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Using a Model to Evaluate the Impact of Managed Care on Medicaid-Eligible Moms and Their Children in a Rural Population

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Abstract

This paper lays out the advantages of using a model for developing research questions and methodologies aimed at evaluating how managed care arrangements for rural Medicaid moms and their children might affect their access to health care and their related health status. The PRECEDE (predisposing, reinforcing, and enabling causes in educational diagnosis and evaluation) health-education program planning model is refined and applied to a population of Medicaid-eligible moms and their children to help organize and clarify the research questions and to identify the types of variables we need to consider for this exercise. An explanation of those variables, why they are important, and how they can be obtained is presented.

Using a Model to Evaluate the Impact of Managed Care on Medicaid-Eligible Moms and Their Children in a Rural Population

This paper lays out the advantages of using a model for developing research questions and methodologies aimed at evaluating how managed care arrangements for rural Medicaid moms and their children might affect their access to health care and their related health status.

Previously (Riportella-Muller and Selby 1990; Selby et al. 1989), the author adapted and used the PRECEDE health-education program planning model (Green et al. 1980) to design interventions to improve utilization in the preventive health care program for Medicaid-eligible children and then to plan for their evaluation. Here, we refine the model further to help organize and clarify the research questions and to identify the types of variables we need to consider for studying the impact of managed care on rural Medicaid moms and their children in Wisconsin. While the PRECEDE (predisposing, reinforcing, and enabling causes in educational diagnosis and evaluation) model is usually applied as an intervention and evaluation planning tool, we have not used the model for the intervention, which was planned by the state and is currently being implemented in most of Wisconsin's counties. The model still proves valuable for developing a full evaluation design, however.

We hope that our experience with applying this refined model will help others who are trying to understand and evaluate the implications of this change to managed care for rural Medicaid populations. The model may help to ensure that the appropriate questions are asked when planning the transition to managed care to rural Medicaid moms and their children. It should also serve as a guide to planning theory-based research in general.

BACKGROUND

To help control upwardly spiraling Medicaid costs, Wisconsin and other states continue to turn to competitive market solutions such as managed care organizations, of which health maintenance organizations (HMOs) are a subset. These delivery arrangements, similar to (and in some cases parallel to) those available in the private sector, attempt to eliminate inappropriate and unnecessary services and rely on primary care and care coordination. Many believe that the coordination of care, encouraged in a managed care delivery system and beginning with access to the system through a primary care provider, will provide improved access and improved patient health outcomes.

The current plan in Wisconsin will expand mandatory enrollment in managed care for the AFDC Medicaid population to some or all parts of 68 of Wisconsin's 72 counties. The state has contracted with an average of three HMOs per county. Twelve counties have more than five, and the range is two to eight.

While we can anticipate some of the problems and successes of this transition to managed care, any major social policy shift needs to be evaluated by a variety of methods. Outside evaluation of the effects of this shift for populations in the five metropolitan counties for which Wisconsin has had up to 10 years of experience has been minimal and is outdated (Rowland and Lyon, 1987; Liss and Dunham, 1986). Experience with the state's internal evaluations (Piper and Bartels, 1995; Bureau of Health Care Financing, 1994) suggests that we cannot expect their future evaluations to offer a sufficiently broad perspective to understand fully the types of changes and effects that a shift to managed care will bring. For example, the state evaluations (Piper and Bartels, 1995) highlight certain features of managed care plans traditionally considered a strong point for managed care organizations—improved access to primary care—without connecting this access directly to patient outcomes. Further, it is not clear that this approach is sufficient to understand the implications of managed care, particularly for poor children.

