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A Strategy for the use of Administrative Data in the Development of Non-Economic Eligibility Criteria

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A Strategy for the Use of Administrative Data in the Development of Non-economic Eligibility Criteria

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B.S., University of New Mexico, 1995

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Introduction & Background

In the pursuit of goals fundamental to the discipline of public health practice, those seeking to promote the health status of the poor and underserved often labor in a manner reflective of those who have come before them. Programs are typically developed as adaptations of previously existing programs due to an approach that couples legitimacy with familiarity. It is the observation of this author that such an approach, though reasonable when a complex task is undertaken with limited resources, can lead to the development of a program that is anchored to a model that may undermine the effectiveness of the program.

This study will demonstrate a specific effect of this dynamic as experienced by a county-funded safety-net health care coverage program in which policies developed with regard for industry norms have lead to disadvantages born of the fact that the organization itself is atypical to the industry. The key disadvantage examined here is the loss of opportunities to improve the overall health of the program’s target population and better control the long term financial burdens of the safety-net program by taking steps to cover beneficiaries that are likely to become sicker and more costly in the long run. Under certain circumstances examined here, the program may benefit by counter-intuitively accepting short-term expenses (related to the provision of primary and preventive medical benefits) in the interest of gaining long-term savings.

The program that will serve as an example in this thesis is the Coordinated Care Program (CCP), administered by the Health Care District of Palm Beach County, Florida (herein referred to as the District). The District came into being as the result of a county referendum authorizing the expenditure of county property taxes to establish health programs within the county. The two primary programs originally authorized by the referendum included health care coverage for the county’s working poor and a new
agency to establish trauma-related care programs within the county. In both cases, a key objective was to provide a source of payment to providers for what had traditionally been uncompensated care.

Tasked with building a publicly funded health care program from the ground up, the original CCP administrators went about selecting an appropriate operational model. The CCP would take on the responsibility of providing a source of payment for health care services provided to county residents who could not otherwise afford to pay their provider for services rendered. The providers receiving payment would come to include primary care providers operating within Department of Health clinics, primary and specialty physicians in the community and facilities such as hospitals which were a principal concern of those who first conceived of the program. Eventually, the program took the shape of a managed care style health insurance program. Enrolled members are assigned to a primary care physician, provided with a defined set of medical benefits and limited to a network of participating providers. The utilization of specialty physician services and hospital services would be monitored and controlled through the use of service pre-authorizations and case management. Having drawn on their familiarity with commercial health plans, broadly understood Medicare standards of care and Medicaid’s approach to economically qualifying recipients, the administrators of the CCP came to operate the program by adhering to the common practices of a managed care organization. As a result, administrative efforts became focused on short term cost control and value was placed on the ability to limit the utilization of services. This model largely served the purposes of the organization, except when modified to accommodate certain atypical mandates required by the District's original charter.

Among the general responsibilities to be addressed were mandates to support the health of all county residents by assuring that health care services would be available to populations throughout the county. This would require, among other things,
that health care access problems known to exist in certain areas and populations be remediated. Geographically, Palm Beach County is the largest in Florida, extending from the Atlantic coast well into the central regions of South Florida. In addition, the populations known to be underinsured or lacking access to care range widely in terms of location, native language, ethnicity and cultural background. The pool of likely recipients included uninsured inner-city service industry workers as well as rural migrant agricultural workers.

One strategy that the District would employ to bolster the availability of health care services would be to offer a source of payment for uncompensated care provided by the county’s hospitals, none of which are otherwise publicly funded in return for providing indigent care. In addition to providing standard compensation to hospitals for services rendered to existing District plan members, collaborative procedures were put in place to assess incoming hospital patients for possible coverage under District plans if no other source of payment was identified at the time of admission. These procedures function in a manner similar to those used by the hospitals to screen for possible Medicaid eligibility when a patient lacks medical insurance and is believed to be of limited means. Often the patient is qualified for coverage under one of the District’s plans. Determinations of eligibility are discussed in more detail below; however it is important to note that this practice of capturing eligible patients at this point in the continuum of care gives rise to some of the central questions of this discussion. These patients, soon to be granted benefits as District plan members, are brought into the system after having experienced an episode of illness requiring an inpatient admission. Had the potential member been identified at an earlier stage, the member may well have avoided the costly admission by utilizing preventative and primary care services.

