

# Association Between Low-Income Subsidies and Inequities in Orally Administered Antimyeloma Therapy Use

Shelley A. Jazowski, PhD, MPH; Cleo A. Samuel-Ryals, PhD; William A. Wood, MD, MPH; Leah L. Zullig, PhD, MPH; Justin G. Trogon, PhD; and Stacie B. Dusetzina, PhD

Increasing pharmaceutical prices<sup>1</sup> and variations in cost sharing across the phases of Medicare Part D<sup>2</sup> have raised concerns about patients' financial burden and the suboptimal use of orally administered antimyeloma therapy.<sup>1,3,4</sup> Specifically, 29% of patients with high out-of-pocket costs have delayed antimyeloma treatment, and 43% of patients have either partially filled a prescription for or discontinued antimyeloma therapy due to financial burden.<sup>3</sup> Cost-related treatment delays and nonadherence are more pronounced among persons of color (POC).<sup>3,5-7</sup> Compared with White patients, POC are less likely to receive any systemic antimyeloma therapy<sup>6</sup> and, among those who are treated, experience shorter periods of using novel, orally administered medications.<sup>5,7</sup> Given that timely initiation and continued use of therapy are necessary for optimal clinical outcomes,<sup>8</sup> identifying and evaluating policy solutions that address cost-related barriers to care are imperative.

The Medicare Part D low-income subsidy (LIS) program substantially reduces out-of-pocket costs for beneficiaries with limited incomes (eg, <135% of the federal poverty level) and assets (eg, ≤\$9470 for individuals).<sup>2,4,9</sup> For example, in 2021 a 28-day supply of lenalidomide—one of the most expensive first-line, orally administered antimyeloma medications—cost only \$9.20 for a full-subsidy enrollee<sup>9</sup> compared with an average of \$3000 for a nonsubsidized enrollee.<sup>10</sup> Prior research has suggested that LIS program participation improves the uptake of and short-term adherence to anticancer therapies<sup>11-13</sup>; however, the role of reduced out-of-pocket costs in narrowing racial/ethnic inequities and the continuous use of therapy in older adults with multiple myeloma is limited. Our objectives were to compare the initiation of and adherence to orally administered antimyeloma therapy between full-subsidy and nonsubsidy enrollees and to assess the association between the receipt of full subsidies and racial/ethnic inequities in antimyeloma treatment use.

## METHODS

### Study Population

We used the Surveillance, Epidemiology, and End Results (SEER)–Medicare linked database to identify beneficiaries who were

## ABSTRACT

**OBJECTIVES:** The Medicare Part D low-income subsidy program drastically reduces patient cost sharing and may improve access to and equitable use of high-cost antimyeloma therapy. We compared initiation of and adherence to orally administered antimyeloma therapy between full-subsidy and nonsubsidy enrollees and assessed the association between full subsidies and racial/ethnic inequities in orally administered antimyeloma treatment use.

**STUDY DESIGN:** Retrospective cohort study.

**METHODS:** We used Surveillance, Epidemiology, and End Results–Medicare data to identify beneficiaries diagnosed with multiple myeloma between 2007 and 2015. Separate Cox proportional hazards models assessed time from diagnosis to treatment initiation and time from therapy initiation to discontinuation. Modified Poisson regression examined therapy initiation in the 30, 60, and 90 days following diagnosis and adherence to and discontinuation of treatment in the 180 days following initiation.

**RESULTS:** Receipt of full subsidies was not associated with earlier initiation of or improved adherence to orally administered antimyeloma therapy. Full-subsidy enrollees were 22% [adjusted HR [aHR], 1.22; 95% CI, 1.08–1.38] more likely to experience earlier treatment discontinuation than nonsubsidy enrollees. Receipt of full subsidies did not appear to reduce racial/ethnic inequities in orally administered antimyeloma therapy use. Black full-subsidy and nonsubsidy enrollees were 14% less likely than their White counterparts to ever initiate treatment [full subsidy: aHR, 0.86; 95% CI, 0.73–1.02; nonsubsidy: aHR, 0.86; 95% CI, 0.74–0.99].

**CONCLUSIONS:** Full subsidies alone are insufficient to increase uptake or equitable use of orally administered antimyeloma therapy. Addressing known barriers to care (eg, social determinants of health, implicit bias) could improve access to and use of high-cost antimyeloma therapy.

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66 years or older with a primary diagnosis of multiple myeloma (SEER site recode 34000) between January 2007 and December 2015. Eligible patients were (1) continuously enrolled in fee-for-service Medicare Parts A and B in the 12 months prior to diagnosis; (2) covered by fee-for-service Medicare Parts A, B, and D at diagnosis; (3) not diagnosed at autopsy or death; (4) not eligible for Medicare benefits due to end-stage renal disease; and (5) not receiving Medicare Part D partial subsidies at diagnosis. We further restricted the cohort to patients who were non-Hispanic/Latinx White (herein referred to as White), non-Hispanic/Latinx Black or African American (herein referred to as Black), Hispanic/Latinx, or Asian or Pacific Islander (herein referred to as Asian)<sup>7,14</sup> and who had no prior evidence of antimyeloma treatment use (Figure 1).

**Measures**

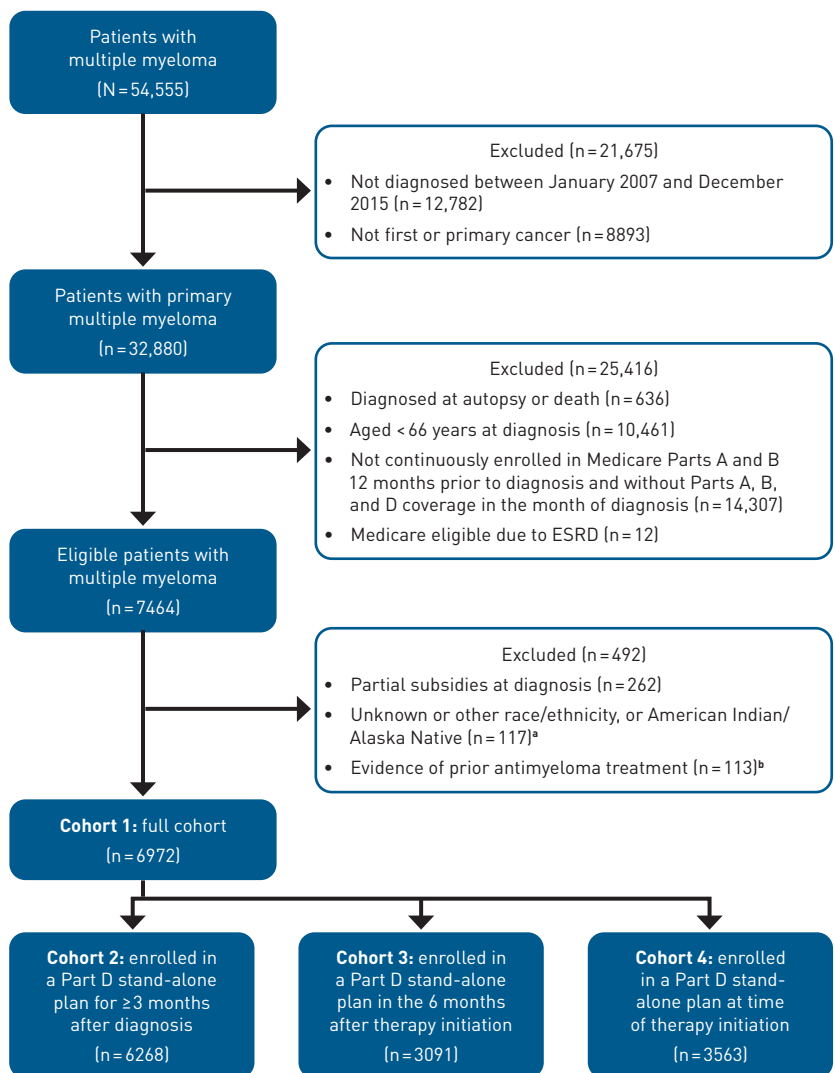
**Treatment initiation.** We identified Medicare Part D–covered medications indicated for or commonly used to treat multiple myeloma: thalidomide, lenalidomide, pomalidomide, ixazomib, panobinostat, melphalan, cyclophosphamide, and etoposide (eAppendix Table 1 [eAppendix available at [ajmc.com](http://ajmc.com)]). We evaluated initiation in 2 ways: (1) time from diagnosis to orally administered therapy initiation in the full cohort (n = 6972) (Figure 1; cohort 1); and (2) the probability of starting antimyeloma treatment within 30, 60, and 90 days<sup>4</sup> of diagnosis among patients continuously enrolled in a Medicare Part D stand-alone plan for at least 3 months after diagnosis (n = 6268) (Figure 1; cohort 2).

**Treatment adherence and discontinuation.** Adherence to and discontinuation of orally administered antimyeloma therapy were assessed among beneficiaries who were continuously enrolled in a Medicare Part D stand-alone plan in the 6 months following treatment initiation (n = 3091) (Figure 1; cohort 3). We defined adherence using the proportion of days covered (PDC)<sup>15</sup> and allowed for switching between orally administered therapies (eg, due to treatment intolerance, therapy nonresponse, or disease progression).<sup>16</sup> Consistent with prior research and Pharmacy Quality Alliance thresholds,<sup>15,16</sup> patients were categorized as adherent to antimyeloma therapy

**TAKEAWAY POINTS**

- ▶ Medicare Part D low-income subsidies reduce cost sharing and may increase the uptake and equitable use of high-cost antimyeloma medications.
- ▶ Receipt of full subsidies was not associated with the timely initiation of or improved adherence to orally administered antimyeloma medications. Moreover, Black enrollees were less likely than White enrollees to ever initiate antimyeloma therapy, regardless of subsidy status.
- ▶ Addressing known barriers to care (eg, implicit bias, social determinants of health) could improve use of high-cost antimyeloma therapy and reduce racial/ethnic inequities in antimyeloma care.

**FIGURE 1. CONSORT Diagram**



ESRD, end-stage renal disease.

<sup>a</sup>Consistent with prior studies of inequities, patients who were American Indian or Alaska Native were excluded from analyses due to limited sample size (n = 31).

<sup>b</sup>Patients who received antimyeloma therapy 32 days or more prior to diagnosis were excluded from all analyses. The initiation date of patients who received therapy fewer than 32 days before diagnosis was recorded as the diagnosis date for initiation analyses (n = 30).

if their PDC was 80% or greater. Discontinuation was defined as a gap of at least 60 consecutive days following exhaustion of available drug supply.<sup>16</sup> We separately evaluated time from orally administered therapy initiation to discontinuation among patients enrolled in a Medicare Part D stand-alone plan at time of initiation (n = 3563) (Figure 1; cohort 4).

