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Michigan State University PH.D. 1986

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THE IMPACTS OF DECENTRALIZATION IN THE MICHIGAN MENTAL HEALTH SYSTEM

By

Michael Joseph Davis

A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

DOCTOR OF PHILOSOPHY

Department of Political Science

1985

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ABSTRACT

THE IMPACTS OF DECENTRALIZATION
IN THE MICHIGAN MENTAL HEALTH SYSTEM

By

Michael Joseph Davis

The goal of this dissertation is to examine whether policy changes in Michigan's mental health system resulted in lower utilization of state-managed hospitals and centers. Michigan's fifty-five community mental health boards were provided with optional levels of responsibility beginning in 1980-81, through "full", "shared", and "local" or dual management contracts. The full management option contains provisions for boards to trade-off state-managed services for local service alternatives.

The analysis centers first on whether board decisions to select one set of responsibilities over another are related to socio-economic patterns among the contract groups. The second component of the analysis focuses on performance change in the contract period (1981 through 1983). A performance model is developed which argues that board utilization over the ten-year period (1974 through 1983) can be explained by variations in population size, wealth and other board characteristics.

Policy impacts are expected to be reflected in differences among the contract groups in both utilization process and utilization level. Testing of the utilization

hypotheses involves construction of a multiple regression model with performance characteristics as independent variables.

The results show that board decisions to select full contractual status are not consistantly related to socio-economic patterns among the boards. Shared management boards tend to rank lower on the socio-economic factors, but the similarity in rankings for the full and local groups indicates that higher levels of socio-economic development are not indicative of a greater likelihood that boards will adopt full responsibilities.

The findings also indicate that management change had expected utilization impacts in both full and shared contract groups. Shared group results are mixed in that several components of the model do not behave as expected, but members of this group hold the line on utilization in the contract period. Although full management results are generally not significant, there are strong tendencies which suggest that both the performance model and the level of utilization undergo desired change in the contract period.

To my parents

William and Teresa

ACKNOWLEDGEMENTS

I would like to express my gratitude to the members of my dissertation guidance committee, Professors Charles Press, Charles Ostrom and Gary Miller. Professor Press provided important guidance and support during the development of this dissertation as well as throughout my doctoral program. I am indebted to him for his time and commitment. Professor Gary Miller's knowledge of public administration and his insightful advice was of great assistance. Professor Ostrom played a key role in developing the research design and methodology. His support and direction were critical in the success of this project.

I also want to thank Susan Lawther, Assistant Director of the Community Mental Health Services Bureau, and Ron Uken, Director of Finance, of the Michigan Department of Mental Health. Susan helped me to understand Michigan mental health policy and provided critical assistance in obtaining data. Ron provided strong support and also assisted in the collection of data.

Very special thanks go to my wife LaVaughn. More than anyone else, she provided me with the inspiration to take on and to complete this dissertation. I will always be indebted to her.

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CHAPTER I

INTRODUCTION

The delivery of mental health services has changed dramatically in the past two decades. Reliance on large state-operated mental health hospitals has gradually given way to a varied community services approach. This shift toward greater decentralization, facilitated by both federal and state intervention, has produced a range of responses by localities. While some communities have embraced new programs to care for former and potential state hospital patients, others have been more selective in expanding local agendas.

This dissertation will focus on the performance of Michigan localities with respect to efforts by the Michigan Department of Mental Health to achieve a comprehensive network of locally managed services. These efforts by Michigan culminated in fiscal year 1980-81 with a set of policies designed to shift management responsibilities to the local agencies. Implementation of these "local management" or unification policies provides an opportunity to assess the extent to which the state and local service network has been impacted. The remainder of the paper is concerned chiefly with setting up and carrying out this analysis. Chapter I begins the study by first highlighting the initial forces behind the community care movement and then describing the

policy objectives and specific strategies employed by the Michigan Department of Mental Health. The obstacles to decentralization and the state's solutions to these obstacles are also described. Finally, this chapter lays out the goals and rationale of this research and presents a brief discussion of methodological concerns.

Early Developments in Community Mental Health

The major force behind the move toward "community mental health" has been the realization of both politicians and mental health professionals that mental health treatment in large, public hospitals is the least effective and the most expensive of methods to alleviate mental health problems. Federal officials took the lead in the 1950's with the passage of the Mental Health Study Act (P.L. 84-182).[1] Under this Act, the Joint Commission on Mental Illness and Health was formed to reassess mental health policies in the U.S. The Commission's report documented fundamental needs for expanded public mental health services for both acutely disturbed mental patients and for chronic and long-term patients. The Commission also criticized the "custodial care" available in the state's public hospitals and

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[1] The federal government had been involved in mental health policy prior to this act. The National Institute of Mental Health (NIMH), for example, was formed in 1946 to improve the quality of state and community-based programs. For a more detailed discussion of early federal involvement, see Bernard L. Bloom, Community Mental Health: A Historical and Critical Analysis (Morristown, N.J.: General Learning Press, 1973), pp. 8-9.

recommended greater utilization of the community as the most appropriate therapeutic setting for many types of mental illness and developmental disabilities.[2] With enthusiastic support from the Kennedy Administration, the Commission's recommendations were submitted to Congress, and in 1963, the Community Mental Health Centers Constitution Act (P.L. 88-164) was passed. This Act made federal grant monies available to communities through NIMH for construction and operation of Community Mental Health Centers (CMHC's). Communities were encouraged to develop comprehensive community service systems to meet the needs of both acutely-ill and long-term patients and to provide services to clients that had formerly been institutionalized in state public hospitals. By the late 1970's over 700 CMHC's were providing local services to almost 50 percent of the U.S. population.[3]

Michigan's own community mental health system was developed concurrently with the federal CMHC system. In 1963, the Michigan legislature authorized the Community Mental Health Services Act (Act 54 of Public Acts of 1963), which sought voluntary participation by the counties in forming community mental health services boards. The Michigan Department of Mental Health (DMH) was directed to

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[2] David Mechanic, Mental Health and Social Policy (Englewood Cliifs, N.J.: Prentice-Hall, Inc., 1980), pp. 80-81. See also, Joint Commission on Mental Illness and Health, Action for Mental Health (New York: Science Editions, 1961).

[3] National Institute of Mental Health, Directory of Federally Funded Community Mental Health Center, 1979 (Washington, D.C.: Government Printing Office, 1979), p. 2.

assist counties in establishing local boards and agencies and to establish procedures for review and approval of local matching grant requests. Programs or services which were approved for 75 percent state matching grants included the following: informational and educational services; consultative services to courts and other agencies; inpatient services, outpatient treatment services, rehabilitative services for the mentally ill and mentally retarded, especially former inpatients.[4]

Later chapters will focus on how the local agencies have developed, especially during the period from 1970 to 1983. Of special interest will be the manner in which these agencies have responded to state policy demands. The following section will clarify several mental health terms which are used later in the study, before moving on to examine state mental health policy.

Discussion of Mental Health Terms

Before turning to a discussion of Michigan mental health policy, it will be helpful to clarify the meaning of several frequently used mental health terms. These are to be discussed in three separate categories depending on whether they refer to state policy, to the local agency, or to the classification of patients.

In the first category the major state policy terms are deinstitutionalization, community placement and

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[4] Legislative Service Bureau, Mental Health Statutes 1967 (Lansing, Michigan: Prepared for the Department of Mental Health, 1968), p. 81.

decentralization. Deinstitutionalization refers to the reduction in the number of patients in state hospitals, and it may involve measures which reduce admissions to, and/or increase discharges from, these hospitals. While in principle deinstitutionalization includes systematic pre-release and community service planning for patients, in practice there has, at times, been little regard for the disposition of released patients.[5] Michigan's deinstitutionalization policies, like those in several other states, have resulted in considerable criticism for responsible state agencies. The Michigan Department of Mental Health has been accused of "dumping" patients into communities which were either unwilling or unable to provide necessary services.

Community placement is defined as "a complex range of services and programs", designed to provide individualized residential and rehabilitative care and treatment for mentally disabled persons in a non-institutional, i.e., community, setting".[6] The term refers generally to the formal process of relocating state hospital patients, but also includes services designed to provide community alternatives to hospital admission. Community placement activities have increased in prominence in recent years as states have sought more systematic means for down-sizing their

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[5] State of Michigan, Joint Committee to Study Abuse in State Mental Health Facilities, Report to the Michigan Legislature, Regular Session of 1978 (December, 1978), pp. 7,9.

[6] State of Michigan, Joint Mental Health Oversight Committee, Report on Community Placement of Mentally Disabled Persons in Michigan (July, 1980), p. 1.

hospitals.

The term, decentralization, refers, in the mental health context, to the process of delegating state mental health service responsibilities to the counties and their CMH boards. The state's decentralization reforms of fiscal year 1980-81 represent major changes over previous strategies for decentralizing the public mental health system. It is expected that these reforms will result in both a unified network of state and CMH board services, and an increase in local accountability. The term, "unification", is also used to depict these recent policy changes.

The category of local agency terms includes "CMH services board" and "CMH agency". The services board is made up of individuals appointed by local elected officials. Its functions include hiring the executive director of the agency, developing local mental health policy and overseeing the delivery of public services in the board jurisdiction. The CMH agency is the county (or multi-county) agency with responsibility for administering local mental health services. These local boards and agencies are often referred to simply as the "CMH boards" by the department of mental health and that usage is adopted in this paper.

The final category of terms involves the classification of patients by the type of disease they suffer from. The two primary target groups in this category are "mental illness", and "developmental diabilities". Mental illness is defined as a "substantial disorder of thought or mood which significantly impairs judgment, behavior, capacity to

recognize reality or ability to cope with the ordinary demands of life".[7] Developmental disabilities is defined as:

> An impairment of general intellectual functioning or adaptive behavior which meets the following criteria: it originated before the person became 18 years of age; it has continues since its organization or can be expected to continue indefinitely; it constitutes a substantial burden to the impaired person's ability to perform normally in society; and it is attributable to mental retardation, cerebral palsy, epilepsy, autism, or any other condition of a person found to be closely related to mental retardation.8

Care and treatment systems for these two target groups are usually structured and administered separately both by DMH and the boards. DMH, for example, provides separate hospitals to serve the mentally ill and the developmentally disabled. These target group differences are normally referred to in DMH shorthand as "MI" and "DD" in reference to patients, services or programs, and hospitals, and that same practice will be followed in this paper.

With this overview of major terms and concepts in mind, we can now turn to a discussion of Michigan's mental health policy.

The Decentralization Mandate

Michigan has actively promoted local mental health services since the first boards became operational in the

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[7] Ibid., p. 79.

[8] Ibid., p. 77.

mid-1960's.[9] The primary goal of DMH in the first decade of the board system was to induce counties to develop local mental health boards, a goal that was almost complete by the mid-1970's. Once most counties had elected to participate, the CMH role was expanded significantly with passage of the revised Mental Health Code of 1974. The new law includes provisions that the state begin to turn over all mental health responsibilities to the boards. According to Section 116 of Public Act 258 of 1974:

> In the administration of Chapter 2 (Community Mental Health Programs), it shall be the objective of the department to shift from the state to a county the primary responsibility for the direct delivery of public mental health services whenever such county shall have demonstrated a willingness and capacity to provide an adequate and appropriate system of mental health services for the citizens of such county.[10]

And in Chapter 2 of Act 258, the department is to "seek to develop and establish arrangements and procedures for the effective coordination and integration of state services and county program services".[11]

Several policy goals were formulated in response to Section 116 and other provisions of Act 258. These goals have appeared consistantly in more recent departmental and legislative policy statements and will be employed in this

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[9] State support of community services actually predates the 1963 board system. For several years, the state had provided financial assistance to private guidance clinics.

[10] Michigan Department of Mental Health, Mental Health Code (Lansing, Michigan: Legislative Service Bureau, May, 1979), p. 2.

[11] Ibid., p. 11.

analysis to represent state intent. The goals are summarized as follows:

1. To assure that an adequate range of services is available and accessible through CMH or state sponsored programs to all citizens of Michigan. Traditionally boards were given several options in choosing which local services to offer. Since 1981, DMH has introduced mandatory core service requirements for all boards.

2. To assure that mental health patients are served in the least restrictive treatment settings. Each board is to provide a continuum of services to accommodate varying levels of patient dependency.

3. To reduce the size or extent of the state's direct service operations. This goal traditionally has referred to reducing the number of residents in state hospitals. In recent years, state placement homes have also been transferred to boards willing to take over these responsibilities.

4. To provide services in the least-cost and most efficient manner. The department has tried to institute cost saving measures into board operations by encouraging services with reasonable economies of scale and also by encouraging greater contracting for services from private profit and non-profit agencies.

The decentralization mandate provided the focal point for development of mental health policy after 1975. In 1976, DMH began targeting a portion of CMH funding for aftercare services to patients who had been released from state hospitals prior to 1976. Procedural steps were also instituted to help ensure greater service planning for patients about to be released from state hospitals. State funds were provided to boards to enable them to plan and manage services to these patients. The department took additional steps to try to move CMH boards into positions of

greater control over local mental health services. Boards were to become the centralized coordinators of local public services and were instructed to implement formal agreements with other local agencies to clarify and coodinate local responsibilities.[12] The consensus among state policymakers, however, was that these and other state strategies had not produced sufficient progress toward a CMH-managed public service system. The following section provides a discussion of those factors which were found to mitigate against community-based services.

Obstacles to Decentralization

It was apparent as 1980 approached that CMH boards would be at the center of future mental health developments. The Joint Committee on Abuse had already recommended phasing out state hospitals and putting more resources into the CMH sector.[13] The major question facing state officials during this period was how to transfer state services to the boards while retaining adequate policy control, and while assuring that high quality, comprehensive services were accessible to all citizens of the state.

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[12] Useful reviews of DMH policies during the period 1975-76 to 1979-80 can be found in Michigan Department of Mental Health, Michigan State Plan for Comprehensive Mental Health Services, 1976 (Lansing, Michigan: Department of Mental Health, 1976), and the updates especially for fiscal years 1977-78 and 1978-79; and also see Michigan Department of Mental Health, Program Policy Guidelines for Fiscal Year 1979-80 (Lansing, Michigan: Department of Mental Health, 1978).

[13] State of Michigan, Report to Michigan Legislature, p. 2.

Several major factors had been identified as having adverse impacts on achievement of this Community care objective. These factors include fragmented authority, budgetary and other administrative obstacles, community placement problems and variations among the boards.

Fragmented authority, the first and possibly most apparent obstacle, stems at least partially from the intergovernmental arrangement of the mental health system. The state, which for several years had been moving to a position of greater dependence on the boards, was experiencing difficulties in influencing local decisions. The boards were largely autonomous in planning local services and they tended to expand local agendas to suit local needs, which were often not in line with state policy objectives. The Joint Committee to Study Abuse in State Mental Facilities observed that boards tended to overproduce psychotherapeutic service and to place less emphasis on aftercare, emergency, and residential services. Further-more, DMH was too weak to assure that state priorities were given a full accounting in local service development.[14]

Authority was dispersed not only to CMH boards which controlled local public services, but to state hospitals which controlled the flow of patients into and out of the hospitals, and to other state and local agencies as well. This fragmentation and division of responsibilities often

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[14] Ibid., pp. 5-6. Governor's Committee on Unification of the Public Mental Health System, Into the 80's (Lansing, Michigan: Department of Mental Health, 1980), p. 6.

resulted in little or no planning and continuity of care for patients who moved between state and local agencies.

A second barrier to community management was financial or budgetary in nature. The department of mental health, which controlled the flow of state funds to both CMH boards and state hospitals, made separate budget authorizations to each sector. Under this arrangement no funds were available for transfer from hospital to board, when patients were relocated from the state hospitals to community settings.[15] This administrative inadequacy made it difficult for boards to plan and finance alternative services to accommodate these patients.

The third obstacle to community development centers on community placement. The process of relocating state hospital patients in communities was beset by several problems. First, a constant shortage of quality placement homes, which could be used to support these patients, existed. In addition, once patients were placed in homes, they often received few if any mental health services. Second, neighborhood and local government opposition to placements had led to adverse publicity and legal delays. And third, the placement process required that numerous state agencies, including public health, social services, DMH, the state hospitals and others be involved in the

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[15] Michigan Department of Mental Health, Program Policy Guidelines for Fiscal Year 1980-81 (Lansing, Michigan: Michigan Department of Mental Health, 1979) app. B-1, p. 9.

numerous activities of placement.[16] These economic, political and bureaucratic difficulties plagued both hospital and CMH efforts to place patients and too often led to low quality placements and to delays in placement. In 1980, DMH reported that hundreds of hospital patients were backed up awaiting suitable placement opportunities.[17]

One final obstacle to decentralization needs to be considered; the characteristics of the local CMH board jurisdictions. The Governor's Unification Committee had noted both "the disparate distribution of resources" and the "great variations in the availability and extent of the network's services" among the boards.[18] The most apparent examples of these board differences are provided by poor and rural boards. In trying to serve small communities scattered over large tracts of land, these boards are unable to realize any significant economies of scale in service delivery.[19] The costs of mounting a full range of services in such boards were and possibly still are prohibitive.

Other local characteristics may also effect CMH performance. Each board must operate within a particular

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[16] The problems of community placement are reviewed in State of Michigan, Joint Committes to Study Abuse in State Mental Health Facilities, Report to Legislature, pp. 5-6, and in State of Michigan, Joint Mental Health Oversight Committee, Interum Report Community Placement, pp. 1-81.

[17] Michigan Department of Mental Health, Guidelines 1980-81, p. 9.

[18] Governor's Committee on Unification, Into the 80's, p. 6.

[19] Michigan Department of Mental Health, Guidelines 1980-81, p. 9.

social and economic context which helps define local mental health demands and expectations on the board. Within this configuration of social and economic factors, boards must attend to the preferences of local elected officials, public and private groups, consumers and the general public. We will return later to examine in detail the potential impacts of local characteristics on mental health performance.

Reforms in Decentralization Strategies

The reforms which were implemented in fiscal year 1980-81 were designed to deal directly with the worst of the obstacles mentioned above. Key components of the reforms include the use of intergovernmental contracting with state hospitals, and changes in incentives to the boards.

The intergovernmental contract, or "performance contract", between DMH and each board was to be the major administrative instrument for transferring state responsibilities to the boards. Implementation of the contracts was felt to represent a significant advance in the ability of the department to monitor and guide performance.

In the pre-contract era, boards had a relatively free hand in defining local program priorities and in deciding upon service output levels. With the contract arrangement, however, major emphasis was shifted to service output. Boards must now negotiate with state officials over binding levels of service output, payment schedules, and penalties for exceeding agreed upon funding levels.[20]

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[20] The distinction between government assistance and

Administrative and legal changes also facilitated reform and clarification of the relationships between CMH boards and state hospital services. Along with these up-front funds, the boards were given authority over patients admissions and discharges from state hospitals. With hospital funds in hand and with control of utilization, the boards were in a position to take the next required step and contract with state hospital providers for specified inpatient services. These hospital subcontracts were to be included as part of the board's contract with the department.

The final key reform was a change in DMH incentives aimed at inducing boards to decrease utilization of state services. If the boards were successful in reducing state service utilization below contractual levels, they could keep the "savings" for reallocation to local programs.

The full complement of reforms was initially implemented in fiscal year 1980-81 as a pilot project with four participating CMH boards. These "pilot boards", as they were called, were carefully selected to assure that at least one urban board (Washtenaw) and one rural board (Alger-Marquette) was chosen, along with one which provided local services entirely by contracting with existing local

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contracts is made in Ruth Hoogland DeHoog, "Political and Economic Approaches to Government `Contracting Out': A Study of Human Service Contracting in Michigan" (Unpublished Ph.D. dissertation, Michigan State University, 1981), pp. 39-40. Hoogland DeHoog notes the open-ended nature of such forms of assistance as grants-in-aid, and the contract focus on binding levels of output.

providers (Kent). The fourth board, St. Clair, was added somewhat later. Additional selection criteria included both board willingness to try the reforms, and a previous record of relatively high performance.

In the first year of the project a second group of boards, designated as "shared management", signed contracts with DMH. These contracts were quite different from those signed by the pilot boards since shared management responsibilities extended only to local service provisions. DMH retained primary responsibilities for state inpatient services to patients from these boards. Funds for state services were simply passed through shared management boards to the appropriate state hospitals. A third group, consisting of all remaining boards and referred to as "local management" or "no contract", chose to continue operating as they had prior to the reforms.

The term "full management" has been used by DMH since fiscal year 1981-82 to refer to additional boards which have elected to implement the original pilot model. Unless otherwise noted in the following chapters, full management will be used to refer to the four pilot boards and the additional full management boards.

Later chapters will examine in greater detail the logic and expectations of the reforms and the implications of and potential for the new classification of boards based on contractual differences. A discussion of the goals of this study follows.

Research Purposes and Rationale

This study will seek to determine if the state's decentralization strategies are achieving desired results. The policy differences among the boards will be based on their management status as indicated by the type of contract signed with the state. These contract differences include full management responsibility, shared management with the state (DMH), or no change from what was previously done. These contract differences allow us to develop and test propositions relating management status to specific indicators of performance derived from the DMH policy objectives listed earlier. This search for management impacts will also have to consider federal and state funding influence, local characteristics such as size, wealth, and economic conditions, and other factors which also may be linked to CMH board performance.

This research will also focus on the extent to which the state's reforms address the range of policy objectives cited earlier in this chapter. From previous work it seems that the related objectives of management transfer and utilization reduction receive most the attention in the new policies. An additional question which must be addressed, concerns the type of contractual responsibilities the various boards choose. An examination of board contract decisions will be presented along with an evaluation of board performance. By considering both contract decisions and perfromance, it should be possible to determine what

factors contribute to board success.

Initial evaluations by DMH indicate that pilot and full management boards have performed well on standard utilization and spending indicators, when compared to non-full management boards. These analyses by DMH were intended to gauge the progress of boards compared to base-year data from 1979-80, and to pinpoint any problems. As such, they were not as concerned with pre-reform performance differences or other influences on performance. This analysis will attempt to fill the need for a more comprehensive assessment of management impacts by including these additional concerns in the models.

This research approach can be justified on both academic and practical grounds. Academically, this research should contribute significantly to what is known about the effects of various state and local characteristics on the policy initiatives of higher-level governments, especially states. Students of politics and public administration do not yet know enough about how localities operate in the face of specific constraints and what the performance implications are likely to be. This seems especially true in the case of mental health even though these problems have been increasing in prominence in recent years. Several states in recent years have had to tackle the question of how to systematically reduce the role of large institutions while assuring that communities will adequately carry on with necessary treatment and support services for these patients. The disappointing experiences from those efforts

highlight the importance of increasing our understanding in this area.

From the practitioner standpoint, this study will try to identify factors other than the state's policies which effect CMH performance, and to differentiate those which can be controlled from those which cannot. A major assumption of the analysis is that the limits to state-initiated decentralization can be found in these other factors, and especially in the local sector. An increased understanding of what these limits are should prove useful in the selection of policies which either deal more adequately with what can be changed, or "work around" obstacles which cannot be readily changed. In the following section, the methodology of this study is briefly introduced.

Methodology

The methodological approach in this study is directed primarily toward the goal of testing hypotheses about local management impacts. The focus is on both the extent to which individual board performance is effected by management status and on how an individual board's performance compares to others with the same or different management status.

The identifcation of local management effects is only one of several necessary steps in reaching valid conclusions about decentralization policy. A thorough analysis will require that, at a minimum, the following criteria are addressed. First, local management differences among CMH boards must be clearly identified. Meeting this requirement

should relatively be unproblemmatic since data on the contract status of boards is available from DMH for the years of the project. Second, self-selection is a very real threat and unless resolved, could adversely affect the intepretation of results. This problem can be seen in the manner in which full management boards, especially the original pilots, have been selected. DMH has tried to select relatively high-performing boards for this status; in doing so, however, the likelihood that these same boards will be high performing in late observations is increased. To help deal with this problem, board comparisons will have to take explicit account of pre-reform performance differences in assessing change over the three year period from 1980-81 to 1982-83.

The third criterion concerns other variables which may be directly related to CMH performance. These variables, which were mentioned in the previous section, represent potentially competing hypotheses which help explain changes in CMH performance. While randomization procedures provide the best guard against these threats, they cannot be applied in this case. Instead, the study relies primarily on multivariate regression techniques and will employ both time-series and cross-sectional data to test management, budgetary, and local or contextual hypotheses. Multiple regression was chosen primarily for its flexibility in evaluating both the combined and individual impacts of several independent variables. Certain other statistics associated with discriminant analysis will also be used in

the course of the analysis.

This study relies on data from several sources. Financial data have come from DMH summaries and CMH financial reports to the department. Most of the utilization data have come from DMH state hospital reports. Additional material has been collected from state agencies or from the U.S. Census and the Michigan Statistical Abstracts. The data are available for sufficient time periods to permit the use of pooled cross-sectional time-series analysis. Analytic models and methodological problems are discussed at greater length in chapters three and four below. In the following section, the remaining chapters are outlined.

Outline of Chapters

This section provides a brief description of remaining chapters.

Chapter II, Background and Discussion of Mental Health Reforms, provides a brief description of the major service components and also discusses recent service trends. Local management reforms are then described and evaluated.

Chapter III, Performance and Policy Impacts, discusses local management expectations and the potential impacts of other variables. It examines closely the contract differences among the CMH boards and develops hypotheses to be tested in later chapters.

Chapter IV, Methodology, describes the research design to be used in the analysis. The models developed in Chapter III are operationalized, and statistical techniques for

testing the models are outlined. In addition, this chapter describes the data to be employed and considers several data limitations.

Chapter V, Results, outlines the results obtained from tests on the models developed earlier. Each of the models is assessed separately before discussing the overall results as they pertain to the state's decentalization strategies.

Chapter VI, Summary and Future Considerations, completes the analysis with an examination of the prospects for decentralization in the coming years. It presents an assessment of the major problems with this research and the major questions posed by the findings. Finally, this chapter discusses the possibilities for future research and analysis.

CHAPTER II

BACKGROUND AND DESCRIPTION OF MENTAL HEALTH REFORMS

Chapter II consists of two parts: the first devoted to a discussion of the background and general outline of the Michigan mental health system, and the second, concentrating on a detailed look at reforms. The presentation of background material focuses on the major public service providers in Michigan. The reforms are then discussed in terms of their major features, with special attention on the role of contracting in the new system.

