

The University of Tampere

Regional Dynamics of Socioeconomic Change

Edited by

Antoni Kuklinski & Olli Kultalahti
& Briitta Koskiaho

FINNPUBLISHERS - TAMPERE

FINNPUBLISHERS - TAMPERE

1979

ISBN 951-848-000-1

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Typeset in Finland by Valmisteksti Oy

Printed in Finland by Tampereen Kirjapaino Oy

PREFACE

The volume is based on mapping and developing new approaches to regional studies, regional planning and regional policy. One of the most important goals has been to make use of international experiences. This is needed because regional development has proved a very difficult task which calls for new ideas and further discussion. The volume consists of papers submitted by contributors from more than ten countries, both Eastern and Western. The authors represent expertise in various academic and professional fields. We take this opportunity to thank them for their valuable contribution.

During his visit to the University of Tampere in 1977, Professor Antoni Kuklinski conducted seminars on regional dynamics and also initiated our present cooperative effort. The basic idea, however, can already be seen in his earlier publications and his work as Programme Director on Regional Development for the United Nations Research Institute for Social Development in 1967–1971. The present volume can be regarded as a further elaboration of these international efforts.

For its part, even the editing process has generated stimulating cooperation between experts from different countries and especially between the University of Tampere, the University of Warsaw and the Committee for Space Economy and Regional Planning, Polish Academy of Sciences. The major credit for this must go to Professor Kuklinski. We are also indebted to the Department of Social Policy at the University of Tampere and Associate Professor Briitta Koskiaho. We also acknowledge our debt to Mrs. Ritva Kultalahti and Mrs. Liisa Ritanen for their assistance in preparing the manuscript for the press.

The individual ideas presented in the papers are the contributors' own views, but we feel that these various papers will add to the understanding of different social contexts and, at the same time, pave the way for future cooperation in this field.

Olli Kultalahti
University of Tampere
Division of Regional
Science

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INTRODUCTION

Olli Kultalahti

This introduction will first give a short outline of the problem of regional dynamics. Some aspects of socioeconomic change will be analyzed in general terms. Then some of the basic ideas presented in the papers will be pointed out following the sequence of the chapters. Perhaps it should be mentioned that the papers could of course have been grouped differently, but the sequence chosen appeared reasonable.

Regional dynamics of socioeconomic change have become more important in recent years. This is partly due to the fact that regional differences have increased along with accelerating technological, economic and social development and partly to our increased knowledge of this process. However, the meaning of 'regional dynamics of socioeconomic change' is not clear enough. The term includes two different aspects: what we mean by 'dynamics' and what by 'socioeconomic change'. In order to understand the aim of this volume we must first clarify the meaning of these terms.

'Socioeconomic change' is the main substantial term as to the perspective of the volume. By 'dynamics' we refer to the principles, 'rules', which control these socioeconomic changes. The term 'regional', in turn, refers to the particular features of the regions in question causing differentiation and, in most cases, inequalization between the regions. One of the most illustrative ways to approach this problem is by means of system thinking. We can regard region as a system in which social activity of people, industrial activity etc. form subsystems. Measures of regional policy are external stimuli which are aimed at strengthening economic development and living conditions. Improvement of living conditions of the people living in the region may, in turn, function as an internal stimulus which promotes innovation diffusion, productivity of work and other conditions for economic development.

At least the following linkages are fundamental in 'socioeconomic change':

- relationships within and between subsystems
- regulating effect of space and distance on functioning and structures of subsystems

cesses, city design and transportation systems. The same multi-tiered system of minimum national plus optional regional increments could be applied not only to emission taxes but also to other major management instruments, such as regulations, standards and subsidies.

Permitting each region, if it wished, to superimpose additional pollution surcharges on top of the national minimum would improve efficiency and technology by letting local areas take account of local environmental conditions and preferences concerning economic growth vs. environmental quality. The use of this multi-tier environmental tax system would avoid the problem of national coercion of local regions, of local regions frustrating national plans either by excessively lax or excessively stringent environmental standards, and would provide positive economic incentives for creating cleaner, less dangerous energy technologies. Automatic economic processes would then be substituted for costly, time-consuming legislative and legal procedures. A generalized set of corrective taxes on detrimental externalities based upon national standards with local variations would assist market forces to address simultaneously the problems of achieving a socially desirable rate of economic growth, the appropriate mix of economic output, and the optimal location for energy and other facilities.

