

Supplementary Appendix

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

Supplement to: Hsu J, Price M, Huang J, et al. Unintended consequences of caps on Medicare drug benefits. *N Engl J Med* 2006;354:2349-59.

Appendix A. Equations for Fixed Effects in Analytical Models

Adherence Models

Annual Model:

$$E[y_{it}] = B_0 + B_1 I_{\text{cap}} + B_2 I_{m2} + B_3 I_{m3} + B_4 I_{m4} + B_5 I_{m5} + B_6 I_{m6} + B_7 I_{m7} + B_8 I_{m8} + B_9 I_{m9} + B_{10} I_{m10} + B_{11} I_{m11} + B_{12} I_{m12} + x_i' B$$

Monthly Model:

$$E[y_{it}] = B_0 + B_1 I_{\text{cap}} + B_2 I_{m2} + B_3 I_{m3} + B_4 I_{m4} + B_5 I_{m5} + B_6 I_{m6} + B_7 I_{m7} + B_8 I_{m8} + B_9 I_{m9} + B_{10} I_{m10} + B_{11} I_{m11} + B_{12} I_{m12} + B_{13} I_{m2} I_{\text{cap}} + B_{14} I_{m3} I_{\text{cap}} + B_{15} I_{m4} I_{\text{cap}} + B_{16} I_{m5} I_{\text{cap}} + B_{17} I_{m6} I_{\text{cap}} + B_{18} I_{m7} I_{\text{cap}} + B_{19} I_{m8} I_{\text{cap}} + B_{20} I_{m9} I_{\text{cap}} + B_{21} I_{m10} I_{\text{cap}} + B_{22} I_{m11} I_{\text{cap}} + B_{23} I_{m12} I_{\text{cap}} + x_i' B$$

Physiologic Models

Annual Model:

$$\text{logit}\{E[y_{it}]\} = B_0 + B_1 I_{\text{cap}} + B_2 I_{m2} + B_3 I_{m3} + B_4 I_{m4} + B_5 I_{m5} + B_6 I_{m6} + B_7 I_{m7} + B_8 I_{m8} + B_9 I_{m9} + B_{10} I_{m10} + B_{11} I_{m11} + B_{12} I_{m12} + x_i' B$$

Monthly Model:

$$\text{logit}\{E[y_{it}]\} = B_0 + B_1 I_{\text{cap}} + B_2 I_{m2} + B_3 I_{m3} + B_4 I_{m4} + B_5 I_{m5} + B_6 I_{m6} + B_7 I_{m7} + B_8 I_{m8} + B_9 I_{m9} + B_{10} I_{m10} + B_{11} I_{m11} + B_{12} I_{m12} + B_{13} I_{m2} I_{\text{cap}} + B_{14} I_{m3} I_{\text{cap}} + B_{15} I_{m4} I_{\text{cap}} + B_{16} I_{m5} I_{\text{cap}} + B_{17} I_{m6} I_{\text{cap}} + B_{18} I_{m7} I_{\text{cap}} + B_{19} I_{m8} I_{\text{cap}} + B_{20} I_{m9} I_{\text{cap}} + B_{21} I_{m10} I_{\text{cap}} + B_{22} I_{m11} I_{\text{cap}} + B_{23} I_{m12} I_{\text{cap}} + x_i' B$$

where

$y \sim \text{Bernoulli}$

$i = 1, \dots, m$ subjects

$t = 1, \dots, n_i$ observations for each subject

$I_{\text{cap}} = 1$ if subject has a cap, 0 otherwise

$I_{mn} = 1$ if month n , 0 otherwise

x_i' = row vector of covariates for subject i

B = column vector of coefficients for covariates

These models were estimated with GEE methods using compound symmetry for the working covariance matrix and robust standard errors.

Appendix B. Supplemental Analyses

Summary: Analyses on Drug Consumption and Adherence, Before and After Reaching the Cap Amount

We tested whether differences between the cap and no-cap groups increased after subjects exceeded the cap amount by examining monthly patterns of drug consumption and adherence among beneficiaries who exceeded \$1,000 in cap drug spending (we estimated cap drug spending for subjects without a cap as if they had a cap). Within each of the chronic drug groups, we examined differences between cap and no-cap subjects in drug consumption (measured in dollars) and drug non-adherence for the relevant chronic drug class for up to six months before and after subjects exceeded the cap amount.

We found that differences in drug consumption and non-adherence between cap and no-cap subjects grew significantly in the months following the exceed month for all three chronic drug class groups. Moreover, differences between the cap and no-cap groups were smaller and relatively stable in the months prior to exceeding the cap amount.