Mental Health Service Components And Recent Trends

The major components of the Michigan mental health system are reviewed below. Each of the components, including state services, CMH services, federal assistance and private services, is described briefly in terms of its major role in, and contribution to, the Michigan system. In each service area, performance trends prior to 1980 are discussed.

State Mental Health Services

The Michigan Department of Mental Health provides inpatient and community placement services throughout the state. Until recently, the Department also provided work

activity, outpatient treatment and other services to formerly hospitalized patients. Financing for these services comes mainly from the state general fund/general purpose dollars as well as federal funds. The state and the CMH boards actually share responsibility for paying the "net cost" of services, with the state paying approximately 90 percent. The net cost, as used here, is the cost to be divided between DMH and the boards, after all other sources of revenue have been exhausted (including Medicaid, other federal reimbursement, commercial insurers and patient/family funds).

Individuals on the receiving end of state services tend to come from the lower income strata of society, as evidenced by the large numbers of hospital residents who qualify for Medicaid and other public assistance. Referrals to the state hospitals have traditionally come from local acute-care hospitals, the legal system, Department of Social Services (DSS) officials, families or through self-referrals or "walk-ins".

During the period from 1970 to 1980, the number of state hospitals increased from 20 to 25. During the same period, as indicated in Table II-1 below, the average annual number of patients in the state's hospitals declined by almost 60 percent.[1] Table II-1 contains a patient breakdown

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[1] Data for Table II-1 were compiled from Michigan Department of Mental Health reports. For 1975 and 1980, the Report Series, No. 49031-XX, Patient Days in Selected Status was used. Since this report was not available for 1970, a by MI and DD hospitals, and also contains a separate

category for Wayne County (Detroit).

As the data indicate, the total average number of patients is fairly evenly split between MI and DD patients over the entire period. Both populations also appear to decline at roughly similar rates. Closer examination reveals, however, that the number of patients in MI hospitals decreased more rapidly prior to 1975 than did the number of DD patients. The MI population actually dropped 52 percent between 1970 and 1975, compared to a 42 percent drop for the DD population for that same period. Between 1975 and 1980, the decline for MI hospitals dropped to 17 percent, while for the DD hospitals the decrease was 28 percent. Thus, the rate of decrease slowed for both groups, but the change is most apparent in the case of the MI hospitals.

Wayne County residents, comprising a full one-third of the total hospital population, declined at a rate slightly lower than the remainder of the state. While the Wayne County proportion of total patients remained constant at about 33 percent for these years, the Wayne proportion of MI patients actually increased from 35 to 36 percent. This was offset, however by a drop in Wayne's proportion of DD

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comparable report, No. 40032-XX, Census of Residents in State Mental Health Facilities was used. This report shows the actual number of patients at specific times, i.e., the last day of the fiscal year. Since during this period hospital populations were declining, the end of year figures for 1970 are propably somewhat understated relative to the average figures for 1975 and 1980.

TABLE II-1

Average Annual Number Of Patients In MI And DD Hospitals For Outstate Michigan And Wayne County For The Years 1970, 1975, & 1980

Hospital Type	Counties	Year 1970	1975	1980
MI	Outstate	7164	3441	2844
	Wayne	3842	1940	1632
DD	Outstate	8082	4718	3410
	Wayne	3694	2120	1491
Totals	Outstate	15246	8159	6254
	Wayne	7536	4060	3123
	Totals	22782	12209	9377

patients from 31 to 30 percent.

Additional statewide data on total rather than average annual number of hospital patients indicate that the length of time patients spent in the state's hospitals was decreasing over the decade of the 1970's.[2] This trend of higher patient turnover was especially evident for MI inpatients, and was in line with DMH policy during these years which sought to realign several MI hospitals into acute-care rather than long-term care facilities.[3]

This review of aggregate hospital data suggests at least two preliminary observations. The first refers to the differential rates of decline for MI and DD patients. This point will be examined further when state community placement is discussed. The second observation concerns the overwhelming impact of Wayne County within the state. Its tremendous size makes it an extreme case relative to all other boards in the state, and may make it difficult to include the Wayne board in analytic models; yet, because of its size, it cannot be ignored. In this analysis, efforts are made to integrate the Detroit-Wayne Board and the rest of the state.

The state's community placement services are generally operated through the hospitals and include several placements

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[2] See Michigan Department of Mental Health, Patient Days In Selected Status (Report No. 49031).

[3] Michigan Department of Mental Health, 1978-79 Fiscal Year Update to the 1976 Michigan State Plan For Comprehensive Mental Health Services (Lansing, Michigan: Department of Mental Health, 1980), pp. 27-28.

alternatives. The major programs are the so-called "contract homes", including family foster care (FFC) and community living facilities (CLF). These homes, whether privately or publicly owned, must meet applicable DSS standards and also must comply with DMH standards in the provision of any in-home mental health services. Several of the DD centers also operate programs referred to as Alternative Intermediate Services for the Mentally Retarded (AIS-MR). Patients placed in AIS-MR homes receive intensive in-home mental health services and medical care.[4]

In the three year period from 1978 through 1980, the average annual number of FFC and CLF patients in placement rose from 1532 to 2071, an increase of just over 35 percent. This increase was accounted for totally by DD placements, however, since the average number of MI placements decreased from 492 in 1978 to 466 in 1980.[5]

These figures suggest part of the reason why DD and MI hospital populations declined at different rates after 1975, as mentioned earlier. It appears that DD patients declined at a higher rate relative to MI patients, due to the fact that more DD patients were being placed in the community.

When federal aid is examined below, it will be apparent that one factor contributing to the state focus on DD patient placement, is that federal revenues are much more

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[4] Michigan Department of Mental Health, Guidelines 1980-81, app. A, pp. 1-2.

[5] See Michigan Department of Mental Health, Patient Days In Selected Status (Report Nos. 49031-02 and 49031-03, for 1978 and 1980).

readily available for DD patients than for MI patients. Before turning to the topic of federal assistance, the discussion in the following section will focus on CMH services.

Community Mental Health Services

Community mental health agencies and boards are official agents of the county or counties comprising the board jurisdiction. As such, elected county commissioners decide both when the county joins the CMH and, in conjunction with the CMH board, what the county's mental health policy will be. Community Mental Health Boards are primarily responsible for providing any or all the following types of services: a) outpatient counseling and prevention services; b) partial day programs (e.g. sheltered workshops); c) residential services for individuals in need of supervised living arrangements; d) inpatient services for acute-care and other care provided by locally operated hospitals; and e) educational and consultative services to local agencies.

County officials took rather well to the community mental health idea, as evidenced by the fact that a large majority of the state populace lived within the juirsdiction of the thirty-one boards in operation by 1970. Between 1970 and 1975, the number of operational boards rose to 51 as local officials continued to respond to increasing mental health demands locally, and to the availability of 75 percent state funding. By the time the state match increased to 90 percent at the beginning of 1976, only a few counties

remained without board status. These came into the CMH fold in the ensuing year.[6]

The demands on state funding to support the fully operational CMH system increased dramatically by 1980. Table II-2 depicts for 1970 and 1980 the breakdown of state general fund/general purpose (GF/GP) appropriations for both CMH services and state inpatient services.[7] As indicated in the table, even though appropriations for state inpatient services increased substantially during this period, the greatest growth occurred in the CMH sector. State appropriations for CMH boards increased almost sevenfold between 1970 and 1980. Further, while the CMH boards accounted for just over 8 percent of the total CMH and state inpatient appropriation in 1970, this proportion increased to almost 25 percent by 1980.

The growth of CMH services had clearly resulted in an expanded network of locally managed services throughout the state. Yet, in spite of this accomplishment, questions had been raised about the management capacity and service priorities of the boards. As indicated in Chapter I, the unclear division of authority and service responsibilties between hospitals and CMH boards had helped to sustain a

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[6] State of Michigan, Senate Fiscal Agency, 1982 Statistical Report (Lansing, Michigan: Senate Fiscal Agency, 1982), pp. 46-47.

[7] Appropriations data in Table II-2 are compiled from the Mental Health Appropriations Acts for fiscal years 1969-70 and 1979-80. The 1970 Appropriation figures can be found in Act 130 of the Public Acts of 1969, while the 1980 figures are in Act 105 of the Public Acts of 1979.

TABLE II-2

State General Fund/General Purpose Appropriations (in $millions) For CMH Boards And State Hospital Inpatients Services For 1970 And 1980

	Year	
Service Sector	1970	1980
CMH	$ 13.1	$104.6
State Hospital Inpatient	146.3	318.9
Totals	$159.4	$423.5

dual service system, in which hospitals and CMH boards served essentially different sets of patients. Thus, even though state appropriations were on the increase during this period, the actual expenditure of those funds by the boards were often not linked directly to the reduction of state hospital patients.

Several of the preceding CMH trends do not reflect well on the chances for success of decentralization. The state's reform policies will have to deal with the fact that a sizable number of the boards did not have the capacity nor the will to take on the extra burdens associated with decentralization. In later sections, the analysis will focus on the extent to which the reforms succeed in realigning board priorities. In the following section, the federal role is examined.

Federal Assistance

Federal assistance in Michigan has focused on three main purposes: establishment of community service centers, upgrading and upkeep of state hospitals, and payment for services to the poor. The major strategy for accomplishing the first purpose has been to funnel grants directly to localities. These grants were designed to induce development of local centers and to enrich the local service base. The grants normally contained the provision that federal revenues to the center would decline after the initial year or two, leaving the center to seek funding elsewhere, usually from DMH.

The number of federal centers in Michigan rose from 8 in 1968 to 24 in 1979.[8] These centers have tended to develop within the same jurisdictions as the state's CMH boards, and in many cases, the local organization designated as the federal center, and the board, are one and the same organization. Where the federal centers developed independently of the boards, several CMHC funds are funneled to the center through the CMH board.

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[8] The 1968 figure is from Interstate Clearinghouse on Mental Health, A Report on 1964-68 Financial, Legal and Administrative Developments in the State's Mental Health Programs (Chicago, Illinois: Council of State Governments, 1969), p. 65 For 1979, see National Institute of Mental Health, Directory of Federally Funded Community Mental Health Centers, 1979 (Washington, D.C.: U.S. Government Printing Office, 1979).

Department of Mental Health data indicate that direct federal grants to the centers were on the decline after fiscal year 1976-77, and were expected to continue to decrease after 1980.[9] Additional figures for overall federal grant revenues, as reported by the boards, also show a leveling off in the late 1970's.[10]

The second major category of federal aid includes federal grants to DMH to remodel and maintain the state's hospitals. The major component in this category is the ICF-MR program (Immediate Care for the Mentally Retarded), which has provided millions of dollars to refurbish the DD centers. Some of these funds have also been available to expand state placement of DD patients through the AIS-MR program (Alternative Intermediate Services for the Mentally Retarded).[11]

The third manner in which the federal government provides assistance is by reimbursing the state and the boards for services provided to patients who qualify for Medicaid or some other type of assistance. Medicaid provisions authorize payment of approximately half the costs for services to developmentally disabled poor and for certain

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[9] Michigan Department of Mental Health, 1978-79 Update For Plan, pp. 59-60.

[10] These federal spending figures were collected by the author from Schedule 1 of the year-end Community Mental Health Financial Reports. These figures include board expenditures for CETA funds.

[11] A useful description of the ICF-MR and AIS-MR programs can be found in State of Michigan, Joint Committee to Study Abuse in State Mental Health Facilities, Report, pp. 36-41.

categories of mentally ill poor (under 21 or over 65 years of age). These provisions also apply under many conditions to DD patients placed in community residential settings.

The federal reimbursement programs cannot be underestimated in their potential impact on state and local decisionmakers. Medicaid funds have greatly decreased the burden of DD hospital costs to the state and, in addition, have provided substantial financial inducements for placement of DD patients. In general this type of financing has not been available for MI hospital patients. This disparity in federal revenues for the two types of patients might help to explain why the Michigan Department of Mental Health has devoted greater attention to placement of DD patients in recent years.

The first category of federal assistance, the direct local grants, will be of primary interest in the remainder of this analysis. Although these grants have not had the fiscal impacts of the federal reimbursement programs, they may be very significant to both the development and subsequent performance of the CMH boards.

At a later point in this study, attempts will be made to clarify the impacts of these federal grants on the CMH boards. In the following section, the focus shifts to a discussion of the role of the private sector.

Contributions from the Private Sector

The private sector has had a long history of serving public clients through contractual arrangements with the

state, and in more recent years, with individual CMH boards. Prior to the boards, and going back at least to the 1940's, DMH had subsidized privately owned and operated guidance clinics throughout the state.[12] As a result of Act 54 of the Michigan Public Act of 1963, the clinics came under the auspices of the CMH boards, which took over sole responsibility for receiving and dispensing state and federal funds.

Public-private service relationships have continued to expand from those early days, as a result of rapid growth in the community services sector. Of the 51 CMH boards in 1975, half offered at least one local service through a contract with a private profit or non-profit agency.[13] Several boards, including Detroit-Wayne, the state's largest, and Kent County, provide most local programs through this type of arrangement.

The Department of Mental Health has encouraged greater use of the contracting by boards to help assure that all local alternatives are employed in developing comprehensive service centers. Any state approved service, including outpatient, work activity, residential and inpatient services can be delivered through contractual arrangements. The potential for cost-effectiveness resulting from contracting rather than mounting full-scale county programs has

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[12] Interstate Clearinghouse on Mental Health, Recent Developments in the State's Community Mental Health Programs, 1960-62 (Chicago, Illinois: Council of State Governments, 1962), p. 17.

[13] Michigan Department of Mental Health, 1978-79 Update For Plan, p. 10.

also been a consideration in state policy.

Local residential placement and inpatient services rely heavily on non-public agencies. Community placement homes and services are provided in some cases by public agencies but the vast majority of these providers are corporations or private individuals. Likewise, the provision of local inpatient services for public clients has almost always relied on private profit and non-profit services. Only the state's largest boards have had county or other public psychiatric hospitals to work with.

Local inpatient services are provided primarily through private psychiatric hospitals and psychiatric units in local general hospitals. These facilities are licensed and regulated by DMH[14] thus qualifying them for state assistance and federal reimbursement for services to qualified patients. The number of these licensed facilities increased in Michigan from 49 in 1977 to 56 in 1981.

Table II-3 provides information on the availability and utilization of these facilities between 1977 and 1981. According to these figures, the number of available psychiatric beds increased by approximately 16 percent during this period, while the number of beds actually used on the average increased at a somewhat lower rate. Utilization figures for 1977 indicate that approximately 80 percent of available psychiatric beds were utilized on the average. In

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[14] See Chapter 1, especially Section 330.1137, of The Mental Health Code of Michigan, Act 254 of the Public Acts of 1974.

TABLE II-3

Total Number Of Private Psychiatric Beds
Available And Average Number Of Beds
Utilized Annually In Michigan
For 1977 & 1981

	Year	
Local Psychiatric Beds	1977	1981
Beds Available	2246	2608
Average Beds Utilized	1795	2034

1981, this percentage of beds used drops off somewhat to 78.[15]

While the availability of local inpatient services was increasing, the number of CMH boards reporting expenditures for (or use of) local inpatient services decreased from 25 in 1977 to 19 in 1981. Reported board expenditures for local inpatient services show considerable variation during this period, much of it accounted for by changes in Wayne County spending. On the whole, however, these CMH expenditures decreased in the late 1970's and 1980 and then began to increase somewhat in fiscal year 1980-81.[16]

[15] Information on local psychiatric hospitals for Table II-3 was collected from Michigan Department of Mental Health, Statistical Report (Part 3), Private Licensed Facilities (Report Series 61001).

[16] These figures for CMH board spending for local inpatient programs were compiled by the author from Schedule 5 of the year-end Community Mental Health Financial Reports.

In previous sections it has been shown that even though state residential placements were on the increase, relatively few placement opportunities were available for state hospital MI patients. On the other hand, in this section it has become apparent that while local inpatient services were increasing in availability, these services were not widely used by the CMH boards. In a later chapter, the effects of local inpatient programs on board performance will be examined in more detail. The analysis will focus on what happens to local inpatient and residential services after implementation of the reforms.

The background material in this chapter has outlined Michigan's mental health system by examing the major agencies, roles and aggregate performance data in each service area. A description of major fiscal and problemmatic relationships between and among the service components has also been provided. The state's decentralization reforms, by employing new incentives and increasing the options of CMH boards, intend to alter these relationships (especially between DMH and the boards and between the state hospitals and the boards). These reforms are examined in greater detail in the following section.

The Michigan Reform Model

The major change in Michigan's mental health system after 1980 has been the use of performance contracting between DMH and each of the CMH boards. These contracts specify roles and service responsibilities for both parties

and, in addition, specify programs, contracted levels of performance, funding levels, reporting and monitoring requirements, and sanctions for failure to perform.

In implementing this network of performance contracts, DMH has provided several options to the boards, as mentioned in Chapter I. Boards signing full management contracts assume responsibility for providing services to all patients and for the management of all public mental health resources within the board jurisdiction. Boards with shared management contracts can select from a continuum of service responsibilities. These boards may contract to simply extend current service responsibilities, or they may assume partial or full responsibility for one or more subgroups of patients currently served through state hospitals. If full or shared management boards succeed in lowering state service utilization below levels specified in the individual contracts, the boards can retain the funds for redirection to local programs.

The third type of contract formalizes board responsibility for local services only. Boards selecting this status agree to assume no formal responsibilities regarding state hospital services and are not given access to state hospital funding.

This summary of the reforms and the DMH implementation plan has set the stage for an indepth discussion of the advantages and potential difficulties of the contract model.

Advantages and Potential Problems

Both intergovernmental and public-private contracting have received considerable attention in recent years. The contract approach has been hailed for providing several theoretical and practical advantages over non-contractual approaches. First, the use of contracts is said to inter-ject market-like conditions in public or public-private transactions. Second, as employed in Michigan, contracting proposes to increase accountability in the public mental health system. And third, contracting maintains or may enhance local autonomy. Each of these proposed advantages is outlined below.

Most of the theoretical basis for contracting has been provided by economists and public choice theorists in public administration. Proponents of the public choice model argue that the process of contracting produces goods and services more efficiently and higher in quality than could be pro-duced through centralized arrangements. The keys to both efficiency and high quality are competition and the profit motive. Efficiency is a result of competitive bidding among potential providers, and selection of those bidding agencies with the best product at the lowest cost. Better quality services result from the increased competition and because the profit motive provides an incentive for good performance on the part of the agency.[17]

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[17] These arguments are made in E. S. Savas, Privatizing the Public Sector (Chatham, N.J.: Chatham House Publishers,

The DMH contract model is similar in several respects to the general model of public sector contracting. The DMH model assumes and relies on competition. This has been evident to some extent in the awarding of management contracts to the boards. In the initial year of the reform project, for example, more boards applied for pilot status than were selected. Under these conditions, DMH was able to select only those boards with the greatest chance of succeeding.

The state's performance contract package also contains provisions for board subcontracting with state hospitals or other local providers. With these increased options, the CMH boards can become the "prudent buyer" and broker for mental health services for all patients from the board jurisdiction. The boards may choose to either hand over the inpatient portion of their budgets to the state hospitals, or set up any of a number of alternatives to continued use of state inpatient services. This is a key feature of the reforms because it formally increases the board's options while porviding the necessary funding for boards to act on decisions about alternative service suppliers.

The final quasi-market element of the reforms is a new set of incentives designed to link state funding to performance outcomes. These incentives provide a financial

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Inc., 1982), pp. 60-66, and in Hoogland DeHoog, Study of Contracting, pp. 10-11. For a general discussion of the public choice model, see Vincent Ostrum and Elinor Ostrum, "Public Choice: A Different Approach to the Study of Public Administration," Public Administration Review 31 (March/April 1971): 302-316.

reward or, in a sense, a profit, for full and shared management boards which cut utilization of state services.

The second advantage of the reforms is the increased accountability which is expected from use of the performance contracts. Board accountability extends to the level of patient responsibilities taken on by the boards, as indicated in the performance contract. DMH remains accountable for serving patients not assumed by the CMH boards. This clarification of responsibilities is expected to yield less duplication of services and greater continuity of care for patients exiting state hospitals.

The third positive outcome expected of the DMH reforms is the maintenance and potential enhancement of local autonomy. Boards have three contracts to choose from and full and shared management boards have additional options regarding care of board patients. Furthermore, the contract method represents a change in the regulatory role of DMH. Instead of extensive monitoring of rules and regulations and detailed prescribing of program and fiscal inputs, DMH will concentrate on output levels and performance of the boards. Thus, the contract approach has the potential for less DMH intrusion in the operation of the boards.

Each of these contracting advantages--increased competition, accountability and local autonomy--face implementation difficulties which may limit the potential accomplishments of contracting. These possible limitations are discussed below for each of the proposed advantages of the reforms.

Although the state's plan is designed to open up the system and increase competition among service providers, this may be difficult to achieve. Critics of the public choice model argue that in order for quasi-market mechanisms, such as contracting to work, there must be competition both in the service environment and in the procedures employed in contracting. To the extent these conditions are not present, the contract model will presumably not perform as well.[18]

Meeting these conditions, especially competition in the service environment, appears problemmatic in Michigan's mental health system for at least two reasons. First, because of the federal or intergovernmental nature of performance contracting, a DMH appears to be in a fairly dependent position vis-a-vis the CMH boards. Thus, while there may be some competition among boards throughout the state for DMH management contracts, the real benefits of competition are weakened, since DMH has no other local organizations to turn to.

The second major problem in increasing the level of competition in Michigan's system can be traced to certain characteristics associated with goods and services like mental health. These services are usually classified as public goods implying that competition and quasi-market conditions are difficult to implement in providing them. The public goods characteristics of mental health services

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[18] Hoogland DeHoog, pp. 19-22.

make the expression of individual demand for these goods more difficult, and imply "that there is often no independent free market...," for supply of these goods. "The private sector is underdeveloped precisely because demand is underexpressed."[19] Under these conditions, the goals of efficiency and quality may be more difficult to achieve because of the dependent relationship between government and the private sector.[20] In attempting to offer these services through the private sector, governments may have to assist in creating essentially a new industry. This scenario may partially describe what has occurred in residential placement programs in mental health. Demand has historically outpaced supply in this service area; there have been too few homes and too few suppliers of mental health and medical services to residents of these homes. These same problems do not characterize the lack of available local inpatient services. As indicated in Table II-3, the supply of local inpatient services has remained ahead of demand in recent years. However, these services have not been widely available for public use, at least not through the CMH boards.

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[19] Ibid., p. 26. E. S. Savas also makes this point in Privatizing, p. 42. Also, a very good discussion of mental health and the public goods characteristics of mental health programs is provided in Julian C. Wolpert and Eileen R. Wolpert, "The Relocation of Released Mental Hospital Patients in Residential Communities," Policy Sciences 7 (1976): 31-51.

[20] Ibid.

Accountability has probably increased somewhat through the DMH contract system. The fact of entering into contractual relations with all or most CMH boards has probably helped ensure this increase. However, the question of accountability is still somewhat unclear, especially for shared and local management boards. In both cases, DMH retains partial or total responsibility for state services. This implies that authority and accountability remain divided for these boards. It appears conceivable, therefore, that the contract system helps to further institutionalize for numerous boards, some aspects of the dual system of the pre-reform period.

The question of CMH board autonomy can be examined by comparing the DMH contract plan to two alternative definitions or models of decentralization. This exercise should assist in clarifying the exact nature of the DMH decentralization model. Administrative decentralization usually refers to administration of territory or area with substantial delegation of authority, discretion and program responsibility to subordinate officials. Political decentralization, on the other hand, normally refers to a redistribution of political power and policymaking authority to lower levels of government, and usually implies significant independence of the lower-level unit in fiscal, personnel and programmatic matters.[21]

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[21] For both definitions, see Advisory Commission on Intergovernmental Relations, The New Grass Roots Government?--Decentralization and Citizen Participation in Urban Areas, Information Report M-71 (Washington, D.C.:

Based on these definitions, the question is whether the DMH performance contract plan represents mainly administrative changes or whether there are political and federal questions involved in this transfer of responsibilities.

A strong case can be made that the DMH model is primarily aimed at administrative change. According to this view, the goal of contracting is to transfer or reassign functions and responsibilities, and the most significant change which takes place is a fiscal one. The boards now have access to state hospital resources, which were not available prior to the reforms.

Another way to look at this question of local autonomy is to compare the status of CMH boards historically. As indicated in Chapter I, previous to 1981, the CMH boards functioned quite autonomously in local mental health affairs, even though DMH controlled the bulk of the funding for the boards. DMH attempted to prescribe desired board actions by issuing budgetary guidelines and exercising approval over board budget requests. There are indications that this somewhat loosely structured budgetary arrangement began to give way in 1981. The performance contract put the focus of DMH review on board performance and also included a cap on state service utilization. DMH began also to implement mandatory program requirements for all CMH boards. In addition, the department began looking seriously into

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U.S. Government Printing Office, 1972), p. 3.

alternative funding schemes to increase equity in the board distribution of state mental health resources.[22]

What appears to be a straightforward reassignment of functions between agencies of two levels of government, may in fact indicate increased encroachment on the part of DMH into what had been primarily local prerogatives. The fact that DMH may be increasing in authority over CMH boards is not surprising. Data from other states indicate that, in general, state governments have been steadily increasing in authority in recent years, vis-a-vis local governments.[23]

Additional Constraints on Implementation

A major study of implementation by Pressman and Wildavsky contends that difficulties in implementation are inherent due to "the complexity of joint action".[24] Implementation usually occurs under the conditions in which major actors have "divergent perspectives" or interests, and in which the actors are likely to change during the implementation process. Further, the carrying out of even

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22 Michigan Department of Mental Health, Guilelines 1982-83.

23 See, for example, G. Ross Stephens, "State Centralization and the Erosion of Local Autonomy," Journal of Politics 36 (February 1974), pp. 73-74, and Sarah F. Liebshcutz and Karen A. Reixach, "Decentralization or Recentralization in New York," paper deliverad at the 1984 Annual Meeting of the American Political Science Association, the Washinton Hilton, August 30-September2, 1984, p. 1.

