Web Table 1: Correlation Matrix of Distance Variables, Closest Food Establishment of Each Type

	Distance to Closest Fast-Food Restaurant	Distance to Closest Full-Service Restaurant	Distance to Closest Bakery	Distance to Closest Convenience Store	Distance to Closest Grocery Store	Distance to Closest Supermarket
Distance to Closest Fast-Food Restaurant	1.000	0.676	0.749	0.797	0.558	0.438
Distance to Closest Full-Service Restaurant	0.676	1.000	0.581	0.687	0.587	0.309
Distance to Closest Bakery	0.749	0.581	1.000	0.759	0.464	0.508

Distance to Closest Convenience Store	0.797	0.687	0.759	1.000	0.611	0.400
Distance to Closest Grocery Store	0.558	0.587	0.464	0.611	1.000	0.065
Distance to Closest Supermarket	0.438	0.309	0.508	0.400	0.065	1.000

Web Table 2: Correlation Matrix of Distance Variables, Mean of 5 Closest Food Establishments of Each Type

	Mean Distance to Closest 5 Fast-Food Restaurants	Mean Distance to Closest 5 Full-Service Restaurants	Mean Distance to Closest 5 Bakeries	Mean Distance to Closest 5 Convenience Stores	Mean Distance to Closest 5 Grocery Stores	Mean Distance to Closest 5 Supermarkets
Mean Distance to Closest 5 Fast-Food Restaurants	1.000	0.792	0.879	0.877	0.575	0.637
Mean Distance to Closest 5 Full-Service Restaurants	0.792	1.000	0.688	0.698	0.692	0.363
Mean Distance	0.879	0.688	1.000	0.836	0.604	0.740

to Closest 5 Bakeries						
Mean Distance to Closest 5 Convenience Stores	0.877	0.698	0.836	1.000	0.586	0.653
Mean Distance to Closest 5 Grocery Stores	0.575	0.692	0.604	0.586	1.000	0.225
Mean Distance to Closest 5 Supermarkets	0.637	0.363	0.740	0.653	0.225	1.000

Web Table 3: Characteristics of Sample by Wave, Continuous Variables, 1971-2001, Female

Variables	Overall Mean (SD) N=7043[a]	Wave 1 Mean (SD) N=1393[b]	Wave 2 Mean (SD) N=1110[b]	Wave 3 Mean (SD) N=1022[b]	Wave 4 Mean (SD) N=1014[b]	Wave 5 Mean (SD) N=934[b]	Wave 6 Mean (SD) N=826[b]	Wave 7 Mean (SD) N=744[b]
BMI	26.0 (5.3)	24.2 (4.5)	24.9 (4.9)	25.6 (5.0)	26.3 (5.4)	27.0 (5.5)	27.5 (5.6)	28.0 (5.8)
Age	50.8 (12.9)	37.9 (9.6)	45.3 (10.0)	49.8 (10.0)	53.1 (9.9)	56.6 (9.9)	60.6 (9.8)	63.1 (9.5)
Distance to Closest Fast-Food Restaurant	1190m (804)	1325m (934)	1210m (745)	1164m (769)	1141m (762)	1145m (775)	1121m (765)	1140m (774)

Distance to Closest Full-Service Restaurant	1087m (808.11)	1083m (880.39)	1144m (859.30)	1141m (873.38)	1054m (733.24)	1042m (728.37)	1042m (739.65)	1092m (751.69)
Distance to Closest Bakery	1500m (1099)	1760m (1397)	1632m (1312)	1426m (968)	1439m (898)	1391m (906)	1297m (849)	1360m (868)
Distance to Closest Convenience Store	1248m (976)	1268m (1028)	1208m (872)	1205m (983)	1202m (920)	1251m (956)	1298m (1027)	1335m (1044)
Distance to Closest Grocery Store	1899m (1413)	1460m (1154)	1787m (1421)	1881m (1421)	2427m (1833)	2073m (1340)	1907m (1185)	1965m (1204)
Distance to Closest Chain Supermarket	2964m (1895)	4223m (2405)	2968m (1968)	2608m (1413)	2714m (1419)	2528m (1518)	2494m (1542)	2499m (1565)
Mean Distance to Closest 5 Fast-Food Restaurants	1909 m (1031)	2100m (1177)	2098m (1062)	2003m (1053)	1857m (1017)	1723m (877)	1690m (879)	1692m (867)
Mean Distance to Closest 5 Full-Service Restaurants	1657m (887)	1704m (931)	1726m (933)	1702m (940)	1646m (850)	1608m (834)	1571m (840)	1571m (805)
Mean Distance to	2492m	2671m	2673m	2649m	2601m	2351m	2077m	2157m

Closest 5 Bakeries	(1465)	(1786)	(1633)	(1595)	(1370)	(1181)	(991)	(1005)
Mean Distance to Closest 5 Convenient Stores	2028m (1200)	2241m (1244)	2046m (1004)	1978m (1168)	1922m (1061)	1901m (1124)	1982m (1380)	2030m (1419)
Mean Distance to Closest 5 Grocery Stores	2875m (1588)	2373m (1346)	2783m (1525)	2794m (1612)	3123m (1846)	3081m (1579)	3048m (1443)	3274m (1602)
Mean Distance to Closest 5 Chain Supermarkets	5062m (2266)	6862m (2761)	4977m (2218)	4731m (1828)	4866m (1664)	4447m (1703)	4203m (1784)	4260m (1810)
Intersections per Square Mile	94.5 (58.0)	100.5 (60.7)	96.1 (58.0)	93.8 (57.9)	93.5 (58.1)	91.9 (56.2)	91.2 (56.0)	90.4 (56.3)

[a] N represents the number of observations across all waves.

[b] N represents the number of subjects in each wave.

