



HHS Public Access

Author manuscript

J Pharm Health Serv Res. Author manuscript; available in PMC 2017 December 01.

Published in final edited form as:

J Pharm Health Serv Res. 2016 December ; 7(4): 209–215. doi:10.1111/jphs.12142.

Disparity Implications of Proposed 2015 Medicare Eligibility Criteria for Medication Therapy Management Services

Junling Wang, M.S., Ph.D. [Professor of Health Outcomes and Policy Research],

Department of Clinical Pharmacy, The University of Tennessee Health Science Center College of Pharmacy, 881 Madison Avenue, Room 221, Memphis, TN 38163

Yanru Qiao, M.S. [Research Assistant],

Department of Clinical Pharmacy, The University of Tennessee Health Science Center College of Pharmacy, 881 Madison Avenue, Room 212, Memphis, TN 38163, Phone: 901-448-3522, Fax: 901-448-1221, yqiao1@uthsc.edu

Christina A. Spivey, LMSW, Ph.D. [Assistant Professor],

Department of Clinical Pharmacy, The University of Tennessee Health Science Center College of Pharmacy, 881 Madison Avenue, Room 258, Memphis, TN 38163, Phone: 901-448-7141, Fax: 901-448-7053, cspivey3@uthsc.edu

Christine Li [Pharmacy Student],

The University of Tennessee Health Science Center College of Pharmacy, 881 Madison Avenue, Memphis, TN 38163, Phone: 901-448-5100, Fax: 901-448-1221, cli25@uthsc.edu

Caroline Clark [Summer Undergraduate Student],

The University of Tennessee Health Science Center College of Pharmacy, 881 Madison Avenue, Memphis, TN 38163, Phone: 901-448-5100, Fax: 901-448-1221, carolee92@gmail.com

Yuewen Deng [Summer Undergraduate Student],

The University of Tennessee Health Science Center College of Pharmacy, 881 Madison Avenue, Memphis TN 38163, Phone: 901-448-5100, Fax: 901-448-1221, ywdeng3@gmail.com

Flora Liu [Consultant],

Firefly Life Technologies, 101 Catskill Court, Belle Mead, NJ 08502, Phone: 901-448-3601, Fax: 901-448-1221, fliu9327@gmail.com

Jeffrey Tillman [Pharmacy Student at College of Pharmacy], and

The University of Tennessee Health Science Center, 881 Madison Avenue, Memphis TN 38163, Phone: 901-448-5100, Fax: 901-448-1221, jtillma3@uthsc.edu

Marie Chisholm-Burns, Pharm.D., M.P.H., M.B.A., F.C.C.P., F.A.S.H.P. [Professor and Dean of College of Pharmacy]

The University of Tennessee Health Science Center, 881 Madison Avenue, Memphis TN 38139, Phone: 901-448-7053, Fax: 901-448-1221, mchisho3@uthsc.edu

Corresponding Author: Junling Wang, Ph.D., M.S., Professor of Health Outcomes and Policy Research, Department of Clinical Pharmacy, College of Pharmacy, The University of Tennessee Health Science Center, 881 Madison Avenue, Room 221, Memphis, TN 38163, Phone: 901-448-3601, Fax: 901-448-1221, jwang26@uthsc.edu.

Conflict of interest disclosures: There are no conflicts of interest.

Abstract

Objectives—Previous studies found that racial and ethnic minorities may be less likely than non-Hispanic Whites (Whites) to meet existing Medicare medication therapy management (MTM) eligibility criteria. To address these issues, the Centers for Medicare & Medicaid Services (CMS) proposed alternative Medicare MTM eligibility criteria for 2015. Due to opposition to other Part D reforms proposed simultaneously by various stakeholders, CMS rescinded all proposed reforms. This study was conducted to determine whether non-Hispanic Blacks (Blacks) and Hispanics have lower likelihood of meeting the proposed 2015 Medicare MTM eligibility criteria.

Methods—This retrospective observational analysis used Medical Expenditure Panel Survey data (2010-2011). The final study sample was comprised of 2,721 Whites (weighted to 37,185,896), 917 Blacks (weighted to 4,665,644), and 538 Hispanics (weighted to 3,532,882). Chi-square tests were used to examine racial and ethnic disparities in meeting proposed 2015 MTM eligibility criteria and each component of proposed 2015 MTM eligibility criteria. In multivariate analysis, a logistic regression model was used to control for population socio-demographic and health-related characteristics.

Key Findings—Compared to Whites with a proportion of MTM eligibility of 58.82%, the eligible proportion was 57.09% ($P=0.20$) for Blacks, and 48.97% ($P<0.0001$) for Hispanics, respectively. According to multivariate logistic regression, odds ratios of meeting MTM eligibility for Blacks and Hispanics compared to Whites were 0.74 (95% Confidence Interval [CI] = 0.62-0.88) and 0.53 (95% CI=0.43-0.67), respectively.

