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Epidemiology and Health Service Resource Allocation Policy for Alcohol, Drug Abuse, and Mental Disorders

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Synopsis

Data from the NIMH Epidemiologic Catchment Area (ECA) Study in Baltimore, Md., are used to illustrate the association between alcohol, drug abuse, and mental disorder diagnoses with health service use. A probability sample of 3,481 adult (age 18 and over) residents of a geographically defined Baltimore City population of 175,000 was found to have a 23.4 per 100 population, 6-month prevalence of 13 specific alcohol, drug, and mental disorders. Of this population, 7.1 percent sought outpatient mental health treatment from both general medical physicians and mental health specialists in a 6-month period. The presence of a mental disorder diagnosis increased the average number of visits to all health providers from 1.91 to 4.06 during the same 6-month period.

Although the presence of a mental disorder diagnosis clearly increased the probability of using both general medical and mental health services, only 15.6 percent of the persons with a mental disorder sought any mental health treatment during this 6-month timeframe—leaving 84 percent of those with mental disorders not seeking any outpatient treatment during the same period. The addition of a measure of high symptomatology (a score of 4 or more on the General Health Questionnaire) increased the percentage of persons with mental disorder using services to 30.5 percent. When a measure of disability was added to the diagnosis and the high symptom level score, 54.7 percent of the population could be predicted to use some mental health service.

These data demonstrate the necessity of having additional patient assessment measures with a diagnosis to predict probable service use. However, even in the most comprehensive multidimensional model, more research is required to explore the phenomena of presumed unmet need—the 45 percent of those with a diagnosis, disability, and high symptoms who do not use services.

Hence, epidemiologists who wish to participate in setting policy for resource allocation must join with their colleagues in economics, sociology, and health services research to identify all factors in addition to disease states that either predispose population groups to use services or represent additional resource allocation needs.

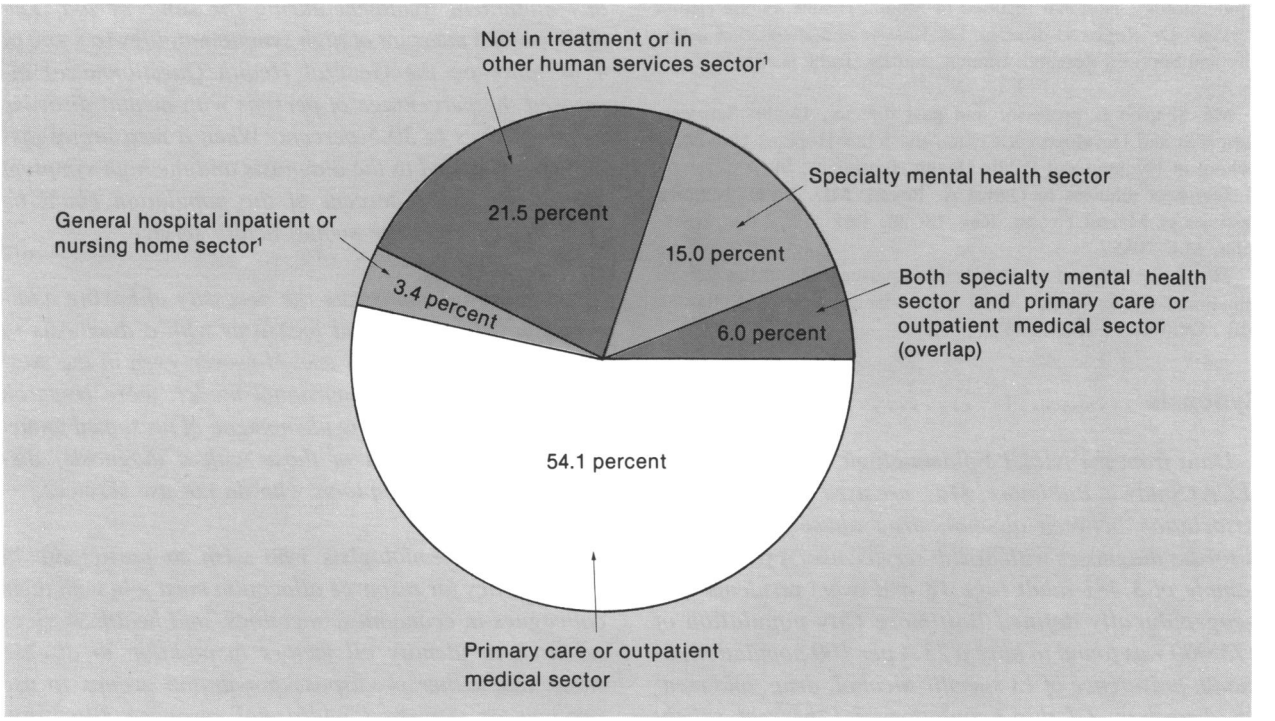
An historical review of health planning literature readily reveals frequent references to the importance of epidemiologic data for planning health services (*1*). Such an approach is most frequently associated with medical service settings where centralized planning of health service allocation is possible—these include prepaid, group practice health maintenance organizations or entire countries with national health services.