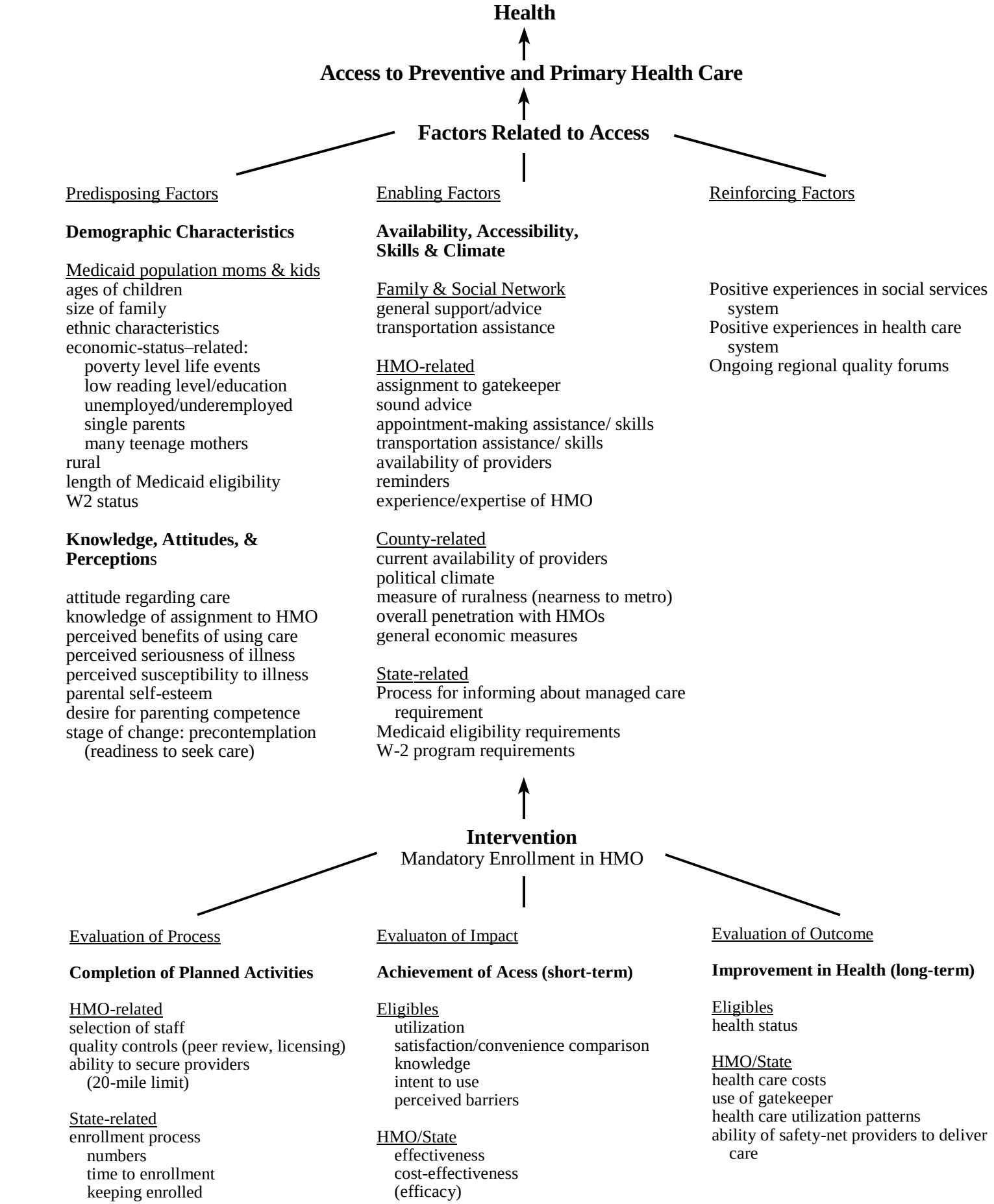
While Wisconsin's data show that use of emergency room services declines among children in managed care, the average severity of illness for visits is not considered. One national study has indicated that declining emergency room visits are indicative of "inappropriate" use for nonemergency care (Hurley, Freund, and Taylor, 1989). Additionally, the experience with implementing and evaluating a program in the five metropolitan counties may not prove instructive for understanding how the program will work, or which features need to be studied, for rural areas. A substantial research base suggests that rural and urban populations have different health care needs and access to health care. A theory-based research model can be the first step in planning a comprehensive evaluation applicable in different settings.

DEVELOPMENT OF THE MODEL

By necessity, policy decisions related to managing the needs of the Medicaid population are focused on the population as a whole, not the individual. The model should therefore allow for analysis at the aggregate level. At the same time, the model has to include important theoretical concepts that are relevant to the concerns and issues for the target population. The PRECEDE model allows assessment at the aggregate level while also providing theoretical concepts. It considers a variety of variables including **p**redisposing, **r**einforcing, and **e**nabling **c**auses in **e**ducational **d**iagnosis and **e**valuation. To this model we added concepts from Becker and colleagues' (1977) Health Belief Model and Pender's (1982, 1987) models for health promotion and disease prevention, as well as from Rogers's (1969) principles of learning, Morley, Messick, and Aguilera's (1967) human behavior during crisis, and Flay's (1986) program evaluation.