Conclusions—The proposed 2015 MTM eligibility criteria would not eliminate racial and ethnic disparities in MTM eligibility. Alternative MTM eligibility criteria should be devised.

Keywords

Race; ethnicity; medication therapy management services; eligibility; Medicare

Introduction

Unnecessary medical expenses due to irresponsible medication use in the United States have been estimated at over \$213 billion in 2013. Medication utilization issues among the elderly, including mismanaged polypharmacy, non-adherence, and suboptimal generic use, accounted for over 80% of these costs.¹ When the Medicare Prescription Drug, Improvement, and Modernization Act of 2003 (MMA) established Medicare Part D to provide prescription drug benefits to Medicare beneficiaries, the Centers for Medicare and Medicaid Services (CMS) required Part D plans to incorporate medication therapy management (MTM) programs into their plans' benefits to address medication utilization issues among the elderly.² The five main components of MTM are medication therapy review, personal medication record, medication-related action plan, intervention and/or referral, and documentation and follow-up.³ These services aim to improve drug use and reduce the risk of adverse drug events through education and counseling provided by qualified health care providers such as pharmacists.²

When MTM programs were first established in 2006, MTM services were restricted to individuals, who (1) have *multiple* chronic conditions, (2) use *multiple* Part D drugs, and (3) have annual drug costs exceeding \$4,000.⁴ Thresholds for *multiple* chronic conditions and drugs were determined at the Part D plans' discretion. MTM program participation was low among Part D enrollees, perhaps due to sponsors' ability to set restrictive criteria; for example, the eligibility thresholds used by Part D plans were as high as 5 chronic conditions and 23 Part D drugs in 2006.⁵ For 2010 and after, CMS capped the allowable MTM eligibility thresholds at 3 chronic conditions, 8 Part D drugs, and \$3000 in drug costs.⁴ These expanded MTM eligibility criteria did not achieve the 25% MTM participation rate that CMS hoped for.⁶ To date, participation rates for MTM programs have never exceeded 15%.⁶ Additionally, MTM eligibility criteria are implicated in racial and ethnic disparities in receiving MTM services.^{5,7-11} Non-Hispanic Blacks (Blacks) and Hispanics may be less likely to meet MTM eligibility criteria because said criteria are predominantly based on prescription drug utilization, and these minorities typically use fewer prescription drugs and incur lower drug costs compared to their non-Hispanic White (White) counterparts.^{5,7-17}

In consideration of these findings, CMS proposed for 2015 to set low caps for the allowable MTM eligibility threshold at 2 chronic conditions (with at least one being a core chronic disease, including cardiovascular disease, diabetes, dyslipidemia, respiratory disease, bone disease—arthritis, mental health, Alzheimer's disease, and end stage renal disease), 2 Part D drugs, and \$620 in annual drug costs.⁶ The threshold of 2 chronic conditions was proposed to be least restrictive but still in keeping with MMA. The threshold of 2 Part D drugs was selected because patients on 2 or more medications were reportedly more likely to have at least one medication-related problem and need MTM services, and the drug cost threshold of \$620 was determined based on average annual costs of two generic prescriptions among Medicare Part D enrollees.⁶

While the MTM eligibility criteria proposed for 2015 appear to be more inclusive, due to opposition to other proposed Part D reforms by various stakeholders, CMS rescinded these proposed changes.¹⁸ However, it is not clear whether these new rules would resolve the disparity issues associated with MTM eligibility. The objective of this study was therefore to determine whether Blacks and Hispanics have lower likelihood of meeting the proposed 2015 criteria for MTM eligibility.

Methods

Data Sources

This study was a secondary database analysis of the Medical Expenditure Panel Survey (MEPS; 2010 and 2011). MEPS is a set of large-scale national surveys managed by the Agency for Health Care Research & Quality.¹⁹ First implemented in 1996, MEPS collects information on health care and medication utilization and costs and health insurance coverage in the United States through surveying individuals and their families, healthcare providers, and employers. MEPS uses an overlapping panel design: a new panel of patients is added to the sample every year, and each panel is surveyed for a duration of 2 years. MEPS oversamples Blacks and Hispanics to produce reliable minority population estimates, making it appropriate for examining racial and ethnic disparities.

Data from years 2010 and 2011 were the most current available at the time of analysis. Two years of data were combined for adequate statistical power. Three MEPS data files were used in this study: Full-Year Consolidated Data File, Prescribed Medicines File, and Medical Conditions File. The Full-Year Consolidated Data File includes information on patients' socio-demographic backgrounds (i.e., age, gender, and race/ethnicity). The Prescribed Medicines File and Medical Conditions File contain information on patients' use of prescription medications and medical conditions, respectively. The study sample was restricted to Medicare beneficiaries who self-reported as White, Black, or Hispanic. Racial disparities were examined by comparing Whites and Blacks, and ethnic disparities were examined by comparing Whites and Hispanics.

