Health Screening and Selection: Evidence from Biennial Subsidies in South Korea

Siho Park

University of Illinois Urbana-Champaign

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Health screening is an important preventive care

- Health screenings are medical tests to find diseases early
  - Cancer (20%)
  - Cardiovascular (22%) + diabetes (3%) + stroke (5%)
- Public support for screenings
  - US spending on 5 cancer screenings: \$43 billion / year ($\approx$ \$130/person) (Halpern et al., 2024)
  - ACA preventive care mandate
  - Government-run public screening programs

We do not want to screen everyone

- Costs and benefits of screening
  - Benefits: early cancer diagnosis ↑, mortality ↓
  - Costs: false positives, overdiagnosis, and unnecessary treatment (Welch and Passow, 2014; Welch et al., 2016; Autier et al., 2017)

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  - Costs: false positives, overdiagnosis, and unnecessary treatment (Welch and Passow, 2014; Welch et al., 2016; Autier et al., 2017)
- We want to screen high-risk individuals
  - (Benefits $>$ Costs): Unhealthy (high-risk) people more likely to have undiagnosed conditions
  - (Costs $>$ Benefits): Healthy (low-risk) people without any disease to find (Kowalski, 2023)

High-risk individuals are less likely to participate in public screenings

- Who participates in screening?
  - High-risk: family history or environmental risk exposure
  - Low-risk: attentiveness to health or better access to health care

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- In **public** health screenings, participants show
  - Higher socioeconomic status
  - Better health behaviors
  - Lower mortality

  (Pill et al., 1988; Waller et al., 1990; Bender et al., 2015; Carethers and Doubeni, 2020)

How can we target health screenings better?

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If health screenings are subsidized, who are the marginal participants?

- Healthier (low-risk) individuals
  - Moral hazard
  - Rationale for cost-sharing

(Arrow, 1963; Pauly, 1968; Zeckhauser, 1970; Newhouse, 1993; Manning and Marquis, 1996)

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  - Moral hazard
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  (Arrow, 1963; Pauly, 1968; Zeckhauser, 1970; Newhouse, 1993; Manning and Marquis, 1996)

- Less healthy (high-risk) individuals
  - Financial constraints
  - Behavioral hazard (present bias, salience)

  (Baicker et al., 2015; Choudhry et al., 2011; Bai et al., 2021)

Research setting and questions

- National Health Screening Program in South Korea
  - Nationwide program for all the citizens
  - Blanket subsidies at even-numbered ages
  - Repeated throughout lifetime

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- National Health Screening Program in South Korea
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- Research questions
  1. Who are most responsive to the subsidies?
  2. What are the causal effects of screening on disease diagnosis and preventive care use?

Preview of results

1. Strong first stage
   - Take-up increases by 16-19%P
   - Positive spillovers to unsubsidized screenings
2. High-risk compliers
   - Compliers are from lower socioeconomic backgrounds with poorer health conditions
3. Cancer diagnosis & preventive care use ↑
   - Cancer diagnoses increase by 17-19%
   - Treatment for cancer precursors and cardiovascular risk factors increases

Contributions to health screening literature

Literature	Prior studies	Gap	Contribution
Selection into screening[1]			

[1] (Kim and Lee, 2017; Einav et al., 2020; Kowalski, 2023)
[2]

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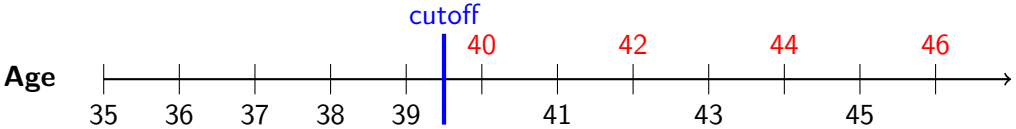
National Health Screening Program

- General health screening
  - Height, weight, waist circumference
  - Sight, hearing
  - Blood pressure, blood sugar and cholesterol level
  - Chest X-ray (tuberculosis), bone density (osteoporosis)
- Cancer screenings

Screening	**Tests**
Stomach	Upper endoscopy
Breast	Mammography
Cervical	Pap smear
Liver	Alpha-fetoprotein blood test & sonogram
Colorectal	Fecal occult blood test $\rightarrow$ colonoscopy

Biennial health screening subsidies



- From age 40
- Biennial subsidies at even ages
- Age = Current year - Birth year
- Coordination following clinical guidelines

Subsidy schedule across screenings

	Biennial subsidy				Annual subsidy		No subsidy	
	General	Stomach	Breast	Cervical	Liver	Colorectal	Lung	Prostate
Age cutoff	40	40	40	30	40	50		
Subsidy amount	100%	90%	90%	100%	90%	90%	0%	0%
Full cost ($)	50	65	40	15	90	10	100	20
Target			Female	Female	High risk group			Male

⇒ Total eligible subsidy amount: $115 (men), $165 (women)