We plotted drug consumption and drug non-adherence for up to six months before (-6) and after (+6) the month in which subjects exceeded the \$1,000 cap amount (month 0). The analysis was limited to months in 2003, therefore if subjects exceeded the cap amount in February, they were included in months -1 through +6; if subjects exceeded the cap amount in November, they were included in months -6 to +1. Only months in which the subject was alive and enrolled in the health plan were included in the analysis.

As in the main analyses, we estimated monthly drug costs and adherence levels using a generalized estimating equation (GEE) approach. To estimate adjusted monthly drug costs and drug non-adherence, we included an interaction between having a cap and the month from the exceed month. All models were adjusted for age, gender, race/ethnicity, SES, medical center, comorbidity (DxCG), length of tenure in the health system (KP), and emergency department (ED) and office copayment level.

We used the same approach described in the main manuscript to find the percent difference in drug consumption and drug non-adherence in each month for subjects with a cap compared with subjects without a cap. Specifically, we used the coefficients from the models along with the mean values of the covariables to find monthly adjusted estimates of the percent decrease in drug consumption and increase in drug non-adherence for the cap group compared to the no-cap group. We used the `-nlcom-` command in Stata 8.2 to calculate both the percent decrease and confidence interval, and plotted these values for each month. In sensitivity analyses, we also used a random effects (RE) approach, which yielded nearly identical results (Figure A2 displays the GEE and RE results for drug consumption for all drugs applicable to the cap). For additional information on the GEE versus RE approach, please see the description of the supplemental analyses on the physiologic outcomes.

Results and Discussion: Analyses on Drug Consumption and Adherence, Before and After Reaching the Cap Amount

Figure A2 presents the percent decrease in monthly drug costs (with a separate graph for results obtained using the GEE and RE approaches with 95% confidence intervals) for subjects with caps compared to subjects without caps, after adjusting for covariates, for all drugs applicable to the cap. Information on differences in drug consumption for the three chronic drug groups is presented in Figure 2 of the manuscript. Figure A3 presents similar results for the increase in the percent of subjects non-adherent to each of the chronic drug classes before and after exceeding the cap amount. The findings for drug consumption and non-adherence were similar across the three chronic drug classes.

Both figures illustrate that the differences between the two groups in drug consumption and non-adherence were relatively stable and close to zero in months before exceeding the cap amount. There are some small and increasing differences in drug consumption and non-adherence in months immediately prior to exceeding the cap amount. One potential explanation for this difference in pre-exceed months is that capped subjects anticipate exceeding the cap and decrease drug use prior to exceeding the cap amount.

Following the month of exceeding the cap amount, differences between the two groups grew substantially (drug consumption decreased and drug non-adherence increased for the cap group compared to the no-cap group). These results support our hypothesis that differences in drug use between the two groups would grow after cap subjects lost drug coverage and faced higher out-of-pocket costs.

Summary: Analyses on Physiologic Outcomes

To support our findings regarding the cap effect on physiologic outcomes, we conducted several supplemental analyses. Our main analyses adjust for an initial physiologic measurement, in order to better control for potential unmeasured differences between the cap and no-cap groups. Specifically, we defined the initial measurement as the first available measurement value during the study period (2002-2003) after the patient started drug therapy.

In these models, we capture the effect of the drug cap on changes in subsequent physiologic outcomes (systolic blood pressure [SBP], glycated hemoglobin [HbA1c], and low-density-lipoprotein cholesterol [LDL] levels) for the three chronic drug groups (antihypertensive, antidiabetic, and lipid-lowering drugs, respectively), after controlling for the initial measurement. Our findings regarding the adverse effect of the cap on physiologic outcomes were robust across several different approaches; we present the results from these approaches in this document.

We also stratified the analyses of physiologic outcomes by whether subjects' spending exceeded or did not exceed the \$1,000 cap amount. These analyses support our hypothesis that the cap effect on physiologic outcomes would be larger among subjects who exceeded the cap amount compared with subjects who did not exceed the cap amount.

Lastly, we investigated the effect of the drug cap on physiologic outcomes among subjects who were newly treated with drugs from each of the chronic drugs classes in 2002. We conducted these analyses to address concerns that the main analyses of physiologic outcomes may reflect cumulative effects of having a drug cap for multiple years. Although these analyses have more limited statistical power compared to our main analyses, the point estimates of the cap effect on physiologic outcomes among newly treated patients also support the main findings.