Study Variables

The outcome variable was "would the patient meet proposed 2015 MTM eligibility criteria," defined as a dummy variable (Yes: 1/No: 0). Regarding the criterion based on "2 chronic conditions, with at least one being a core chronic disease," eligibility was determined using a raw count of chronic conditions among a list of 25 conditions applicable to the Medicare population compiled by Daniel and Malone.²⁰ It was also determined at the same time whether a patient had any core chronic disease specified in the proposed 2015 MTM eligibility criteria.⁶ Regarding the criterion of "2 Part D drugs," eligibility was determined based on the utilization of all medications. To determine MTM eligibility based on the drug cost threshold of \$620, costs of all medications were included in the calculation, and the drug cost threshold of \$620 was converted into 2010 and 2011 dollars for 2010 and 2011 data, respectively, based on consumer price index for medical care.²¹

When selecting independent variables of population characteristics to be included in the regression models, Andersen's Behavioral Model of Health Services Utilization was applied.²² Andersen's Model was used because MTM eligibility criteria are predominantly based on the utilization and costs of prescription medications, and the number of chronic conditions is utilization-based as well. There are three components of this conceptual frame: (1) predisposing characteristics, such as social determinants of health (race/ethnicity, age, gender, and marital status), (2) enabling characteristics such as individual and community resources (type of health insurance, income, highest degree, geographic region and metropolitan statistical area), and (3) need factors or the patient's need for health care (self-perceived health status).

Statistical Analysis

Chi-square tests were used to compare socio-demographic characteristics across racial and ethnic groups within the study population. Chi-square tests were also used to examine racial and ethnic disparities in meeting proposed 2015 MTM eligibility criteria and each component (criterion)'s threshold. In subsequent multivariate analysis, a logistic regression model was used to control for population socio-demographic and health-related characteristics. Odds ratios lower than 1 and statistically significant for MTM eligibility of Blacks and Hispanics would suggest lower likelihood in meeting proposed 2015 MTM eligibility criteria compared to Whites.

The complex design of the MEPS survey was accounted for in all analyses, including primary sampling units, strata, and personal weights. Statistical analyses were conducted using SAS 9.3 (SAS Institute Inc., Cary, North Carolina). The statistical significance level was set a *priori* at 0.05. The study was approved by the Institutional Review Board at the lead authors' institution.

Results

The 2010-2011 study sample was comprised of 2,721 Whites (weighted to 37,185,896), 917 Blacks (weighted to 4,665,644), and 538 Hispanics (weighted to 3,532,882). These weighted numbers corresponded to 81.94%, 10.28%, and 7.78% of the sample, respectively. Higher proportions of Whites were found in the older age groups compared to both Blacks and Hispanics (Table 1). Whites were also shown to have statistically higher proportions of males than Blacks. Whites had a higher proportion of married individuals compared to Blacks and Hispanics. Blacks and Hispanics had higher enrollment in Medicaid and lower enrollment in private insurance. Whites had higher income as well as reported attaining higher educational degrees compared to both minority groups. Regarding self-perceived health status, Whites reported “very good” or “excellent” in higher proportions compared to racial and ethnic minorities. All socio-demographic characteristics aforementioned were shown to have significant differences between Whites and minority populations ($P<0.05$; Table 1).

The overall proportion of 2015 MTM eligibility was 58.00% among the study population. Fifty eight point eighty two percent of Whites met eligibility criteria compared to 57.09% of Blacks ($P=0.20$) and 48.97% of Hispanics ($P<0.001$; Table 2). Regarding having at least 2 chronic conditions and at least one core chronic disease, the only significant difference was found in comparing Whites and Hispanics, with the proportion meeting this criterion lower among Hispanics than Whites ($P<0.001$). Both Blacks and Hispanics had lower proportions of using 2 or more Part D drugs than Whites ($P=0.03$ and $P<0.001$, respectively). When examining the criterion of annual drug spending exceeding \$620, eligible proportions were lower among Blacks and Hispanics than Whites ($P=0.001$ and $P<0.001$, respectively).

According to the multivariate analysis adjusting for patient characteristics in Andersen's Behavioral Model of Health Services Utilization, there were significant differences between the minority populations and Whites in meeting the proposed 2015 MTM eligibility criteria. The odds ratios were 0.74 ($P=0.001$; 95% CI=0.62-0.88) and 0.53 ($P<0.0001$; 95% CI=0.43-0.67) for Blacks and Hispanics, respectively (Table 3). These results suggest that after adjusting for population characteristics, Blacks were 26% less likely to be eligible for 2015 MTM services than Whites, and Hispanics were 47% less likely. The analysis also showed other important socio-demographic factors that were associated with an individual's eligibility likelihood for meeting the proposed 2015 criteria (Table 3). Such factors include gender, Medicaid, and private insurance. Males were 19% less likely than females to meet eligibility criteria (OR: 0.81; $P<0.001$; 95% CI=0.72-0.92). Medicaid recipients were 64% more likely than non-Medicaid recipients to be eligible (OR: 1.64; $P<0.001$; 95% CI=1.31-2.06). Individuals with access to private insurance were 38% more likely than those without to meet eligibility criteria (OR: 1.38; $P<0.001$; 95% CI=1.20-1.60). Self-perceived

health status was also associated with eligibility likelihood. The odds ratios for various levels of health status compared to excellent health status were 1.77 for very good health status, 2.97 for good health status, 5.37 for fair health status, and 7.38 for poor health status ($P<0.0001$ for all). Therefore, individuals who self-reported very good, good, fair, or poor health status were 77%, 197%, 437%, and 638% more likely to be eligible for MTM services than individuals who reported excellent health status.