⇒ 4.5-6.5% of annual health care expenditure / person

Liver high risk group

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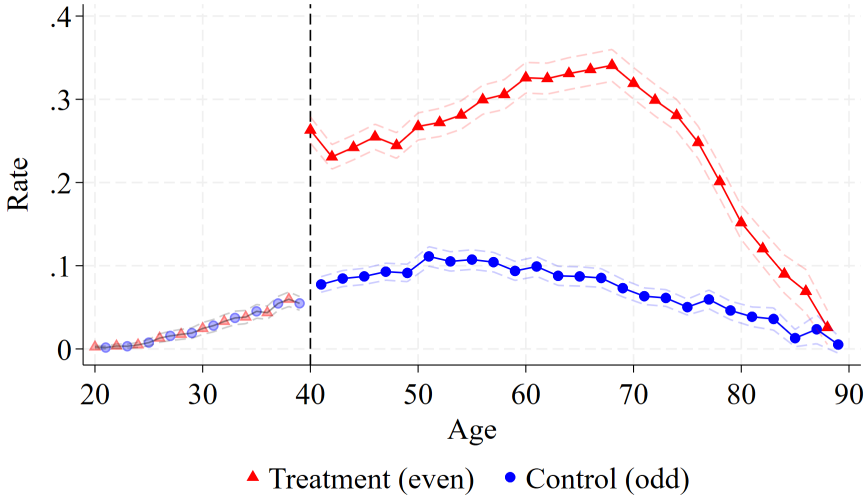
Stomach cancer screening take-up by age



By birth year | Mammogram (US, EU) | Colorectal (US, EU)

Comparing even with odd age groups from age 40

- Even- and odd-aged individuals are balanced conditional on $f(age)$
- Econometric specification

$$screen_{it} = \beta_0 + \beta_1 \cdot treat_{it} + f(age_{it}) + \epsilon_{it} \quad (1)$$

  - Individual i in year t
  - Analytical sample: age $\in$ [40,89]
  - $treat_{it} = 1$ if individual i turns even-numbered age in year t
  - $f(age)$: linear splines with 5 years interval
  - Standard error clustered at the individual level

Treatment and control groups are balanced conditional on f(age)

	(1)	(2)	(3)
	Treatment (Even)	Control (Odd)	Conditional difference
Age	58.697	59.240	-
	(12.532)	(12.353)	-
Female	0.530	0.532	–0.002*
	(0.499)	(0.499)	(0.001)
Currently married	0.799	0.798	–0.0011
	(0.401)	(0.402)	(0.0008)
Years of education	10.320	10.227	–0.003
	(4.510)	(4.538)	(0.008)
Working status	0.610	0.608	–0.003*
	(0.488)	(0.488)	(0.001)
Individual income	1446.3	1425.7	2.762
	(2081.6)	(2068.1)	(5.185)
Household income	4104.4	4086.7	3.221
	(3708.6)	(3737.9)	(14.267)
Own a house	0.734	0.737	–0.0002
	(0.442)	(0.441)	(0.0011)
Number of household members	3.067	3.051	–0.004
	(1.317)	(1.317)	(0.003)
N	54,274	52,909	
Share	(0.51)	(0.49)	
F(8, 15939)			1.65
Prob > F			(0.10)

Identifying variation with intertemporal substitution

- Identifying variation: short-run temporal variation in subsidy eligibility

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- Two sources of identifying variation

$$\text{Even/Odd take-up gap} = \text{Net increase} + \text{Intertemporal substitution}$$

net increase substitution

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- Identifying variation: short-run temporal variation in subsidy eligibility
- Two sources of identifying variation

$$\text{Even/Odd take-up gap} = \text{Net increase} + \text{Intertemporal substitution}$$

net increase substitution

- Interpretation of treatment effects

  $\Rightarrow$ **Short-run** effect of subsidy eligibility **this year**,
  generated by net increase in screening take-up and shift in screening timing

Survey data

- Korean Health Panel Survey dataset (2008-2018)
  - Analytical sample: 107,200 individual-year
  - Demographics / health care utilization / health behaviors
- Health screening take-up well recorded
  - Date, screening type, tests performed, screening results

Data collection

Administrative data

- National health insurance claims data (2002-2021)
  - Standard cohort: 8,670,000 individual-year
  - Customized cohort: 7,450,000 individual-year
- Cancer diagnoses available
  - Coinsurance reduction program for rare and severe diseases
  - True positive cancer diagnoses
  - Including cancers diagnosed without a screening
- Incomplete health screening records