The chronic drug groups were defined as subjects with any use of the following drug classes in 2002: antihypertensive, antidiabetic, and lipid-lowering drugs. Table 1 of the manuscript displays the number of subjects in each of these groups, as well as the percent of each group included in each of the physiologic outcomes analyses. In the models where we did not adjust for an initial value, subjects needed at least one physiologic measurement in 2003 to be included in the analysis.

In models where we adjusted for an initial physiologic measurement value, we included subjects with an initial value plus at least one subsequent value in 2003. The initial value is defined as the first physiologic measurement result (SBP, HbA1c, or LDL) following the first prescription dispensed in 2002 for the relevant drug class; we used dichotomous values for the initial measurement in our analyses of dichotomous outcomes (SBP \geq 140 mm Hg, HbA1c \geq 8.0%, and LDL \geq 130 mg/dl). Table A1 presents the distribution of the month of the study period in which the initial value was measured.

For the stratified analyses, we defined subjects as "exceeders" if they had more than \$1,000 in cumulative cap drug spending (sum of acquisition and dispensing costs for drugs applicable to the cap less patient copayments) during 2003. Newly treated patients were defined as subjects who received a prescription for one of the three chronic drug classes in 2002, with no other prescription dispensed in the same class in the prior six months.

We present estimates of the cap effect on physiologic outcome using four different approaches. We used both GEE and random effects (RE) repeated measures approaches, using all values from 2003. We examined the association between having a cap and poor physiologic outcome both adjusting for an initial measurement value, and not adjusting for an initial value. In the manuscript, we present only the results from the GEE models,

controlling for the initial value; in this appendix we include results from each of the approaches. All models were adjusted for age, gender, race/ethnicity, SES, medical center, comorbidity (DxCg), length of KP tenure, and ED and office copayment level. Only months in which subjects were alive and enrolled in the health plan were included in the analyses. These approaches were repeated in the stratified analyses of exceeders/non-exceeders, and of newly treated patients.

Comment on the GEE vs. RE Approaches

We include the results using the random effects approach as a sensitivity test, recognizing that the RE approach tends to yield larger effect sizes and addresses a slightly different question compared to the population average approach (GEE).¹ The RE approach, in theory, is more robust to potential imbalances between the groups with respect to different assumptions about missing outcomes data needed to obtain unbiased estimates, e.g. missing at random (MAR) versus missing completely at random (MCAR). We chose to present the results from the GEE model in the main manuscript because the population average approach best represents the focus of our research question. Importantly, the results on relative differences in drug consumption and non-adherence from the GEE and RE models were consistent.

Results and Discussion: Analyses on Physiologic Outcomes

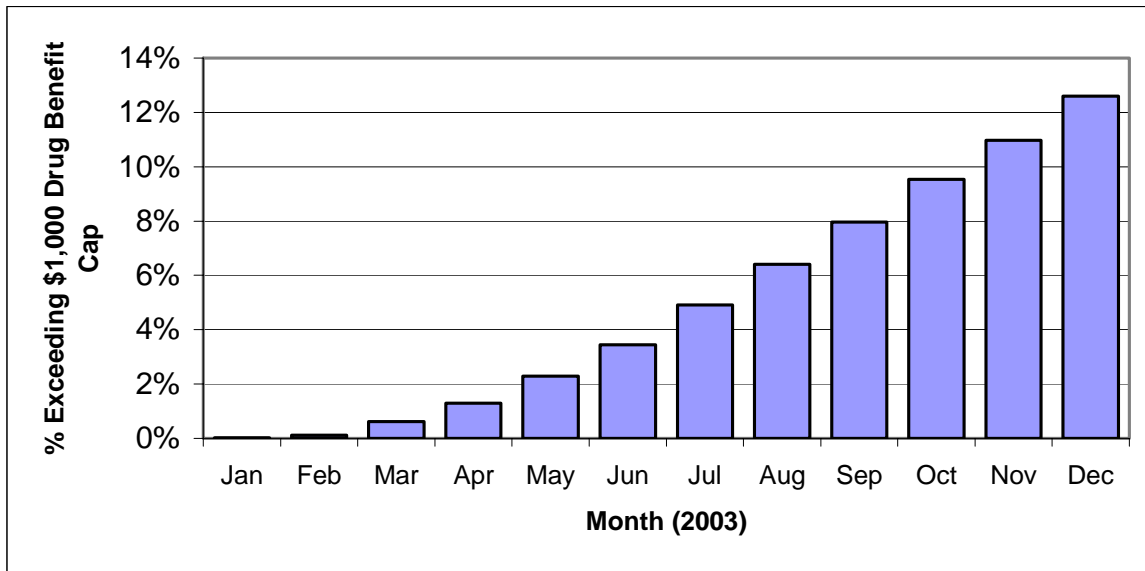
Table A3 presents the results of the analysis of physiologic outcomes for each of four approaches, for each chronic drug group. The results suggest that having a drug cap was positively associated with poor physiologic outcomes for each of the chronic drug groups. These results were consistent across all of the analytic methods, as well as after controlling for the initial physiologic measurement value.