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INTER-REGIONAL EQUITY AS A BASIS FOR POLICY: ALLOCATION OF RESOURCES AMONG MENTAL HEALTH REGIONS IN MASSACHUSETTS

Willard Van Horne, Lee De Cola and Frank L. Sweetser

»... policy effectiveness must...include the quest for social and regional equity ...»

D. Michael Ray
in Antoni Kuklinski, Regional Development and Planning, Leyden, Sijthoff, page 11.

INTRODUCTION

During the past year-and-a-half, the Massachusetts Department of Mental Health has developed and applied an innovative procedure in its quest for fairness in the distribution of resources to the seven mental health regions and the forty mental health areas of the state. On the principle that equity consists in distributing service resources proportionately to needs for service, the Department has conducted studies of its mental health areas, assessed levels of needs, and devised improved methods of allocating new monies to regions. In the process, planners and decision-makers in the Department have recognized the important political realities which condition the actions of the Department and its sub-systems, and have succeeded in balancing sub-system pressures in the interest of the apolitical goal of equity in resource allocation.

In this paper, we first review the regionalization of mental health services in the United States from the early 1960's onward in terms of supporting and mandating legislation. Second, we examine the internal and external pressures which led the Department of Mental Health to its planning thrust for inter-regional equity. Third, we define the problem of inter-regional equity as a balance of needs and resources. Fourth, we explicate the derivation of a

formula to measure differential needs among regions. Fifth, we examine the relation between needs and resources in developing alternate strategies for the allocation of new monies so as to diminish inequities, and we indicate the choices made. In conclusion, we suggest some of the implications of this planning experience for future — and broader — approaches to the enhancement of inter-regional equity in publicly-administered human service enterprises.

1. FEDERAL, STATE AND REGIONAL MENTAL HEALTH PLANNING MANDATES

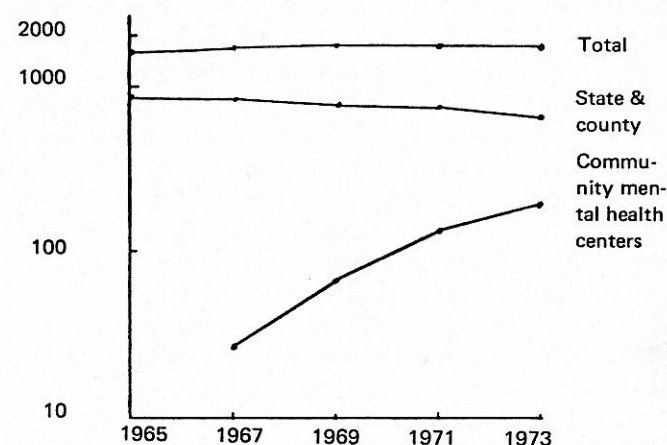
The community mental health movement, which has ideological roots going back more than a hundred years, became a matter of declared National policy in 1963, with Congressional passage of the Community Mental Health Centers Construction Act during the Kennedy administration (Bloom, 1973). This legislation aimed at nothing less than the radical restructuring of American mental health care delivery from a hospital-centered system to a community-based network of comprehensive mental health services, with hospitals' roles greatly diminished.

Basically, in addition to providing funding to states for mental health center construction, the Act defined what functions a community mental health center should serve; and it carefully articulated that the intent of federal planning funds, made available earlier in 1963, was for the states to create comprehensive plans which fully incorporated the community mental health center concept.» (United Community Planning Corporation, 1973). Figure 1 shows the impact of the new service delivery system on inpatient episodes¹ alone during the years from 1967 to 1973. In addition, mental health centers enormously expanded outpatient services throughout the country.