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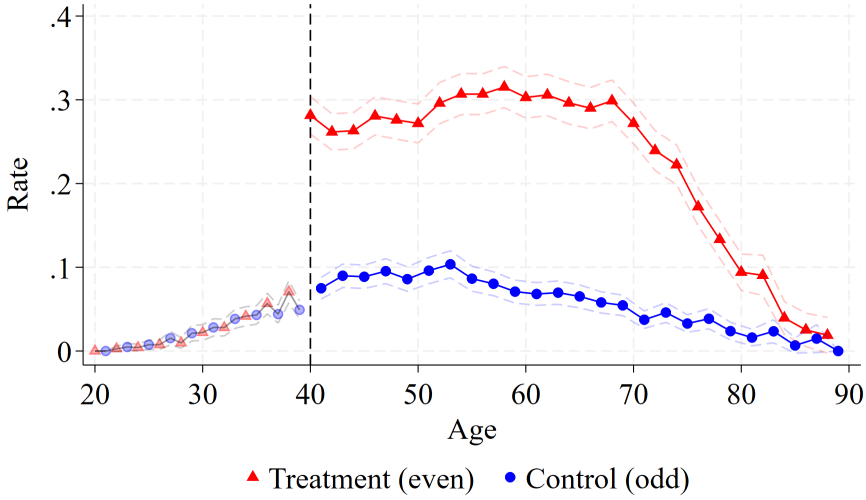
Breast screening



General Cervical

Effect on 1-year take-up

	(1)	(2)	(3)	(4)
	General	Stomach	Breast	Cervical
treat	0.187***	0.190***	0.191***	0.164***
	(0.003)	(0.003)	(0.004)	(0.003)
N	107,183	107,183	56,923	56,923
Control group mean	0.102	0.083	0.067	0.056
Percentage increase	183	229	283	295

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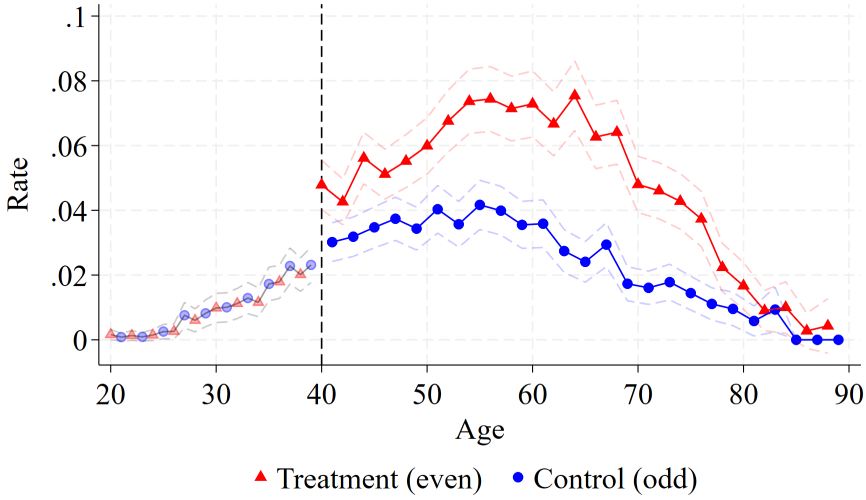
- Arc elasticity: -0.48 to -0.72
- Arc elasticities from RAND HIE: -0.17 to -0.43 (Newhouse, 1993)
- Arc elasticity from another study on screening subsidies: -0.47 (Kim and Lee, 2017)
- Percentage increase in Oregon Medicaid experiment: 45-63% (Finkelstein et al., 2012)

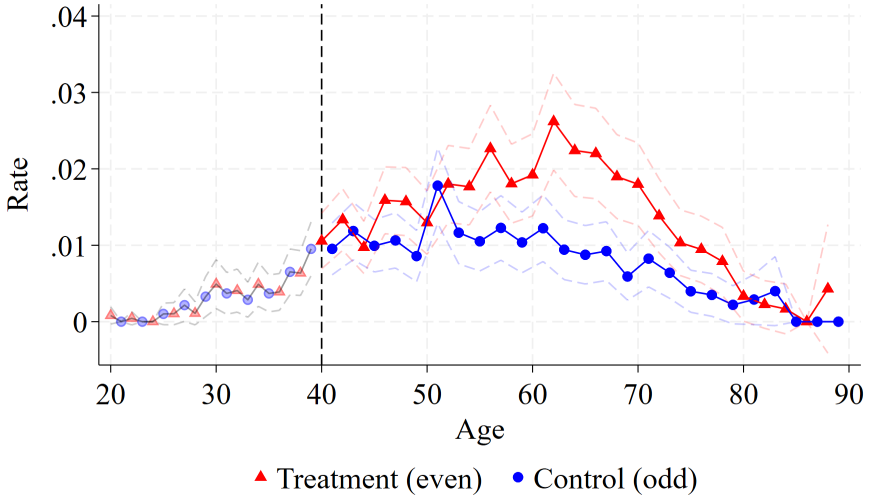
net increase substitution

Liver screening - subsidized every year



Colorectal

Lung screening - not subsidized



Prostate

Cross-screening spillover

	(1)	(2)	(3)	(4)
	Annually subsidized		Unsubsidized	
	Liver	Colorectal	Prostate	Lung
treat	0.027***	0.033***	0.007***	0.0062***
	(0.001)	(0.001)	(0.001)	(0.0007)
N	107,183	107,183	50,260	107,183
Control group mean	0.028	0.027	0.009	0.009
Percentage increase	94	124	81	67