24 Jeffrey L. Pressman and Aaron Wildavsky, Implementation: How Great Expectations in Washington Are Dashed in Oakland (Berkeley, California: University of California Press, 1979), p. 93.

simple public programs is characterized by "multiple decision points" and the subsequent need for multiple clearances.[25]

At least two major factors contribute to the complexity of implementation of full management. First, the contract approach requires that officials from two levels of government be able to reach an accord with regard to both performance and budget expectations. Completion of the DMH-CMH master contract is dependent on the signing of subcontracts between the boards and the DMH inpatients service providers. Before the negotiated contracts and subcontracts are approved, they are required the sign-off of several officials in DMH and in each of the agencies. And second, in trying to reduce utilization of state services, the board is dependent on the support of key local agencies and the DMH institutions. According to Pressman and Wildavsky and others, these factors are likely to contribute to inaction and delay in the implementation of full management.[26] These points can be examined further by looking at a key component of the management reforms; the "single entry-exit system".

As discussed previously, the boards are expected to provide the single point of access for all public services

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[25] Ibid.

[26] Ibid., pp. 113-124. See also, Eugene Bardach, The Implementation Game: What Happens after a Bill Becomes Law (Cambridge, Massachusetts: The MIT Press, 1977), chap. 9, especially pp. 232-242. Part of Bardach's discussion of delay centers on negotiations between county mental health officials and state hospital officials in California.

within the jurisdiction, including DMH services. In order to decrease state facility usage, it is necessary that boards control both admissions to and discharges from the institutions. For the boards to produce changes in either the admissions process or in the level of admissions, requires that the CMH agency exercise influence over the traditional administrative sources of patient admissions. These include the courts, law enforcement officials, officials of local private psychiatric inpatient facilities, and other public and private providers. The implementation analysts argue that these factors are likely to differ significantly in their perception of the stakes involved in changing the use of state institutions.[27]

For local judges, the primary concern is the safety of both the community and the individual.[28] Due in part to the slow pace of development of local services, the courts have traditionally been involved in half or more of all admissions to MI hospitals. In seeking greater input to this judicial admission process, it may be necessary for the boards to demonstrate evaluative and emergency services which are at least the equal of those of the state hospital. Law enforcement officials may be slow to discontinue the

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[27] Bardach, p. 56.

[28] State of Michigan, Mental Health Code, chap. 4. The Code, in Section 330.1469 states that courts must consider alternatives to institutionalization, if these are found "adequate to meet the individual's treament and...sufficient to prevent harm or injuries which the individual may inflict upon himself or others."

practice of transporting dangerous individuals directly to state hospitals, and may require the same assurances as the courts. Local hospitals may prefer not to accept indigent patients because of the perceived stigma, or perhaps because public revenues are not high enough and the regulation too great, in comparison to private-pay patients.

An additional key element in the success of the single entry-exit model is the cooperation of DMH facility officials. Hospital and center directors and clinicians have maintained considerable authority over patient admission and discharge decisions throughout this period. Yet the success of full management requires that boards have a greater role in evaluating clients for admission, and increased clinical and management responsibilities for patients institutionalized in the DMH service system.

Additional actors, including local elected officials and agency leaders, may make important contributions to both contract decisions and performance of the boards. These roles are examined in greater detail in Chapter III.

One final limitation on the DMH reforms is the state's declining economy in the early 1980's. The economy began to fall off in 1980 and by fiscal year 1980-81 state revenues were dropping rapidly, necessitating the first of several rounds of cutbacks in funding to virtually all state agencies. In mental health, the cutbacks in state funds coincided with DMH efforts to implement the decentralization reforms. Most CMH boards suffered significant shortfalls in state funds during fiscal years 1980-81 and 1981-82.

Numerous boards also experienced high levels of unemployment and other adverse factors associated with a depressed economy.

These economic conditions posed at least two immediate problems for state and local mental health policymakers during the early 1980's. First, demands for public mental health services tend to increase during hard economic times as individuals seek help in dealing with the trauma of job loss and associated difficulties. And second, the necessary resources for successful decentralization of the mental health system became even more scarce during this period of fiscal stress. One potential result is that CMH boards were even more restricted in responding to DMH contract options, and in performing up to contracted levels, because thay simply could not afford additional responsibilities.

In addition to directly influencing board capacity to perform, resource scarcity can also contribute to the trend toward greater centralization of state authority. The state was in a position to move aggressively to maintain local performance gains made prior to the economic downturn, at a time when the agencies were experiencing severe fiscal stress and were even more dependent on external sources of funding.[29] The impacts of the economic downturn on

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[29] These comments parallel arguments made by Charles H. Levine and Paul L. Posner in, "The Centralizing Effects of Austerity on the Intergovernmental System," Political Science Quarterly 96 (Spring, 1980): 67-85. Although their study focuses mainly on federal government centralization, the arguments are relevant to Michigan's case.

Michigan's mental health system appear at this point to be significant. In later chapters, the effects of local economic conditions will be assessed more closely.

This chapter of the dissertation began with an examination of the four major components of mental health services in Michigan. Major service trends in the period leading to the DMH reforms were also outlined. Of particular interest was the lack of availability of both private and CMH services. In the second part of the chapter, the DMH contract model has been examined. While DMH policy changes have the potential to realign Michigan's mental health system, several factors, including lack of public funding, and other implementation obstacles, may make these changes difficult to realize.

The objective in the previous section has been to highlight potential problems emanating from the multiple incentives existing among major mental health actors. This study does not intend to address directly the implementation process in each of the boards. The boards can be expected to vary in contract choices and in the manner in which the contracts and subcontracts are carried out. Regardless of contract type, however, it is assumed that board implementation variation can in part be explained by differences in wealth, population size and other primarily local characteristics.

In the following chapter, policy goals and contract options are examined in more detail. Utilization of DMH inpatient services is selected as the most significant

indicator of board performance, and a model of performance is developed to help account for board utilization.

CHAPTER III

PERFORMANCE AND POLICY IMPACTS

The goal of this dissertation, as described earlier, is to determine whether Michigan's mental health reforms are achieving expected results. The previous two chapters have provided background material and performance information on the major service components of the mental health system, and have outlined likely advantages and potential problems of the reforms.

The first part of this chapter looks closely at the impacts which are expected from implementation of the performance contract model. Management reforms are summarized in a discussion of both the contract model and the incentives of the new system. The second section focuses on development of a model of CMH board utilization of state services. In this model, board utilization levels are explained with several influences which are mainly local in origin. These influential factors are expected to define the process by which CMH boards use state inpatient services. Wealth, local economic conditions and other factors provide the context and potential constraints within which local officials must operate.

In the third part of the discussion, the performance model is used to derive potential policy impacts. Specific

hypotheses are presented regarding the effects of full and shared management changes on the utilization process of the boards. Additional hypotheses are put forth to account for the effects of management changes on the levels of utilization among the boards.

Expectations of the DMH Reforms

The discussion in this section begins with an elaboration of DMH policy goals which were first introduced in Chapter I. Specific components of the DMH reforms are summarized in the second part of the discussion, followed by a discussion of CMH board performance.

The Goal of Community Management

The primary "system goal" of the Michigan Department of Mental Health in recent years has been the creation of "a community-based, community-managed system".[1] The performance contract reforms and several additional measures have been implemented by DMH to assist in accomplishing this goal. The goal of a community-managed, community-based system implies necessary shifts in both services and management responsibilities. The nature of these intended transfers is presented below in Table III-1, which provides a two-part breakdown of both services and management

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[1] Michigan Department of Mental Health, Program Policy Guidelines for Fiscal year 1982-83 (Lansing, Michigan: Department of Mental Health, 1981), p. 4. I also want to thank Susan Lawther of the CMH Bureau, Michigan Department of Mental Health, for helping me to understand the new community policies. Note that I am solely responsible for the final interpretation of those policies as they appear in this report.

responsibilities.[2] Services are categorized as institutionally based or community based, while management

TABLE III-1

Proposed Transfer Of Service And Management Responsibilities From State Hospitals To Community Mental Health Boards

Management Responsibility	Services: Institutionally Based	Services: Community Based
State Managed	Decrease	Increase
Community Managed	Increase	Increase

responsibilities are categorized as state (DMH) or community (CMH) managed. The combination of state-managed, institutionally based services refers to state hospital inpatient services provided through the MI hospitals and DD centers. The combination of state-managed, community-based services includes as the major component the state's community placement programs. The lower left cell of the table is a new category implemented as part of the decentralization reforms in 1980-81. Through the performance contract approach, the CMH boards have been able to take over management of

[2] Table III-1 borrows heavily from policy materials produced by the Michigan Department of Mental Health. DMH had used a somewhat similar tabular presentation to show aggregate fiscal shifts from year to year. See, Michigan Department of Mental Health, Guidelines, 1982-83, pp. 5-6.

services to state hospital-based patients from the board jurisdictions. The fourth combination in the lower right cell of the table represents the DMH goal of community management of community-based services. Note that in the table only state-managed, institutionally based services are to decrease while all other categories are to increase.

The arrows between cells in Table III-1 indicate the desired direction of transfers of both services and management responsibilities.[3] These transfers can be summarized in the following set of statements. First, as the top arrow indicates, state hospital inpatient services are to be reduced by the transfer of patients to community settings through the state-managed, community placement programs. Second, the arrow running downward from the upper left cell shows the transfer of management responsibilities over state hospital inpatient services from DMH to the CMH boards. As mentioned previously, these transfers are to occur through the performance contract changes. Third, as the diagonal arrow indicates, state-managed, inpatient services can be transferred directly to community-based services under the auspices of CMH boards. Community mental health boards may, regardless of contractual status (i.e., full, shared or local management), cut down their reliance on state hospital inpatient services by utilizing community services to decrease admissions or increase hospital discharges.

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[3] I would like to thank Ron Uken, Director of Finance, Michigan Department of Mental Health, for bringing this approach to my attention, and for helping with the interpretation of relationships.

Fourth, the arrow running downward from the upper right cell shows the transfer of state-managed, community placement homes and services to CMH management. This transfer policy was initiated by DMH in 1980-81 and applies to all CMH boards assuming that the Department determines that boards have the capacity to take on these services.[4] And fifth, as the lower horizontal arrow depicts, community-managed, state hospital services are to be transferred to community settings. The performance contract approach contains the additional incentives to induce full and shared management boards to reduce the institutional component of services.

Impacts of Performance Contracting

Beginning with fiscal year 1980-81, the performance contract reforms define for full and shared management boards particular options and incentives which were not previously available. Full, shared and local management contract options are briefly summarized as follows:

1. The full management contract option allows selected CMH boards to assume full management responsibilities for delivery of services to all patients from the board jurisdiction.

2. The shared management contract option allows CMH boards to assume full management responsibilities for specific subgroups of patients previously receiving services under state management. While this key feature allows for partial transfer of

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[4] Michigan Department of Mental Health, Program Policy Guidelines for Fiscal year 1979-80 (Lansing, Michigan: Department of Mental Health, 1978), pp. 9, 13-14.

management responsibilities, no shared management boards opted for this alternative in period 1981 through 1983.

3. The local management contract option is available to CMH boards which desire to make no management changes. These boards contract to give the state primary responsibility for state institutional services and fincial management.5

The full management option allows for the formal shift of management responsibilities from DMH to the boards and, in addition, the transfer of necessary funds to assume these responsibilities. Both full management and shared management options provide boards with incentives to increase local services by decreasing state hospital utilization. In the case of full management boards, this incentive is the "full management trade-off". The contracts between DMH and each of these boards spell out the levels of state inpatient services to be purchased by the boards and the accompanying state costs and board breakdown of net funding. Boards which succeed in lowering state hospital inpatient use below contracted levels are able to redirect these "saved" state inpatient funds to board-managed, community-based services. This is the "trade-off" aspect of the incentive for full management boards. The incentive for decreased utilization by shared management boards is similar in principle to the full management incentive but is administered differently. Shared management boards are able to accrue extra local

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5 A useful and concise description of DMH contract options appears in, Nichigan Department of Mental Health, Guidelines, 1982-83, pp. 9-10.

resources by lowering utilization below DMH targeted levels. This "shared management incentive" was first implemented in fiscal year 1982-83.

Local managemant contracts do not in general avail the boards of the same management options or incentives to decrease utilization as experienced by full and shared management boards. This group of boards includes several which refuse to contract with DMH in the first year of the project.

The implementation of the three types of performance contracts has been gradual as indicated in Table III-2, which summarizes the statewide changes in board contract status for four recent years.[6] As the table shows, prior to the performance contract approach in fiscal year 1980-81,

TABLE III-2

Number Of Community Mental Health Boards By Contract Status For Fiscal Years 1879-80 Through 1982-83

Contract Status	1979-80	1980-81	1981-82	1982-83
Full Management	0	4	12	18
Shared Management	0	34	35	30
Local (Dual) Mgmt.	55	17	8	7
Total Boards	55	55	55	55

[6] Data on CMH board contractual status were obtained from the Michigan Department of Mental Health.

boards could not formally take over state management responsibilities. In fiscal year 1979-80 all fifty-five CMH boards managed only traditional community-based services, and have been classified in the table as "CMH Management" even though there were actually no contractual arrangements with the state prior to fiscal year 1980-81.

Table III-2 highlights the apparent trend among the CMH boards to assume greater levels of state management responsibilities. In the full management group, the original group of four pilot boards in 1980-81 expanded to twelve boards in 1981-82 and to eighteen in 1982-83. The number of boards with only local management responsibilities declined from seventeen to seven over the three-year contract period. The shared management group contains the largest number of CMH boards in all three years.

CMH Board Performance

Based on the above discussion of DMH policy and on information presented in the first two chapters, it is possible to identify several indicators of board performance. The goals presented in Chapter I emphasized the need to reduce state-managed, service responsibilities and to build up local service systems. Potential indicators of board progress toward these goals include board spending for CMH-managed programs, the ratio of CMH and state inpatient services spending, the extent to which boards have participated in transfers of state services and the use of state inpatient services by the boards.

Rather than attempt to examine all of these indicators, the decision was made to look at the latter indicator--the use of state inpatient services. Use of this performance or dependent variable can be justified on several counts. First, as previously suggested, reduced CMH board utilization of state inpatient services is the primary policy objective of the DMH reforms. Second, as a performance measure, the utilization of state services provides an indication of the extent to which boards are "dependent" on, or otherwise rely on state inpatient services. And third, data are available for some time previous to the contract reforms, thus making it possible to view performance within the context of overall trends. In later sections the discussion will focus on local environmental variables which may be related to CMH board utilization patterns.

Utilization is defined specifically as the number of board-area residents who are in state hospitals or centers i.e., who are receiving state inpatient care. Data have been collected as semi-annual observations for the ten-year period from 1973-74 through 1982-83. Of special interest are the trends in state inpatient utilization during the reform period--that is, beginning in 1980-81. According to the logic of the reforms, management changes should result in significantly lowered utilization for the policy boards. The impacts of the reform should also be evident in changes in traditional infuences on utilization. The policy hypotheses, which are introduced below, generally distinguish between full and shared management impacts.

Shared management boards are not expected to exhibit changes of the same degree as boards which operate with full management. As indicated, none of the shared management boards took over state inpatient responsibilities during this period. In addition, the shared management incentive to decrease state services utilization did not begin until the last year of the three-year period included in this investigation.

Specific policy hypotheses are to be presented after first examining several local environmental characteristics which are expected to influence CMH board utilization. These environmental impacts will eventually be combined to form a single performance model with hypotheses for each of the factors. This model provides a hypothesized explanation of the process of board use of state inpatient services. The policy hypotheses follow from the process model by outlining changes in the process which are expected as a result of management change.

Explaining CMH Board Performance

This section focuses on identifying those factors which contribute to explaining local performance. The expected influence of each factor will be outlined separately before the factors are combined into a single performance model.

The Process of CMH Board Utiltization

The development of this performance model serves at least two purposes. First, the model itself should be interesting because little or no research has been done on

how contextual factors impact on mental health performance. The second purpose of the performance model is more important to this analysis, however. Each of the factors which make up the model represents a plausible alternative to DMH policy changes for explaining board performance after 1980. To assure a high level of internal validity for conclusions about DMH impacts, these alternative explanations must be accounted for. Internal validity is a question of research design and focuses on the relationship of a policy or program to observed outcomes. It is "the basic minimum" requirement for answering questions about whether a policy or program has made a difference.[7] Before concluding that full management policy has succeeded in reducing state hospital use in full management boards, the effects of several factors on the boards should be understood. It may be, for example, that full managemnt boards are wealthier or experience less troublesome economic downturns than non-full management boards.

The Influence of Social and Economic Factors

Social and economic characteristics are expected to have considerable influence on the mental health priorities of local jurisdictions and the extent to which localities rely on state managed services. In a later section, it will be shown that these variables are also expected to be

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[7] Donald T. Campbell and Julian C Stanley, Experimental and Quasi-Experimental Designs for Research (Chicago, Illinois: Rand McNally College Publishing Company, 1963), pp. 5-7.

associated with board decisions to assume full, shared or local mental health responsibilities.

Political science research has been particularly concerned with the interrelationships among socio-economic influences, such as urbanization and affluence, political characteristics, including party competition and governmental form, and policy outputs. This concern has prompted numerous comparative studies of both state and local policy-making. A brief review of some of the key findings will help to clarify the manner in which these factors have been shown to affect government performance.

At the state level, much of the research has centered on whether socio-economic or political process variables best explain variations in public outputs among the states. The debate was initiated in large part by the work of Dawson and Robinson and Dye, who refuted the long-held view that political system characteristics accounted for most performance variation.[8] Both studies showed that there is no independent link between process characteristics and policy outputs; the level of socio-economic development was the key factor in explaining public program benefit levels as well as relative effort among the fifty states.[9]

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[8] Richard Dawson and James A. Robinson, "Interparty Competition, Economic Variables and Welfare Politics in the American States," Journal of Politics 25 (May 1963): 265-289.

[9] Thomas R. Dye, Politics, Economics and the Public: Policy Outcomes in the American States (Chicago, Illinois: Rand McNally, 1966), pp. 124-48.

The subsequent research refined the measures of political and environmental variables and also differentiated among policy types. Sharkansky and Hofferbert, with the aid of factor analysis, developed multiple dimensions (factors) of political, socio-economic and policy variables. They found that the effects of socio-economic and political variables varied with the dimension of the issue.[10] The "welfare-education dimension" of policy output was found to be dependent on the "voter turnout-party competition" dimension of state politics, and the "affluence dimension" of the state economy. The "natural resources-highways dimension" of policy was inversely related to the "industrialization dimension" and positively related to the affluence dimension.[11] Cnudde and McCrone found that high levels of economic development were associated with significant levels of interparty competition, which in turn yielded high expenditures for welfare services.[12] In addition, Fry and Winter showed that political factors were somewhat more important than socio-economic characteristics in explaining variations in redistributive policies among the states.[13]

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[10] Ira Sharkansky and Richard I. Hofferbert, "Dimensions of State Politics, Economics, and Public Policy," American Political Science Review 63 (September 1969): 875-79.

[11] Ibid., pp. 877-78.

[12] Charles S, Cnudde and Donald J. McCrone, "Party Competition and Welfare Policies in the American States," American Political Science Review 63 (September 1969): 865.

[13] Brian R, Frye and Richard F. Winters, "The Politics of Redistribution," American Political Science Review 63 (September 1969): 518-20.

Mental health policy is like welfare, redistributive, rather than like natural resources-highways.

Although the comparative studies succeeded in showing certain conditions under which political variables were influential, the relative importance of environmental variables remained high in most cases.[14] Numerous research studies focusing on local government units have produce similar results. The basic socio-economic model was found to account for a considerable amount of variation in local government performance.[15] Other research has shown that local government management patterns are influenced to a large degree by environmental and organizational constraints or "contingencies".[16] Environmental constraints, including the range of problems with which local governments must cope, and the availability of resources, were shown to have an independent effect on management patterns in local

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[14] The issue of political versus socio-economic characteristics has not been resolved in the comparative literature. As a whole, the comparative studies have been criticized for poor theoretical development, lack of longitudinal data, and other problems, See, for example, Virginia Gray, "Models of Comparative State Politics: A Comparison of Cross-Sectional and Time Series Analysis," American Journal of Political Science 20 (May 1976): 235-55.

[15] Herbert Jacob and Michael Lipsky, "Outputs, Structure, and Power: An Assessment of Changes in the Study of State and Local Politics," in Hofferbert and Sharkansky, (eds.), State and Urban Politics: Readings in Comparative Public Policy (Boston, Massachusetts: Little, Brown and Company, 1971), p. 16.

[16] Royston Greenwood et al., Patterns of Management in Local Government (Oxford, England: Martin Robertson, 1980), pp. 171-72.

governments.[17] Also of particular relevance is a recent study of Michigan counties and cities which found that socio-economic variables are closely related to the capacity and extent of local governement planning.[18]

These findings suggest ample support for including social, economic and political variables in the performance model. In this initial phase of the research, however, none of the above-mentioned political variables are included in the performance model. The focus instead is on the extent to which environmental variables such as population size and income level help determine the utilization of state services by the boards.

In the previously cited studies, high levels of wealth and population were found to be associated with high level of policy expenditures, benefit levels, and relative effort of state and local governments. In mental health, positive performance signifies lower utilization and therefore a negative relationship between utilization of state services and local population size and wealth. In this analysis, the expectation for wealth is negative as the previous findings would suggest. However, population size, as measured by the population of a county or counties in the board jurisdiction, is expected to be positively related to board utilization. In other words, board jurisdictions with the

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[17] Ibid., pp. 158-59.

[18] William P. Browne, "Community Objectives Planning: Urban-Rural Contrasts," paper prepared for delivery at the Annual Meeting of the Midwest Political Science Association, Milwaukee, Wisconsin, April 1982, pp. 1-13.

largest population are expected to be the highest relative users of state inpatient services.

The expectation for the effect of population size is not in line with findings from the comparative studies, but can be justified for several reasons which are in part unique to mental health. First, the complexity of urban life and faster paced life styles may produce disproportionate numbers of high-risk individuals in these areas (high-risk for inpatient services). It has already been shown that state hospitals use is more volatile in the large population boards. Second, it is also possible that the more highly populated board jurisdictions experience greater adverse impacts from economic downturns than many of the smaller boards. Individuals experiencing the trauma of poor economic conditions may face more difficult problems in urban areas than individuals residing in smaller cities and towns. And third, it seems likely that the larger boards face more difficult and complex management problems than boards with smaller populations. It may be proportionately more difficult, for example, for CMH boards with large and diverse populations to control admissions to state inpatient services. Smaller and potentially more homogeneous board jurisdictions may have an advantage in coordinating the efforts of private and public mental health, social services and law enforcement agencies.

Local Economic Conditions

Local economic conditions may play a highly influential role in determining local program priorities as well as the level of state inpatient services utilized. Poor economic conditions, like those experienced in most Michigan in 1980-81 and 1981-82, produce increased demands on both local and state services, and also make it more difficult for boards to find the necessary resources to meet these demands. Several of the larger mental health jurisdictions in Michigan, including Saginaw, Detroit-Wayne and Genesee (Flint), are heavily dependent on automobile and other heavy manufacturing, and were hit very hard by the recent recession. The number of unemployed workers in some cases almost doubled in one year and remained relatively high into 1983.

Local economic conditions is a justifiable addition to the performance model because this variable provides a more useful measure of economic change than the wealth and population variables. Drastic change in board economic conditions is expected to have impacts which may not be reflected in changes in wealth and population. These independent effects may, however, serve to increase demands for inpatient services at least on a temporary basis. For those boards with traditionally poor economies, the effects of the recent recession may not have been as drastic. These boards may have a history of relatively high levels of utilization and therefore may not experience significant

change in the recessionary period of the early 1980's.

Use of Local Mental Health Resources

This factor includes as local mental health resources public and private profit and non-profit services which are utilized to provide inpatient and residential/placement services. A good deal has been said earlier about the availability and use of private services in the boards. The boards vary considerably in the extent to which they can, or do, contract with private profit or non-profit agencies. Less than half the boards were shown to have contracts with local hospitals in 1981, as indicated in Chapter II. The variation in community-based, board-managed residential services was also found to be quite high in 1980.

Boards that have offered high levels of these services may have several performance advantages over other boards. Heavy reliance on these local programs may mean these boards are less reliant on state-managed inpatient or placement services. Thus, in evaluating the DMH approach, it will be important to take account of board differences in these critical areas. High levels of effort in utilizing these alternative local resources should be negatively associated with use of state inpatient services. That is, as the level of local resource use increases, use of state services should decline.

Federal Influence

Chapter II outlined the potential importance of federal government influence on CMH boards. Federal mental health

grants-in-aid[19] have been designed to stimulate development and enrichment of local mental health services. These federal grants provide CMH boards with additional resources not available to non-recipient boards. In addition, due to the stimulative nature of these grants, boards which have consistently received direct federal funds may also be expected to show relatively higher spending of state funds for community-based programs. This may be attributable to either the declining nature of the grants, which require that state funds be provided to continue the programs, or to the fact that recipients of federal grants are also more aggressive in the state budgetary process. It also should follow that with the federal government assisting in the growth of the local service sector in these boards, they may be in better position to maintain relatively low levels of state service usage, or to reduce use after 1980. Thus, knowledge of whether a CMH board has received federal grants is expected to assist in explaining variations in board utilization.

Distance from State Inpatient Services

The location of state hospitals and centers within the board jurisdictions has been offered by DMH officials as one explanation of board utilization of state services. These officials argue that boards located further from state

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[19] An excellent discussion of the purposes and effects of federal grants-in-aid is contained in Deil S. Wright, Understanding Intergovernmental Relations (North Scituate, Massachusetts: Duxbury Press, 1978), pp. 128-48.

facilities tend to utilize that service at lower rates than other boards. Apparently, the convenient availability of DMH inpatient services leads to a tendancy for closer boards to depend more heavily on these services. A review of some preliminary board utilization data indicated that there is some support for this argument.

These board differences in use of state services may be historically based. In the 1960's and early 1970's, state institutions were heavily involved in the provision of community services, such as outpatient and work activity programs. These aftercare services were directed primarily at former inpatients who had established residency in the surrounding community after release from the state facility. The congregation of these potentially high-risk ex-patients, many of whom may have come from other counties, tends to inflate the state service utilization rate of boards with state institutions in their midst.[20] These potentially distorting influences will have to be considered in analyzing the effects of the contractual reforms on state service utilization.

