

Supplementary Online Content

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This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. ICD-9-CM codes used to derive select clinical characteristics

Clinical characteristic	ICD-9-CM codes
Anxiety disorders	
Generalized anxiety disorder	300.02
PTSD	309.81
Other anxiety disorders	300.0, 300.3
Dementia	290.0, 290.1-290.13, 290.20, 290.21, 290.3, 290.40-290.43, 294.10, 294.11, 294.20, 294.21, 294.8, 331.0, 331.11, 331.19, 331.2-331.7, 331.81-331.83, 331.89, 331.9, 797
Depression	296.20-296.26, 296.30-296.36, 300.4, 311
Seizure disorders	345.00 345.01, 345.10, 345.11, 345.2, 345.3, 345.40, 345.41, 345.50, 345.51, 345.70, 345.71, 345.80, 345.81, 345.9, 345.91
Insomnia	307.40-307.49, 327.00-327.02, 327.09, 327.42, 780.51, 780.52

eTable 2. Interrupted time series analysis of monthly fall-related injury among Medicare Advantage beneficiaries stratified by age and sex, 2010–2015

	Pre-coverage (2010–2012)			Post-coverage (2013–2015)			Pre- to Post-Coverage Change in Slope ^a	
	Fall-related injury per 10,000 person-days (95% CI) ^b	Slope (95% CI) ^c	P value ^c	Fall-related injury per 10,000 person-days (95% CI) ^b	Slope (95% CI)	P value	Slope change (95% CI)	P value
65-69	1.34 (1.31, 1.37)	0.00 (-0.01, 0.02)	0.76	1.38 (1.33, 1.42)	0.06 (0.03, 0.09)	0.001	0.05 (0.02, 0.09)	0.002
Female	1.55 (1.52, 1.59)	0.01 (-0.01, 0.03)	0.56	1.62 (1.57, 1.67)	0.05 (0.02, 0.09)	0.007	0.05 (0.01, 0.08)	0.02
Male	1.07 (1.04, 1.10)	-0.01 (-0.02, 0.01)	0.56	1.07 (1.02, 1.11)	0.06 (0.03, 0.08)	<0.001	0.06 (0.03, 0.09)	<0.001
70-74	1.50 (1.47, 1.54)	0.02 (0.00, 0.04)	0.10	1.56 (1.52, 1.59)	0.05 (0.02, 0.07)	<0.001	0.03 (0.00, 0.06)	0.08
Female	1.77 (1.73, 1.82)	0.02 (0.00, 0.05)	0.10	1.85 (1.80, 1.89)	0.04 (0.01, 0.07)	0.01	0.02 (-0.02, 0.06)	0.29
Male	1.17 (1.14, 1.21)	0.01 (-0.01, 0.04)	0.18	1.21 (1.18, 1.24)	0.05 (0.03, 0.07)	<0.001	0.03 (0.00, 0.06)	0.04
75-79	1.84 (1.80, 1.89)	0.03 (0.00, 0.05)	0.07	1.95 (1.90, 1.99)	0.06 (0.03, 0.09)	0.001	0.03 (-0.01, 0.07)	0.13
Female	2.19 (2.14, 2.25)	0.03 (0.00, 0.06)	0.10	2.31 (2.24, 2.38)	0.06 (0.01, 0.10)	0.02	0.03 (-0.03, 0.08)	0.33
Male	1.39 (1.34, 1.45)	0.03 (-0.01, 0.06)	0.12	1.49 (1.45, 1.53)	0.06 (0.03, 0.08)	<0.001	0.03 (-0.01, 0.07)	0.16
80+	3.20 (3.15, 3.24)	0.04 (0.01, 0.06)	0.006	3.30 (3.23, 3.37)	0.16 (0.11, 0.20)	<0.001	0.12 (0.07, 0.17)	<0.001
Female	3.65 (3.61, 3.70)	0.06 (0.03, 0.08)	<0.001	3.78 (3.70, 3.85)	0.17 (0.12, 0.22)	<0.001	0.11 (0.06, 0.17)	<0.001
Male	2.41 (2.36, 2.47)	0.03 (-0.01, 0.06)	0.14	2.53 (2.45, 2.60)	0.13 (0.08, 0.18)	<0.001	0.11 (0.05, 0.16)	<0.001

CI: confidence interval

^a Policy change is the Medicare Part D expanded coverage of benzodiazepines starting in January 2013.