**LIS program participation.** LIS program participation in the month of diagnosis was identified in the Medicare Part D enrollment file and beneficiaries were categorized as either full-subsidy (dual-eligible or deemed eligible for reduced co-payments) or nonsubsidy (not eligible for cost-sharing subsidy) enrollees.<sup>4,11</sup>

**Covariates.** Covariates included age at diagnosis, sex, marital status, urbanicity, quarter and year of diagnosis, comorbidity score (measured in the 12 months prior to diagnosis with the Klabunde modification of the Charlson Comorbidity Index score),<sup>11,13</sup> clinical markers of symptomatic multiple myeloma (diagnoses of hypercalcemia, renal impairment, anemia, and bone loss or lesions),<sup>17</sup> prior health service use (hospitalizations and emergency department visits in the 12 months prior to diagnosis), and socioeconomic status (SES) and SES-related factors (Census tract-level median household income, poverty level, high school education, and English proficiency).

### Statistical Analyses

We used separate Cox proportional hazards models to evaluate time to orally administered antimyeloma therapy initiation and discontinuation. In the initiation model, we accounted for death as a competing risk<sup>13,18</sup> and censored patients at Medicare Part D stand-alone plan disenrollment. In the discontinuation model, beneficiaries were censored at hospice enrollment, Medicare Part D stand-alone plan disenrollment, or death (whichever came first). We tested the proportionality assumption using martingale and Schoenfeld residuals<sup>19</sup> and by adding time-dependent variables (interaction between covariate and log-time) to each model.<sup>20</sup> We also used modified Poisson regression<sup>21</sup> with robust error variance to estimate the likelihood of starting therapy within 30, 60, and 90 days of diagnosis and adherence to and discontinuation of treatment in the 180 days following initiation.

**Propensity score weighting.** To assess the independent association between subsidies and antimyeloma treatment use, we used stabilized inverse probability of treatment weights to balance observed patient- and Census tract-level factors between full-subsidy and nonsubsidy enrollees. Characteristics were considered balanced if absolute standardized differences were less than 10% (eAppendix Tables 2 and 3).<sup>22</sup> Factors that were imbalanced following propensity score weighting were added as covariates to the regression models (ie, doubly robust).<sup>23</sup>

**Measuring racial/ethnic inequities.** Consistent with the Institute of Medicine's definition of disparities, we used a multivariable (nonweighted) model to first assess the independent effect of race/ethnicity by controlling only for health status (age at diagnosis, sex, marital status, aforementioned clinical characteristics, and

prior health service utilization).<sup>24,25</sup> We then adjusted for urbanicity and Census tract-level SES and SES-related factors to determine if racial/ethnic differences in antimyeloma therapy use were attenuated.<sup>24,25</sup> Finally, we stratified the models by subsidy status to understand whether full subsidies modify inequities in antimyeloma treatment use.

### Sensitivity Analyses

We conducted several sensitivity analyses to check the robustness of our findings. First, individuals who qualified for Medicare due to a disability may have health needs that influence antimyeloma therapy uptake and utilization; therefore, we restricted analyses to patients whose reason for entitlement was age. Second, to further account for cases of symptomatic multiple myeloma, we restricted time-to-initiation analyses to patients treated within 12 months of diagnosis.<sup>7</sup> Third, we examined initiation of infused antimyeloma treatment (eAppendix Table 1) as a negative control because out-of-pocket costs are expected to be low for both full-subsidy and nonsubsidy enrollees.<sup>11</sup> Fourth, because adherence and discontinuation are related measures, we evaluated orally administered therapy adherence among patients who did not discontinue treatment.<sup>16</sup> Fifth, to account for expected clinical use of antimyeloma therapy among beneficiaries receiving an autologous stem cell transplant, we measured adherence in the first 120 days following treatment initiation.<sup>16</sup> Lastly, orally administered antimyeloma medications have varied toxicity profiles that could influence continued use; therefore, we included initial therapy and days' supply in the propensity score models used to assess adherence and discontinuation.

## RESULTS

### Study Population Characteristics

Among the 6972 beneficiaries with multiple myeloma, approximately 30% were receiving full subsidies and 29% were POC (Table 1<sup>17</sup>). Compared with nonsubsidy enrollees, full-subsidy enrollees were less likely to be White (38% vs 85%) and married (31% vs 57%) but more likely to have multiple comorbidities (49% vs 32%) and live in areas with high rates of poverty (44% vs 17%). Following propensity score weighting, baseline characteristics were well balanced between full-subsidy and nonsubsidy enrollees (eAppendix Table 2).

### Treatment Initiation

A smaller proportion of full-subsidy enrollees (43%) started orally administered antimyeloma therapy any time after diagnosis compared with nonsubsidy enrollees (54%) (Figure 2, panel A). However, treatment uptake within 30, 60, and 90 days of diagnosis was similar between full-subsidy and nonsubsidy enrollees (eAppendix Figure, panels A-C). In propensity score-weighted models, receipt of full subsidies was not associated with earlier orally administered treatment initiation or starting antimyeloma therapy in the 30, 60, and 90 days following diagnosis (eAppendix Table 4).

When assessing uptake by race/ethnicity, a lower percentage of Black full-subsidy and nonsubsidy enrollees initiated orally administered treatment any time and in the 90 days after diagnosis compared with their White, Hispanic/Latinx, and Asian counterparts (Figure 2, panel A and eAppendix Figure, panel C). In the health status-adjusted models, receipt of full subsidies did not appear to narrow inequities in therapy initiation. Among both full-subsidy and nonsubsidy enrollees, Black patients were less likely than White patients to experience earlier orally administered treatment initiation (full subsidy: adjusted HR [aHR], 0.86; 95% CI, 0.73-1.02; nonsubsidy: aHR, 0.86; 95% CI, 0.74-0.99) (Table 2).

**Treatment Adherence and Discontinuation**

Less than half of full-subsidy (35%) and nonsubsidy (41%) enrollees were adherent to orally administered therapy (Figure 2, panel B), but a larger proportion of full-subsidy enrollees discontinued treatment compared with nonsubsidy enrollees (40% vs 33%) (Figure 2, panel C). In weighted models, receipt of full subsidies was not associated with adherence to or discontinuation of antimyeloma treatment in the 180 days following initiation (eAppendix Table 5). However, full-subsidy enrollees had a 22% (aHR, 1.22; 95% CI, 1.08-1.38) increased likelihood of earlier therapy discontinuation relative to nonsubsidy enrollees.

We observed low rates of adherence across all races/ethnicities (Figure 2, panel B). For example, only 30% of Black full-subsidy enrollees and 31% of Asian nonsubsidy enrollees adhered to antimyeloma therapy. A larger percentage of White, Black, Hispanic/Latinx, and Asian full-subsidy enrollees discontinued treatment relative to their nonsubsidized counterparts, with the largest difference observed between Black full-subsidy and nonsubsidy enrollees (43% vs 25%) (Figure 2, panel C). In the health status-adjusted models, we did not observe statistically significant differences in orally administered therapy adherence and discontinuation between White patients and Black, Hispanic/Latinx, and Asian patients who received full subsidies (Table 3). Compared with White nonsubsidy enrollees, Black nonsubsidy enrollees were 27% (adjusted risk ratio [aRR], 0.73; 95% CI, 0.57-0.95) and 26% (aHR, 0.74; 95% CI, 0.56-0.98) less likely to discontinue antimyeloma therapy or experience earlier treatment discontinuation, respectively. Findings were similar when controlling for SES and SES-related factors.

**Sensitivity Analyses**

Full-subsidy enrollees were less likely than nonsubsidy enrollees to experience earlier infused therapy initiation (aHR, 0.81; 95% CI, 0.75-0.88) or to start infused treatment within 60 (aRR, 0.84; 95% CI, 0.73-0.98) or 90 (aRR, 0.88; 95% CI, 0.77-1.00) days of diagnosis (eAppendix Table 6). Results of remaining sensitivity analyses were consistent with our primary findings and are not shown.

**DISCUSSION**

In this study comparing the use of orally administered antimyeloma therapy between Medicare Part D full-subsidy and nonsubsidy

**TABLE 1.** Baseline Characteristics of Full-Subsidy and Nonsubsidy Enrollees With Multiple Myeloma<sup>17,a</sup>

Characteristics	Full-subsidy enrollees, n (%) (n = 2075)	Nonsubsidy enrollees, n (%) (n = 4897)	P
<b>Demographics</b>			
Race/ethnicity			<.0001
Non-Hispanic/Latinx White	793 (38.22)	4169 (85.13)	
Non-Hispanic/Latinx Black or African American	638 (30.75)	437 (8.92)	
Hispanic/Latinx	403 (19.42)	173 (3.53)	
Asian or Pacific Islander	241 (11.61)	118 (2.41)	
Age in years at diagnosis			.8418
< 71	487 (23.47)	1159 (23.67)	
71-75	515 (24.82)	1240 (25.32)	
76-81	533 (25.69)	1208 (24.67)	
≥82	540 (26.02)	1290 (26.34)	
Sex			<.0001
Male	864 (41.64)	2504 (51.13)	
Marital status <sup>b</sup>			<.0001
Married	638 (30.75)	2795 (57.08)	
Not married	1293 (62.31)	1754 (35.82)	
Other/unknown	144 (6.94)	348 (7.11)	
Urbanicity <sup>c</sup>			.0022
Big metro	1158 (55.81)	2522 (51.50)	
Metro	554 (26.70)	1465 (29.92)	
Urban	118 (5.69)	330 (6.74)	
Less urban	186 (8.96)	475 (9.70)	
Rural	59 (2.84)	105 (2.14)	
<b>Clinical characteristics</b>			
Year of diagnosis			<.0001
2007	242 (11.66)	383 (7.82)	
2008	200 (9.64)	448 (9.15)	
2009	221 (10.65)	453 (9.25)	
2010	256 (12.34)	457 (9.33)	
2011	253 (12.19)	477 (9.74)	
2012	249 (12.00)	540 (11.03)	
2013	225 (10.84)	702 (14.34)	
2014	241 (11.61)	697 (14.23)	
2015	188 (9.06)	740 (15.11)	
Q of diagnosis			.6288
Q1	571 (27.52)	1288 (26.30)	
Q2	517 (24.92)	1219 (24.89)	
Q3	503 (24.24)	1249 (25.51)	
Q4	484 (23.33)	1141 (23.30)	
Comorbidity score <sup>d</sup>			<.0001
0	600 (28.92)	2253 (46.01)	
1	459 (22.12)	1089 (22.24)	
≥2	1016 (48.96)	1555 (31.75)	