Classic Public Health Model

The classic public health approach to service planning begins with some measure of the true prevalence of disorders in the general population followed by an assessment of the prevalence of similar conditions under treatment in health service settings. If one assumes that an appropriate quality and quantity of services is rendered once a patient enters the health system, then a simple subtraction of treated prevalence from true prevalence is necessary to identify the untreated prevalence. Untreated prevalence may be assumed to indicate the need for both public health outreach efforts to bring this population into treatment or need to allocate additional resources to treatment, or both.

This approach in the mental health area was adopted by the recent President's Commission on Mental Health (*2*). Available epidemiologic data were assessed to estimate the total 1-year annual period prevalence of mental disorders in the U.S. population, followed by a concerted effort to identify the treated prevalence of mental disorders in a full array of general medical and specialty mental health settings. Given the lack of detailed data available, no attempt was made to assess the appropriateness, quantity, or quality of care that was provided in these various settings. What was found is illustrated in figure 1. It shows the distribution of the 15 percent of the U.S. population estimated as having mental disorders among the service delivery settings where they receive care (*3*). We were able to determine that approximately one-fifth of this population was seen in the specialty mental health sector (amounting to 3.1 percent of the total U.S. population); over one-half were seen exclusively in the primary health care sector with no assessment of degree to which they were diagnosed or treated; and 3 per 100 were identified in nursing homes or general hospitals. By subtracting all of those seen in specialty mental health or general medical settings, we were able to estimate that about one-fifth were either untreated or seen by staff of other human service agencies, such as

Figure 1. Estimated percent distribution of persons with mental disorder, by treatment setting, United States, 1975



NOTE: Data relating to sectors other than the specialty mental health sector reflect the number of patients with mental disorder seen in those sectors without regard to the amount or adequacy of treatment provided.

[1]Excludes overlap of an unknown percent of persons also seen in other sectors.

SOURCE: Adapted from Reference 3.

family service agencies, outside the health care system.

One of the major difficulties with these data was our inability to determine which disorders were found in the various service sectors. For example, we could not identify if the common cold equivalent of mental disorders, such as transient anxiety states, were being treated predominantly in the general medical sector, or if major disabling conditions such as schizophrenia were being treated primarily in the specialty mental health sector. Hence, it was not possible to state specifically which type of treatment resource should be increased. The limitations on the data base available for the President's Commission on Mental Health stimulated us to the consideration of a major research program to address these deficiencies. Preliminary findings from this multisite collaborative study, entitled the Epidemiologic Catchment Area (ECA) Program (*4*) of the National Institute of Mental Health (NIMH), will be presented later in this paper as an illustration of both the advantages and the limitations of an improved epidemiologic data base for health policy determinations.

Needs Assessment Model

A public health approach does not equate prevalence of all medical conditions with need for service unless some measure of severity is added (*5*). Others have noted that a useful distinction exists between absolute need (acute life-threatening illness) and relative need (less severe and chronic illness) (*6*). Purists may add an additional caveat that need does not exist unless an effective treatment service is available. However, definitions of effectiveness may range from curative to palliative to supportive treatment, depending on accepted therapeutic standards. The difference between treated prevalence and need is interpreted as unmet need requiring new resources.

In the absence of community needs assessments, indirect measures such as socioeconomic conditions have served as proxy measures of need for service in a population (*7,8*). Community studies have demonstrated correlations between sociodemographic variables and prevalence of mental disorders, and a few researchers have studied the correlation of these variables with specific mental disorders. Translation of the estimated prevalence into resource needs has been relatively unexplored.

In the past, high prevalence rates of alcohol, drug, and mental disorders have been used to galvanize political support for more treatment resources, including alcohol detoxification centers, drug treatment centers, and community mental health centers. The magnitude of the treatment need for mental disorders appeared so great that a major service component of the community centers was consultation and education to support other social networks offering treatment and an often vague program of prevention.

