

# The Effect of Disease Management on Utilization of Services by Race/Ethnicity: Evidence From the Florida Medicaid Program

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**Objective:** To measure possible racial/ethnic differences in a Florida disease management (DM) program on utilization of selected healthcare services for 4 chronic illnesses.

**Study Design:** Pre-post comparison of utilization among 15,275 high-risk beneficiaries enrolled in DM in the Florida Medicaid program between October 2001 and October 2003.

**Methods:** Two-part regression analyses of the effect of DM on annualized inpatient days, emergency department (ED) visits, and outpatient visits, controlling for relevant covariates. Annualized rates were used to adjust for differences in length of program enrollment.

**Results:** Disease management patients in the postperiod had significantly lower annual rates of inpatient days, ED visits, and outpatient visits across most racial/ethnic groups. Disease management reduced utilization by a similar absolute amount in each racial/ethnic group. However, baseline disparities in utilization of inpatient days were not reduced by the DM program.

**Conclusions:** Disease management has a similar effect across different racial/ethnic groups but may not ameliorate important baseline disparities. Evaluations of DM programs should account for baseline disparities in utilization and examine whether those disparities can be reduced through DM.

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For author information and disclosures, see end of text.

Despite evidence that disease management (DM) can improve outcomes,<sup>1,3</sup> few large-scale studies have examined the effects of these programs among publicly insured patients. The assumption of DM programs is that appropriate ambulatory management of chronic diseases will lead to reductions in unnecessary hospitalizations and emergency department (ED) visits and increased use of appropriate outpatient (OP) visits. As more states adopt DM programs for publicly insured beneficiaries, an important issue in evaluating the success of such programs is whether racial/ethnic differences in utilization exist at baseline before the implementation of DM and, if such differences exist, whether DM ameliorates those differences.

Racial/ethnic disparities in utilization can occur because of differences in the following: (1) access to care (including insurance status and ability to pay), (2) prevalence and severity of disease (including risk factors for disease), (3) patient knowledge or preferences regarding the need for care, (4) provider supply (including the geographic distribution of services), and (5) provider behavior (ie, the diagnostic and therapeutic behavior of healthcare professionals). Previous studies<sup>4</sup> have shown that Medicaid has been effective in improving access and clinical outcomes for low-income populations. Within Medicaid populations, disparities are less likely to be caused by access and disease factors and are more likely to be related to patient preferences and provider supply or behavior.

Disease management programs are intended to improve patient self-management and are likely to reduce disparities by reducing variability in patient knowledge regarding their chronic illnesses. To a lesser extent, DM programs may also reduce disparities resulting from provider behavior by empowering patients to be more involved in the management of their chronic illnesses. Therefore, DM programs may result not only in reduced utilization of preventable high-cost services but also in greater uniformity of utilization after controlling for severity of illness and access to care. When baseline racial/ethnic disparities in utilization exist, DM may reduce such disparities to the extent that those disparities are based on racial/ethnic disparities in patient knowledge, provider behavior, or both.

This study examines the effect of DM on utilization of healthcare serv-

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es for high-risk patients in Florida's Medicaid fee-for-service population with 1 or more of 4 common chronic illnesses (asthma, hypertension, diabetes mellitus, and congestive heart failure). Specifically, we examine what is the magnitude of racial/ethnic differences at baseline within the Medicaid population enrolled in DM at baseline and whether DM had an effect on eliminating or reducing those differences, where they exist. This study extends our recently published findings that demonstrated that DM was successful in significantly reducing annual rates of inpatient (IP) days and ED visits but had little effect on OP visits, relative to Medicaid recipients with the same chronic illnesses in usual care (UC).<sup>5</sup>

## METHODS

### Eligibility

Beginning in October 2001, all Florida Medicaid beneficiaries identified with 1 or more of 4 chronic diseases (asthma, hypertension, diabetes mellitus, and congestive health failure) defined by a retrospective analysis of administrative claims data were invited to participate in the DM program. Beneficiaries were not eligible for enrollment in DM if they had certain medical conditions or were eligible for certain categories of service. Eligible patients elected to participate in the DM program or to remain in the UC program; that is, beneficiaries had to opt in the DM program.