(continued)

**TABLE 1.** (Continued) Baseline Characteristics of Full-Subsidy and Nonsubsidy Enrollees With Multiple Myeloma<sup>17,a</sup>

Characteristics	Full-subsidy enrollees, n (%) (n = 2075)	Nonsubsidy enrollees, n (%) (n = 4897)	P
<b>Clinical characteristics</b>			
CRAB criteria*			
Hypercalcemia	462 (22.27)	1019 (20.81)	.1740
Renal impairment	1217 (58.65)	2297 (46.91)	<.0001
Anemia	1137 (54.80)	2888 (58.97)	.0012
Bone loss or erosion	398 (19.18)	1015 (20.73)	.1420
<b>Prior health service use<sup>f</sup></b>			
ED visits	950 (45.78)	1567 (32.00)	<.0001
Hospitalizations	865 (41.69)	1363 (27.83)	<.0001
<b>Census tract factors</b>			
Median income			<.0001
< \$40,164.00	889 (42.84)	854 (17.44)	
\$40,164.00- <\$55,846.00	539 (25.98)	1198 (24.46)	
\$55,846.00- <\$78,904.50	404 (19.47)	1345 (27.47)	
≥ \$78,904.50	243 (11.71)	1500 (30.63)	
% below poverty level <sup>g</sup>			<.0001
< 5%	184 (8.87)	1321 (26.98)	
5%- <10%	331 (15.95)	1393 (28.45)	
10%- <20%	639 (30.80)	1357 (27.71)	
≥ 20%	921 (44.39)	826 (16.87)	
% English nonproficiency			<.0001
≤ 1.47%	812 (39.13)	2682 (54.77)	
> 1.47%	1263 (60.87)	2215 (45.23)	
% with high school diploma			<.0001
< 18.77%	384 (18.51)	1355 (27.67)	
18.77%- <26.94%	575 (27.71)	1165 (23.79)	
26.94%- <35.44%	556 (26.80)	1192 (24.34)	
≥ 35.44%	560 (26.99)	1185 (24.20)	

ED, emergency department; Q, quarter.

<sup>a</sup>The table displays characteristics prior to propensity score weighting. Following propensity score weighting, all covariates had an absolute standardized difference less than 0.10, thus suggesting negligible imbalance between full-subsidy and nonsubsidy enrollees (eAppendix Table 2).

<sup>b</sup>Not married includes patients who were single (never married), separated, divorced, or widowed at time of diagnosis. Other/unknown includes patients who were unmarried or had a domestic partner (same sex, opposite sex, or unregistered) or unknown status at time of diagnosis.

<sup>c</sup>Patients with "unknown" urbanicity (11 patients) and poverty level (17 patients) were combined with the largest categories: "big metro" and "10%- <20%," respectively.

<sup>d</sup>Comorbidities were measured in the 12 months prior to multiple myeloma diagnosis using the Klabunde modification of the Charlson Comorbidity Index score.

<sup>e</sup>CRAB criteria were measured in the 12 months prior to and 6 months following multiple myeloma diagnosis using the methods described by Fiala et al.<sup>17</sup>

<sup>f</sup>Health service use was measured in the 12 months prior to multiple myeloma diagnosis.

enrollees, we found no statistically significant differences in earlier therapy initiation or rates of treatment adherence. In addition, reduced cost sharing did not appear to minimize racial/ethnic inequities in multiple myeloma care. We observed inequities in the uptake of orally administered therapy among both full-subsidy and nonsubsidy enrollees; however, no statistically significant differences in therapy adherence were observed by race/ethnicity and subsidy status.

One possible explanation for our findings and inconsistencies with previous studies<sup>11,13,26</sup> is that utilization management processes<sup>27</sup> and restricted distribution networks<sup>27,28</sup> likely contributed to therapy delays for both full-subsidy and nonsubsidy enrollees. In regard to the former, research has demonstrated median treatment delays of 22 days for initial prior authorization approval and an additional 30 days for an appeal to be filed and approved.<sup>29,30</sup> In terms of the latter, risk evaluation and mitigation strategy programs limit the number of specialty pharmacies that are allowed to dispense immunomodulatory agents (lenalidomide, thalidomide, pomalidomide),<sup>28</sup> which has resulted in therapy delays for approximately one-fourth of patients.<sup>28</sup> Although efforts to streamline processes and evaluate programs for barriers to care have been proposed,<sup>28,31</sup> payers and policy makers should consider permanent reforms to ensure timely access to life-extending antimyeloma therapies.

High out-of-pocket costs may have also limited access to orally administered therapy for some nonsubsidy enrollees. Evidence suggests that out-of-pocket costs greater than \$2000 are associated with abandonment of prescriptions for immunomodulatory agents.<sup>32</sup> Although some patients may eventually fill a prescription (eg, after obtaining financial support), others may choose to initiate infused therapy due to the generosity of coverage for outpatient medical services. Because most fee-for-service Medicare beneficiaries have supplemental insurance to aid with out-of-pocket expenses,<sup>33</sup> reduced cost sharing may only partially explain why nonsubsidy enrollees were more likely than full-subsidy enrollees to initiate infused antimyeloma therapy. Potential reasons for the undertreatment of full-subsidy enrollees include poor patient-provider communication (eg, limited discussions regarding treatment options),<sup>34</sup> inadequate social support,<sup>35</sup> structural barriers (eg, lack of reliable transportation, dearth of health care providers),<sup>35,36</sup> and patients' beliefs and preferences (eg, understanding of disease severity and treatment benefits or adverse effects).<sup>27,35,37</sup>

Common barriers to accessing antimyeloma therapy could also explain why full-subsidy enrollees had a 22% higher probability of discontinuing orally administered treatment; however, our findings indicate that reduced cost sharing may not improve the continuous use of high-cost therapies. Studies have shown that out-of-pocket costs—even those less than \$3—can adversely affect the prolonged use of medications among low-income patients.<sup>12</sup> Although full-subsidy enrollees often pay \$1 for a monthly supply of anticancer therapy,<sup>26,38</sup> approximately 1.2 million are exposed to greater cost sharing because they are enrolled in Medicare Part D plans for which they pay a monthly premium.<sup>39</sup> Full-subsidy enrollees could

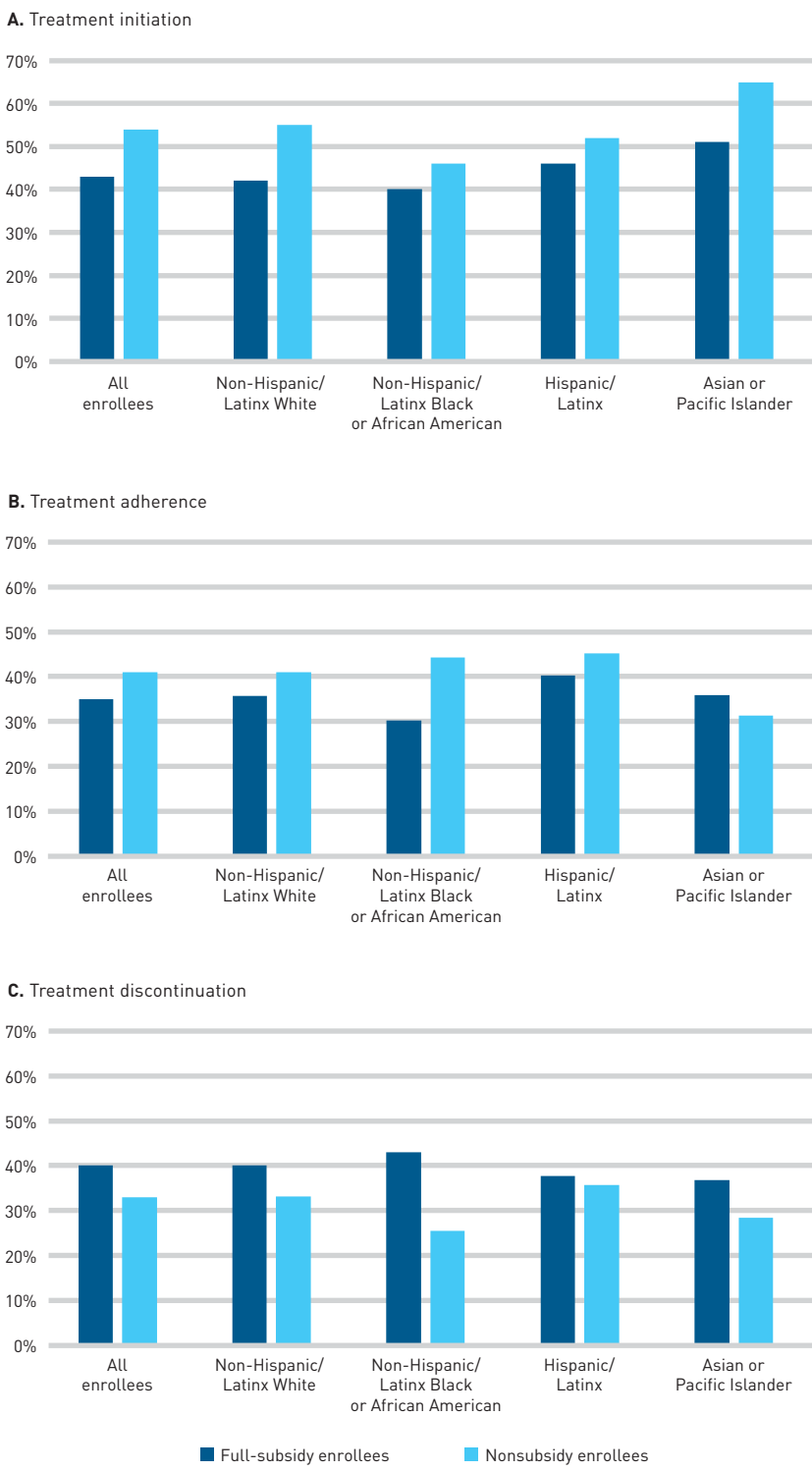


switch to plans that minimize cost sharing,<sup>39</sup> yet many have a poor understanding of the Medicare Part D program<sup>40</sup> and thus do not enroll in a plan that aligns with their health and financial needs. As the number of no-premium plans is expected to decrease by 24% in 2022,<sup>41</sup> federal agencies should consider additional resources to aid full-subsidy enrollees with plan selection to ensure that the LIS program is not inadvertently acting as a financial barrier to anticancer therapy use.

