Impact of Medicare Part D on mental health treatment and outcomes for dual eligible beneficiaries with HIV

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ABSTRACT

Depression is common among women with HIV and untreated depression can result in poor quality of life and worsen HIV outcomes. Women with HIV who are dually enrolled in Medicaid and Medicare faced a potential disruption in medication access when Medicare Part D was implemented in 2006. The goal of this study was to estimate the effects of Medicare Part D implementation on antidepressant use, depressive symptoms, and hospitalization in Medicaid-Medicare dual eligible women with HIV. This study used 2003–2008 data from the Women's Interagency HIV Study. The effects of Medicare Part D were estimated using a difference-in-differences approach, adjusting for temporal trends using a matched control group of Medicaid-only enrollees. Before Medicare Part D implementation, dual eligibles differed from Medicaid-only enrollees in antidepressant use and hospitalization, despite having identical prescription drug coverage through Medicaid. For dual enrollees, the transition to Medicare Part D was not associated with changes in antidepressant use, depressive symptoms, or hospitalization. We did not find disruptive effects on antidepressant use and related outcomes among dual eligibles in this study. Stable antidepressant use may be due to better access to medical care for dual eligibles through Medicare both before and after Medicare Part D implementation, which may have eclipsed any effects of the transition. It may also signal that classification of antidepressants as a protected drug class under Medicare Part D was effective in preventing psychiatric medication disruption.

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Introduction

Depression is the most common psychiatric comorbidity in people with HIV in the United States (Lopes et al., 2012). Untreated depressive symptoms have been associated with reduced antiretroviral therapy (ART) adherence (Bouhnik et al., 2005; Horberg et al., 2008; Lima et al., 2007), unsuppressed HIV viral load (Evans et al., 2002; Leserman, 2008), and shortened survival (Cook et al., 2004). Sub-optimal ART adherence has also been shown to increase the risk of hospitalization in women with HIV (Fielden et al., 2008). By contrast, people with HIV who are treated for depression showed similar ART adherence and HIV viral control to people with HIV who did not have depression (Horberg et al., 2008), highlighting psychiatric medications as an intervention to lessen depression, decrease hospitalization, and improve HIV outcomes.

For many people with HIV, health insurance facilitates access to prescription drugs, such as antidepressants, by reducing or eliminating costs of obtaining therapy (Gebo et al., 2010). Most people with HIV rely on public insurance programs for their health insurance coverage, with 56% receiving coverage through Medicaid or Medicare (Yehia et al., 2014). Medicare provides health insurance to Americans age 65 and over, as well as to persons under the age of 65 with disabilities (The Henry

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J. Kaiser Family Foundation, 2012). Medicaid has traditionally provided health insurance to certain categories of low-income persons (Kaiser Family Foundation, 2013). Of adults with HIV who were enrolled in Medicaid, 31% met eligibility criteria for Medicare and Medicaid in 2007, and were enrolled in both programs ("dual eligibles") (Young, Garfield, Musumeci, Clemans-Cope, & Lawton, 2013). For dual eligibles, Medicare provides primary coverage while Medicaid absorbs the remaining costs and also provides primary coverage for services not available through Medicare (Young et al., 2013).

Before 2006, Medicare did not include an outpatient prescription drug benefit and dual eligibles received prescription drug coverage through Medicaid's drug benefit. On 1 January 2006, Medicare implemented its own prescription drug benefit, Medicare Part D, and required dual eligibles to transition their prescription drug coverage from Medicaid to Medicare Part D (United States Government Accountability Office, 2007). The goal of Medicare Part D was to improve medication access by reducing financial barriers for Medicare enrollees needing prescription drugs. Although a review associated Medicare Part D implementation with increased medication use and decreased out-of-pocket costs in the general Medicare population, its effects on dual eligibles and other vulnerable populations were mixed (Polinski, Kilabuk, Schneeweiss, Brennan, & Shrank, 2010). In the transition to Medicare Part D, dual eligible beneficiaries were randomly assigned to prescription drug plans that, within general guidelines, determined their own formularies and medication access rules, which often varied widely by plan. Further, cost-sharing for prescription drugs was mandated under Medicare Part D (Kaiser Family Foundation, 2006). By contrast, Medicaid's prescription drug benefit had a broader benefits package, only allowed nominal cost-sharing (Crowley & Ashner, 2005), and included protections that allow enrollees to receive their prescriptions without co-payment if they were unable to pay (Kaiser Family Foundation, 2006).