This model was then designed to include issues specifically relevant to a rural Medicaid population. The adapted model is shown in Figure 1. We have tried to be as all-encompassing as possible, identifying those variables which might impact not just on access but on other outcomes as

FIGURE 1


Health
Access to Preventive and Primary Health Care
Factors Related to Access
Predisposing Factors
Demographic Characteristics
Medicaid population moms & kids
ages of children
size of family
ethnic characteristics
economic-status–related:
poverty level life events
low reading level/education
unemployed/underemployed
single parents
many teenage mothers
rural
length of Medicaid eligibility
W2 status
Knowledge, Attitudes, & Perceptions
attitude regarding care
knowledge of assignment to HMO
perceived benefits of using care
perceived seriousness of illness
perceived susceptibility to illness
parental self-esteem
desire for parenting competence
stage of change: precontemplation
(readiness to seek care)
Enabling Factors
Availability, Accessibility, Skills & Climate
Family & Social Network
general support/advice
transportation assistance
HMO-related
assignment to gatekeeper
sound advice
appointment-making assistance/ skills
transportation assistance/ skills
availability of providers
reminders
experience/expertise of HMO
County-related
current availability of providers
political climate
measure of ruralness (nearness to metro)
overall penetration with HMOs
general economic measures
State-related
Process for informing about managed care requirement
Medicaid eligibility requirements
W-2 program requirements
Reinforcing Factors
Positive experiences in social services system
Positive experiences in health care system
Ongoing regional quality forums
Intervention
Mandatory Enrollment in HMO
Evaluation of Process
Completion of Planned Activities
HMO-related
selection of staff
quality controls (peer review, licensing)
ability to secure providers
(20-mile limit)
State-related
enrollment process
numbers
time to enrollment
keeping enrolled
Evaluaton of Impact
Achievement of Acess (short-term)
Eligibles
utilization
satisfaction/convenience comparison
knowledge
intent to use
perceived barriers
HMO/State
effectiveness
cost-effectiveness
(efficacy)
Evaluation of Outcome
Improvement in Health (long-term)
Eligibles
health status
HMO/State
health care costs
use of gatekeeper
health care utilization patterns
ability of safety-net providers to deliver care

well. Additionally, the model provides a framework for identifying variables for which data are reasonably accessible.

The basics of the PRECEDE model require clear identification of the problem. One then proceeds to speculate on contributing causes of the problem, paying particular attention to those behaviors which might be amenable to change. Next, it is necessary to identify the predisposing, enabling, and reinforcing factors likely to have a bearing on the causes. The intervention would then be developed to address the causes of the problem. We believe that these features were taken into account in the design of the intervention through Wisconsin's interactive planning process, whereby local agencies and providers were given opportunities to reflect on and refine the design of the Medicaid plan. Finally, the model requires evaluation on process, impact, and outcome features.

An explanation of the reformulation of the problem using the adapted model follows. We transposed the problem orientation from a negative goal to an affirmative statement of health. That is, the ultimate goal of the Medicaid program is to assure access to health care with the intent of improving health status. Next, we chose to focus on the impact that access to preventive and primary health care will have on health. Factors related to accessing care include a variety of predisposing, enabling, and reinforcing factors. The intervention chosen by the state was to require all AFDC Medicaid families in certain counties to select a managed care provider for all medical needs. Finally, we present our plan, using the adapted model, to show how this intervention could be evaluated for the different levels of outcomes. Each of these factors is explained further below and is presented in Figure 1.

Predisposing Factors

Predisposing factors include the target population's demographic characteristics as well as knowledge, attitudes, and perceptions that might affect decisions to use care or stay healthy. Even though basic demographic characteristics are not changeable (age, race) and some are not easily amenable to change (economic status and related factors), other components such as attitudes, knowledge, and perceptions certainly are. Ideally, all would be considered when the intervention is designed.

Our target population consists of Medicaid families, composed exclusively of mothers and their children who qualify for financial assistance. We know that the single greatest barrier to good health is poverty. Although some data suggest that poor families who qualify for Medicaid are in better health compared with those who barely miss qualifying and have no health insurance at all, this is still a high-risk population. The typical family in Wisconsin's first five Medicaid managed care counties "consists of a single adult woman in her twenties with two young children. Annually, 13.4 percent of women between the ages of 12 and 20 give birth, compared with 10.7 percent of women aged 21 to 49" (Piper and Bartels, 1995:19). These Medicaid HMO enrollees are from the state's urban counties and are also more likely to be African American, Asian American, Hispanic, or Native American than the Medicaid AFDC population statewide. We might expect to see differences in impact or outcomes due to the different ethnic mixture in the expansion counties, which are mostly rural, and would certainly want to take these demographic differences into consideration.