In the current economic climate the major focus has become one of making the best use of existing resources rather than documenting the level of unmet need. Resources that were created on the basis of earlier need assessments have been heavily used, but often by different types of patients or clients from those originally intended (*9*). Hence, new levels of "need" were identified, although priorities for allocation of resources for different types of disorders within treatment settings remain largely unexamined.

Market Models

Given the seemingly inexhaustible reservoir of "relative need" for health services, variability of individual patients' interpretations of their need for care, and the difficulties of predicting who will want services, some planners may operationally equate "demand for service" with "need for care" (*10*). Even if one does not equate "need" with "demand" in an absolute sense, it is possible to insist that sufficient health care resources exist to meet the most urgent needs and that the major planning objective would be to develop ways of reprioritizing the allocation of scarce resources within the system.

In societies where a free market system exists and market dynamics predominate as a means of distributing health resources, there has been concern that the financing system encourages continued growth of demand for all types of services with a consequent increasing allocation of resources to the health area. As a result, a prospective reimbursement system, designed to encourage efficiency and cost containment, has recently been established for U.S. hospitals. This new system is based on the concept of Diagnosis Related Groups (DRGs, refer-

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Research Teams of the NIMH Epidemiologic Catchment Area Program

The Epidemiologic Catchment Area Program is a series of five epidemiologic research studies performed by independent research teams in collaboration with staff of the Division of Biometry of the National Institute of Mental Health (NIMH). The NIMH Principal Collaborators are Darrel A. Regier, Ben Z. Locke, and Jack D. Burke, Jr.; the NIMH Project Officer is Carl A. Taube. The Principal Investigators and Co-Investigators from the five sites are Yale University, U01 MH-34224—Jerome K. Myers, Myrna M. Weissman, and Gary Tischler; Johns Hopkins University, U01 MH-33870—Morton Kramer, Ernest Gruenberg, and Sam Shapiro; Washington University, St. Louis, U01 MH-33883—Lee N. Robins and John Helzer; Duke University, U01 MH-35386—Dan Blazer and Linda George; University of California, Los Angeles, U01 MH-35865—Marvin Karno, Richard L. Hough, Javier Escobar, Audrey Burnam, and Diane Timbers.

'In the current economic climate the major focus has become one of making the best use of existing resources rather than documenting the level of unmet need. Resources that were created on the basis of earlier need assessments have been heavily used, but often by different types of patients or clients from those originally intended.'

ence *11*). Implemented by the Department of Health and Human Services (DHHS), Medicare reimbursement will be based on the expected type and amount of services required for treating patients with particular diagnoses—more specifically, 467 groups of diagnoses—in general hospital settings (*11*). No attempt has been made to deal with ambulatory care settings, where signs and symptoms or other ill-defined conditions or syndromes may be more common reasons for a visit than diagnosable illnesses or disorders. Nor have specialized alcohol, drug, mental health, or chronic care facilities been included in the DRG system for excellent empirical reasons.

Diagnosis in mental health settings is not a good predictor of resource use or length of stay. Taube and coworkers used the DRG mental disorder categories of DHHS in a recent study and found that they explained less than 5 percent of the variation in length of stay in psychiatric settings. This observation is in stark contrast to the health condition DRGs, which explain 30–50 percent of the variation in length of stay (*12*).

Despite the difficulties of this approach, it may provoke a new evaluation of how to use epidemiologic data in setting priorities for resource allocations within health care systems. Rather than start with the community prevalence rate approach of classic public health models, this model starts with treated prevalence and service use rates in existing treatment delivery systems. The classic approach—starting with community prevalence and progressing forward through estimates of need, determinations of facilitators and barriers to care, and service utilization measures, to outcome assessments—essentially is reversed.

In this model, the starting point is to identify that portion of need that consists of disorders currently being treated with the current level of resources. The research objective is to develop more homogenous diagnostic or "need" categories and assess the type and amount of resources appropriate for each group. Such an approach would allow better prediction of the course of an illness and, hence, better prediction of treatment resources needed and the associated costs. The resource allocation objective is to encourage health service providers to be more efficient in choosing the type and amount of service for patients who "demand" treatment. It should be noted that the DRG approach is now being applied only after the patient is hospitalized. It leaves aside the entire set of issues related to hospital admissions. The analogy in ambulatory care is to leave unaddressed questions of nonuse or unnecessary use. If you wish to address issues, it is necessary to consider pathways to care involving a range of cultural attitudes, patients' psychological readiness to seek care, supply of physicians, judgment on appropriate care, and financing measures which affect service use.