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Control group mean	0.028	0.027	0.009	0.009
Percentage increase	94	124	81	67

- Receiving multiple screenings during a single hospital visit
- Cross-vaccine spillover: 8-34% (Carpenter and Lawler, 2019), 1.5% (Humlum et al., 2024)

Same day share Women

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Characterizing marginal participants (compliers)

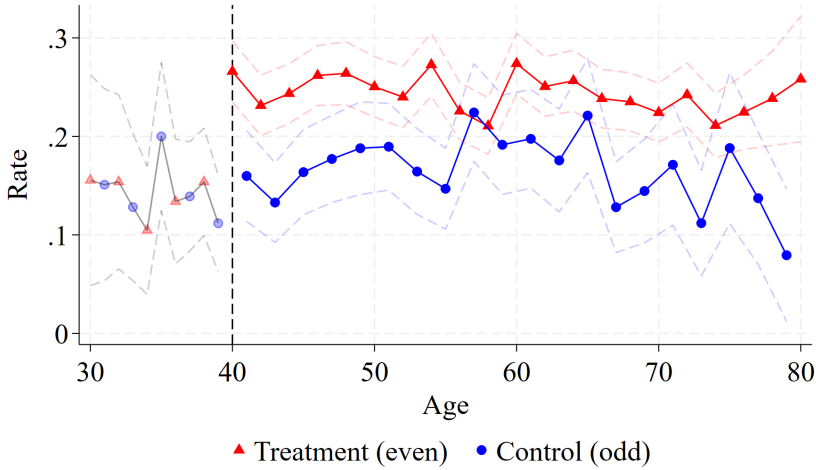
- Who are marginal participants?

	Treatment (even)	Control (odd)
Always-takers	Yes	Yes
Compliers	Yes	No
Never-takers	No	No

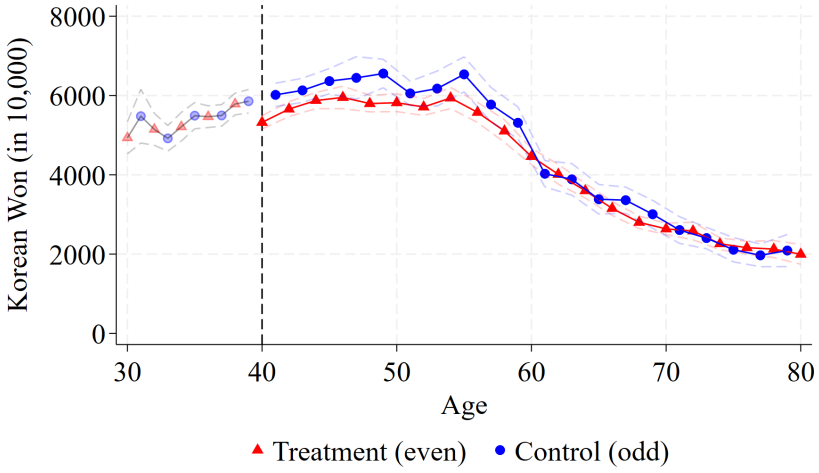
- Cross-sectional & panel approach

- 3 steps for characterizing compliers
  1. Participants at odd ages are always-takers
  2. Participants at even ages are always-takers or compliers
  3. Back out complier characteristics using group shares

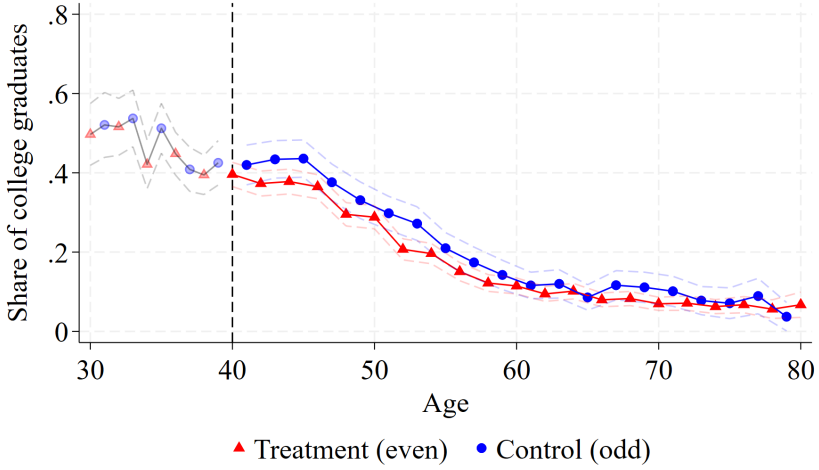
Compliers are more likely to be diagnosed with a stomach disease