Patients were stratified according to risk categories at the time of enrollment. High-risk patients were defined as those with high or moderate clinical risk or with high or moderate cost risk and were offered individualized support from a care manager. The focus of the DM support services was to help patients at highest risk for adverse outcomes to develop self-management skills that better prepare them to maintain or improve their health and to appropriately utilize available health benefits. All DM services were provided by a private vendor through telephone contact with beneficiaries. More detailed information on eligibility, the risk classification of beneficiaries, and the nature of the DM intervention can be found elsewhere.<sup>4</sup>

### Study Population

We obtained utilization data collected for Medicaid beneficiaries identified as high risk that included the annual number of days of IP hospital care, ED visits, and OP visits. After excluding those with less than 1 year of eligibility and those who participated in DM for less than 2 months, our final sample consisted of 15,275 high-risk individuals who chose to enroll in DM. Utilization data were obtained from claims released to the DM vendor, subject to patient confidentiality

requirements of the Florida Agency for Health Care Administration.

### Statistical Analysis

Our analyses measured the effect of DM on annualized IP days, ED visits, and OP visits, controlling for relevant covariates. We used annualized rates of hospital days and ED and OP visits to control for differences in length of program enrollment.

We used a 2-part regression model to test for the effect of DM.<sup>6</sup> The first part of the model uses logistic regression analysis to predict whether a patient had any utilization. The second part applies only to patients who had any utilization and uses multiple linear regression analysis to predict the logarithm of actual utilization.

The independent variables used in both parts of the 2-part model were racial/ethnic group (African American, white, Hispanic, or other), age category (0-14, 15-29, 30-59, or  $\geq 60$  years), geographic location (urban vs rural), indicators for each chronic illness, clinical severity indicator (medium risk vs high risk of adverse outcomes), sex, and hospital indicators. The hospital indicators served to distinguish between patients managed by central staff of the DM vendor and those affiliated with local hospitals.

We report the expected baseline annual utilization rates (ie, controlling for covariates) among DM enrollees for each outcome (IP days, ED visits, and OP visits), which included data for up to 2 years of utilization before DM enrollment, as well as the expected postenrollment utilization rates among DM enrollees. All results are reported at the 5% level of significance.

