELOPMENT AND CURRENT STATUS OF FOSTER CARE IN CHRONIC PSYCHIATRIC PATIENTS

This chapter will give perspective to the problem studied in this thesis; it reviews landmarks in the history of foster care; describes the current Ontario program; outlines the arguments for and against foster care; assesses the current state of the foster care debate in Canada and considers ways to resolve these differences.

A. Definition of Foster Care

Foster care is placing patients in private families other than their own under government supervision (42).

"Foster care" covers a variety of types of patients and of homes. Patients may range from the chronically ill needing long term placement to those convalescent from the first episode of mental illness needing placement for only

a brief time. Homes may range from large nursing homes to a foster family caring for a single patient (18).

B. History of Foster Care

Most reviewers of the history of foster care begin with Gheel in Belgium. This town is the shrine of St. Dymphna who was martyred there in the sixth century. Pilgrims, particularly the mentally ill, came from all over Europe. From the time of the Middle Ages, local families have taken mentally ill persons into their homes, and in the fifteenth century the Pope granted absolution to all such householders. The foster care colony became a state institution in 1852 and an infirmary of two hundred beds was built. There were 2,700 patients in foster care in Gheel in 1952, at a time when the total population of the town was 20,000 (18).

Next most frequently cited is the "Scottish system". Beginning around 1845, mentally ill patients were placed in the homes of private families. In 1867 there were 1,637 patients in foster care in Scotland (58).

Elsewhere in Europe, foster care began in Holland

in 1922 and was well developed in Norway in 1953 according to Wing (74). Switzerland had developed foster care towards the end of the nineteenth century (18). Apparently foster care has never been a feature of English psychiatry (74).

In North America, Massachusetts inaugurated a system of foster care in 1882. This was the only program on the continent until 1931 when New York State began a foster care program for mental defectives. Other states followed: Pennsylvania and Utah in 1935; Rhode Island, Illinois, Maryland and California in 1941; and Michigan in 1942 (58).

In Canada, foster care began with the Approved Home program of Ontario Hospitals in 1933. The Ontario Approved Home program had 523 patients by 1944 and 637 by 1964 (2, 58). Most of these homes were absorbed into the Homes for Special Care (Residential) program from 1965 to 1967.

C. Homes for Special Care in Ontario

The Homes for Special Care Act was passed by the Legislature of the Province of Ontario in May 1964 (31). The purpose of the bill was

> "to provide homes for special care for those discharged from Ontario hospitals for the mentally

> ill, but without home or family. This will enable the Ontario hospitals to carry on their normal function and at the same time will provide a more home-like setting for the patients."
>
> - Concluding speech of the Lieutenant Governor reviewing legislation of the session (29).

Regulations under this Act classify Homes for Special Care as nursing or residential homes and specify payments for each type of care. Rates at April 1, 1974 were $6.50 a day for Residential Home care and $13.00 a day in Nursing Homes.

Residents are admitted if they have been patients in an institution within the Mental Health Act (30). If a physician has completed a certificate of incompetence and the Public Trustee is acting for the patient this arrangement continues after admission to Homes for Special Care. Other patients not being incompetent, may elect to have their affairs handled by the Public Trustee. The resident, or in the case of a woman, her husband, is liable for portion of the payments made for his care if he has property or income such as social security payments (13, 30). In 1968 arrangements were made to identify over 3,000 residents in Homes for Special Care, who by virtue of indigence became eligible for assistance under the Federal-Provincial cost sharing welfare arrangements (28).

Homes are subject to fire safety and public health regulations (30). The type of residential home envisaged was described by Cormack and Holling as

> "the need is for home-like surroundings and a sympathetic understanding of the limited capabilities of the individuals concerned ... The secret of success lies, in large measure, with the proper selection of a hostess or house mother. She must have qualities of sympathy and understanding, as well as firmness, when needed. Such a person will not only provide adequate lodging but, more important, will endeavour to develop community interest in her charges." (13)

There seemed to be some uncertainty about how the new program should be administered. Dr. Holling was Director of the Tuberculosis Prevention Branch of the Ontario Department of Health and was initially responsible for the Homes for Special Care Program. In October 1965 the Program was transferred to the Public Health Administration Branch and in January 1967 to the Chronic Care Section (28).

From 1965 medical care of all Homes for Special Care residents has been given by private physicians in the community under the supervision of the Medical Officers of Health. General supervision of the homes is provided by Field Workers who are generally psychiatric nurses or social workers (28).

Table 1 shows the growth of the Homes for Special Care Program.

Table 1. TOTAL RESIDENTS IN HOMES FOR SPECIAL CARE (Dec. 31 each year)

Year	Residential	Nursing
1965	47	1,343
1966	448	2,531
1967	892	3,479
1968	1,338	4,786
1969	1,456	5,208
1970	1,502	5,599
1971	1,458	5,549
1972	1,457	5,356

Sources: Ontario Department of Health Annual Report 1965 (28)
Allodi and Kedward (2)

D. Arguments for Foster Care

The preceding sections have shown that foster care for chronic psychiatric patients is being increasingly used throughout Western societies. This growth has involved considerable controversy. In this and the following section the arguments for and against foster care are outlined.

> "Money has been saved, the patients have been sufficiently well cared for and in many cases made happier; and asylums have been relieved from overcrowding, prevented from growing unmanageable in size and have been kept to their proper work of treating the curable and recent cases."

> - Dr. Stephen Smith, Commissioner in Lunacy for the State of New York, commenting on the Scottish system in his annual report to the legislature in 1885 (58).

With remarkable consistency the same three arguments for foster care have been put forward ever since: cheaper; increases resources for acute patients; better for chronic patients (15, 18, 42, 45, 50, 61, 71). These arguments will be examined more thoroughly.

1. Cheaper

All studies surveyed reported that foster care was cheaper than hospitalisation. While this is undoubtedly true when costs per patient per day are compared, the difference might be reduced if true estimates of total costs could be obtained.

Here are some examples of cost comparisons. Molholm and Barton reviewing costs per day of four American programs in 1941 concluded that the cost of foster care was about two-thirds the cost of psychiatric hospital care (50). The proportionate difference seems to increase in more recent figures. Watt reported that in California in 1970 the cost of foster care was $7 a day versus $26 a day for psychiatric hospitalisation (71). In Ontario in April 1974 foster home

hostesses were paid $6.50 a day for each resident in their care while the cost of psychiatric hospitalisation was estimated to be $35 a day.

These figures underestimate the foster care costs for at least two reasons. Firstly, as Molholm and Barton warned in 1941, they do not adequately cover the general administrative costs of foster care (50). Secondly, they do not take account of the length of time patients spend in each type of care. Thus, if foster care results in a much longer placement than would have been the case had the patient remained in a psychiatric hospital, it may be the more expensive approach. This point is of less significance when considering foster care programs which are primarily designed for the chronic patient who has spent many years in a psychiatric hospital and whose natural history indicates a high likelihood of indefinite institutional care.

Even allowing for these cautions on estimating total costs it is difficult to argue that foster care is not cheaper than psychiatric hospitalisation.

2. Increases resources for acute patients

By the 1950s the number of long stay patients receiving no more than custodial care had increased

alarmingly. In Canada statistical estimates indicated that they occupied as much as 50 per cent of all hospital beds (37). Similar overcrowding of psychiatric hospitals in the 1950s is reported by Lee (42), Watt (71), Risdorfer et al. (61) and Allodi and Kedward (2).

From the point of view of psychiatric hospital staff, these long-term patients limited resources available to acute patients in an era when the emphasis was on early diagnosis and treatment of new cases.

3. Better for chronic patients

Another development of the 1950s was the growth of an understanding of long term hospitalisation as a cause of clinical deterioration in patients.

The effect of institutions on patients has been described in a variety of ways. These have been well reviewed by Zusman (77). Barton in 1959 wrote about "institutional neurosis" a syndrome characterised by apathy, lack of initiative, submissiveness and loss of interest in the present and future (6). Wing in 1962 discussed "institutionalism" caused by the social pressures of institutional living and the duration of institutionalisation

in people who had a tendency to be admitted to psychiatric hospitals such as the poor, the aged and those lacking community ties (75, 76). Gruenberg in 1964 used "social breakdown syndrome" to describe a process by which a person joins the sick community as a result of extreme susceptibility to the attitudes of others and to external cues (32). Goffman in 1961 from a sociological viewpoint examined the social pressures of living in a "total institution" where all aspects of life are conducted in the same place under the same single authority with a large batch of others treated similarly. He considered psychiatric hospitals as prime examples of "total institutions" (35).

This evidence for the adverse effect of large hospitals in producing "institutionalism" has been the main factor in the drive to reduce the number of psychiatric hospital beds in Western countries in recent years. It was thought that return of long stay patients to the community would arrest, if not reverse the process of "institutionalism" (36).

E. Arguments against Foster Care

Smith, quoted above, was not very successful in his

advocacy of a foster care program for New York State in 1885. There was strong opposition. In 1886 Dr. Charles W. Pilgrim on the staff of Utica Asylum published a paper describing his visit to the colony at Gheel.

> "... To make use of the sentimental argument that such patients are happier under surroundings which most nearly approach home life is puerile, for, as has been said, they are not in a condition to appreciate their environment. And to claim that they are as well cared for in houses without any of the modern conveniences, by those whose intelligence, in some cases, seems little above their own, as they would be in a well-managed, well-constructed hospital under the immediate care of watchful physicians and skilled attendants, I cannot believe to be the case from the evidence which my visit gave ..." (58)

The notion that patients were better off in psychiatric hospitals certainly prevailed. New York State delayed implementation of a foster care program until 1931.

The 1960s saw a considerable decrease in inpatient censuses at most psychiatric hospitals in North America. The demise of the psychiatric hospital was seriously predicted. In 1973 the State of California announced plans to phase out all psychiatric hospitals by 1977 and all institutions for the mentally retarded by 1982 (2). Many of these patients will be placed in foster care and nursing homes.

Several authors have suggested that these newer types of care are really no better than the psychiatric hospital back wards. Stotsky in 1966 asked "Is the hospital back ward being moved to the nursing home?" (67). Collins, Stotsky and Dominick in 1967 published "Is the nursing home the mental hospital's back ward in the community?" They concluded that with the disappearance of small family care type nursing homes, there was little difference in quality of care between large nursing homes and psychiatric hospital back wards (12). Lamb and Goertzel in 1971 asked "Discharged mental patients - are they really in the community?" They felt that the boarding home group in their study was like a small ward moved to a community setting (41).

Further evidence that return to the community is not always the answer to the problems of institutionalisation was provided by Darley and Keehey. To the plethora of syndromes resulting from psychiatric hospitalisation previously mentioned (e.g. institutional neurosis, institutionalism, social breakdown syndrome) they added the "Queequeg syndrome" named after the mate in "Moby Dick" and found in patients in community care settings. They hypothesised that former psychiatric patients are not accepted in the community as recovered, but are given the new and damaging role of citizen on probation (17).

Reich called the care of the chronically mentally ill a national disgrace in an article in the American Journal of Psychiatry in 1973. He graphically described the confusion of priorities in New York City's foster care programs (60).

F. The Foster Care Debate in Canada

Similar arguments for and against foster care have been voiced in Canada. The Saskatchewan experience of rapid reduction in inpatient numbers with increased use of foster homes provides the most cogent argument for foster care. However in Ontario and Quebec major questions have been raised about the quality of foster homes.

Psychiatric hospitals in Canada reduced their patient populations in the 1960s. Most dramatic was the change at Saskatchewan Hospital, Weyburn, where the population shrank from 1,476 at the end of 1962 to 443 at the end of 1966 (34). This hospital has since been entirely phased out as a psychiatric facility and is now used as a chronic diseases hospital. This very fast reduction in patient numbers in Saskatchewan was associated with considerable tensions within the psychiatric service and in some local communities. These problems have been documented by Stewart et al (66) and Smith (65).

Herjanic, Hales and Stewart reported a two year follow-up of all chronic (more than two years hospitalisation) patients discharged from Weyburn in 1963 and 1964. Forty per cent of their study population were in foster care. Twenty five per cent of their sample were readmitted within two years. They concluded "we advocate a bolder approach toward discharge of chronic patients" (34).

Allodi and Kedward questioned whether adequate support services exist outside the hospital for discharged chronic mental patients. In reviewing the statistics for Queen Street Mental Health Centre in Toronto, they found that adding the 496 patients in hospital in 1970 to the 474 patients in Queen Street Mental Health Centre Homes for Special Care gave a total of 960 patients, very little different to the 1,004 patients in the hospital in 1964 prior to the Homes for Special Care program. This suggested "the possibility that many patients have merely been transferred from the hospital to the Homes for Special Care" (2) though they did not consider growth in the size of the population served by the hospital over these years.

The same authors commented on the quality of care in homes for special care

> "all is not well in the foster homes, that in general they have failed in their primary goals of providing

a family life type of setting and of reintegrating the patient to the community. In fact their function seems to be merely custodial." (2)

Murphy, Penee and Luchins described foster homes in three unnamed Canadian provinces but presumably including Quebec, in 1972. They suggested

"those who think foster home placement enables a patient to escape the disadvantages of institutional life are mistaken. Foster homes can be as institutionalised as hospitals are, while lacking the compensatory advantages that some hospitals might possess."

The report describes the lack of community acceptance of former mental patients and the dearth of activities available in foster homes. The authors concluded

"the community may have attitudes which are harmful to patients rather than helpful ... it is both foolish and unfair for those professionals to shirk their assignment, or for administrators to think they can economize by transferring the task back to the lay community." (53)

C. Toward a Resolution

Are foster homes the answer to the dilemma of the chronic psychiatric patient, or are they no advance over psychiatric hospital back wards? At present the answer to each question is sometimes yes and sometimes no, depending

on the type of patient, on the type of home and on the type of support services. Clearly more research is needed to clarify what contributes to "good" outcomes in foster care settings. Stycos called for the same thing in 1951 when he reviewed the dearth of research in the area (68). The following chapter will consider the limited advances that have been made in evaluative research on foster care since.

More research of better quality is needed. In Canada, Kedward et al have suggested that optimal evaluative studies of chronic psychiatric care require following patients prospectively. However they felt this was not possible and proposed a cross-sectional study of chronic patients still in contact with the psychiatric hospital (37). This type of study would give a biassed view, overrepresenting treatment failures who are left behind. The study reported here demonstrates the feasibility of following patients prospectively in their foster care experience to obtain more certain data on the determinants of outcome.

Chapter 3

REVIEW OF THE EVALUATIVE LITERATURE ON FOSTER CARE FOR CHRONIC PSYCHIATRIC PATIENTS

A. Introduction

This review examines literature on the evaluation of foster care for chronic psychiatric patients. While not exhaustive, this review is essentially complete and representative of the limited research in the area. The sources were entries under the heading "Foster care" in Index Medicus from the years 1961 to 1973, citations from articles thus located and books and review articles in related areas. Articles which were merely descriptive of individual programs and without any evaluative component were excluded.

B. Methodological Considerations

The preceding chapter reviewed the debate on whether foster homes were superior to psychiatric hospital back wards.

The question should be easy to resolve. Ideally the answer would come from a randomised controlled trial. A population of chronic psychiatric patients could be defined, stratified for prognosis and for concurrent diseases which might affect outcome, randomised to clearly specified foster home and back ward conditions and all patients followed prospectively to predetermined outcomes. Only one randomised controlled trial was located in this literature review. Lamb and Goertzel randomised chronic psychiatric patients to a high expectation half way house and a low expectation foster care setting and found the high expectation environment to have superior outcomes (41). Weinman et al did compare foster homes with psychiatric hospital back wards and found foster homes to have better results (72). This controlled trial was not randomised and did not consider possible biasses in the groups studied. These controlled trials are set out in more detail in Table 2.

Possible explanations for the lack of randomised controlled trials despite their apparent feasibility are lack of research interest, limited methodological expertise, the time pressure imposed by rapid implementation of foster care programs and the generally uncritical commitment to community care in the 1960s. The research that has been done is of the analytic study type examining determinants of

TABLE 2. CONTROLLED TRIALS OF FOSTER CARE

Study	Methodology	Comparison	Place and date of publication	Number of residents	Results
Lamb and Goertzel (42)	Randomised controlled trial	Foster care (low expectation environment) vs. halfway house (high expectation environment)	California 1971	51	Foster care gave less satisfactory outcomes
Weinman Saunders Kleiner and Wilson (72)	Case control without matching or examination of sample bias	Foster care with rehabilitation program vs. regular psychiatric hospital care	Pennsylvania 1970	223	Foster care with rehabilitation program gave superior outcomes

outcome with a view to improving selection of patients for foster care. The data used have been health records and social workers' ratings, except for Mueller (51) who attempted to interview residents in foster care.