Eligibility for Medicaid benefits and status within the state's new welfare program (called Wisconsin Works) need to be considered as demographic characteristics of the population, as well as system-level enabling factors. Eligibility for Medicaid is an interesting, and somewhat paradoxical, feature of the population. Eligibility can be lost and regained, and the length of time one is certified as

eligible varies by county. Concerns could be expected for any population where losing health insurance puts a family at risk, but a high-risk population is at even higher risk when it loses insurance.

Wisconsin Works (W-2), Wisconsin's welfare replacement program, will add a new twist in our attempts to understand issues related to health care for this population. At a basic level, we should see only minor changes in the composition of the eligible population; eligibility criteria remain the same as they were in July 1996, regardless of work status. However, it is anticipated that some moms will be in jobs paying salaries high enough to disqualify the family from Medicaid. Other variables may be worth examining as well. While moms of infants will have a year to stay at home learning parenting skills, moms of older children will be in the workforce in some capacity. This regular exposure to an environment outside the home might influence their attitudes and knowledge about health care, as well as add a new level of complication to their lives—juggling work and family responsibilities. Whether this will alter the social supports available, particularly in smaller rural communities, is unknown, as is the effect these changes will have on health care attitudes or ability to access the system. The model suggests that we need to consider each of these points when searching for factors related to health care use and outcomes.

The predisposing factors of knowledge, attitudes, and perceptions are more readily changeable than demographics. They provide a focus for eliciting behavioral changes in the desired direction. When adapting the basic PRECEDE model, we added variables about health beliefs (knowledge of the new managed care system, perceptions of its benefits, and parental perceptions of the potential seriousness of various illnesses and children's susceptibility to illness) from the models of Becker and colleagues (1977) and Pender (1982, 1987). Pender's variables about self-esteem and desire for competence are also considered critical predisposing factors that may encourage parents to take responsibility for their own and their children's health care. Even if these variables are not always measured in research, we could

probably make assumptions about them for the target population in the aggregate, and they have value when looking at interventions planned for the aggregate.

We know less about the knowledge, attitudes, and perceptions of this population, although we do know how these have translated into use of preventive health care services. A recent report (Riportella-Muller et al. 1996) indicates that making care "free" is not always sufficient for Medicaid families in rural areas. A large percentage of Medicaid moms did not give a high priority to obtaining preventive health care for their children, partly because of a belief system holding that apparently healthy children do not need regular checkups.

Enabling Factors

The enabling characteristics include features of the health care delivery system that are designed to directly help or hinder use. Enabling characteristics are divided into those in the control of the managed care organization (HMO for simplification purposes), the county, and the state. Factors within the control of the HMO that encourage and enable the recipient to use health care wisely and appropriately include offering sound advice, assistance with scheduling and traveling arrangements, availability of staff, sending of reminders, and the overall experience/expertise of the HMO. We see some features within the context of the total health care environment at the county and/or the state level. These types of features include the current availability of providers, the political climate, the measure of ruralness, the overall penetration of HMOs, and general economic measures. The state is responsible for setting the Medicaid and welfare eligibility requirements as well as for the process for informing recipients of eligibility and assignment requirements, the latter currently in the domain of a private outreach subcontractor. Ideally, all of these factors should be modified specifically for the target population to assure successful outcomes.

Reinforcing Factors

Reinforcing factors are the interpersonal and professional supports that encourage repeated use. These supports could come from the personal, community, and professional levels. In particular, positive experiences with prior contact are likely to encourage future use; negative ones are likely to discourage that use, even perhaps when it is most appropriate. Wisconsin has implemented a series of ongoing regional Managed Care Forums whose aim is continuous quality improvement through ongoing feedback with community members and relevant parties—an informal system-wide reinforcing mechanism. This type of open atmosphere offers an opportunity to overcome some problems inherent in the transition to managed care.

The model then lays the groundwork for acknowledging how particular features of this population might interact with the health care deliverer (HMO) and the statewide environment through enabling and reinforcing features to produce a successful outcome: What works well for one population with a specific set of predisposing characteristics may not work well for another. We can then evaluate to determine if and how managed care organizations help Medicaid families surmount access barriers in rural areas.