Cost-sharing and medication disruptions are of special concern for dual eligibles with mental health conditions because of limited ability to pay for medications and because disruptions can have adverse consequences for symptom occurrences and health service utilization (Morden & Garrison, 2006). Two studies examined the effects of Medicare Part D on dual eligibles with psychiatric conditions shortly after implementation (Huskamp et al., 2009; West et al., 2010). In the first study, psychiatrists indicated that 44% of dual eligible patients had difficulties accessing a psychiatric medication (Huskamp et al., 2009). The second study demonstrated that medication access problems for dual eligibles with psychiatric conditions increased slightly during the first year after Medicare Part D implementation (West et al., 2010). These studies indicated that Medicare Part D was associated with financial and administrative barriers to medication access for dual eligibles with psychiatric conditions, and that those barriers were sustained over at least the first year after implementation.

Thirty-five percent of dual eligibles with psychiatric conditions were unable to access their medication after Medicare Part D implementation because the medication was not covered by their Medicare Part D plan (Huskamp et al., 2009). In a similar population of dual eligibles with psychiatric conditions, 29% discontinued or temporarily stopped their medication because of coverage limitations (West et al., 2010). Increased switching following Medicare Part D implementation may have adversely affected mental health outcomes because psychotropic drugs classes are less therapeutically interchangeable than medications for other chronic conditions (Goldman et al., 2004). Prescription drug plans within Medicare have shown variable medication switching rates, indicating that some plans may be more appropriate for dual eligibles with psychiatric conditions (Donohue & Frank, 2007; Huskamp, 2003).

Given indications of increased cost-sharing, variation in prescription drug plan formularies, and reports of psychiatric medication disruption associated with Medicare Part D among dual eligibles, the goal of this study was to estimate the effects of Medicare Part D implementation on antidepressant use, depressive symptoms, and hospitalization among women with HIV. We used six years of data from the Women's Interagency HIV Study (WIHS), an observational cohort investigating the treatment and prevention of HIV infection in women.

Methods

Data source

The WIHS prospectively studies women who are living with or at high risk for HIV infection (Barkan et al., 1998; Hessol et al., 2009). Since 1994, the WIHS has collected data biannually on 3677 women living with HIV. We used six years of data from study visits between 2003 and 2008. During that timeframe, the WIHS consisted of six study sites, located in the Bronx, NY; Brooklyn, NY; Washington, DC; San Francisco, CA; Los Angeles, CA; and Chicago, IL. Study visits include a physical examination, laboratory measurements, and an interview to obtain insurance, medication, and sociodemographic information.

Design and study sample

This study is a secondary data analysis of WIHS participants who attended study visits between 2003 and 2008

($N = 1,807$). We restricted our study to participants who (1) were living with HIV in 2003 and (2) reported Medicaid-Medicare dual eligibility or Medicaid-only enrollment in 2005. Participants who missed three consecutive visits between 2003 and 2008 were excluded from this analysis to ensure representation in both pre- and post-implementation time periods. There were 125 dual eligibles (67% of all dual eligibles in 2005) and 676 Medicaid-only participants (77% of all Medicaid-only participants in 2005) who met the inclusion criteria for this study.

Measures

Health insurance status

To control for temporal trends in medication use that are unrelated to Medicare Part D implementation, we compared individuals who were on Medicaid only before and after January 2006 to those who transitioned from Medicaid to Medicare Part D's prescription drug coverage during the same period. We categorized participants into two mutually exclusive groups. Participants who were dual eligibles at any point in 2005 were considered dual eligible at the transition to Medicare Part D, and made up our analytic group of interest. Participants who reported Medicaid coverage and no other private or public insurance in 2005 were considered Medicaid-only at the transition to Medicare Part D, and made up our matched control group.

Outcomes of interest

The following self-reported outcomes were examined: (1) antidepressant use, (2) depressive symptoms, and (3) inpatient hospitalization.

We examined pharmacologic treatment of depression by assessing the proportion of participants who self-reported taking "medication for psychological conditions or depression" since their last study visit, taken as a proxy for antidepressant use in the last six months and created a binary indicator variable.

Depressive symptoms were assessed at each visit using the Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff, 1977). First, we treated this outcome continuously, with scores ranging from 0 to 60. Second, we created a binary indicator of probable depression, where participants were classified as having probable depression if their CES-D score was $\geq$16 and as not having probable depression otherwise (Radloff & Locke, 1986). Finally, we assessed self-reported, inpatient hospitalization. In addition to a binary indicator of any hospitalization in the six months since the previous study visit, we also assessed the number of hospitalizations.