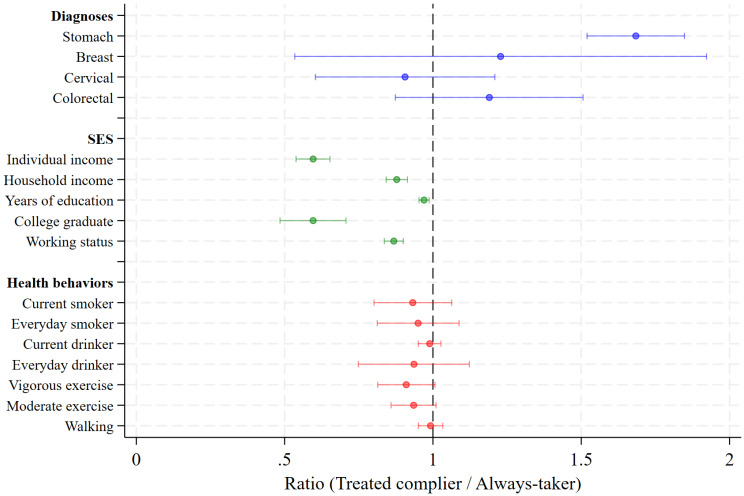
Compliers have lower household income



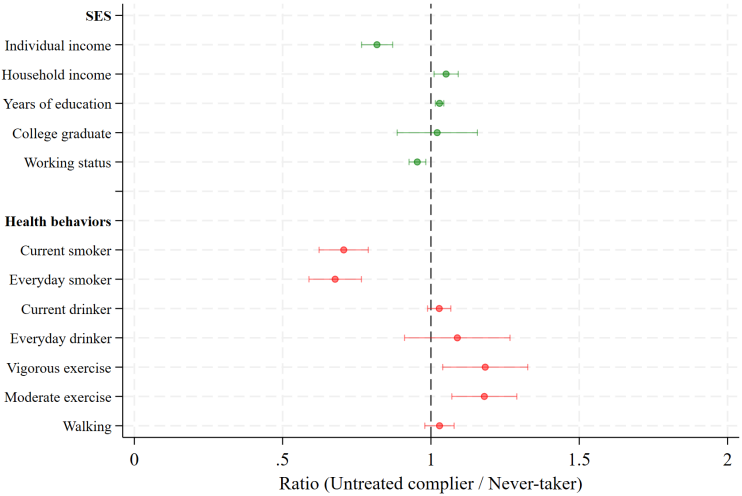
Compliers are less likely to be college graduates



Compliers vs Always-takers

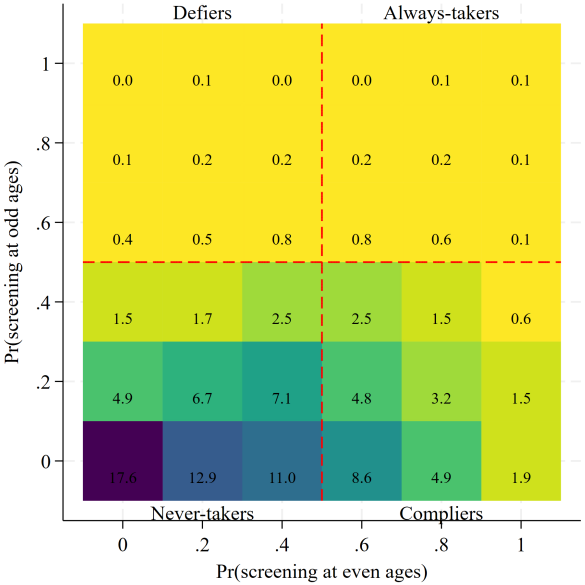


Compliers vs Never-takers



At 40

Bivariate distribution of even and odd probabilities



Definition

Compliers have poorer health

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Always	Compliers	Defiers	Never	Compliers / Always	Compliers / Defiers	Compliers / Never
Panel A. Diagnoses							
Stomach	0.181	0.256	0.189	-	1.413***	1.355**	-
	(0.018)	(0.007)	(0.020)	-	(0.143)	(0.146)	-
Breast	0.015	0.020	0.022	-	1.303	0.885	-
	(0.007)	(0.003)	(0.011)	-	(0.653)	(0.452)	-
Cervical	0.061	0.058	0.058	-	0.950	0.997	-
	(0.015)	(0.005)	(0.024)	-	(0.249)	(0.417)	-
Colorectal	0.183	0.260	0.212	-	1.423*	1.226	-
	(0.030)	(0.013)	(0.032)	-	(0.248)	(0.197)	-
Share	0.022	0.294	0.025	0.659			

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- Compliers through both net increase channel and through intertemporal substitution channel have poorer health