Table A4 presents the results of the analyses of physiologic outcomes stratified by whether subjects' spending exceeded or did not exceed the \$1,000 cap amount. From the GEE analysis adjusting for an initial value, the odds ratio of having an elevated LDL level associated with the drug cap was 1.28 (95% CI: 1.05-1.56) for subjects taking lipid-lowering drugs who exceeded the cap amount. In comparison, the corresponding effect among those who did not exceed the cap amount was smaller in magnitude and not statistically significant (OR=1.07, 95% CI: .095-1.20). For the other chronic drug groups (i.e. antidiabetic and antihypertensive drugs), the point estimate for the odds ratio was consistently larger for those who exceeded the cap amount compared with those who did not. However, not all of these effects were statistically significant. The direction and magnitude of the effects in these analyses support the hypothesis that subjects exceeding the cap would be more likely to have poor physiologic outcomes, compared to those who did not exceed the cap; however, statistical power is more limited because of the smaller sample sizes. These findings were consistent across the analytic approaches.

Table A5 presents the analyses of physiologic outcomes for newly treated patients in 2002. This group may be less likely to exhibit cumulative adverse health effects due to having the cap for multiple years compared to patients who had required multiple prior years of treatment. The sample sizes for newly treated chronic drug users are considerably smaller compared to the total chronic drug groups (e.g., N=4,728 and 21,321 for the newly treated and total antidiabetic drug group, respectively), which limits statistical power compared to our main analyses. The magnitude and direction of the point estimates, however, are consistent with those in our main analyses: the cap was positively associated with poor physiologic outcomes (OR=1.16 [0.98-1.36] for lipid-lowering drug group; OR=1.35 [0.88-2.05] for antidiabetic drug group; and OR=1.09 [0.99-1.20] for antihypertensive drug group).

¹ Neuhaus, J.M., J.D. Kalbfleisch, and W.W. Hauck, *A Comparison of Cluster-Specific and Population-Averaged Approaches for Analyzing Correlated Binary Data*. International Statistical Review / Revue Internationale de Statistique, 1991. 59(1): p. 25-35.

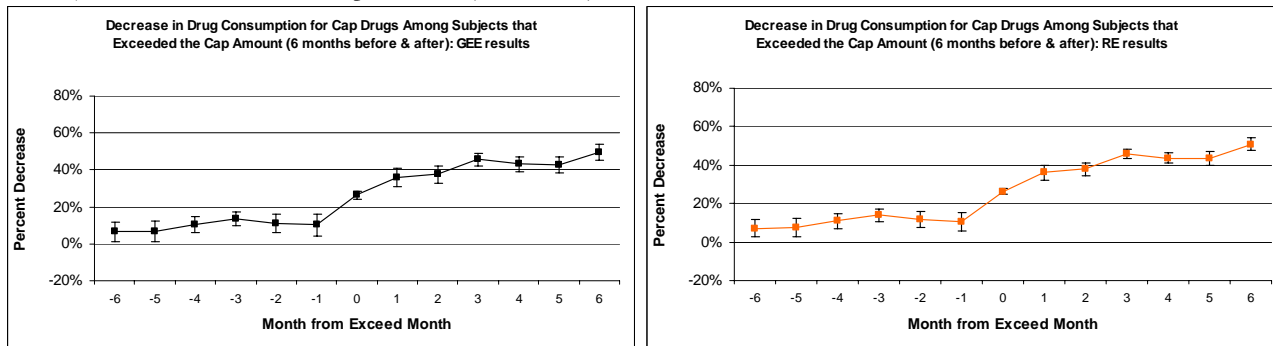
Figure A1: Cumulative Percentage of Subjects Exceeding the \$1,000 Drug Benefit Cap in Each Month



Notes: The figure displays the cumulative percentage of subjects with a \$1,000 annual drug benefit cap who exceed the cap amount in each month of the year. To exceed the calendar year cap amount, subjects consume \$1,000 of prescription drugs, priced at the member price less any patient copayments. The member drug price generally was lower than the market price available from non-health system pharmacies, thus providing subjects with an incentive to obtain their prescription drugs within the health system.