In order to determine if the DRG concept is viable for ambulatory care as well as hospital use, it will be necessary to have reliable diagnostic data linked to service use data. Relative contributions of diagnostic data to predicting service use must be determined to assess the variance attributable to diagnosis and to other factors such as severity, disability, and multiple disorders (complexity), and to sociodemographic factors such as age and family support networks. Only a few such variables are routinely available for assessments of either ambulatory or hospital practice, and it will remain for combined epidemiologic and health services research studies to document the types of new data necessary if we are to improve our resource allocation process under this framework.

Nothing in the DRG market model directly affects consumer demand, nor does it preclude doing comparative studies of community populations to determine untreated prevalence rates and pathways to care. In fact, such additional studies are necessary to assess the prevalence of conditions injurious to individual or public health that require incentives for community residents to come in for needed treatment. However, the focus on treated prevalence in service settings provides an opportunity for epidemiologists to link diagnostic and other measures of severe need more directly with current resource allocation policy decisions.

The Epidemiologic Catchment Area Program

The NIMH Epidemiologic Catchment Area (ECA) Program (*13*) is one major research project that may provide important baseline information on the relationship among diagnosis, other factors, and the use of health services. This multisite epidemiologic and health services research program will assess prevalence, incidence, and service use rates for abuse of alcohol, abuse of drugs, and some mental disorders in about 20,000 community and institutional residents. The research teams and sites are listed in the box. The survey uses a new diagnostic instrument based on a recently developed

classification system for mental disorders—a third edition of the American Psychiatric Association's "Diagnostic and Statistical Manual" (DSM-III) (*14*). The case-identification instrument used is the NIMH Diagnostic Interview Schedule (DIS), which is a highly structured interview protocol that can be administered by trained lay interviewers and scored by computer (*15,16*).

Research design features of the program, including sample size and longitudinal followup, may be summarized as follows: researchers at each of five sites are interviewing a probability sample of approximately 3,000 community residents and 500 institutional residents in communities of 200,000 or more.

The longitudinal design feature includes at least two face-to-face interviews (1 year apart) and one intervening telephone interview that will assess service use as well as change in symptom or diagnostic status. More detailed discussions of the research design and methodology are available elsewhere (*4,17–19*).

Data will be presented on the Wave I 6-month community prevalence rates of 13 disorder categories from the Baltimore, Md., site (*20*). These will be followed by an examination of the relationship between the presence of the current disorder and service use over the previous 6 months. Modifications of service use based on symptom levels and disability days in one site will be looked at for all 13 disorders and for four specific diagnostic groups—cognitive impairment, major depression, alcohol abuse or dependence disorders, and drug abuse or dependence disorders.

Results

Table 1 presents the 6-month current prevalence rates for 13 DSM-III related conditions, as determined by the NIMH Diagnostic Interview Schedule. These are the first data available in this country on the prevalence of specific DSM-III defined mental disorders in large-scale community epidemiologic studies. In this paper, we focus on the overall unduplicated prevalence rates for the Baltimore site and highlight the first four diagnostic categories of major depression, alcohol abuse or dependence, drug abuse or dependence, and severe cognitive impairment, as determined on the Mini-Mental Status Exam of Folstein and co-workers (*21*).

To orient the subsequent discussions of these data, it should be noted that the total prevalence rate in Baltimore is approximately 23 percent of the probability sample of almost 3,500 residents in the community. Of these, approximately 2 percent had a diagnosis of major depression, 6 percent a diagnosis of alcohol abuse or dependence, and 2 percent a diagnosis of drug abuse or dependence. Severe cognitive impairment occurred in more than 1 percent.

Given the 6-month prevalence rate among community residents in the Baltimore area, it is possible from this study to identify the range of services that were available for some form of mental health treatment. Figure 2 identifies the specialty mental health resources, general medical resources, and other human resources within the community about which respondents were specifically queried as to their attendance for a general health or mental health visit in the prior 6 months. In this paper, only specialty mental health and general medical re-

Table 1. Six-month prevalence of DIS/DSM-III mental disorders for Baltimore, NIMH Epidemiologic Catchment Area Program, 1981–82

DIS/DSM-III disorders	*Percent of population with disorder*	*Standard error of percent*
Any DIS disorder covered	23.4	*1.0*
Selected disorders:		
Major depression	2.2	*0.3*
Alcohol abuse or dependence	5.7	*0.6*
Drug abuse or dependence	2.2	*0.3*
Severe cognitive impairment	1.3	*0.2*
Other disorders:		
Schizophrenia	1.0	*0.2*
Schizophreniform	0.2	*0.1*
Manic episode	0.4	*0.1*
Dysthymia	2.1	*0.2*
Phobia disorders	13.4	*0.8*
Panic disorder	1.0	*0.2*
Obsessive or compulsive	2.0	*0.3*
Somatization	0.1	*0.1*
Antisocial personality	0.7	*0.2*

NOTE: DIS/DSM-III Diagnostic Interview Schedule/Diagnostic and Statistical Manual, Edition 3.