More specifically, there exists a class of hospital-source applicants who had made prior application for District coverage but were denied initial coverage (or a
continuation of previously qualified coverage) under the District's eligibility policies. Having been modeled after Medicaid's eligibility criteria, which aim to provide health coverage for the poor, the District's procedures for eligibility require the applicant to demonstrate proof of identity, proof of residency within the county and proof of limited income (calculated as a percentage of the U.S. Federal Poverty Level Guidelines). Each of the requirements must again be satisfied in order to continue coverage once an eligibility period, typically one year, has come to a close. The health status of individual applicants is never evaluated as a factor in the determination of eligibility; and this leads to the central question of this study: Would an analysis of the available administrative data show that determining eligibility with disregard for the applicant's health status creates potential disadvantages for the program in it's operating costs or in the fulfillment of its charter? To argue that the practice does not create disadvantages, one would have to assume that the marginally impoverished sick are not likely to become sicker and poorer over time, if their basic health care needs are not met. Such an argument would also run counter to the overall findings of the Kaiser Commission on Medicaid and the Uninsured. This commission catalogued a large volume of studies (1991—2001) supporting the notion that a lack of health care leads to the deterioration of an individual’s health; and that poor health hinders the individual’s ability to earn income. [1] Historically, it has been shown that full-time workers in bad health earn an average of 11.3% less compared to those in good health. [2] And as for the potential effects on health status, the uninsured have been found to experience significantly higher rates of avoidable hospital admissions (13% compared to 10 % respectively). [3] In this particularly case, individuals (though previously known to the CCP as prior members or applicants) are not assessed for health status when the opportunity presents itself; and demonstrable medical neediness is set aside when the choice is made to ignore utilization data on hand. The results of the analysis will also speak to the question of
how the program’s operational model helps or hinders in the fulfillment of its mandates. These two seemingly distinct issues are interrelated because the program’s eligibility determinations are a function of its eligibility policies, which are in turn developed with deference for the adopted model. Absent here is an attempt to evaluate whether or not the current strategy for determining eligibility is appropriate. The intent is to present conditions under which the evaluation of individual applicants’ health status may serve the District in its efforts to provide adequate health services with the resources it is afforded.

There is ample evidence in the literature of health services research, and in the collective experience of the managed care movement, that the improved health status of members is a source of savings for the health plan as well as an obvious benefit to the member. [4, 5] For commercial HMOs, the simplest advantage is gained by seeking to cover the healthiest member population available in the market. The high health status of covered members translates into lower medical expenses and increases the plan’s profitability under typical risk arrangements. The District would similarly gain financial advantages and avoid budget shortfalls by covering the healthiest population possible. However, its unique responsibilities obligate the District to take all qualifying applicants. In addition, there are a significant number of members, especially those identified through the hospital screening procedures, who come to the plan with existing medical debts and already suffering the costly disadvantages of missed opportunities for the prevention and/or maintenance of their health problems. It is under these circumstances that an advantage may be gained by seeking ways to deliberately improve and maintain the health status of the qualifying population by working to preserve consistent access to preventive care for at risk individuals. [6, 13]

The study conducted to demonstrate lost opportunities to effectively cover members while gaining a cost advantage for the District began with the prediction that a
significant portion of members entering the program had previously applied for coverage. The prediction was straightforward given the relationship between the District’s coverage plans and the nature of eligibility criteria for each plan.

First, it is expected that members may enter the system by actively seeking out coverage under the District’s standard plan (called Option 1). In contrast, uninsured patients who are admitted to one of the county’s hospitals may be assisted by in-hospital staff to apply for coverage under the District’s Retro plan, which is designed to compensate the hospitals for charges already incurred. Taking into account the likely financial pressures created by a state of health that is severe enough to warrant acute facility care, it is reasonable to predict that a portion of members in the Retro population had sought coverage under Option 1 at a prior date. In other words, an uninsured person in the community with an existing condition (and of the general socioeconomic level serviced by the District) would likely seek the coverage available from the District. Failing to qualify for Option 1 coverage would leave this individual without access to basic care, and therefore at risk for worsening health and worsening finances. If this individual then incurs a hospital admission at a later date, he or she is likely to qualify for Retro coverage. Therefore, an analysis was undertaken to address the following questions: Is there a significant number of Retro plan members who can be identified as having sought or acquired coverage under the District’s standard coverage plan, Option 1? Can it be determined if such a group would exhibit characteristics indicative of conditions under which an applicants health status should be assessed as part of the District’s eligibility criteria?
Methods

The SAS System (version 8) statistical programming language was used to access the plan’s administrative data from an Oracle repository and conduct an analysis designed to examine the assumptions of the study and answer the questions posed above. [7] 1. Can the program’s own administrative data be utilized in identifying population members at risk for declining health status? 2. Can an objective examination of the relevant data reveal circumstances (e.g. the presence of specific medical conditions) under which decisions should be made in favor of granting benefits in the interest of avoiding greater long term costs? 3. What are the possible implication for the program and its eligibility policies?