In Massachusetts, initial planning funds were used to examine the types of organizational structures best suited to carry out the federal mandate. After careful study, the Department of Mental Health recommended that the state be divided into seven regions and further subdivided into thirty-

1. Episodes are defined as the number of persons in residence within an inpatient facility at Time 1 (usually the first day of a calendar or fiscal year) plus all admissions to that facility between Time 1 and Time 2 (usually the first day of the next calendar or fiscal year). Since episodes include readmissions, and since a given client may have multiple admission during the Time 1-Time 2 time interval, episodes do NOT represent an unduplicated patient count.

Figure 1. *Inpatient episodes in the United States (thousands, logarithmic scale).*



Source: National Institute of Mental Health, Statistical Note 124, 'Provisional Data in Patient Care Episodes in Mental Health Facilities, 1973.' October 1975.

seven (later, forty) 'catchment areas'.² These recommendations were largely incorporated in the Massachusetts Comprehensive Mental Health and Retardation Services Act of 1966. This legislation anchored mental health care delivery within clearly delimited geographic areas, and enhanced service accessibility to clients by providing for service networks in each of the administrative entities. Moreover, by rendering each area program responsible for the provision of mental health services to every resident of that catchment area, it assured that »the severely ill, difficult to treat, socially disadvantaged, or personally unattractive patients would not get 'lost' or 'be dumped'.« (Goldblatt, *et al*, 1973).

Regional planning efforts were strengthened considerably as a result of this State legislation. »The seven DMH Regions represent a more reasonable scale (than the forty catchment areas) on which to base planning, while still providing a sub-state focus which avoids over-reliance upon centralized Department of Mental Health headquarters.« (Joroff, 1976). Regionally-based planning efforts within the Commonwealth's mental health delivery system

2. Catchment areas were clearly delimited geographic areas within which mental health services were to be provided to the population residing in this area. The original enabling legislation called for catchment areas no smaller than 75 000 in size and no larger than 200 000.

were also strengthened as a consequence of the passage of the National Health Planning and Resource Development Act. This legislation created regionally-based health planning agencies charged with increasing the quality of *all* health services - both somatic and mental health services. And, because the regionally-organized 'health system agencies' established under this legislation were also empowered to review applications for federal mental health funding, the Act confronted State mental health authorities with a forced choice: *either* they could relinquish much of their planning responsibility to a generalized health-care planning system; *or* they could intensify their own mental health planning efforts, especially at the regional level, where the major locus of agency interface was developing. (Smith, *et al*, 1975).

2. THE RESPONSE TO PRESSURES FOR INTENSIFIED PLANNING CAPABILITIES

The Massachusetts Department of Mental Health opted to intensify its own planning efforts, particularly at the Regional level.³ Accordingly, the Department established a central Office of Information Systems, Evaluation and Planning early in 1975, with supplementary regional staff in each of the seven Department of Mental Health regional offices. The major missions of this office were 1) to develop an integrated management information system and 2) to use the information gained to strengthen both short-term and long-range planning efforts. A planning issue of paramount concern within this embryonic office, was the issue of inter- and intra-regional resource allocation. This concern was prompted, in part, by the system of newly-formed Health Systems Services, and their growing demand for this type of information. It was prompted too by the federal government's demand that every State Mental Health Authority, as a prerequisite to any federal funding under the Community Mental Health Centers Act, examine carefully the distribution of 'needs' and 'resources' in every catchment area. Finally, the Department's own Regional Administrators were exerting increasing pressure upon the Department to develop fairer methods of allocating 'new' monies each fiscal year.

3. It may be of interest at this point to put Massachusetts in an international perspective. The state has a current (1975) population of about 6 million, placing it between Denmark and Austria in demographic size, and 'gross domestic product' of perhaps 40 billion dollars - making it between Denmark and Sweden in economic size. Source: Organization for Economic Cooperation and Development, 1975, and Federal Reserve Bank of Boston.

The Department responded to these pressures by assigning its newly-created planning office the critical task of establishing guidelines for the equitable distribution of mental health resources among the catchment areas. This required, initially, a comprehensive examination of the resource-allocation issue, to determine how equitably or inequitably 'resources' were, in fact, distributed among the seven regions and forty catchment areas.