Figure 2. Definitions for mental health resources classification used in interviews

Specialty mental health resources:

Psychiatrists, psychologists, psychiatric social workers, and mental health counselors in private practice or in health plans for family clinics

Mental health centers

Psychiatric outpatient clinics at general or Veterans Administration hospitals

Outpatient clinics at psychiatric hospitals

Drug treatment clinics

Alcohol treatment clinics

General medical resources:

Medical care practitioners to whom visits were made for emotional or mental health problems

Other human service resources:

Clergy

Family service agencies

Crisis centers

Spiritualists, herbalists, natural therapists

Table 2. Percent of population with any outpatient visit for mental health treatment in past 6 months, by type of provider seen and 6-month DIS disorder status, Baltimore ECA site, 1981–82

Provider type	Percent of population			
		Persons with any DIS disorder[1]		
	Total population	Recent (6 month)	Past (lifetime) only	None
All health and mental health	7.1	15.6	7.6	3.8
Standard error	*0.5*	*1.6*	*1.4*	*0.5*
General medical only	3.7	7.5	3.5	2.4
Standard error	*0.4*	*1.0*	*1.0*	*0.4*
Mental health specialist	3.4	8.1	4.1	1.5
Standard error	*0.4*	*1.2*	*1.0*	*0.3*

[1] DIS disorder includes any of 13 noted in table 1 in last 6 months.

NOTE: DIS Diagnostic Interview Schedule; ECA Epidemiologic Catchment Area.

Table 3. Average number of all outpatient visits in past 6 months, percent for mental health reasons and to mental health specialists, by 6-month DIS disorder status, Baltimore ECA site, 1981–82

DIS/DSM-III diagnostic status[1]	Average visits per person, all providers any health condition	Percent of average visits—	
		For mental health reasons	To mental health specialists
Total population	2.61	20.3	16.0
Standard error	*0.13*	*3.1*	*3.2*
Without DIS disorder	1.91	10.0	6.7
Standard error	*0.09*	*1.9*	*1.8*
With recent DIS disorder	4.09	30.0	23.8
Standard error	*0.36*	*3.9*	*4.1*
Selected recent DIS diagnoses:			
Major depression	6.88	42.2	31.5
Standard error	*1.42*	*4.8*	*5.3*
Alcohol abuse or dependence	5.02	41.1	38.1
Standard error	*1.11*	*9.2*	*9.7*
Drug abuse or dependence	3.78	32.2	30.7
Standard error	*1.04*	*6.3*	*6.5*
Severe cognitive impairment	3.15	36.8	35.6
Standard error	*0.96*	*18.4*	*18.7*

[1] DIS disorder includes any of 13 noted in table 1 in last 6 months.

NOTE: DIS/DSM-III Diagnostic Interview Schedule/Diagnostic and Statistical Manual, Edition 3; ECA Epidemiologic Catchment Area.

sources will be defined as settings for a mental health visit.

Table 2 presents a picture of the use of mental health services by the Baltimore population for the same period covered by the prevalence determinations. Hence, despite the fact that about 23 percent received 1 of the 13 diagnoses of mental disorder listed in table 1, only 7.1 percent had an outpatient visit for mental health treatment purposes. Of these, slightly more than half, or 3.7 percent of the population, saw general medical providers only, and 3.4 percent visited mental health specialists. The presence of a DIS disorder more than doubled the likelihood of seeking treatment (15.6 percent) and increased the probability of seeking help from a mental health specialist. In contrast, the absence of a DIS disorder did not preclude a visit for mental health service but reduced the likelihood by almost half (to 3.8 percent) and also increased the probability that a general medical provider would be contacted for such treatment.

In addition to a preliminary look at the proportion of the population with or without a mental disorder diagnosis who use any mental health service, the next step is to look at the relative frequency or intensity of service use as predicted by the diagnosis. Table 3 shows that the average number of patient visits to all health providers for all reasons was 2.6 visits per person in the 6-month time period. Of these 2.6 visits, approximately 20 percent were for mental health treatment purposes, with 79 percent of these accounted for by mental health specialists (that is, $16.0 \div 20.3 = 79$ percent).