Now that these local characteristics have been reviewed, specific expectations about their impacts on utilization can be summarized. Table III-3 presents a set of hypotheses pertaining to board utilization. These hypotheses contain population, wealth, and local economy

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[20] Michigan Department of Mental Health, Guidelines, 1979-80, attachment 3, pp. 1-4.

variables, along with federal status and the development of local resources. In addition, variables are included to measure board distance from state services. This "performance model" is expected to perform quite well in explaining board performance since it is assumed that the key factors which influence utilization decisions have been included. If this is true, then these variables should explain utilization in both the pre-contract periods, and should be sensitive enough to detect possible group

TABLE III-3

Hypotheses Relating Local Characteristics
To State Facility Utilization
By The CMH Boards

1. Population size should be positively related to board use of state services.
2. Wealth should be negatively related to board utilization of state inpatient services.
3. Local economic conditions of the boards are expected to be positively related to state service use.
4. Use of local mental health resources should be negatively related to state inpatient utilization.
5. Federal assistance to the boards is expected to be negatively related to state inpatient utilization.
6. Board distance to state inpatient services is expected to be negatively related to state service use.

differences. The policy hypotheses developed in the following section assume that if the DMH reforms are

successful, the performance or process variables will be effected in the three-year contract period.

Policy Impacts on the Utilization Process

In previous sections, major components of the policy reforms have been outlined and a model of mental health performance had been developed. This locally based model provides the necessary background or context within which the expected effects of policy reforms can be spelled out. Previous hypotheses have emphsized the fact that board utilization is conditioned by a specific set of key local characteristics. Based on the material provided in the section of this chapter, the changes in management policy, including the contract approach and the new incentives, are expected to alter the process through which the boards utilize state services. This suggests that the patterns of utilization among the boards will change and these changes should be reflected in changes in the effects of economic factors.

The influence of local economic conditions provides a good example of these points. Poor economic conditions are generally assumed to be at least moderately associated with increased use of state inpatient facilities. If the reforms result in changes in local decisions and utilization patterns, then the traditional effects of local economic conditions may also show a change during the contract period. This may result because under the reform provisions, the boards are better able to handle economic

downturns and the accompanying increased demands for indigent inpatient or residential care. Boards operating under new management relationships, especially those in the full management category, should be increasing their stock of local alternatives to state services, and seeking ways to decrease the numbers already receiving these services. To the extent that such actions are pursued by the boards, the effect of local economic variations may be decreased during the contract period.

The expected effect of board population size has been described as positive in Table III-3. If the reforms have no impact on the influence of population size, there should be no change in this factor for any of the groups during the contract period. This result would suggest that management change produced no utilization changes related to size among the groups.

Wealth has been proposed as negatively related to state inpatient use among the boards. High wealth in the localities is generally associated with higher levels of professionalism in local government, greater availability of alternative private mental health resources, and other factors supportive of a strong commitment to local mental health efforts. If the same negative results are found for the full and shared management boards, this would tend to indicate that the effect of wealth is the same during the contract period. If, however, some of the less wealthy boards are able to decrease utilization levels significantly under the new arrangements, especially in comparison to the

reduction of wealthy boards, then the overall effect of wealth may decline during the contract period.

Management reform has given greater emphasis to the development of local resources by the boards. The effect of management change should be to increase the linkage between locally managed inpatient and residential services and the state facility services. In short, boards with relatively higher levels of local resources should perform at significantly higher levels under full and shared management policies.

The earlier hypothesis for federal influence has argued that CMH boards with heavy federal involvement may be generally more active and exhibit relatively lower levels of utilization than remaining boards. This attribute should be amplified under the management changes, especially if the heightened activity extends to programmatic activities and management responsibilities. On the assumption that this will be the case, federally active boards should prosper, that is, decrease utilization, in the new system.

Distance from state inpatient services is expected to be negatively related to board utilization, suggesting that the highest users of these services are expected to be those boards located relatively close to the state facilities. If the management changes succeed in changing the behavior of these relatively high users, then inverse effect of distance may be reduced during the contract period. On the other hand, a heightened negative effect would indicate that utilization levels are even lower for boards located further

from state inpatient services.

The hypotheses presented in Table III-4 below summarize the expected impacts of the management changes. These assertions pinpoint the expected changes in the traditional utilization process by noting that population size, wealth, local economic conditions and distance are all expected to decline if management reforms succeed in changing board utilization patterns.

TABLE III-4

Hypotheses Relating Policy Change To Impacts On The Utilization Process In CMH Boards

1.	Management changes are expected to result in a decline in the effect of population size in the contract period. In spite of a decline, the relationship is expected to remain positive.
2.	The effects of wealth are expected to decline in the contract period for those boards experiencing management change.
3.	The effects of local economic conditions should drop off although these effects are expected to remain positive.
4.	The negative relationship between use of local resources and state inpatient utilization should be increased for the boards which change management responsibilities.
5.	The negative relationship federal assistance and board utilization is expected to be increased in the contract period for the contracting boards.
6.	The effects of distance should be negative in the contract period but should decline for the full and shared management boards.

The development of the conceptual model policy impacts has utilized both environmental and policy expectations to identify potential reform effects on the board utilization process. Discussions in the previous two sections have highlighted two separate models to explain CMH board utilization. The first provided a general explanation of performance and has been used as a yardstick in developing alternative policy expectations. The policy hypotheses make up the second explanation of board performance and are based on the change in the traditional explanations of board utilization.

The following section provides a brief description of two additional hypotheses which focus on expected changes in actual utilization levels among the policy groups.

Impacts on Utilization Levels

Preceding hypotheses have been chiefly concerned with relating changes in utilization patterns among the boards to diffences in contract arrangments. The hypotheses presented in this section are concerned directly with changes in utilization levels which are expected as a result of management changes. If the performance contract approach and the new incentives are working as intended, the affected boards should show a significant decline in the use of state services.

The expectations can be made more specific by differentiating among the boards based on full, shared or local management contracts. Since full management boards

had by far the greatest exposure to the major elements of the performance contracting reforms, these boards are expected to show the greatest change in utilization in the contract period. The utilization hypotheses are given as follows:

1. Boards with full management responsibilities are expected to significantly reduce state service utilization in the contract period, when compared to shared and local management boards.

2. Boards with shared management responsibilities are expected to significantly reduce state service utilization in the contract period, when compared to local management boards.

These utilization hypotheses follow from the performance model impacts cited earlier. Management changes, especially in the case of full management boards, are expected to result in changes in the utilization process because these boards decline in utilization in ways which cannot be adequately explained by the performance model alone. If the policy reforms have only minimal effects on the performance model, this should be reflected in minor differences in mean utilization levels for the full, shared and local management boards. These results would support the performance model hypotheses and would indicate that, despite the management changes, no changes are observable in either the level or the process of state service utilization among these policy groups.

The discussions which follow provide an outline of factors which may be influential in the contract choices

made by the boards. This component of the analysis will prove helpful in ascertaining basic socio-economic differences among the contract groups.

Adoption of Management Innovations

The final hypotheses of this chapter are somewhat different than the previous performance and group hypotheses. The focus is on the factors which are expected to influence board adoption of full management contracts. These factors are relevant to the present analysis due to the possibility that full management reform may attract only a specific subgroup of boards which have certain performance and local characteristics in common. This would be a significant finding since it would tend to corroborate previous research findings. If, however, the characteristics which full management boards have in common are indicative of lower utilization levels, it may be more difficult to identify the independent effects of full management changes. These matters are considered at greater length in the first section of the analysis in Chapter V.

The question of which local factors ar associated with full management innovation is important on its own; that is aside from what this knowledge contributes to the evaluation of full management effects. Very little is known about community mental health innovation; in fact, the hypotheses developed later in the section reflect what is known generally about innovative public organizations.

Earlier research has shown that the likelihood of public agency innovation is influenced by social and economic conditions of the jurisdiction, the skills and motivations of local agency and political leaders, the level of professionalism of local agencies, and the organizational incentives operating in the state and local agencies. Each of these factors is briefly discussed below.

Jack Walker found that socio-economic variables are very significant in explaining variations in state innovations. He contends that high levels of wealth and urbanization are likely to be associated with greater professionalism and with the availability of "slack resources" which assist governments in funding innovations.[21] Walker goes on to argue that the dissemination of innovations occurs as government decisionmakers attempt to emulate other governments of similar status or in the same region.[22] According to these arguments, full management boards are likely to be the wealthiest and the most urbanized of the boards. They not only should have the necessary agency and fiscal resources, but also should have easier access to a large marketplace of alternative public and private mental health resources.

The second influence on local adoption, professionalism, is closely related to the first. Walker, in fact,

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[21] Jack L. Walker, "The Diffusion of Innovations Among the American States", American Political Science Review 63 (September 1969): 882-883.

[22] Ibid., p. 894.

treats professionalism as almost synonomous with high wealth and urbanization.[23] Weidner has argued that local professionals are the most likely group to support intergovernmental policy changes. According to Weidner, local mental health professionals are liable to share programmatic values with professionals at higher levels of government, and are apt to evaluate and support new programs on the basis of these values.[24] For Weidner, the most likely source of opposition to full management may come from local political officials who are more likely to view full management in terms of its potential political implications. Moreso than agency professionals, these actors may be wary of DMH encroachment.[25]

The potentially significant role of individual leaders in the adoption process of states and localities has been noted by Sharkansky and Hofferbert, Walker and others.[26] CMH directors who are innovators or entrepreneurs, and also skilled managers, may be able to assemble the necessary elements of support for full management adoption.

Full management status for the board appears to offer benefits to CMH agency leadership. First, full management

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23 Ibid., p. 883.

24 Edward W. Weidner, "Decision-Making in a Federal System, in Aaron Wildavsky (ed.), American Federalism in Perspective (Boston, Massachsetts: Little Brown and Company, 1967), pp. 241-43.

25 Ibid., p. 244.

26 Sharkansky and Hofferbert, "Dimensions," p. 979, and Walker, p. 883.

implies increased management responsibilities and the possibility of career enhancement. This may include increased prestige as an "innovator". As Joseph Schlesinger suggests, progressive ambitions may result in innovative behavior.[27] Second, full management may be perceived as a useful avenue to achieve greater local authority and autonomy in mental health affairs. And third, full management may be perceived by some leaders as the best way to expand the programmatic base of the agency and jurisdiction.

Board jurisdictions which lack active and skilled agency leadership may be less likely to adopt full management changes. As Weimer notes, there are no real disincentives for local leaders who choose not to adopt or to "keep up" with the latest changes.

Organizational incentives comprise the final factor which may influence innovation by public organizations. These incentives affect both sponsoring agency officials and the receiving organization, and are expected to have potentially adverse impacts on the dissemination of innovations.[28] Weimer contends that sponsoring agencies such as DMH are often under considerable pressure to "move money" and to expand the adoption process to new agencies or governments. Officials of the adopting agency, the CMH

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[27] Joseph Schlesinger, Ambition and Politics: Political Careers in the Unites States (Chicago, Illinois: Rand McNally and Company, 1966), see chap. 1.

[28] David L. Weimer, "Federal Intervention in the Progress of Innovation on Local Public Agencies: A Focus on Organizational Incentives," Public Policy 28 (Winter 1980): 105-107.

board, may be motivated by the financial incentives of full management status, and/or by the desires of a local agency leader to be an innovator, or to expand the influence of the agency. According to Weimer, neither set of officials is likely to assess carefully the adequacy of full management to the particular local setting. This could lead to net costs for both the adopting agency and the DMH sponsors.[29] These incentives imply that full management status may be granted to boards which are not yet ready for this level of responsibilities. In addition, board officials may opt for full management status for non-programmatic reasons, i.e., to enhance or maintain funding levels in an uncertain economy.

Previous discussions have highlighted the potential influence of socio-economic characteristics, professionalism, leadership, and organizational incentives on the adoption of full management contracts by the CMH boards. While hypotheses could be developed to account for the effects of each of these factors, only two have been selected for further analysis; socio-economic effects and local leadership influence. The socio-economic hypothesis will be examined more thoroughly because the data are readily available and because these factors have received more support in the reported results of other studies. The argument has been made that the contract groups are likely to be characterized by identifiable patterns on socio-economic variable. More

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[29] Ibid.

specifically, it should be expected that boards with full management contracts will be consistently higher in these attributes than the boards in the other groups. The evidence to be reviewed for the local leadership hypothesis is quite sketchy and will be more useful for purposes of illustration; no attempt will be made to systematically test this hypothesis.

No hypothesis has been included to account for variations in professionalism in the CMH agencies and jurisdictions. If Walker is correct, measures of wealth and population should provide useful surrogates or indirect measures of professionalism. Organizational incentives were also not included due to a lack of suitable information. Since no systematic interview data were collected in this initial phase of the research, data on officials' attitudes and perceptions were unavailable.

Summary

The first sections of this chapter have provided information on the logic and design of the DMH reforms. Board utilization was selected as the principle performance indicator for the analysis, and the expectations of the reforms were specified.

Alternative utilization models were developed in the second part of the chapter to account for factors which may be important in explaining board use of state services. The performance model has outlined a general set of potentially influential factors, including wealth, economic conditions,

and population size.

Management reform hypotheses have been introduced within the context of the basic performance model. These hypotheses were developed to compare policy group and performance model effects. It has been hypothesized that management change will result in changes in the utilization model. More specifically, it has been argued that CMH boards operating under full management policies are expected to experience the most consistent changes in utilization patterns.

The performance and policy model hypotheses have been presented on the assumption that there were no systematic differences among the board policy groups in the period prior to the initiation of the contract measures. At issue is whether the board decision to choose full management responsibilities is closely related to differences in environmental and other local characteristics. It is especially important to resolve this question for purposes of the later analysis. If the full management boards are consistently different on local characteristics in the pre-contract period, when compared to shared and local management boards, this may indicate that the process model will be different for these boards during the contract period. The methods introduced in the following chapter will help to identify potential environmental patterns among the policy groups, and will also help to assure that these potential biases are properly reflected in the analysis.

CHAPTER IV

METHODOLOGY

This chapter presents the research design and methodology to be used in the analysis. The models which are used to test the hypotheses developed in the previous chapter are operationalized and statistical methods are described in detail. The first part of the chapter examines questions of research design and statistical methods and presents three utilization models. The second half is devoted to additional statistical procedures which will be used to establish similarities and differences among groups. These procedures consist of factor analysis and discriminant analysis.

The main objective in this chapter is to develop models and methods to assure that relatively strong inferences can be made regarding the expected effects of the DMH management reforms. The key evaluative or research question has two components. The first asks whether the policy reforms work. In other words, are there indications that the performance contract approach is performing as expected. The second component of the question follows from the first and is concerned with showing that any observed effects of management change are due to the policy and not to some other influence.

Research Design

The major purpose of the research design is to assist in isolating the independent impacts of the DMH policy reforms. To accomplish this it will be necessary to account for as much extraneous variance[1] as possible. The performance model described in Chapter III should prove very helpful in accounting for outside influences. If that model has been adequately specified, then the key factors which effect performance will have been identified.

The central component of the design is a multiple regression statistical model which may include both local characteristics and policy variables. Three models will be developed to analyze utilization effects generally, and group impacts in particular. For these models, data have been collected semiannually for the period 1974 through 1983 both for the dependent variable and the performance variable.

The policy variables are created as binary or dummy variables which are normally used to designate "treated" cases as "1's" and others as "0's".[2] If this logic is extended, then boards which have similar contract status can be identified with separate group variables. These dummy

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[1] Fred N. Kerlinger, Foundation of Behavioral Research (New York: Holt, Rinehart and Winston, Inc., 1973), pp. 306-310. Kerlinger stresses that the major purpose of research designs is to control variance.

[2] Fred N. Kerlinger and Elazer J Pedhazur, Multiple Regression in Behavioral Research (New York: Holt, Rinehart and Winston, Inc., 1973), pp. 117-121.

variables will be used to test utilization differences among the groups, and will also be used in creating group performance model variables. These procedures are described in a later section.

In some ways, the utilization models of this analysis resemble other common multiple regression approaches to evaluation. These models generally include "covariates" to model the selection and/or causal process associated with performance, and dummy variables to account for group differences on the dependent variable.[3] A few of these models may also include group-performance model variables to account for group effects on performance variables. The models in this analysis go a step further than the conventional cross-sectional models, by introducing time series data. This combining of cross-sectional and time series data in a regression model is referred to as the "pooled cross-sectional time series" technique or model.

There are several advantages to using this type of pooled model. First, rather than being restricted to cross-sectional regression or to time series analysis of individual boards, all cross-sectional observations over the appropriate time periods can be used in a single multiple regression analysis. Second, the time series data give this design greater internal validity than many other designs.

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[3] Thomas D. Cook and Donald T. Campbell, Quasi-Experimentation: Design and Analysis Issues for Field Setting (Chicago: Rand McNally College Publishing Company, 1979), pp. 298-99.

The increase in validity comes about chiefly because time-dependent changes are built into the model. And third, the time element also opens up interesting possibilities with regard to the use of dummy variables to represent policy differences. Dummy variables can now be used not only to group boards by contract type, but also to pinpoint the timing of contract changes. Boards can now be given 1's corresponding to the year in which they attain a particular status. A detailed description of these variables is presented in the following section. The next section also examines the pooled cross-sectional time series model in depth after a general introduction to the multiple regression model.

Statistical Methodology

The discussion of the statistical methodology begins with the classical linear model. Use of this model implies that relationships between dependent and independent variables are essentially linear and additive. In other words, utilization is assumed to be linearly related to the combination of regressors making up the performance model and the board policy groupings.

The Classical Model

The classical linear model is presented below along with the assumptions upon which the model is based.

$$Y_i = b_1 + b_2 x_{i2} + b_3 x_{i3} + \ldots + b_k x_{ik} + e_i$$

In this equation, Y is the dependent or endogenous variable

and the x's represent the different independent or exogenous variables. The e term in this model is the error or disturbance term. The subscript i refers to the i^{th} observation where i = 1, 2...n. The subscript k is used to denote the separate independent variables 1 through k. The regression intercept or regression constant is b_1, and b_2 through b_k are the regression slopes associated with the independent variables. Each slope coefficient measures the change in the expected value of Y, the dependent variable, corresponding to a unit change in the particular independent variable, while holding the remaining independent variables constant.[4] The assumptions of the model are given as follows:

1. The error term, Ei, is normally distributed.
2. $E(E_i) = \sigma$
3. $E(E_i^2) = \sigma^2$
4. $E(E_i E_j) = \sigma \ (i = j)$
5. Each x_k is a set of fixed numbers in repeated samples.
6. The number of observations, n, must exceed the number of exogenous variables, k.
7. There must be no exact linear relation between any of the independent variables.

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[4] Jan Kmenta, Elements of Econometrics (New York: The MacMillan Company, 1971), pp. 347-356.

The first assumption requires that the disturbance approximate a normal distribution. The second assumption states that the expected value of the disturbance term is equal to zero. The third assumption is that the error terms are "homoskedastic" which means that the disturbance or error term is assumed to be constant across cases. The fourth assumption states that the error terms at two points in time are not to be correlated. This assumption is usually stated as the "nonautocorrelation" assumption. The fifth assumption is sometimes referred to as "nonstochastic x". It requires that values of independent variables be fixed in repeated samples. The sixth assumption requires that number of observations exceed the number of coefficients to be estimated in the model. And finally, independent variables should not exhibit high degrees of multicollinearity.

The equation for the pooled cross-sectional time series model has been presented as follows:[5]

$$Y_{it} = b_1 x_{it,1} + b_2 x_{it,2} + \ldots + b_k x_{it,k} + e_{it}$$

The subscript i refers to cases 1 through n while the subscript t refers to time periods 1 through t. Total observations are arrived at by multiplying total cases by total time periods, thus n = n * t. As before, the numbers 1 through k refer to the independent variables. Y_{it} is the dependent variable and the subscripts indicate that the model estimates the values of the dependent variable for

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[5] Ibid., pp. 508-509.

each case at each time period. The coefficients, b_2 through b_k, are common across cases and across time periods for each of the independent variables. These coefficients measure the overall impact on the dependent variable of a unit change in a particular independent variable.

Assumptions and Estimation Problems

The most widely used estimation technique, ordinary least squares, or OLS, is based on the seven assumptions of the classical multiple regression model. When these criteria can be met, OLS is the preferred method of estimation. OLS estimates are referred to as Best, Linear, Unbiased Estimators (BLUE) estimators, in part, because the expected value of the estimator equals the population value.[6]

The problem with OLS estimation is that the assumption of the model cannot always be met. This is especially true when cross-sectional and time series data are combined. Kmenta and others include the pooled model in the category of the "generalized linear regression model", which is less restrictive in assumptions about the disturbance term.[7] The presence of heteroskedasticity violates the requirement that the cases, whether firms, states or CMH boards, exhibit equal variance in the disturbance terms. If the data contain modest of high degrees of heteroskedasticity, then the use of OLS estimation alone is not advised, since

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[6] Ibid., pp. 209-213.

[7] Ibid., pp. 499-502.

estimated coefficients will be biased and traditional statistical tests invalid.[8]

Autocorrelation, a problem which may afflict time series models, results when a disturbance carries over from one period to the next. In Kmenta's terms, the disturbance is interpreted as:

> ...a summary of a large number of random and independent factors thatenter into the relationship under study, but which are not measurable....one would suspect that the effect of these factors operating in one period, would, in part, carry over into the following period.[9]

The consequences of violating the non-autocorrelation assumption, i.e., of using OLS estimation when disturbance terms are autocorrelated, can be severe. The variances of the estimated coefficients will be biased meaning that t-tests for individual estimated are invalid.[10]

When data are found to violate the above assumptions, generalized least squares, or GLS, estimation is advised. This technique enables investigators to pinpoint potential problems and to take corrective action. The following section provides information about the form of the GLS model to be used in this analysis. It is referred to as the weighted least squares (WLS) model and it is usually employed to correct for problems of heteroskedasticity.

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[8] Robert S. Pindyck and Danial L. Rubinfeld, Econometric Models and Economic Forecasts (New York: McGraw-Hill Book Company, 1981), pp. 140-41.

[9] Kmenta, p. 269.

[10] Charles W. Ostrum, Jr., Time Series Analysis: Regression Techniques (Beverly Hills, California: Sage Publications, Inc., 1978), pp. 16-17.

Although there are indications of some positive autocorrelation in the data, no correlations were made in this analysis. Test results concerning the presence and degree of autocorrelation will be presented in a later section.

The Weighted Model

When both large and small units are included as cases in an analysis, and when one of the independent variables (population) also measures size--the likelihood is that heteroskedasticity is present and that the condition can be traced to the population variable.

If this type of problem is found, it would represent a common form of heteroskedasticity in which the variation in residual term is influenced by the size of the CMH boards.[11] In other words, the larger the board population, the larger the disturbance.

Although a formal test for heteroskedasticity was not conducted, several procedures were utilized to help confirm the presence of non-constant disturbance terms. The boards were first ranked from high to low on the local population variable. A visual inspection was then made of the residuals for the twenty highest and lowest ranking boards. The averages for these two groups were quite different, with high-population boards showing much higher residual trems than the smaller boards. This confirmed the suspicion that population and disturbance terms were closely related.

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[11] Pindyck and Rubinfeld, p. 141.

This type of non-constant variance problem can be remedied with weighted least squares estimation. WLS estimation may involve a variety of weighted techniques depending on the source of the problem. When the condition can be traced to an independent variable such as local population, the weighting is accomplished with this variable. The general form of this WLS model is as follows:

$$\frac{Yit}{Xit,2} = b1 \frac{1}{xit,2} + b2 + b3 \frac{xit,3}{xit,2} + \ldots + bk \frac{xit,k}{xit,2} + \frac{eit}{xit,2}$$

In this case, the term xit,2, is the board population for the i^{th} case and the t^{th} time period. all terms in the WLS model are divided by the population variable. The intercept or constant term becomes a variable term in this model $(b1 \frac{1}{xit,2})$, while the slope associated with the population variable (b_2) becomes the new intercept term. Xit,3 through xit,k are the remaining explanatory variables and eit is the disturbance term.[12]

The primary advantage to using the weighted model is that variation in the disturbance can be effectively removed. The WLS coefficients meet the constant variance criterion requirement, which means they are efficient and unbiased. The standard errors of these estimators are also unbiased enabling the valid use of statistical tests.[13]

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[12] Kmenta, p. 270.

[13] Pindyck and Rubinfeld, p. 142.

If the OLS estimates were used under these conditions, the least squares estimates would produce a fit that over-emphasized the boards with larger variance. The squared multiple correlation coefficient (R^2), which provides a measure of the goodness of fit, would tend to be somewhat higher in the OLS estimation.

The WLS estimates, together with the original data, can be used to re-estimate the utilization model. This step involves fitting a new regression plane to the data with the transformed coefficicents. A revised goodness of fit can be computed with a person correlation coefficient between the new estimate of utilization and the original data. The re-estimate R^2 value will be somewhat lower than the OLS estimate, but it will be free of the potential effects cited above.

Utilization Models

In this section, the pooled cross-sectional time series model is outlined for three related utilization models. For each model, the variables are operationalized and specific statistical tests are examined.

The Performance Model

As mentioned earlier, use of state hospitals among the boards can be explained in a model which depicts utilization as a linear, additive function of several local factors which make up the performance model. These factors include wealth, local economic conditions, federal involvement, utilization of local resources and proximity to state

inpatient services. Specific hypotheses regarding each of these variables have been presented in Tables III-3 and III-4. It should be noted that one additional variable has been added to the model. A detailed description of this variable is included below. The multiple regression equation representing the operationalized model is presented first, followed by separate discussions of each variable.

$$\begin{aligned} CENSUS = {} & b_1 + b_2 SWTOTL + b_3 LPOP - b_4 INCOME \\ & + b_5 RATE - b_6 LRES - b_7 FED - b_8 BMMI \\ & - b_9 BMDD + E \end{aligned}$$

CENSUS

This is the dependent variable and is the main indicator of state hospital utilization by the boards. It measures the total number of patients in the state hospitals and centers, based on the county of residence of individuals at the time of admission. The data are point-in-time observations taken twice annually between 1974 and 1983. Observations were collected for all fifty-five CMH boards for the last day of the sixth month, and the last day of the twelfth month of Michigan's fiscal years. In 1976 the state's July to June fiscal year changed to the current October to September period. Since these data were collected to correspond to the fiscal year, the six semiannual observations for fiscal years 1973-74 through 1975-76 are for June and December, while remaining observations are for March and September. This change in

months poses no significant data problems.[14]

SWTOTL

This variable is total patients in state hospitals. This statewide figure is the new independent variable mentioned above and in consists of twenty observations which are cross-sectional sums of the semiannual individual board CENSUS figures over the ten year period. The major purpose in adding this variable to the model was to detrend the data. In other words, the function of SWTOTL is to capture extraneous variance thought to be due simply to the overall downward trend in the dependent variable. This procedure should help to provide a clearer picture of the actual impacts of the remaining exogenous variables. The slope coefficient associated with SWTOTL is b_2 which measures the impact of statewide totals on board CENSUS figures. To be more specific, this coefficient measures the impact on the dependent variable of a unit change in state total patients. The relationship between board utilization figures and statewide totals is expected to be strong and positive. That is, downward trends among the boards are expected to be closely linked to the downward trend in the statewide total.