Compliers are have lower SES

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	Always	Compliers	Defiers	Never	Compliers / Always	Compliers / Defiers	Compliers / Never
Panel B. SES							
Individual income	2688	1043	2405	1288	0.388***	0.434***	0.810***
	(247)	(37)	(222)	(28)	(0.038)	(0.043)	(0.034)
Household income	6093	3999	5587	3764	0.656***	0.716***	1.063***
	(308)	(67)	(284)	(46)	(0.035)	(0.038)	(0.022)
Years of education	12.184	9.876	11.486	9.585	0.811***	0.860***	1.030**
	(0.312)	(0.098)	(0.349)	(0.075)	(0.022)	(0.027)	(0.013)
College graduate	0.270	0.123	0.291	0.142	0.456***	0.423***	0.869**
	(0.039)	(0.008)	(0.038)	(0.006)	(0.072)	(0.062)	(0.066)
Working status	0.753	0.560	0.733	0.603	0.744***	0.764***	0.930***
	(0.030)	(0.010)	(0.032)	(0.007)	(0.033)	(0.036)	(0.020)

Compliers are have lower SES

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Compliers show better health behaviors than never-takers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Always	Compliers	Defiers	Never	Compliers / Always	Compliers / Defiers	Compliers / Never
Panel C. Health behaviors							
Current smoker	0.272	0.268	0.381	0.399	0.984	0.702***	0.670***
	(0.043)	(0.016)	(0.047)	(0.010)	(0.165)	(0.096)	(0.043)
Everyday smoker	0.260	0.257	0.350	0.386	0.991	0.735**	0.667***
	(0.042)	(0.015)	(0.046)	(0.010)	(0.170)	(0.106)	(0.044)
Current drinker	0.828	0.775	0.856	0.763	0.935	0.905***	1.016
	(0.042)	(0.014)	(0.031)	(0.008)	(0.050)	(0.036)	(0.021)
Everyday drinker	0.111	0.141	0.175	0.151	1.274	0.807	0.933
	(0.027)	(0.010)	(0.033)	(0.006)	(0.329)	(0.161)	(0.078)
Vigorous exercise	0.374	0.300	0.340	0.278	0.802***	0.883	1.080*
	(0.032)	(0.010)	(0.028)	(0.006)	(0.074)	(0.079)	(0.043)
Moderate exercise	0.526	0.474	0.525	0.419	0.902*	0.903*	1.133***
	(0.031)	(0.010)	(0.031)	(0.006)	(0.056)	(0.056)	(0.029)
Walking	0.830	0.812	0.818	0.780	0.979	0.993	1.042***
	(0.023)	(0.007)	(0.019)	(0.005)	(0.029)	(0.025)	(0.011)

Summary of compliers' characteristics

- Compared to always-takers
  - Lower SES
  - Poorer health (Kim and Lee, 2017)
- Compared to never-takers
  - Better health behaviors (Oster, 2020; Einav et al., 2020; Kowalski, 2023)
- Targeting higher-risk participants
  - Guidelines alone cannot target high-risk (screening, vaccine) (Einav et al., 2020; Lawler, 2020)
  - Lower prices help target high-risk (screening, vaccine, drug adherence) (Choudhry et al., 2011; Baicker et al., 2015; Kim and Lee, 2017; Chandra et al., 2024; Humlum et al., 2024)

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Data and econometric specification

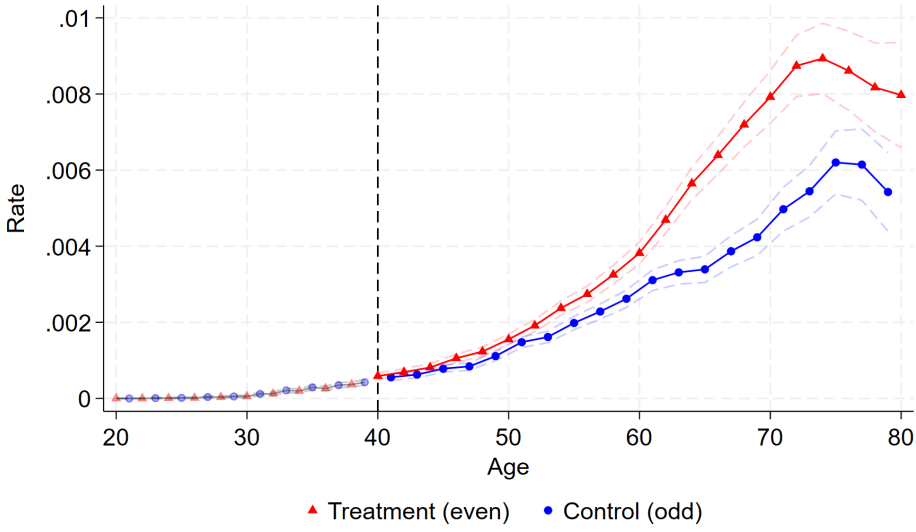
- NHIS claims data
  - All cancer diagnosis (true positive)
  - Preventive care use
  - Mortality