The presence of a recent DIS diagnosis more than doubled the average number of visits to all health providers from about two to four visits during the 6-month interval. The relative proportion of visits for mental health reasons increased threefold as did the relative percentage of such visits to mental health specialists.

With the availability of data on specific mental disorders, it is possible to see the relative service demands for various diagnoses. Visits to all health care providers during the 6-month period averaged seven for persons with major depression, five for those with alcohol abuse or dependence, four for those with drug abuse or dependence, and three for those with severe cognitive impairment. Table 3 is particularly helpful in illustrating that individuals with alcohol, drug abuse, or mental disorders

are much more active consumers of general medical services as well as relatively high consumers of specialty mental health services. This relationship has frequently been noted in the past, and it is an important finding for determinations of health service resource allocations to other medical conditions with an associated mental disorder. In fact, there is a growing literature which demonstrates that the use of specialty alcohol, drug abuse, or mental health services tends to decrease the use of general medical services and, thereby, offsets to some extent the additional costs of the specialty services by reducing costs of general medical services (*22*).

Previous tables have shown that a substantial portion of persons with mental disorders did not seek mental health treatment during the 6-month interval and that a much smaller but significant percentage of individuals with no mental disorder did seek some mental health services from both generalists and specialists. If one were to predict service utilization more accurately, additional factors such as level of symptomatology rather than strict diagnoses may be a helpful dimension. In order to test this hypothesis, an additional questionnaire for screening psychiatric symptoms (*23*), the General Health Questionnaire (GHQ), was given to all respondents at the Baltimore site.

At Johns Hopkins University, Baltimore, the ECA investigators chose the 20 items from the original 60-item version of the GHQ which best discriminated cases from noncases. These 20 items are not one of the standard GHQ scales used in practice; however, a score of 4 or greater still retains properties similar to the short forms of the GHQ.

A GHQ score of 4 or more generally indicates a high likelihood of a mental disorder. Table 4 demonstrates the contribution of the symptom level and the presence of a recent or past DIS disorder in the percent of population who use any outpatient mental health service visit. The percent of population using such treatment ranges from 2.7 percent with no DIS disorder and no GHQ symptoms to 14.2 percent for those with a GHQ of 9 or more and no DIS disorder, and up to 41 percent for those with both a recent disorder and a high level of symptomatology. This contrasts with the table 2 rate of 15.6 percent of persons with any DIS disorder using such services in the 6-month interval.

Hence, addition of a GHQ cutoff score of 4–8 would raise the proportion to 23 percent, and a cutoff of 9 or more would more than double the 16 percent DIS predictive rate to a 41 percent probability of using some mental health service.

Table 5 shows the effect of the increased symptomatology on the specific mental disorders of depression, alcohol abuse or dependence, drug abuse or dependence, and severe cognitive impairment. The probability of using a mental health service, for example, more than doubles for major depression, increases almost fourfold for alcohol abuse or dependence, and almost fivefold for severe cognitive impairment.

An additional factor that one might wish to have is information on the disability status of persons with mental disorders. The Baltimore site researchers were also able to collect information on the number of disability days accounted for in the previous 3 months. Disability days are defined as restriction of activities that lasts a full

Table 4. Percent of population with any outpatient visit for mental health treatment in past 6 months, by GHQ symptom level and DIS disorder status, Baltimore ECA site, 1981–82

Symptom level	Total	DIS disorder status[1]		
		Recent (6 months)	Past (lifetime) only	None
Total	7.1	15.6	7.6	3.8
Standard error	*0.5*	*1.6*	*1.4*	*0.5*
GHQ = 0	3.7	8.0	3.8	2.7
Standard error	*0.5*	*1.7*	*1.3*	*0.6*
GHQ = 1–3	5.9	9.5	6.4	4.3
Standard error	*0.8*	*1.9*	*2.2*	*0.9*
GHQ = 4–8	16.2	22.9	18.4	8.3
Standard error	*2.2*	*4.0*	*6.6*	*2.4*
GHQ = 9 or more	33.5	40.9	34.7	14.2
Standard error	*4.1*	*5.5*	*10.9*	*5.4*

[1] DIS disorder includes any of 13 noted in table 1 in last 6 months.
NOTE: DIS Diagnostic Interview Schedule; GHQ General Health Questionnaire, reference *23*; ECA Epidemiologic Catchment Area.