Feinstein advocated the use of health records in studies, which are retrospective in data but prospective in population for research into therapy and prognosis (21). Later he introduced the terms retrolective and prolective to describe the timing of data collection (20). He would reserve the terms retrospective and prospective for the direction of following a sample of patients under study. Hence in the jargon of Feinstein most of the studies reviewed are retrolective and prospective.

There are two main designs for analytic studies: the cohort study and the case history study (11). Equivalent terms for cohort study are comparative prospective study or follow up study (22). Equivalent terms for case history study are case-control study (4) and comparative retrospective study (22). The differences between these types of studies are illustrated by the following example from epidemiology taken from Clark and MacMahon.

> "The question to be answered is whether the rate of lung cancer in cigarette smokers is greater than in non-smokers ... There are two general ways in which this comparison can be made.

1. Directly, by a cohort study. In this type of study a cohort of smokers (exposed) and non-smokers (not exposed) is selected and followed to determine their actual experience with respect to the frequency of the disease.
2. Indirectly, by a case history study. In this type of study a group of cases of the disease is selected and queried about the frequency of the exposure. A comparable group without the disease is queried in a similar way." (11)

In analytic studies of foster care the outcomes are discharge, rehospitalisation or estimates of level of functioning rather than the development of a disease. Similarly, the factors studied are disease states, demographic variables and treatments used (here collectively called determinants) rather than exposure to a risk factor.

The cohort study is superior to the case history study in the following ways:

1. Closer to the experimental ideal though, the assignment of exposure is not under the investigator's control.

2. Reduces bias in the selection of comparative groups.

3. Avoids the problems of matching, which is generally needed in case history studies.

4. Gives a better picture of changes over time (4, 11).

Table 3 gives details of seven analytic studies of

Table 3. ANALYTIC STUDIES OF FOSTER CARE

Study	Methodology	Place and date of publication	Number of residents	Determinants of satisfactory outcomes
Lyle and Trail (45)	Cohort study with uniform two year follow up	Washington 1961	77	Older age Greater length of previous psychiatric hospitalisation Diagnosis other than chronic brain syndrome with convulsive disorder
Watt (71)	Cohort study with uniform five year follow up	Massachusetts 1970	12	Older age
Lee (42)	Cohort study with variable follow up period	California 1963	245	Greater length of previous psychiatric hospitalisation
Molholm and Barton (50)	Cohort study with variable follow up period	Massachusetts 1941	299	Greater caretaker interest Urban foster homes Greater length of previous psychiatric hospitalisation
Mueller (51)	Cohort study with variable follow up period	Colorado 1968	141	Greater length of previous psychiatric hospitalisation
Ullmann and Berkman (70) Giovannoni and Ullmann (23)	Cohort study with variable follow up period	California 1959	191	Older age Greater length of previous psychiatric hospitalisation Presence of male figure in foster home
Oltman and Friedman (56)	Case history without matching	Connecticut 1964	189	Diagnosis of schizophrenia does not affect outcome

foster care. A uniform follow up period (used by Lyle and Trail and by Watt) allows a more certain comparison of cohorts than the variable follow up period that results from cutting off follow up on all patients at the same date.

C. Types of Residents

Foster care has been used for a broad group of patients. While most programs have a group of chronic patients who are long term residential placements these are mixed with others, convalescent from an acute illness, who will be discharged from care in the short term. It is important to understand the goals of the program and the nature of the resident population in order to interpret results. All programs reviewed had a substantial group of convalescent patients. The preceding chapter showed that by contrast the Ontario Homes for Special Care program was directed at residents needing long term placements.

D. Types of Outcomes

The outcomes used in the studies listed in Tables 2 and 3, are discharge to the community and acute psychiatric

rehospitalisation. The appropriateness of either outcome depends on the objectives of the program and the type of residents.

Discharges and rehospitalisations have limitations as outcome measures. Lamb and Goertzel pointed out that a resident rehospitalised because of an aggressive outburst after two years of good adjustment perhaps working and achieving some integration into the community was not really the poor outcome he was called (41). By contrast a withdrawn virtually mute schizophrenic resident in care for a longer period would be called a good outcome.

Ullmann and Berkman (70) devoted considerable effort to improving the specification of outcomes. Operating definitions based on patterns of discharges and rehospitalisations were evolved for resident groups described as sitters, goers, jumpers, trippers, shufflers and failures. These more specific outcomes did not facilitate the search for determinants of outcome.

Discharges and rehospitalisations have the advantage of being certain events which are recorded in health records. There is a problem with rehospitalisations in that elective rehospitalisations for rehabilitation or medical care must be differentiated from those for acute psychiatric reasons

(50). On balance, discharges and rehospitalisations have been useful outcome measures for the present level of evaluative research in foster care.

E. Determinants of Outcome - Residents

Resident variables for which an association with outcome has been demonstrated are age, disease type and length of hospitalisation. Sex does not seem to affect outcome.

1. Age

Three studies of foster care found a direct relationship between age and satisfactory outcome in foster care. Lyle and Trail found that prognosis for adjustment was directly related to age (45). Ullmann and Berkman had similar findings (70). Watt found that the age of the patients at the time of release was positively correlated with the number of months spent out of hospital. The rank order correlation of +0.64 was significant at the .02 level (71).

2. Sex

Chesler has demonstrated that women are disproportionately overrepresented in psychiatric outpatient and inpatient groups (10). The same trend is apparent in foster care. Molholm and Barton's sample contained 69.9 per cent women (50), Lee's 60.8 per cent (42) and Risdorfer, Primanis and Dozoretz 68.1 per cent (61). The other analytic studies were from Veteran's Administration facilities. Lyle and Trail quoting United States national figures reported that 61.3 per cent of patients in foster care were women compared to 51.5 per cent women in public psychiatric hospitals (45). Risdorfer et al offerred differential family rejection as an explanation for the sex difference in their geriatric population.

> "The reason for this difference is that geriatric males are more easily accepted in the homes of distant relatives or friends. In contrast, geriatric females are more demanding and create more difficulty in the management of their daily life." (61)

A more plausible explanation may be that women are better conditioned by our society for the dependent role required of foster home residents.

Only Molholm and Barton specifically examined sex as a determinant of outcome. They found no significant difference in outcome between males and females (50).

Although women are overrepresented in foster care populations, there is no reason to believe their outcomes are any different from men in foster care.

3. Disease type

Follow up studies of psychiatric hospitalisation reveal a higher rate of rehospitalisation for patients diagnosed schizophrenic than other diagnostic categories (44, 48). However in follow up studies of chronic psychiatric patients there appears to be no difference in outcomes between schizophrenics and others (8, 34). This seems to be the pattern for schizophrenics in foster care. Oltman and Friedman found the same proportion of schizophrenics in the successfully adjusted group as there was in the originally discharged group (56). Lyle and Trail similarly found no difference in the proportion of schizophrenics in their successfully adjusted group compared to their rehospitalised group (45). The available evidence suggests that schizophrenics at least do no worse than other diagnostic groups.

Chronic brain syndrome was significantly correlated with unsatisfactory outcome in Lyle and Trail's study (45). Watt found a similar relationship (71). Patients with chronic brain syndromes may have a less satisfactory outcome in

foster care.

4. Duration of previous psychiatric hospitalisation

Three studies found that residents who had been in hospital for long periods of time had fewer rehospitalisations in foster care. Molholm and Barton found that for males there was a significant association between hospitalisation for more than two years and avoidance of rehospitalisation (50). Lee divided his residents into two groups at the median duration of hospitalisation, 23 months, and found the longer hospitalised had fewer rehospitalisations (42). Lyle and Trail reported a mean duration of hospitalisation of 10.7 years for their adjusted group compared to 5.3 years for their rehospitalised group.

If discharge is the outcome of interest then residents with shorter hospitalisations are more likely to be discharged from foster care. This was clearly shown in Mueller's study (51).

F. Determinants of Outcome - Foster Homes

Foster home variables for which an association with outcome has been demonstrated are rural-urban location and

quality of hostesses. Associations with home size and frequency of moves between homes have not been studied.

1. Size

None of the literature reviewed provided any data relating outcome to size of home. However recalling the arguments for foster care presented in the last chapter, there was the implication that the smaller ought to be better.

2. Rural or urban location

Only Holholm and Barton classified homes along this dimension. In their sample 30 per cent were placed in city homes, 27 per cent town and 43 per cent country. They found that there was a tendency for more patients to be discharged from the city with fewer returns to the hospital than occurred in both town and country homes, though they did not report the statistical significance of this association. However they reasonably cautioned that differences in patient types and availability of work opportunities might explain these results (50).

Murphy, Penee and Luchins in their survey of Canadian foster care commented that

> "In part, it was geographic distance that prevented the boarders from having a more varied life, for their homes were often too far from town for them to walk to a bingo game, for instance ... " (53)

Lyle and Trail (45) and also Padula (57) described an apparently high proportion of rural foster homes in their programs, though they did not give any statistical information.

The available evidence suggests that a large proportion of foster homes are in rural settings. This is in an era when the old isolated rural psychiatric hospitals have been generally decried as antithetical to reintegration into the community (57).

Since urban areas generate greater numbers of psychiatric hospital patients and higher rates of admission (19), rural foster homes may contain many patients placed far from their community of origin. This might contribute to a worsening of their psychiatric condition and possibly explain the higher rates of rehospitalisation found for rural foster homes by Holholm and Barton (50).

In summary, the available evidence suggests that rural location of foster homes might lead to less satisfactory outcomes.

3. Quality of hostesses

Hostesses is the term used in Ontario for women who operate foster homes. Terms used in other places are sponsor, caretaker and foster mother.

Foster care sponsors are nearly always female. Silberstein quoted by Lamb and Goertzel described the situation clearly

> "All of the care homes (22) I visited were operated by women. Husbands, if any, were only peripherally involved in the operation of the homes. Most of the women prior to becoming caretakers, had jobs in which they provided physical care to sick, aged and disabled persons. The caretakers were quite maternal, met the physical needs of their guests, and related to them as they would to young children. They expected the residents to be docile recipients of their services. Few caretakers delegated any responsibilities to their guests and did not feel these former patients were capable of handling them ... " (41)

Men do seem to be needed too. Giovannoni and Ullmann had social workers rate foster homes on twelve characteristics. Only one of these twelve, the presence of a male figure, added to the accuracy of prediction of outcome within three of four groups already homogeneous with respect to duration of hospitalisation and type of ward (23). By contrast, Lyle and Trail did not find any association between marital status of sponsor and outcome (45).

Two studies attempted to rate the degree of interest of hostesses. Molholm and Barton rated hostesses as "great interest", "sympathetic", "indifferent" and "mercenary". Fifty seven per cent of residents in homes rated "great interest" were discharged compared to twenty four per cent in the "sympathetic" and "indifferent" group (50). Similarly, Lyle and Trail rated closeness of ties between the resident and hostess. Sixty nine per cent of the residents in their adjusted group formed close ties with the hostess compared to thirty five per cent in the rehospitalised group ($p<0.05$) (45). An opposing view is that of Affleck who argued for moderation in stimulation of chronic schizophrenic patients in foster care (1). His comments may be more applicable to a long term placement resident group rather than the more convalescent type resident groups studied in the reports cited above.

Perhaps the most interesting study in this area is that of Lamb and Goertzel (41), who in a randomised controlled trial assigned patients on discharge to a "high expectation" therapy oriented half way house and to a "low expectation" foster care setting. They found that the high expectation group had a higher rehospitalisation rate, but had a longer time out of hospital, with a higher level of instrumental performance.

On balance it appears that the quality of the hostesses, rated in a variety of ways, does influence the discharge rate, though the relationship to rehospitalisation is unclear.

4. Transfers between homes

Some writers emphasise the need for tailoring the type of home to the resident (57, 61) and suggest that several changes in home might be necessary to achieve this. No literature reviewed has considered the question of an association between number of changes of home and outcome. It would seem likely that patients with several changes of homes are at greater risk of rehospitalisation. This association remains probable whether the changes of home resulted from home factors, such as the closure of a home, or patient factors, such a disturbed behaviour. The interpretation of any such association would be very difficult in the absence of certain knowledge about the reasons for each transfer.

5. Changes over time

If the knowledge about prediction of outcomes and hence selection of patients were improving, it would seem probable that the rate of good outcomes would increase over

time. Molholm and Barton analysed results by individual years of first placement between 1934 and 1938 and found no significant differences (50).

C. Determinants of Outcome - Health Care

No data were located on health care variables having an association with outcome for residents in foster care.

All programs surveyed were hospital based with psychiatric care given by hospital or clinic psychiatrists. The first line health professional in most programs was a social worker who supervised the placements and carried most of the administrative burden.

Murphy, Penee and Luchins criticised the very limited time such field workers had available to spend with the residents. Most of their time was spent delivering the residents' medicine and in discussing problems with the hostesses. They concluded that a partial answer to the problems of foster care was increased use of professionals.

> "Usually they were absent for financial reasons, and it is this absence of professional effort that is mainly responsible for the picture presented ..." (53)

By contrast, care by professionals did not seem

beneficial in the two year follow up study of chronic psychiatric patients in Saskatchewan. Herjanic, Hales and Stewart found that patients followed up regularly by the clinic teams were readmitted significantly ($p<.01$) more often than other groups (34). These results cannot be directly extrapolated to foster care residents, as only forty per cent of this sample of chronic patients were in foster care. Nevertheless the results are so striking that they force a revision of the attitude that all that is needed is more professional input.

Another report on this Saskatchewan discharged chronic patient population showed that their utilisation of general medical services was significantly less than the Provincial norm (9). Cassell, Grunberg and Fraser questioned whether the follow up medical care received by these patients was adequate.

These studies are only peripheral to assessing the importance of the quality of health care as a determinant of outcome in foster home residents. The existing evaluative literature on foster care does not give any help. In the following chapter the more general literature on health care evaluation is examined for means of measuring quality of care applicable to foster care of chronic psychiatric patients.

Chapter 4.

MEASUREMENT OF THE QUALITY OF HEALTH CARE IN FOSTER HOME RESIDENTS

This chapter reviews the use of tracer conditions in the evaluation of ambulatory health care and the possible application of this technique to foster home residents.

A. Tracer Conditions in the Evaluation of Ambulatory Care

Kessner has advocated the use of tracer conditions for the evaluation of ambulatory care (39). By tracer condition he meant

> " ... specific health problems that, when combined in sets, allow health care evaluators to pinpoint the strengths and weaknesses of a particular medical practice setting ... how a physician or team of physicians routinely administers care for a common ailment or how a system identifies high risk pregnant women will be an indicator of the general quality of care and the efficacy of the system delivering the care" (39)

He has established criteria for the selection of tracer conditions. In decreasing order of importance they are

(i) Functional impact be major

(ii) Diagnosis be not difficult

(iii) Prevalence be relatively large

(iv) Impact of care be substantial

(v) Management criteria be relatively clear

(vi) Epidemiology and natural history be reasonably understood.

B. Selection of Tracer Conditions for Foster Home Residents

Review of the evaluative studies on foster care cited in the preceding chapter reveals that the major diagnostic groups among chronic psychiatric patients in foster care are

(i) Chronic schizophrenia

(ii) Chronic brain syndrome without convulsive disorder

(iii) Chronic brain syndrome with convulsive disorder

(iv) Mental retardation.

The application of Kessner's criteria to these four diagnostic groups is set out in Table 4. All satisfy the first two criteria: functional impact is major and diagnosis is clear in the foster care population. Only chronic schizophrenia and mental retardation would be sufficiently prevalent in the practice of a primary care physician

Table 4. SELECTION OF TRACER CONDITIONS FOR FOSTER HOME RESIDENTS

Kessner's criteria	Condition			
	Chronic schizophrenia	Chronic brain syndrome without convulsive disorder	Chronic brain syndrome with convulsive disorder	Mental retardation
Functional impact	Major			
Diagnosis	Established in this population			
Prevalence				
In total population per 100,000	250 (14, 49)	600 (64)	500 (64)	3,000 (16)
In practice of physician attending foster home estimated per 1,000	10	2	3	10
Impact of care	Substantial	Slight	Substantial	Slight
Management criteria consensus	Reasonable	Fair	Reasonable	Fair
Understanding of epidemiology	Moderate			

attending foster care homes. The estimate for the number of chronic schizophrenics cared for by such a physician was derived from a survey of the residential homes for special care in Haldimand County, Ontario. The estimates for the other conditions are extrapolated from the total population prevalence with some allowance for those in institutional care. Of chronic schizophrenia and mental retardation, the impact of care and consensus of management criteria is only adequate for chronic schizophrenia. The adequacy of these two criteria will be outlined in the next two sections.