LPOP

Board population figures are to be used mainly as a measure of size. This variable is considered to be an

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[14] A review of the data for these periods indicates no apparent differences in seasonality or other problems associated with the change of time periods.

important component in the performance model explanation of utilization. Large and small CMH boards appear to face different kinds of mental health problems. Some of these potential difficulties for the largest boards were outlined in Chapter III. LPOP is expected to be positively related to board utilization and highly significant in impact.

INCOME

Total personal income is designed to measure relative wealth among the boards. There are twenty observations on this variable for each of the boards, covering the 1974 through 1983 period. Since only annual data were available, these figures were repeated in each year to correspond to the semiannual data available for remaining independent variables. INCOME is expected to be strongly related to utilization and this relationship is expected to be negative.

RATE

The unemployment rate in CMH boards is used as a measure of local economic conditions. The observations are monthly average unemployment figures are were collected for the same six-month intervals as the CENSUS data. In this exploratory study, the decision was made to use employment figures corresponding to the same time points as the dependent variable. This assumes that changes in unemployment within the boards have almost immediate impact on board utilization of state hospitals.

As indicated in Table III-3, board unemployment figures are expected to be strongly related to utilization. This relationship is thought to be positive as indicated by the sign for RATE in the above utilization model. As argued earlier, increasing levels of unemployment should be reflected in increased state hospital use.

FED

This variable designates CMH boards which consistently received federal grants between 1974 and 1983. The data employed in developing this dummy variable were taken from Quarterly Financial Reports by the boards and consist of semiannual expenditures of a variety of federal grants. Due to the manner in which the observations were collected, it was not possible to separate CETA funds from other federal programmatic grants to the boards. It was possible, however, to separate out thoses boards which received non-CETA grants from those receiving no federal funding. Since the main focus is on boards which consistently obtain grants, a dummy variable was used to designate consistent recipients with 1's and all others with 0's. If a board reported federal expenditures of non-CETA grants for half or more of the ten years, the board was assigned a 1 for the entire ten-year period. The coefficient associated with FED indicates whether this group of long-time federally active boards also utilizes state hospitals at a lower rate. It is expected that the coefficient is significant and negatively related to utilization.

LRES

This variable is CMH board spending for local residential and inpatient programs. LRES is a measure of the use of these local resources by the board. Observations are for semiannual periods and were collected from Quarterly Financial Reports made by the boards. This category of local expenditures is expected to be strongly and negatively associated with utilization.

MMI

This term refers to the number of miles separating a board from the nearest state hospital for the mentally ill. MMI is thus a partial measure for proximity to state inpatient services. The observations are the number of miles between the major population center of a board and its nearest MI state hospital. This variable is assumed to be strongly and negatively related to total utilization. The closer a board is to a state hospital, the more likely it is that the board will utilize those services at a higher rate.

MDD

Indicates the number of miles separating a CMH board from the nearest state center for developmental disabilities. This and the previous variable make up the total measure of board-hospital proximity. Rather than compute an average or in some other way combine the measures, it was felt there was sufficient justification to look at distance from each hospital and center. MI hospitals and DD centers are

administered separately and serve different patient groups. It is also assumed that boards utilize these institutions differently due in part to differences in proximity of the two institutions.

The variables in the performance model are summarized in Table IV-1. Each variable and concept is listed in the table along with a brief description of the operationalization of the variable, and the source of information.

The performance model has been put forth as an attempt to explain or account for most of the variance in state inpatient use among CMH boards. In effect, the components of the performance model express the process of utilization among the boards as a group. The impacts of local environmental characteristics, along with statewide utilization levels, are expected to provide the key factors in an overall explanation of utilization.

The Management Group Covariate Model

Now that the performance model has been developed, it is time to consider management group impacts with the context of this model. This will be accomplished by the addition of group variables to the performance model. The goal of this segment of the analysis is to examine whether management changes by the CMH boards led to any changes in the manner in which utilization was explained in the previous section. The development of the interaction model produces, in effect, three performance models within the same regression equation. The first model consists of the

TABLE IV-1

Summary Of Variables, Operationalizations And Data Sources For The Utilization Models

Variable/Concept	Operationalization	Source
CENSUS--Board utilization of state hospitals	Number of patients in state hospitals by county/voard of residence - measured semiannually	DMH--Census of residents in MI hospitals and DD centers; Reports 40032-01 and 40032-02
SWTOTL--Statewide utilization of state hospitals	Number of patients in state hospitals statewide	
LPOP--Size of the CMH board jurisdiction	Total number of persons residing within the board jurisdiction	Michigan Department of Management and Budget--State Demographics Office
INCOME--Wealth in board jurisdictions	Total board personal income in millions of dollars	Michigan Statistical Abstract-- "Total Personal Income in Michigan Counties"
LRES--Utilization of local mental health resources	Total reported semiannual expenditures by boards for residential and local inpatient programs	Quarterly Financial Reports submitted by boards to DMH-- Schedule 5
FED--Federal influence/ involvement in the boards	Boards which received federal grants for at least five years were assigned 1, others 0	Quarterly Financial Reports submitted by boards to DMH-- Schedule 1

TABLE IV-1 (Continued)

Variable/Concept	Operationalization	Source
RATE--Economic condition in the CMH boards	Average unemployment rate for sixth and twelfth months of fiscal years	Michigan Employment Security Commission--Report 3221; "Civilian Labor Force and Employment Estimates"
MMI--Proximity to state, MI hospitals	Number of miles between MI state hospital and population center of the board	Department of Mental Health information on location of state hospitals 1974 through 1983; state map
MDD--Proximity to state DD centers	Number of miles between DD centers and the population center of the board	Same as MMI

performance model variables reviewed in the previous section, while the second and third models contain the group-performance model interaction terms for both the full and shared management groups. The entire model is given as follows:

$$\begin{aligned} CENSUS = {} & b_1 + b_2 SWTOTL + b_3 FMTOTL + b_4 SMTOTL + b_5 LPOP \\ & + b_6 FMLPOP + b_7 SMLPOP - b_8 INCOME - b_9 FMINC \\ & - b_{10} FMINC + b_{11} RATE + b_{12} FMRATE + b_{13} SMRATE \\ & - b_{14} LRES - b_{15} FMLRES - b_{16} SMLRES - b_{17} FED \\ & - b_{18} FMFED - b_{19} SMFED - b_{20} MMI - b_{21} FMMI \\ & - b_{22} SMMI - b_{23} MDD - b_{24} DMDD - b_{25} SMDD + E \end{aligned}$$

The new variables which have been added to this model are simply group versions of the overall performance model variables. The management group-performance model variables measure the effect of the variable for the particular management group during the contract period. The results of this policy impact model should assist in examing the impacts of management reforms on the process of board utilization.

The group interaction terms were developed in line with the following procedures: first, dummy or binary variables were created for each of the three management groups. The boards were assigned 1's for the periods during which they were members of particular groups and 0's for the periods for which they were not members.

Members of each group were also assigned 0's for all observations prior to 1980-81, the first year of management

changes. Each group dummy variable thus consists of a vector of 1's and 0's with the 1's designating that boards were members of one or more groups for two or more periods. These dummy variables now designate both management group membership, and duration and change in status during the contract period. These dummy variables will be the focus of the following section, but in this section they are used to create the new group interaction variables. The second procedural step involves multiplying the group dummy variables by each of the performance model variables.

The resulting group variables will provide estimates or the impacts of the management changes on the performance model. In interpreting this interaction model, it should be noted that the performance variables, such as RATE or LRES, now measure the impact for the seven-year period from 1973-74 through 1979-80. Impacts for the contract period are contained in the group performance model estimates. According to the hypotheses proposed in Chapter III, this model should enable the assessment of impacts of group change on the factors which are known to explain the utilization. If management status has no impacts on the factors which determine utilization, and if the performance model does not change significantly, then the performance model estimates should resemble the group performance model estimates for the contract period. This will signify that the traditional explanations of utilization remains valid in one or both groups, or in other words, that management change played little or no role in the utilization process.

Support for the policy hypotheses will come in the form of changes in signs and in the magnitude and significance of the group variables in comparison to the pre-contract performance variables.

Since the impacts of the performance model variables are not expected to change significantly in this interaction model, the discussion of individual variables will focus on group impacts variables. Note that the following subsections are divided on the basis of the performance variables.

SWTOTL

The group versions of this variable (FMTOTL and SMTOTL) measure the impact on group utilization of changes in the statewide inpatient census for the contract period. It is expected that SWTOTL, FMTOTL, and SMTOTL will all be positively associated with utilization.

LPOP

By comparing the group population estimates, FMLPOP, and SMLPOP, to the pre-contract impacts, it should be possible to gauge whether management change had any impact on the traditional effects of size. As stated earlier population should be positively related to board utilization. If management changes produce no utilization impacts, then the estimate for LPOP should have the same sign and be of similar magnitude to the estimate for FMLPOP and SMLPOP. The policy hypotheses argue that management impacts will result in a decline in the impact of size for

the management groups.

INCOME

The group INCOME variables, FMINC and SMINC, provide estimates of the effect of wealth in each of the groups during the contract period. If management reforms are successful in leading to changes in board utilization, this should be reflected in changes in the manner in which wealth effects the utilization process. The previous hypotheses argued that the impacts of wealth will most likely be diminished if management changes are successful. This would suggest that the effects of wealth are not as predictable in the contract period. Less wealthy members of the group may contribute to this change by showing relatively strong performance in the contract period. If the results show an increased negative impact in one or both groups, this may indicate that wealthier boards were able to take advantage of the contract changes, while less wealthy boards were not.

RATE

The interpretation of the group estimates, FMRATE and SMRATE, is similar to previous variables. Changes in size or sign for group variables will suggest that this particular component of the utilization process has been effected by management decisions. If the change in policy is successful, then it seems reasonable to expect that the effect of local economic conditions will be diminished or even reversed during the contract period.

LRES

DMH reform policy has focused considerable attention on the need to increase development of CMH-managed alternatives to institutionalization. These attempts to involve the boards in the planning and placement process are not for the most part new, but the implementation mechanisms have changed considerably. Many of the CMH boards have become more closely involved with the state hospitals and centers due in part to the requirement that full (and shared) management boards set up subcontracts with the state providers.

One of the chief aims of these policies is to strengthen the relationship between hospital placement needs and CMH-managed programs. LRES, the measure of board spending for local inpatient and residential programs, will provide an estimate of the effect of these programs on board utilization during the pre-contract period. The hypothesized strong negative impact for LRES applies to each of the groups, except that the impacts of FMLRES and SMLRES are expected to be more pronounced. This would suggest that the relationship between CMH-managed alternative services and state hospital use is strengthened. Board spending for these services contributes directly to lower utilization of services. If these estimates are also significant, then full and shared management boards have consistently greater impacts than local management boards.

FED

Since FED was constructed as a dummy variable, both FMFED and SMFED are also dummy variables. Comparison of pre-contract and group coefficitents well indicate whether federally active boards utilized state inpatient services at a lower level in the contract period. As indicated in the previous chapter, boards with high levels of federal interaction may also be expected to take advantage of the state's management options. If this occurs, the group estimates for FED should be even lower than the hypothesized pre-contract level of FED.

MMI and MDD

The group estimates for each of the distance variables should experience little change over the pre-contract impact, if management reforms have little or no impact on the extent to which service proximity effects use. If, however, management changes result in greater decline in utilization for boards with state hospitals nearby, then the group coefficient for one of both distance variables may be positive. On the other hand, the impact of management may be negative and of greater magnitude for the groups, indicating that at least some of the change in utilization occurs for boards located relatively far from state services.

The performance and group variables are summarized in Table IV-2 below, which contains variables and

TABLE IV-2

Summary Of Group Variables And Operationalizations For The Covariate Utilization Model

Performance Variable	Group Variable	Operationalization of Group Variables
SWTOTL	FMTOTL SMTOTL	These variables result from multiplying the group dummy variables, FM and SM, by the total state inpatients. They estimate the impact of the statewide trend within each management group.
LPOP	FMLPOP	Group dummy variables are multiplied by the board population variable. The new group interaction terms measure the impact of size within each of the management groups.
INCOME	FMINC SMINC	Group income variables are the products of group dummy variables and INCOME. The interaction terms provide a measure on the impact of INCOME in each group.
RATE	FMRATE SMRATE	The products of group dummy variables and unemployment rate provide group estimates of the unemployment rate (RATE).
LRES	FMLRES SMLRES	These covariates are constructed by multiplying group dummy variables times expenditures for local resources. Resulting variables measure the effect of board spending in each group.

TABLE IV-2 (Continued)

Performance Variable	Group Variable	Operationalization of Group Variables
FED	FMFED SMFED	The group variables are the product of the two dummy variables and the dummy variable for FED. The new estimates indicate whether federally active boards have lower utilization levels in the groups.
MMI	FMMMI SMMMI	Group dummy variables are multiplied by the MI distance variable to measure the effect of proximity to state sevices within each of the groups.
MDD	FMMDD SMMDD	Group dummy variables are multiplied by the MI distance variable to measure the effect within each of the groups.

operationalizations of the interaction model. Data sources for these variables are the same as indicated in Table IV-1.

The analysis of this model will pay particular attention to the following areas. First, the overall covariate model will be compared to the performance model alone. If the added group variables contribute to the performance model explanation, this would provide support for the policy hypotheses. The F statistic will be used to test for these differences between the two models. Second, a comparison of the individual estimates will also be used to check whether the performance variables in the group model show any change compared to the variables in Table IV-1.

Third, the analysis will focus on management impacts by examining the group estimates in comparison to pre-contract performance estimates. This step in the analysis will also involve comparisons of full, shared and local management effects. Of primary interest are the patterns of group impacts which may be present in the covariate results. It has been hypothesized that management reforms will effect the process by which the board jurisdictions have traditionally utilized state services. Where applicable, differences in slope coefficients for the groups will be tested and reported. The key statistic for testing these estimates is the t-value. In most cases, the tests will be one-tailed with a .05 level of probability. This yields a critical t-value of $\pm$ 1.64 which can be used to compare the estimated results in Chapter V.

The final component of the regression analysis concerns the impacts of policy change on the mean utilization levels of the boards. To ascertain these changes, the previous models will need to be slightly altered. These procedures are outlined in the following section.

Changes in Utilization

The analysis of policy impacts on board utilization requires that the management group dummy variables, FM and SM, be added to the performance and covariate models. These group variables were defined earlier as dummy variables with "1's" and "0's" indicating membership or duration of boards in the groups during the contract period. The interpretation of these dummy variable coefficients is quite different from the estimates discussed so far. Whereas previous group estimates have generally depicted the slope coefficients of the groups, the group dummy variables measure the difference in average utilization between the full or shared group and the local management group.

If the full management trade-offs and other components of the reforms are successful, then the management groups will have coefficients which are negative and significantly different than local managment. These results would indicate that full and shared management utilization in the contract period was significantly below the mean for the local management group. The analysis of group utilization is much more straightforward than the previous analysis of group covariates. In that model, the focus is on policy

impacts on the utilization process, i.e., on those performance variables which are related to utilization. In this model, the major concern is with identifying utilization change among the groups. The two concerns are more closely related than may first appear, however.

The evaluation of the covariate model in Chapter V may indicate that one or more management groups are experiencing a decline in state service utilization, which can be interpreted from the process impacts in that model. In other words, changes in the group performance model should suggest whether a particular group is increasing or decreasing in utilization, or remaining at the same level. A steep decline in utilization by one group should be reflected in key differences on the group covariate model, as hypothesized in Chapter III.

To this point the discussion of utilization models has focused on three main points. First, a basic performance model has been proposed to take account of the major environmental and board variables which might be important in an explanation of utilization. Second, after a review of the performance model, management differences were introduced by dividing the boards into three policy groups based on management group membership. The group-performance model interaction terms were then added to the basic model with the intent of accounting for group effects on performance variables. And third, to complete the analysis, procedures were introduced for estimating final versions of the models, with group dummy variables included. These

variables are included to measure group trends in utilization in the post-1980 period.

The following section examines the question of CMH board selection of contract status.

The Contract Decision

Two major statistical procedures or models will be employed to provide information about the nature of group differences on key social and economic characteristics, and the relationship of these differences to board contract decisions. The procedures include factor analysis which will be used to form composite measures of numerous social and economic indicators, and discriminant function analysis, which will help search for patterns among the groups. Each of these is described in the sections which follow.

Socio-Economic Differences in 1980

As indicated in Chapter III, no formal hypotheses were presented regarding the relationship between management groups and socio-economic differences. It was strongly suggested, however, that since full management status is the most innovative and potentially most risky of the contract alternatives, the recipient boards might exhibit similarities in social and economic characteristics. Of the seventeen variables selected for analysis, six clearly fall in the category of economic measures. Remaining categories include population, educational and religious variables. One additional variable that is more difficult to categorize is the number of years of board operation. The objective in

choosing these variables was to encompass a wide range of indicators which may be related to the likelihood that boards will opt innovation in mental health. The population breakdown, for example, includes indicators for population density, percent minorities, percent foreign-born, percent elderly and the urban-rural makeup of the boards. In addition to the standard indicators of wealth, the economic category includes measures for local economic conditions and also for the manufacturing, service and farm components of the local economy. The full list of these variables is summarized in Table IV-3 which contains variable names, concepts, operationalizations and sources for the data.

Each of the variables in Table IV-3 was included in a factor analysis intended to discover the interrelationships among the variables. The factor-analysis method thus enables the creation of a reduced number of new variables based on the shared variance among the original variables.

The "fundamental assumption" of factor analysis is that the covariation among observed variables in a data set can be accounted for by one or more underlying factors. The number of estimated factors will be less than the number of variables, and each factor will represent a separate linear comination of the variables in the analysis.[15] Each factor can be represented in a multiple regression form as follows:

$$F = a1x1 + a2x2 + \ldots + aixi + ui$$

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[15] Jae-On Kim and Charles W. Mueller, Introduction to Factor-Analysis (Beverly Hills, California: Sage Publications, Inc., 1978), pp. 12-15.

TABLE IV-3

Summary Of Social And Economic Variables, Concepts, Operationalizations And Data Sources

Variable/ Concept	Operationalization	Source of Data
INCOME-- Level of wealth in the boards	Total board personal income in millions of dollars	Total county personal income--Michigan Statistical Abstract
FAMINCOM-- Level of family income within the boards	Median family income	Summary of Social and Economic Characteristics-- U.S. Census, 1980
POVERTY-- Degree of poverty in the boards	Percent of population defined as living in poverty	Summary of Social and Economic Characteristics-- U.S. Census, 1980
PCNTMNFG-- Extent of manufacturing in local economies	Percent of total board income derived manufacturing	Labor and Proprietors' Earnings in Michigan Manufacturing, by County--Michigan Statistical Abstract
PCNTSERV-- Extent of service sector in local economies	Percent of total board income derived from service activities	Labor and Proprietors' Earnings in Service Industry Establishments-- Michigan Statistical Abstract
PCNTFARM-- Level of farming in board jurisdictions	Percent of board income derived from agriculture	Labor and Proprietors' Earnings in Agriculture Michigan Statistical Abstract
RATE-- Local economic conditions	Average unemployment rate for the twelve months of 1980	Civilian Labor Force and Employment Estimates (Report 3221)--Michigan Employment Security Commission

TABLE IV-3 (Continued)

Variable/ Concept	Operationalization	Source of Data
DENSITY-- Size of the CMH boards	Population per square mile	Michigan Department of Management and Budget
URBAN-- Proportion of board population which is urban	Percent of population living inside urbanized areas	Characteristics of the Population-- U.S. Census, 1980
MINORITY-- Size of the minority population in the board	Percent of population classified as minority	Persons by Race-- U.S. Census, 1980
FOREIGN-- Extent of the foreigning in local economies	Percent of population which was foreign-born	Selected Social Characteristics, 1980-- U.S. Census, 1980, Table P-2 Statistical Abstract
HSCHOOL-- Level of high school education in the board	Percent of over-25 age group with a high school degree	Selected Social Characteristics, 1980-- U.S. Census, 1980
COLLEGE-- Size of the college education population	Percent of over-25 age group with four or more years of college	Selected Social Characteristics, 1980-- U.S. Census, 1980
SENIORS-- Size of the over-65 sector of the population	Percent of total board population which is age 65 or older in 1980	"Percentage of Population 65 and Over for Michigan Counties"-- Michigan Statistical Abstract, 1982-83

TABLE IV-3 (Continued)

Variable/ Concept	Operationalization	Source of Data
CHURCHS-- Extent of religious activism in the board	Total number of churches per capita	Churches and Church Membership in the U.S., 1980-- Quinn, et. al., Glen Mary Research Center; Atlanta, GA, 1982
ADHERE-- Religious affiliation among board citizens	Percent of board population which is categorized as adherents to a	Churches and Church Membership in the U.S., 1980-- Quinn, et. al., Glen Mary Research Center; Atlanta, GA, 1982
NYEARS-- The number of years the board has been oper-ing	The number of years between the initial year of the board and 1980	Michigan Department of Mental Health

In this equation, F is a particular factor; the x_i are the observed variables; and the a_i are the factor loadings or weights showing the relationship between a factor and each of the variables. A factor can be thought of as a pattern or cluster of variables which share common variance with respect to some underlying factor which has not been named. Factor loadings "measure which variables are involved in which factor pattern and to what degree".[16]

Factor analysis normally involves some type of rotation or iterative process in searching out distinct patterns among the variables. The process of selecting a rotated factor begins with an initial or unrotated factor matrix. Rotation normally stops when each factor loads or correlates with the smallest number of variables.[17]

The next step in the analysis is to inspect the rotated factors for those variables with high positive or negative loadings. The usual criterion for selection of a variable as "high loading" on a factor is $\pm.50$ or $\pm.60$. This analysis will employ the more conservative level of $\pm.60$. Once these variables have been identified for each factor, the analyst attempts to identify meaningful patterns among the variables which can be interpreted as new or more general measures. In other words, if a given factor was found to include predominantly economic variables, the factor might be appropriately named "wealth". This

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[16] R. J. Rummel, "Understanding Factor Analysis," Conflict Resolution 2 (1967): 462-64.

[17] Ibid., pp. 473-74.

procedure has been followed in producing the results in Table IV-4 below.

As the table shows, the factor analysis produced three clearly identifiable factors corresponding to wealth, urban and education dimensions in the data. The seven variables included in the left column of the table all share relatively high levels of variance with a common underlying factor, which has been interpreted as WEALTH. The last three variables in that column make negative contributions to the WEALTH factor. The negative loadings suggest that CMH boards which are relatively high on manufacturing, the income measures and overall years of board operation, tend to also have relatively low levels of poverty, senior citizens and churches.

The second factor, URBAN, focuses on population variables, and appears to distinguish the boards based on an urban-large city orientation. The factor, EDUCATION, differentiates among the boards based on two educational variables and a variable which measures the extent of services in the local economy. Three additional factors were produced for the seventeen variables, but were dropped because no variables loaded highly on any of them. Note that three variables , RATE, PCNTFARM and ADHERE did not qualify for inclusion in the final three factors.
Now that the factor analysis component has been presented, the next to last procedural step can be described. This step involves construction of factor scales based in part on the information provided in Table IV-4. While more than one

TABLE IV-4

Variables And Factor Loadings On Three Rotated Factors: WEALTH, URBAN AND EDUCATION

	Factors					
	WEALTH		URBAN		EDUCATION	
Variables And Loadings	PCNTMNFG	.71	DENSITY	.81	COLLEGE	.66
	INCOME	.67	URBAN	.76	HSCHOOL	.63
	FAMINCOM	.61	MINORITY	.67	PCNT	.59
	NYEARS	.59	FOREIGN	.63		
	POVERTY	-.80				
	SENIORS	-.61				
	CHURCHS	-.58				

method of scale construction is available, this analysis will utilize the standard normal or Z score variables, produced as a part of the factor analysis. The use of Z-scores means that for each variable the distribution for all boards will have a zero mean and a standard deviation of one. The purpose of using Z-scores is to ensure that all data are standardized or more comparable across both cases and scales.

Based on the results in Table IV-4, the WEALTH scale is produced by combining the Z-score values for each board on all seven variables which loaded highly on this factor. The same process is used in developing the URBAN and EDUCATION scales. The equation for combining the Z-scores uses the signs of the factor loadings to determine whether to add or

subtract the Z values.[18] The signs for POVERTY, SENIORS and CHURCHS on the WEALTH factor indicate that these Z-scores are subtracted for each CMH board.

To demonstrate how this procedure works, assume that the Z-scores for one of the poorer boards are approximately -1.5 for each of the first four variables in the WEALTH factor. Assume also that the board has high relative values on POVERTY (1.5), SENIORS (1.0) and CHURCHS (1.0). The score, based on the signs of the factor loadings, is -9.5, a result which places this hypothetical board relatively low on the WEALTH scale. A low score such as this results if boards rank relatively low on wealth indicators and high on poverty indicators. In Table V-1 in the next chapter, the Lake County CMH jurisdiction registers the lowest overall score on the WEALTH scale (-14.94), while the Oakland CMH jurisdiction shows the highest score (11.60) among all boards. That table contains scores for all boards on the three scales for all boards on the three scales.

While the boards scale values provide an interesting set of results as they are employed in this analysis to examine basic social and economic differences among the management groups. To assist in this examination, a discriminant function analysis was utilized. These procedures are introduced in the following section and discussed further in Chapter V.

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[18] I want to thank Professor John E. Hunter of the Psychology Department at Michigan State University for his assistance in developing the factor scales, and also for helping me to better understand factor analysis.

Differentiating Among Management Groups

The factor analytic results have been utilized to construct three different socio-economic scales, each of which provides board scores indicating the relative position of the boards. The question for the analysis focuses on whether the groups differed systematically on these values, and specifically on whether the full management boards are consistently different from boards in the remaining groups.

The discriminant technique is designed to search for differences in two or more groups based on data for one or more discriminating variables. The three factor scales were used as the discriminating variables, along with three variables indicating group affiliation of the boards. The latter variables were created by assigning 1's to boards based on their management status at the end of 1982-83. All non-members were assigned 0's for each group.