Web Table 4: Characteristics of Sample by Wave, Continuous Variables, 1971-2001, Male

Variables	Overall Mean (SD) N=6380[a]	Wave 1 Mean (SD) N=1352[b]	Wave 2 Mean (SD) N=1059[b]	Wave 3 Mean (SD) N=949[b]	Wave 4 Mean (SD) N=915[b]	Wave 5 Mean (SD) N=813[b]	Wave 6 Mean (SD) N=701[b]	Wave 7 Mean (SD) N=591[b]
BMI	27.6 (4.0)	26.7 (3.6)	26.8 (3.6)	27.3 (3.8)	27.9 (3.9)	28.4 (4.2)	28.7 (4.3)	28.9 (4.5)
Age	50.9 (12.9)	38.9 (10.0)	46.1 (10.6)	50.7 (10.4)	53.9 (10.2)	57.0 (10.0)	60.7 (9.8)	62.9 (9.7)
Distance to Closest Fast-Food Restaurant	1223m (827)	1314m (933)	1236m (752)	1205m (788)	1178m (791)	1196m (830)	1161m (807)	1196m (823)
Distance to Closest Full-Service Restaurant	1112m (828)	1070m (879)	1178m (865)	1168m (867)	1080m (756)	1085m (783)	1074m (779)	1134m (786)
Distance to Closest Bakery	1538m (1123)	1721m (1375)	1659m (1284)	1467m (979)	1491m (957)	1451m (1000)	1357m (909)	1418m (924)

Distance to Closest Convenience Store	1281m (1011)	1261m (1041)	1250m (868)	1246m (1008)	1244m (973)	1292m (1017)	1356m (1106)	1396m (1105)
Distance to Closest Grocery Store	1943m (1453)	1433m (1138)	1810m (1435)	1974m (1491)	2529m (1891)	2149m (1347)	1993m (1211)	2051m (1255)
Distance to Closest Chain Supermarket	3015m (1958)	4241m (2431)	3011m (2007)	2541m (1451)	2720m (1447)	2564m (1594)	2535m (1618)	2622m (1684)
Mean Distance to Closest 5 Fast-Food Restaurants	1945m (1060)	2091m (1189)	2124m (1063)	2037m (1063)	1888m (1050)	1758m (946)	1729m (928)	1744m (921)
Mean Distance to Closest 5 Full-Service Restaurants	1687m (905)	1690m (936)	1758m (923)	1728m (938)	1679m (878)	1646m (882)	1630m (879)	1627m (840)
Mean Distance to Closest 5 Bakeries	2535m (1491)	2646m (1787)	2698m (1624)	2650m (1565)	2653m (1406)	2409m (1257)	2161m (1044)	2235m (1060)
Mean Distance to Closest 5 Convenient Stores	2064m (1226)	2238m (1266)	2069m (987)	2016m (1177)	1965m (1112)	1936m (1195)	2033m (1439)	2097m (1472)
Mean Distance to Closest 5 Grocery Stores	2919m	2341m	2798m	2871m	3240m	3172m	3170m	3391m

	(1620)	(1339)	(1517)	(1646)	(1909)	(1586)	(1485)	(1652)
Mean Distance to Closest 5 Chain Supermarkets	5133m (2309)	6873m (2774)	5008m (2239)	4700m (1817)	4884m (1685)	4496m (1770)	4251m (1828)	4386m (1911)
Intersections per Square Mile	92.4 (55.8)	100.5 (58.7)	92.6 (54.3)	91.40 (53.79)	90.6 (56.1)	89.3 (55.3)	88.5 (54.4)	87.2 (54.7)

[a] N represents the number of observations across all waves.

[b] N represents the number of subjects in each wave.

Web Table 5: Characteristics of Sample by Wave, Categorical Variables, 1971-2001, Female

Variables		Overall % N=7043[a]	Wave 1 % N=1393[b]	Wave 2 % N=1110[b]	Wave 3 % N=1022[b]	Wave 4 % N=1014[b]	Wave 5 % N=934[b]	Wave 6 % N=826[b]	Wave 7 % N=744[b]
Education	High School or <	53.6	48.2	56.9	55.0	54.4	54.4	54.8	53.2
	> High School	42.2	39.3	43.1	44.0	42.6	42.1	42.5	43.4
	Missing	4.2	12.6	0	1.0	3.0	3.5	2.7	3.4
Married		75.2	84.7	79.0	76.4	73.7	71.4	68.2	64.4
Current Smoker		30.8	47.2	39.1	31.5	27.0	22.5	18.2	16.4
Alcohol Consumption	0 drinks per day	35.5	17.5	30.1	38.8	38.3	40.2	51.0	45.6
	1-2 drinks	59.4	76.2	63.2	55.2	56.7	55.8	45.9	50.8

	per day								
	> 2 drinks per day	5.2	6.3	6.7	6.0	5.0	4.1	3.2	3.6

[a] N represents the number of observations across all waves.

[b] N represents the number of subjects in each wave.

Web Table 6: Characteristics of Sample by Wave, Categorical Variables, 1971-2001, Male

Variables		Overall % N=6380[a]	Wave 1 % N=1352[b]	Wave 2 % N=1059[b]	Wave 3 % N=949[b]	Wave 4 % N=915[b]	Wave 5 % N=813[b]	Wave 6 % N=701[b]	Wave 7 % N=591[b]
Education	High School or <	47.2	42.2	49.7	50.1	48.7	48.1	46.8	46.0
	> High School	48.8	44.6	50.2	49.0	48.8	49.6	50.8	52.1
	Missing	4.0	13.2	0.1	1.0	2.4	2.3	2.4	1.9
Married		83.4	84.2	83.6	84.2	83.9	83.0	81.9	81.7
Current Smoker		31.4	47.4	40.1	30.2	26.8	22.9	18.1	15.4
Alcohol Consumption	0 drinks per day	22.5	9.8	19.0	21.5	27.9	27.7	32.7	31.6
	1-2 drinks per day	53.7	61.4	50.9	53.7	50.7	52.5	50.6	50.8

	> 2 drinks per day	23.9	28.8	30.1	24.8	21.4	19.8	16.7	17.6

[a] N represents the number of observations across all waves.

[b] N represents the number of subjects in each wave.