C. Impact of Medical Care in Chronic Schizophrenia

Medically administered therapies relevant to chronic schizophrenia are maintenance neuroleptic therapy and psychotherapy. Psychotherapy does not have an established role. Klein and Davies describe the evidence for the usefulness of psychotherapy in chronic schizophrenia as anecdotal, uncontroiled and not impressive (40).

However there is excellent evidence for the value of maintenance neuroleptic therapy (i.e. the use of tranquillising drugs) in preventing relapse in chronic schizophrenia. The use of Chlorpromazine in the management of schizophrenia was first reported in Europe by Hamon, Paraire and Velluz (5)

and in North America by Lehmann and Hanrahan (43). Since then the value of Chlorpromazine and other neuroleptics in treating both acute and chronic schizophrenia has been repeatedly demonstrated. Most convincing is the National Institute of Mental Health collaborative study involving over 800 patients randomly assigned to four groups: high dose (2,000 mg. Chlorpromazine), low dose (300 mg. Chlorpromazine), placebo and choice of treating physician (59). Two hundred and ten chronic schizophrenics were assigned to a placebo for a twenty four week period, in which time forty per cent regressed (determined by principal investigator) and had to be returned to known medication, compared to only thirteen per cent of the low dose patients and six per cent of the high dose patients. The relapse rate was much greater for patients whose pre-study neuroleptic dose was greater than 300 mg. of Chlorpromazine. More recently the National Institute of Mental Health Collaborative Outpatient Study in Schizophrenia has clearly established the value of Chlorpromazine in preventing rehospitalisation in discharged schizophrenic patients (35).

D. Consensus of Medical Management Criteria in Chronic Schizophrenia

There is evidence that there was good agreement on

the value of maintenance neuroleptic therapy for chronic schizophrenia in the decade preceding the definitive National Institute for Mental Health randomised controlled trial. At least four uncontrolled trials of withdrawal of neuroleptic therapy in large series of chronic schizophrenic patients were published in major psychiatric journals prior to 1964 (7, 24, 36, 55, 73).

E. Maintenance Neuroleptic Therapy in Chronic Schizophrenia for Foster Home Residents

The preceding sections have demonstrated that a review of the adequacy of maintenance neuroleptic therapy in chronic schizophrenics who need moderate to large doses of neuroleptics is a possible tracer condition for evaluating quality of medical care in foster home residents.

Operating definitions are required for what is a moderate dose of neuroleptics and for what is an adequate maintenance neuroleptic level. These problems are taken up in the next chapter.

A further dilemma is how the level of neuroleptic therapy is ascertained. An audit of prescriptions written

by the primary care physician and dispensed by pharmacists would be an indicator. However this method assumes good compliance with taking the medication prescribed, among foster home residents.

Nevertheless, despite the assumptions involved, maintenance neuroleptic therapy in chronic schizophrenics offers promise as a tracer condition for the evaluation of medical care among foster home residents.

Chapter 5

METHOD

The review in Chapter 3 of previous evaluative studies of foster care demonstrated that older age, greater length of previous psychiatric hospitalisation, greater caretaker interest and urban location of homes contributed to better outcomes. In Chapter 4 methods for evaluating quality of health care for foster home residents were considered. This chapter sets out the application of these ideas to the present study.

This research is intended to provide a partial evaluation of the Residential Homes for Special Care program in the Hamilton area. In the following section the cohort studied is described. Subsequent sections review the objectives of the program to establish which can be subjected to evaluation and explain the evolution of operating definitions of standards for use in evaluation. Later sections describe the design, hypotheses, analysis, sources of data and handling the data.

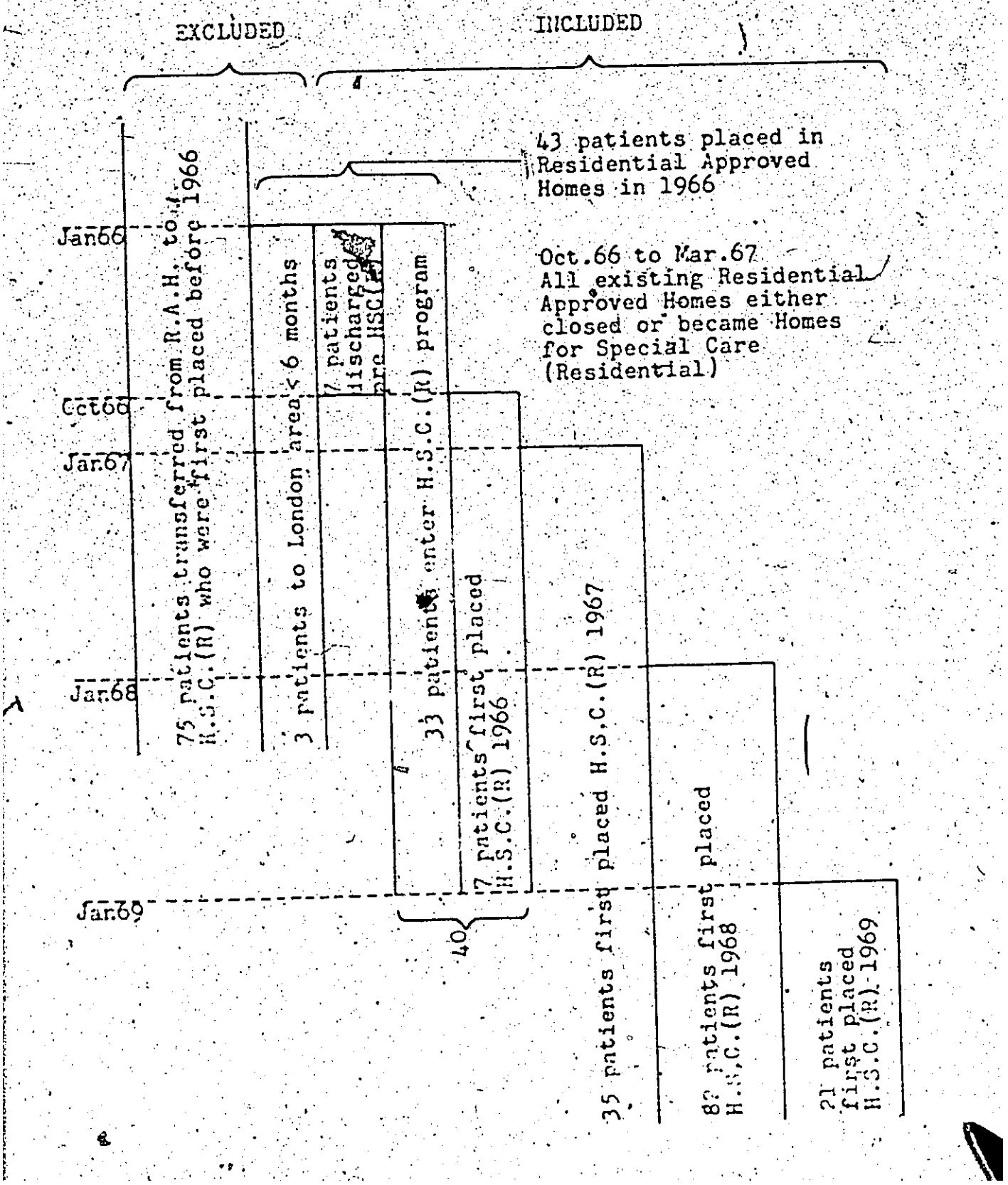
A. Description of Cohort Studied

The composition of the cohort can be understood by referring to Table 5. All residents first discharged to Hamilton area residential homes for special care in the years 1967, 1968 and 1969 were included. This program began in the Hamilton area in October 1966 and the first homes licensed were existing approved homes. To increase the cohort size, all residents first discharged to approved homes in 1966 were added as the great majority of these were still in care when these homes became homes for special care between October 1966 and March 1967.

Exclusions were 75 residents first placed in approved homes before 1966 and three residents first placed in approved homes in 1966 who were transferred to London area approved homes within six months.

The area covered by the Hamilton Homes for Special Care Office included the City of Hamilton and Wentworth County (now Regional Municipality of Hamilton-Wentworth), the west half of Halton County (now Regional Municipality of Halton), Brant County, Haldimand County (now Regional Municipality of Haldimand-Norfolk) and Lincoln and Welland Counties (now Regional Municipality of Niagara). Residents in the cohort were placed in 41 homes within this area.

Table 5. COMPOSITION OF COHORT



B. Objectives of the Residential Homes for Special Care Program.

Rochon suggested that careful specification of different levels of program objectives is a necessary prerequisite to any evaluation (78). The objectives set out below follow his classification.

Sources examined to determine program objectives were the Homes for Special Care Act (31) and regulations under that Act (30), speeches in the Ontario Legislature at the time the Act was introduced (29), Annual reports of the Ontario Department of Health from 1964 to 1970 (28) and the article by Cormack and Holling (13). Representative quotations from these sources have already been given in Chapter 1 Section C.

1. Overall objectives.

(a) To reduce psychiatric hospital overcrowding and to increase resources for acute patients.

(b) To improve the functioning of chronic psychiatric patients.

Evidence that the first overall objective had been achieved in the Queen Street Mental Health Centre (Toronto)

area had been presented by Allodi and Kedward (2). It seemed reasonable to assume that the same had been achieved in the Hamilton area.

The second overall objective was given more detailed consideration.

2. Intermediate and operational objectives in improving the functioning of chronic psychiatric patients

(a) Intermediate objective - To improve functioning by promoting integration into the community.

Operational objectives

(i) To locate residential homes geographically so as to facilitate community integration.

(ii) To select hostesses for their ability to encourage community interest in the residents.

(iii) To provide field workers, qualified as psychiatric nurses or social workers, whose training should enable them to help hostesses promote community integration.

(iv) To provide an occupational therapist to advise hostesses on ways of stimulating activities among residents.

(b) Intermediate objective - To improve functioning by creating a home-like atmosphere in the residential homes.

Operational objectives

(i) To provide reasonable space and privacy for each resident.

(ii) To avoid homes with large numbers of residents.

(iii) To select hostesses for their ability to provide sympathetic understanding and create a home-like atmosphere.

(c) Intermediate objective - To improve functioning by providing adequate medical care.

Operational objectives

(i) To provide medical care through local primary care physicians.

(ii) To supervise this medical care through medical officers of health.

(iii) To provide psychiatric consultation when needed through psychiatric hospital staff.

Four of these operational objectives were examined in the present study: home location, home size, quality of hostesses and quality of medical care.

The following section explains the manner in which operating definitions were developed to measure these operational objectives.

C. Operational Definitions for Measures used in Evaluating Program Objectives

1. Home location

Homes located within the City of Hamilton or the Town of Dundas were classified as urban. No homes were located in other urban centres. All other homes were classified as rural though some were in small towns, chiefly Dunnville.

2. Home size

Homes were classified by the greatest number of residents for a sustained period (at least six months) in the years 1966 to 1970.

3. Quality of hostesses

A former field worker who had been extensively involved in the Hamilton area program during the years under study (1966 to 1972) made global ratings of the quality of hostesses on a four point scale. Unfortunately it was not possible to find a second person who knew the homes in the period studied, to provide independent ratings to check on observer variation. Factors to be considered in making the global ratings were attitude of hostesses in

encouraging social contacts in their residents, adequacy of supervision of medication and cooperation with field workers.

4. Quality of medical care

Three indirect measures derived from a prescription audit were used; adequate neuroleptic maintenance in chronic schizophrenics; presence of drug interactions; frequency of drug prescribing. The manner in which operating definitions were evolved for each is set out below.

(a) Adequate neuroleptic maintenance in chronic schizophrenia

Five persons deemed to have some expert knowledge of psychopharmacology were polled by questionnaire and personal interview as to what were adequate standards for neuroleptic maintenance in chronic shcizophrenia requiring moderate neuroleptic levels. Although each of Drs. Fitzgerald, Grof, MacCrimmon, Saxena and Singh provided useful guidance, the operating definition used is a consensus and synthesis which is the responsibility of the author.

Operating definition

Adequate neuroleptic maintenance in residents with a hospital discharge diagnosis of schizophrenia and a hospital

discharge neuroleptic level equivalent to at least 200 mg./day of Chlorpromazine, is maintaining a neuroleptic dose at least half of the dose level at hospital discharge as determined by audit of prescriptions written by the primary care physician.

Important assumptions involved in this definition were

(i) The neuroleptic dose at hospital discharge was the appropriate dose for the resident.

(ii) Compliance was high. The neuroleptic was taken by the patient as prescribed by the physician.

(iii) All neuroleptics could be converted to equivalent doses of Chlorpromazine.

Justifications for these assumptions were

(i) It was feasible to partially check this assumption by examining the neuroleptic doses prescribed in the hospital in the year prior to discharge.

(ii) Compliance could not be examined directly. It seemed reasonable to assume that compliance would be high in a supervised setting where all drugs were given out by the hostess at prescribed times.

(iii) This assumption had been used widely in studies of neuroleptic therapy (5, 59). The multipliers used to obtain Chlorpromazine equivalent doses are taken from Ban, T.A.: Schizophrenia: A Psychopharmacological Approach (5) and are

given in Table 6a.

Table 6a. MULTIPLIERS TO OBTAIN CHLORPROMAZINE EQUIVALENT DOSES

Drug	Multiplier
Chlorpromazine	1
Chlorprothixine	1
Haloperidol	50
Methotrimeprazine	1.33
Perphenazine	10
Thioridazine	1
Trifluoperazine	20

(b) Drug interactions

Standard texts on psychotropic drug management (5, 40, 62) and the American Pharmaceutical Association's Evaluation of Drug Interactions 1973 (3) were consulted.

The following drug interactions were regarded as significant regardless of dose levels:

Neuroleptic - barbiturate or glutethemide except with a diagnosis of epilepsy.

Neuroleptic - antihypertensive medications.

Neuroleptic - amphetamine or methylphenidate.

Tricyclic antidepressant - antihypertensive medications.

(c) Frequency of drug prescribing

If prescriptions were routinely written every three

months, it was possible that a mean frequency of prescribing greater than four times a year could indicate a greater frequency of office visits and perhaps a better quality of care. This variable was included at the suggestion of Dr. D. Fitzgerald. It was recognised that differences in the medical and psychiatric conditions could account for differences in prescribing frequency. An example is residents with mental retardation for whom no regular drugs were prescribed.

D. Design

This research attempted to test the usefulness of the measures for evaluating program objectives developed in the preceding section. This was done by examining in a series of cohort studies whether any association existed between these measures and more certain measures of the program's effectiveness, such as discharges and rehospitalisations. The usefulness of using these outcomes had been demonstrated from the literature review in Chapter 3.

Every resident was followed to one of these outcomes.

1. Stable in program at three years after discharge.

OR One of the following outcomes occurring within three years

of hospital discharge

2. Discharged to community
3. Discharged to non Homes for Special Care institution
4. Readmitted acutely to psychiatric hospital
5. Readmitted electively to psychiatric hospital for rehabilitation
6. Died.

Other possible determinants of outcome suggested by the literature review were resident factors such as age, sex, disease type and duration of psychiatric hospitalisation and the frequency of transfers between homes. This set of variables was included to aid in interpretation of biasses in cohorts derived from the measures for evaluating program objectives. They too were initially tested as individual cohort studies.

E. Hypotheses

In the hypotheses that follow "discharge" = discharged to community and "rehospitalisation" = readmitted acutely to psychiatric hospital.

1. Resident factors as determinants of outcome

(a) Age

Hypothesis 1

Residents who are older than the median age will have fewer rehospitalisations and fewer discharges than residents who are younger than the median age.

(b) Sex

Hypothesis 2

There is no difference between male and female residents with respect to rates of rehospitalisation and discharge.

(c) Disease type

Hypothesis 3A

There is no difference between residents with a hospital discharge diagnosis of schizophrenia and residents with other diagnoses with respect to rates of rehospitalisation and discharge.