Discussion

MEPS, the nation's most comprehensive database for health care utilization and expenditures, was used in this study to test the disparity implications of the proposed 2015 MTM eligibility criteria. The descriptive analyses found there would still be significant differences in Whites versus Blacks in meeting two components of the proposed criteria: 2 Part D drugs, and \$620 Part D drug costs. There would also still be disparities between Whites and Hispanics in meeting the MTM eligibility criteria as a whole, as well as each individual component. Based on the adjusted analyses, both Blacks and Hispanics were less likely to be MTM eligible based on the proposed 2015 criteria than their White counterparts. These findings suggest that despite the changes proposed in the 2015 MTM eligibility criteria, eligibility disparities would still be circumscribed to racial and ethnic status.

This study's findings concerning disparities follow patterns similar to those identified in prior research,^{5,7-11} as summarized in Table 4. It was previously reported that according to 2006 MTM eligibility thresholds (the most restrictive since MTM implementation), the adjusted odds ratios for meeting eligibility criteria for Blacks and Hispanics compared to Whites were 0.36–0.60 ($P<0.05$) and 0.13–0.46 ($P<0.05$), respectively.⁵ Under the 2010 MTM eligibility criteria, the adjusted odds ratios for Blacks and Hispanics were 0.65–0.71 ($P<0.05$) and 0.48–0.59 ($P<0.05$), respectively.⁵ In the current study, the adjusted odds ratios for Blacks and Hispanics compared to Whites were 0.74 (95% CI=0.62-0.88) and 0.53 (95% CI=0.43-0.67), respectively. Because the confidence intervals in the current study overlap with the ranges reported in previous studies, this suggests the proposed MTM eligibility criteria for 2015 are associated with similar racial and ethnic disparities in MTM eligibility as in previous studies.

The MTM program was designed with laudable intentions as a value-based strategy because individuals meeting the stipulated eligibility criteria seem to have more complicated health issues and may be more likely to benefit from MTM services.²³ However, Blacks and Hispanics may be less likely to meet these utilization-based eligibility criteria than their White counterparts because they historically receive fewer medications and incur lower drug costs. The proposed 2015 Medicare MTM eligibility criteria feature eligibility thresholds substantially lower and less restrictive than the existing Medicare MTM eligibility criteria. However, these criteria remain utilization-based and fail to address the intrinsic disparity implications of utilization-based MTM eligibility thresholds.

MTM program is an important Medicare benefit, because based on previous research, MTM programs have led to positive clinical and economic outcomes.²⁴⁻²⁶ For example, a large integrated health care system in Minneapolis showed in their 10-year study that patients

experienced improved clinical outcomes (55% of patients improved), cost savings (estimated cost savings of \$86/encounter), and high satisfaction with their treatment (95.3% satisfied) after receiving MTM services.²⁴ In another retrospective study, Hui et al. found that mortality was significantly reduced due to MTM intervention, and odds for hospitalization dropped.²⁵ MTM services are also particularly beneficial for the elderly with chronic conditions in whose management pharmacotherapy plays a major role. In a recent study that CMS commissioned, Medicare Part D enrollees with diabetes, chronic heart failure, and chronic obstructive pulmonary disease who received MTM services experienced better outcomes from drug therapy and incurred lower hospitalization costs than those who did not receive MTM services.²⁶

Racial and ethnic disparities are a costly problem for the United States. It has been estimated that eliminating health disparities across racial and ethnic groups would have saved \$229.4 billion in direct medical costs in 2003-2006.²⁷ Realizing the importance of reducing disparities, the U.S. Department of Health and Human Services (HHS) has taken actions to tackle this issue. One of HHS' most prominent initiatives, *Healthy People 2020*, has included reduction of disparities as a major goal.²⁸ MTM services can be instrumental in reducing racial and ethnic disparities. This is because the prevalence of some chronic diseases targeted by MTM services, such as hypertension and diabetes, including the poor control of these conditions, is higher in minority populations than in Whites.^{29,30} The present study further highlights missed opportunities for MTM to contribute to the reduction of racial and ethnic disparities.

