Education and Mortality: Evidence from a Social Experiment

BY **Costas Meghir, Mårten Palme and Emilia Simeonova**

ONLINE APPENDIX

TABLE A1 - ICD 9 AND ICD10 CODES GROUPS USED TO ESTABLISH DIFFERENT CAUSES OF DEATH AND HOSPITALIZATION

Cause	ICD9	ICD10
Treatable causes of death		
Tuberculosis	010-018, 137	A15-A19. B90
Malignant neoplasm of cervix uteri	180	C53
Chronic rheumatic heart disease	393-398	I05-I09
All respiratory diseases	460-519	J00-J99
Asthma	493	J45, J46
Appendicitis	540-543	K35-K38
Abdominal hernia	550-553	K40-K46
Hypertensive and cerebrovascular disease	401-405,430-438	I10-I15, I60-I69
Chollelthiasis and cholecystitis	574, 575.0, 575.1	K80-K81
Preventable causes of death		
Lung cancer	162	C33-C34
Cirrhosis of liver	571.0-571.3, 571.5-571.6	K70, K74.3-K74.6
External causes of death	800-999	V, W, X, Y

TABLE A2 - THE EFFECTS OF REFORM ASSIGNMENT ON EDUCATIONAL ATTAINMENT

Panel A Difference-in-Differences estimates of the effect of reform assignment on educational attainment.

Change in percent attending:	(1) All	(2) Low SES	(3) High SES
Males and Females			
At least comprehensive/junior secondary	9.16	11.36	2.76
	(0.44)	(5.12)	(0.20)
More than comprehensive/junior secondary	1.58	1.73	0.60
	(0.23)	(2.67)	(0.26)
Changes in years of schooling	0.255	0.304	0.086
	(0.015)	(0.017)	(0.024)
Sample size	1,508,620	1,030,782	287,110
Males			
At least Comprehensive/junior secondary	11.28	14.12	3.12
	(0.52)	(0.60)	(0.27)
More than comprehensive/junior secondary	2.17	2.44	0.78
	(0.29)	(0.34)	(0.36)
Changes in years of schooling	0.301	0.363	0.097
	(0.018)	(0.021)	(0.031)
Sample size	781,123	533,922	148,138
Females			
At least Comprehensive/junior secondary	6.91	8.38	2.34
	(0.41)	(0.48)	(0.21)
More than comprehensive/junior secondary	0.95	0.95	0.41
	(0.28)	(0.34)	(0.35)
Changes in years of schooling	0.205	0.238	0.086
	(0.021)	(0.024)	(0.035)
Sample size	727,497	496,860	138,972

Panel B: Regression Discontinuity estimates of the effect of reform on educational attainment			
	(1)	(2)	(3)
Change in percent attending:	All	Low SES	High SES
Males and Females			
At least comprehensive/junior secondary	9.03	11.09	2.44
	(0.46)	(5.31)	(0.21)
More than comprehensive/junior secondary	1.57	1.84	0.59
	(0.21)	(0.40)	(0.38)
Changes in years of schooling	0.241	0.300	0.068
	(0.029)	(0.028)	(0.037)
Sample size	1,508,620	1,030,782	287,110
Males			
At least Comprehensive/junior secondary	11.08	13.70	2.86
	(0.57)	(0.67)	(0.29)
More than comprehensive/junior secondary	2.03	2.48	0.70
	(0.44)	(0.52)	(0.49)
Changes in years of schooling	0.313	0.375	0.081
	(0.023)	(0.033)	(0.050)
Sample size	781,123	533,922	148,138
Females			
At least Comprehensive/junior secondary	6.83	8.29	1.99
	(0.41)	(0.49)	(0.29)
More than comprehensive/junior secondary	1.06	1.14	0.48
	(0.41)	(0.48)	(0.53)
Changes in years of schooling	0.177	0.217	0.055
	(0.031)	(0.032)	(0.047)
Sample size	727,497	496,860	138,972

Notes: Each number represents an impact from a separate regression by method and demographic group. DiD specification includes a full set of dummy variables for year of birth and municipality of birth as well as separate linear trends for municipalities of birth. RD specification includes separate quadratic polynomials in the running variable before and after the break point, a dummy variable for gender as well as a full set of dummy variables for month of birth. The samples of low and high SES background men and women do not add up to the aggregate sample size because of missing information on father's education in the registry data. Standard errors are in parentheses and are clustered by municipality of birth.