Table 5. Percent of persons with any visit for mental health treatment in past 6 months, by GHQ symptom level and selected 6-month DIS disorders, Baltimore ECA site, 1981–82

Six-month DIS disorder[1]	Symptom level	
	GHQ 0–3	GHQ 4 or more
No DIS disorder	3.3	9.6
Standard error	*0.5*	*2.2*
Recent DIS disorder	8.7	30.5
Standard error	*1.3*	*3.3*
Selected recent DIS diagnoses:		
Major depression	18.8	43.2
Standard error	*8.7*	*7.0*
Alcohol abuse or dependence	11.6	40.2
Standard error	*3.2*	*7.1*
Drug abuse or dependence	10.9	21.7
Standard error	*4.7*	*8.9*
Severe cognitive impairment	3.0	14.7
Standard error	*3.0*	*12.9*

[1] DIS disorder includes any of 13 noted in table 1 in last 6 months.
NOTE: GHQ General Health Questionnaire; DIS Diagnostic Interview Schedule; ECA Epidemiologic Catchment Area.

day or more during the 3 months prior to interview. The respondent reports whether these limitations are due to injury, physical illness, or emotional problems including trouble with nerves.

The synergistic effect of having any disability days, as well as specific disability days for an emotional condition, is reflected in table 6. Presence of disability days for an emotional condition resulted in a marked increase in the probability of seeking some mental health treatment. The presence of such disability days was associated with a rate of 32 percent of those without a DIS disorder who used such treatment and 49 percent of those with a recent DIS disorder using mental health care. There was some variability in the likelihood of seeking services associated with specific disorders; 61 percent of persons with major depression used such care. About 45 percent of those with alcohol abuse or dependence and cognitive impairment and 28 percent of those with drug abuse or dependence had some mental health visit if they had a disability day related to emotional conditions.

In order to summarize the relation of these three key indicators to the probability of having a visit, several multivariate models were estimated. Both any use of services for mental health reasons and use of mental health specialty resources only were employed as dependent variables in a binary variable multiple regression. Then, using Feldstein's method (*24*), probabilities of use of service were estimated for persons with high GHQ

Table 6. Percent of persons with mental health treatment visits in past 6 months, by disability days in past 3 months, according to DIS 6-month disorder[1] status, Baltimore ECA site, 1981–82

DIS/DSM-III diagnostic status	Population with—		Disability days because of—	
	No disability	Any disability physical or emotional condition	Physical conditions only	Emotional conditions
Recent DIS disorder	12.3	18.8	8.6	48.9
Standard error	*2.2*	*2.0*	*1.8*	*5.6*
No DIS disorder	2.5	7.2	5.1	31.6
Standard error	*0.5*	*1.1*	*1.0*	*5.8*
Selected recent DIS diagnoses:				
Major depression	27.8	42.4	23.7	61.5
Standard error	*13.0*	*6.3*	*9.6*	*7.6*
Alcohol abuse or dependence	15.8	23.1	13.9	44.7
Standard error	*4.9*	*4.2*	*4.7*	*8.6*
Drug abuse or dependence	15.9	11.5	7.2	28.4
Standard error	*6.1*	*6.0*	*6.5*	*16.4*
Cognitive impairment	6.9	10.4	0.0	44.8
Standard error	*6.8*	*7.7*	*0.0*	*26.2*

[1] DIS disorder includes any of 13 noted in table 1 in last 6 months.

NOTE: DIS Diagnostic Interview Schedule; ECA Epidemiologic Catchment Area.

Table 7. Adjusted[1] probability of use of any ambulatory mental health and specialty mental health services for mental health treatment, by combinations of DIS 6-month diagnosis, symptoms, and disability[2], Baltimore ECA site, 1981–82

Presence of indicator (DIS/DSM III diagnosis, high symptom, disability days)	Percent of population	Adjusted probability	
		Any mental health visit	Specialty sector
Total population	100.0	.071	.034
No positive indicator	65.6	.032	.013
Diagnosis only	14.2	.059	.029
High GHQ only	8.9	.091	.051
Disability days only	1.2	.300	.097
Diagnosis and GHQ	6.2	.199	.107
Diagnosis and disability	1.2	.377	.281
GHQ and disability	0.8	.390	.214
Diagnosis, GHQ, and disability	1.9	.547	.187

[1] Adjusted for age, sex, race, education, marital status, and usual source of care.

[2] Indicators are as follows:
Diagnosis—presence of any of 6-month DIS diagnoses listed in table 1;
Symptoms—anyone with GHQ score ≥4;
Disability—anyone with 1 or more disability days for emotional condition.