Disparity research has experienced four stages of development: (1) documentation of patterns of disparities; (2) identification of the causes of disparities; (3) interventions to address disparities; and (4) comprehensive interventions to address disparities.³¹ To address the problem of disparities in MTM eligibility, a fourth-stage strategy, a comprehensive approach, needs to be taken. Changing MTM eligibility criteria can only be one prong of the solution; addressing the pattern of lower utilization of prescription drugs among minorities than Whites is critical.^{5,7-17}

Encouraging patterns emerge when comparing proposed 2015 MTM eligibility criteria to previous/existing MTM eligibility criteria. The proportions of MTM eligibility before 2010 were reported to be 9.76%, 9.19%, and 8.86% among Whites, Blacks, and Hispanics, respectively.⁵ The proportions reported in the current study were over 45% for all racial and ethnic groups, representing an over 400% increase. The purpose of the proposed 2015 MTM eligibility criteria was to increase the MTM enrollment to 55%, a goal that would have been met had these thresholds been implemented, as the proportion of MTM eligibility among the total study sample was 58%.⁶

Although MTM eligibility thresholds have been lowered by CMS, MTM enrollment rates have continued to hover below CMS expectations, which suggests that not all eligible individuals enrolled in MTM services. Moreover, it is possible that racial and ethnic minorities may enroll at a lower rate than their White counterparts given that minorities tend to have worse access to health services.³² If this has been the case, this pattern may further complicate the disparity issues associated with MTM services.

The current study produced novel findings, but does have limitations. Although nationally representative, MEPS represents only non-institutionalized civilians, not individuals such as those living in nursing homes.¹⁹ MEPS is also mainly self-reported and has the potential of human error associated with data collection, data transfer and data entry. However, MEPS is the nation's most comprehensive database on health care utilization and expenditures and is used commonly in federal reports and national studies.¹⁹ Another limitation is that when determining MTM eligibility based on number of Part D drugs, all prescription medications, rather than only Part D drugs, were included. This is due to the lack of plan-specific formulary information for Medicare beneficiaries in MEPS and wide variation in plan formularies. When determining eligibility based on number of chronic conditions, a list of medical conditions compiled by Daniel and Malone was used due to the lack of a comprehensive list of chronic conditions used by Part D plans to identify the MTM-eligible population.²⁰ Although methodological limitations may have caused inaccurate classification of individuals, the reliability of study findings is supported by the consistency between this study's proportions of MTM eligible individuals and the proportions that CMS projected to be eligible.⁶

Conclusion

Racial and ethnic minorities would be less likely than Whites to meet the proposed 2015 Medicare MTM eligibility criteria when considering differences in population characteristics across racial and ethnic groups. Future studies need to determine MTM enrollment proportions across racial and ethnic groups and devise alternative MTM eligibility criteria for the Medicare Part D program.

Acknowledgements and Funding

This study was supported by grant R01AG049696 from the National Institute On Aging. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institute On Aging or the National Institutes of Health.

References

1. Aitken, M.; Valkova, S. [26 February 2016] Avoidable costs in U.S. healthcare. 2013. <http://www.drugstorenews.com/sites/drugstorenews.com/files/Avoidable%20Costs%20in%20Healthcare.pdf>. (Archived by WebCite® at <http://www.webcitation.org/6fatM9xnn>)
2. Centers for Medicare and Medicaid Services, Department of Health and Human Services. Medicare Program; Medicare prescription drug benefit. Final rule. Fed Regist. 2005; 70(18):4193–4585. [PubMed: 15678603]
3. Pharmacists Association, National Association of Chain Drug Stores Foundation. Medication therapy management in community pharmacy practice: core elements of an MTM service (Version 1.0). J Am Pharm Assoc. 2005; 45(5):573–579.
4. Centers for Medicare and Medicaid Services, Department of Health and Human Services. [26 February 2016] 2010 Call Letter. 2009. <https://www.cms.gov/Medicare/Prescription-Drug-Coverage/PrescriptionDrugCovContra/downloads/2010CallLetter.pdf>. (Archived by WebCite® at <http://www.webcitation.org/6fatk0FjU>)
5. Wang J, et al. Disparity implications of Medicare eligibility criteria for medication therapy management services. Health Serv Res. 2010; 45(4):1061–1082. [PubMed: 20500223]