We also observed that Black full-subsidy and non-subsidy enrollees had a lower likelihood of ever initiating orally administered therapy. This, to our knowledge, is not only a novel finding, but it also suggests that subsidies alone are insufficient to narrow racial/ethnic inequities in antimyeloma care. Research indicates that health care provider characteristics (eg, demographics, implicit bias, training) independently influence quality of care, including the underprescribing of medication and timely receipt of aggressive therapies.<sup>42,43</sup> For example, implicit bias during racially discordant patient-provider interactions has been associated with limited patient-centered communication<sup>43,44</sup> and shared decision-making,<sup>44,45</sup> patients' lack of confidence in and nonadherence with recommended treatment plans,<sup>43</sup> and patients' overall perceptions of mistrust of and dissatisfaction with the health care system.<sup>44,45</sup> Given the low rates of treatment initiation<sup>3,5</sup> and high risk of excess mortality<sup>5</sup> among Black patients with multiple myeloma, future studies should focus on the development of interventions that improve patient-provider communication and address health care providers' biases.

Contrary to prior research,<sup>12</sup> we found that Black non-subsidy enrollees were less likely than their White counterparts to discontinue orally administered treatment. White non-subsidy enrollees may have been prescribed a shorter duration of antimyeloma therapy (eg, 3 to 4 cycles of induction therapy with lenalidomide) in preparation for an autologous stem cell transplant. Approximately 28% of older adults (≥ 70 years) receive an autologous stem cell transplant,<sup>46</sup> yet White patients are undergoing transplantation at a greater frequency than Black patients.<sup>5,6</sup> Although it may appear that racial inequities in autologous stem cell transplantation are contributing to

**FIGURE 2.** Unadjusted Proportion of Enrollees Who Used Orally Administered Antimyeloma Therapy



\*Panel A represents the proportion of 6972 enrollees who initiated orally administered antimyeloma treatment any time after diagnosis. Panels B and C represent the proportion of 3091 enrollees who adhered to (proportion of days covered ≥ 80%) and discontinued (gap ≥ 60 days) orally administered antimyeloma therapy in the 180 days after diagnosis, respectively.

**TABLE 2.** Racial/Ethnic Inequities in Orally Administered Antimyeloma Treatment Initiation

Race/ethnicity	Time to initiation <sup>a,b</sup>		30 days <sup>a</sup>		60 days <sup>a</sup>		90 days <sup>a</sup>	
	Effect of race <sup>c</sup>	SES-adjusted <sup>d</sup>	Effect of race <sup>c</sup>	SES-adjusted <sup>d</sup>	Effect of race <sup>c</sup>	SES-adjusted <sup>d</sup>	Effect of race <sup>c</sup>	SES-adjusted <sup>d</sup>
<b>All enrollees</b>								
Non-Hispanic/Latinx White	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Non-Hispanic/Latinx Black or African American	0.85 (0.76-0.94)	0.87 (0.77-0.97)	0.94 (0.73-1.20)	1.01 (0.76-1.33)	0.85 (0.74-0.98)	0.86 (0.73-1.00)	0.84 (0.74-0.95)	0.84 (0.74-0.96)
Hispanic/Latinx	0.94 (0.83-1.06)	0.98 (0.85-1.13)	0.79 (0.56-1.12)	0.86 (0.58-1.25)	0.98 (0.83-1.16)	1.04 (0.86-1.26)	0.96 (0.83-1.11)	0.99 (0.85-1.32)
Asian or Pacific Islander	1.10 (0.96-1.28)	1.15 (0.98-1.34)	1.17 (0.82-1.66)	1.19 (0.81-1.74)	1.13 (0.94-1.36)	1.18 (0.97-1.45)	1.10 (0.94-1.28)	1.12 (0.85-1.17)
<b>Full-subsidy enrollees</b>								
Non-Hispanic/Latinx White	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Non-Hispanic/Latinx Black or African American	0.86 (0.73-1.02)	0.87 (0.72-1.04)	0.90 (0.60-1.33)	0.98 (0.64-1.49)	0.85 (0.68-1.06)	0.85 (0.67-1.07)	0.85 (0.70-1.02)	0.88 (0.72-1.07)
Hispanic/Latinx	0.96 (0.79-1.15)	1.05 (0.86-1.29)	0.70 (0.42-1.15)	0.84 (0.48-1.46)	0.94 (0.73-1.21)	1.02 (0.77-1.35)	0.88 (0.72-1.09)	0.99 (0.79-1.25)
Asian or Pacific Islander	1.15 (0.92-1.42)	1.18 (0.93-1.48)	1.06 (0.62-1.83)	1.26 (0.69-2.31)	1.17 (0.89-1.53)	1.28 (0.95-1.35)	1.10 (0.88-1.38)	1.23 (0.96-1.58)
<b>Nonsubsidy enrollees</b>								
Non-Hispanic/Latinx White	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref
Non-Hispanic/Latinx Black or African American	0.86 (0.74-0.99)	0.86 (0.74-1.00)	0.89 (0.62-1.29)	0.97 (0.66-1.43)	0.84 (0.68-1.03)	0.84 (0.68-1.03)	0.80 (0.67-0.96)	0.80 (0.67-0.96)
Hispanic/Latinx	1.03 (0.83-1.27)	1.03 (0.83-1.27)	0.94 (0.55-1.63)	1.01 (0.58-1.77)	1.14 (0.88-1.48)	1.19 (0.91-1.54)	1.11 (0.89-1.38)	1.14 (0.91-1.42)
Asian or Pacific Islander	1.11 (0.89-1.40)	1.13 (0.90-1.43)	1.28 (0.74-2.21)	1.27 (0.73-2.21)	1.02 (0.75-1.40)	1.05 (0.77-1.44)	0.98 (0.75-1.28)	0.99 (0.76-1.30)

Ref, reference; SES, socioeconomic status.

<sup>a</sup>HRs and 95% CIs are presented for time to initiation, and risk ratios and 95% CIs are presented for treatment started within 30, 60, and 90 days of diagnosis. A total of 6972 patients were included in the time-to-initiation analysis and 6268 patients were included in the analysis of treatment started within 30, 60, and 90 days of diagnosis.

<sup>b</sup>Models with all enrollees were stratified by hypercalcemia and models with full-subsidy enrollees were stratified by hypercalcemia, bone loss, and age at diagnosis because the proportionality assumption was not satisfied for these variables.

<sup>c</sup>In accordance with the Institute of Medicine’s definition of disparities, we assessed the independent effect of race/ethnicity by controlling only for health status (age at diagnosis, sex, marital status, clinical characteristics, and prior health service use).

<sup>d</sup>We adjusted for urbanicity and Census tract–level SES and SES-related factors (median household income, poverty level, high school education, and English proficiency) to determine if observed racial/ethnic differences in treatment initiation were attenuated.

the continuous use of orally administered therapy among Black nonsubsidy enrollees, future research is needed to identify the underlying factors and the short- and long-term clinical outcomes associated with these inequities.

**Limitations**

This study had several limitations. First, causality could not be assessed in our observational study and residual confounding resulting from unobserved characteristics may not have been addressed by our statistical models. Second, we were not able to discern reasons for not starting, delaying, or stopping orally administered antimyeloma therapy. Future research should assess health care providers’ and patients’ treatment preferences to identify barriers to and the root causes of inequities in therapy uptake and continued use. Third, we lacked data on the receipt of prescription assistance outside of the Medicare Part D program.

Cost-sharing support could have provided enrollees with the financial resources to start and/or adhere to orally administered therapy. Fourth, our analysis did not account for phases of the Medicare Part D benefit. Nonsubsidy enrollees who entered the catastrophic coverage phase likely had relatively low out-of-pocket costs that contributed to continued treatment use. Fifth, we were limited to Census tract–level SES and SES-related factors and thus may have misclassified individuals’ SES. Future studies should examine both patient- and area-level SES to better understand the associations among out-of-pocket costs, race/ethnicity, and orally administered anticancer medication use.<sup>12</sup> Sixth, our analysis did not account for known barriers to health equity.<sup>47,48</sup> Future research should examine the role of structural racism (eg, residential segregation, scientific racism) in access to and use of anticancer therapy.<sup>47,48</sup> Seventh, our analysis focused on fee-for-service beneficiaries, which may limit the generalizability of our findings

**TABLE 3.** Racial/Ethnic Inequities in Adherence to and Discontinuation of Orally Administered Antimyeloma Therapy

Race/ethnicity	Adherence <sup>a</sup>		Discontinuation <sup>a</sup>		Time to discontinuation <sup>a,b</sup>	
	Effect of race <sup>c</sup>	SES-adjusted <sup>d</sup>	Effect of race <sup>c</sup>	SES-adjusted <sup>d</sup>	Effect of race <sup>c</sup>	SES-adjusted <sup>d</sup>
<b>All enrollees</b>						
Non-Hispanic/Latinx White	Ref	Ref	Ref	Ref	Ref	Ref
Non-Hispanic/Latinx Black or African American	0.98 (0.85-1.13)	1.09 (0.94-1.27)	0.94 (0.81-1.09)	0.82 (0.70-0.97)	0.99 (0.84-1.17)	0.85 (0.71-1.03)
Hispanic/Latinx	1.12 (0.95-1.31)	1.22 (1.03-1.46)	1.01 (0.85-1.20)	0.94 (0.77-1.15)	1.05 (0.86-1.28)	0.90 (0.71-1.13)
Asian or Pacific Islander	0.87 (0.70-1.07)	0.90 (0.73-1.12)	0.99 (0.80-1.23)	0.94 (0.74-1.18)	1.03 (0.80-1.32)	0.92 (0.70-1.20)
<b>Full-subsidy enrollees</b>						
Non-Hispanic/Latinx White	Ref	Ref	Ref	Ref	Ref	Ref
Non-Hispanic/Latinx Black or African American	0.96 (0.73-1.25)	1.02 (0.77-1.34)	1.00 (0.80-1.24)	0.98 (0.78-1.23)	1.00 (0.77-1.29)	0.98 (0.75-1.28)
Hispanic/Latinx	1.14 (0.88-1.46)	1.13 (0.87-1.48)	0.95 (0.74-1.21)	1.01 (0.77-1.32)	0.86 (0.65-1.15)	0.91 (0.66-1.26)
Asian or Pacific Islander	0.95 (0.70-1.28)	0.87 (0.63-1.20)	0.96 (0.71-1.29)	1.01 (0.74-1.39)	0.81 (0.57-1.16)	0.88 (0.61-1.28)
<b>Nonsubsidy enrollees</b>						
Non-Hispanic/Latinx White	Ref	Ref	Ref	Ref	Ref	Ref
Non-Hispanic/Latinx Black or African American	1.10 (0.92-1.30)	1.19 (0.99-1.42)	0.73 (0.57-0.95)	0.67 (0.51-0.88)	0.74 (0.56-0.98)	0.64 (0.48-0.86)
Hispanic/Latinx	1.14 (0.88-1.48)	1.19 (0.92-1.55)	1.02 (0.74-1.41)	1.03 (0.74-1.42)	1.14 (0.81-1.60)	1.13 (0.80-1.61)
Asian or Pacific Islander	0.78 (0.55-1.12)	0.78 (0.55-1.11)	0.88 (0.60-1.30)	0.95 (0.64-1.40)	0.97 (0.64-1.47)	1.05 (0.69-1.60)

Ref, reference; SES, socioeconomic status.