- Intent-to-treat (ITT) estimates

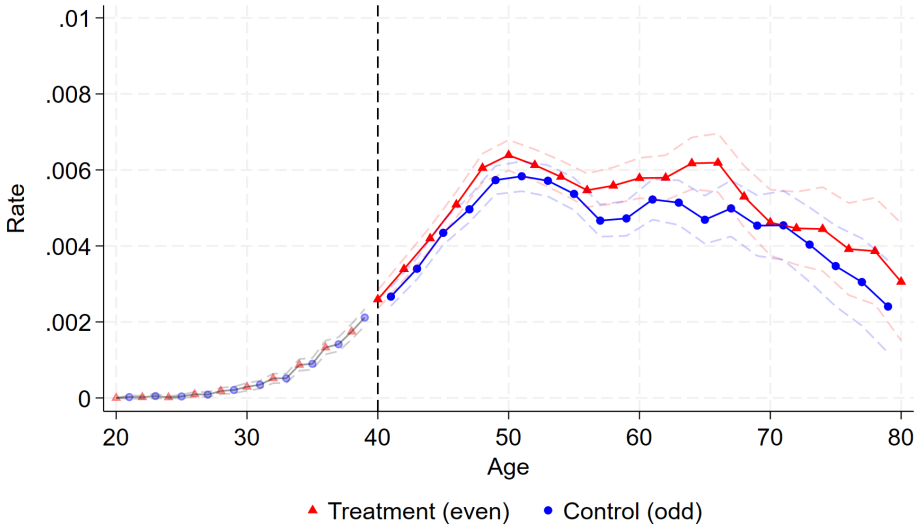
$$y_{it} = \eta_0 + \eta_1 \cdot treat_{it} + f(age_{it}) + \varepsilon_{it} \tag{2}$$

  - Individual i in year t with age $\in [40, 89]$
  - $treat_{it} = 1$ if individual i turns even-numbered age in year t
  - $f(age)$: linear splines with 5 years interval
  - Standard error clustered at the individual level
  - Only capture short-run effect

More stomach cancer diagnoses in the treatment group



More breast cancer diagnoses in the treatment group



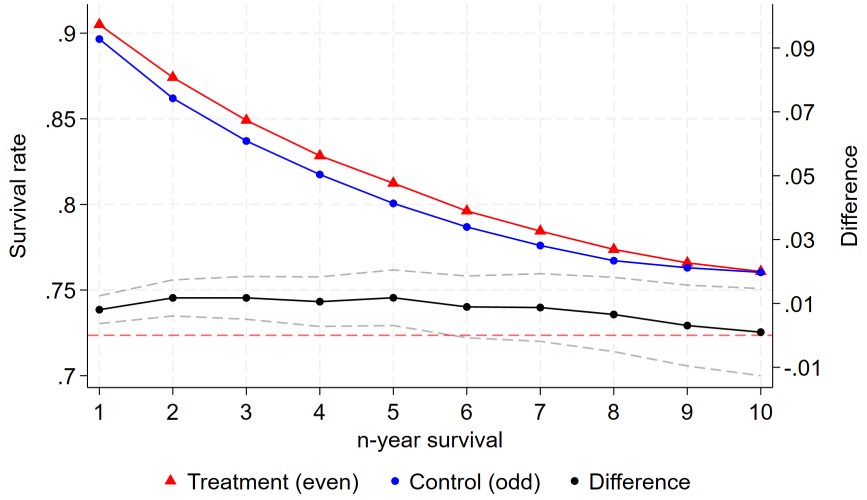
Screening increases both **in-situ** and **invasive** cancer diagnoses

	(1)	(2)	(3)	(4)
	Control group mean	ITT	Percent relative to control	N
Any cancer	0.009	0.0016***	18	7,449,256
		(0.0001)		
invasive	0.008	0.0014***	17	7,449,256
		(0.0001)		
in-situ	0.001	0.0002***	19	7,449,256
		(0.00003)		
Stomach cancer	0.0020	0.00077***	41	7,449,256
		(0.00006)		
invasive	0.0018	0.00075***	41	7,449,256
		(0.00005)		
in-situ	0.0001	0.00003***	55	7,449,256
		(0.000007)		
Breast cancer	0.005	0.0005***	11	3,503,656
		(0.0001)		
invasive	0.004	0.0003***	8	3,503,656
		(0.0001)		
in-situ	0.001	0.00016***	24	3,503,656
		(0.00004)		
Cervical cancer	0.002	0.00020***	13	3,503,656
		(0.00007)		
invasive	0.001	0.00008	11	3,503,656
		(0.00005)		
in-situ	0.001	0.00014***	17	3,503,656
		(0.00004)		

