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Benefits of Using Prevalence Estimates in Penetration Rates

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This paper argues for an alternative way of generating a MHSIP performance indicator in the domain of Access to care, i.e., penetration rates. The MHSIP model uses the number of individuals served in the numerator and the population in the denominator. The alternative model uses an estimate of the prevalence of serious disorder in the denominator instead of the population. The alternative model generates a rate easier to understand more accurate in representing the population of in need of public mental health services.

The paper will use actual data from a State to demonstrate how the two models lead to different conclusions. The State Division responsible for mental health and substance abuse services (the Division) assessed the population in need of mental health services and the number of individuals served through the public mental health sector.ⁱ

Population in Need. The population of interest for mental health was individuals qualifying for public support of services. Since the sliding fee schedule for any financial support for public services started for families below 300% of the federal poverty guidelines, the population of interest was restricted to individuals in these families.

Need in the population of interest was defined as youths with serious emotional disturbance (SED) and adults with serious mental illness (SMI). The strategy employed developed a conservative estimate of the population in need.

Results from national epidemiological surveys and research studies were used to generate synthetic prevalence estimates in the population in accordance with federal definitions.ⁱⁱ A model to predict prevalence of SED/SMI was constructed based on epidemiological studies. Estimates were developed for counties and demographic groups using 2000 Census population data to the extent available. The population of the state was 1,711,263 and the population under 300% of poverty was 904,403. The prevalence of serious disability in the population of under 300% poverty was 64,675.

Service Utilization. Individuals served in the mental health sector included persons with services funded through the Division or Medicaid in calendar year 2000. Medicaid claims were selected by diagnoses. Service data were provided to the WICHE Mental Health Program to unduplicate across data sets.ⁱⁱⁱ

The total number of individuals who received behavioral health services in the year 2000 was 41,865. 38% received services from the Division (15,944 of the 41,865), and 74% received services from Medicaid (30,923) in the year. 5,035 individuals received services from both the Division and Medicaid.

Penetration Rates. A penetration rate provides an indicator of whether persons with mental illness are receiving services and whether the system is responsive to various consumer

populations. The measure used in MHSIP reflects the proportion of persons in the population receiving services. So, the unduplicated number of individuals served is used in the numerator and the population is used in the denominator and the result is a proportion of the population served.

The refinement here is to change the denominator to use estimates of persons in the population with serious mental illness instead of the general population. Using the population assumes prevalence rates are the same across demographic groups. Research shows however that different populations have different rates of mental illness. Consider some odds ratios developed from the National Comorbidity Survey: the odds ratio for females is over twice that for males; for divorced adults it is almost twice that of married adults; and for young adults ages 18-24 it is almost twice that of adults 45-54 (Kessler et. al, 1998). Since this information and the requisite technology are available, they may be used to make more precise estimates of those in need than using the gross population as a whole for comparison.

Table 1. on the following page shows a comparison of penetration rates using three different denominators in penetration rates. The denominators include the total population, the population of interest (i.e., < 300% poverty), and the prevalence of individuals with serious mental illness in the population of interest.

Findings indicate considerable difference in rank orders of age groups using different methods. Ages 45-55 had the second highest ranked need using prevalence estimates but were the fifth ranked using population figures. These differences would lead to different interpretations and potentially to different actions and for that reason are important to consider.

Two distinct advantages of using a prevalence-based measure over a population-based measure may be seen. First, a more precise estimate has been made taking into account the prevalence of SMI among individuals. Second, the prevalence-based measure is more accurate in reflecting the population of interest. This is reflected in the greater proportion of the prevalence total compared with the population total (64.71% vs. 2.45%). Instead of reflecting all individuals in the population, the model reflects those of most concern, i.e., individuals with SED or SMI.

The example used only one demographic variable to show how improvements may be made with this model. Additional demographic variables may be used including gender, race/ethnicity groups, marital status, education, poverty, and residence. In all, 8,100 distinct cells were computed.

Using a prevalence-based measure results is a more accurate indicator than using a population-based measure. Either is only an indicator of the capacity of the system to admit individuals in the target group (SMI/SED). Neither says nothing about the amount, quality, or appropriateness of services received.

ⁱ The project was supported by a Mental Health Statistics Improvement Program grant to the state.

ⁱⁱ Dr. Charles Holzer, University of Texas Medical Branch worked on the national Epidemiological Catchment Area survey. He has worked on needs assessments with a number of states, some of which may be seen at <http://129.109.4.19/estimation/estimation.htm>.

ⁱⁱⁱ The WICHE Mental Health Program operates out of Boulder, Colorado. The contact person for this project is Chuck McGee (CMcGee@ WICHE.edu). A database was created by Dr. Allan Press to unduplicate across agencies. The Western Interstate Commission for Higher Education was created by national legislation to serve states and has operated continuously 1955.

Table 1. A Comparison of Penetration Rates by Age Groups Using Different Denominators:

Total Population, Population < 300% Poverty, and Prevalence Estimate:
(The Numerator is Service Utilization)

Base Data from a Midwestern State

Age Group	Population		Prevalence		Service Utilization		
	A.		B.			C.	
	State Total	% of Total	< 300% Poverty	% of Total		Persons with SMI < 300% Poverty	% of Total
unknown						130	
18-20	80,162	8%	36,380	8%	3,977	11%	1,745
21-24	94,263	9%	59,148	12%	4,711	13%	3,057
25-34	223,273	22%	127,145	27%	8,631	24%	6,411
35-44	263,834	26%	124,735	26%	10,315	29%	6,162
45-54	225,754	22%	74,224	16%	4,913	14%	3,253
55-64	141,540	14%	57,177	12%	2,892	8%	1,518
Total	1,028,826	100%	478,809	100%	35,439	100%	22,146

Penetration Rates Using 3 Methods

Age Group	Population			Prevalence			Rank Order by Method		
	D. / A.		D. / B.	D. / C.		D. / A.		D. / B.	D. / C.
	State Total	< 300% Poverty	Persons with SMI < 300% Poverty	State Total	< 300% Poverty	Persons with SMI < 300% Poverty	State Total	< 300% Poverty	Persons with SMI < 300% Poverty
18-20	2.20%	4.80%	44%	4	4	6	4	4	6
21-24	3.20%	5.20%	65%	1	1	3	1	1	3
25-34	2.90%	5.00%	74%	2	2	1	2	2	1
35-44	2.30%	4.90%	60%	3	3	4	3	3	4
45-54	1.40%	4.40%	66%	5	5	2	5	5	2
55-64	1.10%	2.70%	52%	6	6	5	6	6	5
Total	2.20%	4.60%	62%						