<sup>a</sup>Risk ratios and 95% CIs are presented for adherence and discontinuation within 180 days of treatment initiation, and HRs and 95% CIs are presented for time to discontinuation. A total of 3091 patients were included in the analysis of adherence and discontinuation within 180 days of treatment initiation and 3563 patients were included in the analysis of time to discontinuation.

<sup>b</sup>The model with all enrollees that assessed the independent effect of race was stratified by marital status, bone loss, and age at diagnosis, and the SES-adjusted model was stratified by marital status, bone loss, age at diagnosis, and high school education because the proportionality assumption was not satisfied for these variables. Similarly, the model with full-subsidy enrollees was stratified by bone loss, and the model with nonsubsidy enrollees was stratified by age at diagnosis, marital status, and year of diagnosis.

<sup>c</sup>In accordance with the Institute of Medicine’s definition of disparities, we assessed the independent effect of race/ethnicity by controlling only for health status (age at diagnosis, sex, marital status, clinical characteristics, and prior health service use).

<sup>d</sup>We adjusted for urbanicity and Census tract-level SES and SES-related factors (median household income, poverty level, high school education, and English proficiency) to determine if observed racial/ethnic differences in treatment use were attenuated.

to patients covered by Medicare Advantage plans. Eighth, some beneficiaries may have remained untreated due to asymptomatic multiple myeloma<sup>49,50</sup>; however, a growing body of literature suggests that early intervention with orally administered therapy may prevent progression to symptomatic disease and improve overall survival.<sup>49,50</sup> Ninth, PDC measures only prescription refills and we were not able to determine if patients actually ingested medication as prescribed. Last, although we did not account for hospitalizations, both adherent and nonadherent hospitalized patients experienced short durations of stay (median, ≤3 days) that would not have meaningfully changed our measures of orally administered treatment use.

## CONCLUSIONS

Receipt of Medicare Part D full subsidies does not appear to improve the use of or reduce racial/ethnic inequities in the initiation of orally administered antimyeloma therapy. Policy makers, health care providers, and researchers should focus on identifying the underlying causes of suboptimal treatment use and developing

interventions to address known barriers to access. Together, these actions could improve the uptake and equitable use of high-cost antimyeloma therapy. ■

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**Author Affiliations:** Department of Health Policy, Vanderbilt University School of Medicine (SAJ, SBD), Nashville, TN; Department of Health Policy and Management, University of North Carolina at Chapel Hill Gillings School of Global Public Health (SAJ, CAS-R, JGT), Chapel Hill, NC; Lineberger Comprehensive Cancer Center, University of North Carolina at Chapel Hill (CAS-R, WAW, JGT), Chapel Hill, NC; Flatiron Health, Inc (CAS-R), New York, NY; Department of Medicine, University of North Carolina at Chapel Hill School of Medicine (WAW), Chapel Hill, NC; Department of Population Health Sciences, Duke University School of Medicine (LLZ), Durham, NC; Center of Innovation to Accelerate Discovery and Practice Transformation, Durham Veterans Affairs Health Care System (LLZ), Durham, NC; Vanderbilt-Ingram Cancer Center (SBD), Nashville, TN.

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**Address Correspondence to:** Shelley A. Jazowski, PhD, MPH, Department of Health Policy, Vanderbilt University School of Medicine, 2525 West End Ave, Ste 1200, Nashville, TN 37203. Email: shellej.jazowski@vumc.org.