The Intervention

As noted above, Wisconsin has been administering managed care arrangements in five metropolitan counties for as long as 10 years (time varies by county). In the fall of 1996, Wisconsin attempted to expand that managed care program to all counties. AFDC-Medicaid–eligible families in counties where there is a choice of at least two HMOs are required to choose or be assigned to a managed care provider. In counties with fewer than two options, enrollment is voluntary. The design of Wisconsin's Medicaid managed care program took place through an interactive planning process in which local agencies and providers were given opportunities for reflection on and refinement of the

design of the expansion plan. Important characteristics of the target population, their needs, and the needs of the providers most likely to serve this population were all considered. It should be noted here that the model allows for a comparison of this new intervention to the fee-for-service system formerly used by most of the recipients, and still in use in the state. Either “intervention” could be inserted here; to do an evaluation of the fee-for-service model, one would need to modify both the system and provider variables.

Evaluation: Process, Impact, and Outcome Measures

Finally, the intervention must be evaluated in terms of process, impact, and outcome. Process factors involve the inputs of the system. Impacts are the intermediate behavioral changes resulting from the intervention. Outcomes relate to the achievement of long-term goals. Often we make the assumption that patient outcomes are better by having accessed the medical care system than they would have been without that access. The quality of the HMOs procedures (process) helps determine if utilization of care (an individual impact) translates into successful patient outcomes.

How successful we think the intervention is may depend on the subject of our inquiry. Are we looking at success for the individual or success for the system? The model is useful for an evaluation of both the role of individuals and the role of the system in success for the individuals. In addition, the model also reminds us about the possibility that the intervention may also affect the system, and how these factors may play back on one another.

Process factors that will ultimately affect the recipient include quality features of the HMO—how it selects its staff, and quality controls such as peer review and licensing requirements. An example of the application of the model to a specific setting—rural areas—will be the ability of the HMO to assure access to primary care within the 20-mile limit required by the contract with the state.

The state-level process factors include how many eligible participants were enrolled and how much time it took to get and keep them enrolled.

The most direct measure of impact for the participant would be the actual utilization patterns. How often did the children and their moms use preventive services, acute care services, and hospital services? Other related measures include satisfaction/convenience, intent to use, and perceived barriers to use. Impact from the system perspective would be measured as effectiveness and cost-effectiveness.[1] Effectiveness refers to the achievement of the desired impact (appropriate use of health care services) under real-life conditions. Did the children receive preventive health screenings within the appropriate time frame for their age? Were lead screenings completed? Did the moms receive yearly PAP smears? Cost-effectiveness refers to the cost of the intervention attempts per desired impact. It is measured by dividing the monetary costs of the attempts by the number of effective interventions. These data could help policymakers evaluate the possible allocation of resources to an activity they view as successful at favorable costs.

The final step of the evaluation is to consider the ultimate outcome of the intervention. Outcomes relate to the achievement of long-term goals. Good process and a successful impact create the potential for successful outcomes for both the participants and the system.

One way to determine a positive outcome for the state is to look at costs of the program. Medicaid managed care is one attempt to contain spiraling health care costs; the evidence on these grounds is solid (Gold, Sparer, and Chu 1996). Managed care organizations have multiple methods of controlling costs, but usually this is accomplished through restricting access to care.

Restricting access need not be negative; it can also be seen as appropriate care. For example, rather than have patients self-referring for care, the notion of a gatekeeper function offers opportunities

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[1]If this were an experimental design, we could measure efficacy, achievement of a desired impact under ideal or highly controlled conditions of program implementation.

for better medical care choices. Are all cases assigned to a gatekeeper who is usually a primary care provider? The argument has been made that many high-risk patients and families would benefit from this more rationally organized system of care. Many are looking at health outcomes as a result of use of managed care arrangements (Bureau of Health Care Financing, 1994) and see this as the ultimate measure of a successful program. Following from this argument, at the individual level we might expect improved health status as an outcome of the intervention. For example, one measure of individual improved health status would be a decrease in the number of unnecessary hospitalizations. Limiting the number of unnecessary hospitalizations also serves the system by reducing unnecessary costs.