Web Table 7: Multilevel, Cross-classified, Multivariable Regression Parameter Estimates for the Adjusted Change in BMI for Every 1 Kilometer Increase in Distance to Food Establishments, 1971 – 2001, Overall

Variables	Model 1 β (95% Credible Interval), Adjusted for Age, Sex, Time[a]	Model 2 β (95% Credible Interval), Adjusted for Other Covariates[b]	Model 3 β (95% Credible Interval), Adjusted for all Covariates and Relative Closeness[c]	Model 4 β (95% Credible Interval), Adjusted for all Covariates with Lagged BMI as the Dependent Variable[d]	Model 5 β (95% Credible Interval), Adjusted for all Covariates and Relative Closeness with Lagged BMI as the Dependent Variable
Distance to Closest Food Establishment					
Distance to Closest Fast-Food	-0.09 (-0.17, -0.01)[e]	-0.11 (-0.20, -0.04)[e]	-0.10 (-0.19, -0.01)[e]	-0.10 (-0.20, -0.01)[e]	-0.08 (-0.18, 0.02)

Restaurant					
Distance to Closest Full-Service Restaurant	0.05 (-0.04, 0.13)	0.02 (-0.07, 0.11)	0.02 (-0.07, 0.11)	0.02 (-0.07, 0.11)	0.00 (-0.09, 0.10)
Distance to Closest Bakery	-0.01 (-0.07, 0.05)	-0.02 (-0.08, 0.04)	0.01 (-0.05, 0.08)	0.00 (-0.06, 0.06)	0.01 (-0.06, 0.08)
Distance to Closest Convenience Store	0.04 (-0.03, 0.11)	0.02 (-0.06, 0.09)	0.01 (-0.07, 0.09)	0.02 (-0.06, 0.10)	0.06 (-0.03, 0.15)
Distance to Closest Grocery Store	-0.04 (-0.09, 0.004)	-0.06 (-0.10, -0.01)[e]	-0.05 (-0.11, 0.01)	0.01 (-0.04, 0.06)	0.00 (-0.06, 0.05)
Distance to Closest Chain	-0.02 (-0.05, 0.01)	-0.02 (-0.06, 0.01)	-0.01 (-0.05, 0.03)	-0.01 (-0.05, 0.02)	-0.01 (-0.05, 0.03)

Supermarket					
Mean Distance to Closest 5 Food Establishments					
Mean Distance to Closest 5 Fast-Food Restaurants	0.00 (-0.08, 0.07)	-0.03 (-0.10, 0.05)	0.00 (-0.08, 0.08)	-0.03 (-0.11, 0.05)	0.00 (-0.09, 0.09)
Mean Distance to Closest 5 Full-Service Restaurants	0.01 (-0.08, 0.09)	-0.04 (-0.13, 0.06)	-0.05 (-0.15, 0.04)	-0.02 (-0.12, 0.08)	-0.05 (-0.15, 0.06)
Mean Distance to Closest 5 Bakeries	-0.01 (-0.06, 0.04)	-0.03 (-0.08, 0.03)	0.01 (-0.06, 0.08)	-0.03 (-0.09, 0.03)	-0.04 (-0.11, 0.03)
Mean Distance to Closest 5 Convenient Stores	0.03 (-0.04, 0.09)	0.01 (-0.06, 0.08)	0.00 (-0.08, 0.07)	-0.04 (-0.11, 0.04)	0.00 (-0.08, 0.08)

Mean Distance to Closest 5 Grocery Stores	-0.05 (-0.11, 0.01)	-0.08 (-0.15, -0.03)[e]	-0.09 (-0.16, -0.02)[e]	-0.03 (-0.09, 0.03)	-0.07 (-0.15, 0.01)
Mean Distance to Closest 5 Chain Supermarket	0.00 (-0.05, 0.04)	-0.01 (-0.06, 0.02)	0.00 (-0.04, 0.04)	-0.02 (-0.05, 0.02)	-0.02 (-0.06, 0.03)

[a] Adjusted for time as both a categorical fixed effect and a linear random effect

[b] Adjusted for age, time as both a categorical fixed effect and linear random effect, education and time-varying marital status, smoking status, alcohol consumption, and intersections per square mile

[c] Adjusted for age, time as both a categorical fixed effect and linear random effect, education and time-varying marital status, smoking status, alcohol consumption, intersections per square mile, and relative closeness measures for each of the food establishment types (relative closeness for fast food as the reference category).

[d] Adjusted for age, time as both a categorical fixed effect and linear random effect, education and time-varying marital status, smoking status, alcohol consumption, intersections per square mile. Distance at each wave is linked to BMI at the subsequent wave.

[e] 95% Credible Interval does not contain 0.

Web Table 8: Multilevel, Cross-classified, Multivariable Regression Parameter Estimates for the Adjusted Change in BMI for Every 1 Kilometer Increase in Distance to Food Establishments, 1971 – 2001, Female

Variables	Model 1 β (95% Credible Interval), Adjusted for Age and Time[a]	Model 2 β (95% Credible Interval), Adjusted for Other Covariates[b]	Model 3 β (95% Credible Interval), Adjusted for all Covariates and Relative Closeness[c]	Model 4 β (95% Credible Interval), Adjusted for all Covariates with Lagged BMI as the Dependent Variable[d]	Model 5 β (95% Credible Interval), Adjusted for all Covariates and Relative Closeness with Lagged BMI as the Dependent Variable
Distance to Closest Food Establishment					
Distance to Closest Fast-Food	-0.15 (-0.29, -0.03)[e]	-0.19 (-0.32, -0.06)[e]	-0.15 (-0.29, -0.01)[e]	-0.17 (-0.32, -0.03)[e]	-0.14 (-0.29, 0.02)

Restaurant					
Distance to Closest Full-Service Restaurant	0.12 (-0.02, 0.25)	0.08 (-0.06, 0.21)	0.08 (-0.07, 0.22)	0.07 (-0.07, 0.23)	0.05 (-0.09, 0.19)
Distance to Closest Bakery	0.01 (-0.08, 0.09)	-0.04 (-0.12, 0.05)	0.01 (-0.09, 0.10)	-0.05 (-0.14, 0.04)	-0.03 (-0.13, 0.08)
Distance to Closest Convenience Store	0.05 (-0.07, 0.16)	0.00 (-0.12, 0.12)	0.01 (-0.12, 0.14)	0.02 (-0.11, 0.15)	0.09 (-0.04, 0.21)
Distance to Closest Grocery Store	-0.05 (-0.12, 0.02)	-0.07 (-0.15, 0.001)	-0.06 (-0.14, 0.02)	0.03 (-0.05, 0.11)	0.04 (-0.04, 0.13)
Distance to Closest Chain	-0.02 (-0.07, 0.03)	-0.03 (-0.08, 0.02)	-0.02 (-0.08, 0.04)	-0.01 (-0.06, 0.05)	-0.02 (-0.08, 0.04)