^b During first month of the period.

^c All slope, slope changes, and P values reported were obtained from regression models that included fixed effects for month.

eTable 3. Interrupted time series analysis of monthly fall-related injury among Medicare Advantage beneficiaries prescribed opioids stratified by age, 2010–2015

	Pre-coverage (2010–2012)			Post-coverage (2013–2015)			Pre- to Post-Coverage Change in Slope ^a	
	Fall-related injury per 10,000 person-days (95% CI) ^b	Slope (95% CI) ^c	P value ^c	Fall-related injury per 10,000 person-days (95% CI) ^b	Slope (95% CI)	P value	Slope change (95% CI)	P value
65-69	5.70 (5.49, 5.90)	-0.09 (-0.21, 0.03)	0.16	5.71 (5.53, 5.90)	0.16 (0.04, 0.28)	0.01	0.25 (0.08, 0.42)	0.005
70-74	6.15 (5.98, 6.33)	-0.05 (-0.15, 0.05)	0.34	6.02 (5.86, 6.19)	0.20 (0.09, 0.30)	0.002	0.25 (0.10, 0.40)	0.002
75-79	7.07 (6.80, 7.33)	-0.03 (-0.18, 0.12)	0.68	6.94 (6.69, 7.18)	0.15 (-0.01, 0.31)	0.09	0.18 (-0.04, 0.40)	0.12
80+	9.84 (9.65, 10.02)	-0.12 (-0.23, -0.02)	0.03	9.48 (9.30, 9.67)	0.26 (0.14, 0.38)	<0.001	0.38 (0.22, 0.54)	<0.001

CI: confidence interval

^a Policy change is the Medicare Part D expanded coverage of benzodiazepines starting in January 2013.

^b During first month of the period.

^c All slope, slope changes, and P values reported were obtained from regression models that included fixed effects for month.

eTable 4. Interrupted time series analysis of monthly overdose among Medicare Advantage beneficiaries stratified by age and sex, 2010–2015