TABLE A3 - THE ASSOCIATION BETWEEN YEARS OF SCHOOLING AND HOSPITALIZATION

	Days in hospital care	Cancer	Circulatory diseases	Respiratory diseases
Years of schooling	-1.947	0.0026	-0.0042	-0.0017
	(0.035)	(0.0001)	(0.0001)	(0.0001)
Mean dep variable	27.10	0.1104	0.2653	0.1425
N	1,305,121	1,305,121	1,305,121	1,305,121

Note: Indicator variables for gender as well as year of birth also included in the specification. All dead before 2015 excluded from the sample.

TABLE A4 - THE ASSOCIATION BETWEEN YEARS OF SCHOOLING AND CONSUMPTION OF PRESCRIBED DRUGS

	All	*Musculo-skeletal System (M)*	*Respiratory System (R)*	*Nervous System (N)*
Have experiences of	0.0001	-0.0003	0.0001	-0.0033
	(0.0001)	(0.00003)	(0.00005)	(0.0002)
Mean of dependent variable	0.9414	0.0211	0.0368	0.628
Defined daily doses	-313.07	-6.02	-11.50	-45.44
	(4.57)	(0.24)	(0.55)	(1.16)
Mean of dependent variable	8,405.01	285.59	528.17	1,122.56
Neuroleptics	*Pain Relief (N2)*	*Psycholeptics (N5)*	*Antidepressants (N6)*	
Have experiences of	-0.0059	-0.0015	-0.0033	
	(0.0002)	(0.0002)	(0.0001)	
Mean of dependent variable	0.516	0.327	0.217	
Defined daily doses	-17.45	-17.28	-6.45	
	(0.30)	(0.66)	(0.40)	
Mean of dependent variable	245.07	388.77	390.53	

Notes: Each number represents an impact from a separate regression by method and demographic group. DiD specification includes a full set of dummy variables for year of birth and municipality of birth as well as separate linear trends for municipalities of birth. RD specification includes separate quadratic polynomials in the running variable before and after the break point, a dummy variable for gender as well as a full set of dummy variables for month of birth. The samples of low and high SES background men and women do not add up to the aggregate sample size because of missing information on father's education in the registry data. Standard errors are in parentheses and are clustered by municipality of birth.

TABLE A5 - REFORM EFFECT ON MORTALITY BY AGE OF DEATH. UPPER PANEL: LINEAR PROBABILITY MODEL ESTIMATES FOR DEATHS IN DIFFERENT AGE INTERVALS. LOWER PANEL: COX PROPORTIONAL HAZARD MODEL ESTIMATES WHEN SAMPLE HAS BEEN RESTRICTED TO UPPER AGE LIMITS

Age interval		40-44	45-49	50-54	55-59	60-64	65-70
DiD, LPM		0.0002	0.0001	0.0006	0.0003	-0.0019	0.0011
		(0.0003)	(0.0004)	(0.0006)	(0.0008)	(0.0014)	(0.0026)
RD, LPM		0.0001	-0.0001	-0.0003	0.0011	-0.0027	-0.0052
		(0.0004)	(0.0006)	(0.0008)	(0.0011)	(0.0021)	(0.0040)
N (Thousands)		1,573	1,567	1,551	1,371	1,025	570
Age interval	-40	-45	-50	-55	-60	-65	-70
DiD, stratified Cox	0.9802	1.0006	0.9918	1.0074	1.0096	0.9955	0.9987
	(0.0243)	(0.0217)	(0.0181)	(0.0150)	(0.0122)	(0.0108)	(0.0103)
RD, Cox Regression	0.9727	0.9965	0.9728	0.9921	1.0096	0.9928	0.9967
	(0.0321)	(0.0278)	(0.0225)	(0.0185)	(0.0158)	(0.0147)	(0.0144)

Notes: Each number represents an impact from a separate regression by method and demographic group. Standard errors are in parentheses and are clustered by municipality of birth. DiD LPM specification includes a full set of dummy variables for year of birth and municipality of birth as well as separate linear trends for municipalities of birth. Stratified Cox regressions include year of first implementation specific linear trends. RD specification includes separate quadratic polynomials in the running variable before and after the break point, a dummy variable for gender as well as a full set of dummy variables for month of birth.. The samples of low and high SES background men and women do not add up to the aggregate sample size because of missing information on father's education in the registry data. Standard errors are in parentheses and are clustered by municipality of birth.