Hypothesis 3B

Residents with a hospital discharge diagnosis of

chronic brain syndrome will have more rehospitalisations and fewer discharges than residents with other diagnoses.

(d) Extent of previous hospitalisation

Hypothesis 4A

Residents who have had longer than the median number of previous psychiatric hospitalisations will have fewer rehospitalisations and fewer discharges than residents who have had less than the median.

Hypothesis 4B

Residents who have had longer than the median previous psychiatric hospitalisation time will have fewer rehospitalisations and fewer discharges than residents who have had less than the median.

2. Foster home factors as determinants of outcome

(a) Size

Hypothesis 5

Homes of size less than the median will have fewer rehospitalisations and more discharges than homes of size greater than the median.

(b) Rural or urban location

Hypothesis 6

Homes in urban settings will have fewer rehospitalisations and more discharges than homes in rural settings.

(c) Quality of hostesses

Hypothesis 7

Homes rated superior or above average will have fewer rehospitalisations and more discharges than homes rated inferior or below average.

(d) Frequency of transfers between homes

Hypothesis 8

Residents who have been in the program at least a year with an experience of mean home placements less than the median will have fewer rehospitalisations and more discharges than residents with greater than the median home placements per year.

(e) Changes over time

Hypothesis 9

There is an improving trend towards fewer

rehospitalisations and more discharges in cohorts of patients first discharged in 1966 through 1969.

3. Drug prescribing factors as determinants of outcome

(a). Neuroleptic maintenance in schizophrenia

Hypothesis 10

Residents with a discharge diagnosis of schizophrenia and a neuroleptic dose at discharge equivalent to at least 200 mg. of Chlorpromazine/day, whose medication is reduced to less than half of the discharge dose at the prescription in effect at the middle of the last quarter before outcome (inadequate neuroleptic), will have a higher rate of rehospitalisation than those whose medication is reduced by less than half, is unaltered or is increased (adequate neuroleptic).

(b). Drug interactions

Hypothesis 11

Residents who have significant drug interactions according to the operational definition developed, in the prescription in effect at the middle of the last quarter before outcome will have a higher rate of rehospitalisation

than those in whom no drug interaction is noted.

(c) Frequency of drug prescribing

Hypothesis 12

Residents who have been in the program for at least one year for whom five or more prescriptions are written each year as a mean figure will have a lower rate of rehospitalisation than those for whom less than five prescriptions are written each year.

F. Analysis

The initial analysis of all of the hypotheses outlined above involved generating a two way table for each and testing the significance of any association with a Chi square statistic for two independent samples using Yates' correction for one degree of freedom (63). The pattern of change of outcomes in cohorts discharged over time was tested with a Chi square analysis for linear trend (4, 47).

If the results justified acceptance of hypothesis 10, supplementary analyses would be required to check the assumption that the neuroleptic dose at discharge was the appropriate one for the resident. This could be done by

examining prescriptions written at three, six, nine and twelve months before discharge to see if they were at variance with the neuroleptic dose at discharge. A similar check would be needed for the assumption that, for a reduction in neuroleptic medication to be a determinant of outcome that made biological sense, it must have occurred in the last or second to last quarter before rehospitalisation. This could be done by examining the neuroleptic doses of earlier quarters.

If the results justified the acceptance of hypothesis 11, supplementary analyses would be required to check the assumption that for drug interaction to be a determinant of rehospitalisation that made biological sense, it must have occurred in the last quarter before rehospitalisation. This could be done by examining prescriptions of previous quarters for drug interactions.

Because any conclusions based on univariate analyses are based on the assumption that apparent determinants were acting independently of each other, a series of correlations between apparent determinants was necessary to check this assumption.

The relative contribution of any apparent determinants was found by multiple regression analysis

(4, 26) and by logistic function regression (79) and displayed in sets of nested tables.

C. Sources of Data

Table 6b sets out the sources of data used in the study.

Despite the predictions of Kedward et al (37) that in Ontario it would not be possible to collect complete enough data to follow chronic psychiatric patients prospectively, data were available for every resident in the cohort for most variables.

Homes for Special Care Office records, hospital medical records, field worker's ratings of hostesses and frequency of drug prescribing were available for every case.

Prescriptions written by the primary care physicians were dispensed by the hospital pharmacies until December 31 1972. Pharmacy records were complete from the beginning of the program until October 1968, and from February 1970 until December 1972. Prescriptions dispensed from October 1968 to February 1970 were unavailable because of destruction of records. This meant that the prescription in effect at the

Table 6b. SOURCES OF DATA

Source of data	Variables		Extent of data
	Var.No.	Variable name	
H.S.C. Office Records Hamilton (168 res.) Lakeshore (3 res.)	1	Identification of residents in sample	171 residents
	2	First home (identifying code and size)	
	4	Half year when first placed	
	5	Time to outcome	
	7	Outcome	
	8	Home at outcome (identifying code and size)	
	10	Mean homes per year to outcome	
Daily patient movement for H.R.H. 1966	1	Identification of residents in sample	7 residents
Medical Records Psychiatric Hospital Hamilton	6	Age at outcome	178 residents
	11	Number of previous psychiatric hospitalisations	
	12	Duration of previous psychiatric hospitalisation	
	13	Diagnosis at time of first H.S.C.(R) placement	
	14	Type of neuroleptic at discharge	
	15	Dose of neuroleptic at discharge in Chlorpromazine equivalents	
	16-19	Proportion of discharge dose of neuroleptics at 3, 6, 9 and 12 months prior to discharge	
	20	Rating of in-hospital prescribing in year before discharge	
Ratings of field worker	3	First home (quality of hostess)	178 residents
	9	Home at outcome (quality of hostess)	
Prescription Records Psychiatric Hospital Pharmacy Hamilton (168 res.) Lakeshore (3 res.)	21	Mean prescriptions per year to outcome	178 residents
	22,25 ...52	Proportion of discharge neuroleptic dose at 2nd, 3rd ... 12th quarter	Incomplete because of destruction of records from Oct.68 to Feb.70 Prescription of last quarter before outcome available for 111 residents
	23,26 ...53	Rating of prescription at 2nd, 3rd ... 12th quarter	
	24,27 ...54	Outcome at end of 2nd, 3rd ... 12th quarter	
	55	Proportion of discharge neuroleptic dose at last quarter before outcome	
	56	Rating of prescription at last quarter before outcome	

middle of the last quarter before outcome could only be examined for 111 residents. The existence of index cards, available for each resident, on which the dates of dispensing prescriptions was recorded, allowed an estimate of the frequency of drug prescribing in each case.

H. Handling the Data

The extraction and coding sheets used are found in Appendix 1. Coding was done by the staff of the Field Survey Unit and keypunching by the staff of the Computation Services Unit, Health Sciences Centre, McMaster University.

Descriptive statistics and two way tables were generated using the CCSS (Conversational Computer Statistical System) program. Multiple regression analysis used the Statistical Package for the Social Sciences (54), and logistic function regression analysis used Logit program (courtesy of Prof. R. Roberts). Initial Chi squares, Spearman Correlation coefficients and Fisher Exact tests were done using programs made available by Dr. C. Goldsmith.

Chapter 6

RESULTS

The results are presented in the following sequence:

Descriptive statistics of single variables.

Univariate analysis of determinants of outcome for each hypothesis.

Correlations between apparent determinants.

Comparison of urban and rural cohorts.

Serendipitous findings from the prescription audit.

A. Descriptive Statistics

The frequency distributions of individual variables are set out in Tables 7 to 19. The histograms or bar graphs are divided by sex in each case. Means and standard deviations are given for variables that are ratio data.

1. Time first placed (Table 7)

Nearly half, 82 (46%), of all residents first placed

in the program from 1966 to 1969 were placed in 1968.

2. Outcome (Table 8)

The outcomes used in later analyses were:

(a) Discharge to community, 21 residents (12%) with a clear predominance of females, 18 (86%).

(b) Readmitted acutely, 52 residents (29%) with a sex distribution comparable with the total sample (each 58% female).

3. Placement duration (Table 9)

Eighty nine residents (50%) remained in the program at three years.

4. Resident variables

(a) Age (Table 10)

The mean age for males was older (55.3 years) than the mean age for females (53.4) years). This difference was not statistically significant using a two sample t test.

(b) Diagnosis (Table 11)

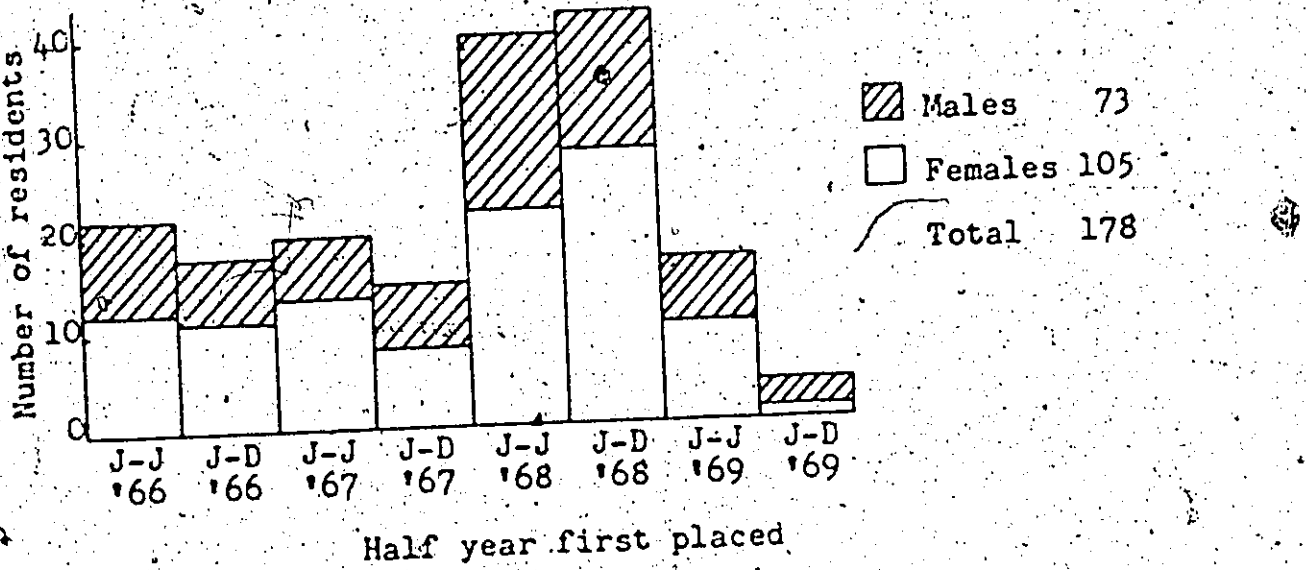
The most frequent disgnoses were:

Schizophrenia, 103 residents (58%)

Mental retardation, 24 residents (13%)