Figure A2. Adjusted Percent Decrease in Drug Consumption for Subjects with Drug Benefit Caps Compared with Subjects Without Caps Among Subjects Who Exceeded the Cap Amount: GEE and RE models

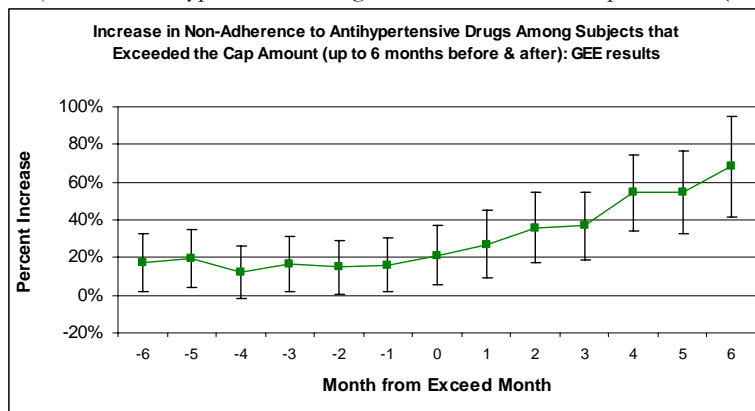
All subjects who Exceeded the Cap Amount (n = 28,010)



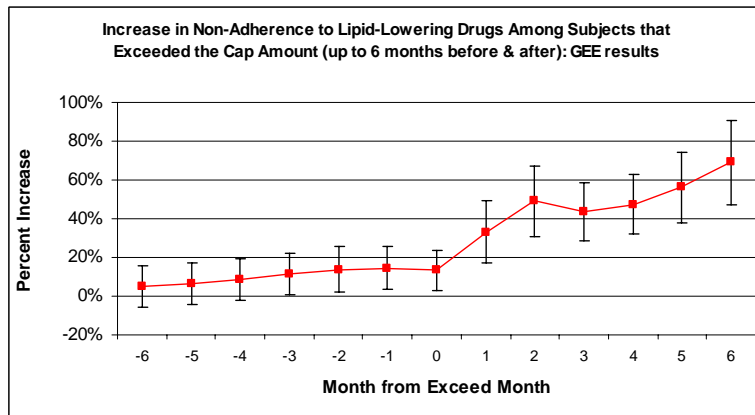
Notes: This figure displays the percent decrease (subjects with caps, compared with subjects without caps, among those who exceeded the cap amount) with 95% confidence intervals (vertical bars) in monthly drug consumption for drugs applicable to the cap for up to six months before (months -6 to -1) and after (months 1 to 6) subjects exceeded the cap amount. The model on the left uses a population average (GEE) approach, the model on the right uses a random-effects (RE) approach, both are adjusted for age, gender, race/ethnicity, neighborhood SES, comorbidity level, years in KPNC, emergency department cost-sharing levels, office cost-sharing levels, medical center, month from exceed month, and interaction of cap and month from exceed month.

Figure A3: Adjusted Percent Increase in Non-Adherence to Chronic Drug Therapy for Subjects with Drug Benefit Caps Compared with Subjects Without Caps Among Subjects Who Exceeded the Cap Amount Who Were Receiving Antihypertensive, Lipid-Lowering, or Antidiabetic Therapy

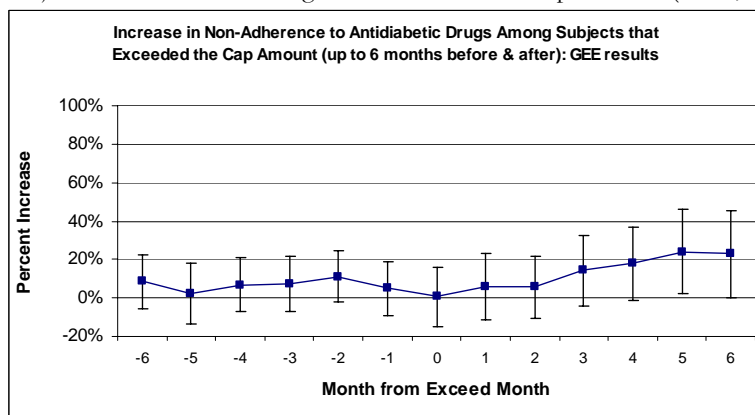
Subjects on Antihypertensive Drugs who Exceeded the Cap Amount (n = 21,843)



Subjects on Lipid-Lowering Drugs who Exceeded the Cap Amount (n = 13,213)



Subjects on Antidiabetic Drugs who Exceeded the Cap Amount (n = 6,210)



Notes: This figure displays the percent increase (subjects with caps, compared with subjects without caps, among those who exceeded the cap amount) with 95% confidence intervals (vertical bars) in subjects who were non-adherent to chronic drug therapy for up to six months before (months -6 to -1) and after (months 1 to 6) subjects exceeded the cap amount. Non-adherence was measured by proportion of days covered (PDC<80%). These models use a GEE approach and are adjusted for age, gender, race/ethnicity, neighborhood SES, comorbidity level, years in KPNC, emergency department cost-sharing levels, office cost-sharing levels, medical center, month from exceed month, and interaction of cap and month from exceed month.