## REFERENCES

- Dusetzina SB, Huskamp HA, Keating NL. Specialty drug pricing and out-of-pocket spending on orally administered anticancer drugs in Medicare Part D, 2010 to 2019. *JAMA*. 2019;321(20):2025-2027. doi:10.1001/jama.2019.4492
- Davidoff AJ, Hendrick FB, Zeidan AM, et al. Patient cost sharing and receipt of erythropoiesis-stimulating agents through Medicare Part D. *J Oncol Pract*. 2015;11(2):e190-e198. doi:10.1200/JOP.2014.001527
- Huntington SF, Weiss BM, Vogl DT, et al. Financial toxicity in insured patients with multiple myeloma: a cross-sectional pilot study. *Lancet Haematol*. 2015;2(10):e408-e416. doi:10.1016/S2352-3026(15)00151-9
- Olszewski AJ, Dusetzina SB, Eaton CB, Davidoff AJ, Trivedi AN. Subsidies for oral chemotherapy and use of immunomodulatory drugs among Medicare beneficiaries with myeloma. *J Clin Oncol*. 2017;35(29):3306-3314. doi:10.1200/JCO.2017.72.2447
- Ailawadhi S, Parikh K, Abouzaid S, et al. Racial disparities in treatment patterns and outcomes among patients with multiple myeloma: a SEER-Medicare analysis. *Blood Adv*. 2019;3(20):2986-2994. doi:10.1182/bloodadvances.2019003008
- Fakhri B, Fiala MA, Tuchman SA, Wildes TM. Undertreatment of older patients with newly diagnosed multiple myeloma in the era of novel therapies. *Clin Lymphoma Myeloma Leuk*. 2018;18(3):219-224. doi:10.1016/j.clml.2018.01.005
- Ailawadhi S, Frank RD, Advani P, et al. Racial disparity in utilization of therapeutic modalities among multiple myeloma patients: a SEER-Medicare analysis. *Cancer Med*. 2017;6(12):2876-2885. doi:10.1002/cam4.1246
- Mikhael J, Ismaila N, Cheung MC, et al. Treatment of multiple myeloma: ASCO and CCO joint clinical practice guideline. *J Clin Oncol*. 2019;37(14):1228-1263. doi:10.1200/JCO.18.02096
- 2021 resource and cost-sharing limits for low-income subsidy (LIS). CMS. October 30, 2020. Accessed August 5, 2022. <https://www.cms.gov/files/document/2021-lis-resource-limits-memo.pdf>
- Brooks A. Medicare Part D patients may pay more than \$15K for their specialty medications. GoodRx Health. June 2, 2021. Accessed August 5, 2022. <https://www.goodrx.com/insurance/medicare/medicare-part-d-patients-out-of-pocket-costs-for-specialty-medications>
- Chou YT, Farley JF, Stinchcombe TE, Proctor AF, Lafata JE, Dusetzina SB. The association between Medicare low-income subsidy and anticancer treatment uptake in advanced lung cancer. *J Natl Cancer Inst*. 2020;112(6):637-646. doi:10.1093/jnci/djz183
- Biggers A, Shi Y, Charlson J, et al. Medicare D subsidies and racial disparities in persistence and adherence with hormonal therapy. *J Clin Oncol*. 2016;34(36):4398-4404. doi:10.1200/JCO.2016.67.3350
- Winn AN, Keating NL, Dusetzina SB. Factors associated with tyrosine kinase inhibitor initiation and adherence among Medicare beneficiaries with chronic myeloid leukemia. *J Clin Oncol*. 2016;34(36):4323-4328. doi:10.1200/JCO.2016.67.4184
- Jarrin OF, Nyandeghe AN, Grafova IB, Dong X, Lin H. Validity of race and ethnicity codes in Medicare administrative data compared to gold-standard self-reported race collected during routine home health care visits. *Med Care*. 2020;58(11):e1-e8. doi:10.1097/MLR.0000000000001216
- Hess LM, Raebel MA, Conner DA, Malone DC. Measurement of adherence in pharmacy administrative databases: a proposal for standard definitions and preferred measures. *Ann Pharmacother*. 2006;40(7-8):1280-1288. doi:10.1345/aph.1H018
- Dusetzina SB, Huskamp HA, Jazowski SA, et al. Oral oncology parity laws, medication use, and out-of-pocket spending for patients with blood cancers. *J Natl Cancer Inst*. 2020;112(10):1055-1062. doi:10.1093/jnci/djz243
- Fiala MA, Dukeman J, Tuchman SA, Keller M, Vij R, Wildes TM. Development of an algorithm to distinguish smoldering versus symptomatic multiple myeloma in claims-based data sets. *JCO Clin Cancer Inform*. 2017;1:CC1.17.0089. doi:10.1200/JCO.17.00089
- Dignam JJ, Zhang Q, Kocherginsky MN. The use and interpretation of competing risks regression models. *Clin Cancer Res*. 2012;18(8):2301-2308. doi:10.1158/1078-0432.CCR-11-2097
- Allison PD. *Survival Analysis Using SAS: A Practical Guide*. 2nd ed. SAS Institute Inc; 2010.
- Testing the proportional hazard assumption in Cox models. UCLA Institute for Digital Research & Education. Accessed August 5, 2022. <https://stats.idre.ucla.edu/other/examples/asa2/testing-the-proportional-hazard-assumption-in-cox-models/>
- Zou G. A modified Poisson regression approach to prospective studies with binary data. *Am J Epidemiol*. 2004;159(7):702-706. doi:10.1093/aje/kwh090
- Austin PC. Balance diagnostics for comparing the distribution of baseline covariates between treatment groups in propensity-score matched samples. *Stat Med*. 2009;28(25):3083-3107. doi:10.1002/sim.3697
- Nguyen TL, Collins GS, Spence J, et al. Double-adjustment in propensity score matching analysis: choosing a threshold for considering residual imbalance. *BMC Med Res Methodol*. 2017;17(1):78. doi:10.1186/s12874-017-0338-0
- Samuel CA, Landrum MB, McNeil BJ, Bozeman SR, Williams CD, Keating NL. Racial disparities in cancer care in Veterans Affairs health care system and the role of site of care. *Am J Public Health*. 2014;104(suppl 4):S562-S571. doi:10.2105/AJPH.2014.302079
- Le Cook B, McGuire TG, Lock K, Zaslavsky AM. Comparing methods of racial and ethnic disparities measurement across different settings of mental health care. *Health Serv Res*. 2010;45(3):825-847. doi:10.1111/j.1475-6773.2010.01100.x
- Rivera DR, Ennewell L, Barrett MJ, et al. Population-based utilization and costs associated with tyrosine kinase inhibitors for first-line treatment of chronic myelogenous leukemia among elderly patients. *J Manag Care Spec Pharm*. 2020;26(12):1494-1504. doi:10.18553/jmcp.2020.26.12.1494
- Sweiss K. Oral antimyeloma therapy: barriers to patient adherence and tips for improvement. *HOPA News*. 2018;15(3):3-6.
- Schepers AJ, Jones AR, Reeves BN, Tuchman SA, Bates JS. A comparison of response in the presence or absence of a delay in induction therapy with bortezomib, lenalidomide, and dexamethasone. *J Oncol Pharm Pract*. 2019;25(7):1692-1698. doi:10.1177/1078155218815283
- Cavallo J. Study finds prior authorization may be associated with delayed receipt of oral anticancer drugs. The ASCO Post. September 20, 2021. Accessed August 5, 2022. <https://ascopost.com/news/september-2021/study-finds-prior-authorization-may-be-associated-with-delayed-receipt-of-oral-anticancer-drugs/>
- Wallace ZS, Harkness T, Fu X, Stone JH, Choi HK, Walensky RP. Treatment delays associated with prior authorization for infusible medications: a cohort study. *Arthritis Care Res (Hoboken)*. 2020;72(11):1543-1549. doi:10.1002/acr.24062
- Newcomer LN, Weininger R, Carlson RW. Transforming prior authorization to decision support. *J Oncol Pract*. 2017;13(1):e57-e61. doi:10.1200/JOP.2016.015198
- Doshi JA, Li P, Huo H, Pettit AR, Armstrong KA. Association of patient out-of-pocket costs with prescription abandonment and delay in fills of novel oral anticancer agents. *J Clin Oncol*. 2018;36(5):476-482. doi:10.1200/JCO.2017.74.5091
- Koma W, Cubanski J, Neuman T. A snapshot of sources of coverage among Medicare beneficiaries in 2018. Kaiser Family Foundation. March 23, 2021. Accessed August 5, 2022. <https://www.kff.org/medicare/issue-brief/a-snapshot-of-sources-of-coverage-among-medicare-beneficiaries-in-2018/>
- Institute of Medicine. *Delivering High-Quality Cancer Care: Charting a New Course for a System in Crisis*. The National Academies Press; 2013.
- Seal BS, Anderson S, Shermock KM. Factors associated with adherence rates for oral and intravenous anticancer therapy in commercially insured patients with metastatic colon cancer. *J Manag Care Spec Pharm*. 2016;22(3):227-235. doi:10.18553/jmcp.2016.22.3.227
- Yang W, William JH, Hogan PF, et al. Projected supply of and demand for oncologists and radiation oncologists through 2025: an aging, better-insured population will result in a shortage. *J Oncol Pract*. 2014;10(1):39-45. doi:10.1200/JOP.2013.001319
- Eek D, Krohe M, Mazar I, et al. Patient-reported preferences for oral versus intravenous administration for the treatment of cancer: a review of the literature. *Patient Prefer Adherence*. 2016;10:1609-1621. doi:10.2147/PPA.S106629
- Caram MEV, Oerlin MK, Dusetzina S, et al. Adherence and out-of-pocket costs among Medicare beneficiaries who are prescribed oral targeted therapies for advanced prostate cancer. *Cancer*. 2020;126(23):5050-5059. doi:10.1002/cncr.33176
- Cubanski J, Damico A, Neuman T. Medicare Part D in 2018: the latest on enrollment, premiums, and cost sharing. Kaiser Family Foundation. May 17, 2018. Accessed August 5, 2022. <https://www.kff.org/medicare/issue-brief/medicare-part-d-in-2018-the-latest-on-enrollment-premiums-and-cost-sharing/>
- Riley GF, Warren JL, Harlan LC, Blackwell SA. Endocrine therapy use among elderly hormone receptor-positive breast cancer patients enrolled in Medicare Part D. *Medicare Medicaid Res Rev*. 2011;1(4):0.001.04.a04. doi:10.5600/mmrr.001.04.a04
- An overview of the Medicare Part D prescription drug benefit. Kaiser Family Foundation. October 19, 2022. Accessed August 5, 2022. <https://www.kff.org/medicare/fact-sheet/an-overview-of-the-medicare-part-d-prescription-drug-benefit/>
- Os D, Niu J, Etting LS, Buchholz TA, Giordano SH. Determinants of practice patterns and quality gaps in lung cancer staging and diagnosis. *Chest*. 2014;145(5):1097-1113. doi:10.1378/chest.13-1628
- Penner LA, Dovidio JF, Gonzalez R, et al. The effects of oncologist implicit racial bias in racially discordant oncology interactions. *J Clin Oncol*. 2016;34(24):2874-2880. doi:10.1200/JCO.2015.36.3658
- Thornton RL, Powe NR, Roter D, Cooper L. Patient-physician social concordance, medical visit communication and patients' perceptions of health care quality. *Patient Educ Couns*. 2011;85(3):e201-e208. doi:10.1016/j.pcc.2011.07.015
- Penner LA, Dovidio JF, West TV, et al. Aversive racism and medical interactions with black patients: a field study. *J Exp Soc Psychol*. 2010;46(2):436-440. doi:10.1016/j.jesp.2009.11.004
- Munshi PN, Vesole D, Jurczynski A, et al. Age no bar: a CBMTR analysis of elderly patients undergoing autologous hematopoietic cell transplantation for multiple myeloma. *Cancer*. 2020;126(23):5077-5087. doi:10.1002/cncr.33171
- Bailey ZD, Feldman JM, Bassett MT. How structural racism works – racist policies as a root cause of U.S. racial health inequities. *N Engl J Med*. 2021;384(8):768-773. doi:10.1056/NEJMs2025396
- Essien UR, Dusetzina SB, Gellad WF. A policy prescription for reducing health disparities—achieving pharmacoequity. *JAMA*. 2021;326(18):1793-1794. doi:10.1001/jama.2021.17764
- Bolli N, Sgherza N, Curci P, et al. What is new in the treatment of smoldering multiple myeloma? *J Clin Med*. 2021;10(3):421. doi:10.3390/jcm10030421
- Zhao AL, Shen KN, Wang JN, Huo LQ, Li J, Cao XX. Early or deferred treatment of smoldering myeloma: a meta-analysis on randomized controlled trials. *Cancer Manag Res*. 2019;11:5599-5611. doi:10.2147/CMAR.S205623

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**eAppendix Table 1.** Antimyeloma Therapy Indications and Uses

<b>Drug</b>	<b>Drug Class</b>	<b>FDA Approved</b>	<b>Indication or Use</b>
<u>Orally-administered Therapy</u>			
Thalidomide	Immunomodulatory agent	Yes	Approved in combination with dexamethasone for the treatment of patients with newly diagnosed multiple myeloma
Lenalidomide	Immunomodulatory agent	Yes	Approved in combination with dexamethasone for the treatment of patients with multiple myeloma
Pomalidomide	Immunomodulatory agent	Yes	Approved in combination with dexamethasone for the treatment of patients with multiple myeloma who received at least 2 prior therapies and have demonstrated disease progression on or within 60 days of completion of last therapy
Ixazomib	Proteasome inhibitor	Yes	Approved in combination with lenalidomide and dexamethasone for the treatment of patients with multiple myeloma who have received at least 1 prior therapy
Panobinostat	Histone deacetylase inhibitor	Yes	Approved in combination with bortezomib and dexamethasone for the treatment of patients with multiple myeloma who have received at least 2 prior regimens
Melphalan	Chemotherapy	Yes	Approved for the palliative treatment of patients with multiple myeloma
Cyclophosphamide	Chemotherapy	Yes	Approved for the treatment of patients with multiple myeloma
Etoposide	Chemotherapy	No	Used in combination with chemotherapy, steroids, and/or immunomodulatory agents to treat patients with multiple myeloma
<u>Infused Therapy</u>			
Bortezomib	Proteasome inhibitor	Yes	Approved for the treatment of patients with multiple myeloma
Carfilzomib	Proteasome inhibitor	Yes	Approved in combination with dexamethasone or lenalidomide and dexamethasone for the treatment of patients with relapsed or refractory multiple myeloma OR as a single agent for the treatment of patients with multiple myeloma who have received 1 or more lines of therapy
Daratumumab	Monoclonal antibody	Yes	Approved in combination with bortezomib, melphalan and prednisone for patients newly diagnosed with multiple myeloma who are ineligible for autologous stem cell transplant OR in combination with lenalidomide and dexamethasone or bortezomib and dexamethasone for the treatment of patients with multiple myeloma who have received at

			least 1 prior therapy OR in combination with pomalidomide and dexamethasone for the treatment of patients with multiple myeloma who have received at least 2 prior therapies OR as a monotherapy for the treatment of patients with multiple myeloma who have received at least 3 prior lines of therapy
Elotuzumab	Monoclonal antibody	Yes	Approved in combination with lenalidomide and dexamethasone for the treatment of patients with multiple myeloma who have received 1 to 3 prior therapies OR in combination with pomalidomide and dexamethasone for the treatment of patients with multiple myeloma who have received at least 2 prior therapies
Melphalan	Chemotherapy	Yes	Approved for the palliative treatment of patients with multiple myeloma for whom oral therapy is not appropriate
Cyclophosphamide	Chemotherapy	Yes	Approved as a single agent or in combination with other agents for the treatment of patients with multiple myeloma
Doxorubicin	Chemotherapy	Yes	Approved in combination with bortezomib for the treatment of patients with multiple myeloma who have not previously received bortezomib and have received at least 1 prior therapy
Carmustine	Chemotherapy	Yes	Approved for palliative therapy as a single agent or in combination with prednisone to treat patients with multiple myeloma
Bendamustine	Chemotherapy	No	Used as a single agent or in combination with immunomodulatory agents or proteasome inhibitors to treat patients with multiple myeloma
Cisplatin	Chemotherapy	No	Used in combination with chemotherapy, steroids, immunomodulatory agents, and/or proteasome inhibitors to treat patients with multiple myeloma
Etoposide	Chemotherapy	No	Used in combination with chemotherapy, steroids, and/or immunomodulatory agents to treat patients with multiple myeloma
Vincristine	Chemotherapy	No	Used in combination with chemotherapy and steroids to treat patients with multiple myeloma

**Abbreviations:** FDA, Food and Drug Administration

**Source:** FDA-approved indications were identified on each product's labels, while off-label use was collected from treatment guidelines and cancer/medical websites (e.g., American Cancer Society).