TABLE A6 - THE EFFECTS OF EDUCATION REFORM ON MORTALITY BY CAUSE OF DEATH. COX PROPORTIONAL HAZARD REGRESSIONS. MEN AND WOMEN

	(1) All	(2) Low SES	(3) High SES
		Preventable	
Reform, stratified	0.9639	0.9988	0.9159
	(0.0359)	(0.0450)	(0.0942)
Reform, RD	0.9212	0.9586	0.8867
	(0.0434)	(0.0545)	(0.1099)
Deaths	*26,043*	*17,332*	*3,217*
		Treatable	
Reform, stratified	1.0488	1.0891*	1.0454
	(0.0369)	(0.0516)	(0.0937)
Reform, RD	1.0621	1.0861	1.1185
	(0.0525)	(0.0680)	(0.1183)
Deaths	31,998	20,722	*3,937*
N	1,562,493	1,051,462	354,287

Notes: Each number represents an impact from a separate regression by method and demographic group. DiD specification includes a full set of dummy variables for year of birth and municipality of birth as well as separate linear trends for municipalities of birth. RD specification includes separate quadratic polynomials in the running variable before and after the break point, a dummy variable for gender as well as a full set of dummy variables for month of birth. The samples of low and high SES background men and women do not add up to the aggregate sample size because of missing information on father's education in the registry data. Standard errors are in parentheses and are clustered by municipality of birth.

TABLE A7 - THE EFFECTS OF EDUCATION REFORM ON PRESCRIBED DRUG CONSUMPTION IN DAILY DOSES. MEN AND WOMEN

	(1) All	(2) Low SES	(3) High SES
		Defined Daily Doses: All	
Reform, DiD	31.61	18.24	88.35
	(40.86)	(48.72)	(77.54)
Reform, RD	3.39	-71.94	122.62
	(54.87)	(66.28)	(102.39)
Mean Dependent Var	8,405.01	8,643.82	7,113.00
		Musculo-skeletal System (M)	
Reform, stratified	5.04	5.58	5.71
	(2.43)	(3.09)	(4.91)
Reform, RD	4.24	3.33	3.27
	(3.40)	(4.08)	(6.36)
Mean Dependent Var	285.59	294.86	254.86
		Respiratory System (R)	
Reform, stratified	6.09	7.48	4.24
	(6.17)	(7.62)	(11.89)
Reform, RD	-7.12	-4.35	7.84
	(8.44)	(9.93)	(18.54)
Mean Dependent Var	524.17	526.57	508.30
		Nervous System (N)	
Reform, DiD	17.40	19.26	-7.09
	(10.83)	(13.31)	(22.98)
Reform, RD	-3.04	1.72	-22.63
	(14.61)	(18.41)	(32.49)
Mean Dependent Var	1,122.56	1,131.80	1,087.93
		Pain Releif (N2)	
Reform, DiD	0.59	0.78	1.94
	(3.33)	(4.10)	(6.08)
Reform, RD	-4.72	-5.90	0.04
	(4.15)	(5.00)	(8.23)
Mean Dependent Var	245.07	254.07	209.13
		Psycholeptics (N5)	
Reform, stratified	15.79	13.45	8.03
	(5.69)	(7.10)	(12.51)
Reform, RD	8.10	4.86	4.29
	(7.72)	(9.65)	(17.84)
Mean Dependent Var	388.77	385.24	384.13
		Antidepressants (N6)	
Reform, stratified	-0.90	5.45	-20.91
	(4.27)	(5.37)	(9.19)
Reform, RD	-5.41	2.40	-23.28
	(6.03)	(7.65)	(12.94)
Mean Dependent Var	390.53	392.62	399.51