Statistical analysis

Using the raw data, we plotted each of our outcome variables for visits between 2003 and 2008 using a segmented locally weighted smoothed spline (Lowess) plot (Cleveland, 1979) to visualize discontinuities associated with the transition and to support the validity of a difference-in-differences analysis by demonstrating that the parallel trends assumption holds.

Propensity score matching. An unadjusted comparison between dual eligibles and the Medicaid-only group could be confounded by inherent differences between the two groups, we used propensity scores to match dual eligibles with study participants who were enrolled in Medicaid only.

Propensity scores were created using logistic regression, where dual eligibility was a function of the pre-treatment covariates. After estimating the propensity scores, dual eligibles were matched 1:1 with Medicaid-only participants using a nearest-neighbor matching approach, without replacement (Morgan & Harding, 2006). Of the baseline (pre-Medicare Part D) variables considered for the propensity score model, our final set included: race (African-American vs. other), HIV viral load, age, hospitalization, any antidepressant use, and total number of medications (ART and other). As continuous variables, age and HIV viral load were included as splines (Royston & Sauerbrei, 2007), and categorical variables were dichotomized. We used Stata's psmatch2 program to match the groups by propensity score (Leuven & Sianesi, 2014) and mkspline to create restricted cubic splines (Stata Corp., n.d.; Nichols, 2007). We compare covariate balance pre- and post-propensity score matched groups in Table 1.

We used a difference-in-differences (DiD) approach on the propensity score-matched cohort to estimate the effects of Medicare Part D implementation on dual eligibles with HIV. The Medicaid-only comparison group allowed us to control for temporal trends (e.g., advances in ART or antidepressants) that were common to both groups. The DiD approach consists of a linear model with an interaction term for insurance group (dual eligible or Medicaid-only) and time period (pre- or post-Medicare Part D). The approach allowed us to compare the average changes in proportions between pre- and post- Medicare Part D in dual eligibles (the group that was affected by Medicare Part D implementation) to the average changes in proportions between pre- and post-Medicare Part D in participants with Medicaid only (the group that was unaffected by Medicare Part D implementation). The resulting "difference-in-differences" can be attributed to the policy change, if both groups have parallel trends in the pre-Medicare Part D

Table 1. Baseline Characteristics of Medicaid-Medicare dual eligibles and Medicaid-only participants, Women's Interagency HIV Study (2005).

	Unmatched sample ($n = 801$)			Propensity score-matched sample ($n = 234$)		
	Dual eligibles ($n = 125$)	Medicaid-only ($n = 676$)	p-value[a]	Dual Eligibles ($n = 117$)	Medicaid-only ($n = 117$)	p-value[a]
Age, median (IQR)	47 (41, 52)	43 (38, 49)	<0.01	46 (41, 52)	46 (41, 51)	0.79
African American, %	56.5	67.9	0.01	59.4	59.4	1.00
Hispanic Ethnicity, %	24.2	26.6	0.58	23.2	31.0	0.15
WIHS Site, %						
Bronx	15.2	28.7	<0.01	15.3	40.2	<0.01
Brooklyn	20.0	23.5	0.39	22.4	19.7	0.75
Washington, DC	8.0	8.6	0.83	7.7	5.1	0.43
Los Angeles	20.0	11.0	<0.01	18.8	7.7	0.01
San Francisco	24.0	15.1	0.01	23.1	15.4	0.14
Chicago	12.8	13.2	0.91	13.7	12.0	0.67
Out-of-pocket prescription drug spending, %	22.8	12.9	<0.01	22.6	14.8	0.13
100% ART adherent[b]	51.2	43.2	0.13	52.6	48.4	0.56
Antidepressant use, %	38.2	18.4	<0.01	37.6	35.9	0.79
CES-D score, median (IQR)	14 (3.5, 28.5)	15 (6, 25)	0.84	14 (6, 24)	14 (4, 29)	0.85
Hospitalized in past six months, %	23.5	17.2	0.02	19.7	17.9	0.74
Annual household income <$12,000/year, %	62.4	67.1	0.32	62.9	70.0	0.29
Education, %						
Less than high school	25.6	51.9	<0.01	25.0	23.3	0.76
Employed, %	12.9	18.6	0.13	11.2	12.9	0.69
CD4 cell count, median (IQR)	466 (312, 643)	416 (249, 622)	0.27	422 (291, 643)	452 (279, 644)	0.89
Suppressed HIV VL[c], %	59.3	48.0	0.02	56.5	60.9	0.51

Abbreviations: ART, antiretroviral therapy; CES-D, Center for Epidemiologic Studies Depression Scale; IQR, interquartile range; HIV, Human Immunodeficiency Virus; VL, viral load.