3. THE PROBLEM OF EQUITY

Measuring 'resources' as dollars expended on providing mental health services would seem to offer a fairly straightforward approach to the problem of determining fair and unfair resource distribution. Unfortunately, the matter is not so simple. The process of defining area 'resources' involves very awkward public versus private sector distinctions. A given catchment area may, for example, be characterized by a relatively small share of public (State, local or Federal) expenditures in the provision of mental health services, while enjoying a more substantial share of such expenditures in the private sector, in private clinics, private psychiatric hospitals and the like. Whether these 'private sector' resources are truly significant, however, will depend upon the socioeconomic complexion of the area in which they are located. Clearly, such resources must be discounted if they are unavailable to a largely low-income population. Conversely, they should probably be weighed more heavily to the extent that their service area is affluent. Moreover, very little systematic information is available concerning private sector expenditures on mental health services. Given the serious data gaps, and the obvious complexity of deriving a defensible public-private weighting formula, analysis had to be limited to an examination of public sector resources.

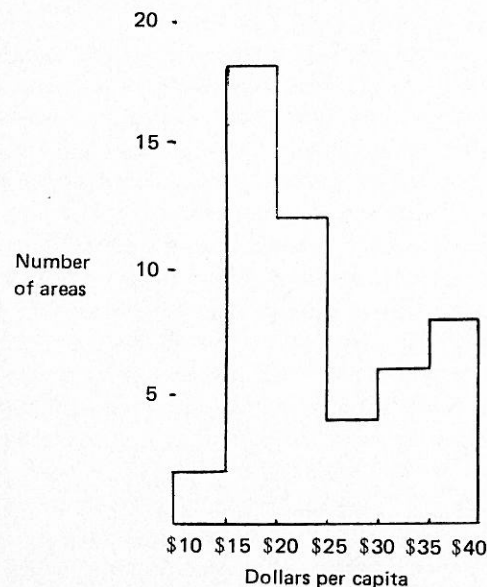
Even with resources narrowly defined in terms of public sector funds, a serious complication is created by the impact of federal dollars. When federal dollars are fully counted, areas with a substantial share of these dollars would be regarded as enjoying a significant percentage of all public sector funding statewide. As a result, even when such areas also have a significant percentage of statewide need for mental health services, their current total resources usually push them above the statewide mean. In effect, they are penalized in the assignment of new money allocation because of their previous success in obtaining federal monies. On the other hand, if federal monies were completely discounted in determining an area's percentage share of statewide resources, those areas having federal funding would be effectively rewarded by ignoring this important source of aid. While the disadvantage accruing to catchment

areas lacking federal funding might ultimately serve as a stimulus to their future grant solicitation efforts, the probability is high that the aggressive grant-getting areas would maintain their relative advantage. For this reason, and since federal dollars, after all, have the same purchasing power as State dollars, it was decided to count all such aid fully.

When the data were collected, there was a considerable range in per capita funds being received by catchment areas; the resources spent in the 'richest' areas were almost \$ 40. per capita, while those in the 'poorest' were less than \$14. as shown in Figure 2. The reasons for this inequality were mainly bureaucratic. For example, while a state hospital might serve a number of contiguous areas, its resources would be largely concentrated in the area in which it was located, providing that local community with a large programmatic infrastructure. On the other hand, some areas even without state hospitals enjoyed the rewards of having articulate program personnel versed in the arts of grantsmanship, while other communities (urban ghettos, isolated rural towns, even suburbs with high unemployment rates) remained neglected.

This analysis showed that there was indeed a strong reason to develop a

Figure 2. *Distribution of mental health resources among Massachusetts mental health catchment areas, fiscal year 1976-77.*



scheme for improving regional equity, and to develop a formula by which future resources could be directed to those parts of the state having the greatest need for mental health services. The difficult problem - however such a scheme might be implemented - was defining need.