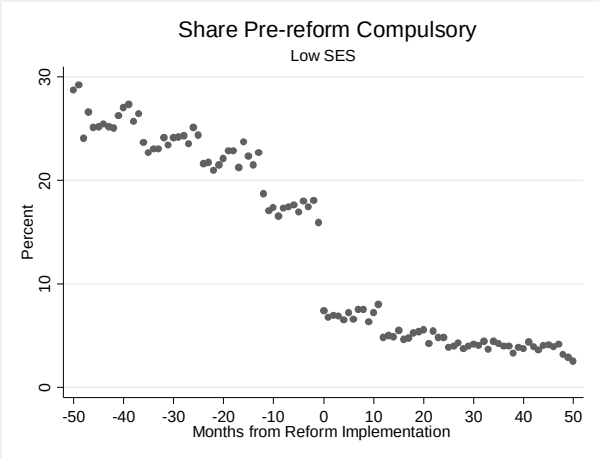
Notes: Each number represents an impact from a separate regression by method and demographic group. DiD specification includes a full set of dummy variables for year of birth and municipality of birth as well as separate linear trends for municipalities of birth. RD specification includes separate quadratic polynomials in the running variable before and after the break point, a dummy variable for gender as well as a full set of dummy variables for month of birth. The samples of low and high SES background men and women do not add up to the aggregate sample size because of missing information on father's education in the registry data. Standard errors are in parentheses and are clustered by municipality of birth. Standard errors clustered on the municipality of birth level in parentheses.

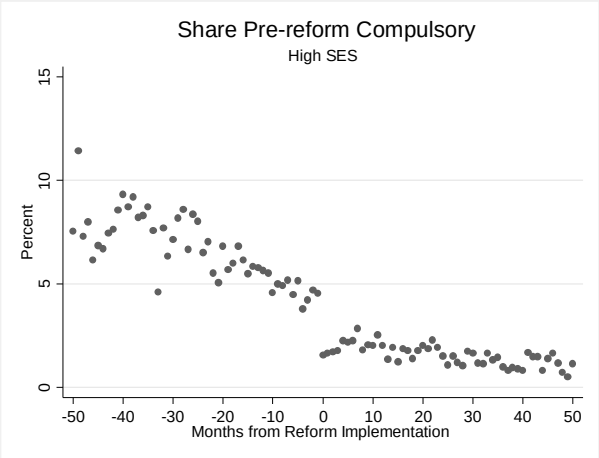
TABLE A8 - IV ESTIMATES OF THE REFORM EFFECT ON MORTALITY AND HOSPITALIZATION

	Mortality	Hospitalization
Years of schooling, DiD IV	0.0019	6.879
	(0.0086)	(303.889)
Years of schooling, RD IV	0.0054	3.746
	(0.0089)	(2.598)
Sample size	1,633,005	1,207,988

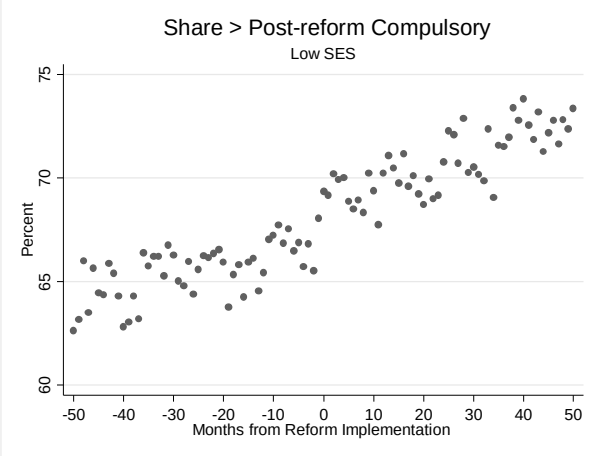
Note: DiD specification includes a full set of dummy variables for year of birth and municipality of birth as well as separate linear trends for municipalities of birth. RD specification includes separate quadratic polynomials in the running variable before and after the break point, a dummy variable for gender as well as a full set of dummy variables for month of birth.