Table A1. Distribution of Timing of Initial Physiologic Measurement

N	LDL			HbA1c			SBP		
	All	No cap	Cap	All	No cap	Cap	All	No cap	Cap
	47,084	10,923	36,161	21,321	4,494	16,827	104,948	23,311	81,637
Month	%	%	%	%	%	%	%	%	%
Jan-02	16.7%	17.8%	16.3%	17.7%	19.1%	17.3%	21.9%	22.8%	21.6%
Feb-02	14.4%	15.3%	14.1%	14.5%	14.7%	14.5%	13.9%	14.7%	13.7%
Mar-02	13.4%	13.7%	13.3%	13.9%	15.1%	13.6%	12.2%	12.3%	12.1%
Apr-02	10.3%	10.6%	10.2%	11.9%	11.9%	11.8%	9.9%	10.4%	9.8%
May-02	8.1%	8.0%	8.1%	9.0%	8.7%	9.1%	7.6%	7.8%	7.6%
Jun-02	6.6%	6.3%	6.7%	7.2%	6.4%	7.5%	5.6%	5.5%	5.6%
Jul-02	5.7%	5.5%	5.7%	5.2%	5.0%	5.2%	5.0%	4.7%	5.0%
Aug-02	4.9%	4.4%	5.0%	4.5%	4.3%	4.6%	4.1%	3.9%	4.2%
Sep-02	4.1%	3.9%	4.2%	3.8%	3.7%	3.8%	3.6%	3.2%	3.7%
Oct-02	3.6%	3.4%	3.7%	2.8%	2.2%	3.0%	3.5%	3.0%	3.6%
Nov-02	3.1%	2.8%	3.1%	2.5%	2.5%	2.5%	2.8%	2.4%	2.9%
Dec-02	2.5%	2.2%	2.5%	1.9%	2.1%	1.8%	2.3%	2.1%	2.4%
Jan-03	2.4%	2.1%	2.5%	1.6%	1.4%	1.7%	2.0%	1.8%	2.0%
Feb-03	1.5%	1.5%	1.5%	1.1%	0.9%	1.2%	1.2%	1.2%	1.3%
Mar-03	1.1%	0.9%	1.1%	0.9%	0.6%	0.9%	1.1%	1.2%	1.1%
Apr-03	0.7%	0.7%	0.7%	0.6%	0.5%	0.6%	0.8%	0.8%	0.8%
May-03	0.4%	0.3%	0.5%	0.4%	0.4%	0.4%	0.6%	0.6%	0.6%
Jun-03	0.2%	0.2%	0.3%	0.2%	0.3%	0.2%	0.5%	0.5%	0.5%
Jul-03	0.2%	0.2%	0.2%	0.2%	0.2%	0.3%	0.4%	0.4%	0.4%
Aug-03	0.1%	0.1%	0.1%	0.1%	0.1%	0.1%	0.3%	0.3%	0.3%
Sep-03	0.1%	0.0%	0.1%	0.0%	0.0%	0.0%	0.2%	0.2%	0.3%
Oct-03	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%
Nov-03	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%
Dec-03	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes: Initial physiologic measurements are defined as the first available measurement in 2002-03 after starting drug therapy, among subjects with at least one study measurement in 2003.

Table A2. Distribution of Number of Physiologic Measurements Per Subject

N	LDL			HbA1c			SBP		
	All	No cap	Cap	All	No cap	Cap	All	No cap	Cap
	47,084	10,923	36,161	21,321	4,494	16,827	104,948	23,311	81,637
# measures per subject	%	%	%	%	%	%	%	%	%
1	35.3%	33.2%	36.0%	32.5%	30.0%	33.1%	17.7%	16.1%	18.2%
2	31.5%	31.8%	31.4%	35.1%	33.8%	35.4%	18.6%	18.2%	18.7%
3	18.7%	19.2%	18.6%	20.6%	22.4%	20.1%	16.3%	16.4%	16.3%
4	9.6%	10.3%	9.4%	8.4%	9.7%	8.0%	12.7%	12.4%	12.8%
5+	4.8%	5.5%	4.6%	3.5%	4.0%	3.3%	34.6%	36.9%	33.9%