**eAppendix Table 2.** Absolute Standardized Differences Pre- and Post-weighting Among Treatment Initiation Cohorts

	<b>Cohort 1 (n=6,972)<sup>a,b</sup></b>		<b>Cohort 2 (n=6,268)<sup>a,b</sup></b>	
	<b>Pre-IPTW</b>	<b>Post-IPTW</b>	<b>Pre-IPTW</b>	<b>Post-IPTW</b>
<b>Demographics</b>				
Race/ethnicity				
Non-Hispanic/Latinx White	1.1015	0.0070	1.1379	0.0107
Non-Hispanic/Latinx Black or African American	0.5692	0.0153	0.5936	0.0193
Hispanic/Latinx	0.5148	0.0126	0.5201	0.0153
Asian or Pacific Islander	0.3663	0.0053	0.3654	0.0102
Age at diagnosis				
<71	0.0047	0.0436	0.0044	0.0406
71-75	0.0115	0.0542	0.0240	0.0669
76-81	0.0235	0.0941	0.0173	0.0996
≥82	0.0073	0.0007	0.0028	0.0039
Sex				
Male	0.1912	0.0262	0.1920	0.0028
Female	0.1912	0.0262	0.1920	0.0028
Marital status				
Married	0.5503	0.0473	0.5720	0.0481
Not married	0.5495	0.0465	0.5835	0.0402
Other/unknown	0.0067	0.0015	0.0250	0.0151
Urbanicity				
Big metro	0.0865	0.0016	0.1074	0.0078
Metro	0.0715	0.0055	0.0742	0.0053
Urban	0.0435	0.0192	0.0623	0.0323
Less urban	0.0254	0.0044	0.0318	0.0055
Rural	0.0449	0.0007	0.0267	0.0000
<b>Clinical Characteristics</b>				
Year of diagnosis				
2007	0.1298	0.0092	0.1280	0.0208
2008	0.0168	0.0236	0.0468	0.0218
2009	0.0468	0.0028	0.0410	0.0021
2010	0.0970	0.0024	0.1070	0.0013
2011	0.0785	0.0270	0.0672	0.0165
2012	0.0304	0.0169	0.0293	0.0094
2013	0.1057	0.0327	0.1153	0.0370
2014	0.0782	0.0235	0.0906	0.0327
2015	0.1864	0.0221	0.1796	0.0131
Quarter of diagnosis				
Q1	0.0275	0.0390	0.0243	0.0430
Q2	0.0007	0.0392	0.0053	0.0333

Q3	0.0294	0.0135	0.0281	0.0113
Q4	0.0007	0.0122	0.0017	0.0005
Comorbidity score				
0	0.3587	0.0506	0.3746	0.0574
1	0.0028	0.0449	0.0528	0.0494
≥2	0.3563	0.0121	0.3693	0.0154
CRAB criteria				
Hypercalcemia	0.0355	0.0199	0.0206	0.0396
No hypercalcemia	0.0355	0.0199	0.0206	0.0396
Renal impairment	0.2368	0.0030	0.2311	0.0082
No renal impairment	0.2368	0.0030	0.2311	0.0082
Anemia	0.0843	0.0651	0.0728	0.0525
No anemia	0.0843	0.0651	0.0728	0.0525
Bone loss or erosion	0.0388	0.0644	0.0407	0.0837
No bone loss or erosion	0.0388	0.0644	0.0407	0.0837
<b>Prior Health Service Use</b>				
ED visits				
Yes	0.2855	0.0112	0.3058	0.0081
No	0.2855	0.0112	0.3058	0.0081
Hospitalizations				
Yes	0.2942	0.0344	0.3043	0.0394
No	0.2942	0.0344	0.3043	0.0394
<b>Census Tract Factors</b>				
Median income				
<\$40,164.00	0.5760	0.0133	0.5783	0.0147
\$40,164.00-<\$55,846.00	0.0350	0.0087	0.0422	0.0124
\$55,846.00-<\$78,904.50	0.1896	0.0007	0.1877	0.0037
≥\$78,904.50	0.4760	0.0217	0.4813	0.0310
% Below poverty level				
<5%	0.4859	0.0379	0.4947	0.0417
5%-<10%	0.3042	0.0236	0.3033	0.0377
10%-<20%	0.0680	0.0020	0.0702	0.0183
≥20%	0.6255	0.0134	0.6354	0.0201
% English non-proficiency				
≤1.47%	0.3173	0.0358	0.3316	0.0262
>1.47%	0.3173	0.0358	0.3316	0.0262
% High school diploma				
<18.77%	0.2187	0.0150	0.2166	0.0060
18.77%-<26.94%	0.0897	0.0186	0.0809	0.0167
26.94%-<35.44%	0.0564	0.0442	0.0743	0.0317
≥35.44%	0.0640	0.0110	0.0545	0.0094

**Abbreviations:** ED, emergency department; IPTW, inverse probability of treatment weights

<sup>a</sup> Cohort 1 (full cohort) included patients with multiple myeloma meeting inclusion criteria. Cohort 2 was restricted to patients who had ≥3 months of continuous Medicare Part D stand-alone plan coverage after diagnosis.



<sup>b</sup> Following propensity score-weighting, all covariates had an absolute standardized difference  $<0.10$ , thus suggesting negligible imbalance between full subsidy and non-subsidy enrollees.

**eAppendix Table 3.** Absolute Standardized Differences Pre- and Post-weighting Among Treatment Adherence and Discontinuation Cohorts

	<b>Cohort 3 (n=3,091)<sup>a,b</sup></b>		<b>Cohort 4 (n=3,563)<sup>a,c</sup></b>	
	<b>Pre-IPTW</b>	<b>Post-IPTW</b>	<b>Pre-IPTW</b>	<b>Post-IPTW</b>
<b>Demographics</b>				
Race/ethnicity				
Non-Hispanic/Latinx White	1.1179	0.0065	1.1690	0.0056
Non-Hispanic/Latinx Black or African American	0.5445	0.0057	0.5624	0.0039
Hispanic/Latinx	0.5750	0.0033	0.5555	0.0180
Asian or Pacific Islander	0.4122	0.0085	0.3997	0.0055
Age at diagnosis				
<70	0.0197	0.0963	0.0148	0.0977
70-73	0.0922	0.0620	0.1006	0.0167
74-78	0.0056	0.0259	0.0014	0.0171
≥79	0.0601	0.1726	0.0831	0.1203
Sex				
Male	0.2707	0.0341	0.2646	0.0518
Female	0.2707	0.0341	0.2646	0.0518
Marital status				
Married	0.5954	0.0640	0.5816	0.0573
Not married	0.5698	0.0586	0.5806	0.0483
Other/unknown	0.0527	0.0122	0.0100	0.0198
Urbanicity				
Big metro	0.1695	0.0455	0.1702	0.0132
Metro	0.1483	0.0251	0.1534	0.0089
Urban/rural	0.0493	0.0294	0.0431	0.0275
<b>Clinical Characteristics</b>				
Year of diagnosis				
2007	0.1205	0.0180	0.1342	0.0248
2008	0.0661	0.0058	0.0671	0.0162
2009	0.0331	0.0787	0.0111	0.0740
2010	0.1136	0.0114	0.1036	0.0267
2011	0.0733	0.0404	0.0629	0.0343
2012	0.0084	0.0050	0.0095	0.0042
2013	0.1716	0.0257	0.1607	0.0769
2014	0.0681	0.0064	0.0611	0.0091
2015	0.1435	0.0382	0.1361	0.0526
Quarter of diagnosis				
Q1	0.0543	0.0202	0.0306	0.0157
Q2	0.0279	0.0081	0.0300	0.0076
Q3	0.0127	0.0565	0.0034	0.0630
Q4	0.0421	0.0275	0.0050	0.0396

Comorbidity score				
0	0.4196	0.0072	0.4373	0.0317
1	0.0814	0.0381	0.0828	0.0641
≥2	0.3669	0.0281	0.3782	0.0256
<b>CRAB criteria</b>				
Hypercalcemia	0.0275	0.0691	0.0171	0.1167
No hypercalcemia	0.0275	0.0691	0.0171	0.1167
Renal impairment	0.1770	0.0105	0.2196	0.0189
No renal impairment	0.1770	0.0105	0.2196	0.0189
Anemia	0.0697	0.0597	0.0602	0.0111
No anemia	0.0697	0.0597	0.0602	0.0111
Bone loss or erosion	0.0872	0.0748	0.0499	0.0669
No bone loss or erosion	0.0872	0.0748	0.0499	0.0669
<b>Prior Health Service Use</b>				
ED visits				
Yes	0.3937	0.0093	0.3757	0.0217
No	0.3937	0.0093	0.3757	0.0217
Hospitalizations				
Yes	0.2925	0.0354	0.3304	0.0299
No	0.2925	0.0354	0.3304	0.0299
<b>Census Tract Factors</b>				
Median income				
<\$41,507.50	0.5676	0.0237	0.5511	0.0170
\$41,507.50-<\$58,356.00	0.0411	0.0079	0.0439	0.0245
\$58,356.00-<\$83,275.50	0.2373	0.0353	0.2118	0.0537
≥\$83,275.50	0.4234	0.0519	0.4429	0.0477
% Below poverty level				
<5%	0.5460	0.0408	0.5529	0.0016
5%-<10%	0.2094	0.0541	0.2282	0.0280
10%-<20%	0.0799	0.0402	0.0967	0.0425
≥20%	0.6041	0.0267	0.5891	0.0137
% English non-proficiency				
≤1.34%	0.3368	0.0667	0.3201	0.0390
>1.34%	0.3368	0.0667	0.3201	0.0390
% High school diploma				
<17.50%	0.2387	0.0289	0.2250	0.0602
17.50%-<25.73%	0.0542	0.0498	0.0430	0.0074
25.73%-<34.73%	0.0882	0.0316	0.1013	0.0358
≥34.73%	0.0862	0.1059	0.0699	0.0860

**Abbreviations:** ED, emergency department; IPTW, inverse probability of treatment weights

<sup>a</sup> Cohort 3 included patients who were continuously enrolled in a Medicare Part D stand-alone plan in the 6 months following orally-administered antimyeloma therapy initiation. Cohort 4 included patients who were enrolled in a Medicare Part D stand-alone plan at time of orally-administered antimyeloma therapy initiation.