Supermarket					
Mean Distance to Closest 5 Food Establishments					
Mean Distance to Closest 5 Fast-Food Restaurants	0.00 (-0.11, 0.11)	-0.05 (-0.16, 0.07)	0.00 (-0.13, 0.14)	-0.08 (-0.20, 0.05)	-0.04 (-0.17, 0.11)
Mean Distance to Closest 5 Full-Service Restaurants	0.05 (-0.09, 0.19)	-0.01 (-0.16, 0.14)	-0.05 (-0.20, 0.09)	0.01 (-0.15, 0.17)	-0.04 (-0.20, 0.13)
Mean Distance to Closest 5 Bakeries	0.02 (-0.06, 0.10)	-0.02 (-0.10, 0.06)	0.03 (-0.08, 0.13)	-0.04 (-0.13, 0.06)	-0.02 (-0.13, 0.09)
Mean Distance to Closest 5 Convenient Stores	0.02 (-0.09, 0.12)	-0.03 (-0.12, 0.09)	-0.03 (-0.15, 0.08)	-0.08 (-0.20, 0.04)	-0.02 (-0.13, 0.11)

Mean Distance to Closest 5 Grocery Stores	-0.06 (-0.15, 0.03)	-0.11 (-0.21, -0.01)[e]	-0.10 (-0.20, 0.01)	-0.06 (-0.16, 0.04)	-0.10 (-0.21, 0.02)
Mean Distance to Closest 5 Chain Supermarket	0.02 (-0.03, 0.08)	0.00 (-0.06, 0.06)	0.01 (-0.05, 0.08)	0.01 (-0.06, 0.07)	0.00 (-0.07, 0.07)

[a] Adjusted for time as both a categorical fixed effect and a linear random effect

[b] Adjusted for age, time as both a categorical fixed effect and linear random effect, education and time-varying marital status, smoking status, alcohol consumption, and intersections per square mile

[c] Adjusted for age, time as both a categorical fixed effect and linear random effect, education and time-varying marital status, smoking status, alcohol consumption, intersections per square mile, and relative closeness measures for each of the food establishment types (relative closeness for fast food as the reference category).

[d] Adjusted for age, time as both a categorical fixed effect and linear random effect, education and time-varying marital status, smoking status, alcohol consumption, intersections per square mile. Distance at each wave is linked to BMI at the subsequent wave.

[e] 95% Credible Interval does not contain 0.

Web Table 9: Multilevel, Cross-classified, Multivariable Regression Parameter Estimates for the Adjusted Change in BMI for Every 1 Kilometer Increase in Distance to Closest Establishment of Each Type, 1971 – 2001, Male

Variables	Model 1 β (95% Credible Interval), Adjusted for Age and Time[a]	Model 2 β (95% Credible Interval), Adjusted for Other Covariates[b]	Model 3 β (95% Credible Interval), Adjusted for all Covariates and Relative Closeness[c]	Model 4 β (95% Credible Interval), Adjusted for all Covariates with Lagged BMI as the Dependent Variable[d]	Model 5 β (95% Credible Interval), Adjusted for all Covariates and Relative Closeness with Lagged BMI as the Dependent Variable
Distance to Closest Food Establishment					
Distance to Closest Fast-Food	-0.05 (-0.15, 0.04)	-0.05 (-0.14, 0.05)	-0.05 (-0.15, 0.05)	-0.06 (-0.16, 0.04)	-0.04 (-0.16, 0.06)

Restaurant					
Distance to Closest Full-Service Restaurant	-0.04 (-0.14, 0.05)	-0.05 (-0.14, 0.05)	-0.05 (-0.15, 0.06)	-0.05 (-0.17, 0.05)	-0.03 (-0.15, 0.08)
Distance to Closest Bakery	-0.02 (-0.08, 0.04)	-0.01 (-0.07, 0.05)	0.00 (-0.08, 0.07)	0.05 (-0.03, 0.12)	0.02 (-0.06, 0.10)
Distance to Closest Convenience Store	-0.01 (-0.09, 0.06)	0.00 (-0.08, 0.08)	-0.01 (-0.10, 0.08)	-0.02 (-0.11, 0.08)	-0.02 (-0.12, 0.08)
Distance to Closest Grocery Store	-0.04 (-0.08, 0.01)	-0.04 (-0.08, 0.01)	-0.04 (-0.10, 0.01)	0.00 (-0.05, 0.06)	-0.02 (-0.09, 0.04)
Distance to Closest Chain	0.01 (-0.03, 0.05)	0.01 (-0.03, 0.05)	0.01 (-0.03, 0.05)	0.00 (-0.04, 0.04)	0.01 (-0.04, 0.05)

Supermarket					
Mean Distance to Closest 5 Food Establishments					
Mean Distance to Closest 5 Fast-Food Restaurants	-0.01 (-0.08, 0.07)	0.00 (-0.08, 0.08)	0.01 (-0.09, 0.10)	0.00 (-0.09, 0.10)	0.03 (-0.07, 0.13)
Mean Distance to Closest 5 Full-Service Restaurants	-0.03 (-0.13, 0.06)	-0.04 (-0.15, 0.05)	-0.04 (-0.15, 0.07)	-0.05 (-0.16, 0.06)	-0.03 (-0.16, 0.09)
Mean Distance to Closest 5 Bakeries	-0.02 (-0.07, 0.04)	-0.01 (-0.07, 0.05)	0.00 (-0.07, 0.08)	-0.02 (-0.09, 0.05)	-0.08 (-0.16, 0.01)
Mean Distance to Closest 5 Convenience Stores	0.01 (-0.06, 0.08)	0.03 (-0.05, 0.10)	0.02 (-0.07, 0.11)	-0.01 (-0.10, 0.07)	-0.02 (-0.11, 0.08)

Mean Distance to Closest 5 Grocery Stores	-0.05 (-0.10, 0.01)	-0.06 (-0.12, 0.01)	-0.07 (-0.14, 0.005)	0.01 (-0.06, 0.08)	-0.02 (-0.10, 0.07)
Mean Distance to Closest 5 Chain Supermarket	0.00 (-0.05, 0.04)	0.00 (-0.04, 0.04)	0.00 (-0.05, 0.04)	-0.03 (-0.08, 0.02)	-0.04 (-0.09, 0.01)

[a] Adjusted for time as both a categorical fixed effect and a linear random effect

[b] Adjusted for age, time as both a categorical fixed effect and linear random effect, education and time-varying marital status, smoking status, alcohol consumption, and intersections per square mile

[c] Adjusted for age, time as both a categorical fixed effect and linear random effect, education and time-varying marital status, smoking status, alcohol consumption, intersections per square mile, and relative closeness measures for each of the food establishment types (relative closeness for fast food as the reference category).