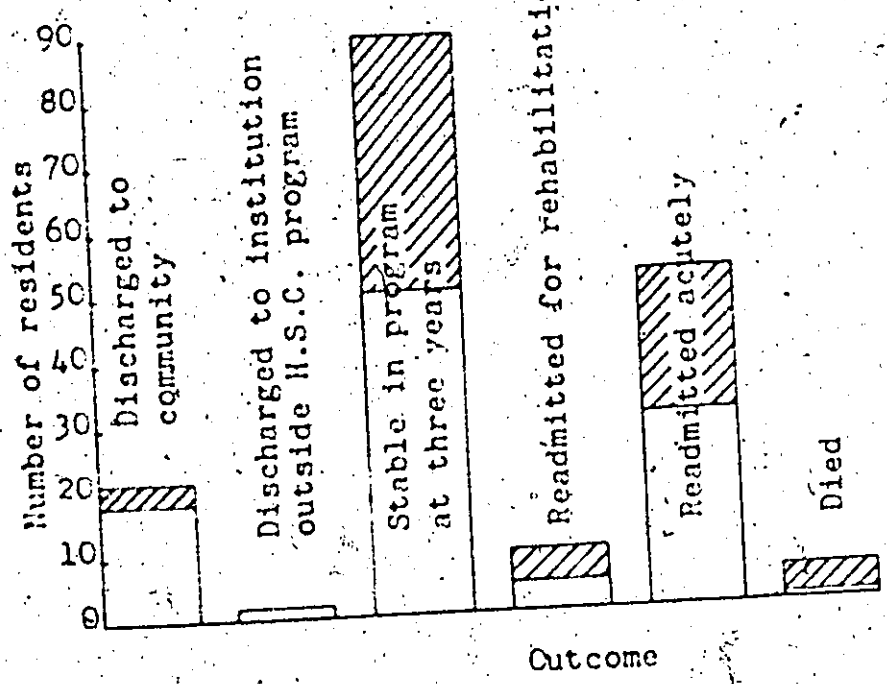
TIME FIRST PLACED

Table 7. Histogram for Time First Placed by Half Years



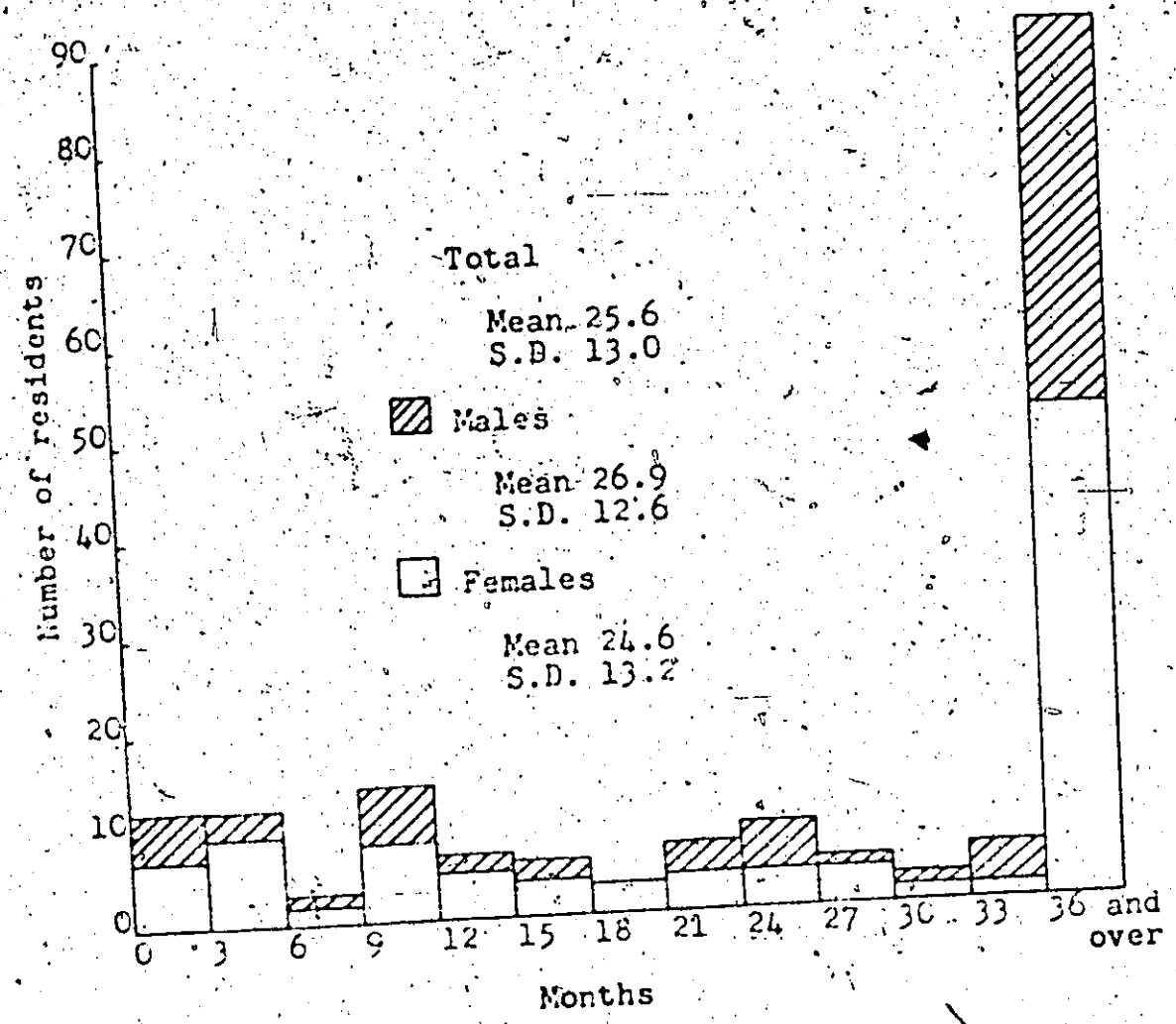
OUTCOME

Table 8. Bar graph for outcomes



PLACEMENT DURATION

Table 9. Histogram for Placement Duration by Quarter-Years



RESIDENT VARIABLES

Table 10. Histogram for Age by Five Year Intervals

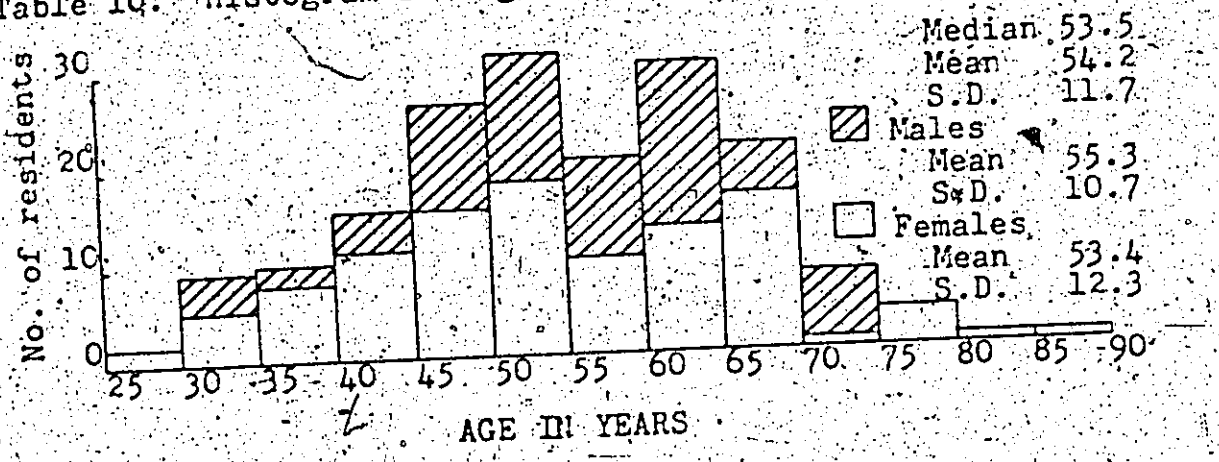
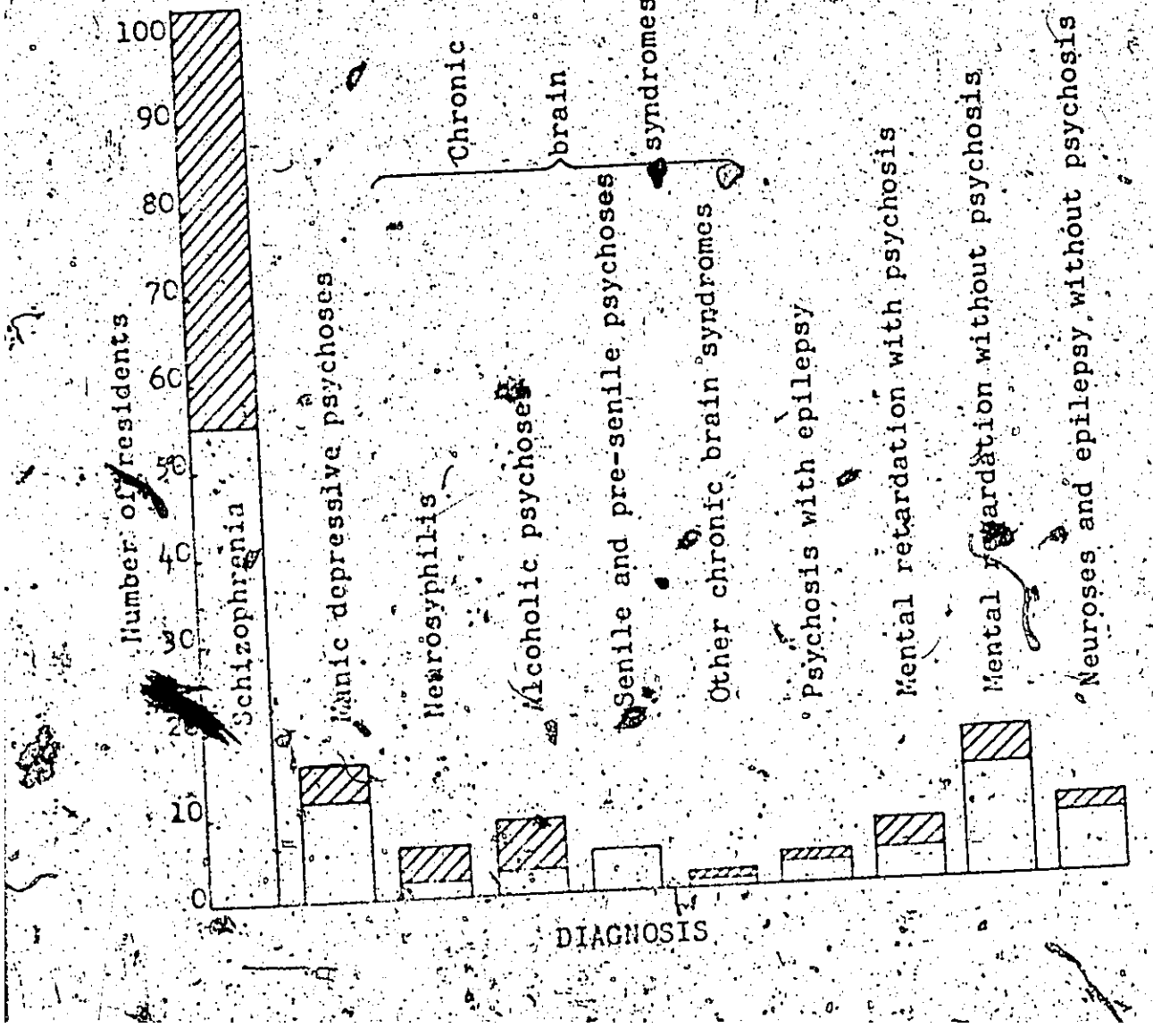


Table 11. Bar Graph for Diagnostic Groups



Chronic brain syndromes, 22 residents (12%).

(c) Number of previous psychiatric hospitalisations (Table 12)

Forty one males (56%) had only one hospitalisation compared to 31 (31%) of the females. This association was highly significant $\chi^2=11.61$ ($p<.001$).

(d) Duration of previous psychiatric hospitalisation (Table 13)

By contrast, males had longer duration of previous psychiatric hospitalisation. The mean duration for males was 16.3 years compared to 10.7 years for females. This difference was statistically significant ($p<.001$) using a two sample t test.

Thus the modal male resident had had a single but long previous psychiatric hospitalisation, while the modal female resident had had more than one previous psychiatric hospitalisation for a shorter total time. The interpretation of these results is difficult. Perhaps the men were more ill than the women although there were no differences in distribution of diagnoses. Perhaps the results reflect a selection bias with men with shorter previous hospitalisation time being selected for other more intensive treatment programs.

RESIDENT VARIABLES (continued)

Table 12. Bar Graph for Number of Previous Psychiatric Hospitalisations

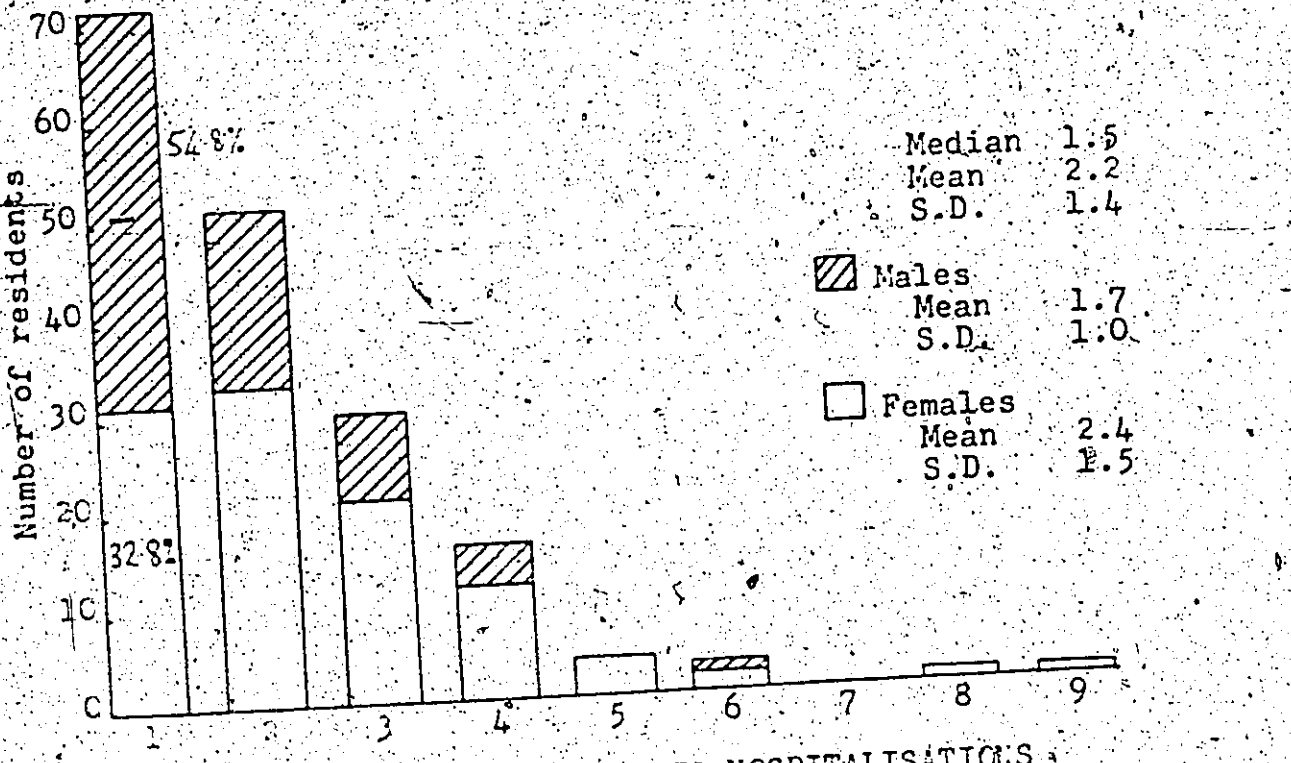
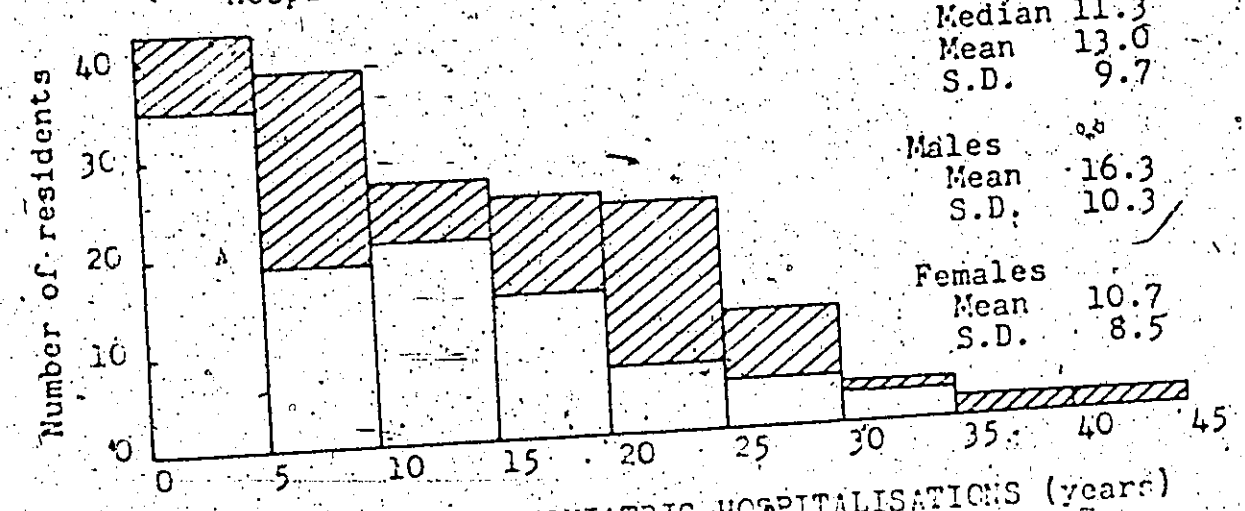


Table 13. Histogram for Duration of Previous Psychiatric Hospitalisation by Five Year Intervals



5. Foster home variables

(a) First home size (Table 14)

The most frequent home size was seven residents. This distribution probably reflects the effect of the Regulations under the Homes for Special Care Act. The provisions for exits and fire safety measures are more demanding for homes of more than seven residents (30).

(b) Outcome home size (Table 15)

This table shows a similar pattern. Twenty one residents (12%) initially placed in residential homes had been transferred to Homes for Special Care (Nursing Home) by the end of the three year follow up period.

(c) Home location and quality of hostess (Table 16)

One hundred and thirty one residents (74%) were first placed in rural homes. At outcome 108 residents (69%) were in rural homes. This might reflect the decreasing use of rural homes in 1968 and 1969.

(d) Mean homes per year (Table 17)

The most frequent rates were 0.3 (reflecting one home for three years) and 0.6 (reflecting two homes for three years).