Table A3. Adjusted Odds of Poor Physiological Outcomes Associated with Having a \$1,000 Cap on Drug Benefits

Estimation Method	Sample	Total Obs	OR	95% CI	
LDL \geq 130 mg/dl: Subjects receiving lipid-lowering drugs					
Random Effect (RE): Adjusted for initial LDL level					
LDL level	47,084	103,085	1.22	1.06	1.42
Population Average (GEE): Adjusted for initial LDL level*					
	47,084	103,085	1.13	1.03	1.25
RE: Not adjusted for initial LDL level					
	50,719	109,900	1.25	1.07	1.46
GEE: Not adjusted for initial LDL level					
	50,719	109,900	1.14	1.04	1.25
HbA1C \geq 8% : Subjects receiving antidiabetic drugs					
RE: Adjusted for initial HbA1c level					
	21,321	46,215	1.45	1.07	1.95
GEE: Adjusted for initial HbA1c level*					
	21,321	46,215	1.23	1.03	1.46
RE: Not adjusted for initial HbA1c level					
	22,186	48,178	1.54	1.13	2.10
GEE: Not adjusted for initial HbA1c level					
	22,186	48,178	1.27	1.07	1.49
SBP \geq 140 mm Hg: Subjects receiving antihypertensive drugs					
RE: Adjusted for initial SBP level					
	104,948	442,579	1.06	1.01	1.27
GEE: Adjusted for initial SBP level*					
	104,948	442,579	1.05	1.00	1.09
RE: Not adjusted for initial SBP level					
	108,474	454,116	1.08	1.02	1.15
GEE: Not adjusted for initial SBP level					
	108,474	454,116	1.07	1.02	1.12

* Results reported in main manuscript.

Notes: This table reports the odds ratio (OR) of having poor physiologic outcome levels (based on all test values in 2003) associated with a \$1,000 drug cap, estimated using regression models allowing for repeated measures. All analyses adjust for age, gender, SES, race/ethnicity, comorbidity, years in KPNC, emergency department cost-sharing level, office cost-sharing level, and medical center. The physiologic outcome models that do not adjust for an initial value include those subjects who have been prescribed drug treatment and received the drug in 2002, and who had subsequent physiologic measurements in 2003. The models adjusting for an initial value include those subjects described above, with the added criterion that these subjects had at least one initial measurement in 2002 or 2003 after starting drug therapy in addition to at least one subsequent measurement in 2003. Analyses of physiologic outcomes that adjust for an initial value use the first available measurement value after starting drug therapy in 2002-2003 as the initial value. The lower bounds of the 95% CI for all ORs were greater than 1.0, including the OR for SBP>140mmHg (GEE: adjusted for initial SBP level). Odds ratios with $p < 0.05$ and their associated 95% CIs in bolded font.

Table A4. Adjusted Odds of Poor Physiological Outcomes Associated with Having a \$1,000 Cap on Drug Benefits: Among Subjects Who Exceeded the Cap Amount and Subjects Who Did Not Exceed the Cap Amount

Estimation Method	Subjects Who Exceeded the Cap Amount in 2003					Subjects Who Did Not Exceed the Cap Amount in 2003				
	Sample	Total Obs	OR	95%	CI	Sample	Total Obs	OR	95%	CI
LDL \geq 130 mg/dl: Subjects receiving lipid-lowering drugs										
RE: Adjusted for initial LDL level	11,066	26,335	1.47	1.11	1.95	36,018	76,750	1.11	0.93	1.32
GEE: Adjusted for initial LDL level*	11,066	26,335	1.28	1.05	1.56	36,018	76,750	1.07	0.95	1.20
RE: Not adjusted for initial LDL level	11,763	27,692	1.57	1.17	2.11	38,956	82,208	1.11	0.92	1.33
GEE: Not adjusted for initial LDL level	11,763	27,692	1.29	1.07	1.55	38,956	82,208	1.07	0.97	1.19
HbA1C \geq 8%: Subjects receiving antidiabetic drugs										
RE: Adjusted for initial HbA1c level	5,608	13,387	1.69	1.05	2.73	15,713	32,828	1.33	0.90	1.95
GEE: Adjusted for initial HbA1c level*	5,608	13,387	1.31	0.98	1.74	15,713	32,828	1.18	0.94	1.48
RE: Not adjusted for initial HbA1c level	5,773	13,788	1.74	1.01	3.00	16,413	34,390	1.48	1.00	2.19
GEE: Not adjusted for initial HbA1c level	5,773	13,788	1.45	1.10	1.92	16,413	34,390	1.19	0.97	1.46
SBP \geq 140 mm Hg: Subjects receiving antihypertensive drugs										
RE: Adjusted for initial SBP level	20,270	112,202	1.09	0.97	1.21	84,678	330,377	1.03	0.97	1.11
GEE: Adjusted for initial SBP level*	20,270	112,202	1.06	0.97	1.15	84,678	330,377	1.03	0.98	1.08
RE: Not adjusted for initial SBP level	20,549	113,470	1.06	0.94	1.18	87,925	340,646	1.07	1.00	1.15
GEE: Not adjusted for initial SBP level	20,549	113,470	1.07	0.98	1.17	87,925	340,646	1.05	1.00	1.11