	Pre-coverage (2010–2012)			Post-coverage (2013–2015)			Pre- to Post-Coverage Change in Slope ^a	
	Overdose per 100,000 person-days (95% CI) ^b	Slope (95% CI) ^c	P value ^c	Overdose per 100,000 person-days (95% CI) ^b	Slope (95% CI)	P value	Slope change (95% CI)	P value
65-69	1.31 (1.22, 1.40)	-0.14 (-0.19, -0.09)	<0.001	0.86 (0.81, 0.91)	0.10 (0.06, 0.13)	<0.001	0.23 (0.17, 0.30)	<0.001
Female	1.32 (1.19, 1.45)	-0.08 (-0.16, -0.01)	0.04	0.98 (0.91, 1.05)	0.06 (0.02, 0.11)	0.01	0.15 (0.06, 0.24)	0.003
Male	1.31 (1.20, 1.42)	-0.21 (-0.27, -0.15)	<0.001	0.71 (0.64, 0.79)	0.13 (0.08, 0.18)	<0.001	0.34 (0.26, 0.42)	<0.001
70-74	1.35 (1.27, 1.43)	-0.10 (-0.14, -0.05)	<0.001	1.02 (0.95, 1.09)	0.05 (0.01, 0.10)	0.05	0.15 (0.08, 0.21)	<0.001
Female	1.47 (1.37, 1.57)	-0.12 (-0.17, -0.06)	<0.001	1.18 (1.09, 1.28)	0.00 (-0.06, 0.06)	0.89	0.12 (0.04, 0.20)	0.007
Male	1.21 (1.10, 1.32)	-0.07 (-0.13, -0.01)	0.03	0.81 (0.72, 0.90)	0.11 (0.05, 0.17)	0.002	0.18 (0.10, 0.27)	<0.001
75-79	1.61 (1.52, 1.70)	-0.14 (-0.20, -0.09)	<0.001	1.10 (1.01, 1.19)	0.13 (0.07, 0.19)	<0.001	0.27 (0.19, 0.35)	<0.001
Female	1.57 (1.45, 1.70)	-0.10 (-0.18, -0.03)	0.01	1.19 (1.06, 1.33)	0.11 (0.02, 0.20)	0.02	0.21 (0.10, 0.33)	<0.001
Male	1.65 (1.44, 1.86)	-0.19 (-0.32, -0.07)	0.004	0.98 (0.87, 1.09)	0.15 (0.07, 0.22)	<0.001	0.34 (0.19, 0.49)	<0.001
80+	1.60 (1.50, 1.69)	-0.06 (-0.12, -0.01)	0.03	1.47 (1.41, 1.53)	0.00 (-0.03, 0.04)	0.87	0.07 (0.00, 0.14)	0.06
Female	1.60 (1.50, 1.70)	-0.05 (-0.11, 0.00)	0.09	1.48 (1.38, 1.57)	0.02 (-0.04, 0.09)	0.51	0.08 (-0.01, 0.16)	0.10
Male	1.60 (1.46, 1.73)	-0.08 (-0.16, -0.01)	0.04	1.46 (1.34, 1.58)	-0.03 (-0.10, 0.05)	0.05	0.05 (-0.05, 0.16)	0.03

CI: confidence interval

^a Policy change is the Medicare Part D expanded coverage of benzodiazepines starting in January 2013.

^b During first month of the period.

^c All slope, slope changes, and P values reported were obtained from regression models that included fixed effects for month.

eTable 5. Interrupted time series analysis of monthly overdose among Medicare Advantage beneficiaries prescribed opioids stratified by age, 2010–2015

	Pre-coverage (2010–2012)			Post-coverage (2013–2015)			Pre- to Post-Coverage Change in Slope ^a	
	Overdose per 100,000 person-days (95% CI)^b	Slope (95% CI)^c	P value^c	Overdose per 100,000 person-days (95% CI)^b	Slope (95% CI)	P value	Slope change (95% CI)	P value
65-69	4.59 (4.19, 4.99)	-0.27 (-0.50, -0.04)	0.03	3.62 (3.21, 4.04)	0.31 (0.05, 0.58)	0.03	0.59 (0.24, 0.94)	0.002
70-74	3.84 (3.43, 4.25)	0.05 (-0.18, 0.29)	0.66	3.69 (3.25, 4.12)	0.19 (-0.10, 0.47)	0.21	0.13 (-0.23, 0.50)	0.48
75-79	4.86 (4.39, 5.33)	-0.42 (-0.68, -0.15)	0.01	3.48 (3.03, 3.92)	0.34 (0.06, 0.63)	0.03	0.76 (0.36, 1.15)	<0.001
80+	3.44 (3.09, 3.79)	0.22 (0.02, 0.42)	0.04	4.01 (3.58, 4.43)	-0.13 (-0.40, 0.15)	0.37	-0.35 (-0.68, -0.01)	0.05