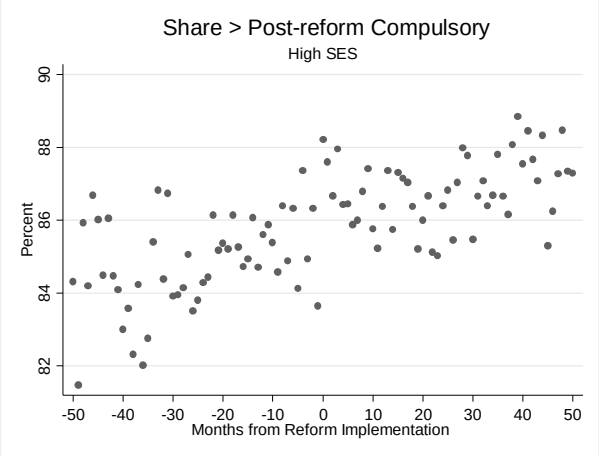
Panel A



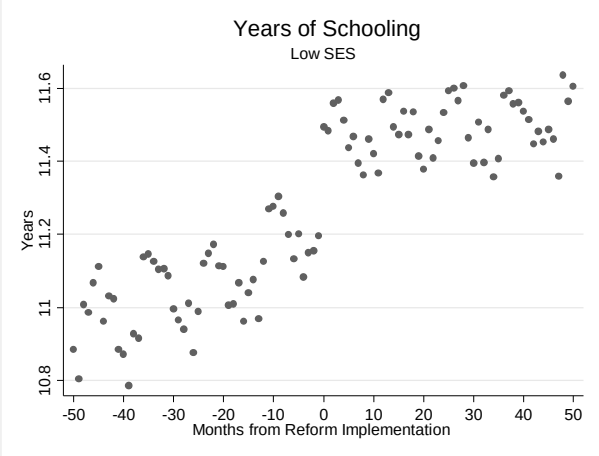


Panel B





Panel C



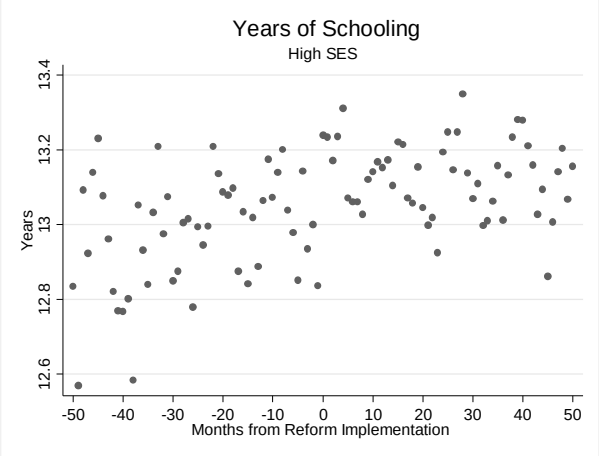
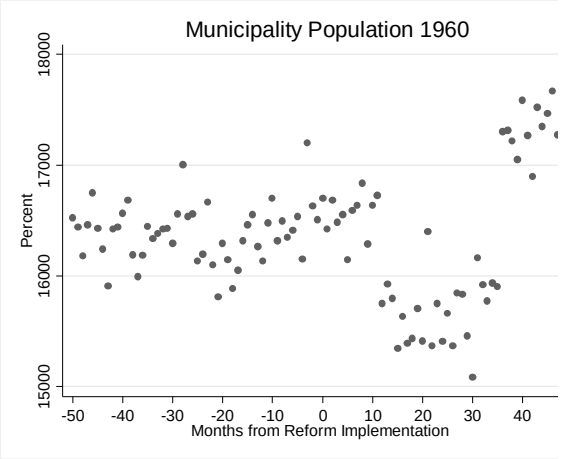


FIGURE A1. EFFECTS OF THE REFORM ON EDUCATIONAL ATTAINMENTS BY FATHER'S EDUCATION

Notes: The horizontal axis measures the number of months between the month of birth for the individuals included in the cell and the month of birth of the first cohort of individuals affected by the reform (A) Share with less final education than the pre-reform compulsory level; (B) effect on educational attainment beyond the post-reform compulsory level; (C) years of schooling.



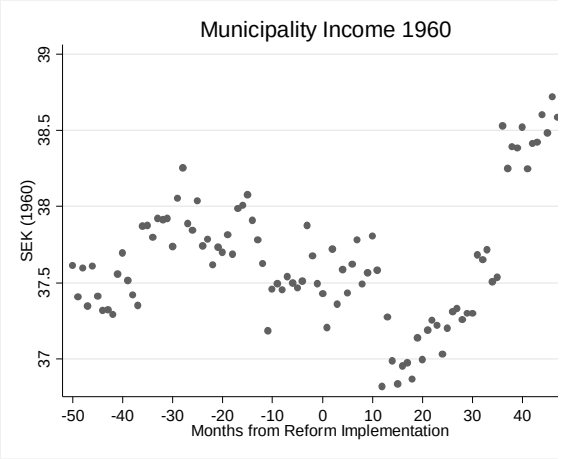


FIGURE A2. OUTCOMES FOR POTENTIAL CONFOUNDERS

Notes: Right panel: municipality average income in 1960; left panel: municipality population size. The horizontal axis measures the number of months between the month of birth for the individuals included in the cell and the month of birth of the first cohort of individuals affected by the reform.

