

CCNC Program Evaluation: Strategies and Challenges

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Since Medicaid medical home programs are still in their nascent stages, there is little in the literature that documents the best way to determine their effectiveness. Additionally, understanding the programs' efficacy in an operating environment such as a statewide Medicaid program can be difficult.¹ Recent reports identify key methodological issues involved in the evaluation of Medicaid disease management programs.²⁻⁶ The challenge to evaluating these programs is establishing precise, equivalent comparison groups that enable us to compare the quality and cost of care for patients enrolled in the medical home as compared to what these patients would have encountered in absence of the medical home initiative.

Establishing Precise, Equivalent Comparison Groups

In health care delivery research the gold standard for comparing the effectiveness of an intervention like Community Care of North Carolina (CCNC) would be to conduct a randomized control trial. However, for ethical and pragmatic reasons, this type of trial is not feasible. With the assumption that care provided within CCNC is better care, randomizing patients into care options outside of the CCNC networks may cause concern and raise objections. In general, truly randomized assessments of financing options for health care are difficult to field. CCNC networks now span all 100 counties and participation is mandatory for most Medicaid recipients.⁷ Consequently there are no other practice locations to randomize patients into. Thus, we must consider other methods to create an intervention and reference groups that are as equivalent as possible to obtain an unbiased and accurate assessment of the effectiveness of the program.

The intervention group in this case would be a group of patients who receive care from a CCNC medical home. A reference group would be a group of patients with similar characteristics and in similar environments who received care from a "standard" health care system. A properly selected intervention group and reference group should be able to use comparable metrics to measure process and outcomes. We also should be able to adjust for the difference in key variables.

This enables the intervention group's health and health care resource use to be compared to what was expected in the same population in the absence of intervention.⁵ With complex concepts such as medical homes, however, achieving equivalence can be a difficult task; there are many elements to consider when selecting comparison groups before we are able to isolate the differential effect of the medical home program.

Patient Equivalence

In order to create equivalent comparison groups, there should be no systematic differences between the patients in the intervention group and the reference group. Differences in patient demographic characteristics such as age, gender, socioeconomic status, and health status have the potential to affect assessment of outcomes or costs between the comparison groups. Additionally, since patients are able to select their

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own physicians, there may be systematic differences in utilization and cost for those who choose medical home practices involved in the CCNC program. For example, patients with greater anticipated utilization may select a medical home provider due to increased care coordination. Since we are unable to randomize patients into medical homes in order to control for selection bias, adjustments should be made in the analysis stage for demographic differences, comorbidities, and other measurable factors that are related to self-selection into medical homes.

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Practice Equivalence

In order to examine the efficacy of the CCNC program, it is important to consider the possible systematic differences between the practices in the CCNC program and those outside of the program. Practice patterns may vary among the program networks and practices due to the degree of CCNC program implementation or the services available in particular networks. Given that the program was rolled out over time, the practice style of early-adopting providers could differ in important ways from those that recently joined the program. For example, the early adopters may be more likely to be supportive and engaged in the disease and case management program.¹ The practices that joined the program more recently may still be training managers and orienting their practitioners, and their program effects may not yet be realized.¹ The degree of implementation and varying practice patterns of the CCNC medical homes may limit the precision of the estimate of the effect of the program and should be taken into consideration when interpreting the results.

External Factors

In addition to patients and practices, other external factors can affect the equivalency of comparison groups. Changes in health care outcomes and costs between groups over time cannot be assumed to be solely due to the CCNC intervention.⁵ External factors such as changes in physician practice patterns, patient severity mix, and prices of health care supplies and services could have an impact on costs, utilization, or outcomes.³ If it is believed that these factors disproportionately affect one comparison group over the other, they must be controlled for in the analysis, if possible, in order to obtain unbiased estimates of efficacy.

There are additional external factors that could affect the precision of the estimates. Medicaid enrollees are likely to shift in and out of Medicaid eligibility. This affects those enrolled in the medical home program because care discontinuity can limit the effectiveness of a medical home initiative. Thus, if we include those with interruptions in Medicaid coverage in analyses, we may reduce the accuracy of our estimates about the program's efficacy. Conversely, if we limit the study population to individuals who are continuously enrolled in the focus time period, we may reduce the sample size and jeopardize the significance of the findings.¹

Interventions such as disease management programs and medical homes do not and are not expected to produce immediate, even short term, results. Medical home components such as increased preventive care and case management may take years to generate measurable health improvements and cost reduction. There are also costs associated with setting up and running the CCNC program, so there will be a delay before the program sees a return on investment. Moreover, some medical home components may actually lead to a short-term cost increase. Case management, for example, is aimed at increasing adherence to medications,

which may lead to long-term decreases in utilization but can actually lead to short-term increases in costs.¹ If we use baseline estimates measured before the program effects were realized, we may underreport the effect of the CCNC program on select outcomes and cost.³