Another system-level outcome would consider how the expansion to Medicaid managed care affects the safety-net providers who have been providing care for the underserved and uninsured for many years. Among the more common types of safety-net providers are public hospitals, community health centers, and local health departments. There is a concern that safety-net providers will be at financial and, therefore, performance risk unless managed care organizations contract with them to provide services (Gold, Sparer, and Chu 1996; Lipson and Naierman, 1996; Horn, 1994). Asking if the change in access to safety-net providers leads to a change in the outcome for the served populations links this system effect to the effect on recipients.

So, the model forces us to ask questions for the individual patient as well as for the system. For the system, questions abound about cost and impact on selected providers. The model also permits comparisons of the managed care delivery program to the fee-for-service system of delivery. Since the transition is in the process of occurring, comparisons can only be made to prior experience with managed care in the aggregate. Perhaps the policy requirements of the mandates need to be compared—that is, is it easier to mandate a performance standard for a managed care organization than in a fee-for-service environment? It reminds us to look at the features that might make a managed care arrangement different from fee-for-service. For example, is managed care more likely to offer a regular source of care to this

patient population? Knowing that the fee-for-service system has problems delivering preventive health care to Medicaid populations, we are interested in determining if managed care arrangements do a better job or if they are too constrained by barriers beyond the control of the system.

It is in teasing out how one might answer these questions that the model takes on its particular utility. At its most basic level, the model forces one to consider all of the factors that might be interacting to create a given outcome. It also sets the framework for collecting data. Careful attention to the inclusion of all factors opens the possibility that we will ask the right questions of the right actors—that is, collect the appropriate data to help us derive substantive conclusions.

USING THE MODEL TO IDENTIFY VARIABLES FOR RESEARCH

The model also provides a helpful framework for identifying the variables required for the research evaluation. Figure 2 lists the components of the adapted PRECEDE model and suggested sources of obtaining the data. While perhaps none but the most comprehensive study could include all these variables, it is useful to consider not only how each of these might impact on desired outcomes but also if these data are easily accessible. Data needs are categorized according to the predisposing factors of demographic variables and variables affecting knowledge, attitudes, and perceptions; enabling factors; reinforcing factors; and evaluation factors. The data needs then lead us to identify potential sources of data. In general, most variables are available from Medicaid claims files or other existing county and state data. Some data will need to be collected from the HMOs and some from surveys of eligible recipients. To do the latter may require the development and testing of instruments.

FIGURE 2
Examples of Variables and Sources of Data Identified by the Adapted PRECEDE Model of Medicaid Managed Care Effects for Medicaid Moms and Their Children

Variables	Sources of Data
Predisposing Factors	
Demographics	
ages of children, size of family, ethnic characteristics, rural location, length of Medicaid eligibility, W-2 status	Medicaid claims files
economic-status–related	extrapolated from county/state data
Knowledge, Attitudes, & Perceptions	survey of eligible moms
Enabling Factors	
HMO-related	
assignment to gatekeeper, sound advice, appointment-making and transportation assistance, availability of providers, reminders	survey of HMOs
experience/expertise of HMO	Office of the Commissioner of Insurance reports
County-related	county assessments
State-related	public access state information
Reinforcing Factors	
positive experiences	survey of eligible moms
ongoing regional quality forums	public access state information
Intervention	
mandatory assignment	state information on affected counties, individuals
Evaluation of Interventions	
Process Factors	
HMO-related	survey of HMOs
State-related	public access state information
Impact Factors	
Eligibles - utilization	HMO claims data
satisfaction, knowledge, intent to use, etc.	survey of eligible moms
HMO/State	
effectiveness	HMO claims data
cost-effectiveness	HMO claims data matched to survey of HMOs; matched to state expenditure data
Outcomes Factors	
Eligibles - health status	HMO claims data, survey of eligible moms
HMO/State	
costs	survey of HMOs, state expenditure data
use of gatekeeper	survey of HMOs
health care utilization patterns	HMO claims data
ability of safety-net providers to deliver care	survey of safety-net providers

DISCUSSION

This paper has specified how an adapted PRECEDE model, originally developed to evaluate health education effects, can serve as a guide for research on the impacts of individual health status and the system resulting from a major system change from fee-for-service to managed care. An additional benefit of this model is to provide a theoretical basis for evaluation research. Continued study and refinement of this model are under way so it can be applied to a rural Medicaid population. If the concepts and variables considered here result in better understanding of the impact of managed care on a rural Medicaid population, the model can be applied and extended by others developing similar comprehensive approaches.

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