The analysis proceeds by first creating a number of discriminant functions equal to the number of groups minus one. Since there are three groups, two discriminant functions are produced. These were linear in form as were the previous factor analysis and regression models. In fact, the procedure is somewhat similar to multiple regression analysis with group membership as the dependent variable.[19] The objective is to find the combination of factor variables which "will maximize the differences..."

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[19] Kerlinger and Pedhazur, p. 337.

among contract groups "relative to the differences within groups."[20] The discriminant functions contain regression weights which indicate the relative importance of the scales in differentiating among the groups. These weights for the factor variables and the two discriminant functions are reported in Table V-2 in the following chapter.

The functions are to be evaluated for how well they are able to pick out group differences. The first statistic which will be used to indicate differences is the canonical correlation. The square of this estimate provides a measure of the extent to which group membership is related to factor scores. The second statisic is the F-test of significance whci is applied in modified form to the discriminant functions.[21]

The F statistic compares within group sums of squares and between group sums of squares in an effort to identify significant group differences. Based on these results, the discriminant analysis should be able to tell whether group membership can be predicted based on board scores on three factor scales.

If full management boards are found to differ consistently from the other groups, this may have implications for the analysis of regression models. This

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[20] Ibid., p. 340.

[21] A useful discussion of statistical tests for evaluating dicriminant functions is contained in William R. Klecka, "Discriminant Analysis," in SPSS: Statistical Package for the Social Sciences, Nie et al., (eds.)(New York: McGraw-Hill Book Company, 1975), pp. 434-67.

could be a problem if the factor scores were also closely related to utilization differences among the boards. Under such conditions, it may be quite easy to confuse full management impacts with group differences in composite socio-economic factors. It is felt that if the discriminant analysis identifies clear differences, the performance models should be able to accommodate and take account of potential group differences going into the contract period.

Summary and Conclusion

The procedures and models outlined in this chapter provide the basis for testing the concepts introduced in Chapter III. If management reforms change the outcomes of utilization decisions made by the local jurisdictions, then these changes should be reflected in impacts on the utilization process and in declines in utilization levels for the boards.

The multiple regression model has been described in some detail because the pooled cross-sectional time series model is not as commonly used as some othe models. This model is also vulnerable to two major assumption problems: heteroskedasticity and autocorrelation. Analysis of the data indicated that the non-constant variance problem was major, and that the source of the problem could be traced to the board population. On the basis of this information, a weighted model was developed with board population providing the weighted factor.

The WLS model was used to estimate three different

models explaining board utilization. The first is the basic performance model which attepts to provide a general explanation of board utilization. The second model includes variables which provide estimates of group effects on the performance model. This interaction or covariate model produces performance model estimates for both full and shared management groups for the contract period.

The third type of model involves making only minor adjustments to the previous performance and group interaction models. Dummy variables representing group membership are added to both models to test whether management reforms lead to changes in group utilization levels. The dummy variables provide estimates of mean utilization of the groups, after controlling for the effects of other variables in the model.

The final segment of this chapter has provided an outline of procedures which will be used to examine group differences, and the association of potential differences with board contract decisions. Both factor analysis and discriminant function analysis have been used to test for group differences. The results of these tests appear early in the following chapter, since they may lend important information to the subsequent utilization analysis.

CHAPTER V

RESULTS

The purpose of this chapter is to report the results for the models presented in the previous chapter. In the first section, information is provided about differences and similiarities among management groups on several local variables for the year 1980. This part of the analysis will make use of the results of the factor analysis described in Chapter IV, and will attempt to differentiate the groups based on their factor scale scores. The intent of this discussion is to establish whether the management groups differed systematically on these local variables prior to the contract period, and whether these differences are associated with board decisions regarding management status.

In the second section, results for the estimated performance model are evaluated in comparison to earlier hypotheses. The goal of this analysis is to increase understanding of the factors which help explain variation in board utilization over the ten-year period. The performance model will then be used to provide the context for assessment of management impacts in sections three and four of the chapter.

In the third part of the chapter, the performance model is expanded to include the impacts of management changes by

the boards. This is accomplished by introducing covariates or interaction terms, which measure group impacts on performance model characteristics for the contract period. The goal of this part of the analysis is to assess the extent to which the management groups changed on those factors which explain utilization. The impacts of management reforms are to be analyzed by comparing management group performance model behavior to the results for the overall performance model. Performance impacts will also be assessed by looking at group differences in average utilization levels in the contract period. The main purpose of this discussion is to ascertain whether full and/or shared management boards significantly drop their utilization levels as part of their new management responsibilities.

Selection of Board Management Status

The discussion in this section assesses contract group differences and similarities for the year prior to the contract period. The purpose of this analysis is to determine if board decisions to innovate and to accept greater mental health responsibilities are conditioned by certain local characteristics which are shared by these boards. It has been hypothesized that full management boards may comprise a distinct group of boards with high rankings on social and economic indicators. These expectations are generally supported by previous research studies, some of which were reviewed in Chapter III. Tests of the socio-economic hypotheses involve use of both factor analysis and

discriminant function analysis. After reviewing the results of the test, additional influences on board adoption decisions are examined, including the DMH selection process, and leadership differences among the boards.

Innovation and Socio-Economic Impacts

In Table V-1 on the following page, the factor scale data are presented for each of the fifty-five CMH boards. The boards are not ranked but are listed in alphabetical order according to group membership, with the three full management groups making up the first eighteen boards. These three groups are shown in the order in which the member boards selected full management status. Boards numbered 1-4 are the pilot boards of 1980-81, while 5-12 and 13-18 are the numbers for the full management groups of 1981-82 and 1982-83, respectively. The shared management group consists of boards numbered 19-48 and the remaining boards (numbered 49-55) make up the local management group.

Several summary statistics for each factor scale are provided at the bottom of Table V-1; these include the range, the overall means and standard deviations and the group means. A review of these measures suggests that the full management group has a somewhat higher mean for both the WEALTH and EDUCATION factors, while the local management group average tends to be higher on the URBAN facoter. The two most similar groups are full and local, with the shared management group average falling consistently lower on each factor. Apart from the information about the shared

TABLE V-1

Factor Scale Results For All CMH Boards On WEALTH, URBAN And EDUCATION Factors-- 1980 Data

	Boards	Factor Scales		
		WEALTH	URBAN	EDUCATION
1.	Alger-Marquette	-.33	-.08	.97
2.	Kent	5.07	3.31	2.56
3.	St. Clair	3.05	.54	-.26
4.	Washtenaw	8.28	5.01	7.80
5.	Clinton-Eaton-Ingham	5.12	2.03	3.70
6.	Ionia	2.27	-1.73	-1.75
7.	Kalamazoo	5.64	2.84	5.16
8.	Mason	-1.76	-1.39	-.55
9.	Muskegon	2.54	2.04	-.19
10.	Newago	-3.74	-2.57	-1.66
11.	Northeast	-5.89	-1.89	-2.69
12.	Ottawa	5.61	.16	1.08
13.	AuSable	-7.66	-1.32	-1.82
14.	Bay-Arenac	2.41	-.36	-1.58
15.	Berrien	1.98	2.92	.47
16.	Calhoun	4.24	1.68	.56
17.	Grand Tarverse-Leelenaw	-1.97	-1.79	6.52
18.	Midland-Gladwin	3.35	-.86	1.33
19.	Allegan	1.62	-1.67	-1.37
20.	Antrim-Kalkaska	-5.48	-2.97	-2.24
21.	Barry	1.35	-2.70	-.17
22.	Branch	-.56	-2.47	-2.35
23.	Cass	2.61	-1.25	-2.19
24.	Central Michigan	-6.29	-1.84	.08
25.	Copper Country	-7.23	-1.06	-.74
26.	Delta	-3.03	-.83	.44
27.	Detroit-Wayne	5.96	16.68	-.40
28.	Dickinson-Iron	-3.23	-.52	-1.04
29.	Eastern Upper Peninsula	-8.89	1.89	.58
30.	Genesee	8.10	4.52	-.43
31.	Gogebic	-8.89	1.36	.67
32.	Huron	-4.33	-2.64	-2.72
33.	Jackson-Hillsdale	3.23	-.17	.43
34.	Lenawee	2.87	-1.31	.39
35.	Luce	-5.18	-2.80	-2.21
36.	Manistee-Benzie	-4.26	-2.24	-.64
37.	Menominee	-.49	-1.56	-2.26
38.	Monroe	6.03	-1.01	-.68

TABLE V-1 (Continued)

	Boards	Factor Scales WEALTH	URBAN	EDUCATION
39.	Montcalm	-1.04	-2.67	- .81
40.	Northcentral	-6.94	-1.25	-.04
41.	Northern	-2.83	-1.70	3.52
42.	Oceana	-5.97	-2.62	-1.24
43.	Saginaw	5.70	3.25	-.45
44.	St. Joseph	1.48	-1.73	-2.19
45.	Sanilac	-3.33	-2.09	-2.47
46.	Shiawiasee	4.70	-1.62	-.29
47.	Tuscola	-.09	-2.49	-2.60
48.	VanBuren	-1.80	-.58	-1.20
49.	Gratiot	-.05	-1.26	1.20
50.	Lake	-14.94	-.64	-2.87
51.	Lapeer	3.28	-2.23	-1.16
52.	Livingston	7.26	-1.66	3.01
53.	Macomb	11.48	7.12	.15
54.	Oakland	11.60	6.73	6.99
55.	Schoolcraft	-10.62	-.35	-3.02
Range:				
	MINIMUM	-14.94	-2.97	-3.02
	MAXIMUM	11.60	16.68	7.08
Mean--All Boards		-.000	-.010	-.013
Standard Deviation		3.99	3.33	2.45
Group Means:				
Full Management		1.567	.474	1.057
Shared Management		-1.207	-.560	-.822
Local Management		1.141	1.101	.614

management group, the factor scale results do not indicate clear differences for the full management group. These group differences will be discussed in more detail after completion of the following discriminant analysis.

The purpose of employing the discriminant analysis is to systematically test for group differences on the factor scale results. The analysis utilized the three composite factor scales as independent variables, and group membership as the dependent variable.[1] The analysis produced two discriminant functions with weights or coefficients to reflect the relative importance of the three factors in each of the functions. These results are presented in Table V-2 below. The coefficients for each function provide the best estimate of how the factor scale data interrelate in explaining group membership differences. The estimated coefficients for the first factor in Table V-2 show that EDUCATION and to some extent, WEALTH, are the most important discriminatory variables. The third factor, URBAN, has almost no influence on the capacity of the function to differentiate among the groups.

The ability of the second function to differentiate group membership is almost entirely dependent on the URBAN factor, which has a considerably higher coefficient than either WEALTH or EDUCATION. The negative signs for the latter estimates show that the URBAN factor is inversely

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[1] A single dependent variable was constructed with separate values for members of each of the three contract groups.

TABLE V-2

Standard Coefficients For The Three Factors Scales On Two Discriminant Functions

	Discriminant Functions	
Factor	First	Second
WEALTH	.227	-.306
URBAN	.034	1.142
EDUCATION	.867	-.323
n = 55		

related to composite measures of WEALTH and EDUCATION. In other words, high URBAN values tend to be related to lower values for both WEALTH and EDUCATION. This result seems to occur in part because several board jurisdictions with large populations also have large proportions of populace which are low-income and poorly educated.[2]

Now that the two discriminant functions have been estimated and described, it is possible to test for group differences. This testing provides an assessment of the ability of the functions to explain group variation. The canonical correlation for the first function is .37, while

[2] For discussion of the interpretation of the signs of discriminant function coefficients, see Klecka, "Discriminant Analysis,"

for the second function it is .09. Squaring these values to assess the proportion of variance in group membership explained by the functions, yields values of .13 and.01, respectively.[3] Note that predicted membership was under fifty percent within each of the three contract groups. Since neither function is significantly able to pick up group differences, there seems to be very little relationship between board social and economic characteristics in 1980, and subsequent management decisions.

The factor analytic and discriminant results are important because they help establish that board decisions to elect one management status over another do not seem to be related to any pattern of board socio-economic characteristics. If the discriminant and factor results had shown a strong relationship between the social and economic factors, and board decisions to participate in full management, this would have had implications for the subsequent analysis of performance. If, for example, full management boards had scored consistently higher on the scales, this might indicate that larger and wealthier boards were "selecting-in" to full management status. Since these same factors are expected to be related to utilization performance, extra caution would be required in the analysis to sort out the effects on performance of wealth, size and full management.

The lack of relationship between management decisions and environmental variables may appear somewhat surprising

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[3] A good review of the canonical correlation and R-square appears in Kerlinger and Pedhazur, pp. 342-45.

in light of the research findings and hypotheses reviewed in Chapter III. The results of the innovation studies have suggested that wealthier and larger boards would more likely select full management status than less wealthy and smaller boards. Although a large number of full management boards scored average or above on one or more of the factor scales, several of the wealthiest and largest jurisdictions declined to participate in full management. These jurisdictions include Wayne, Oakland, Macomb and Genesee, the largest population centers in the state, and the Saginaw County jurisdiction. The Wayne, Genesee and Saginaw Boards signed shared management contracts while Oakland and Macomb Counties were content with the lowest level of contract participation, local management. The discussion in the following section is devoted to additional factors which may have influenced board adoption of full management.

Additional Effects On Board Innovation

Several factors potentially account for the unexpected board response to the contract options. First, it can be argued that the selection process, at least in the initial year of the project, helped determine which boards obtained full management status. The criteria of regional representativeness and local commitment resulted in the selection of the Kent and Washtenaw jurisdictions, which scored well above average on the factors, and the St. Clair and Alger-Marquette pilots, which scored considerably lower. Only two additional CMH boards showed significant interest

in full management pilot status in 1980-81. One of these, the Saginaw County Board, registered a high ranking on the factors, while the remaining candidate, the Northeast Board ranked quite low. Each of these boards was screened out in the application process by regional DMH officials.

The selection process had almost no influence in the second and third years of the project. The criteria of representativeness and local commitment were dropped entirely. DMH officials, anxious to expand the number of full management, negotiated contracts with all fourteen applicants in 1981-82 and 1982-83.

Economic uncertainty is the second factor which may have influenced local mental health innovation. During the three years of the contract period, the statewide economy went into a deep recession which affected both both state and local mental health revenues. Under these conditions, numerous boards appeared to adopt a "wait and see" approach, before committing dwindling resources to a new venture.

The third factor which may influence board decisions is variation in local political support. Some jurisdictions have had particular problems in assembling support for large-scale community mental health programs. Two of the largest and wealthiest boards, Oakland and Macomb, have shown relatively less local effort than most other boards. CMH agency budgets have remained relatively low in each board while dependence on state inpatient institutions has remained relatively high. Citizens in each of these jurisdictions have at times vehemently protested the placement of

state service recipients in the communities. As discussed previously, both boards declined either shared or full contracts during this period. Both state and local officials point out that traditionally these jurisdictions have been politically opposed to a greater role for the CMH agency.

The final factor which influences adoption of full management is agency leadership. From discussions with DMH and local officials it appears that the agency directors played key roles in securing full management, especially for the original pilot boards. These pilot leaders resembled each other in that they were each actively involved in both professional and statewide CMH associations, i.e., the CMH Boards Directors' Association. In addition, at least two of the directors were heavily involved in the Governor's Unification Task Force which helped forge the guidelines for the new system.

DMH officials report that one agency director in particular, from a smaller more rural jurisdiction, was the single biggest influence in the adoption decision of this board. This director was able to secure the necessary local support while lobbying effectively with DMH officials to obtain the contract. This CMH director, along with one other pilot director, moved on to new positions within a short time after their boards adopted the new contracts.

The overall lack of board support for full management in the first three years of the reforms can be attributed in part to board variations in political support, agency leadership and economic uncertainty. Favorable support from

local political officials is essential but may not be the only element required for adoption of full management. Support from agency leadership has also been shown to be a critical element. Although much of the discussion of leadership has been concerned with the potential positive role of the director, there is one reported example in which an agency director who was opposed to full management, was able to influence potentially supportive board members to oppose the new measures.

In board jurisdictions with less favorable environments for mental health change, the role of an active agency director may be restricted. As Browne and Epstein report, the expectations of advocates/entrepreneurs are constrained by what is politically feasible to achieve within a given contextual environment.[4] In localities with no significant history of public mental health activity, and in which the political agenda is focused on economic or other issues, the full management option may not be a realistic alternative.

Now that board contract decisions have been examined in some detail, the next step is to estimate the basic model for explaining performance (utilization) variation across time and across the fifty-five CMH jurisdictions. This model, as developed in the following section, contains two variables which have been used in the factor and

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[4] Laurily Keir Epstein and William P. Browne, "The Social and Political Conditions of Issue Credibility: Public policy and the Elderly," paper prepared for delivery at the 1978 Annual Meeting of the American Political Science Association, The New York Hilton, New York, August 31-September 3, 1978.

discriminant analysis presented above. The first variable is INCOME which was found in the factor analysis to have a very high loading on the WEALTH factor. The second variable is LPOP, local population, which loaded highly on the URBAN factor. Note that no measure of the EDUCATION factor is included in the performance model even though this factor was given a large weight in the discriminant analysis. EDUCATION was excluded mainly because no suitable over-time measure of educational attainment could be found.

Although these variables were shown to have little influence on board innovation, their inclusion in the performance model can be justified for at least two reasons. First, previous research has found that wealth and size are strongly related to state and local government performance. Second, the implementation research suggests that adoption decisions, i.e., selection of a full versus shared or local contract, are often separable from implementation success or performance change. According to the implementation analysts, the local coalition of support for adoption of new programs may not be capable of overseeing the implementation of the program.[5] Not only are major actors likely to change, as with the pilot board agency directors, but responsibilities for implementation will rest in part with several largely autonomous local agencies and the DMH The major implication of the above arguments is that even though the variables proved ineffective in discerning

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[5] Paul Berman, "The Study of Macro and Micro Implementation," Public Policy 26 (Spring 1978): 159-163.

full management board differences, they nontheless may be important in the subsequent implementation. The environmental variables may provide key indicators of the ability of the localities to make use of the new components of full management. Wealth may be an especially important parameter which measure both the budgetary resources available to the board and the availability of local service alternatives.

It has been shown in this section that some of the more common characteristics of innovative public agencies do not operate as expected in the Michigan CMH jurisdictions; there are no apparent socio-economic patterns among boards in the three groups. The analysis was extended to several additional variables, including agency leadership, the level of political support and economic conditions. While there is only sketchy evidence for these variables, the assessment helps to establish that factors other than social and economic variables may have significant impact in local mental health policy adoption decisions. The extent to which board adoption decisions are related to subsequent performance outcomes remains to be seen. The analysis of utilization begins with the results of the performance model in the following section.

Explaining Board Utilization: The Performance Models

Results for the estimated performance models are evaluated in this section. After reviewing the ten-year model, the results are compared to those for the same model

estimated for the period 1973-74 through 1979-80. Comparisons of these models will help clarify any changes in the performance model which correspond to the contract period.

The Ten-Year Performance Model

The weighted least squares (WLS) results for the performance model appear below in Table V-3. Results for the ordinary least squares (OLS) estimates of the same performance model appear in Table V-3A in the Appendix to this chapter. The WLS results will provide the main focus for the analysis because these estimates contain desirable statistical properties relative to the OLS estimates. The statistics reported at the bottom of each table provide measures of the goodness of fit of each model. Comparison of these measures helps to highlight the impacts of heteroskedasticity on the estimates, and the need for WLS estimation. The OLS results include an R^2 of .957 which is higher than the R^2 of .950 produced with the WLS model. The higher OLS value results because this estimation technique provides the best fit to the data, regardless of heteroskedasticity or other potential violations of the regression assumptions. Under conditions of heteroskedasticity, OLS estimation actually gives greater emphasis to larger variance terms in an effort to produce the best fit.[6] As a result, the F value is overstated and the standard deviation

[6] Pindyck and Rubinfeld, p. 141.

TABLE V-3

WLS Performance Model Results For
All CMH Boards For The Years
1973-74 Through 1982-83

Variable	b	Standard Error	t
SWTOTL	.003232	.000245	13.20*
LPOP	.001453	.000057	25.34*
INCOME	-.058545	.007349	-7.97*
RATE	.413550	.064290	6.43*
LRES	-.000011	.000005	-1.98*
FED	.859854	2.304829	.37
MMI	-.067007	.015297	-4.38*
MDD	.081897	.015179	5.40*
CONSTANT	-26.949969	3.046782	-8.85*
FMPOST	-31.634614	3.863753	-1.21
SMPOST	-27.134624	1.072382	-.17

R^2 = .951

F = 2113.33

* = Coefficient is significant at least to the .05 level

n = 1100

of the residuals is lower than for the transformed model. When the original data are re-estimated with the coefficients derived from the WLS estimation, the standard deviation of the residuals increases and the precision of the F value drops.[7] This occurs because the transformation produces a new fit to the data, one which meets the assumption of constant variance across the boards.[8] The tables show that the correlation procedures result in a substantially different model. The effects of population and wealth are slightly lower in the weighted model and their t-values indicate a sizable drop in significance. In addition, the impact of FED and RATE drop off considerably, and the signs for LRES and MMI change once the distortive effects of size-utilization interaction are removed.

The high R^2 and the highly significant F value indicate that the transformed performance model provides a very good explanation of board utilization. Approximately ninety-five percent of the variance in utilization can be accounted for by the characteristics making up the model. In other words, if the statewide utilization trend is known, along with information about board population, wealth, the condition of the local economy, federal involvement and distance from state inpatient services, then board utilization can be

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[7] The formula for calculation of the F-statistic for the re-estimated model uses the multiple R-square, and can be found in Kmenta, p. 367. A similar method of estimating the F-statistics was used for each of the WLS models in Chapter V.

[8] These procedures are fairly similar to those described in Kmenta, pp. 265-66.

predicted quite well.

The individual characteristics are of particular interest in assessing the performance model. The t-values reported in Table V-3 show that all but three variables have a significant impact on board use of state inpatient services. FED, FMPOST, and SMPOST are not significant. The latter two variables are the group dummy variables which indicate the change in average per-capita utilization for each group in the post-contract period. Both variables will be considered in detail in a later section on utilization change.

All but two of the variables have impacts which are in the hypothesized direction, as suggested in Table III-3. The major exception is MDD, distance to a state DD center, which was expected to be negatively related to board utilization levels. The reasoning behind the difference between MDD and the counterpart measure, distance to an MI hospital (MMI), is examined in more detail below.

The discussion of individual performance model characteristics begins with the statewide utilization trend. The coefficient for SWTOTL in Table V-3 provides an estimate of the relationship between board per-capita utilization and statewide per-capita utilization over the ten-year period. The slope coefficient for SWTOTL indicates that the utilization level of the average board is about .3 percent of the statewide total. It was expected that this effect would be positive and strongly linked to board utilization, and that is what the results in Table V-3 indicate. The

coefficient is positive since statewide downward (or upward) trends must ultimately be reflected in similar trends. The fact that the coefficient is quite significant suggests that board utilization trends follow statewide utilization trends fairly closely. The relatively high significance of the impact also suggests that this variable succeeds in helping to de-trend board utilization figures over the ten-year period.

The population size of the CMH board jurisdictions is expected to be positively related to state inpatient service utilization; boards with the largest populations are expected to be the highest relative users of the state's services. The fact that LPOP, the measure for board population, is positive and highly significant, indicates that board size is strongly related to utilization and in the expected direction. The coefficient for LPOP in Table V-3 indicates that, when all other factors are held constant, an average of .14 percent of board populations are being served in the state institutions. These results support the contention in Chapter III that size would provide an important component of the overall explanation of utilization.

The level of wealth of the CMH boards was expected to be strongly and negatively related to utilization. In other words, low-income boards should register relatively higher levels of utilization. The results in Table V-1A provide strong support for this hypothesis. After the effects of the remaining performance variables have been

controlled, the inverse relationship between INCOME and utilization remains strong and intact. Results for the previous variable have shown that larger-population boards are also higher users of state services. On the basis of the results for INCOME, it appears that, regardless of board size, boards with higher wealth will rely less on the state's inpatient services.

Variations in economic environments among the boards are expected to be strongly related to variations in utilization. Relatively poor economic conditions are assumed by DMH officials to account for a variety of social problems which lead directly to increased demands on the state inpatient services. If these expectations are to be supported by the results, then changes in utilization must be positively and significantly related to differences in board economies, as measured by the unemployment rate. The coefficient for RATE in Table V-1A indicates that the impact is, as predicted, positive and highly significant. The positive sign for RATE means that utilization goes up (or down) with the level of unemployment. These results indicate fairly strong support for the local economy hypothesis and also support the expectations of DMH officials.

CMH board spending for locally managed residential and inpatient services should be significantly and inversely related to board utilization. This appears to be a reasonable expectation since board spending for these programs suggests greater investment by the boards in

alternatives to state institutionalization. Sufficient support for this hypothesis requires that the coefficient for LRES in Table V-3 be significant and negative in its effect on utilization. The results in the table show that both conditions are met. For the period 1973-74 to 1982-83, high board spending for residential and inpatient programs led to lower utilization levels.

Federally active CMH boards were expected to utilize state hospitals at lower levels than non-federally active boards, for the ten-year period. This hypothesis is not supported by the results in Table V-3. The coefficient for FED is positive indicating that federally active boards tended to use more state services. The impact is not significant, however, which means that the positive effect is not consistent across these boards.

Expectations for each of the distance variables, MMI and MDD, are the same; the number of miles from a state hospital or DD center should be significantly and negatively related to utilization. That is, boards located relatively close to the institutions should make use of the services at a higher rate relative to more distant boards. As indicated in the table, MMI performs as expected, but MDD is positive in impact. The apparent disparity in the impacts of these two distance measures may reflect that fact that MI and DD patients and the respective institutions are quite different. Of major importance is the fact that state MI hospital use is characterized by high turnover and generally shorter lengths of stay when compared to DD center

utilization. In addition, boards which have DD centers within the jurisdiction do not appear to experience the same distortion effect as suggested earlier for boards with state MI hospitals nearby. These results provide ample support for the MI hospital hypothesis, but clearly do not coincide with earlier expectations for the DD distance variable.

The discussion of the performance model has highlighted several factors which impact strongly on board utilization levels. All but two of these factors behaved as expected in explaining board performance. The first, federal influence, was found to make no significant difference, while the second, MDD had an unexpected positive sign. Although final judgment will be reserved until the covariate model is reviewed, the results for these variables may suggest that the model is in need of revision with regard to these variables.