[a]Statistical significance tested using *t* tests and chi-square tests for continuous and categorical/binary variables, respectively.

[b]Proportions calculated within subset on ART, where 100% ART adherence is defined as the proportion of time that antiretrovirals were taken as prescribed over the past six months.

[c]Suppressed HIV viral load corresponds to a viral load measurement of <200 copies/mL.

time period, known as the parallel trends assumption (Stuart et al., 2014).

Finally, sensitivity analyses assessed the robustness of the results to the length of the time period analyzed (comparing 1, 2, or 3 years on either side of Medicare Part D implementation) and to propensity score matching approaches (nearest neighbor, kernel, 1:1). Study results remained consistent when we explored abbreviated lengths of time before and after Medicare Part D implementation, as well as a range of propensity score model specifications. All statistical analyses were performed using Stata 13 (StataCorp, College Station, TX).

Results

Eight hundred and one women met the inclusion criteria, of whom 125 (16%) were dual eligibles and 676 (84%) were Medicaid-only (Table 1). Before propensity score matching, dual eligibles differed from Medicaid-only participants by age, race, education, WIHS site, out-of-pocket prescription drug spending, antidepressant use, hospitalization, and HIV viral suppression. The median age of dual eligibles was higher (47 years; interquartile range [IQR]: 41–52) than Medicaid-only participants (43; IQR: 38–49). Fewer dual eligibles were African-American compared to Medicaid-only participants (57% vs. 68%). A greater proportion of dual eligibles completed high school or higher levels of education compared to Medicaid-only participants (74% vs. 48%). Annual household income was low overall; two-thirds of participants (66%) earned less than $12,000 annually with 21% earning less than $6,000 (result not shown). Despite higher household income, greater education levels, and higher prevalence of HIV viral suppression, a larger proportion of dual eligibles reported being hospitalized in the past six months (24%) compared to Medicaid-only participants (17%).

There was a striking difference in antidepressant use between dual eligibles and Medicaid-only participants in 2005. Over 38% of dual eligibles reported antidepressant use compared to 18% of Medicaid-only participants. This finding was more pronounced in dual eligibles with probable depression (CESD $\geq$ 16), of whom 49% were taking antidepressants compared to 25% of Medicaid-only participants with probable depression (result not shown). Despite different levels of antidepressant use, dual eligibles and Medicaid-only participants had similar levels of depressive symptoms as both groups had a median CES-D score of 14 and similar IQRs.

Before propensity score matching, we created Lowess plots for all outcomes to visualize trend breaks associated with Medicare Part D implementation and to provide