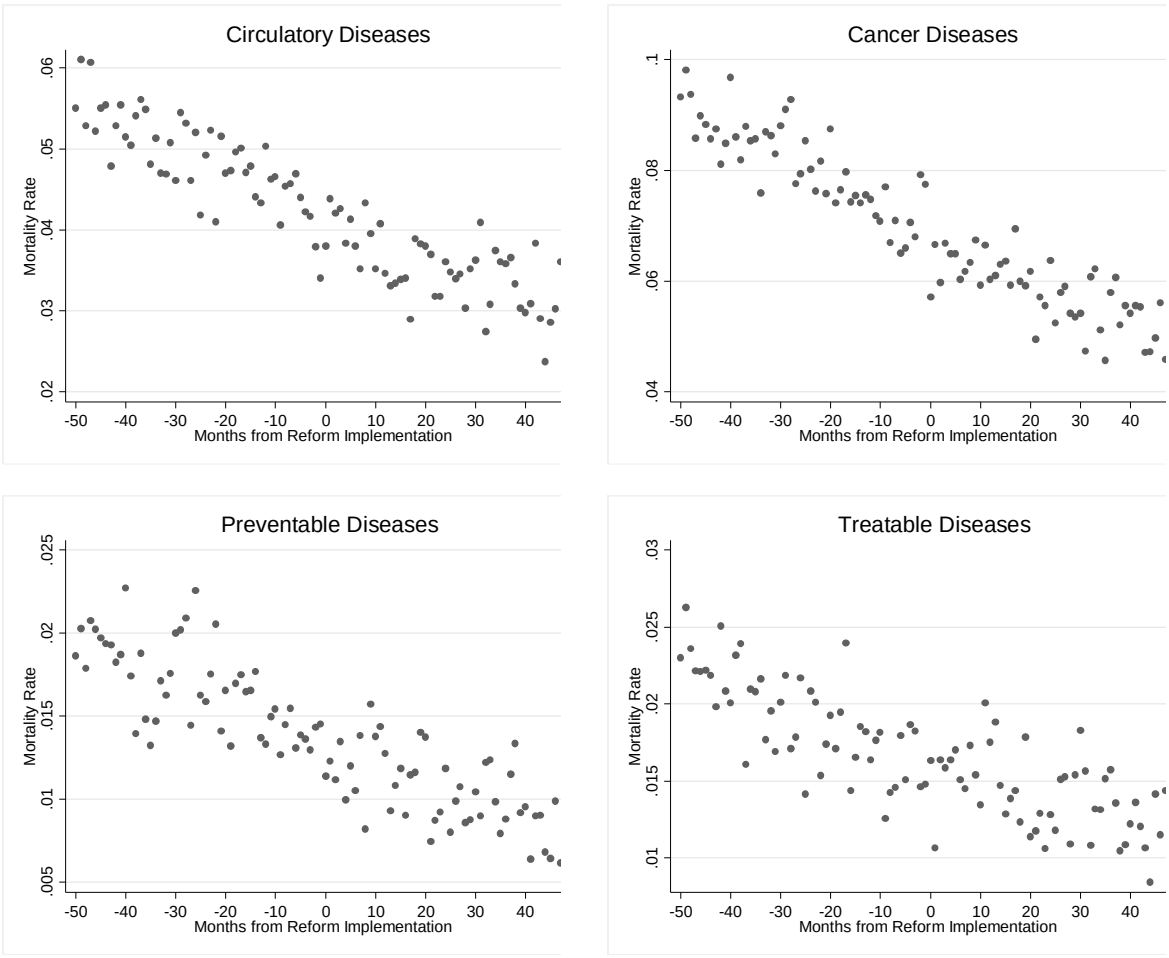


FIGURE A3. REFORM EFFECT ON MORTALITY BY CAUSE OF DEATH

Notes: The horizontal axis measures the number of months between the month of birth for the individuals included in the cell and the month of birth of the first cohort of individuals affected by the reform.

