

Supplementary Materials

Supplementary Methods

The difference-in-differences approach requires parallel trends between the treatment and control groups before the intervention. To test this assumption, we compared the trends of adherence with and without switching before generic entry between Non-LIS and LIS with two methods:

(1) We plotted percent of women being adherent with and without switching by quarters before generic entry and after generic entry (See Supplementary Figure 1).

(2) We regressed interaction terms between quarter indicators before generic entry and Non-LIS group indicator on adherence with and without switching, adjusting for all the covariates included in our main analyses. We used the 2nd quarter of 2007 as reference and did not include the 1st quarter of 2007 as the number of women with adherence with switches was very small in the first quarter of 2007 (See Supplementary Table 3).

We found the interaction terms were only statistically significant at $\alpha=0.05$ for the interaction between the second quarter of 2008 and Non-LIS for the binary outcome (2). Thus, both methods show that the pre-trends for Non-LIS and LIS were mostly parallel.

Supplementary Tables

Supplementary Table 1 Predicted Probabilities of Adherence with and without Drug Switches Using Multinomial Logit

Binary Outcomes	Non-LIS (Large cost reduction after generic entry)			LIS (Minimal cost-reduction after generic entry)			Group Difference due to Cost Reduction	
	Pre-Generic Entry Period (N=4,978)	Post-Generic Entry Period (N=10,951)	Changes after Generic Entry	Pre-Generic Entry Period (N=1,582)	Post-Generic Entry Period (N=3,166)	Changes after Generic Entry	Group Differential Changes after Generic Entry	p-value
Adherent without switches	0.696 (0.683 , 0.709)	0.780 (0.772 , 0.788)	0.084 (0.069 , 0.099)	0.821 (0.802 , 0.840)	0.771 (0.756 , 0.787)	-0.049 (-0.073 , -0.026)	0.135 (0.107 , 0.163)	<0.001
Adherent with switches	0.068 (0.061 , 0.075)	0.131 (0.125 , 0.138)	0.063 (0.054 , 0.073)	0.069 (0.056 , 0.082)	0.114 (0.102 , 0.126)	0.045 (0.028 , 0.062)	0.019 (-0.000 , 0.039)	0.052
Non-adherent with switches	0.027 (0.022 , 0.031)	0.018 (0.016 , 0.021)	-0.009 (-0.014 , -0.003)	0.013 (0.008 , 0.018)	0.020 (0.015 , 0.025)	0.007 (0.001 , 0.014)	-0.017 (-0.027 , -0.008)	<0.001
Non-adherent without switches	0.210 (0.198 , 0.221)	0.070 (0.066 , 0.075)	-0.139 (-0.152 , -0.126)	0.097 (0.083 , 0.111)	0.095 (0.084 , 0.105)	-0.003 (-0.019 , 0.014)	-0.137 (-0.158 , -0.116)	<0.001

Supplementary Table 2 Coefficients for All Variables in Linear Probability Models

Variables	Binary Outcome (1): Adherent without Switches				Binary Outcome (2): Adherent with Switches			
	Coefficient	p-Value	Confidence Interval		Coefficient	p-Value	Confidence Interval	
			Lower Limit	Upper Limit			Lower Limit	Upper Limit
Intercept	0.706	<.0001	0.629	0.783	0.218	<.0001	0.164	0.273
Post	-0.048	0.000	-0.073	-0.024	0.044	<.0001	0.027	0.060
Post*Non-LIS	0.128	<.0001	0.099	0.157	0.021	0.033	0.002	0.040
Non-LIS	-0.121	<.0001	-0.146	-0.096	-0.003	0.709	-0.018	0.012
Age at DX	0.002	<.0001	0.001	0.003	-0.002	<.0001	-0.003	-0.001
Race								
White	Ref				Ref			
Black	-0.016	0.177	-0.038	0.007	-0.027	0.000	-0.042	-0.012
Asian	0.024	0.140	-0.008	0.055	-0.017	0.143	-0.041	0.006
Hispanic	-0.052	0.021	-0.097	-0.008	0.005	0.747	-0.026	0.037
Other	0.056	0.001	0.024	0.088	-0.021	0.106	-0.046	0.004
Married	-0.002	0.775	-0.014	0.011	0.012	0.009	0.003	0.022
Location								
Big Metro	Ref				Ref			
Urban	0.021	0.007	0.006	0.035	-0.020	0.000	-0.030	-0.009
Rural	0.065	0.009	0.016	0.113	-0.032	0.062	-0.065	0.002
HR Status								
ER+/PR+	0.000	.	0.000	0.000	0.000	.	0.000	0.000
ER-/PR+	0.011	0.786	-0.067	0.088	-0.012	0.651	-0.066	0.041
ER+/PR-	-0.001	0.927	-0.017	0.016	0.003	0.579	-0.009	0.015
Stage								
I	Ref				Ref			
0	0.023	0.216	-0.014	0.060	-0.019	0.158	-0.045	0.007
II	-0.006	0.670	-0.033	0.021	0.004	0.659	-0.015	0.024
III	-0.044	0.027	-0.083	-0.005	0.016	0.272	-0.012	0.044
IV	-0.083	0.000	-0.126	-0.040	0.051	0.001	0.020	0.081
Unknown	-0.028	0.225	-0.072	0.017	-0.009	0.541	-0.038	0.020