* Results reported in main manuscript.

Notes: This table reports the odds ratio (OR) of having poor physiologic outcome levels (based on all test values in 2003) associated with a \$1,000 drug cap, estimated using regression models allowing for repeated measures for subjects who exceeded the cap amount (\$1,000 in total cap drug spending) and those who did not exceed the cap amount in 2003. All analyses adjust for age, gender, SES, race/ethnicity, comorbidity, years in KPNC, emergency department cost-sharing level, office cost-sharing level, and medical center. The physiologic outcome models that do not adjust for an initial value include those subjects who have been prescribed drug treatment and received the drug in 2002, and who had subsequent physiologic measurements in 2003. The models adjusting for an initial value include those subjects described above, with the added criterion that these subjects had at least one initial measurement in 2002 or 2003 after starting drug therapy in addition to at least one subsequent measurement in 2003. Analyses of physiologic outcomes that adjust for an initial value use the first available measurement value after starting drug therapy in 2002-2003 as the initial value. Odds ratios with $p < 0.05$ and their associated 95% CIs in bolded font.

Table A5. Adjusted Odds of Poor Physiologic Outcomes Associated with Having a \$1,000 Cap on Drug Benefits: Among Subjects Newly Treated with Chronic Drugs in 2002

Estimation Method	Sample	Total Obs	OR	95% CI	
LDL \geq 130 mg/dl: Subjects newly treated with lipid-lowering drugs in 2002					
RE: Adjusted for initial LDL level	16,791	35,347	1.26	0.99	1.60
GEE: Adjusted for initial LDL level	16,791	35,347	1.16	0.98	1.36
RE: Not adjusted for initial LDL level	18,874	39,750	1.26	1.02	1.56
GEE: Not adjusted for initial LDL level	18,874	39,750	1.15	1.00	1.33
HbA1C \geq 8%: Subjects newly treated with antidiabetic drugs in 2002					
RE: Adjusted for initial HbA1c level	4,728	9,709	1.65	0.76	3.59
GEE: Adjusted for initial HbA1c level	4,728	9,709	1.35	0.88	2.05
RE: Not adjusted for initial HbA1c level	5,133	10,768	1.89	1.10	3.22
GEE: Not adjusted for initial HbA1c level	5,133	10,768	1.58	1.05	2.37
SBP \geq 140 mm Hg: Subjects newly treated with antihypertensive drugs in 2002					
RE: Adjusted for initial SBP level	25,820	105,346	1.11	0.98	1.26
GEE: Adjusted for initial SBP	25,820	105,346	1.09	0.99	1.20
RE: Not adjusted for initial SBP level	26,983	109,754	1.20	1.06	1.36
GEE: Not adjusted for initial SBP level	26,983	109,754	1.15	1.04	1.26

Notes: This table reports the odds ratio (OR) of having poor physiologic outcome levels (based on all test values in 2003) associated with a \$1,000 drug cap, estimated using regression models allowing for repeated measures for subjects who were newly treated in 2002. A newly treated subject is defined as subjects who were prescribed drug treatment and received the drug in 2002, with no receipt of a drug in the same class in the six months prior. All analyses adjust for age, gender, SES, race/ethnicity, comorbidity, years in KPNC, emergency department cost-sharing level, office cost-sharing level, and medical center. The physiologic outcome models that do not adjust for an initial value include those subjects who have been prescribed drug treatment and received the drug in 2002, and who had subsequent physiologic measurements in 2003. The models adjusting for an initial value include those subjects described above, with the added criterion that these subjects had at least one initial measurement in 2002 or 2003 after starting drug therapy in addition to other subsequent measurements. Analyses of physiologic outcomes that adjust for an initial value use the first available measurement value after starting drug therapy in 2002-2003 as the initial value. Odds ratios with $p < 0.05$ and their associated 95% CIs in bolded font.