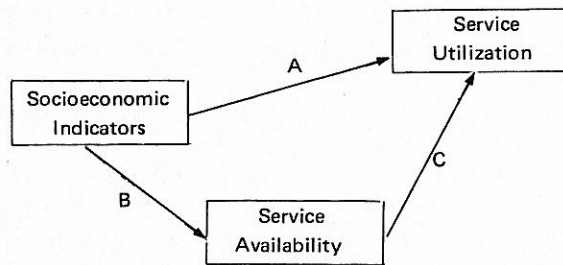
4. DEFINING NEED FOR SERVICE

Efforts to estimate potential need for mental health services have followed conceptually similar but methodologically dissimilar tracks. One approach has been the 'total prevalence' approach. On the basis of prevalence studies of mental illness, both treated and untreated, it has been possible to estimate the size and character of population groups at high risk of mental disorder (Sorkin, *et al*, 1973). United States Census data can then be used to estimate actual numbers of individuals in given areas who are in need of mental health services. Perhaps the most noteworthy feature of this approach is that it does not rely on actual mental health service utilization data to estimate potential demand for service. Instead, it assumes that certain population subgroups are at higher risk of mental illness than others, and estimates potential demand for mental health services in different areas by analyzing the composition of their populations.

A second approach has been the 'utilization-based' approach. This approach assumes that estimates of 'potential demand' for mental health services must be informed by knowledge of actual or existing utilization patterns in given areas. (Brandon, 1976). If one can establish which area sociodemographic characteristics best predict actual utilization, and if the effect of existing levels of service can be explicitly controlled, then potential demand estimates can be made.

The conceptual model underlying the utilization approach consists of a causal structure that relates three collections of key variables in such a way as to express their interdependencies. The ideal model schematically is a 'path analysis' that can be represented in the present case by the diagram below. Theoretically, it should be possible to analyze the direct influence of *socio-economic factors* such as poverty on service *utilization* (Path A) by controlling for the influence of availability on utilization (Path C). This may be done by including in the analysis the effect of the socioeconomic factors on utilization as mediated by availability (Path B-C). Let us explore a hypothetical example from the field of law enforcement. Path A represents the influence of income on reported crime. Now, if there is a strong police presence in poor neighborhoods (Path B), there is likely to be a high rate of reported crime in

such neighborhoods (Path C), not only because there is actually a lot of crime in such neighborhoods (what we are trying to determine), but also because that is where many of the police to whom crime is reported spend their time. We need a way of correcting for this indirect link. One way to correct this would be to perform a controlled experiment in two socioeconomically similar neighborhoods, by providing one with a higher level of police service than the other. If the crime rates in the two areas differ, then there is reason to infer that there may be no direct link between income and crime, while if the rates are similar, it may be possible to ignore the influence of service availability on utilization. The first outcome is presumptive evidence for the existence of what in social science research is called an 'intervening variable' (Blalock, 1961). While the second suggests that the problem may not exist or at least may not be severe.



Our model made use of this analytical conceptualization, along with several important assumptions. First, we assumed that socioeconomic factors may indicate need but are not in themselves measures of need. For example, the existence of single-parent families in a neighborhood does not in itself represent a need for mental health services, but may indicate related conditions that produce a need. Second, we assumed that utilization is an expression of demand for services and therefore a sign of need, but that the utilization may well also be a response to the presence of professional staff, nearby and effective facilities, or even good advertising. Third, we assumed that it is possible quantitatively to develop a need index based solely on socioeconomic indicators, even when those indicators may have an extremely complex connection with needs for services. For example, our model is not, except in the grossest manner, able to account for the common phenomenon of under use of mental health service by the poor. Finally, we had to assume that the data we had to represent the socioeconomic factors were good enough not only to represent the phenomena referred to, but also to be used for the guiding of policy.

Using these assumptions, we systematically explored relationships among a large number of variables to see which models would best fit the conceptual scheme outlined above. We first examined correlation coefficients and scatter diagrams relating service utilization activity to the availability of services and the socioeconomic characteristics of the mental health catchment areas. Among the correlations developed were those that related 1) the admissions rate to state hospitals to 2) a dummy variable indicating the presence or absence of a community mental health center (CMHC), and to 3) the percent of female-headed households in 1970, 4) 1973 per capita income, 5) 1975 unemployment rate, 6) 1975 population density, and 7) 1970 percent families in poverty. The correlation matrix for these variables shows the magnitude and direction of these relationships (see Table 1).