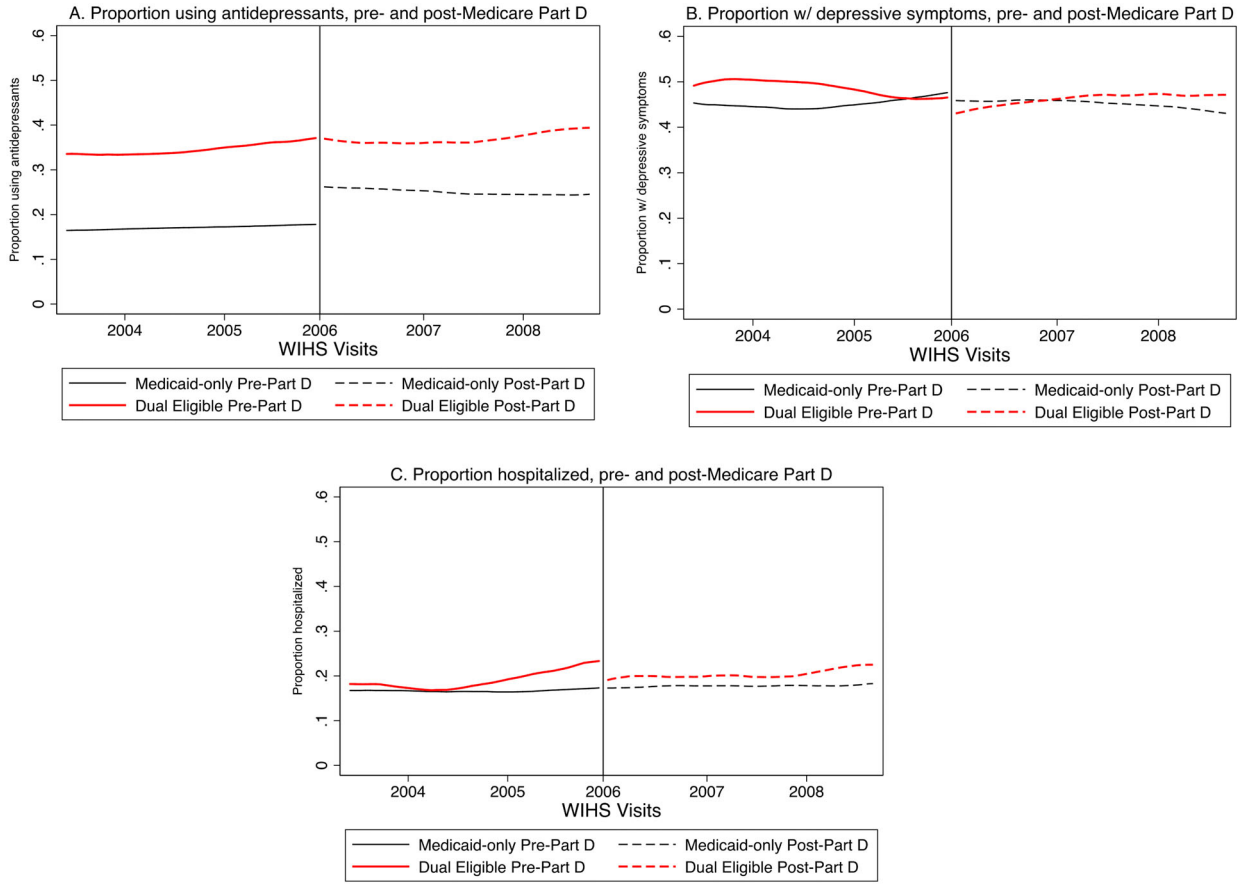

Figure 1. Changes in proportions of outcomes of interest, by insurance type and time period, in the Women's Interagency HIV Study (WIHS), 2003–2008.

graphical support for the parallel trend assumption (Figure 1, panels A–C). Lowess plots indicated that the parallel trend assumption held for all outcomes and supported the validity of the DiD analyses. Lowess plots did not indicate a trend break for any outcome with dual eligible participants, although for the control group of Medicaid-only enrollees, there appeared to be increased antidepressant use. After matching on propensity scores, our sample was limited to 117 dual eligibles (94% of the 125 participants who were dual eligible in 2005) whose propensity scores were within the range of the propensity scores of the control group, and a matched group of 117 Medicaid-only participants.

Within the matched cohort, we estimated the DiD for all outcomes and obtained the average changes in proportions among dual eligibles between the two time periods, adjusted for temporal trends (Table 2). After accounting for temporal trends by subtracting the estimates in the matched control group, the implementation of Medicare Part D did not have an impact on dual eligibles' antidepressant use, depressive symptoms, or inpatient hospitalization.

Discussion

This study yielded several key findings. First, the unmatched, unadjusted comparison between dual eligibles and Medicaid-only participants showed that, in 2005, antidepressant use was significantly higher among dual eligibles than among participants with Medicaid only (38% vs. 18%), despite similar levels of depressive symptoms. Further, a greater proportion of dual eligibles with probable depression reported antidepressant use in 2005 compared to Medicaid-only participants with probable depression (49% vs. 25%). However, both groups received prescription drug coverage through Medicaid in 2005, making it unlikely that prescription drug coverage characteristics (formularies, utilization management tools, etc.) are responsible for this difference in antidepressant use.

There are several possible explanations for these findings given the same prescription drug coverage between the two groups before Medicare Part D implementation was similar. First, there were several other differences between dual eligibles and Medicaid-

Table 2. Difference-in-differences estimates – average proportion change from pre- to post-Medicare Part D time period, by insurance type, Women's Interagency HIV Study, 2003–2008.