[d] Adjusted for age, time as both a categorical fixed effect and linear random effect, education and time-varying marital status, smoking status, alcohol consumption, intersections per square mile. Distance at each wave is linked to BMI at the subsequent wave.

[e] 95% Credible Interval does not contain 0.

Web Table 10: Multilevel, Cross-classified, Multivariable Regression Parameter Estimates for Covariates, Female[a]

Variables N=7043[b]		Model 1[c] β (95% Credible Interval)	Model 2[d] β (95% Credible Interval)
Wave	Wave 2	0.79 (0.62, 0.97)[e]	0.83 (0.63, 1.01)[e]
	Wave 3	1.44 (1.26, 1.61)[e]	1.48 (1.27, 1.68)[e]
	Wave 4	2.12 (1.93, 2.30)[e]	2.19 (1.95, 2.39)[e]
	Wave 5	2.88 (2.66, 3.06)[e]	2.95 (2.71, 3.16)[e]
	Wave 6	3.48 (3.26, 3.70)[e]	3.53 (3.28, 3.78)[e]
	Wave 7	3.82 (3.61, 4.02)[e]	3.88 (3.63, 4.12)[e]

Age		0.074 (0.051, 0.098)[e]	0.074 (0.051, 0.099)[e]
Married		0.49 (0.28, 0.70)[e]	0.50 (0.30, 0.71)[e]
Education	More than High School	-0.56 (-1.07, -0.049)[e]	-0.56 (-1.10, -0.042)[e]
	Missing Education	0.45 (-0.33, 1.23)	0.45 (-0.35, 1.23)
Current Smoker		-1.07 (-1.27, -0.87)[e]	-1.06 (-1.25, -0.86)[e]
Alcohol Consumption	1-2 Drinks per Day	0.23 (0.090, 0.37)[e]	0.23 (0.088, 0.38)[e]
	> 2 Drinks per Day	0.40 (0.054, 0.72)[e]	0.40 (0.066, 0.73)[e]

Intersections per Square Mile	-0.002 (-0.005, 0.001)	-0.002 (-0.004, 0.0005)

[a] Parameter estimates represent change in BMI for every one unit difference in the covariate.

[b] N represents the number of observations across all waves.

[c] Base model without distance exposure variables

[d] Model including relative closeness measures for food establishments

[e] 95% Credible Interval does not contain 0.

Web Table 11: Multilevel, Cross-classified, Multivariable Regression Parameter Estimates for Covariates, Male[a]

Variables N=6380 [b]		Model 1[c] β (95% Credible Interval)	Model 2[d] β (95% Credible Interval)
Wave	Wave 2	0.14 (0.031, 0.25)[e]	0.16 (0.025, 0.28)[e]
	Wave 3	0.55 (0.42, 0.68)[e]	0.57 (0.42, 0.71)[e]
	Wave 4	1.04 (0.87, 1.19)[e]	1.06 (0.89, 1.23)[e]
	Wave 5	1.46 (1.26, 1.65)[e]	1.48 (1.28, 1.67)[e]
	Wave 6	1.67 (1.46, 1.90)[e]	1.69 (1.44, 1.92)[e]
	Wave 7	1.85 (1.58, 2.11)[e]	1.87 (1.60, 2.13)[e]

Age		0.034 (0.018, 0.049)[e]	0.034 (0.017, 0.050)[e]
Married		0.37 (0.19, 0.56)[e]	0.38 (0.19, 0.56)[e]
Education	More than High School	-0.31 (-0.70, 0.071)	-0.32 (-0.69, 0.041)
	Missing Education	0.23 (-0.34, 0.79)	0.22 (-0.39, 0.78)
Current Smoker		-0.71 (-0.85, -0.56)[e]	-0.71 (-0.86, -0.57)[e]
Alcohol Consumption	1-2 Drinks per Day	0.12 (-0.016, 0.26)	0.12 (-0.008, 0.25)
	> 2 Drinks per Day	0.34 (0.17, 0.51)[e]	0.34 (0.17, 0.52)[e]

Intersections per Square Mile	0.001 (-0.001, 0.002)	0.001 (-0.001, 0.002)

[a] Parameter estimates represent change in BMI for every one unit difference in the covariate.

[b] N represents the number of observations across all waves.

[c] Base model without distance exposure variables

[d] Model including relative closeness measures for food establishments

[e] 95% Credible Interval does not contain 0.