FOSTER HOME VARIABLES

Table 14. Bar Graph for First Home Size by Mean Number of Residents

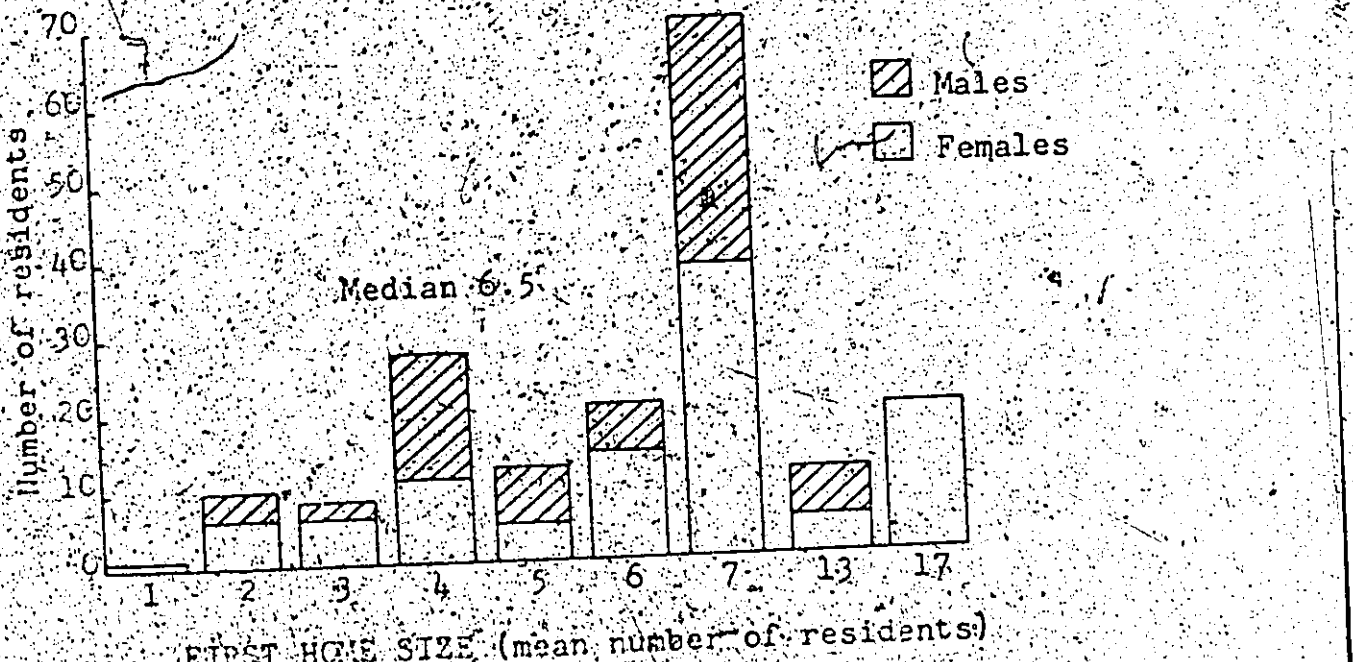
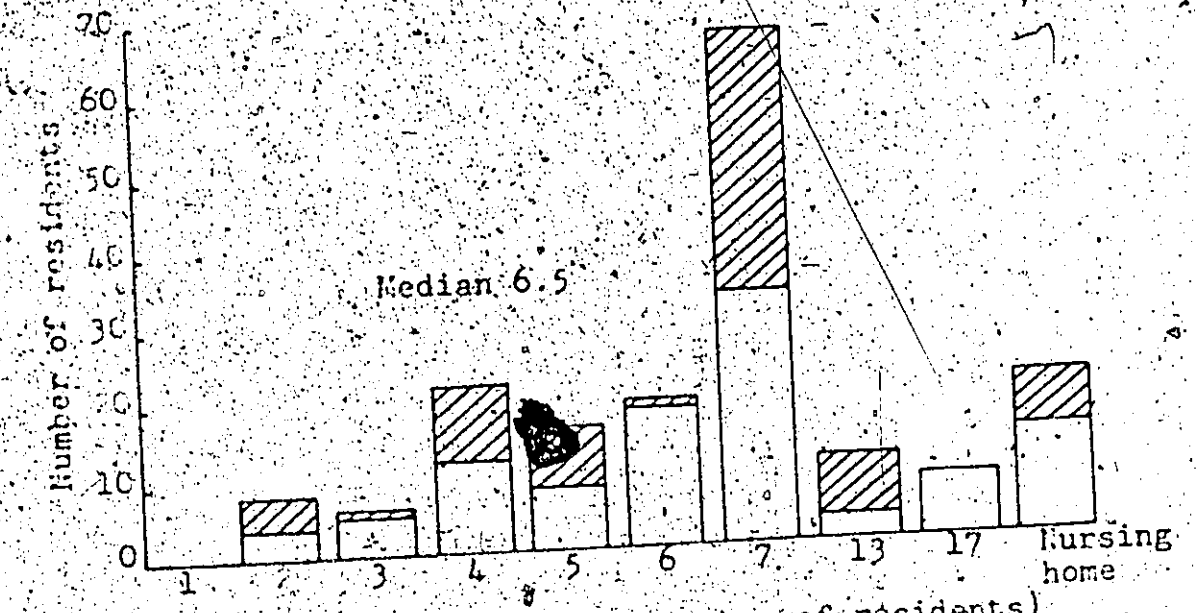
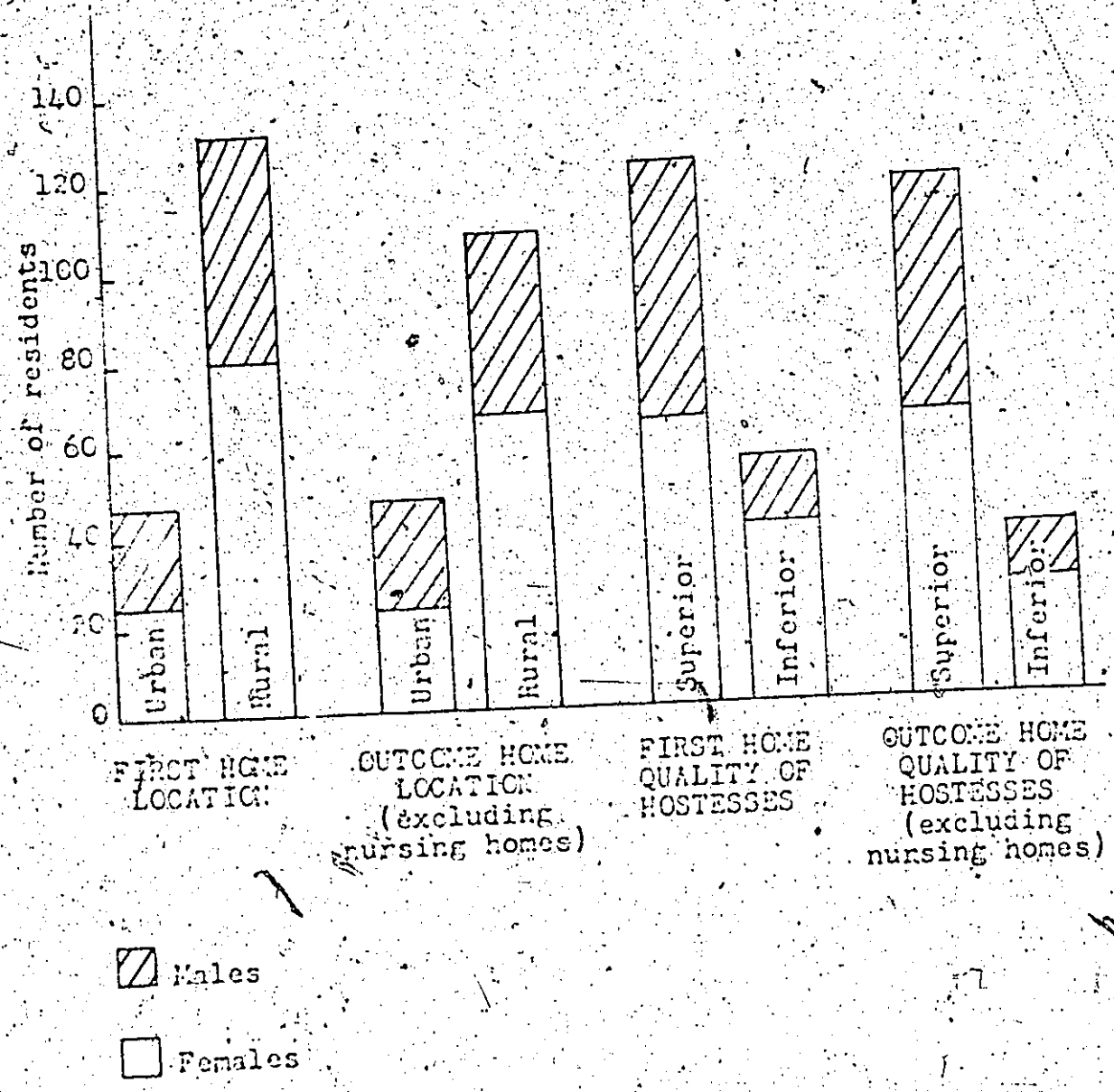


Table 15. Bar Graph for Outcome Home Size by Mean Number of Residents



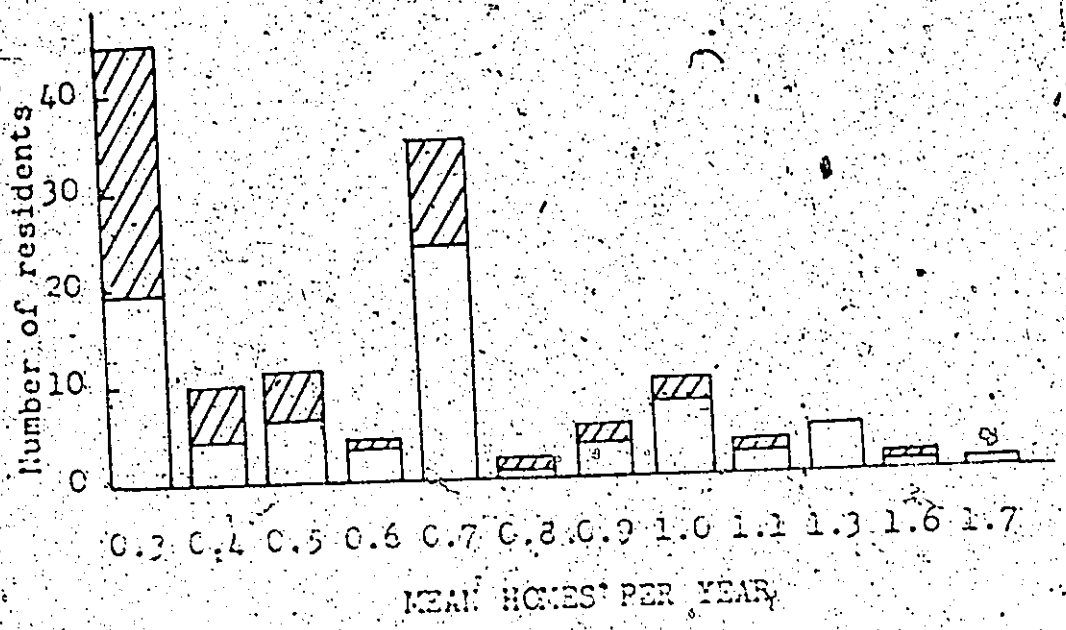
FOSTER HOME VARIABLES (continued)

Table 16. Bar Graphs for Home Location and Quality of Hostesses



FOSTER HOME VARIABLES (continued)

Table 17. Bar Graph for Frequency of Transfers between Homes as Mean Homes per Year (excluding residents less than one year in program)



	Males	Females
Median	.55	
Mean	.61	Mean .56	Mean .67
S.D.	.32	S.D. .44	S.D. .31

6. Drug prescription variables

(a) Neuroleptics at discharge (Table 18)

The distribution of 136 residents discharged on neuroleptics was:

Chlorpromazine	42	(30%)
Trifluoperazine	38	(28%)
Thioridazine	18	(13%)
Combinations of two neuroleptics	17	(13%)
Sundry single neuroleptics	21	(15%)

Seventy seven residents (57%) were discharged on more than the equivalent of 200 mg. Chlorpromazine /day.

(b) Drug interactions

Eight residents (4%) had drug interactions at some time during the period studied. Nine residents (5%) had drug interactions present in prescription in Hospital in the year before discharge.

(c) Mean prescriptions per year (Table 19)

Fifty five residents (31%) had five or more prescriptions as a mean figure each year.

DRUG PRESCRIPTION VARIABLES

Table 18a. Bar Graph for Type of Neuroleptic Prescribed at Discharge (136 residents only)

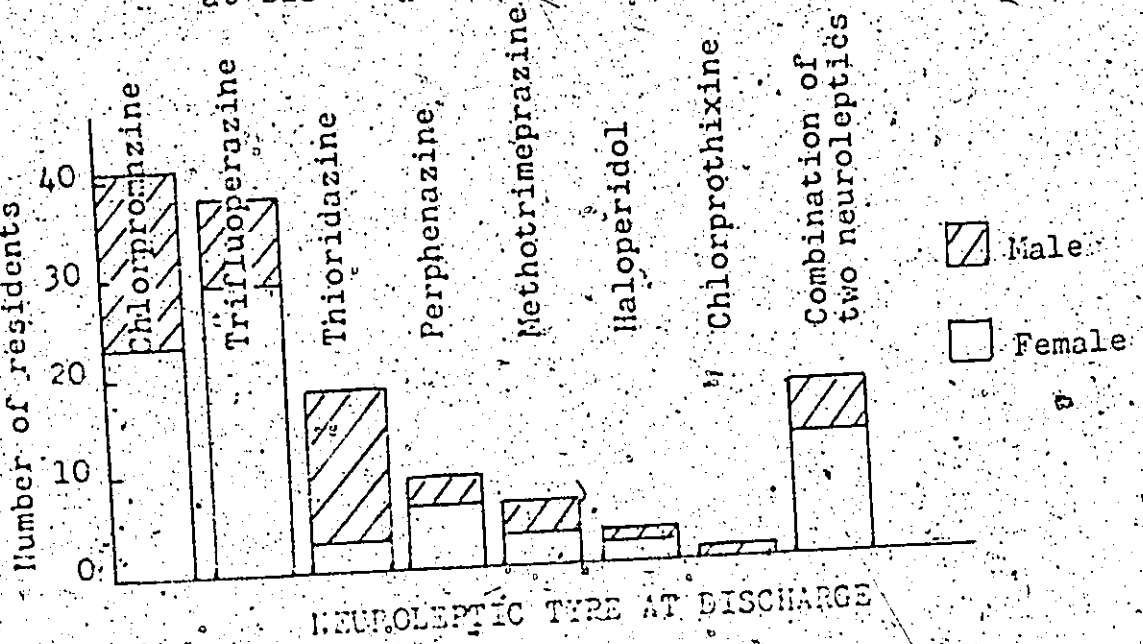
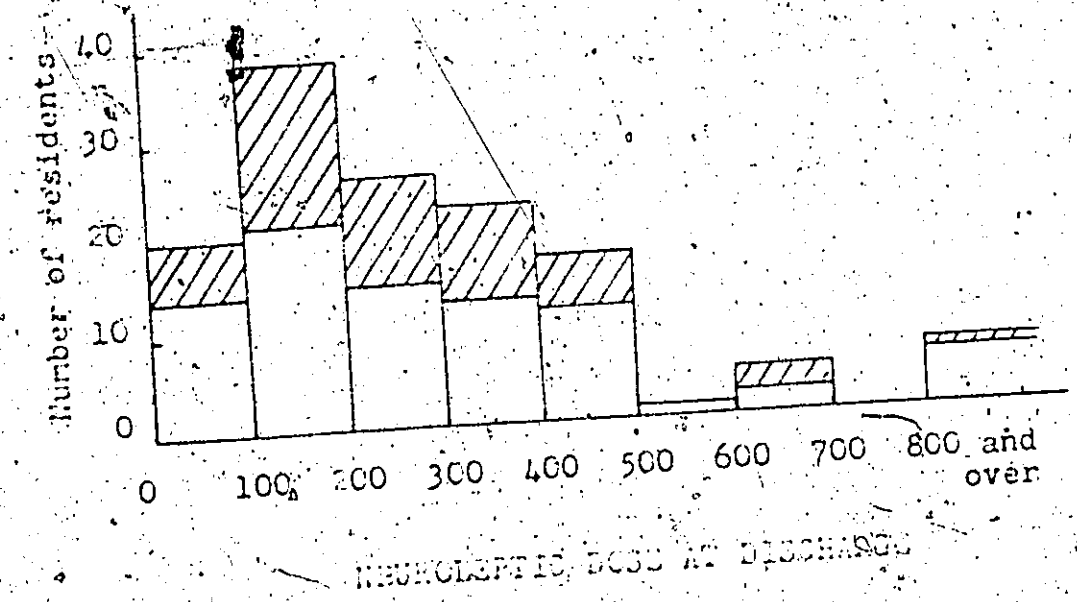
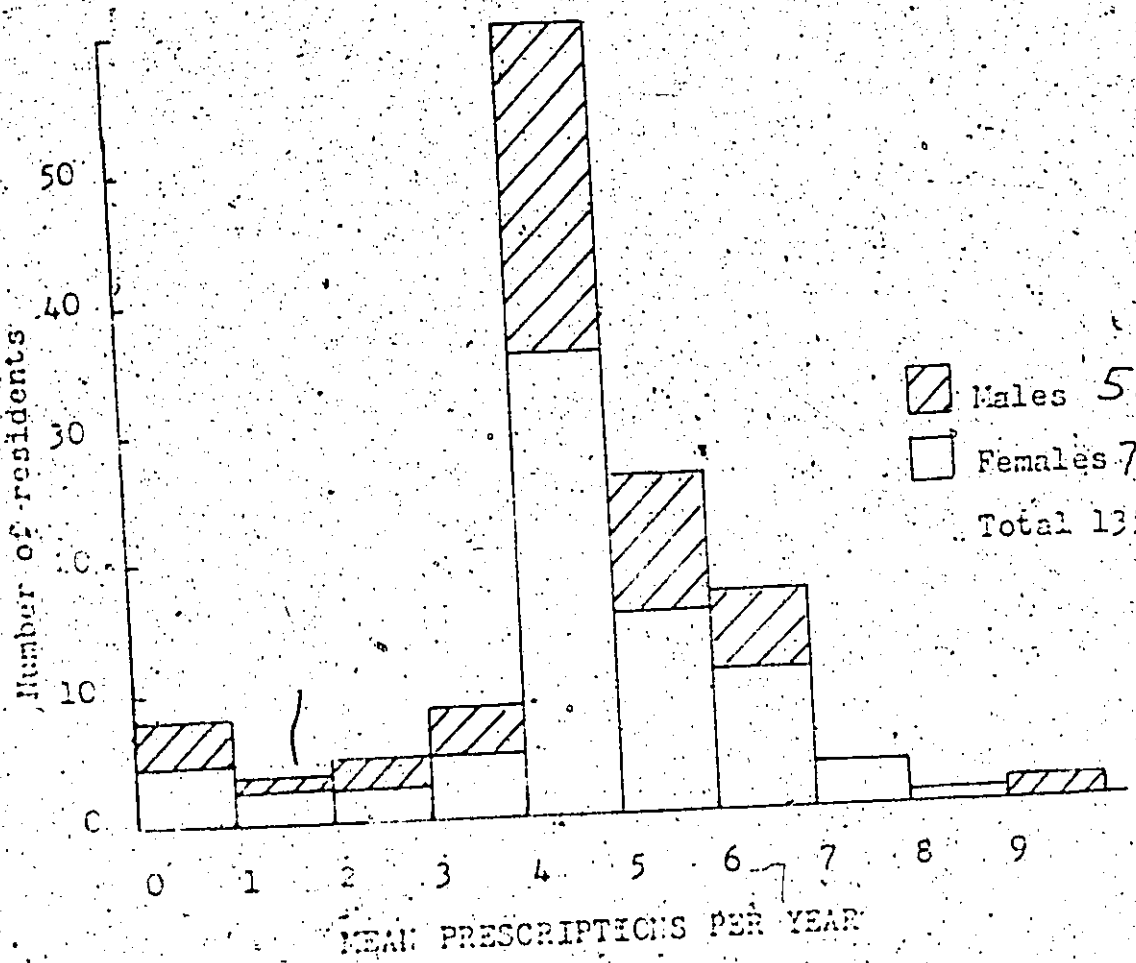


Table 18b. Histogram for Dose of Neuroleptic Prescribed at Discharge Converted to Chlorpromazine Equivalents per Day (136 residents only)



DRUG PRESCRIPTION VARIABLES (continued)

Table 19. Histogram for Frequency of Drug Prescriptions as Mean Prescriptions per Year (excluding residents less than one year in program)



B. Univariate Analysis of Determinants of Outcome

Two way tables for all hypotheses are found in Appendix 2. Tables which were significant or approached significance are set out in Tables 20 and 21.