## RESULTS

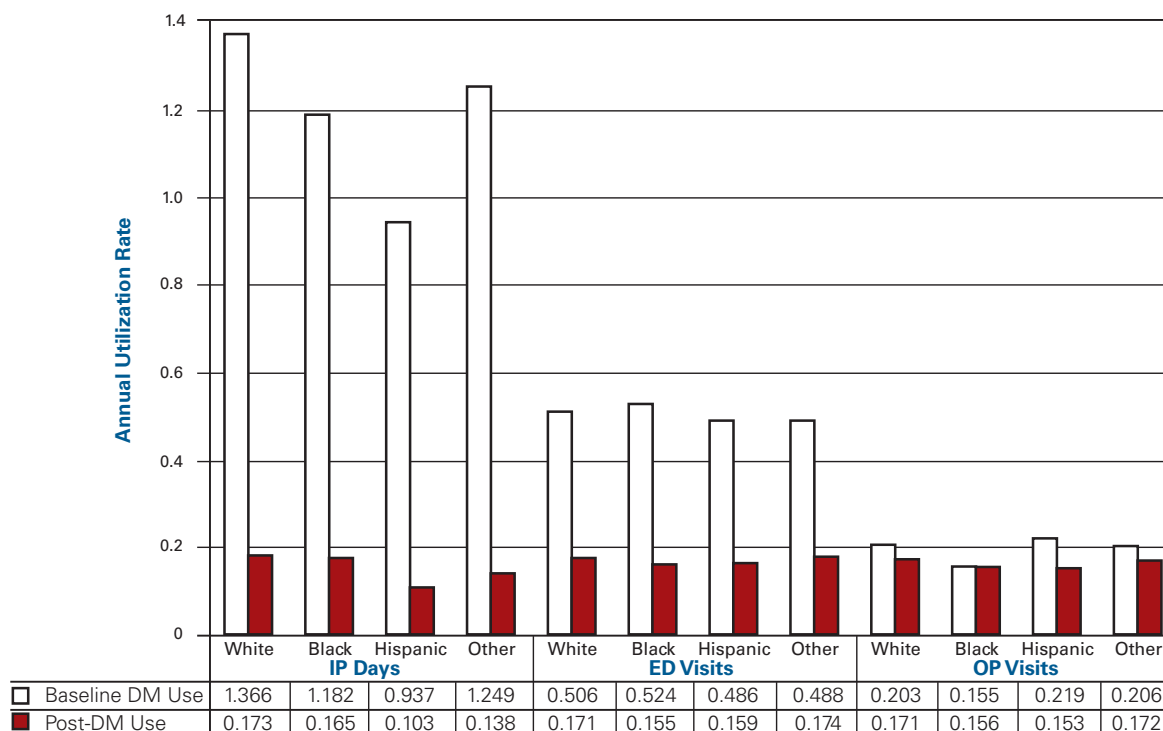
Overall, 32% of high-risk Medicaid beneficiaries who were eligible for DM chose to participate in the program. Participation rates varied significantly across the 4 racial/ethnic groups examined, with 28% of Hispanics, 29% of white subjects, 35% of African Americans, and 37% of other racial/ethnic groups participating.

The **Figure** summarizes the key findings from this analysis. The results combine the findings from the 2-part model to demonstrate the overall effect on annual utilization rates of enrollment in DM, controlling for other covariates.

At baseline, IP days per year ranged from 0.937 among Hispanics to 1.366 among white subjects. At baseline, Hispanics and African Americans had significantly lower IP use than white subjects, and Hispanics had significantly

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■ **Figure.** Baseline and Postenrollment Annual Utilization Rates for Hospital Inpatient (IP) Days, Emergency Department (ED) Visits, and Outpatient (OP) Visits Among Disease Management (DM) Enrollees, October 2001 to October 2003



lower use than African Americans. Disease management significantly reduced IP utilization within all 4 groups by a similar absolute amount, ranging from 0.834 days among Hispanics to 1.193 days among white subjects. Because DM had a similar absolute effect across all 4 groups, some of the baseline disparities in annual IP use remained in the post-DM period. Hispanics continued to have significantly lower annual use of IP days compared with white subjects and African Americans after enrollment in DM.

In contrast, ED visits were not significantly different across the 4 racial/ethnic categories at baseline. Disease management significantly reduced utilization within all 4 groups by a similar amount, ranging from 0.314 fewer visits per year among the “other” category of race/ethnicity to 0.369 fewer visits per year among African Americans. As a result, post-DM annual ED visits did not significantly differ across the 4 racial/ethnic categories.

African Americans had significantly fewer annual OP visits at baseline (0.155 per year) compared with white subjects (0.203 per year), Hispanics (0.219 per year), and others (0.206 per year). Each of these 3 groups had statistically significant declines in annual ED visits as a result of DM, while the frequency of ED visits among African Americans remained

unchanged. In the post-DM period, there were no longer any significant disparities across the 4 racial/ethnic groups in annual OP visits.

## DISCUSSION

An important issue in the adoption of DM programs for Medicaid is how well such programs are likely to work among populations that have lower incomes and are more diverse than is typically found among those with employment-based insurance. Our results indicate that the Florida DM program was equally effective in absolute terms in significantly reducing utilization of hospital IP days, ED visits, and OP visits across 4 racial/ethnic groups (except for OP visits among African Americans). Because IP days and ED visits are 2 of the most costly components of care, the Florida DM program may have produced a net savings to the state. Although our study did not focus on measuring costs or evaluating the net costs of the Florida DM program, our findings suggest that even modest reductions in IP days and ED visits could have a large effect on Medicaid expenditures.