Tumor Grade									
Low	Ref					Ref			
High	-0.023	0.005	-0.039	-0.007	0.015	0.013	0.003	0.026	
Unknown	0.004	0.770	-0.022	0.030	0.000	0.982	-0.018	0.019	
Tumor Size									
0 - <1 cm	Ref					Ref			
1 - 2 cm	-0.003	0.679	-0.019	0.012	-0.010	0.098	-0.022	0.002	
>2 cm	-0.017	0.196	-0.043	0.009	-0.011	0.247	-0.031	0.008	
Unknown	0.020	0.350	-0.022	0.063	0.001	0.943	-0.030	0.032	
Lymph Node Involvement									
Negative	Ref					Ref			
Positive	-0.003	0.809	-0.025	0.019	0.000	0.989	-0.016	0.016	
Not Examined	0.015	0.173	-0.006	0.036	-0.015	0.040	-0.030	-0.001	
Radiation	0.014	0.058	0.000	0.029	-0.005	0.381	-0.016	0.006	
Surgery									
Lumpectomy	Ref					Ref			
Mastectomy	0.008	0.302	-0.008	0.025	-0.001	0.828	-0.013	0.010	
No/Other/Unknown	-0.035	0.028	-0.066	-0.004	0.014	0.219	-0.008	0.036	
Part D Coverage									
MAPD									
PDP	-0.041	<.0001	-0.054	-0.028	0.015	0.002	0.005	0.025	
Mixed	-0.019	0.222	-0.049	0.011	0.007	0.557	-0.015	0.029	
Cancer Registry									
California	Ref					Ref			
Connecticut	-0.003	0.851	-0.031	0.025	0.003	0.767	-0.018	0.024	
Detroit	-0.013	0.424	-0.044	0.018	-0.014	0.225	-0.036	0.008	
Hawaii	-0.064	0.012	-0.115	-0.014	0.027	0.153	-0.010	0.064	
Iowa	0.017	0.293	-0.014	0.048	-0.029	0.007	-0.051	-0.008	
New Mexico	-0.057	0.013	-0.102	-0.012	0.049	0.007	0.013	0.085	
Seattle	0.000	0.997	-0.029	0.029	-0.018	0.086	-0.039	0.003	
Utah	-0.003	0.908	-0.046	0.041	-0.025	0.097	-0.054	0.004	
Kentucky	-0.002	0.902	-0.030	0.026	-0.020	0.053	-0.039	0.000	

Louisiana	-0.033	0.022	-0.062	-0.005	-0.002	0.809	-0.023	0.018
New Jersey	0.026	0.009	0.006	0.046	-0.019	0.011	-0.033	-0.004
Georgia	-0.037	0.001	-0.059	-0.015	0.003	0.699	-0.013	0.019

Variables	Binary Outcome (3): Non-adherent with Switches				Binary Outcome (4): Non-Adherent without Switches			
	Coefficient	p-Value	Confidence Interval		Coefficient	p-Value	Confidence Interval	
			Lower Limit	Upper Limit			Lower Limit	Upper Limit
Intercept	0.053	<.0001	0.028	0.079	0.022	0.448	-0.035	0.080
Post	0.009	0.036	0.001	0.017	-0.004	0.710	-0.023	0.016
Post*Non-LIS	-0.018	0.000	-0.027	-0.008	-0.131	<.0001	-0.154	-0.108
Non-LIS	0.015	0.000	0.007	0.023	0.109	<.0001	0.089	0.129
Age at DX	-0.001	<.0001	-0.001	0.000	0.001	0.071	0.000	0.001
Race								
White	Ref				Ref			
Black	-0.005	0.234	-0.012	0.003	0.047	<.0001	0.029	0.066
Asian	-0.012	0.003	-0.020	-0.004	0.006	0.606	-0.017	0.029
Hispanic	0.001	0.902	-0.013	0.015	0.046	0.008	0.012	0.080
Other	-0.011	0.022	-0.020	-0.002	-0.024	0.024	-0.046	-0.003
Married	-0.003	0.154	-0.007	0.001	-0.007	0.112	-0.016	0.002
Location								
Big Metro	Ref				Ref			
Urban	-0.004	0.103	-0.010	0.001	0.003	0.543	-0.008	0.014
Rural	-0.008	0.345	-0.026	0.009	-0.025	0.177	-0.060	0.011
HR Status								
ER+/PR+	0.000	.	0.000	0.000	0.000	.	0.000	0.000
ER-/PR+	0.000	0.993	-0.028	0.028	0.002	0.957	-0.056	0.059
ER+/PR-	-0.002	0.412	-0.008	0.003	0.000	0.954	-0.012	0.012
Stage								
I	Ref				Ref			
0	0.000	0.978	-0.012	0.012	-0.005	0.744	-0.032	0.023
II	0.001	0.881	-0.008	0.009	0.001	0.940	-0.019	0.021