Web Figure Legends

Web Figures 1 and 2: Map of Study Area and Location of Food Establishments, Wave 1 (1971-1975) and Wave 7 (1998-2001)

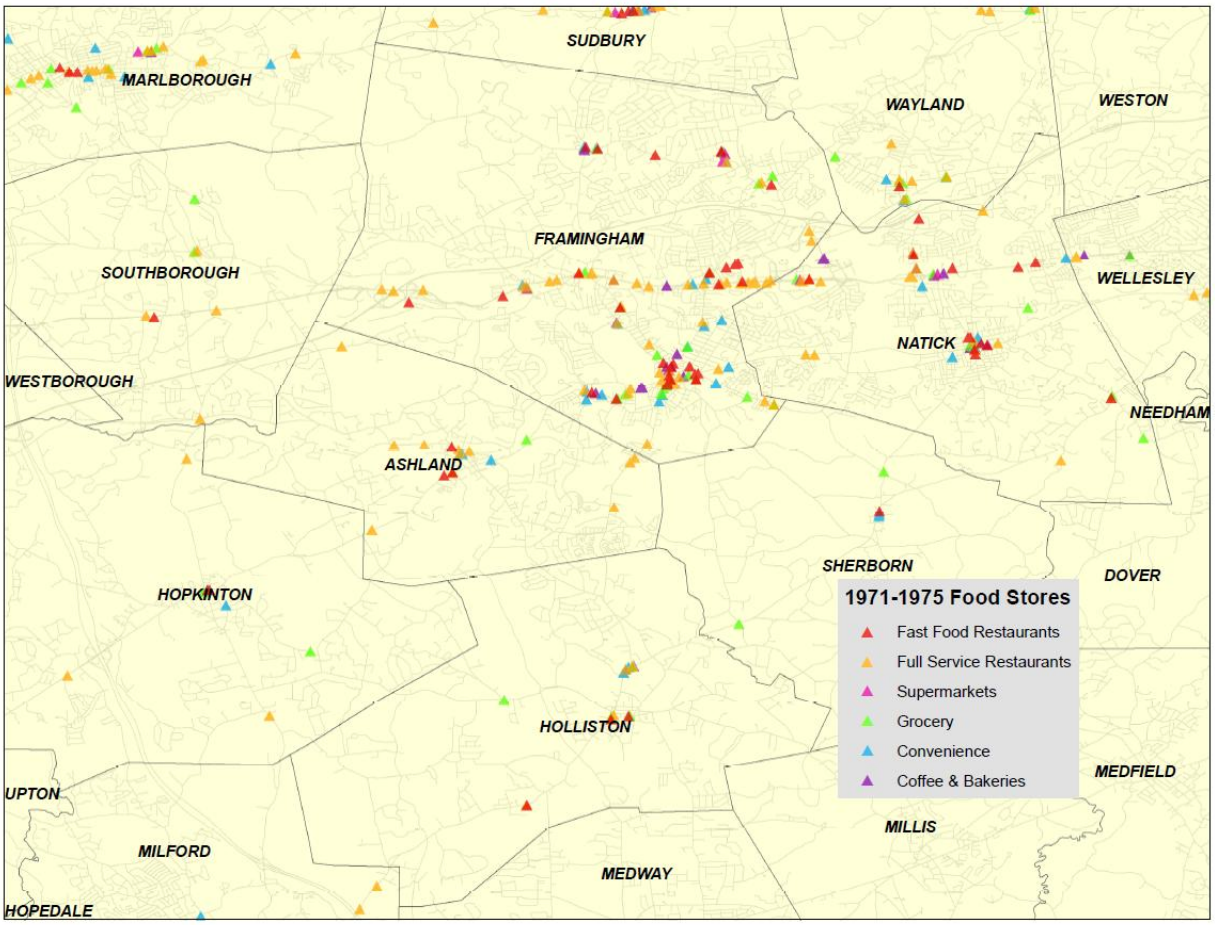
Using ArcGIS, Version 9.3 (Redlands, CA), we geocoded all food establishments by wave in Framingham, Ashland, Holliston, Natick, Massachusetts and in towns bordering this primary study area. Web Figure 1 includes all food establishments present during Wave 1 and Web Figure 2 includes all food establishments present in Wave 7. We calculated driving distances between each subject's residential address and 1) the nearest restaurant or food store, divided into specific categories of establishments, and 2) the mean driving distance to the five closest restaurants or food stores, again divided by category.

Web Figure 3: Multilevel, Cross-Classified Data Structure

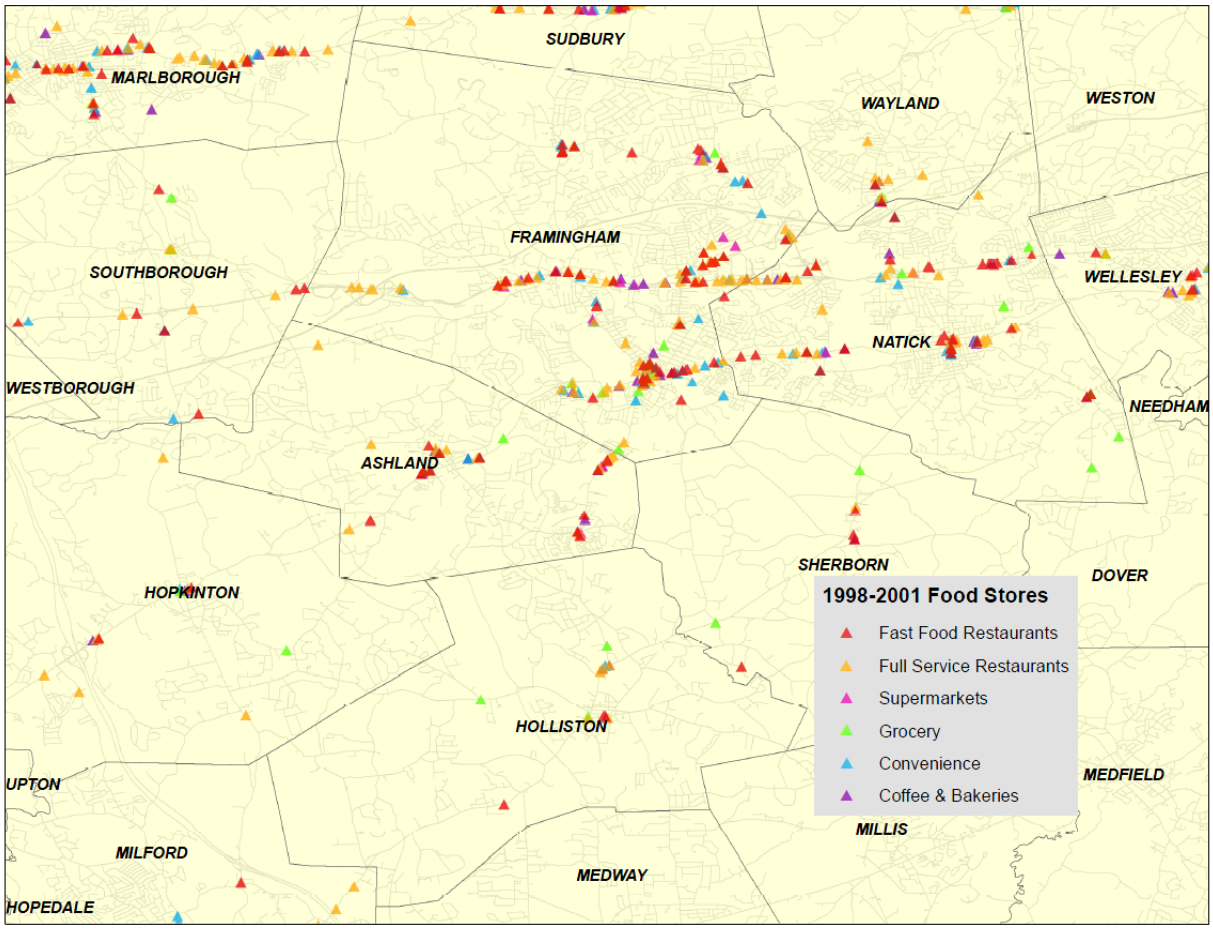
We utilized three-level, cross-classified models to explore the association between distance to food establishments and BMI. The three-levels included observations, individuals, and neighborhoods/census tracts. In contrast to a typical multilevel model, in which each level is nested within the level above, our data structure included a cross-classification of observations separately into individuals and neighborhoods. Individuals were not nested within neighborhoods because subjects moved over time and could live in a different neighborhood at each of the seven waves of data collection. For example, in the hypothetical example presented in Figure 1, individual 1 was examined/surveyed during each of the seven waves, and in each of those waves, the subject lived in the same