	Antidepressant use			Depressive symptoms (CESD ≥ 16)			Hospitalization		
	%	SE	*p*-value	%	SE	*p*-value	%	SE	*p*-value
Pre-Medicare Part D									
Medicaid-only	26.3			44.2			19.4		
Dual eligible	33.2			48.0			19.4		
Difference	+7.0	0.05	0.13	+3.8	0.05	0.46	+0.0	0.03	0.99
Post-Medicare Part D									
Medicaid-only	32.8			43.4			19.9		
Dual eligible	36.1			46.2			20.6		
Difference	+3.4	0.05	0.51	+2.8	0.05	0.58	+0.8	0.03	0.81
Difference-in-Differences	−3.6	0.04	0.37	−1.0	0.04	0.79	+0.8	0.03	0.81

Abbreviations: CESD, Center for Epidemiologic Studies Depression Scale; SE, Standard Error.

only enrollees in 2005 (age, race, education, hospitalization, HIV viral suppression, and WIHS site). However, the association between insurance type and antidepressant use remained after adjustment for the variables above. Second, people with psychotropic medication needs may be more likely to become Medicare enrollees through a mental health-related disability. Third, although dual eligibles received prescription drug coverage through Medicaid before 2006, they were still receiving medical coverage through Medicare. Dual eligibles may access medical care more easily than Medicaid enrollees; access to care rather than prescription drug coverage may have determined antidepressant use. This interpretation is supported by studies showing that Medicare's provider reimbursements were 39% higher than Medicaid's provider reimbursements, and that providers were more likely to accept new patients if they were Medicare enrollees than they were to accept Medicaid enrollees (Hing, Decker, & Jamoom, 2015; Norton & Zuckerman, 2000).

The DiD analyses indicated that Medicare Part D implementation did not affect antidepressant use in dual eligibles, despite the program's mandatory cost-sharing. Although self-reported antidepressant use did not appear to be disrupted by Medicare Part D implementation, it is possible that Medicare Part D drug plans led enrollees to switch to less effective antidepressants. Prior research indicated that of dual eligibles who had difficulty accessing a psychiatric medication following Medicare Part D, 19% were switched to a different drug because their prescribed medication was either not covered or not approved (West et al., 2007).

Moreover, we did not detect a change in depressive symptoms following Medicare Part D implementation. Depressive symptoms remained stable in both groups throughout the study period. Finally, dual eligibles showed no change in inpatient hospitalization following Medicare Part D implementation, as the proportion of dual eligibles being admitted to the hospital remained at about 20%.

Strengths and limitations

WIHS does not collect data on insurance characteristics and we were unable to examine specific characteristics of Medicare Part D prescription drug plans, such as utilization management tools for antidepressants (Hall, Kurth, & Moore, 2007). It is possible that study visits occurring at six-month intervals were too far apart to detect acute disruptive effects, as identified in prior studies of medication access. However, given the periodic timing of WIHS data collection, these findings indicate that Medicare Part D did not have a sustained, long-term effect on antidepressant use, depressive symptoms, or inpatient hospitalization among dual eligibles. Finally, WIHS participants may have distinct patterns of self-reported antidepressant use, depression, and health service utilization based on study participation and gender that limit generalizability to all dual eligible people with HIV. Despite these limitations, this study has the advantage of data collected independently of insurance status, medical care engagement, or prescription fill behavior. These data are a valuable resource for studying medication access problems, as claims data may selectively represent people who successfully fill medications.

Conclusions

Coordinating care and managing costs for dual eligibles is a vital health policy issue. We found that while receiving the same prescription drug coverage through Medicaid in 2005, a greater proportion of dual eligibles used antidepressants compared to Medicaid-only participants, despite similar levels of depressive symptoms. Although prior research has indicated that dual eligible HIV patients have had difficulty accessing medications after the transition to Medicare Part D (Das-Douglas et al., 2009) we identified no such effect on antidepressant use. This analysis also identified no changes in depressive symptoms or inpatient hospitalization following Medicare Part D implementation. These findings

may indicate that protections for psychotropic drug classes under Medicare Part D were meeting their intended function in this vulnerable population several years after implementation. Stable medication use may also be due to better access to medical care for dual eligibles through Medicare both before and after Medicare Part D implementation, which may eclipse any effects of the transition in prescription drug coverage. Even though this study centers on the 2006 Medicare Part D implementation, it contributes to contemporary research in the following ways. During a time when insurance coverage transitions are a focus of the national healthcare debate, this study adds to the limited body of knowledge on how transitioning prescription drug coverage from Medicaid to Medicare Part D affects mental health-related service utilization and depressive symptoms in people with HIV. This study may be especially relevant to people with HIV as the population of people with HIV ages in Medicare Part D coverage and the transition from Medicaid to Medicare Part D becomes more common.

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