Significant determinants of rehospitalisation were rural location of first home or outcome home and inferior quality of outcome home. Inferior quality of first home just failed to achieve statistical significance, while small first home size and four or less mean prescriptions per year were lesser non significant trends.

All these results were in the predicted direction except for small homes which were associated with more rather than fewer rehospitalisations.

Significant determinants of discharge were younger age, shorter duration of previous psychiatric hospitalisation and female sex. More than one previous psychiatric hospitalisation and urban first home location were non significant trends as predictors of discharge.

All these results were in the predicted direction except for female sex which was related to more discharges when no sex difference had been predicted and less than the

Table 20. DETERMINANTS OF REHOSPITALISATION - TWO WAY TABLES

Outcome home
(excluding nursing homes)
Location

	Rehosp.	Other	Total
Rural	43 (40%)	65	108
Urban	5 (10%)	44	49
Total	48	109	157

Highly significant
$\chi^2 = 12.55$ ($p<.001$)

Outcome home
(excluding nursing homes)
Quality of hostesses

	Rehosp.	Other	Total
Superior	28 (24%)	90	118
Inferior	20 (51%)	19	39
Total	48	109	157

Very significant
$\chi^2 = 9.22$ ($p<.005$)

First home
Location

	Rehosp.	Other	Total
Rural	46 (35%)	85	131
Urban	6 (13%)	41	47
Total	52	126	178

Very significant
$\chi^2 = 7.31$ ($p<.01$)

First home
Quality of hostesses

	Rehosp.	Other	Total
Superior	30 (24%)	93	123
Inferior	22 (40%)	33	55
Total	52	126	178

Non significant
trend
$\chi^2 = 3.76$ ($p<.10$)

First home
Size

Number of residents	Rehosp.	Other	Total
< med. 6.5	28 (36%)	50	78
> med. 6.5	24 (24%)	76	100
Total	52	126	178

Non significant
trend
$\chi^2 = 2.45$ ($p<.20$)

Frequency of drug prescribing
(excluding residents less than one year in program)

Mean pre-scriptions per year	Rehosp.	Other	Total
< med. 4.5	17 (20%)	70	87
> med. 4.5	5 (10%)	43	48
Total	22	113	135

Non significant
trend
$\chi^2 = 1.69$ ($p<.20$)

Table 21. DETERMINANTS OF DISCHARGE - TWO WAY TABLES

Age

Years	Disch.	Other	Total
< med. 53.5	17 (20%)	67	84
> med. 53.5	4 (4%)	90	94
Total	21	157	178

Very significant
$\chi^2 = 9.41$ ($p < .005$)

Duration of previous psychiatrit hospitalisations

Years	Disch.	Other	Total
< med. 11.3	17 (19%)	72	89
> med. 11.3	4 (4%)	85	89
Total	21	157	178

Very significant
$\chi^2 = 7.78$ ($p < .01$)

Sex

	Disch.	Other	Total
Male	3 (4%)	70	73
Female	18 (17%)	87	105
Total	21	157	178

Significant
$\chi^2 = 5.83$ ($p < .02$)

Number of previous psychiatric hospitalisations

	Disch.	Other	Total
< med. 1.5	5 (7%)	67	72
> med. 1.5	16 (15%)	90	106
Total	21	157	178

Non significant trend
$\chi^2 = 2.01$ ($p < .20$)

First home Location

	Disch.	Other	Total
Rural	12 (9%)	119	131
Urban	9 (19%)	38	47
Total	21	157	178

Non significant trend
$\chi^2 = 2.43$ ($p < .20$)

median number of previous psychiatric hospitalisations which was associated with fewer rather than more discharges.

Other hypotheses were rejected. The following variables were not significant for either discharge or rehospitalisation: diagnosis of schizophrenia; diagnosis of chronic brain syndrome; size of outcome home; frequency of transfers between homes. The next set of variables were not significant for rehospitalisation: age; sex; number and duration of previous psychiatric hospitalisations; adequacy of neuroleptic maintenance and drug interaction. These variables were not significant for discharge: first home size; outcome home location; and quality of hostesses for both first and outcome homes.

Chi square for linear trend on the outcomes for each year showed non significant trends, although for rehospitalisation it did approach a significant level.

It is unwise to draw conclusions from this univariate analysis unless the apparent determinants of outcome can be shown to be working independently of one another. If two or more of these determinants were highly correlated with each other, a single one of them might really be responsible for all of the effects observed, and conversely the effect of a barely significant but real determinant

might be masked.

C. Correlations between Apparent Determinants

Spearman rank order correlation coefficients (63) were calculated for all possible correlations between the twelve apparent determinants from Tables 20 and 21 using dichotomised data. Significant correlations are listed in Table 22. To simplify the presentation, outcome home location and outcome home quality correlations are exclude as they essentially duplicate the equivalent first home variables with which they are highly correlated.

The first five correlations in the table show that there were significant correlations between the apparent determinants of discharge. It was conceivable that two of them, such as age and sex, could account for most of the effect. Duration of previous psychiatric hospitalisation correlated with age, which was not very surprising, and with sex, which was apparent from the descriptive statistics. Number of previous psychiatric hospitalisations was correlated with sex, while first home location was correlated with both age and sex. There was no significant correlation between age and sex so that they could be considered

Table 22. SIGNIFICANT CORRELATIONS BETWEEN APPARENT DETERMINANTS

Pair of variables	Spearman's Rank Order Correlation
Age - First home location	.15
Sex - First home location	-.19
Sex - Duration of previous psychiatric hospitalisation	-.19
Sex - Number of previous psychiatric hospitalisations	-.27
Age - Duration of previous psychiatric hospitalisation	.29
First home location - Mean prescriptions per year	-.24
First home location - First home quality	.40
First home location - Outcome home location	.80

Based on 178 residents in each case, with the exception of First home location - Mean prescriptions per year which is based on 135 residents

independent of each other.

The last three correlations in the table show that there were even greater correlations between the apparent determinants of rehospitalisation. Here, home location (whether first or outcome home) seemed to account for most of the effect. Mean prescriptions per year was highly correlated with first home location and was unlikely to be exerting an independent effect. First home quality was highly correlated with home location because all urban homes had been rated superior. A multivariate technique was needed to see if home quality exerted any effect in addition to home location. First home size was not significantly correlated with first home location and might conceivably exert a small independent effect.

D. Multivariate Analysis and Nested Tables

The dichotomised variables of the apparent determinants were examined using multiple regression (4) and logistic function regression (79). Both techniques gave the same significant variables. The various regression equations have not been included in the results. Instead, a set of nested tables for rehospitalisation (Table 23) and discharge (Table 24) are given to display

the results of using the multivariate techniques.

Chi square tests, or where appropriate Fisher Exact tests were applied to all component tables in these nested tables and significant differences are noted.

An unexpected result was the effect of age on rehospitalisation within the rural subset (Table 23). Age had a non significant correlation with rehospitalisation (r_s=.0856) . However it did have some effect (though not quite reaching statistical significance) after controlling for location. This effect had been submerged by the more powerful determinant, first home location. This finding illustrated the limitations of a univariate analysis. First home size and quality of hostesses were included because they each showed a persistent effect, though this was very spread and hence never statistically significant within any sub table.

The nested table for determinants of discharge (Table 24) were essentially congruent with the pattern shown on the initial univariate analyses. However it did seem that duration of previous psychiatric hospitalisation had some effect independent of age.

Table 23. DETERMINANTS OF REHOSPITALISATION - NESTED TABLES

First Home Location	Age	First Home Size	Quality of Hostess	
Urban 6/47 (13%)	Young 3/24 (13%)	Small 2/10 (20%)	Superior	2/10 (20%)
			Inferior	-
		Large 1/14 (7%)	Superior	1/14 (7%)
			Inferior	-
	Old 3/23 (13%)	Small 2/6 (33%)	Superior	2/6 (33%)
			Inferior	-
		Large 1/17 (6%)	Superior	1/17 (6%)
			Inferior	-
χ^2 =7.31 Very significant (p<.01)				
Rural 46/131(35%)	Young 25/56 (47%)	Small 13/29 (45%)	Superior	9/18 (50%)
			Inferior	4/11 (36%)
		Large 12/27 (44%)	Superior	6/15 (40%)
			Inferior	6/12 (50%)
χ^2 =3.20 Non significant trend (p<.10)				
	Old 21/75 (28%)	Small 11/33 (33%)	Superior	5/22 (23%)
			Inferior	6/11 (54%)
		Large 10/42 (24%)	Superior	4/21 (19%)
			Inferior	6/21 (29%)

Table 24. DETERMINANTS OF DISCHARGE - NESTED TABLES

Age	P.P.H. Duration	Sex	First Home Location		P.P.H. No.
YOUNG 17/84 (20%)	SHORT 14/55 (25%)	FEMALE 13/40 (33%) (Fisher Exact Test Significant ($p<.05$))	Urb 5/10 (50%)	1	2/4 (50%)
				2+	3/6 (50%)
			Rur 8/30 (27%)	1	0/6 (0%)
				2+	8/24 (33%)
		MALE 1/15 (6%)	Urb 1/6 (17%)	1	1/3 (33%)
				2+	0/3 (0%)
			Rur 0/9 (0%)	1	0/6 (0%)
				2+	0/3 (0%)
	LONG 3/29 (10%)	FEMALE 1/15 (6%)	Urb 1/8 (13%)	1	0/4 (0%)
				2+	1/4 (25%)
			Rur 0/7 (0%)	1	0/3 (0%)
				2+	0/4 (0%)
		MALE 2/14 (14%)	Urb 2/4 (50%)	1	1/1 (100%)
				2+	1/3 (33%)
			Rur 0/10 (0%)	1	0/7 (0%)
				2+	0/3 (0%)
$\chi^2 = 9.41$ Very significant ($p<.005$)					
	SHORT 3/34 (14%)	FEMALE 3/21 (14%)	Urb 0/4 (0%)	1	0/1 (0%)
				2+	0/3 (0%)
			Rur 3/17 (18%)	1	1/7 (14%)
				2+	2/10 (20%)
		MALE 0/13 (0%)	Urb 0/3 (0%)	1	- -
				2+	0/3 (0%)
			Rur 0/10 (0%)	1	0/6 (0%)
				2+	0/4 (0%)
OLD 4/94 (4%)					
	LONG 1/60 (1%)	FEMALE 1/29 (3%)	Urb 0/3 (0%)	1	0/1 (0%)
				2+	0/2 (0%)
			Rur 1/26 (4%)	1	0/5 (0%)
				2+	1/21 (5%)
		MALE 0/31 (0%)	Urb 0/9 (0%)	1	0/4 (0%)
				2+	0/5 (0%)
			Rur 0/22 (0%)	1	0/14 (0%)
				2+	0/8 (0%)

P.P.H. = previous psychiatric hospitalisation

F. Comparison of Urban and Rural Cohorts

Because first home location was such a powerful determinant of rehospitalisation, a further set of two way tables was compiled to further check whether first home location was truly independent of other factors. These tables are displayed in Table 25. The associations with quality of hostess and mean prescriptions per year were already known from the correlations of apparent determinants. Urban homes were used more frequently for residents first placed in the later years of the study period. Non significant trends existed between urban location and less than the median mean homes per year and between urban location and less than the median age. Other variables did not demonstrate any association.

Further interpretation of these associations was difficult. If first home location was the preeminent determinant of rehospitalisation, then the reduced use of rural homes in 1968 and 1969 might account for the non significant linear trend towards fewer rehospitalisations over time. The trend associating urban location with fewer mean homes per year was really an artefact resulting from the way the latter variable was derived. Residents rehospitalised had shorter durations in the program and hence greater mean homes per year. The association was an

Table 25. TWO WAY TABLES FOR FIRST HOME LOCATION

Quality of hostesses

	Urb	Rur	Total
Superior	47	76	123
Inferior	0	55	55
Total	47	131	178

Highly significant
χ^2=26.62 (p<.001)

Year first placed

	Urb	Rur	Total
'66, '67	8	67	75
'68, '69	39	64	103
Total	47	131	178

Highly significant
χ^2=15.15 (p<.001)

Mean prescriptions per year (more than one year in program)

	Urb	Rur	Total
4 or less	21	66	87
5 or more	23	25	48
Total	44	91	135

Very significant
χ^2=6.98 (p<.01)

Mean homes per year (more than one year in program)

	Urb	Rur	Total
< med.	27	39	66
> med.	17	52	69
Total	44	91	135

Non significant trend
χ^2=3.36 (p<.10)

Age

	Urb	Rur	Total
< med.	28	56	84
> med.	19	75	94
Total	47	131	178

Non significant trend
χ^2=3.28 (p<.10)

No significant association with

- Sex
- P.P.H. No.
- P.P.H. Duration
- Schizophrenia
- Chronic brain syndrome
- First home size

indirect reflection of the effect of rural location on rehospitalisation.

In summary, rural and urban residents were not different with respect to sex, number and duration of previous psychiatric hospitalisations or the diagnoses of schizophrenia and chronic brain syndrome. There was a non significant trend associating younger residents with urban location. Rural and urban homes were no different with respect to size, but quality of hostesses was always rated superior in urban areas. There was a very significant association between rural location and fewer mean prescriptions per year.

F. Serendipitous Findings from the Prescription Audit

Adequacy of neuroleptic maintenance was unrelated to outcome and did not prove of any use as an indicator of quality of care.

For most residents prescriptions were never altered. Of the 102 residents who entered the program on medication and who remained for two years, 65 (64%) had no change at all in their prescription at two years.

This situation might be laudable for neuroleptics where adequacy of maintenance dose is important. It is less satisfactory if the drugs prescribed are not clearly indicated for long term therapy. An example is the tricyclic antidepressants.

Standard references on psychotropic drug therapy suggest that these drugs should be given for a period of three to six months after remission of depressive symptoms (27, 40). There are no definite contraindications to longer term therapy and this may be justified in an individual patient (40).

In the cohort studied the tricyclic antidepressants were typically given for prolonged periods. These drugs were used in 24 residents, but in 17 of these (71%) they were administered for over a year and in 10 (42%) for over three years. Tricyclic antidepressants had been given for prolonged periods in hospital before entering the program. In one case prescriptions in hospital and in foster care showed almost eight years of continuous tricyclic antidepressant therapy. The details of these residents are given in Table 26.

