APPENDIX

Effects of Medicare Part D on Disparity Implications of Medication Therapy Management Eligibility Criteria

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When examining the effect of Medicare Part D on racial disparities, the expected value of \( y \) (i.e., dependent variable) can be analyzed using the following difference-in-differences-in-differences (DDD) model:

\[
E[y|\text{Black}, \text{Eligible}, \text{Period}] = F[b_0 + b_1 \text{Black} + b_2 \text{Eligible} + b_3 \text{PostPeriod} + b_4 \text{ComparisonPeriod} + b_5 \text{Black} \times \text{Eligible} + b_6 \text{Black} \times \text{PostPeriod} + b_7 \text{Black} \times \text{ComparisonPeriod} + b_8 \text{Eligible} \times \text{PostPeriod} + b_9 \text{Eligible} \times \text{ComparisonPeriod} + b_{10} \text{Black} \times \text{Eligible} \times \text{PostPeriod} + b_{11} \text{Black} \times \text{Eligible} \times \text{ComparisonPeriod} + e]
\]

In this equation, the function “\( F \)” depends on the nature of the dependent variable:
- “Black” denotes a dummy variable (1 for blacks, 0 for whites)
- “Eligible” denotes a dummy variable for individuals’ medication therapy management (MTM) eligibility (1 for eligible, 0 for ineligible)
- “Period” denotes a vector of categorical variables and represents 3 different time periods, including 2004-2005 as the reference period and dummy variables for the “PostPeriod” (1 for 2007-2008) and “ComparisonPeriod” (1 for 2001-2002).

The coefficient estimate for “Black*Eligible*PostPeriod” (\( b_{10} \)) is a 3-way interaction term representing changes in differences in disparity patterns between MTM-ineligible and MTM-eligible individuals between 2007-2008 (PostPeriod) and 2004-2005 (ReferencePeriod).

Similarly, the coefficient estimate for “Black*Eligible*ComparisonPeriod” (\( b_{11} \)) is an interaction term representing changes from 2001-2002 (ComparisonPeriod) to 2004-2005 (ReferencePeriod). The “\( e \)” is an error term. Because 2004-2005 is an earlier period than 2007-
2008, the models were linear, so the net effect of Part D could be directly estimated by calculating the difference between $b_{10}$ and negative $b_{11}$.

Thus, another level of difference was calculated based on results from the DDD model, resulting in a difference-in-differences-in-differences-in-differences (DDDD) model (see Figure in the body of the article).

The interpretation of the results depends on the direction of disparities. If whites had lower values for a variable than minorities, and if the confidence interval of DDDD included only positive values, then that would suggest that the difference in racial disparities was reduced after implementing Part D. Similarly, the same conclusion would be true if whites had higher values for a variable, and if the confidence interval included only negative values.