The data included member demographic records, multiple eligibility records associated with individual members and institutional medical claims. The data sets contained records from membership activity and medical claims of all District plans for calendar years 2001 – 2003. As a methodology for assessing health status and isolating differences between a specific group of selected Retro plan members and a control population (all Option 1, standard coverage plan members), SAS code was adapted from the Agency for Healthcare Research and Quality (AHRQ) of the U.S. Department of Health and Human Services. The AHRQ has developed a set of health care quality indicators known as Prevention Quality Indicators (PQI). [8] The PQI set is intended for use by health care payers and hospitals as a means of assessing the availability and quality of an area’s ambulatory health care system by evaluating the rates of certain avoidable inpatient hospital admissions. The agency has also created and publicly distributed a set of SAS programs meant to be used with administrative medical data for the purpose of generating the measures as designed. [9]
A key feature of the PQI set is their use of Ambulatory Care Sensitive Conditions (ACSC) as a marker of a health delivery system's effectiveness. The AHRQ’s documentation on its PQI reporting tools presents evidence that the ACS conditions (defined by the presence of specific combinations of diagnosis and medical procedure codes submitted on inpatient hospital claims) can indicate a lack of ambulatory care quality that could be reasonably expected to prevent these inpatient admissions. [10, 11] Portions of the AHRQ’s SAS programs were modified and used to identify and categorize inpatient claims records in this study. This adaptation allowed for the possibility of identifying circumstances, such as the existence of certain chronic medical conditions in the population, under which the District may wish to examine non-economic factors of eligibility before making final determinations of coverage. In the past, some government programs have targeted coverage policies on diagnosis-related indicators of need. [12]

As a first step, the membership data for all Retro members (N=3642) were analyzed to identify a subset of Retro plan members with eligibility histories showing prior contact with the District, either as denied applicants or as previously approved recipients of District plan benefits (N=942). To help further define the group of interest and limit the occurrence of outliers, the retained group of returning Retro members was limited to only those receiving Retro coverage within one year of the previously recorded contact. The entire subsetting procedure resulted in the retention of 643 Retro members exhibiting a return to the District within one year of prior application or coverage. This was 18% of the 3642 individual Retro plan members observed for the period. The entire population of Option 1 members (N=19105) observed for the same period was used as a comparative group.
Selection of Retro Group Members:

All Retro Members
CY 2001 - 2003
N = 3642

Retro Members with Prior Contact
N = 942

Retro Members Prior Contact
Within a Year
N = 643

The age and gender proportions of each group are displayed in Table 1. The Retro group has slightly larger proportion of males (54%) than the Option1 group which is a much larger group and is more evenly divided by gender with 49% male and 51% female members. The groups also differ with regard to their age distribution. The Retro group has a higher proportion of members age 35-50, and relatively fewer individuals in the younger age brackets. When the mean ages of the two groups are tested, the difference between the two groups is statistically significant (p<.001). However, the difference of 2.4 years between the mean age of the Retro and Option1 groups (46.1 and 48.5 years, respectively) is not likely to constitute a biologically (or clinically) significant difference that could alter the results of this study.

Table 1. Age & Gender Distribution of Study Groups

<table>
<thead>
<tr>
<th>Retro Population</th>
<th>Age</th>
<th>Female (% Female)</th>
<th>Male (% Male)</th>
<th>Total (% of Age Group)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-20</td>
<td>3 (100)</td>
<td>(0)</td>
<td>3 (0)</td>
</tr>
<tr>
<td></td>
<td>21-34</td>
<td>40 (39)</td>
<td>63 (61)</td>
<td>103 (16)</td>
</tr>
<tr>
<td></td>
<td>35-50</td>
<td>144 (46)</td>
<td>170 (54)</td>
<td>314 (49)</td>
</tr>
<tr>
<td></td>
<td>51-64</td>
<td>103 (48)</td>
<td>112 (52)</td>
<td>215 (33)</td>
</tr>
<tr>
<td></td>
<td>&gt;64</td>
<td>6 (75)</td>
<td>2 (25)</td>
<td>8 (1)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>296 (46)</td>
<td>347 (54)</td>
<td>643</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Option 1 Population</th>
<th>Age</th>
<th>Female (% Female)</th>
<th>Male (% Male)</th>
<th>Total (% of Age Group)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0-20</td>
<td>492 (51)</td>
<td>468 (49)</td>
<td>960 (5)</td>
</tr>
<tr>
<td></td>
<td>21-34</td>
<td>1991 (50)</td>
<td>1982 (50)</td>
<td>3973 (21)</td>
</tr>
<tr>
<td></td>
<td>35-50</td>
<td>3197 (44)</td>
<td>4094 (56)</td>
<td>7291 (38)</td>
</tr>
<tr>
<td></td>
<td>51-64</td>
<td>3356 (58)</td>
<td>2448 (42)</td>
<td>5804 (30)</td>
</tr>
<tr>
<td></td>
<td>&gt;64</td>
<td>731 (68)</td>
<td>346 (32)</td>
<td>1077 (6)</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>9767 (51)</td>
<td>9338 (49)</td>
<td>19105</td>
</tr>
</tbody>
</table>
Once the two comparative member populations were identified, inpatient hospital claims for these members were extracted from the source tables. The modified AHRQ SAS code and SAS formats were then used to flag claims conforming to the PQI criteria for ACSC admissions. The procedure was able to evaluate each claim individually and identify any claim that the PQI criteria would define as one related to an ambulatory care sensitive condition. A given claim could be ascribed to one or more of sixteen different PQI conditions. The sixteen categories are defined below and are coded TAPQ01—16. These codes assigned by the AHRQ SAS formats are retained here as shorthand labels; and to facilitate cross-referencing to related and future studies.