Despite the shortcomings, the overall performance model performs very well. When the individual factors are combined in a single model, the outcome is an explanation of utilization which accounts for most board differences during the ten-year period. The fine performance of the model qualifies it as the model which will provide the context for analyzing management changes beginning in 1980-81. The process of board utilization has been defined in terms of the effects of several characteristics associated with the boards. It has been hypothesized that the response of CMH jurisdictions to mental health problems during the ten-year period would be conditioned by trends in these particular

TABLE V-4

WLS Performance Model Results For
All CMH Boards For The Years
1973-74 Through 1979-80

Variable	b	Standard Error	t
SWTOTL	.002412	.000296	8.12*
LPOP	.001358	.000071	19.24*
INCOME	-.062244	.000019	-6.00*
RATE	.322174	.078848	4.08*
LRES	-.000078	.000019	3.99*
FED	3.820199	2.643313	1.44
MMI	-.076943	.017775	-4.33*
MDD	.110468	.017695	6.21*
CONSTANT	-34.032077	3.564645	-9.54*
FMPOST	-34.434641	1.797957	-.22
SMPOST	-20.486001	.913042	-14.83*

R^2 = .961

F = 1866.02

* = Coefficient is significant at least to the .05 level

n = 770

characteristics. In a later section, the model will be expanded by introducing group performance model variables to pick up group effects in the contract period. First, however, performance model results are presented for the period prior to the contract changes.

The Pre-Contract Performance Model

Comparison of the estimated ten-year model with results estimated for the period, 1973-74 to 1979-80, should help establish whether the performance model was significantly different in the contract period. If the results are different, it may indicate that the effects of performance model characteristics changed during the contract period. Changes in these variables may be suggestive of at least two possibilities. First, observed utilization changes may be due to changes in the overall model or certain of its components rather than to the management reforms. Second, the new incentives and fiscal flexibility may help board decisionmakers to significantly alter the process which defines utilization in the board. These points will be examined in the following section which introduces management group performance model estimates.

The results for the seven-year model are given in Table V-4. The interpretation and names for the eight performance variables and the constant term are the same as in Table V-3. Comparisons of the dummy variables, FM and SM, are not as straightforward in the tables. Changes in management status which occurred during the contract period

are not reflected in the pre-contract variables. The group dummy variables in these tables are considered separately in a later section.

With the exception of the effects of LRES, the results in Table V-4 are quite similar to those in V-3. In the ten-year model, SWTOTL, LPOP and RATE are significantly higher than for the pre-contract effects, while FED and both distance variables have slightly lower effects. The greatest change in impact occurs for LRES which is positive in the pre-contract model but negative when the entire ten-year period is examined. These results suggest strongly that the change in effect for LRES coincided with the management reforms after 1979-80. Greater board spending for locally managed alternatives to state services results in declining utilization in the contract period. When the management group covariates for LRES are examined, it will be possible to determine if this local spending effect varies among the groups. The covariate model is the subject of the following section.

The Performance Model And Management Group Differences

The purpose of this section is to provide a breakdown of performance model effects for each of the groups. The assessment in this section provides the second major component of the analysis of the effects of the decentralization reforms. While the first component focused on the relationship between board environmental variables and contract decisions, this one concentrates on comparisons of

group performance model estimates. On the basis of results in this section, it should be possible to determine if contract differences among boards are closely associated with changes in how the performance model explains utilization in each of the groups. After describing the covariate approach, thw WLS model will be compared to the OLS results and to the results in Tables V-3 and V-4. Finally, the ten-year covariate results will be compared to pre-contract group estimates.

The Covariate Model

Results for the model with group covariates are presented in Table V-5, while the OLS results for the same model are given in Table V-5A of the Appendix to this Chapter. In each table, the performance variables are identified as in previous model. However, in both Tables V-5 and V-5A each performanace variable is followed by the corresponding management group variables. The group covariate terms were created, as described in Chapter IV, by multiplying each group dummy or binary variable by each of the performance model variables. Since the group dummy variables were constructed with ones as values for the group members during the contract period only, the group covariates provide an estimate of the change in these variables during the contract period.

Interpretation of the performance variable impacts is different in this model due to the presence of the covariate terms. These group interaction terms in some ways divide

TABLE V-5

WLS Results For The Ten-Year Model
With Estimated Group Changes
For 1980-81 To 1982-83

Variable	Coefficient/ Group Change	Standard Error	t
SWTOTL	.002458	.000251	9.78*
FMTOTL	.009557	.011032	.86
SMTOTL	.001396	.002199	.63
LPOP	.001341	.000063	21.07*
FMLPOP	.000451	.000861	.52
SMLPOP	-.001293	.000266	-4.85*
INCOME	-.056049	.008448	-6.63*
FMINCOM	-.045679	.080741	-.56
SMINCOM	.127496	.028388	4.49*
RATE	.460901	.067249	6.85*
FMRATE	-.707686	.853069	-.82
SMRATE	-.350101	.198816	-1.76*
LRES	-.000077	.000017	4.38*
FMLRES	-.000084	.000020	-4.12*
SMLRES	-.000078	.000021	-3.67*
FED	-.607843	2.481891	-.24
FMFED	3.609862	14.816056	.24
SMFED	2.358567	6.864829	.34
MMI	-.071609	.017031	-4.20*
FMMMI	-.220851	.168382	-1.31
SMMMI	.081087	.041050	1.73*

TABLE V-5 (Continued)

Variable	Coefficient/ Group Change	Standard Error	t
MDD	.103742	.017087	6.07*
FMMDD	-.237576	.224287	-1.05
SMMDD	-.088427	.039942	-2.21*
CONSTANT	-30.357592	3.056464	-9.93*
FMPRE	-.119288	1.689404	-.70
FMPOST	-33.282336	87.416164	-.38
SMPRE	7.217440	.781846	9.23*
SMPOST	1.506528	18.152204	.08

R^2 = .962

F = 967.80

* = Coefficient is significant at least to the .05 level

n = 1100

the ten-year period into pre-contract and contract periods. The performance model coefficients no longer provide estimates of impacts for the full ten-year period for all boards; instead, they represent the combined effects for all boards in in the pre-contract period, and for local management boards in the contract period. Thus, during the contract period, the impacts of the performance model are distributed among the full, shared and local contract groups. The combined estimates of overall pre-contract and local management impacts provide the base for comparison of full and shared management effects during the contract period. These base estimates will be referred to as local management or performance model estimates in future discussions. In Tables V-5 and V-5A, the group covariate terms represent the difference in slope (effect) between the local management group and the full or shared group. For example, the variable, SWTOTL, in the WLS model, has an estimated coefficient of approximately .0028, while the group variable, FMTOTL, shows a value of .0053. The latter value is the difference between the estimated coefficients for SWTOTL and FMTOTL. In Table V-6 below, the group coefficients will be presented.

Significance level are given in Tables V-5 and V-5A in terms of t-values just as in the previous tables. T-values for the local management estimates provide a measure of the strength of relationship between the particular variable and board utilization. The signs for the coefficients indicate the direction of relationship between the performance

TABLE V-6*

WLS Results For The Ten-Year Model With
Estimated Group Coefficients
For 1980-81 To 1982-83

Performance Variable	Local	Shared	Full
SWTOTL	.002458*	.003854	.012015
LPOP	.001341*	.000048*	.001792
INCOME	-.056049*	.071447*	-.101728
RATE	.460901*	.110799*	-.246786
LRES	-.000077*	.000001*	-.000008
FED	-.607843*	1.750724	3.002019
MMI	-.071609*	-.000522*	-.292460
MDD	.103742*	.015315*	-.133834
CONSTANT	-30.357592*	--	--
PRE	--	-23.140151*	-30.476881
POST	--	-28.851064	-63.639928

* Statistics for Table V-5 apply to this table also.

variables and utilization. A positive sign means that values of the variable are positively related to utilization while negative signs imply an inverse relationship. The significance levels for the group covariate terms indicate whether the change or difference between a particular group performance estimate and the local management estimate is significant. The signs for the group covariates show the direction of change for the full and shared management groups in the contract period. A positive sign indicates the amount of increase in effect over the local management estimate, while a negative sign means that the group impact drops after 1980-81.

The results in Tables V-5 and V-5A are presented in somewhat different form in Tables V-6 and V-6A, respectively. The values in the latter tables represent the actual coefficients for both the full and shared groups in the contract period. Table V-6A can be found in the Appendix to Chapter V. The group coefficients in the new tables are calculated by adding the group difference estimates to the performance model coefficients in Table V-5 and V-5A. Since Table V-6 provides a concise summary of group effects, it will be the focus of much of the analysis below, although the change results in Table V-5 will also be referred to. The designations of significance for the full and shared group refer to the differences between local management/pre-contract coefficient and the appropriate group estimate. The constant term and dummy variables in Tables V-6 and V-6A will be examined in detail in a later

section.

Comparison of the WLS results to the OLS versions provides some interesting results. In the weighted model, several variables, including LPOP, INCOME and LRES show a marked decline in significance. The drop in significance levels suggests that these variables were affected most by the biases resulting from the correlation of error term with the size variable. Once these heteroskedastic effects are removed the significance of SWTOTL, MMI, RATE and SMRATE increases. OLS estimation has effectively suppressed the significance levels of these variables while overstating the significance of the size dependent variables. Thus, WLS estimation provides the most accurate results and is the preferred model for the remainder of the analysis.

The first task in evaluating the covariate model is to compare the WLS results in Table V-6 with those estimated earlier in Tables V-3 and V-4. In all three tables, the variables, SWTOTL, INCOME, RATE, FED and the distance measures have similar signs as well as coefficients which are fairly similar in magnitude. This means that the effects of the performance variables in the ten-year model (Table V-3) closely resemble the effects of the pre-contract/local management estimates in the covariate model (Table V-6).

It was shown in Tables V-3 and V-4 that the effect of LRES was positive in the pre-contract period but negative in the ten-year model. The sign for LRES in Table V-6 supports these earlier findings. The coefficient is positive meaning

that when other factors are held constant, higher board spending for local reasources was associated with higher utilization, both for all boards in the pre-contract period and for local management boards in the contract period. The addition of local management effects to the pre-contract estimates (in Table V-4) has little observable impact on the estimates. The group effects for LRES, FMLRES and SMLRES show that although there was variation in effect, both groups declined significantly. By 1982-83, the effect of board spending for locally managed services had reversed; greater spending was related to lower utilization in these groups. This point is considered in greater detail in a later discussion.

The ten-year performance and group effects models can be compared by testing whether the additional group covariates make any difference in the explanation of utilization. The null hypothesis is that the addition of group coefficients in Table V-6 has no significance, when compared to the base performance model in Table V-3. The test was conducted with an F-statistic to test for the difference in R-squares for the two models. These R-square terms are reported at the bottom of each table. A one-tailed test and a significance level of .05 yield a critical F-value of 10.49, which is significant when compared to the tabled value of 1.79.[9] This result indicates that the group covariates make a significant contribution to the explanation

[9] The test is described in Kmenta, p. 370.

of utilization. The actual change in R-square for the two models is quite small, however, meaning that the covariates add only a small amount to the explained variance.

The coefficients for the statewide and group utilization trends were introduced earlier. The expectation was that the full and shared groups would show a significant deviation from the pre-contract/local management trend, thus suggesting a significant drop in utilization. Results in Table V-6 indicate that there is a tendency, especially in the full management case, for groups to adhere less closely to the base estimate, but these effects are not consistent across group members. Therefore, the group results for SWTOTL provide only a partial support for the statewide trend hypotheses.

The impact of board population, LPOP, was expected to be positively related to board utilization. If the group population variables are similar in impact to LPOP, then it can be argued that management change had little or no impact on the manner in which population size effects utilization. Such results would imply that larger boards utilized state inpatient services at higher levels regardless of the management status of the boards. As Table V-6 points out, the pre-contract and local management effect, LPOP, has the expected possitive effect of LPOP in the ten-year model in Table V-3. The coefficient for FMLPOP, which measures the impact of population size among management boards, has the same sign and is similar in magnitude to the local management estimate. The effect of population size in the

full contract group is therefore unchanged.

In the case of shared management, SMLPOP was expected to perform similarly to FMLPOP. However, as the coefficients in Table V-6 show, the effect of population size in this group has dropped off substantially in comparison to both local and full boards. This change for SMLPOP can be seen in Table V-5 which provides an estimate of the magnitude of drop in the impact of size. The t-ratio for SMLPOP indicates that this decline is consistent among members of the shared management group.

The expectation for board wealth in Table V-6 is the same as in the ten-year model of Table V-3; INCOME should be strongly and inversely related to utilization. If management changes produce little or no effect on the performance model, then the group coefficients for INCOME in Table V-6 should be similar to each other. In other words, wealth will continue to have essentially the same effect on board utilization in the contract period, regardless of which type of management change the board has experienced. If, on the other hand, the new contractual scheme is successful in altering local utilization decisionmaking, the effect of wealth on utilization may decline, as hypothesized. This would occur in either the full or shared groups if the policy change made it easier for poorer group members to reduce utilization. A final possibility is that the more economically developed boards within each group will be the most likely to prosper under the new system.

While INCOME in Table V-6 is essentially similar to the ten-year coefficient in Table V-3, the results for FMINCOM show little change in effect. The magnitude of FMINCOM is somewhat higher than for INCOME but as the t-ratios in Table V-5 show, the change in the contract period is insignificant. This means wealthier boards continue to show declining levels of utilization in the full management group. The impact of wealth in the shared management group is quite different than for the other groups. Compared to local and full impacts, the shared group effect if significantly higher in the contract period. Wealthier shared management boards make use of state inpatient services at a relatively higher rate than less wealthy participants in this group.

The results for LPOP and INCOME have provided only partial support for the hypotheses of Chapter III. Both variables are significant and have the expected signs but the group coefficients are mixed. Only the shared group shows a decline in the effect of LPOP. On the variable INCOME, the shared group has a positive effect while the full contract effect is unchanged from the pre-contract and local management estimate. These results also provide only mixed support for the earlier findings of several studies of social and economic effects on performance. These points are discussed further in later sections.

If board economic conditions show minimal or no change in effect during the contract period, then the estimated change for FMRATE and SMRATE in Table V-5 should be zero.

Under these conditions, the full, shared and local coefficients in Table V-6 would be very similar to each other. If, as hypothesized, management changes enable the boards to beeter deal with poor or declining economic conditions, the full and shared impacts for RATE would be lower in comparison to the local management coefficient. The coefficients in Table V-6 provide only partial support for these expectations. The coefficient for SMRATE indicates that the positive relationship between utilization and unemployment in the shared group has dropped off significantly but remains positive. Boards with higher unemployment levels continue to utilize state inpatient services at relatively higher levels. In the case of full mamagement boards, it appears that there is a tendency for boards with the highest unemployment rates to show relatively greater declines in utilization compared to the local management group. The significant t-ratio in Table V-5 suggests that this full management difference is not significant among members of the full management group.

The results for board economic conditions may be influences in part by the statewide economic downturn, the start of which coincided with implementation of the reforms in 1980-81. Although boards experiences the downturn somewhat differently, depending on the extent of heavy industry and other characteristics of the jurisdictions, virtually all boards experiences significant increases in unemployment. Thus, the changes in the effects of RATE may be due not so much to changes in management, but to cganges

in this environmental indicator. The decline in utilization impact suggests the tendency in each group to decrease or hold the line on utilization despite the deterioration in local economic conditions.

LRES was expected to be strongly and negatively related to board utilization, as it was in the ten-year model of Table V-3. In Table V-5, the coefficient for RES is positive, suggesting that in the pre-contract period (and among local boards in the contract period), higher levels of expenditures for local resources were associated with higher levels of utilization. It follows that much of the negative impact for LRES in the ten-year model must come from the changes for the full and shared groups during the contract period. The changes evident in Tables V-5 and V-6 tend to support this contention. The shared management coefficient in Table V-6 indicates that the effect of LRES is now negative. This means that increasing spending for local resources is related to declining utilization for shared management boards. As depicted in Table V-6, the full management estimate for LRES also changes signs and has a greater negative or inverse effect than the shared estimate. These results tend to support the earlier hypotheses that management changes would give boards greater flexibility and control in integrating state and locally managed services. Although greater spending is linked to declining utilization levels for both groups, the effect is greatest for the full management group.

The expectation for federal influence is the same as in the previous model; boards with a relatively high level of federal involvement should also have lower utilization in the performance model and among local management boards. These results should also be obtained in each of the groups. The results in Table V-6 show that the expectations for FED are only partially supported, while those for the groups are not supported at all. In the base group, federally active boards tended to utilize state inpatient services at lower levels than less-active boards, but the change was insignificant. The group coefficients are positive suggesting that more-active boards had higher relative utilization than less-active. Since neither estimate is significant, it appears that active boards performed at similar levels in all three management groups.

The distance estimates for full and shared management groups were expected to be smaller in magnitude in comparison to the pre-contract and local management estimate. The initial hypotheses in Chapter IV argued that if management changes are successful, the effects of distance would show a decline within one or more of the contract groups.

As indicated in Table V-6, the full and shared group estimates appear to be quite different from the local estimates. The full management estimate for distance to an MI hospital, FMMMI, suggests that during the contract period, the more-distant full management boards experienced an increased negative effect due to distance. While this

effect is considerably greater than the local effect, it is not significant. The coefficient for shared management shows that distance is also inversely related to utilization. The impact for this group also declined in magnitude, but the change is not significant relative to the local management estimate.

The covariate results for MDD are similar to those for the previous distance variable. The full management coefficient in Table V-6 shows a greater tendency for more-distant boards to decline in utilization in the contract period. Although the change in this estimate appears large, the low t-ratio in Table V-5 indicates lack of consistency in the full management group. On the other hand, the shared management estimate shows a significant drop in the effect of distance on utilization.

The distance effects provide only partial support for the hypotheses of Chapter IV. The effect of distance was expected to decline as an explanation of utilization once management changes were implemented. This occurred only for shared management board distance to a DD center. The remaining shared management coefficient and both full management coefficients are essentially similar to the local management (and pre-contract) effect.

Results in Table V-6 provide general support for the contention that management change would have an impact on the process of board utilization as defined by these particular environmental and local factors. The shared group actually differs significantly from the effects of

the local group on several variables including SWTOTL, LPOP, INCOME, RATE, LRES, and MDD. For shared management, the effects of LPOP, RATE, LRES and MDD have declined in magnitude, while the effects of INCOME have been positive and greater in absolute terms than the local management estimate.

The positive result for the shared group impact of wealth runs counter to previous expectations. The implication is that wealthier boards did not decline substantially in the use of state inpatient services. In fact, INCOME is positive and significantly related to utilization. It should be mentioned that part of this positive effect may result because wealthier shared management boards experienced a decline or leveling off in INCOME in the post-1980 period. If this decline in the growth of INCOME approximates the utilization trend for these boards, it could help account for the positive sign of shared management INCOME.

The full management boards resemble the local group on all but one variable; LRES. These results appear to support those arguments which uphold the importance of environmental influences on local decisionmaking. Socio-economic characteristics, which were hypothesized as providing the context of board utilization, and which have been supported in the ten-year period, appear to continue to influence utilization in the contract period.

The Pre-Contract Era

In assessing the performance model in Table V-3, most variables were found to significantly influence board utilization. It has also been confirmed that the pre-1981 estimates in Table V-4 were virtually unchanged from the ten-year results. With the introduction of group variables in Table V-5, it has been possible to assess the post-1980 performance model differences, especially between full and shared management boards. The final set of results in Table V-5 below, provides pre-contract estimates for the group performance model. Although these results are not directly comparable to the estimates in Table V-6, they do help to clarify the pre-contract differences among the groups. The full and shared effects in Table V-6 are derived relative to the system-wide effects prior to the contract period, and to local management effect during the contract period. In Table V-7, the pre-contract comparison group is made up only of local management boards. The group utilization dummy variables are also different in the two models. Table V-6 contains both pre- and post- group utilization estimates, while Table V-7 contains only the pre-contract effects for the local group.

Local management effects are considerably smaller in magnitude in the pre-contract period, suggesting that much of the impact for the local group in Table V-6 is actually comprised of the pre-contract effects for all boards. When the local management group is considered alone, in

Table V-7, the effects of population and wealth drop off considerably. In addition, only three performance variables are significant in explaining local management utilization in the pre-contract period.

The major differences for shared management occur for INCOME, FED, and LPOP. In Table V-7, the shared group effect for INCOME suggests that, in comparison to the local boards, higher wealth was associated with lower utilization. This same comparison in Table V-6 indicates that relative to the overall pre-contract/local management effect, INCOME was positively related to utilization. The results for FED suggest that federal influence was significant among members of this group only in the period prior to the management reforms. At the same time that the effect of wealth is changing in a positive direction, the effect of population size (LPOP) is declining. This is a reversal in effect for both variables and is due at least in part to the different comparison groups in the two models.

In the pre-contract model in Table V-7, the full management group is consistently different from the local group on SWTOTL, LPOP, INCOME and MMI, but is similar in effect on the remaining variables. However, in comparison to the statewide and local management base in Table V-6, full management contract performance is fairly similar (except for LRES). The positive effects of LPOP have increased somewhat while negative trends are evident for INCOME, RATE and LRES. The effects for both RATE and LRES have changed direction (positive to negative) in the

TABLE V-7

WLS Results For The Ten-Year Model With
Estimated Group Coefficients
For 1973-74 To 1979-80

Performance Variable	Local	Shared	Full
SWTOTL	.002079*	.002613	.004467
LPOP	.000712*	.001300*	.001229*
INCOME	.005851	.059055*	-.040925*
RATE	.378302*	.412861*	.042247
LRES	-.000007	.000077*	.000008
FED	-1.974137*	-11.314504*	4.597901
MMI	.030479	-.056151*	-.339246*
MDD	-.038894*	.097790*	-.020998
CONSTANT	-19.374336*	-23.850220*	-17.981775
PRE	--	-23.140151*	-30.476881
POST	--	-28.851064	-63.639928

R^2 = .971

F = 1383.18

* = Coefficient is significant at least to the .05 level

n = 770

contract period. The change for RATE suggests that higher unemployment is not associated with higher utilization, as it is for the local and shared groups, and in the pre-contract period. The negative effect for LRES appears to be part of a statewide post-1980 reversal in the impact of relative board spending for local alternative services. Previous discussions of Table V-6 have noted that both full and shared boards experienced significant shifts in the effects of this variable.

Comparisons of Tables V-6 and V-7 reveal that the process of utilization has changed for both full and shared management boards in the post-1980 period. The impacts for shared management, especially for INCOME, appear to indicate that utilization is on the rise in this group. However, potential increased effects for high-wealth boards may be more than offset by a drop-off in the effects of both population size and use of local alternative services. The full management group findings suggest that changes in these boards are associated with relatively lower utilization levels during the contract period. In the following section, group utilization changes are identified and discussed within the context of these performance model differences.

Changes In Group Utilization

The discussion in this section centers on the variables depicting relative contract group utilization levels in the previous models (Tables V-3 through V-7). Binary variables

were developed to identify board membership for each group, and these were estimated as part of the above models. In each case, group variables were coded to pick up mean utilization levels in the contract and/or pre-contract periods. In Table V-3, the estimates are referred to as FMPOST and SMPOST, to signify that they pick up utilization levels for each group during the contract period. Since Table V-4 consists of pre-contract estimates, the group results are labeled FMPRE and SMPRE. In each of these tables, the CONSTANT term refers to the utilization level of the base group. The base in Table V-3 consists of all boards in the pre-contract period and local boards during the contract period, while in Table V-4, the base is the local management group in the pre-contract period.

In Table V-5, the utilization variables are given as FMPRE and FMPOST, and SMPRE and SMPOST, and each represents the difference or change in the base estimate for the particular group in the contract or pre-contract period. In Table V-6, the group coefficients are calculated in the same manner as the remaining variables--by adding the group differences estimated in Table V-5 to the base estimate or CONSTANT. The PRE and POST terms identify the time periods covered, while the group coefficients are shown under the appropriate group name. The base for estimating the group variables in Table V-7 is the local management group during the seven-year pre-contract period. The statewide pre-contract effects, which are part of the base in Table V-6, have been removed in the Table V-7 estimates.

It was hypothesized earlier that the full and shared groups would show a marked decline in contract period utilization. In Table V-3, the weighted mean performance level for full management is -31.6, while for shared and base group boards, the figures are -27.1 and -26.9, respectively. These figures indicate that after controlling for the ten-year performance variables, the full management group average is lower than the average performance levels of the remaining groups. This drop is not consistent among the members of the full contract group. The pre-contract model in Table V-4 shows that, when the comparison group is the local management boards only, the relative utilization level of shared boards was higher during the seven-year period.

The covariate results for the pre-contract period in Table V-7 indicate that the full and local groups have similar average utilization levels after controlling for group performance model differences. Compared to the local group base, the shared boards experienced a consistently lower utilization average in the period preceding the management reforms. However, relative to the broader base in Table V-6, it is clear that this shared group difference does not carry over to the contract period.

The lack of effect for shared mangement may be associated with apparent changes in two performance variables. As indicated earlier, INCOME and FED, factors which contributed to lower utilization rates in the pre-contract period, have positive effects in the post-1980 era.

On the full management side, the lower utilization trend is associated with several performance variable differences in the contract period. Relative to the larger base in Table V-6, the full management group has changed signs on LRES, RATE and MDD and has increased in the negative effect of income.

Appendix A to this chapter contains the OLS group utilization results in Tables V-3A through V-7A. These tables identify the group estimates with the same terminology as the WLS counterparts in this chapter. These findings suggest that full management mean utilization was lower than the shared management mean in both pre-contract and contract periods. Note that these OLS estimates are subject to the same non-constant variance problems as the group-performance variable interaction terms, and are not considered as reliable as the WLS utilization averages.

In summary, the boards most likely to have lower levels of utilization in the base group of Table V-6 are those with higher wealth, and those located further from DMH hospitals for the mentally ill. On the other hand, boards with higher unemployment levels, higher spending for local services and closer access to state DD centers should tend to have higher utilization levels. Shared management boards which spend more for local resources, and which are located further from MI hospitals, are most apt to be lower in state facility usage. In this same group, boards with high unemployment and wealth, and those located further from DD centers, should register relatively higher use levels.

The most likely candidates for utilization decline among full management boards are those with high wealth, and those which spend more for local resources, and those which are located relatively far from state MI hospitals. Boards which are least likely to show a drop-off in facility use are those with larger populations and those located close to state DD centers. The overall results for this chapter are summarized in the following section.