6. Centers for Medicare and Medicaid Services, Department of Health and Human Services. Medicare program; contract year 2015 policy and technical changes to the Medicare advantage and the Medicare prescription drug benefit programs. Proposed rule. *Fed Regist.* 2014; 79(100):1917–2073.
7. Munshi KD, et al. Disparity implications of the Medicare medication therapy management eligibility criteria: A literature review. *Expert Rev Pharmacoecon Outcomes Res.* 2013; 13(2):201–216. [PubMed: 23570431]
8. Wang J, Qiao Y. Historical Trend of disparity implications of Medicare MTM eligibility criteria. *Res Social Adm Pharm.* 2013; 9(6):758–769. [PubMed: 23062785]
9. Wang J, et al. Potential health implications of racial and ethnic disparities in meeting MTM Eligibility Criteria. *Res Social Adm Pharm.* 2014; 10(1):106–125. [PubMed: 23759673]
10. Wang J, et al. Potential effects of racial and ethnic disparities in meeting Medicare medication therapy management eligibility criteria. *J Pharm Health Serv Res.* 2014; 5(2):109–118. [PubMed: 25045406]
11. Wang J, et al. Effects of Medicare Part D on disparity implications of medication therapy management eligibility criteria. *Am Health Drug Benefits.* 2014; 7(6):346–358. [PubMed: 25558303]
12. Briesacher B, et al. Racial and ethnic disparities in prescription coverage and medication use. *Health Care Financ Rev.* 2003; 25(2):63–76. [PubMed: 15124378]
13. Hall-Lipsy EA, Chisholm-Burns MA. Pharmacotherapeutic disparities: racial, ethnic, and sex variations in medication treatment. *Am J Health Syst Pharm.* 2010; 67(6):462–468. [PubMed: 20208053]
14. Schore J, et al. Racial disparities in prescription drug use among dually eligible beneficiaries. *Health Care Financ Rev.* 2003; 25(2):77–90. [PubMed: 15124379]
15. Wang J, et al. Disparities in access to essential new prescription drugs between non-Hispanic Whites, non-Hispanic Blacks, and Hispanic Whites. *Med Care Res Rev.* 2006; 63(6):742–763. [PubMed: 17099124]
16. Wang J, et al. The economic implications of the racial and ethnic disparities in the use of selective serotonin reuptake inhibitors. *Curr Med Res Opin.* 2007; 23(4):853–863. [PubMed: 17407642]
17. Wang J, et al. Utilizing new prescription drugs: Disparities among non-Hispanic Whites, Non-Hispanic Blacks, and Hispanic Whites. *Health Serv Res.* 2007; 42(4):1499–1519. [PubMed: 17610435]
18. Barlas S. Medicare backs off on MTM changes: Congressional and patient-group opposition to other, more controversial Part D reforms sank the plan. *P T.* 2014; 39(7):463–519. [PubMed: 25083123]
19. Agency for Healthcare Research and Quality, Department of Health and Human Services. [26 February 2016] Medical Expenditure Panel Survey. <http://meps.ahrq.gov/mepsweb/index.jsp>. (Archived by WebCite® at <http://www.webcitation.org/6fatwnSsc>)
20. Daniel GW, Malone DC. Characteristics of older adults who meet the annual prescription drug expenditure threshold for Medicare medication therapy management programs. *J Manag Care Pharm.* 2007; 13(2):142–154. [PubMed: 17330975]
21. Bureau of Labor Statistics. [26 February 2016] Consumer Price Index. <http://www.bls.gov/cpi/#tables>. (Archived by WebCite® at <http://www.webcitation.org/6fau6FLU1>)
22. Andersen RM. Revisiting the behavioral model and access to medical care: Does it matter? *J Health Soc Behav.* 1995; 36(1):1–10. [PubMed: 7738325]
23. Edgar BS. Shifting the focus from cost to value: A government perspective. *J Manag Care Pharm.* 2006; 12(6 Suppl B):S11–15. quiz S24–26. [PubMed: 17274691]
24. Ramalho de Oliveira D, et al. Medication therapy management: 10 years of experience in a large integrated health care system. *J Manag Care Pharm.* 2010; 16(3):185–195. [PubMed: 20331323]
25. Hui RL, et al. Impact of Medicare MTM program: Evaluating clinical and economic outcomes. *Am J Manag Care.* 2014; 20(2):e43–51. [PubMed: 24738554]
26. Acumen; Westat. [26 February 9 2016] Medication Therapy Management in Chronically Ill Populations: Final Report. 2013. http://innovation.cms.gov/files/reports/mtm_final_report.pdf. (Archived by WebCite® at <http://www.webcitation.org/6fauGuWoF>)

27. LaVeist TA, et al. Estimating the economic burden of racial health inequalities in the United States. *Int J Health Serv*. 2011; 41(2):231–238. [PubMed: 21563622]
28. Koh HK. A 2020 vision for healthy people. *N Engl J Med*. 2010; 362(18):1653–1656. [PubMed: 20445177]
29. Byrd L, et al. Disparities in health care: Minority elders at risk. *ABNF J*. 2007; 18(2):51–55. [PubMed: 17608287]
30. Institute of Medicine. The healthcare environment and its relation to disparities.. In: Smedley, BD.; Stith, AY., editors. *Unequal treatment: Confronting racial and ethnic disparities in health care*. National Academy Press; Washington: 2002. p. 80-124.
31. Thomas SB, et al. Toward a fourth generation of disparities research to achieve health equity. *Annu Rev Public Health*. 2011; 32:399–416. [PubMed: 21219164]
32. Wang J, et al. A comparison of direct medical costs across racial and ethnic groups among children with cancer. *Curr Med Res Opin*. 2008; 24(3):847–858. [PubMed: 18257977]