neighborhood/census tract. Individual #2, however, was only examined/surveyed during each of the first three waves and then lost to follow-up. During each of the waves of examination, the subject lived in a different neighborhood/census tract.

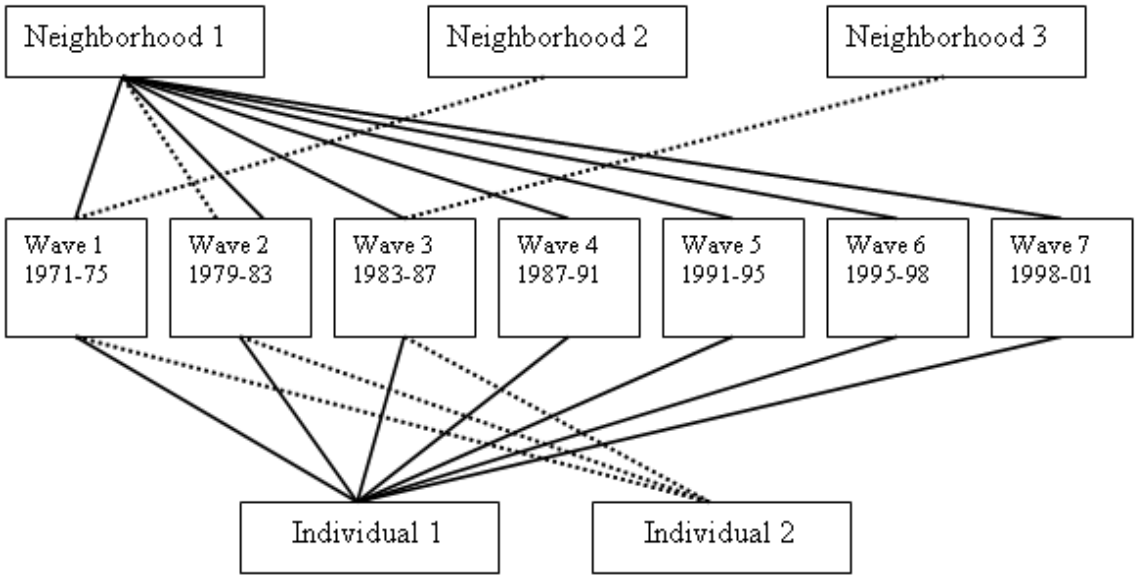
Web Figure 1: Map of Study Area and Location of Food Establishments, Wave 1, 1971-1975



Web Figure 2: Map of Study Area and Location of Food Establishments, Wave 7, 1998-2001



Web Figure 3: Multilevel, Cross-Classified Data Structure



Web Methods Note 1: Food Establishment Search Methodology

We gathered data on food establishments from 1971 through 2001 using multiple sources. For each establishment, we collected the name, address, opening date, closing date (or last observed date) and category (fast-food or full service restaurant, bakery/coffee shop, convenience store, independent grocery store/farmer's market/meat market, or chain supermarket). The sources of data included:

- Local Boards of Health: As required by Massachusetts law, local Boards of Health inspect all food establishments every six months and maintain records of these inspections. We focused data collection intensively on the four towns where subjects were living – Framingham, Ashland, Holliston, and Natick, Massachusetts – and directly examined all files for open and closed establishments. Because some subjects living in these four towns lived near the town border, subjects could have been more directly exposed to food establishments in a neighboring town. Therefore, we collected detailed information from Boards of Health for a one-mile buffer area around the four towns. We either directly visited or relied on verbal reports provided by the Boards of Health of Wellesley, Wayland, Weston, Sudbury, Southborough, Milford, Hopkinton, Medway, Sherborn, and Dover.

- Framingham-area Yellow Pages: The data collection from Boards of Health generated information on both open and closed food establishments. However, the data on closed food establishments was less robust because of the purging of

records over time. To supplement information on all food establishments, especially closed establishments, we examined Yellow Pages from the Framingham area for one selected year near the mid-point of each wave of data collection (1973 for Wave 1, 1981 for Wave 2, 1986 for Wave 3, 1989 for Wave 4, 1993 for Wave 5, 1997 for Wave 6, 2000 for Wave 7). Yellow Pages categories for the search included restaurants, delicatessens, pizza, sandwiches, food carry-out, Chinese, bakers, markets, farms, grocers, convenience stores, fruit and vegetable retail, meat retail, fish and seafood retail, bagels, donuts, and coffee houses.