NOTE: ECA Epidemiologic Catchment Area; DIS/DSM-III Diagnostic Interview Schedule/Diagnostic and Statistical Manual, Edition 3; GHQ General Health Questionnaire.

symptom scores, any recent DIS/DSM-III mental disorder diagnosis, and emotional disability days. The probabilities were adjusted for the demographic variables of age, sex, race, and marital status, and for the usual source of care. Such adjustments are made to assure that the service use dependent variable—associated with symptom level, diagnosis, or disability independent variables—was not confounded by a concentration of high service use or higher independent variable rates, or both, in one or more demographic groups. These adjusted probabilities are shown in table 7.

As in the previous tables, both increased symptomatology (as measured by the GHQ) and presence of any 1 of the 13 recent DIS diagnoses examined in this paper increase the probability of use considerably. In the case of any use of mental health services, the effect of each indicator *alone*, controlling for *all* other variables in the model, is a twofold to tenfold increase in the probability of use. As shown in table 7, the probability of use for the two-thirds of the population with no diagnosis, no high symptom score, or disability is .032, but it rises to .059 for a DIS/DSM-III diagnosis alone, to .091 for a GHQ score greater than 4 alone, and to .300 for a disability day for emotional conditions only. For use of specialty sector services only, a high GHQ score alone is associated with a fourfold increase in the likelihood of use, but persons with a recent DIS disorder have twice the probability of specialty use of the population reporting no mental health problems. For both dependent variables, reporting disability days for emotional reasons is associated with an even more dramatic sevenfold increase in the probability of use.

Persons with combinations of indicators have much higher predicted probabilities of use; for example, persons reporting all three indicators (1.9 percent of the population) have a 17-fold higher predicted probability of any use of mental health services than those with none of the three indicators. The result of this combination of three independent variables is that 55 percent of the population so defined use some mental health services in a 6-month period, and almost 19 percent visit a mental health specialist. The importance of the disability variable as a predictor of service use comes through in the multivariate models just as it did in the previous bivariate analyses. These results underscore the importance of including nondiagnostic factors in assessing the need for and use of services in community populations.

Conclusions

This presentation has focused on the contribution of epidemiologic data concerning alcohol abuse, drug abuse, and mental disorders for predicting the demand for treatment services in outpatient settings. The most striking finding is that 74 percent of persons with a recent DIS diagnosis did not seek treatment during a 6-month interval. Likewise, almost 4 percent of persons with no recent or past history of mental disorder did seek some type of outpatient treatment for mental health purposes. A combination of additional correlates such as the level of symptomatology as identified on the GHQ and a measure of disability status greatly increased the ability to identify who would use some type of mental health service. It is anticipated that similar nondiagnostic but related correlates will need to be added to DRGs in the future if they are to be useful planning devices for making decisions about allocating either outpatient or inpatient services.

Additional information was collected on the division of responsibility between generalists and specialists in the provision of mental health services. Generalists provided the only mental health service to approximately 52 percent of those seeking such services. However, the relatively high intensity of services provided by mental health specialists resulted in their accounting for 79 percent of the total volume of mental health visits.

These descriptive data provide the broad outlines of the types of information necessary to make rational prospective determinations on the appropriateness of outpatient services use. However, before one is able to prescribe the most appropriate and efficient allocation of resources of both generalists and specialists, a much improved data base will be required.

The essential differences between the goals of epidemiologists and the goals of health resources allocation may be summarized by looking at the differences in independent and dependent variables. In epidemiology the goal is to look at factors that affect the distribution and determinants of disease in populations. In contrast, research in resource allocation is concerned with the distribution and determinants of health services use. As a result of these distinctions, epidemiologists who wish to participate in setting policy for resource allocation must join with their colleagues in economics, sociology, and health services research to identify all factors in addition to disease states that predispose population groups to use services.

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Epidemiology of End Stage Renal Disease and Implications for Public Policy

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Synopsis

In 1972 the Congress extended Medicare coverage to all persons under age 65 suffering from end stage renal disease (ESRD). The intent of this law (PL 92–603, the Social Security Amendments of 1972) was to allow all Americans access to an emerging and very expensive technology, regardless of their ability to pay.

The legislation had an immediate and dramatic impact on the population receiving dialysis. Prior to the passage of the legislation the dialysis population was white, educated, young, married, employed, and male. Within 4 years after implementation of the law, the dialysis population was more than one-third nonwhite, less well educated, significantly older, and about half female—making it more representative of the population as a whole.

During consideration of this legislation the dialysis population was expected to increase from 5,000 to 7,000 patients and cost $135 million in the first year. Actually, in the first year of the program, there were 10,300 patients and the cost was $241 million. Today, while patients with ESRD represent only 0.25 percent of Medicare beneficiaries, they consume approximately 10 percent of the Medicare Part B budget.