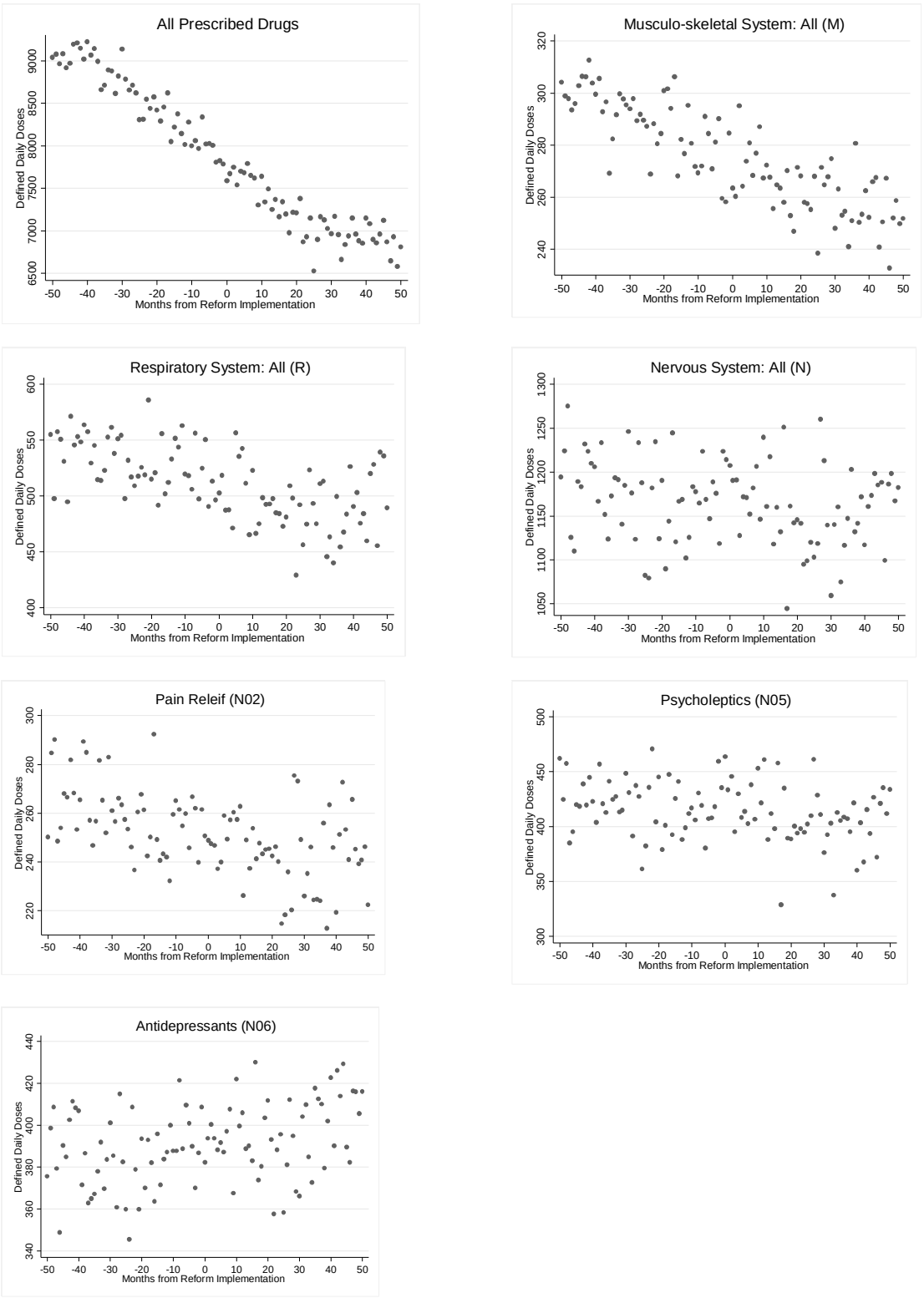


FIGURE A4. THE EFFECTS OF EDUCATION REFORM ON PRESCRIBED DRUG CONSUMPTION IN DAILY DOSES BY ATC MAIN CATEGORY

Notes: The horizontal axis measures the number of months between the month of birth for the individuals included in the cell and the month of birth of the first cohort of individuals affected by the reform. Men and women.