<sup>b</sup> Following propensity score-weighting in cohort 3, all covariates but one age category (≥79) and one high school category (≥34.73%) had an absolute standardized difference <0.10. Covariates that were imbalanced were included as covariates in the propensity-score weighted modified Poisson models (i.e., doubly-robust).

<sup>c</sup>Following propensity score-weighting in cohort 4, all covariates but one age category ( $\geq 79$ ) and presence of hypercalcemia had an absolute standardized difference  $< 0.10$ . Covariates that were imbalanced were included as covariates in the propensity-score weighted Cox proportional hazards model (i.e., doubly-robust).

**eAppendix Table 4.** Association Between Low-income Subsidies and Orally-administered Antimyeloma Treatment Initiation

	Time to Initiation <sup>a</sup>		30 Days <sup>b,c</sup>		60 Days <sup>b,d</sup>		90 Days <sup>b,e</sup>	
	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Full subsidy	0.85 (0.79-0.92)	0.93 (0.86-1.00)	0.89 (0.74-1.08)	1.16 (0.88-1.54)	0.88 (0.79-0.97)	1.02 (0.87-1.20)	0.89 (0.82-0.97)	1.00 (0.87-1.15)
Non-subsidy	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref

<sup>a</sup> Hazard ratios and 95% confidence intervals are presented for time to initiation analyses. Unadjusted and propensity score-weighted Cox proportional hazards models included patients with multiple myeloma meeting inclusion criteria (n=6,972).

<sup>b</sup> Risk ratios and 95% confidence intervals are presented for treatment started within 30, 60, and 90 days of diagnosis. Unadjusted and propensity score-weighted modified Poisson models included patients enrolled in Medicare Part D stand-alone plans for  $\geq 3$  months after diagnosis (n=6,268).

<sup>c</sup> 133 (7.41%) full subsidy enrollees and 371 (8.30%) non-subsidy enrollees initiated orally-administered antimyeloma treatment covered by Medicare Part D within 30 days of diagnosis.

<sup>d</sup> 384 (21.38%) full subsidy enrollees and 1,089 (24.35%) non-subsidy enrollees initiated orally-administered antimyeloma treatment covered by Medicare Part D within 60 days of diagnosis.

<sup>e</sup> 501 (27.90%) full subsidy enrollees and 1,395 (31.19%) non-subsidy enrollees initiated orally-administered antimyeloma treatment covered by Medicare Part D within 90 days of diagnosis.



**eAppendix Table 5.** Association Between Low-income Subsidies and Adherence to and Discontinuation of Orally-administered Antimyeloma Therapy

	Adherence <sup>a,b</sup>		Discontinuation <sup>a,b</sup>		Time to Discontinuation <sup>c,d</sup>	
	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Full subsidy	0.86 (0.77-0.95)	0.97 (0.81-1.16)	1.23 (1.11-1.36)	1.12 (0.93-1.34)	1.37 (1.21-1.54)	1.22 (1.08-1.38)
Non-subsidy	Ref	Ref	Ref	Ref	Ref	Ref

<sup>a</sup> Risk ratios and 95% confidence intervals are presented for adherence to and discontinuation of antimyeloma therapy analyses. Unadjusted and propensity score-weighted modified Poisson models included beneficiaries who were continuously enrolled in Medicare Part D stand-alone plans in the 180 days following treatment initiation (n=3,091).

<sup>b</sup> Age at diagnosis and high school education were imbalanced following weighting and were included as covariates in the propensity score-weighted models (i.e., doubly-robust).

<sup>c</sup> Hazard ratios and 95% confidence intervals are presented for time to discontinuation analyses. Unadjusted and propensity score-weighted Cox proportional hazards models included beneficiaries who were enrolled in a Medicare Part D stand-alone plan at time of treatment initiation (n=3,563).

<sup>d</sup> Age at diagnosis and presence of hypercalcemia were imbalanced following weighting and were included as covariates in the propensity score-weighted model (i.e., doubly-robust).

**eAppendix Table 6.** Sensitivity Analyses Assessing the Association Between Low-income Subsidies and Initiation of Orally-administered Antimyeloma Therapy

	Time to Initiation <sup>a</sup>		30 Days <sup>a,b,c</sup>		60 Days <sup>a,b,d</sup>		90 Days <sup>a,b,e</sup>	
	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted	Unadjusted	Adjusted
Full subsidy	0.70 (0.65-0.76)	0.81 (0.75-0.88)	0.68 (0.58-0.80)	0.86 (0.66-1.11)	0.72 (0.66-0.79)	0.84 (0.73-0.98)	0.73 (0.68-0.80)	0.88 (0.77-1.00)
Non-subsidy	Ref	Ref	Ref	Ref	Ref	Ref	Ref	Ref

<sup>a</sup> Hazard ratios and 95% confidence intervals are presented for time to initiation analyses and risk ratios and 95% confidence intervals are presented for treatment started within 30, 60, and 90 days of diagnosis.

<sup>b</sup> Unadjusted and propensity score-weighted modified Poisson analyses assessing infused therapy initiation were restricted to patients who were enrolled in Medicare Parts A and B for  $\geq 3$  months after diagnosis (n=6,274).

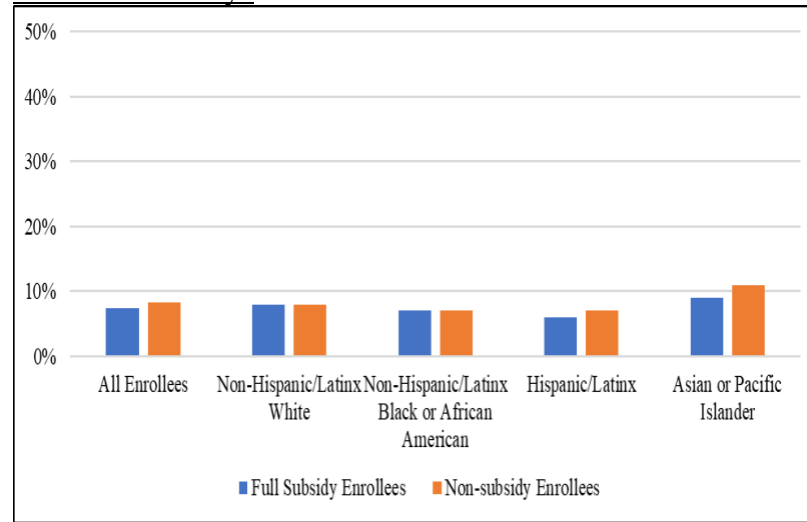
<sup>c</sup> 161 (8.98%) full subsidy enrollees and 592 (13.21%) non-subsidy enrollees initiated infused antimyeloma treatment covered by Medicare Part B within 30 days of diagnosis.

<sup>d</sup> 418 (23.31%) full subsidy enrollees and 1,449 (32.34%) non-subsidy enrollees initiated infused antimyeloma treatment covered by Medicare Part B within 60 days of diagnosis.

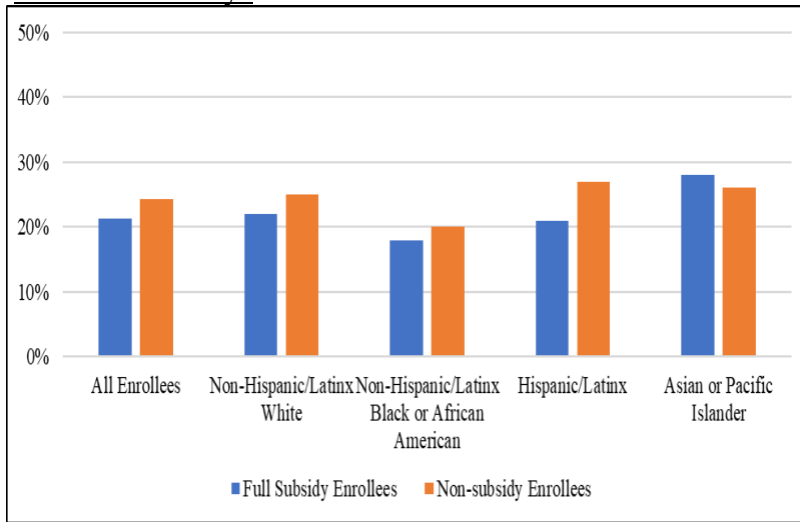
<sup>e</sup> 519 (28.95%) full subsidy enrollees and 1,769 (39.48%) non-subsidy enrollees initiated infused antimyeloma treatment covered by Medicare Part B within 90 days of diagnosis.

**eAppendix Figure.** Unadjusted Proportion of Enrollees who Initiated Orally-administered Antimyeloma Therapy in the 30, 60, and 90 Days After Diagnosis

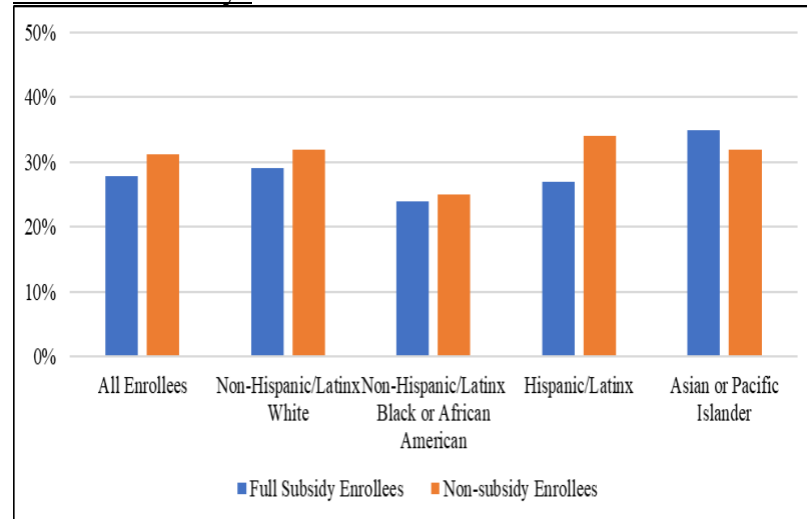
**Panel A – 30 Days**



**Panel B – 60 Days**



**Panel C – 90 Days**



<sup>a</sup> 6,628 patients were included in the analysis of orally-administered therapy initiation within the 30, 60, and 90 days of diagnosis.