Table 26. PROLONGED TRICYCLIC ANTIDEPRESSANT THERAPY

Case No.	Drug	Daily dose (mg.)	Time given in hospital (months)	Time given in foster care (months)	Outcome
120	Amitriptyline	50	> 12	24	Rehosp.
130	Amitriptyline	30		15	Stable
132	Desimipramine	75	> 12	36	Stable
134	Amitriptyline	75	3	36	Stable
137	Amitriptyline	100		21	Stable
139	Amitriptyline	100	>12	36	Stable
144	Imipramine	75	>12	36	Stable
145	Amitriptyline	75		24	Stable
160	Amitriptyline	75	>12	12	Discharge
206	Amitriptyline	75	>12	36	Stable
219	Amitriptyline	75	>12	36	Stable
221	Amitriptyline	40	>12	36	Stable
239	Amitriptyline	75	69	24	Died
305	Amitriptyline	75	6	36	Stable
317	Amitriptyline	75	>12	36	Stable
321	Imipramine	75	>12	36	Stable
418	Amitriptyline	75	>12	21	Rehosp.

If these residents really needed tricyclic antidepressants for this length of time it might be expected that there would be evidence of a trial interruption in their use, to establish that they did indeed require them. There was no such interruption in any case.

These residents were followed forward beyond the three year follow up period to the last available prescription towards the end of 1972. Seven were still in the program on the same dose of tricyclic antidepressant at that time.

Chapter 7

CONCLUSION

This study has provided a partial evaluation of the Residential Homes for Special Care program in the Hamilton area. It has clearly demonstrated the feasibility of following residents prospectively in their foster care experience. Data were obtained for every resident for all variables except some drug prescription variables.

The process measures used for evaluating aspects of the program were of limited value. The rating of quality of hostesses by the former field worker appeared to have some predictive validity for rehospitalisation, though its independent effect was uncertain because of the high correlation with home location. The measures evolved for prescription audit were less satisfactory. Neuroleptic maintenance was nearly always adequate in terms of the operating definition used, so reduction in neuroleptic maintenance was of no value as a predictor of rehospitalisation. The value of neuroleptics in chronic schizophrenia demonstrated in other studies is not called

into doubt. These residents were given reasonable maintenance neuroleptic therapy and rehospitalisation when it occurred was probably related to other factors. Drug interactions were also infrequent and of no value as a determinant of rehospitalisation. Frequency of drug prescribing had some value as a determinant of rehospitalisation, though it also was highly correlated with home location and might have little independent effect. It is concluded that prescription audit by itself has only limited value as a process measure for evaluation of quality of health care because of its lack of association with real outcomes.

Foster home variables rather than resident variables were the significant determinants of rehospitalisation, pointing out the need for careful reassessment of some aspects of the Homes for Special Care program. Residents first placed in rural homes had many more rehospitalisations than those placed in urban homes. Examination of resident variables such as age, sex, number and duration of previous psychiatric hospitalisation and diagnosis revealed no significant differences between the urban and rural groups. It is possible that resident factors not examined in this study such as rehabilitative potential, personality and employment might have shown differences in these groups.

While location of home, quality of hostesses and

frequency of drug prescribing were determinants of rehospitalisation, the present data do not allow any of these to be seen as causing rehospitalisation. However, assuming that many of the residents originally came from urban areas, the very extensive use of rural foster homes would seem to be antithetical to the program's stated objective of promoting reintegration into the community. The above assumption could be partially checked by reexamining medical records for admitting addresses. It is proposed to do this before compiling any further reports on this research.

Resident variables rather than foster home variables were the significant determinants of discharge. These were younger age, female sex and shorter duration of previous psychiatric hospitalisation. Consequently the program itself is not seen as having any effect on discharges. In view of the program's objective of providing long term residential placement for patients for whom nothing further can be done in the psychiatric hospital, discharges may be an indicator of inappropriate placements. The modal discharged resident, young, female and with shorter previous psychiatric hospitalisation may represent a group for whom the residential Homes for Special Care program is not the answer.

Although the prescription audit measures did not

prove very useful in predicting outcome, examination of prescriptions did reveal a group of residents on excessively prolonged tricyclic antidepressant therapy. If similar patients exist in Homes for Special Care (Nursing Homes) and in residential homes in other areas, and if a sufficient number were on these drugs to the present, they might be worthy of study from a pharmacological viewpoint, before and after discontinuing the medication. The prolonged use of these drugs is evidence of a need for psychiatric reassessment of residents on an annual or even a two yearly basis.

More research is needed in the area of foster care for chronic psychiatric patients. For Ontario the findings of the present study warrant replication in at least one other area of the Province. Areas with sufficient use of urban homes such as London, Lakeshore or Queen Street Mental Health Centre would be possible locations. A randomised controlled trial of urban and rural home placement seems feasible, although it would take several years to gather a sufficient sample at present rates of placement, unless more than one centre was used. At the very least more data on residents and homes could be gathered prospectively before future placements are made to allow a more thorough analytic study at a future time.

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...ient Name _____ Id. _____ 1 2 3

... _____ Date of Birth _____ 4 5 6 7

...S.C. where first placed _____ 8

...e first placed _____

...e of Outcome _____ 9 10

...e to Outcome (difference) _____ 11 12
(nearest month)

Age at Outcome _____
(nearest year)

...come
1. Discharged from H.S.C. ☐
2. Stable at 3 years ☐
3. Readmit - rehabilitation ☐
4. Readmit - acute ☐
5. Died ☐

13

...at Outcome _____ 14 15 16 17

... of Homes during placement _____ x12 = _____ Mean Homes per year 18 19

→ Time to Outcome _____

...vious psychiatric hospital admissions

_____ to _____ _____

_____ to _____ _____

_____ to _____ _____ 20

_____ to _____ _____

_____ to _____ _____

...al No. = _____ Total Time _____ 21 22 23

...vious placements in community residential homes

_____ to _____ _____ 24

_____ to _____ _____

...al No. = _____ Total Time _____ 25 26 27

...agnosis at time of first H.S.C. placement

...DA-8 _____ _____ 28 29

Patient Name _____ Id. _____

This Prescription: In Hospital; Dis. -3 -6 -9 -12
In H.S.C.; Out. -3 -6 -9 -12 -15 -18 -21 -24 -27 -30 -33 -36
Physician _____ Date required _____

1. Neuroleptics — Date of Prescription _____

Drug	AA	PZ	PD	B&T	Dose	T/D	D.Dose	Mult.	CPZE
	☐	☐	☐	☐		x	=	x	=
	☐	☐	☐	☐		x	=	x	=

2. Antiparkinsonian drugs — Dis.CPZE= _____ Total = _____

3. Minor tranquillisers — Proportion = _____

4. Hypnotics

5. Anticonvulsants

6. Tricyclic antidepressants

7. MAOI antidepressants

8. Antihypertensive drugs

9. Vitamins

10. Sympathomimetic amines, Methyl dopa, eye drops for glaucoma

11. Others

This Prescription: In Hospital; Dis. -3 -6 -9 -12
In H.S.C.; Out. -3 -6 -9 -12 -15 -18 -21 -24 -27 -30 -33 -36
Physician _____ Date required _____

1. Neuroleptics — Date of Prescription _____

Drug	AA	PZ	PD	B&T	Dose	T/D	D.Dose	Mult.	CPZE
	☐	☐	☐	☐		x	=	x	=
	☐	☐	☐	☐		x	=	x	=

2. Antiparkinsonian drugs — Dis.CPZE= _____ Total = _____

3. Minor tranquillisers — Proportion = _____

4. Hypnotics

5. Anticonvulsants

6. Tricyclic antidepressants

7. MAOI antidepressants

8. Antihypertensive drugs

9. Vitamins

10. Sympathomimetic amines,

PDPHSC-3

Patient Name _____

Quarter 2 3 4 5 6 7 8 9 10 11 12
or Last Quarter before Outcome ☐

Quarter ending _____

Mid-quarter point (Above -2 months + 15days) _____

Date of prescription in effect at M-Q P _____

1. Neuroleptics — Physician _____

Drug	Dose	T/D	D.Dose	Mult.	CPZE
_____	____	x ____	= ____	x ____	= ____
_____	____	x ____	= ____	x ____	= ____

2. Antiparkinsonian drugs — Dis.CPZE= _____ Total= _____

3. Minor tranquillizers: _____ x ____ — Proportion = _____

4. Hypnotics _____ x ____

5. Anticonvulsants _____ x ____

6. Tricyclic antidepressants _____ x ____

7. Antihypertensive drugs _____ x ____

8. Diuretics _____ x ____

9. Vitamins _____ x ____

10. Sympathomimetic amines, Methyl dopa _____ x ____

11. Others _____ x ____

Coding for Neuroleptic Propoxtion		Coding for Adequacy Rating		Coding for Outcome End of Quarter	
	0.00 - 0.14 0	No change in type			
1/4 1/5	0.15 - 0.29 1	of Neuroleptic	00	Discharged	1
1/3 2/5	0.30 - 0.44 2	Neuroleptic added	01	Stable	2
1/2	0.45 - 0.59 3	Neuroleptic delet	02	Readmit rehab.	3
2/3 3/5	0.60 - 0.74 4	Drug interaction	04	Readmit acute	4
3/4 4/5	0.75 - 0.89 5	Anticonvulsant inadequate	08	Death	5
	0.90 - 1.19 6	Hypnotic inadequate	16		
	1.20 or more 7	Tricyclic Antidep-ressants inadequ.	32		
	No neuroleptics at discharge 8	Total =			
Post-outcome	9	Post-outcome	99	Post-outcome	9

☐ ☐ ☐

Patient Name _____

Diagnosis at discharge _____ 24 25

Neuroleptics at discharge _____ 26

Dose at discharge (CPZE) _____ 27

Neuroleptic proportions in year before discharge -3 -6 -9 -12 28 29 30 31

Rating of in hospital prescribing _____ 32

Mean prescriptions per year

Total pres. to outcome _____ x12 _____ 33

Time to outcome

QUARTERS

2: 34 35 36 37
3: 38 39 40 41
4: 42 43 44 45
5: 46 47 48 49
6: 50 51 52 53
7: 54 55 56 57
8: 58 59 60 61
9: 62 63 64 65
10: 66 67 68 69
11: 70 71 72 73
12: 74 75 76 77

Last Quarter before Outcome 78 79 80

APPENDIX 2

DETERMINANTS OF OUTCOME - TWO WAY TABLES BY HYPOTHESES

DETERMINANTS OF OUTCOME - RESIDENTS

	Rehosp.	Other	Total	Disch.	Other	Total
Hypothesis 1. Age						
Years						
<med. 53.5	28 (33%)	56	84	17 (20%)	67	84
>med. 53.5	24 (26%)	70	94	4 (4%)	90	94
Total	52	126	178	21	157	178
	Not significant			Very significant $\chi^2 = 9.41$ ($p < .005$)		
Hypothesis 2. Sex						
Males	22 (29%)	51	73	3 (4%)	70	73
Females	30 (29%)	75	105	18 (17%)	87	105
Total	52	126	178	21	157	178
	Not significant			Significant $\chi^2 = 5.83$ ($p < .02$)		
Hypothesis 3. Disease state						
Schizophrenia	27 (26%)	76	103	12 (12%)	91	103
Other	25 (33%)	50	75	9 (12%)	66	75
Total	52	126	178	21	157	178
	Not significant			Not significant		

DETERMINANTS OF OUTCOME - RESIDENTS (continued)

	Rehosp.	Other	Total	Disch.	Other	Total
Hypothesis 3. Disease state (continued)						
Chronic brain syndrome	5 (23%)	17	22	1 (5%)	21	22
Other	47 (30%)	109	156	20 (13%)	136	156
Total	52	126	178	21	157	178
	Not significant			Not significant		
Hypothesis 4. Number of previous psychiatric hospitalisations						
< med. 1.5	21 (29%)	51	72	5 (7%)	67	72
> med. 1.5	31 (29%)	75	106	16 (15%)	90	106
Total	52	126	178	21	157	178
	Not significant			Non significant trend $\chi^2 = 2.01$ ($p < .20$)		
Hypothesis 4. Duration of previous psychiatric hospitalisations						
Years						
< med. 11.3	27 (30%)	62	89	17 (19%)	72	89
> med. 11.3	25 (28%)	64	89	4 (4%)	85	89
Total	52	126	178	21	157	178
	Not significant			Very significant $\chi^2 = 7.78$ ($p < .01$)		

DETERMINANTS OF OUTCOME - FOSTER HOMES

Hypothesis 5. Size of first home

No. of residents

	Rehosp.	Other	Total
< med. 6.5	28 (36%)	50	78
> med. 6.5	24 (24%)	76	100
Total	52	126	178

Non significant trend
$\chi^2 = 2.45$ ($p < .20$)

	Disch.	Other	Total
< med. 6.5	10 (13%)	68	78
> med. 6.5	11 (11%)	89	100
Total	21	157	178

Not significant

Hypothesis 5. Size of outcome home

No. of residents

	Rehosp.	Other	Total
< med. 6.5	22 (31%)	49	71
> med. 6.5	30 (28%)	77	107
Total	52	126	178

Not significant

	Disch.	Other	Total
< med. 6.5	10 (14%)	61	71
> med. 6.5	11 (10%)	96	107
Total	21	157	178

Not significant

Hypothesis 6. Rural or urban - first home

	Rehosp.	Other	Total
Rural	46 (35%)	85	131
Urban	6 (13%)	41	47
Total	52	126	178

Very significant
$\chi^2 = 7.31$ ($p < .01$)

	Disch.	Other	Total
Rural	12 (9%)	119	131
Urban	9 (19%)	38	47
Total	21	157	178

Non significant trend
$\chi^2 = 2.43$ ($p < .20$)

Hypothesis 6. Rural or urban - outcome home (excluding nursing homes)

	Rehosp.	Other	Total
Rural	43 (40%)	65	108
Urban	5 (10%)	44	49
Total	48	109	157

Highly significant
$\chi^2 = 12.56$ ($p < .001$)

	Disch.	Other	Total
Rural	12 (11%)	96	108
Urban	9 (18%)	40	49
Total	21	136	157

Not significant

DETERMINANTS OF OUTCOME - FOSTER HOMES (continued)

	Rehosp.	Other	Total	Disch.	Other	Total
Hypothesis 7. Quality of hostesses - first home						
Superior	30 (24%)	93	123	16 (13%)	107	123
Inferior	22 (40%)	33	55	5 (9%)	50	55
Total	52	126	178	21	157	178
	Non significant trend $\chi^2 = 3.76$ ($p < .10$)			Not significant		
Hypothesis 7. Quality of hostesses - outcome home (excluding nursing homes)						
Superior	28 (24%)	90	118	16 (16%)	102	118
Inferior	20 (51%)	19	39	5 (13%)	34	39
Total	48	109	157	21	136	157
	Very significant $\chi^2 = 9.22$ ($p < .005$)			Not significant		
Hypothesis 8. Transfers between homes (excluding residents less than one year in program)						
Mean homes per year						
< med. 5.5	8 (14%)	58	66	6 (9%)	60	66
> med. 5.5	15 (21%)	54	69	5 (7%)	64	69
Total	23	112	135	11	124	135
	Not significant			Not significant		

DETERMINANTS OF OUTCOME - FOSTER HOMES (continued)

Hypothesis 9. Changes over time

Year first discharged	Rehosp.	Other	Total
1966	13 (33%)	27	40
1967	14 (40%)	21	35
1968	21 (26%)	61	82
1969	4 (19%)	17	21
Total	52	126	178

Chi square for linear trend = 2.12
Non significant trend ($p < .20$)

Year first discharged	Disch.	Other	Total
1966	3 (8%)	37	40
1967	3 (9%)	32	35
1968	12 (15%)	70	82
1969	3 (14%)	18	21
Total	21	157	178

Chi square for linear trend not significant

DETERMINANTS OF OUTCOME - DRUG PRESCRIPTION

	Rehosp.	Other	Total
Hypothesis 10. Adequacy of neuroleptic maintenance in chronic schizophrenia (schizophrenics with neuroleptic dose at discharge greater than 200 mg. per day Chlorpromazine equivalent with complete prescription data available)			
Neuroleptic dose at last quarter before outcome			
< half dose at discharge	1 (50%)	1	2
> half dose at discharge	9 (22%)	32	41
Total	10	33	43
	Not significant		
Hypothesis 11. Drug interaction (excluding 68 cases of incomplete prescription data)			
Drug interaction	0 (0%)	5	5
No drug interaction	28 (27%)	77	105
Total	28	82	110
	Not significant		
Hypothesis 12. Frequency of drug prescription (excluding residents less than one year in program)			
Mean prescriptions per year			
< med. 4.5	17 (20%)	70	87
> med. 4.5	5 (10%)	43	48
Total	22	113	135
	Non significant trend $\chi^2 = 1.69$ ($p < .20$)		