Summary and Assessment of Results

The findings of this chapter can be summarized in several major points. The policy groups were shown to be essentially similar on common socio-economic characteristics for the year prior to initiation of the contract plan. Differences among groups were not associated with contract selection decisions. Although this finding is contrary to earlier expectations, it is understandable within the context of the Michigan mental health system. In the first three years, the full management policy option was clearly not perceived as beneficial by a sizable majority of the boards. Other factors, including variations in level of political support and economic uncertainty, and differences in leadership characteristics, clearly influences board contract selection choices.

Second, the basic performance model provides a useful explanation of overall utilization and, for the most part, produces expected results for the individual variables in the model. Both population size and wealth prove to be

especially important in explaining variations among the boards. The group results for population size and wealth also indicate considerable support for earlier hypotheses, especially for full and shared management boards. The shared group appears to be distinct from the others in the effects of both wealth and population size.

Third, the performance of the full management group suggests a greater tendency for wealthier boards to benefit from full management. At the same time, it appears that full management boards are better able to combat declining or unstable economic conditions. The coefficient for RATE indicates that higher unemployment is associated with relatively lower utilization rates in the contract period. The full management group also experiences a negative effect for LRES which exceeds that of the other groups. This finding is not obvious in the pre-contract period and suggests that full management boards were somewhat better able to integrate local alternative services and state facility usage in the contract period.

The fourth and final point focuses on the comparison of full and shared management performance variable changes. In Chapter III (see Table III-4), it was argued that these groups would register a decline in the effects on utilization of traditional environmental and other performance variables. This has clearly not been the case. As emphasized above, the effects of population size decline for the shared group but remain high for the other two groups. Most of the remaining variables also are similar in

magnitude to the base group. These results point out that environmental and other local characteristics continue to influence state facility use to a high degree in the post-1980 period.

Group performance model changes are summarized in Table V-8 below. The table contains predicted group utilization figures using two sets of regression coefficients--the pre-contract estimates from the model in Table V-7, and the contract period estimates in Table V-6. Table V-8 is repeated in Chapter VI as part of the summary discussion. The discussion in that chapter provides a more in-depth analysis of these results, and also elaborates on procedures used to produce predicted group utilization levels for each year. The figures are also presented at this point in the analysis because they provide an excellent summary of group differences as discussed in this chapter.

Utilization levels in Table V-8 highlight the differences between pre-contract and contract periods. Use of DMH inpatient services clearly declines in the period 1981 through 1983. In addition, the shared management utilization trend is constant during this period, while the full management trend is downward.

Based on these results, it can be inferred that the new management policies had the desired effects on board utilization in the contract period. Shared group effects are somewhat mixed with respect to the observed effects of individual components of the model, yet these boards appear to hold the line on utilization in the contract period.

TABLE V-8

Predicted Mean Utilization
For The Policy Groups
For The Years 1979-80
Through 1982-83

	Management Group		
Year*	Local/ Pre-Contract	Shared	Full
1980	132.94	143.46	143.72
1981	152.86	143.26	130.46
1982	161.36	144.16	119.64
1983	166.75	143.85	108.49

*Values for 1980 wew calculated with the coefficients estimated in Table V-7 (pre-contract model). Therefore, these estimates are not directly comparable to the 1981 through 1983 averages

Full management results are more straightforward as evidenced by the high proportion of performance model variables which have negative signs in the contract period. Although the full management results are generally not significant, there are strong tendencies which indicate that both the process and level of utilization undergo change in the contract period.

A relatively high degree of validity for these findings has been ensured by several steps taken in the analysis, These include the discriminant analysis which provided a check for the effects of selection among the members of the groups, and the performance model which included the key alternative explanations of utilization variation. These models were expanded to include group-performance model interactions in the contract period. The use of these terms in the model helps to increase the internal validity of the analysis by controlling for group differences and changes in performance variables. Use of the weighted least squares estimates also contributes to the validity of the findings. More confidence can be placed in these WLS estimates because the biasing effects due to the non-constant variance term have been removed.

The models and methods chosen for this analysis have attempted to isolate the impacts of management change on the performance of process model, and have also tried to measure group change in utilization. Impacts on the utilization process were found for each group, although further analysis showed that the process impacts in the full management group

were more likely indicative of a steeper decline in use of state inpatient services. These results suggest that full management policies, including fiscal incentives to reduce utilization, resulted in moderate impacts on board utilization patterns.

APPENDIX A

APPENDIX A

The Following Tables, V-3A Through V-7A, Represent The Ordinary Least Squares Counterparts To The Estimated Weighted Least Squares Results In Tables V-3 Through V-7 In This Chapter

TABLE V-3A

OLS Performance Model Results For All CMH Boards For The Years 1973-74 Through 1982-83

Variable	b	Standard Error	t
SWTOTL	.006390	.002520	2.53*
LPOP	.002060	.000039	52.38*
INCOME	-.086777	.003765	-23.04*
RATE	3.685517	.745531	4.94*
LRES	.000063	.000006	9.38*
FED	2.988827	7.242472	.41
MMI	.065554	.078570	.83
MDD	.326008	.079938	4.07*
CONSTANT	-178.870990	29.987481	-5.56*
FMPOST	-279.122570	15.463225	-6.48*
SMPOST	-184.458821	10.123631	-.55

R^2 = .959

F = 2587.91

* = Coefficient is significant at least to the .05 level

n = 1100

TABLE V-4A

OLS Performance Model Results For All CMH Boards
For The Years 1973-74 Through 1979-80

Variable	b	Standard Error	t
SWTOTL	.011271	.002744	4.10*
LPOP	.001724	.000055	31.31*
INCOME	-.060522	.005379	-11.25*
RATE	1.919190	.918445	2.08*
LRES	.000136	.000010	12.56*
FED	25.848823	9.257195	2.79*
MMI	.113220	.091482	1.23
MDD	.205887	.092704	2.22*
CONSTANT	-278.426340	33.711734	-8.25*
FMPRE	-291.385360	8.485934	-1.52
SMPRE	-185.698920	9.412949	-9.85

R^2 = .968

F = 2284.64

* = Coefficient is significant at least to the .05 level

n = 770

TABLE V-5A

OLS Results For The Ten-year Model
With Estimated Group Changes
For 1980-81 To 1982-83

Variable	Coefficient/ Group Change	Standard Error	t
SWTOTL	.008053	.002230	3.61*
FMTOTL	.013954	.033374	.41
SMTOTL	-.000054	.017905	-.30
LPOP	.001770	.000041	42.46*
FMLPOP	-.000160	.001561	-.10
SMLPOP	-.001520	.000650	-2.33*
INCOME	-.069401	.003746	-18.52*
FMINCOM	-.019612	.143780	-.13
SMINCOM	.165467	.056274	2.94*
RATE	2.202048	.757366	2.90*
FMRATE	-1.716477	2.853315	-.60
SMRATE	-1.770125	1.639798	-1.07
LRES	.000143	.000008	16.59*
FMLRES	-.000162	.000021	-7.62*
SMLRES	-.000175	.000026	-6.59*
FED	19.222670	7.743475	2.48*
FMFED	.426679	31.064615	.13
SMFED	-30.259443	19.090407	-1.58
MMI	.112222	.077986	1.43
FMMMI	-.557637	.382991	-1.45
SMMMI	-.190044	.195471	-.97

TABLE V-5A (continued)

Variable	Coefficient/ Group Change	Standard Error	t
MDD	.188805	.079690	2.36*
FMMDD	-.579565	.462731	-1.25
SMMDD	.006679	.194614	.34
CONSTANT	-207.520000	27.031007	-7.67*
FMPRE	-21.678694	6.867411	-3.15
SMPOST	84.639753	268.047471	.31
SMPRE	59.050650	6.920655	8.53*
SMPOST	110.625050	153.376761	.72

R^2 = .971

F = 1295.83

* = Coefficient is significant at least to the .05 level

n = 1100

TABLE V-6A

OLS Results For The Ten-Year Model With Estimated Group Coefficients For 1980-81 To 1982-83

Performance Variable	Management Group		
	Local	Shared	Full
SWTOTL	.008053*	.007999	.022007
LPOP	.001770*	.000250*	.001610
INCOME	-.069401*	.096066*	-.089013
RATE	2.202048*	.485573	.485571
LRES	.000143*	-.000032*	-.000019*
FED	19.222670*	-11.036773	19.649349
MMI	.112222	-.077822	-.445416
MDD	.188805*	.195484	-.390760
CONSTANT	-207.520000*	--	--
PRE	--	-148.469350	-229.198691*
POST	--	-96.894950	-122.881251

Statistics for Table V-5A apply to this table also.

TABLE V-7A

OLS Results For The Ten-year Model
With Estimated Group Coefficients
For 1973-74 To 1979-80

Performance Variable	Management Group		
	Local	Shared	Full
SWTOTL	.013112*	.006762*	.024615*
LPOP	.001107*	.002243*	.000151*
INCOME	-.013641*	-.074347*	.043670*
RATE	3.754071*	2.071040	-.012760*
LRES	.000044*	-.000030*	.000008
FED	11.442865	-30.211816*	37.078303*
MMI	.145528	-.254091*	.073120
MDD	.164143*	.549332*	-.694403*
CONSTANT	-227.883680*	-154.767590*	-196.744940

R^2 = .978

F = 1845.15

* = Coefficient is significant at least to the .05 level

n = 770

CHAPTER VI

SUMMARY AND FUTURE CONSIDERATIONS

In the first part of this chapter, an overall review of the study is presented, along with a summary of major findings. Group utilzation changes are then explored for typical CMH jurisdiction, by employing estimated group coefficients from the previous models. Performance model findings are also reviewed in light of previous expectations with socio-economic results providing the major topic of discussion. And finally, an overall assessment of full management contracting is presented.

In the last part of the chapter, the focus shifts to future research and to the potential utility of the approach outlined in this study. Several potential problems and proposed solutions are identified and briefly discussed as a prelude to future work in this area.

Review and Assessment

In the years following the Mental Health Code changes of 1974, the state response was to increase monetary commitments to the boards and to make available a broad array of elective services. At the same time that the CMH system was expanding, however, few formal linkages were established between CMH jurisdictions and the DMH institutions. Legal prohibitions on information sharing,

CHAPTER VI

SUMMARY AND FUTURE CONSIDERATIONS

In the first part of this chapter, an overall review of the study is presented, along with a summary of major findings. Group utilization changes are then explored for typical CMH jurisdiction, by employing estimated group coefficients from the previous models. Performance model findings are also reviewed in light of previous expectations with socio-economic results providing the major topic of discussion. And finally, an overall assessment of full management contracting is presented.

In the last part of the chapter, the focus shifts to future research and to the potential utility of the approach outlined in this study. Several potential problems and proposed solutions are identified and briefly discussed as a prelude to future work in this area.

Review and Assessment

In the years following the Mental Health Code changes of 1974, the state response was to increase monetary commitments to the boards and to make available a broad array of elective services. At the same time that the CMH system was expanding, however, few formal linkages were established between CMH jurisdictions and the DMH institutions. Legal prohibitions on information sharing, and other

administrative impediments, made it very difficult for boards to attempt to manage the two service networks. Maintaining these essentially separate treatment systems meant that CMH boards were virtually unable to track clients and to systematically plan for the provision of alternatives to DMH services.

The Michigan performance contract changes of 1980-81, introduced DMH-CMH contracting and also formalized relationships between the boards and the DMH facilities. The formalization of these relationships was designed to make it easier for the boards to provide a continuum of services for all clients. In the case of full management, boards were given increased service options and the capacity to "trade off" state-managed services for local alternatives. Boards which were able to provide suitable alternatives, at presumably lower costs in comparison to state inpatient services, were able to realize the trade-off.

The major question for the analysis centers on whether these new administrative arrangements and incentives result in changes in the board's response to mental health problems. The analysis of management reforms consists of two main components. The first results from a concern that only the wealthiest and largest boards would agree to full management. A combination of factor analysis and discriminant function techniques were employed to investigate the hypothesis that socio-economic patterns would be discernable among the groups. This hypothesis turned out to be essentially unfounded.

The second component of the analysis is performance change in the contract period. Board utilization of DMH-managed inpatient services was selected as the best overall indicator of CMH board performance. Use of this indicator assumes that decreased utilization is a primary objective of full management implementation. An overall utilization performance model, consisting of social, economic, distance and local resources variables, was developed to help take account of plausible alternative explanations of utilization. Within the context of this model, policy changes among the boards were hypothesized to produce specific changes in both the process and level of utilization among the contract groups.

The hypotheses were tested by comparing group changes to an overall model of performance expectations. The resting involved construction of a multiple regression model of utilization, which included alternative explanations as independent variables. With the aid of binary variables to designate group membership, a group interaction model was developed to delineate group and contract-period impacts. The resulting covariate model depicts overall effects, group interaction effects, and average utilization estimates. With the aid of these econometric models, and pooled cross-sectional and time-series data, it is possible to assess contract-period group differences in the context of overall performance model effects.

As reviewed in Chapter V, the results for the performance model have been supportive of the hypotheses outlined

in earlier chapters. The effects for the groups, on the other hand, have not been as clear-cut. In the following section, group utilization changes are discussed in more detail.

Utilization in the Typical CMH Jurisdiction

The findings from Chapter V are used in this section to account for group utilization differences beginning in 1980. Table VI-1 below contains utilization estimates for each of the groups for 1980 through 1983. As noted at the bottom of the table, the 1980 utilization averages were obtained with the pre-contract model of Table V-7. The estimated averages for 1981, 1982 and 1983 are obtained with the covariance model in Table V-6.[1] Utilization values for each group were arrived at by multiplying the appropriate coefficients by the average values for all CMH boards on each of the performance variables.

As shown in Table VI-1, the contract groups appear to be fairly similar in utilization level for 1980. Based on the pre-contract estimates, the local management group had lower utilization than either of the remaining groups. The full and shared group averages were also identical using the coefficients for the pre-contract era. The increase for the local/base group between 1980 and 1981 reflects the different base in the ten-year group interaction model.

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[1] Recall that the base groups for the two models are different. In Table V-7, the base group consists of local boards only, while in Table V-6, the base includes all boards for the seven-year pre-contract period.

TABLE VI-1

Predicted Mean Utilization
For The Policy Groups
For The Years 1979-80
Through 1982-83

Year*	Management Group		
	Local/ Pre-contract	Shared	Full
1980	132.94	143.46	143.72
1981	152.86	143.26	130.46
1982	161.36	144.16	119.64
1983	166.75	143.85	108.49

* Values for 1980 were calculated with the coefficients estimated in Table V-7 (pre-contract model). Therefore, these estimates are not directly comparable to the 1981 through 1983 averages.

When these largely pre-contract effects are extended through 1983 with average performance model data for each year, the result is a steady rise in utilization during the contract period.

Both full and shared groups are lower in average utilization in 1981 than the pre-contract base level. As expected, the full management group registers the lowest utilization level in 1981, a trend which increases in 1982 and 1983. The shared group maintains a fairly constant level of utilization in 1982 and 1983, in comparison to the pre-contract base. These results appear to indicate that the full management utilization trend is downward. This finding implies that citizens who live within full management jurisdictions have a better chance of receiving community treatment than individuals residing in shared management jurisdictions. The decline in dependence on DMH inpatient services, on the part of full management boards, cannot be taken too far, however. The results for Table V-6 have shown clearly that these are only tendencies. There is considerable within-group variation, especially among full management boards, which implies that the performance of at least some full management boards did not depart significantly from previous trends.

The Utilization Process

Previous comparative policy studies by Dye, Sharkansky and others have emphasized the importance of demographic characteristics and economic development in accounting for

variations in both likelihood of innovation, and the level of policy output among state and local governmental units.[2] Jurisdictions with large populations and high levels of wealth are expected to take on new programs more readily, and to produce greater relative output once the preograms are adopted. Extension of the hypotheses to mental health policy results in the argument that both population and wealth are negatively related to utilization. Both attributes are expected to provide in large part the conditions necessary to sustain a low level of dependence on DMH inpatient services. In addition, these environments are more likely to support a relatively large and innovative mental health program.

Quite a different view of the effects of population size has been proposed in this research, a view which stresses that jurisdictions with larger populations will have higher utilization lavels. This hypothesis of a positive relationship between population and utilization has been justified because the larger metropolitan centers face the greatest challenges in obtaining the necessary local support to effectively manage the utilization process. The the counter-hypothesis of the effects of population size.

Additional support for the population hypothesis is provided in the earlier factor analysis results. Several of the boards with the largest populations decided not to take performance model results have indicated strong support for

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[2] See the discussion of these studies in Chapter III above, pp. 65-69, 81-86.

on full contract responsibilities in the first three years on implementation. Although this finding conflicts with earlier research, it is understandable if it is assumed that the large-population boards faced the greatest risks from full management. Where prospects for control of utilization were low, the benefits of the trade-off may well have been perceived as unattainable.

The findings for population effects were also influenced by the economic conditions of the early 1980's. This influence appears especially strong in the shared contract performance model results; both wealth and unemployment are positively associated with utilization among members of this group. The factor analysis findings may shed some light on these shared management performance differences. The 1980 data indicated that the shared management group had relatively low status on each of the composite socio-economic factors. Even though these shared groups trends were not significant in defining group differnces, they may indicate a large subset of boards which was more vulnerable to the depression-like conditions of Michigan's economy in that period. The subset of wealthy shared management boards provides a useful example of the effects of economy change. The economic effects were particularly adverse since the economies of several of these boards were primarily dependent on automobile and other heavy manufacturing.

In summary, the differences between previous research expectations and the findings of this study, with regard to the effects of population and wealth, can be accounted for

by three major factors. The first factor has already been mentioned; drastic changes in the state's economy may have disproportionately hurt the shared management boards.

A second factor which helps account for the differences in findings is the redistributive nature of public mental health services. The early comparative policy studies focused more on policies such as education, highways and health, which tend to engender relatively higher levels of support from citizens and local elected officials. Many mental health jurisdictions tend to be more supportive of these types of services than of mental health and other types of redistributive services. Many jurisdictions appear to have yet to reach a concensus on whether to devote more effort to an expansion of mental health responsibilities. Mental health is a new item on many local political agendas, in comparison to major policy concerns of the counties. As such, these kinds of services may have only spotty bases of support within the local jurisdictions.[3] Under these conditions, and in the absence of aggressive community intervention, DMH inpatient utilization levels are explainable in the socio-economic changes in the early 1980's. For a large number of these boards, the shared management contract appears to have been a "safe" alternative. Whereas full management would have required the boards to essentially

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[3] The only large-scale mental health organization with well-developed local roots is the Michigan Association of Retarded Citizens (MARC). This group consists of chapters in 70 or more of Michigan's 83 counties, and offices and paid staff in about half of these chapters.

break new ground in relationships with DMH and the inpatient institutions, shared management required very little in the way of changes.

A final element which sets these mental health findings apart from previous research is that most of the previous comparative models were cross-sectional and did not include the time element in estimating the effects of economic or population differences. The models employed in this analysis have the advantage of utilizing cross-sectional observations made over a ten-year period. When viewed from this extended time perspective, differences in population size are found to be positively related to higher utilization, while the effects of wealth produce lower utilization levels.

Full Management: An Interum Assessment

Previous discussions have argued that economic principles form the basis of much of full management policy. The full management boards are expected to be better able to take advantage of available local service options, due in part to the ability of the boards to manage both DMH and CMH service components. In the new policy design, board choices are expanded to include the possibility of trading off continued use of DMH services for locally managed and presumably lower-cost alternatives.

Full management responsibilities also carry certain risks for the boards. Utilization is capped at negotiated levels and sanctions are specified in the contract for

overutilization by the boards.[4] Within these constraints, full management boards are to become the prudent buyers of public mental health services with the local jurisdictions.

In principle, a competitive local service environment is considered essential if prudent boards are to succeed in lowering utilization while maintaining a relatively high level of service quality. The results indicate, however, that at least some full contract boards suceeded under less-than-ideal competitive service circumstances. Two of the original pilots, the Alger-Marquette and St. Clair Boards, provide good illustrations of this point. Neither board could choose from a large variety of alternative inpatient and residential services. Yet each has been able to cut back utilization by soliciting new or increased commitments from available public and private agencies. From these examples it would appear that to achieve utilization effects alone, it is not as important that the local service environment be competitive, but rather that the board have access to at least a minimum level of resources which can be employed as DMH alternatives.

According to the economic logic of contracting, boards which are compelled to work with only one or a few providers in a given service area, e.g., residential home providers, or inpatient service agencies, may experience adverse implications for the quality of services provided. The service providers may be in a position to stipulate higher prices

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[4] The full management contract normally stipulates that overutilization is funded by the local CMH jurisdiction.

and/or to offer subquality services. This problem is more general, however, and seems to characterize mental health and other welfare related services. While the level of alternative resources varies considerably among boards, very few jurisdictions can boast an abundance of these services which can be committed to serve present or potential recipients of DMH inpatient services. In fact, numerous jurisdictions, including several in northern lower Michigan and in the Upper Peninsula, have great difficulty in securing even a minimal level of necessary professional mental health services.

The issue of service quality has not been addressed in this study. It is a critical question, however, and warrants future examination. In mental health, the concern over service quality has historical roots in past abuses, and also has immediate importance. The increase in both DMH and CMH community residential services, and the accompanying increase in CMH management responsibilities has heightened the concern over comparative service quality.

The final topic in this section concerns full management implementation constraints arising from the differing interests of the major actors. As suggested in Chapter II, the ability of a local agency to implement the contract may be influenced by the actions of board and elected court officials, local public and private agencies, the courts, and the DMH service facilities. A good example of the dependent position of the boards is provided in a case involving a full management board and the board's major

supplier of DMH inpatient services. Top officials of this particular DMH facility were adamantly opposed to the board control concept. When the board attempted to transfer a sizable number of patients out of the facility and into board-managed services, facility officials responded with public denunciations, charging that the board could not assure adequate treatment and protection for these patients. The facility also adopted a dilatory stance in subcontract negotiations with the board. The board was eventually able to achieve some success in reducing utilization, but recurring conflicts with the facility resulted in considerable delay in effects. This example illustrates that full management effects may be compromised by the inaction or opposition of key actors. Most remaining full management boards appear to have relatively cooperative relationships with their respective DMH hospitals/centers.

Additional information about the interactions of CMH officials and remaining key actors is unavailable at this time. The availability of this type of information would help considerably in understanding the complexities of implementing full management, and the capacities of the boards to resolve problems. Each of the full contract boards has implemented the contract in a different manner. In doing so, each has responded within a different set of contingencies or constraints, including variations in local agency, board and political support, and differences in size, wealth and available local resources. The earlier utilization models have provided broad local parameters of

the utilization process, but have been unable to account for specific differences in the behavior of local actors, and how these differences may translate into utilization effects.

The discussion in this section has presented a mixed or even negative assessment of full management. Full management policy may be vulnerable in the implementation stages due both to the scarcity of public mental health resources, and the opposing interests and incentives of other mental health actors. Yet the policies are beset by similar implementation obstacles. The real key may be to understand whether full management enabled boards to better deal with these potential problems. The analysis in Chapter V has suggested that there are some encouraging signs for the performance contracting approach. A subset of the full management group has been able to decrease utilization of DMH inpatient services as a direct result of management status.

Future Considerations

The models employed to analyze the effects of DMH reforms are preliminary in at least two respects. First, since no directly applicable research was previously conducted, the selection of performance model variables has been exploratory. Despite this exploratory status, the performance model has shed considerable light on local factors which explain utilization variation among boards. And second, the analysis is preliminary in the sense that only

three years of contract experience were included in the analysis. Since the main objective was to account for any early effects of management changes, the lack of further data has not been a hindrance to the analysis. This analysis has examined several utilization models with the intent of making a progress report, rather than a pronouncement of success or failure of the reforms.

The performance and policy models may benefit from several changes or additions. The first of these potential modifications would address the problem of state placement efforts. The state gas continued to expand its role in placing individuals from the hospitals/centers into state-managed community settings. Even though these efforts serve to lower board utilization levels, the models reviewed above were not developed to take account of these activities. Addition of state placement efforts to the performance and group models may produce a more comprehensive view of DMH policy impacts.

As previous discussions have suggested, there is reason to suspect that the DMH gospitals/centers may have an independent effect on utilization by CMH boards located within the catchment areas of these facilities. This possibility can be built in the performance model to provide a method of checking these effects.

The third potential addition to the model is related to the first two. There is some justification for employing separate models to account for the utilization processes with respect to MI and DD patients. It has been suggested

by DMH officials that utilization patterns for these two types of patients are quite different. The hospitals for the mentally ill experience much greater turnover than the DD centers, and are more likely subject to economic fluctuations.

A fourth change in the approach is essentially a methodological one. The presence of autocorrelation poses potential problems for the analysis of results. This problem and the potential effects on the estimated models have been discussed.[5] The results of a test for the presence of autocorrelation revealed a moderate level of positive autocorrelation in each of the models.[6] These results suggest that some caution may be advised in drawing conclusions from the esimated utilization models. In future research, it may be necessary to investigate this problem more closely.

A fifth possible modification to the models concerns full and shared management group effects. In the previous analysis, members of each policy group were combined, regardless of when the boards selected a particular contract status during the three-year period. In other words, these models have not been concerned with separating the effects of first- and second-year members from later boards. By treating each group as a whole, it is difficult to detect

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[5] For a discussion of the effects of autocorrelation, see Chapter IV, pp. 97-98, of this report.

[6] The test for autocorrelation involved use of the Durbin-Watson statistic. The results ranged from 1.1 to 1.3, approximately, indicating moderate levels of autocorrelation.

any lagged effects which may result from full or shared management changes. If there are lagged effects, the adding of new full management boards for 1982-83 to the overall group variables may help account for the lack of significance of full management effects.

A final point concerns future work with the utilization models. The ability of these models to detect reform effects is likely to improve as additional observations become available. When the models are estimated with two to three years of additional data, it should be easier to clarify policy impacts. As these data become available, it will also be possible to comment on whether performance changes are temporary or whether the effects are likely to be long-term. Data on full management trade-offs for 1982-83 indicate that several full management boards exceeded their negotiated utilization levels in that year.[7] While these changes may suggest only temporary full management effects, it should be noted that remaining boards continued to take advantage of the trade-offs in fiscal year 1982-83.

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[7] Full management trade-off data consist of allocated dollars to the boards. These figures are preliminary and were provided to the author by the Bureau of Community Mental Health Services, Michigan Department of Mental Health.

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