Because eligible individuals had to opt in the DM program and the overall participation rate was 32%, it is possible that

our findings are subject to self-selection bias. In our previous work comparing DM enrollees with those who remained in UC, we found that DM had a significant effect on our outcome variables even after controlling for differences in the propensity to enroll in DM between DM enrollees and nonenrollees using observable characteristics, including race/ethnicity.<sup>4</sup> Nevertheless, DM enrollees may still differ from those who remain in UC according to unobservable characteristics (eg, motivation to successfully self-manage their chronic illnesses). Therefore, our results may overstate the effect of DM if the program was more likely to attract enrollees who were highly motivated to succeed. The only way to assess the magnitude of this potential self-selection bias would be to compare our findings with those of similar Medicaid DM programs using random assignment of beneficiaries to DM and UC or using a pre-post comparison with mandatory DM program participation. However, there are no such studies in the DM literature, to our knowledge.

Our findings indicate that the Florida DM program had a uniform absolute effect on IP days, ED visits, and OP visits across racial/ethnic groups within the Medicaid population. The initial disparity between racial/ethnic groups in IP days at baseline was not eliminated as a result of DM. The low rate of IP days per year observed among Hispanics at baseline may reflect access barriers resulting from language discordance between patient and provider or a lack of cultural competency on the part of providers. The fact that we observed comparable absolute reductions in IP days for all racial/ethnic categories indicates that DM may have further exacerbated access problems for Hispanics. On the other hand, it is also possible that the higher utilization rates of IP days among the non-Hispanic groups reflect higher rates of inappropriate utilization at baseline, so larger declines in those groups would have been desirable. Or, the baseline differences could be due to IP utilization for acute conditions unrelated to the 4 chronic illnesses managed in the DM program.

In contrast to the effects of DM on IP days, DM seems to have eliminated disparities in annual OP visits that existed at baseline between African Americans and the other 3 racial/ethnic groups. Further investigation is necessary to understand what are the sources of these disparities in baseline utilization and whether DM programs are appropriately reducing or eliminating those differences. Specifically, states adopting DM programs for their Medicaid populations should investigate possible sources of these baseline utilization differences across racial/ethnic categories, where they exist, as part of their evaluations of these programs.

### Take-away Points

The Florida disease management (DM) program was effective in significantly reducing utilization of hospital inpatient days, emergency department visits, and outpatient visits across 4 racial/ethnic groups (except for outpatient visits among African Americans).

- State Medicaid programs are exploring DM programs to reduce the costs of treatment and to improve the quality of care for beneficiaries with chronic illnesses.
- With financial pressures facing many Medicaid programs, our results should prove promising to other states attempting to identify programs that manage resources more efficiently.
- Disease management programs may be effective in reducing disparities in utilization that exist within chronically ill Medicaid populations.

A concern regarding DM programs when implemented as part of a publicly funded program such as Medicaid is that reductions in utilization may produce savings to taxpayers but may result in poorer-quality care or poorer outcomes. In a separate study,<sup>7</sup> we investigated the effect of Florida's DM program on self-reported health status and behavior measures, as well as several clinical outcome measures. Our results in that study suggest that DM patients generally had better outcomes on the self-reported and clinical outcomes measures relative to patients in UC. As a result, we have no reason to conclude that lower utilization of hospital days and ED visits has resulted in worse health outcomes among DM patients. States adopting DM programs for their Medicaid populations should evaluate the effect of these programs on clinical and health-related quality-of-life outcomes, not just on expenditure and utilization outcomes.

In light of financial pressures facing many state Medicaid programs, our results should prove promising to other states attempting to identify programs to manage scarce resources more efficiently. Disease management programs seem to be an effective method for improving self-management of chronic illnesses and for reducing utilization of high-cost services, while reducing at least some disparities in utilization that exist among chronically ill Medicaid populations.

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