The data were next examined using a regression model that accounted for 56% of the variance in admission rate among catchment areas:

$$\begin{aligned}
 \text{Admission rate} = 161 & - .67 \text{ (Community Mental Health Centers)} \\
 & \quad (5.13) \\
 & + 3.52 \text{ (\% Female-Headed Households)} \\
 & \quad (1.42) \\
 & - .0191 \text{ (Per capita Income)} \\
 & \quad (2.28) \\
 & - 2.29 \text{ (Unemployment rate)} \\
 & \quad (1.20) \\
 & + .00119 \text{ (Population Density)} \\
 & \quad (1.51) \\
 & - 3.77 \text{ (\% Families in Poverty)} \\
 & \quad (1.50)
 \end{aligned}$$

(t-statistics below Coefficients)

$$R^2 = .56$$

The regression analysis demonstrated that at the level of catchment areas (rather than the individual or neighborhood level) there were important relationships among social characteristics and service utilization, and, further that when the availability of alternative services was taken into account at least some of those characteristics could be used to predict service utilization. However, the regression presented us with a number of issues that required acknowledgment and resolution if we were to develop a satisfactory need formula. On the one hand, we found, for example, that because community mental health centers were concentrated in the Boston Metropolitan Area (where density and the prevalence of female-headed households was high),

Table 1. Correlation matrix for model variables.

	CMHC	% Female-headed households	Per capita income	Unemployment rate	Population density	% Families in poverty
Admission rate	-.67	-.19	-.03	-.21	-.28	-.32
CMHC		.53	-.19	.31	.64	.61
% Female-headed households			-.22	.41	.75	.82
Per capita income				-.48	-.06	-.46
Unemployment rate					.30	.48
Population density						.73
% Families in poverty						

the presence of the community mental health center variable reversed the signs of these two variables' relationships to admission. In light of this change of sign, the two variables were selected, along with per capita income, for the need formula. On the other hand, we could not very well argue that unemployment and poverty rates should be given *negative* weights in the formula, in spite of their negative influence on admissions. We expect that these anomalies may be due to the fact that economically-distressed people are alienated from, rather than attracted to, even such extreme social services as mental hospitals - they may show up in the courts or in other hospitals as the victims of crime.

The final step in the development of a need formula was an equation that predicted admission rate based on the marginal influence of the acceptable variables. The constant term was adjusted so that the mean predicted rate was equal to the mean actual rate, giving us a social indicator weighting scheme relatively free of the influence of service availability:

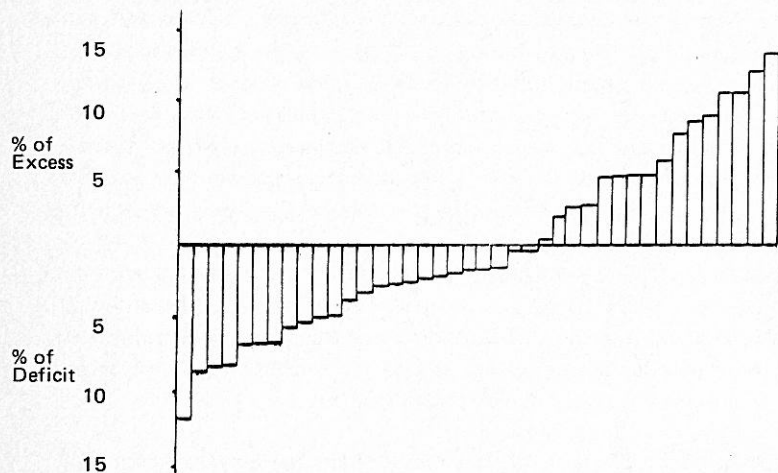
$$\begin{aligned} \text{Predicted Admission Rate} = & 104 + 3.52 (\% \text{ Female-Headed Households}) \\ & - .0191 (\text{Per Capita Income}) \\ & + .00119 (\text{Population Density}) \end{aligned}$$

The predicted admission rates for each catchment area were weighted by the area's population in order to distribute this synthetic need around the state, giving us each area's percentage of the total relative need for services.