Table 1

Socio-demographic characteristics across racial and ethnic groups among the Medicare population in 2010-2011

| Variables | Groups | Non-Hispanic Whites | | Non-Hispanic Blacks | | Hispanics | |
|---------------------------------|------------------------|---------------------|-------|---------------------|-------|-----------|-------|
| | | No. | % | No. | % | No. | % |
| Age | <65 | 356 | 12.79 | 223 | 23.55 | 82 | 14.75 |
| | 65-75 | 1,316 | 47.27 | 426 | 44.98 | 288 | 51.80 |
| | 75-85 | 786 | 28.23 | 219 | 23.13 | 144 | 25.90 |
| | >85 | 326 | 11.71 | 79 | 8.34 | 42 | 7.55 |
| Gender | Female | 1,525 | 54.78 | 578 | 61.03 | 312 | 56.12 |
| | Male | 1,259 | 45.22 | 369 | 38.97 | 244 | 43.88 |
| Marital status | Not married | 1,298 | 46.62 | 635 | 67.05 | 285 | 51.26 |
| | Married | 1,486 | 53.38 | 312 | 32.95 | 271 | 48.74 |
| Medicaid | No | 2,510 | 90.16 | 644 | 68.00 | 326 | 58.63 |
| | Yes | 274 | 9.84 | 303 | 32.00 | 230 | 41.37 |
| Private Insurance | No | 1,342 | 48.20 | 658 | 69.48 | 447 | 80.40 |
| | Yes | 1,442 | 51.80 | 289 | 30.52 | 109 | 19.60 |
| Poverty Categories ^a | Poor | 426 | 15.30 | 304 | 32.10 | 159 | 28.60 |
| | Near poor | 180 | 6.47 | 112 | 11.83 | 50 | 8.99 |
| | Low income | 494 | 17.74 | 209 | 22.07 | 131 | 23.56 |
| | Middle income | 813 | 29.20 | 211 | 22.28 | 160 | 28.78 |
| | High income | 871 | 31.29 | 111 | 11.72 | 56 | 10.07 |
| Highest degree | Lower than high school | 556 | 20.12 | 389 | 41.65 | 338 | 62.36 |
| | High school | 1,378 | 49.87 | 417 | 44.65 | 148 | 27.31 |
| | Bachelor | 370 | 13.39 | 52 | 5.57 | 32 | 5.90 |
| | Master and higher | 265 | 9.59 | 37 | 3.96 | 9 | 1.66 |
| | Other | 194 | 7.02 | 39 | 4.18 | 15 | 2.77 |
| Region | Northeast | 456 | 16.38 | 160 | 16.90 | 101 | 18.17 |
| | Midwest | 764 | 27.44 | 160 | 16.90 | 46 | 8.27 |
| | South | 990 | 35.56 | 562 | 59.35 | 211 | 37.95 |
| | West | 574 | 20.62 | 65 | 6.86 | 198 | 35.61 |
| MSA | No | 667 | 23.96 | 159 | 16.79 | 48 | 8.63 |
| | Yes | 2,117 | 76.04 | 788 | 83.21 | 508 | 91.37 |
| Self-perceived health status | Excellent | 465 | 17.06 | 89 | 9.58 | 40 | 7.31 |
| | Very good | 779 | 28.59 | 183 | 19.70 | 89 | 16.27 |
| | Good | 870 | 31.93 | 296 | 31.86 | 206 | 37.66 |
| | Fair | 409 | 15.01 | 275 | 29.60 | 173 | 31.63 |
| | Poor | 202 | 7.41 | 86 | 9.26 | 39 | 7.13 |

P<0.05 for the differences between non-Hispanic Whites (Whites) and non-Hispanic Blacks (Blacks) and between Whites and Hispanics for all characteristics except for gender, for which only the former comparison was significant.

^aCategories of poverty status: negative income or poor, <100% of federal poverty line; near poor, 100 <125% of federal poverty line; low income, 125–<200%; middle income, 200–<400%; and high income, 400% and greater.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 2

Numbers and proportions of individuals across racial and ethnic groups meeting the proposed 2015 Medicare eligibility criteria for medication therapy management services

| Analyses | Groups | Number Eligible | Number Eligible Weighted | Proportion Eligible (%) | P Value Compared to Whites |
|--|---------------------|-----------------|--------------------------|-------------------------|----------------------------|
| Proposed 2015 MTM eligibility | Whites ^a | 3,170 | 43,763,731 | 58.82 | |
| | Blacks ^a | 1,007 | 5,337,688 | 57.09 | 0.20 |
| | Hispanics | 525 | 3,442,381 | 48.97 | <0.001 |
| 2 of chronic conditions and 1 core chronic disease | Whites | 4,438 | 60,579,906 | 82.35 | |
| | Blacks | 1,419 | 7,426,748 | 80.44 | 0.07 |
| | Hispanics | 798 | 5,245,953 | 74.44 | <0.001 |
| 2 of Part D drugs | Whites | 4,605 | 62,999,906 | 85.45 | |
| | Blacks | 1,440 | 7,544,259 | 81.63 | 0.03 |
| | Hispanics | 845 | 5,524,304 | 78.82 | <0.001 |
| \$620 Part D drug cost | Whites | 3,375 | 46,476,667 | 62.63 | |
| | Blacks | 1,055 | 5,591,061 | 59.81 | 0.001 |
| | Hispanics | 581 | 3,840,689 | 54.20 | <0.001 |