Once the relevant claims were identified and categorized, further analyses were then done to compare the results from each group and delineate the groups’ experience of ACSC admissions. The first metric applied is the relative proportion of ACSC admissions by PQI category in each study group. Also examined were the relative rates of specific admission types as a percentage of total admissions; and as a rate of admissions per 1000 members.

It is expected that the results will support the hypothesis that the selected Retro group will exhibit higher rates of admissions for certain ACSC conditions. In particular, it is expected that a significant disparity will be found for conditions likely to worsen in the absence of primary care and preventive medical management (services provided for the Option1 group and unavailable to the Retro group prior to a qualifying admission).

Results

The two groups proved to be similar in some respects, and greatly disparate in others. Firstly, there was an evaluation of the proportional distribution ACSC-related claims for each group. The proportion of preventable admissions belonging to each of
the sixteen categories of ACS conditions was calculated. This measure revealed a similar distribution of ACSC categories in each of the two groups (Figure 1). This suggests that the groups are comparable with respect to the range of PQI-conforming conditions that they experience.

Figure 1. Comparison of Percentage PQI Hits by Category

The following chart (Figure 2) displays how prevalent the individual PQI conditions are as a percentage of all inpatient admissions observed within each group. Here it is clear that the Retro group experiences certain ACSC admissions as a greater proportion of all inpatient admissions for the group. A comparison of proportions was done for each of the sixteen categories to identify the level of statistical significance of differences observed between the Retro and Option1 groups. A Pearson chi-square value was calculated to quantify the level of significance for each of the comparisons.
The categories found to be significantly different were Diabetes with Short Term Complications (p<.001), Congestive Heart Failure or CHF (p<.001) and Adult Asthma (p=.001). These three categories are labeled TAPQ01, TAPQ08 and TAPQ15 respectively. An examination of Figure 2 shows that, in each of the three categories, the proportion of admissions experienced by the Retro groups was roughly twice the proportion of total admissions observed for the Option 1 group over the same period. The same chi-square test revealed that ten other categories exhibited no statistically significant differences. Chronic obstructive pulmonary disease (TAPQ05) and Uncontrolled Diabetes (TAPQ14) were significant at the p<.05 level. Interestingly, these two categories are clinically similar to the highly significant categories of Diabetes with Short Term Complications and CHF.

The only category of hospital admissions that was experienced at a higher proportion by the comparative Option1 group (p=.007) was Dehydration (TAPQ10). This result may be partially attributable to the nonspecific nature of the dehydration diagnosis and its use as an admitting diagnosis. It is possible that patients with existing medical coverage (i.e. the Option1 group) are more likely to receive this diagnosis; in contrast to an uninsured patient for whom the hospital is attempting to document a qualifying admission.

Overall, there is no question that there are specific differences between the groups with respect to certain conditions.
Finally, there is clear evidence that the rate of PQI-conforming admissions per 1000 members in the Retro group are high; particularly when contrasted with the rates observed for the comparison group (Figure 3). Because these rates are controlled for population size, it is evident that the Retro group is at risk for experiencing more ACSC admissions. By comparison, the Option 1 group had relatively few admissions per 1000 members. The comparative rates displayed in Figure 3 show that additional ACSC conditions appear to disproportionately affect the Retro group while Diabetes STC, CHF and Adult Asthma continue to persist as standouts.