5. ALLOCATING NEW RESOURCES

We now had a measure of need, defensible if somewhat crude, that could be compared to the amount of resources each of the 40 catchment areas was receiving, and we could begin to explore means of allocating new funds among the areas in order to close the gap between areas whose relative need exceeded their relative share of resources, and those whose relative need fell short of their relative resources. Looking at the difference between the percentage of resources going to an area and its percentage of need, we found that there were 24 areas with a resource 'deficit' and 16 with a resource 'excess.' The distribution of these resource deficits and excesses is shown in Figure 3. The total deficit (equal to the total excess) amounted to about 28 million dollars of the mental health budget, i.e. this amount would have had to be redistributed from the 16 to the 24 areas in order to cancel out the inequi-

Figure 3. Resource deficits and excess among 40 Massachusetts catchment areas, 1977.



ty. While this analysis was underway, however, we learned that only 6 million dollars in new funds would be made available for the fiscal year '78-'79 to address the issue of inequity, so that only a small inroad could be made on the problem. How should the money be spent? Several strategies were considered.

A simplistic strategy would be to apportion the money among areas according to population alone. This would reduce inequity - albeit inefficiently - increasing the poor areas' resources proportionately more than those of the 'rich' areas. This would have a slight 'leveling' effect, but would really do little to reduce relative inequalities. Another strategy might be to give all of the new money to the very poorest areas and ignore the rest (it was not regarded as politically acceptable to *withdraw* funds from the well-off areas; to receive no new monies was the worst any area administrators should expect). This would also lessen inequalities. The strategy selected was something of a compromise between these two in which each of the 40 areas would receive at least \$ 25,000, while the remaining 5 million dollars would be distributed among the deficit areas in proportion to their fraction of the total deficit.

But, it was one thing to design and speculate about various strategies and quite another to implement them. First of all, the allocation schemes, while they hopefully made every area a winner, made some bigger winners than others, and there were bound to be claims (as there were) that the scheme selected was discriminatory, short-sighted, dictatorial, and even too apoli-

tical. Even more important, any truly effective scheme would have to take into account the hierarchical structure of the Department, and particularly the important regional decision-makers. The Central Office had fulfilled its analytical role and had made several key policy decisions that could probably not have been efficiently made at any lower level, while it would be up to the area administrations to develop programmatic activities that would address some of the socioeconomic problems highlighted by the analysis. The seven Regional Administrators - with more sensitivity to local needs than the Central Office but with a better grasp of intra-regional problems than the forty areas - were given that fraction of the 6 million dollars represented by their constituent areas' formula allocations and allowed to distribute it intra-regionally as they saw best, either according to the formula or according to other criteria that they would have to justify.

6. CONCLUSION

The work described here is just a beginning in ongoing planning efforts to integrate a rational, quantitative, analytical process into allocational decision-making within the Massachusetts Department of Mental Health. Any large and traditional bureaucracy tends to resist efforts to change the way decisions are made and carried out. Individuals' habits are difficult to abandon, while any structural change is bound to be resisted by those who fear that their prerogatives are being challenged - and our efforts certainly do invest technicians with more power. But the changes are underway.

At the technical level the process is clearly becoming iterative. The success of our early efforts illustrates how critical good and timely data are for analysis: to reflect things as they are and for models to represent the system as it is. We are, therefore, integrating into the budget and planning process as part of a larger information system a yearly area data-collecting effort. Local and Central Office mental health planners will soon be provided with current data on program funds, clients, and projections. The sophistication of future allocation models will clearly benefit from this effort.

At the administrative level, the efforts of the Office of Information Systems, Evaluation and Planning have fostered a growing constituency among decision-makers and their staffs within the Department of Mental Health for analysis and quantitative data. While the data-collection effort clearly puts a burden on the system as a whole (and we must not underestimate the tediousness of record-keeping for staff), the jobs of professionals throughout the system are made easier by current information graphically displayed and imagi-

natively modeled. One measure of our success in this regard is the frequency with which planners within and outside the Department request our technical assistance in data collection and compilation, and in the development of allocational models.

In sum, our analysis has begun to enhance the equitableness of the resource distribution process among mental health regions and areas in Massachusetts, and to foster the acceptance of the idea among administrators and direct-care staff. While we are often challenged on the germaneness and accuracy of our data and the validity of our models, no one has yet argued that we should stop trying to redirect the flow of resources from those whose relative needs are small and whose resources are great to those needing much and getting little. This in itself is no mean accomplishment and gives meaning to our work.

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