III	0.005	0.413	-0.007	0.017	0.023	0.127	-0.007	0.053
IV	0.000	0.944	-0.014	0.013	0.033	0.053	0.000	0.066
Unknown	-0.004	0.493	-0.015	0.007	0.040	0.029	0.004	0.077
Tumor Grade								
Low	Ref				Ref			
High	0.002	0.508	-0.004	0.007	0.006	0.290	-0.005	0.018
Unknown	-0.006	0.100	-0.014	0.001	0.002	0.811	-0.017	0.022
Tumor Size								
0 - <1 cm	Ref				Ref			
1 - 2 cm	0.003	0.313	-0.002	0.008	0.011	0.055	0.000	0.021
>2 cm	0.006	0.129	-0.002	0.014	0.022	0.021	0.003	0.041
Unknown	-0.002	0.781	-0.013	0.010	-0.020	0.234	-0.053	0.013
Lymph Node Involvement								
Negative	Ref				Ref			
Positive	0.002	0.529	-0.005	0.010	0.000	0.959	-0.016	0.017
Not Examined	-0.002	0.515	-0.009	0.005	0.003	0.708	-0.013	0.019
Radiation	0.002	0.466	-0.003	0.007	-0.011	0.040	-0.022	-0.001
Surgery								
Lumpectomy	Ref				Ref			
Mastectomy	0.005	0.092	-0.001	0.011	-0.012	0.042	-0.024	0.000
No/Other/Unknown	0.011	0.042	0.000	0.021	0.010	0.389	-0.013	0.034
Part D Coverage								
MAPD								
PDP	0.007	0.007	0.002	0.011	0.019	<.0001	0.010	0.029
Mixed	0.005	0.375	-0.006	0.016	0.007	0.519	-0.015	0.029
Cancer Registry								
California	Ref				Ref			
Connecticut	0.005	0.366	-0.005	0.015	-0.005	0.618	-0.025	0.015
Detroit	0.006	0.305	-0.005	0.017	0.020	0.077	-0.002	0.043
Hawaii	0.016	0.064	-0.001	0.033	0.021	0.251	-0.015	0.057
Iowa	-0.002	0.720	-0.012	0.008	0.015	0.230	-0.009	0.038
New Mexico	0.009	0.286	-0.007	0.025	0.000	0.975	-0.030	0.029

Seattle	0.006	0.289	-0.005	0.017	0.012	0.241	-0.008	0.033
Utah	0.007	0.373	-0.009	0.024	0.020	0.227	-0.012	0.053
Kentucky	0.000	0.975	-0.010	0.010	0.021	0.051	0.000	0.042
Louisiana	0.004	0.460	-0.006	0.013	0.032	0.004	0.010	0.054
New Jersey	-0.004	0.188	-0.011	0.002	-0.003	0.679	-0.018	0.011
Georgia	0.016	0.001	0.007	0.025	0.018	0.031	0.002	0.034

Supplementary Table 3 Coefficients for interaction terms between quarter indicators before generic entry and Non-LIS group indicator with and without switching

Interaction terms between quarter indicator and Non-LIS	Binary Outcome (1): Adherent without Switches	Binary Outcome (2): Adherent with Switches	Binary Outcome (3): Non-adherent with Switches	Binary Outcome (4): Non-Adherent without Switches
	Coefficient (p-Value)	Coefficient (p-Value)	Coefficient (p-Value)	Coefficient (p-Value)
3 rd quarter of 2007*Non-LIS	0.0328 (0.446)	-0.0224 (0.414)	-0.0101 (0.406)	-0.000219 (0.995)
4 th quarter of 2007*Non-LIS	-0.0479 (0.245)	0.0349 (0.166)	-0.0113 (0.368)	0.0244 (0.478)
1 st quarter of 2008*Non-LIS	-0.0476 (0.245)	0.0130 (0.617)	-0.0153 (0.217)	0.0500 (0.138)
2 nd quarter of 2008*Non-LIS	-0.0716 (0.112)	0.0577* (0.029)	-0.00766 (0.556)	0.0216 (0.573)

p-values in parentheses

Supplementary Figures

Supplementary Figure 1 Percent of adherence with and without drug switches by quarter of initiation