An additional area of interest that surfaces here is the 11-fold difference in the rate of admissions for Bacterial Pneumonia (TAPQ11), which may be related to the lack of insurance typically experienced by the vast majority of members coming into the Retro plan. Although TAPQ11 appears to be highly prevalent in the Retro Group when the
number of admissions per member is examined, the same condition did not manifest itself with statistical significance in the Retro group as a proportion of the group’s total admissions. An analogous pattern is also observed for Urinary Tract Infection, TAPQ12.

Figure 3. Comparison of PQI-Conforming Admissions per 1000 Members

Discussion

The results of the study support several of the assumptions made prior to undertaking the analysis. It was predicted that the design of the eligibility criteria and the characteristics of the Retro population would likely give rise to a significant number of Retro plan members with whom the District had prior contact. Nearly one fifth of all Retro members had a prior relationship reflected in the eligibility records.

The identification of members with a history of prior contact allowed for an evaluation and comparison of medical services utilization. Specifically, the utilization of
hospital services related to ACSCs was of interest due to the high cost and preventable nature of such admissions. The discovery of significantly different rates of admission between the group of interest and the Option1-insured population adds validity to the notion that a targeted evaluation of applicant’s health status could lead to long term savings for the District; and better overall health maintenance for the affected population.

The use of AHRQ’s PQI methodology for identifying certain hospital admissions allowed for a review of utilization that was objectively designed and targeted for conditions thought to be important in the assessment of health care access and quality. With administrative data available for both the Retro group and the Option 1 group, it was possible to produce a direct comparison between the two. Prior to the analysis, it was possible to argue that the Retro group (because an inpatient admission typically marks the start of a coverage period) is simply a sicker group; and would be expected to experience higher hospital admission rates across the board. However, it was discovered that the Retro group’s rates of admission were in some cases significantly higher, but only for specific ACS conditions.

The available data also allowed for the evaluation of two possible confounding factors, age and gender. Though the overall average age of the study groups were statistically different, the actual difference in years between the means (2.4 years) is not biologically significant enough to alter clinical outcomes. The strength of the statistical significance can be attributed to the relatively large size of the groups compared. Similar findings resulted from the comparison of mean ages for subgroups comprised of only those members affected by Diabetes STC, CHF and Adult Asthma. Gender was not pursued as a possible explanation for the differences observed primarily because the both genders were nearly evenly represented in both groups.

It is evident that there is an association between a group’s level of access to care and the rate of ACSC-related hospital admissions experienced by the group. A more
comprehensive study would be needed to rule out alternative explanations for the association. These may include factors such as demographics other than age and gender (e.g. ethnicity and immigration status).

Persistent and progressive chronic conditions were among those notably related to Retro admissions. Diabetes with Short Term Complication (TAPQ01), Congestive Heart Failure (TAPQ08) and Adult Asthma (TAPQ15) were experienced at a higher rate by the Retro group as compared with the Option 1 group (p<=.001). These three conditions related to chronic principle diagnoses appeared in the Retro group more disproportionately than acute conditions such as Perforated Appendicitis (TAPQ02). Though perforated appendicitis is indicative of a lack of ambulatory care because it clearly results from a failure to obtain appropriate and timely care for acute appendicitis, it is not a condition that is chronic and persistent over time. Contact with such a patient during the prior year could not be expected to have identified the patient as one at risk for complications requiring acute care. In contrast, as the results of the comparison suggest, the presence of certain chronic conditions in the applicant pool may provide the opportunity to identify applicants for whom special consideration of health status may prove advantageous.

**Conclusion**

The results strongly suggest that Retro members with a medical history of Diabetes, CHF or Adult Asthma are more likely to exhibit preventable admissions (thought preventable if adequate primary care is available) than the typical applicant for whom the medical history is not known. Furthermore, because the Retro group is made up of prior applicants and/or enrollees, it is known that there was an opportunity to provide these individuals with primary care benefits prior to the period in which the
ACSC inpatient admissions were observed. The opportunity was missed; and the likelihood is that the health status of individuals, as well as the financial health of the program suffered as a result.

The findings also support the concept that it is possible to create benefits for the District and its recipients by developing ways to evaluate specific non-economic eligibility factors such as the health status of the applicant. Further analysis and review of the District’s eligibility policies and procedures would be required prior to integrating the evaluation of an applicant’s health status into the general member qualification process. Though the knowledge gained from this study could be used to develop the first steps towards doing so, the District would once again be at odds with its basic managed care operational model. The simple act of seeking out members who will predicatively require care in excess of the general population may mildly shock the culture of the organization. However, the long term effects of this cultural shift would serve to realign the organization with its original mandates and the true spirit of its mission.
References