Selecting a Reference Group

Another option is to create baselines from reference groups. Given the many factors that can result in biased and imprecise assessments of the comparison groups, reference groups should be selected carefully to ensure internal validity. Evaluations of disease management programs have typically involved two major categories of reference groups: the first, historical comparison groups, involves patients chosen from a prior time period. The second, concurrent comparison groups, comprises patients selected from the same, present time period.⁵

Historical Comparison Groups

Historical comparison groups can include the same patients who eventually receive the intervention (such as pre-post tests studies), a group of patients who do not get the intervention (such as benchmark designs), or some combination of both.⁵ The benefit to a pre-post design is that it is comparatively easy to conduct because it uses patients as their own control; thus, there is no need for an external reference group.⁵ However, if the patient, practice, and external threats to validity described above are not successfully controlled for, this design has the potential to be biased.

To assess the cost-effectiveness of the CCNC program for fiscal year 2003-2006, Mercer Human Resources Consulting Group employed historical benchmarks.⁸ They used utilization and cost data for all Medicaid enrollees statewide from the previous year and trended the data forward using the utilization and unit cost trend components of medical inflation. They compared these historical benchmarks to actual cost data for the CCNC program and concluded that savings ranged from \$118-\$130 million in 2004, with an average per member per month (pmpm) payment savings of 17%.⁸ A more recent study by Mercer for fiscal year 2007 found an average pmpm payment savings of 11%. The second study employed a similar methodology as the first, but the benchmark data used in the projection was limited to historical claims data for only patients enrolled in the state's traditional primary care case management program, Carolina Access.⁹ Other than medical inflation, they did not control for other patient, practice, and external factors that could confound the results; thus, their conclusions may have been biased.

Concurrent Comparison Groups

Concurrent comparison groups enable the researcher to compare the intervention group with a defined subset of the general population during the same time period.⁵ The benefit of this design is that, compared to historical comparison design, it can control for external factors or secular trends. For

example, spending levels and patient outcomes in any given year may be more reflective of the Medicaid case mix during the time period than of the intervention,³ but with historical benchmarks, the researcher would be unable to control for this trend. The drawback to concurrent comparison design is that all measurable non-equivalences between the intervention and reference groups must be adjusted for. Failure to adjust for these non-equivalences could bias the estimates.

In their evaluation of the CCNC asthma and diabetes programs, researchers at the Cecil G. Sheps Center for Health Services Research elected to use a concurrent comparison group. Although their analyses were limited due to unmeasurable population differences, discontinuity of care, and the degree of program implementation, they did not have to be concerned with some external confounding factors such as medical inflation and were able to adjust for some measured differences in the enrolled populations such as age. The study found modest savings for patients enrolled in CCNC networks compared to patients using Access. Per member per month payments were 2.6%-4.7% lower for asthma patients and 1.7%-3.7% lower for patients with diabetes during the three years of the study (2000-2002). A critical component of their analysis was age adjustment, given the finding that the CCNC asthma population was significantly younger than the Access population and that younger people with asthma were less costly to treat.¹

Suggestions for Solution

Although both the historical and the concurrent comparison groups have their benefits and limitations, the concurrent

approach is the most applicable in the evaluation of the CCNC program because it allows for stratification of key variables that may affect the equivalence of the comparison groups. It also easily addresses secular trends that could influence cost and outcomes and have an impact on the internal validity of the study. This method is more accurate than the use of a historical method that ignores demographic differences in reference and comparison groups, which can lead to invalid results.

The real challenge in evaluating the CCNC program in North Carolina moving forward is the difficulty of finding an appropriate concurrent reference group of patients treated outside CCNC networks. There is no longer a large enough contingent of Medicaid patients treated in earlier iterations of the program or outside CCNC. Our suggestion is that researchers may look to neighboring states for comparison groups. States with fee-for-service Medicaid reimbursement programs, in environments absent formal managed care or HMO structures, would provide near contrasting interventions for equivalent comparison groups. If there were managed elements in the Medicaid program those would have to be described carefully. Any potential comparison group would need to be evaluated on the basis of demographic characteristics in order to determine a similar distribution to the North Carolina reference group under study. Differences in demographic characteristics could be adjusted in the analysis and still provide valid evaluation results. While gaining access to another state's Medicaid data can be a challenge, accessibility is improving. The effort to find and use a comparison population will be paid off with greater confidence in a sound evaluation of this important program. **NCMJ**

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