- Framingham-area White Pages: Because some food establishments appear only in the White pages, we examined White Pages from the same years as above to capture additional information on food establishments. We conducted a search for large chain food establishments in the White Pages. Further, for all establishments indentified in the Yellow Pages, we searched the White Pages for the wave before the first entry and after the last entry for the establishment to determine whether they were open in neighboring search years but simply not included in the Yellow Pages.

- Dun and Bradstreet: Dun and Bradstreet is a commercial entity has collected data for decades on millions of businesses through a variety of sources, including interviews with company principals, telephone directories, court records, financial reports, and filings. We purchased data on retail food establishments (fast-food or

limited-service restaurants, full-service restaurants, grocery stores, supermarkets, convenience stores, gas stations with convenience stores, meat markets, farms, bakeries, and coffee shops) for each of the above search years. This database had similar information to the Board of Health data including names, addresses, categories, opening year and closing year.

- Final database of food establishments: We combined all of the above data sources and eliminated duplications by searching each database by address and food establishment name. We then assigned food establishments to every wave during which they were open. To further clarify the type of food establishment, we conducted site visits to all open establishments in the four towns where included subjects lived, and we either conducted site visits or discussed the list of food establishments with the Boards of Health for each of the 10 surrounding towns. For validation, we circulated our final database for each town to the relevant Boards of Health and to Framingham Heart Study (FHS) staff who were longtime residents of the area.

During our site visits and discussions with Boards of Health and FHS staff, we defined food establishments using descriptions influenced by the U.S. Census North American Industry Classification System (NAICS):

- Fast-food restaurants – restaurants with limited to no wait staff where payment is tendered prior to food consumption;

- Full-service restaurants – restaurants with wait staff where payment is tendered after food consumption;
- Bakeries/coffee shops – restaurants that sell primarily coffee or baked goods;
- Convenience stores – retail food stores that sell primarily packaged foods and limited to no fresh produce;
- Independent grocery stores, meat markets, seafood markets, and farmer's markets – retail food stores that sell fresh meat and/or produce but are not affiliated with a known national or regional chain; and
- Chain supermarkets – retail food stores that are connected to a known national or regional chain.

In total, we identified 1482 food establishments in the 14 towns included in the search, from 1971 to 2001. The combination of records from local Boards of Health and the search of Yellow Pages and White Pages yielded 907 of these food establishments. The Dun and Bradstreet data added 475 food establishments. We excluded 39 food establishments for which we could not identify a type. If a food establishment was location entirely within another food establishment (e.g., coffee shop within a gas station, fast-food restaurant within a large food store, we included it only with the larger food establishment. The final sample size of food establishments was 1443.

Web Methods Note 2: Modeling Equations

We utilized three-level, cross-classified models to explore the association between distance to food establishments and BMI. The three-levels included observations, individuals, and neighborhoods/census tracts. In contrast to a typical multilevel model, in which each level is nested within the level above, our data structure included a cross-classification of observations separately into individuals and neighborhoods. Individuals were not nested within neighborhoods because subjects moved over time and could belong to a different neighborhood at each of the seven waves of data collection. Using the subscripts *i* and *t* to denote individual and wave, respectively. We define Y_{it}, A_{it}, and $\mathbf{X}_{it}$ to be random variables representing BMI, neighborhood of residence, and a vector of covariates for individual $i = 1,\ldots,n_I$ at wave $t = 1,\ldots,7$. As is convention, the constant 1 is the first element of $\mathbf{X}_{it}$, which also includes indicator variables for waves two through 7. The general form of the models used for our analysis is then given by:

$$Y_{it} \mid A_{it} = a, \mathbf{X}_{it} = \mathbf{x} \sim \text{Normal}(\theta_{i0} + \theta_{i1}t + \lambda_a + \boldsymbol{\beta}^T \mathbf{x}, \sigma^2) \qquad (1)$$

$$\begin{pmatrix} \theta_{i0} \\ \theta_{i1} \end{pmatrix} \sim \text{Normal}\left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \tau_0^2 & \rho\tau_0\tau_1 \\ \rho\tau_0\tau_1 & \tau_1^2 \end{pmatrix} \right), \qquad (2)$$

$$\lambda_a \sim \text{Normal}(0, \upsilon^2), \qquad (3)$$

where θ_{i0} and θ_{i1} are the random intercept and random slope of the coefficient for wave for individual *i*, λ_a is the random effect for neighborhood $a \in \{1,\ldots n_A\}$ where n_A is the number of neighborhoods, $\boldsymbol{\beta}$ is the vector of regression coefficients of the covariates, σ^2 is the variance of the pure error associated with each observation, τ_0^2 and τ_1^2 are the population variances of the individual-specific intercepts and wave slopes respectively,

ρ is the population correlation between individuals' intercepts and wave slopes, and υ^2 is the variance of the neighborhood effects.

We analyzed all models using Markov Chain Monte Carlo (MCMC) methods to generate multiple iterative samples from the joint posterior distribution of the parameters, from which parameter estimates could be constructed. For the prior distributions we use standard diffuse (i.e., minimal information) priors including flat priors for regression parameters and independent inverse-Gamma priors for variance components. We used generalized least squares models to generate starting values from which to run the MCMC models. We used 20,000 MCMC iterations to generate final estimates for each model with 500 iterations set for the burn-in period.

We conducted overall analyses as well as sex-stratified analyses because interaction terms between distance measures and sex were significant in final models.

Web Methods Note 3: Creation of the Relative Closeness Measure

As a sensitivity analysis, we included a set of covariates in the final series of models to control simultaneously for the relative proximity of all food establishment categories. Food establishment categories are geographically clustered, and distance measures are highly correlated. Inclusion of distances to all six food establishment categories in the same model was affected by collinearity. Therefore, we created a set of variables to represent the relative closeness between residential addresses and all food establishment types at each wave. We created these measures by:

- Identifying the 50 closest food establishments to each residential address at each wave;
- Taking the inverse of the distance to each of these 50 food establishments and summing the resulting inverse distances;
- Dividing each individual food establishment's inverse distance by the sum of inverse distances; and
- Summing the resulting scaled values by food establishment category to obtain six non-negative numbers for each subject at each wave, which together added to one.

The values for the 6 variables determined as above may be interpreted as the share of the closeness of each of the food establishment categories to a given residential address.