^aWhites: Non-Hispanic Whites; Blacks: Non-Hispanic Blacks.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 3

Racial and ethnic disparities in meeting proposed 2015 Medicare eligibility criteria for medication therapy management services^a

| Variables | Groups | Estimate | P | Odds Ratio (OR) | 95% Confidence Interval for OR |
|---------------------------------|------------------------|----------|--------|-----------------|--------------------------------|
| Intercept | -- | -1.43 | <.0001 | -- | -- |
| Racial and ethnic groups | Non-Hispanic Whites | -- | -- | -- | -- |
| | Non-Hispanic Blacks | -0.30 | 0.001 | 0.74 | 0.62-0.88 |
| | Hispanics | -0.63 | <.0001 | 0.53 | 0.43-0.67 |
| Age | -- | 0.01 | 0.005 | 1.01 | 1.00-1.02 |
| Gender | Female | -- | -- | -- | -- |
| | Male | -0.21 | 0.001 | 0.81 | 0.72-0.92 |
| Marital status | Not married | -- | -- | -- | -- |
| | Married | 0.01 | 0.87 | 1.01 | 0.88-1.17 |
| Medicaid | No Medicaid | -- | -- | -- | -- |
| | Medicaid | 0.49 | <.0001 | 1.64 | 1.31-2.06 |
| Private insurance | No private insurance | -- | -- | -- | -- |
| | Any private insurance | 0.33 | <.0001 | 1.38 | 1.20-1.60 |
| Poverty categories ^b | Poor | -- | -- | -- | -- |
| | Near poor | -0.21 | 0.10 | 0.81 | 0.63-1.04 |
| | Low income | -0.19 | 0.04 | 0.83 | 0.69-0.99 |
| | Middle income | -0.08 | 0.39 | 0.92 | 0.77-1.11 |
| | High income | -0.20 | 0.06 | 0.82 | 0.69-0.99 |
| Highest degree | Lower than high school | -- | -- | -- | -- |
| | GED or high school | 0.10 | 0.23 | 1.10 | 0.94-1.29 |
| | Bachelor | 0.13 | 0.26 | 1.14 | 0.91-1.44 |
| | Master and higher | 0.14 | 0.26 | 1.15 | 0.90-1.47 |
| | Other | 0.17 | 0.25 | 1.18 | 0.89-1.58 |
| Geographic region | Northeast | -- | -- | -- | -- |
| | Midwest | 0.15 | 0.19 | 1.64 | 0.93-1.46 |
| | South | 0.22 | 0.04 | 1.24 | 1.01-1.54 |
| | West | -0.03 | 0.75 | 0.97 | 0.79-1.19 |
| MSA ^c | Not MSA | -- | -- | -- | -- |
| | Yes MSA | 0.06 | 0.52 | 1.06 | 0.90-1.26 |
| Self-perceived health status | Excellent | -- | -- | -- | -- |
| | Very good | 0.57 | <.0001 | 1.77 | 1.48-2.12 |
| | Good | 1.09 | <.0001 | 2.97 | 2.50-3.54 |
| | Fair | 1.68 | <.0001 | 5.37 | 4.36-6.62 |
| | Poor | 2.00 | <.0001 | 7.38 | 5.39-10.09 |

-- Not applicable.

^a Covariates based on the Andersen's Behavioral Model of Health Services Utilization are predisposing factors (age, gender, and marital status), enabling factors (type of health insurance, income, highest degree, geographic region, and metropolitan statistical area), and need factors (self-perceived health status).

^b Poverty categories: negative income or poor, <100% of federal poverty line; near poor, 100–<125% of federal poverty line; low income, 125–<200%; middle income, 200–<400%; and high income, 400% and greater.

^c MSA: metropolitan statistical area.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 4

Racial and ethnic disparities in the eligibility criteria for medication therapy management services as measured using adjusted odds ratios in comparison to a previous study

| Minority Groups | Wang et al. 2010 (2006 MTM Eligibility Criteria) ^a | Wang et al. 2010 (2010 MTM Eligibility Criteria) ^a | Current Study (Proposed 2015 MTM Eligibility Criteria) |
|---------------------|---|---|--|
| Non-Hispanic Blacks | 0.36–0.60 ($P<0.05$) | 0.65–0.71 ($P<0.05$) | 0.74 (95% CI=0.62-0.88) |
| Hispanic Whites | 0.13–0.46 ($P<0.05$) | 0.48–0.59 ($P<0.05$) | 0.53 (95% CI=0.43-0.67) |

^aData source: Wang J et al. Disparity implications of Medicare eligibility criteria for medication therapy management services. *Health Serv Res* 2010; 45(4): 1061-1082.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript