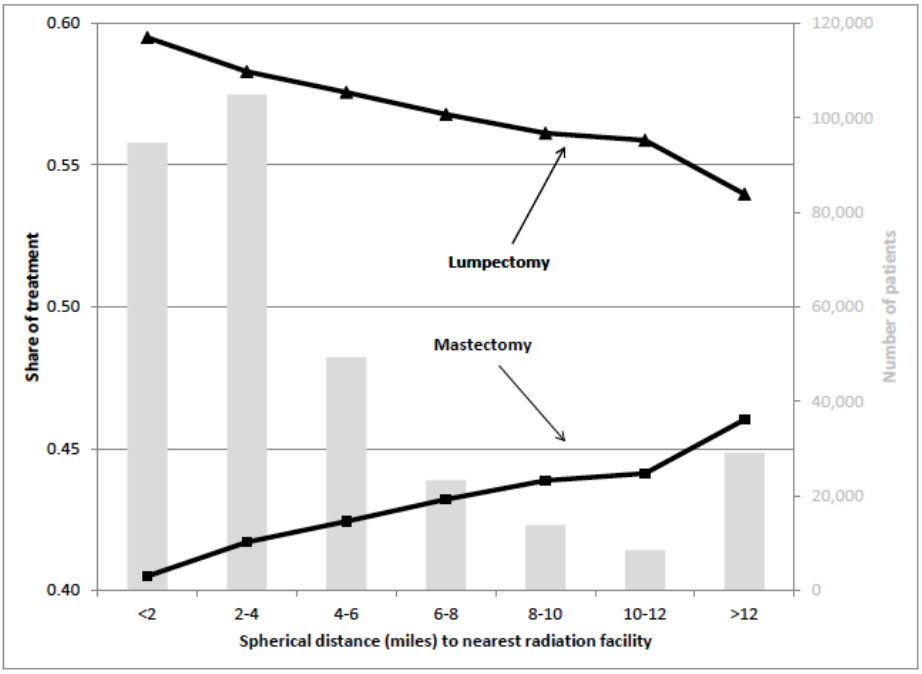
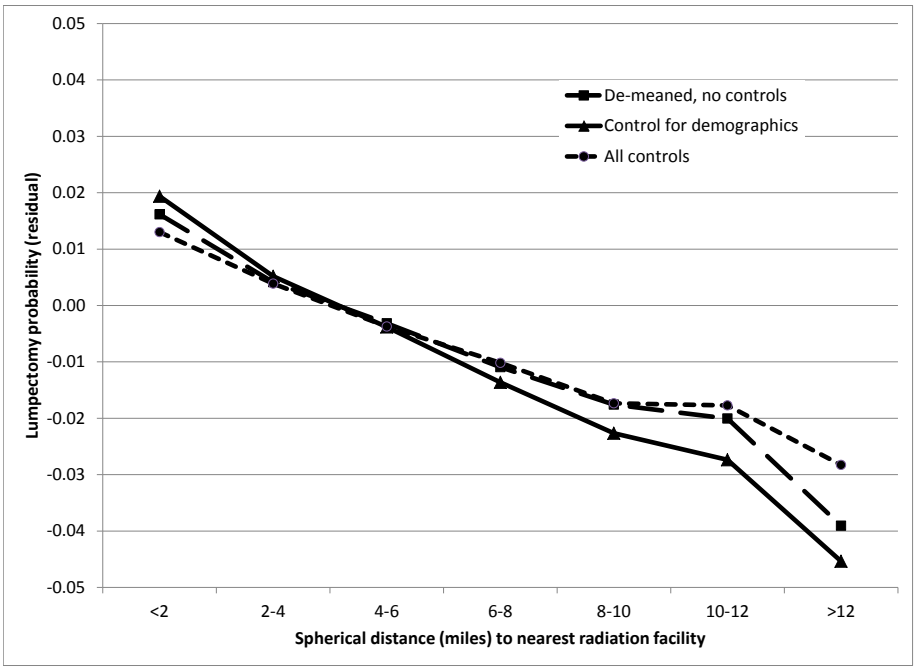
A Appendix: Additional figures and tables

Figure A.1: **Treatment choice by spherical distance to nearest radiation facility**

(a) Raw data



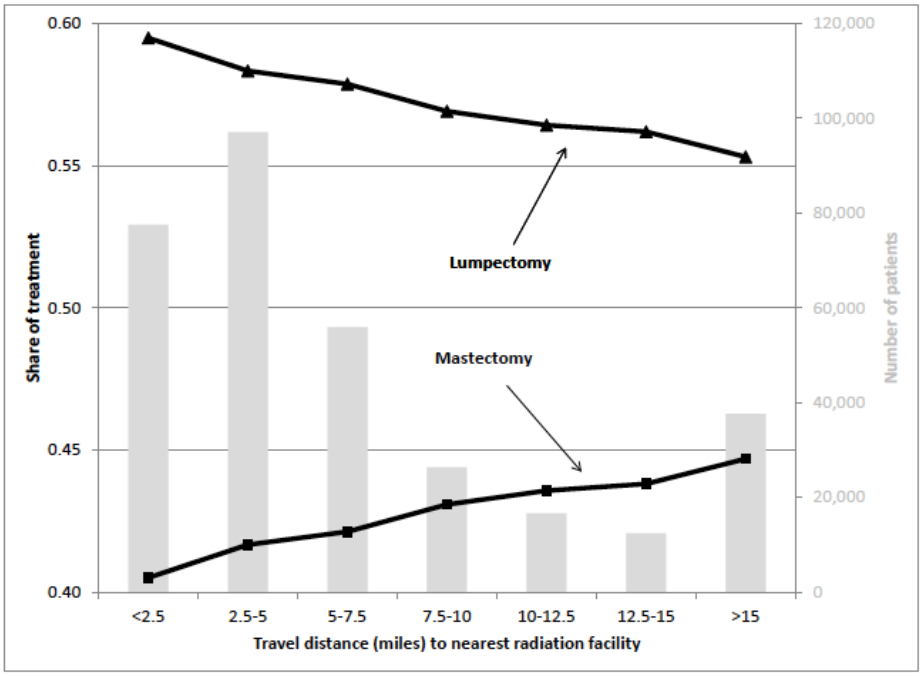
(b) Residualized data



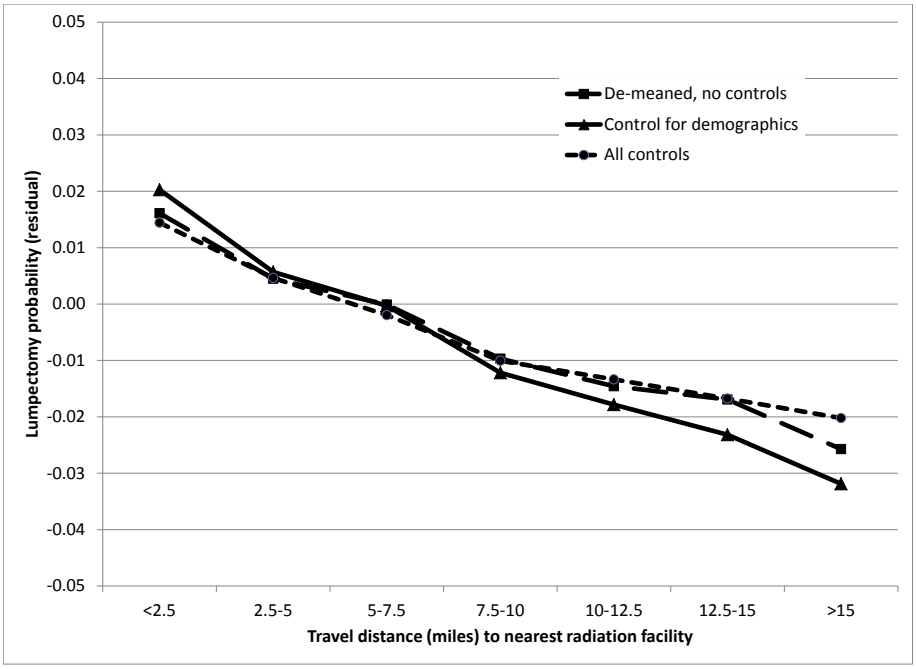
Notes: These figures plot the probability of treatment by spherical distance in miles to the nearest radiation facility, measured from the patients' address of residence at the time of cancer diagnosis, for our baseline sample (N=323,612). Panel (a) plots the raw data, and a histogram of the number of patients by spherical distance. Panel (b) plots the de-meaned lumpectomy rate as well as two residualized versions. The first residualizes lumpectomy probability using patient characteristics. The second adds neighborhood-level covariates from the 2000 Census and clinical covariates. All covariates are as described in the notes to Table 1.

Figure A.2: **Treatment choice by travel distance to nearest radiation facility**

(a) Raw data



(b) Residualized data



Notes: These figures plot the probability of treatment by travel distance in miles to the nearest radiation facility, measured from the patients' address of residence at the time of cancer diagnosis, for our baseline sample (N=323,612). Panel (a) plots the raw data, and a histogram of the number of patients by spherical distance. Panel (b) plots the de-meaned lumpectomy rate as well as two residualized versions. The first residualizes lumpectomy probability using patient characteristics. The second adds neighborhood-level covariates from the 2000 Census and clinical covariates. All covariates are as described in the notes to Table 1.

Table A.1: **Robustness: Treatment choice by travel time, full sample**

	Homogeneous Logit				Heterogenous Logit	
	No covariates	Column (1) + demographics	Column (2) + Census block characteristics	Column (3) + clinical characteristics (all controls)	All controls, also interacted with distance	Column (4) + random coefficients
	(1)	(2)	(3)	(4)	(5)	(6)
Average effect of a 10-minute increase in travel time	-0.0068	-0.0096	-0.0067	-0.0060	-0.0088	-0.0265
(standard error)	(0.00057)	(0.00054)	(0.00063)	(0.00056)	(0.00056)	(0.00262)
Standard deviation (across patients) of the above effect	0.00002	0.00018	0.00018	0.00009	0.00598	0.04869

Notes: This table summarizes estimates from logit regressions estimating the relationship between breast cancer treatment choice of lumpectomy (mean = 0.58) and travel time to the nearest radiation facility, measured from the patients' address of residence at the time of cancer diagnosis, for our full sample (that is, not limited to women receiving lumpectomy or mastectomy; N=343,399). The outcome variable is an indicator variable, equal to 1 if the patient receives a lumpectomy. This table reports the estimated effect with respect to a ten-minute increase in travel time by computing - for each patient in our sample - the predicted probability of a lumpectomy choice (given the estimated coefficients) and the way it would change if we made her drive 10 minutes longer; we then report the average marginal effect in the sample and its standard error (clustered at the county level, and based on 50 replications of the bootstrap), as well as the standard deviation of this effect across patients. Column (1) reports estimates from a logit model with no controls. Columns (2), (3), and (4) add covariates for demographics, Census block controls, and clinical controls successively. Column (5) adds interactions between these covariates and our distance measures, and Column (6) allows random coefficients on distance. All covariates are as described in the notes to Table 1.

Table A.2: **Robustness: Treatment choice by spherical distance**

	Homogeneous Logit				Heterogenous Logit	
	No covariates	Column (1) + demographics	Column (2) + Census block characteristics	Column (3) + clinical characteristics (all controls)	All controls, also interacted with distance	Column (4) + random coefficients
	(1)	(2)	(3)	(4)	(5)	(6)
Average effect of a 10-mile increase in spherical distance	-0.0177	-0.0211	-0.0146	-0.0151	-0.0231	-0.0732
(standard error)	(0.00116)	(0.00097)	(0.00097)	(0.00101)	(0.00120)	(0.00840)
Standard deviation (across patients) of the above effect	0.00010	0.00052	0.00052	0.00124	0.01470	0.26626

Notes: This table summarizes estimates from logit regressions estimating the relationship between breast cancer treatment choice of lumpectomy (mean = 0.58) and spherical distance to the nearest radiation facility, measured from the patients' address of residence at the time of cancer diagnosis, for our baseline sample (N=323,612). The outcome variable is an indicator variable, equal to 1 if the patient receives a lumpectomy. This table reports the estimated effect with respect to a ten mile increase in spherical distance by computing - for each patient in our sample - the predicted probability of a lumpectomy choice (given the estimated coefficients) and the way it would change if we made her travel ten spherical miles longer; we then report the average marginal effect in the sample and its standard error (clustered at the county level, and based on 50 replications of the bootstrap), as well as the standard deviation of this effect across patients. Column (1) reports estimates from a logit model with no controls. Columns (2), (3), and (4) add covariates for demographics, Census block controls, and clinical controls successively. Column (5) adds interactions between these covariates and our distance measures, and Column (6) allows random coefficients on distance. All covariates are as described in the notes to Table 1.

Table A.3: **Robustness: Treatment choice by travel distance**

	Homogeneous Logit				Heterogenous Logit	
	No covariates	Column (1) + demographics	Column (2) + Census block characteristics	Column (3) + clinical characteristics (all controls)	All controls, also interacted with distance	Column (4) + random coefficients
	(1)	(2)	(3)	(4)	(5)	(6)
Average effect of a 10-mile increase in travel distance	-0.0091	-0.0116	-0.0081	-0.0084	-0.0112	-0.0691
(standard error)	(0.00072)	(0.00069)	(0.00064)	(0.00066)	(0.00081)	(0.00510)
Standard deviation (across patients) of the above effect	0.00004	0.00007	0.00003	0.00004	0.00006	0.24492

Notes: This table summarizes estimates from logit regressions estimating the relationship between breast cancer treatment choice of lumpectomy (mean = 0.58) and travel distance to the nearest radiation facility, measured from the patients' address of residence at the time of cancer diagnosis, for our baseline sample (N=323,612). The outcome variable is an indicator variable, equal to 1 if the patient receives a lumpectomy. This table reports the estimated effect with respect to a ten mile increase in travel distance by computing - for each patient in our sample - the predicted probability of a lumpectomy choice (given the estimated coefficients) and the way it would change if we made her travel ten miles longer; we then report the average marginal effect in the sample and its standard error (clustered at the county level, and based on 50 replications of the bootstrap), as well as the standard deviation of this effect across patients. Column (1) reports estimates from a logit model with no controls. Columns (2), (3), and (4) add covariates for demographics, Census block controls, and clinical controls successively. Column (5) adds interactions between these covariates and our distance measures, and Column (6) allows random coefficients on distance. All covariates are as described in the notes to Table 1.

Table A.4: **Parameter estimates and standard errors underlying Table 3**

	Homogeneous Logit				Heterogenous Logit	
	No covariates	Column (1) + demographics	Column (2) + Census block characteristics	Column (3) + clinical characteristics (all controls)	All controls, also interacted with distance	Column (4) + random coefficients
	(1)	(2)	(3)	(4)	(5)	(6)
Travel time (minutes)	-0.0032	-0.0041	-0.0029	-0.0030	-0.0045	
(standard error)	(0.00102)	(0.00124)	(0.00112)	(0.00129)	(0.00197)	
Mean of (random) coefficient on travel time						-8,910
(standard error)						(51,629)
Std. deviation of (random) coefficient on travel time (minutes)						3.5E+12
(standard error)						(4.78E+13)

Notes: This table summarizes the parameter estimates and their standard errors that give rise to the average marginal effects reported in Table 3. All details are as reported in the notes to Table 3.

Table A.5: **Robustness: Treatment choice by non-linear travel time**

	Homogeneous Logit			
	No covariates	Column (1) + demographics	Column (2) + Census block characteristics	Column (3) + clinical characteristics (all controls)
	(1)	(2)	(3)	(4)
Travel time <= 5 minutes	0.153 (0.0439)	0.203 (0.0503)	0.150 (0.0423)	0.165 (0.0475)
Travel time is 5-10 minutes	0.104 (0.0373)	0.140 (0.0426)	0.0998 (0.0377)	0.111 (0.0424)
Travel time is 10-15 minutes	0.0574 (0.0329)	0.0806 (0.0354)	0.0445 (0.0291)	0.0480 (0.0302)
Travel time >= 15 minutes	---------- Omitted category ----------			

Notes: This table summarizes estimates from logit regressions estimating the relationship between breast cancer treatment choice of lumpectomy (mean = 0.58) and travel time to the nearest radiation facility, measured from the patients' address of residence at the time of cancer diagnosis, for our baseline sample (N=323,612). Unlike in Table 3, we here parametrize travel time non-linearly: <=5 minutes, 5 to 10 minutes, 10 to 15 minutes, or more than 15 minutes (omitted). All other details are as reported in the notes to Table 3.

Table A.6: **Robustness: Treatment choice by travel time, linear probability models**

	No covariates	Column (1) + demographics	Column (2) + Census block characteristics	Column (3) + clinical characteristics (all controls)	All controls, also interacted with distance
	(1)	(2)	(3)	(4)	(5)
Trvael time (in 10-minute units)	-0.0078	-0.0100	-0.0070	-0.0068	-0.0101
(standard error)	(0.00252)	(0.00303)	(0.00275)	(0.00293)	(0.00440)

Notes: This table summarizes estimates from linear probability models estimating the relationship between breast cancer treatment choice of lumpectomy (mean = 0.58) and travel time to the nearest radiation facility, measured from the patients' address of residence at the time of cancer diagnosis, for our baseline sample (N=323,612). The outcome variable is an indicator variable, equal to 1 if the patient receives a lumpectomy. Column (1) reports estimates from a model with no controls. Columns (2), (3), and (4) add covariates for demographics, Census block controls, and clinical controls successively. Column (5) adds interactions between these covariates and our distance measures. Standard errors are clustered by county. All covariates are as described in the notes to Table 1.