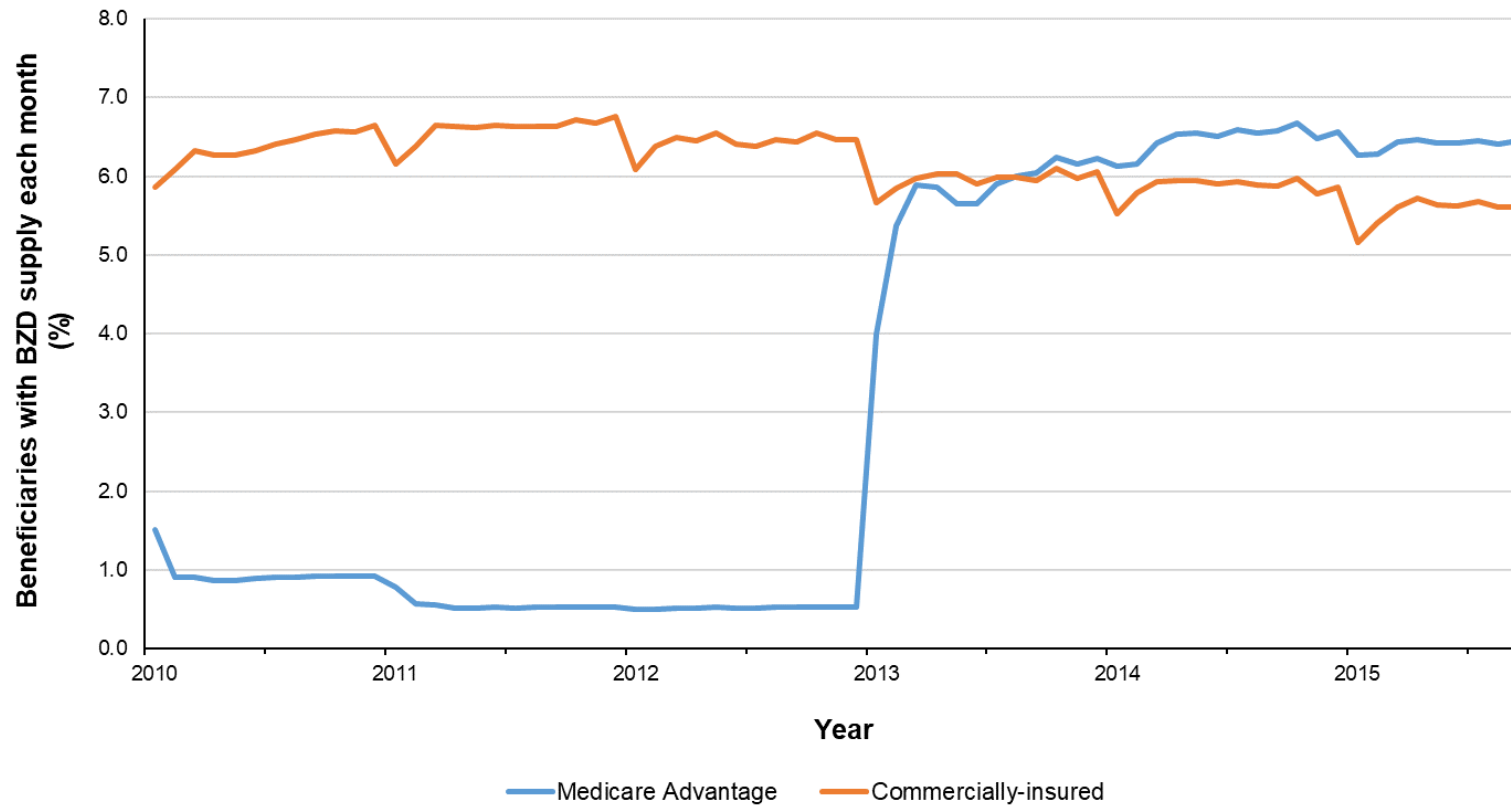
CI: confidence interval

^a Policy change is the Medicare Part D expanded coverage of benzodiazepines starting in January 2013.

^b During first month of the period.

^c All slope, slope changes, and P values reported were obtained from regression models that included fixed effects for month.

eFigure 1. Monthly proportions of Medicare Advantage and commercially-insured enrollees (comparison group) with ≥ 1 day of benzodiazepine available, 2010–2015



The date of the prescription claim and days'-supply field were used to determine whether beneficiaries possessed benzodiazepines in a given month.

eFigure 2. Monthly proportions of Medicare Advantage and commercially-insured enrollees (comparison group) with ≥ 1 day of benzodiazepine available stratified by age, 2010–2015