LATE comparison with other studies

- Local Average Treatment Effect = ITT (insurance claims) / First stage (survey)
  - Cancer detection rate among compliers
- LATE for breast screening: 0.0026
  - Organized breast screening program in Europe: 0.0010 (Guthmuller et al., 2023)
  - US mammogram recommendation at age 40: 0.0019 (Kadiyala and Strumpf, 2016)
  - Another mammogram subsidy in Korea: 0.0025 (Kim and Lee, 2017)
- LATE for stomach screening: 0.0041
  - Another stomach screening subsidy in Korea: 0.0025 (Kim and Lee, 2017)

Cancer patients diagnosed in the treatment group live longer



Lead time bias

Screening leads to treatment of cancer precursors

	(1)	(2)	(3)	(4)
	Control group mean	ITT	Percent relative to control	N
Helicobacter Pylori	0.00017	0.00003***	15	8,673,954
		(0.00001)		
Polypectomy	0.01174	0.00724***	62	8,673,954
		(0.00009)		

Screening increases medication use for chronic diseases

	(1)	(2)	(3)	(4)
	Control group mean	ITT	Percent relative to control	N
High blood pressure	0.23884	0.00046*** (0.00013)	0.2	8,673,954
Diabetes	0.08918	0.00015** (0.00006)	0.2	8,673,954
High cholesterol	0.13901	0.00419*** (0.00011)	3	8,673,954

High blood pressure | Diabetes | High cholesterol

Screening increases medication use for osteoporosis

	(1)	(2)	(3)	(4)
	Control group mean	ITT	Percent relative to control	N
Tuberculosis	0.00195	0.00001	0.5	8,673,954
		(0.00002)		
Osteoporosis	0.02613	0.00106***	4	8,673,954
		(0.00007)		

Impact on 1-year mortality

	(1)	(2)	(3)	(4)
	Control group mean	ITT	Percent relative to control	N
Total death	0.009084	–0.000048 (0.000072)	–0.530	6,740,415
Cancer death	0.002805	–0.000015 (0.000041)	–0.548	6,740,415
Stomach cancer death	0.000334	–0.000002 (0.000014)	–0.515	6,740,415
Breast cancer death	0.000153	–0.000011 (0.000013)	–7.057	3,480,294
Cervical cancer death	0.000059	0.000008 (0.000008)	12.735	3,480,294
Liver cancer death	0.000434	–0.000015 (0.000016)	–3.511	6,740,415
Colorectal cancer death	0.000287	0.000016 (0.000013)	5.715	6,740,415
Lung cancer death	0.000646	–0.000003 (0.000020)	–0.503	6,740,415
Prostate cancer death	0.000116	0.000003 (0.000012)	2.358	3,260,121

Robustness checks

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Takeaways

1. Subsidies can effectively target high-risk participants

2. Screenings significantly increase early detection of diseases and preventive care use

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References

Arrow, K. J. (1963). Uncertainty and the welfare economics of medical care. *American Economic Review*, 53(5):941–973.

Autier, P., Boniol, M., Koechlin, A., Pizot, C., and Boniol, M. (2017). Effectiveness of and overdiagnosis from mammography screening in the netherlands: population based study. *bmj*, 359.

Bai, L., Handel, B., Miguel, E., and Rao, G. (2021). Self-control and demand for preventive health: Evidence from hypertension in india. *Review of Economics and Statistics*, 103(5):835–856.

Baicker, K., Mullainathan, S., and Schwartzstein, J. (2015). Behavioral hazard in health insurance. *The Quarterly Journal of Economics*, 130(4):1623–1667.

Bender, A. M., Jørgensen, T., and Pisinger, C. (2015). Is self-selection the main driver of positive interpretations of general health checks? the inter99 randomized trial. *Preventive medicine*, 81:42–48.

Bitler, M. P. and Carpenter, C. S. (2016). Health insurance mandates, mammography, and breast cancer diagnoses. *American Economic Journal: Economic Policy*, 8(3):39–68.

Bitler, M. P. and Carpenter, C. S. (2017). Effects of state cervical cancer insurance mandates on pap test rates. *Health services research*, 52(1):156–175.

Carethers, J. M. and Doubeni, C. A. (2020). Causes of socioeconomic disparities in colorectal cancer and intervention framework and strategies. *Gastroenterology*, 158(2):354–367.

Carpenter, C. S. and Lawler, E. C. (2019). Direct and spillover effects of middle school vaccination requirements. *American Economic Journal: Economic Policy*, 11(1):95–125.

Chandra, A., Flack, E., and Obermeyer, Z. (2024). The health costs of cost-sharing. *The Quarterly Journal of Economics*, page qjae015.

Choudhry, N. K., Avorn, J., Glynn, R. J., Antman, E. M., Schneeweiss, S., Toscano, M., Reisman, L., Fernandes, J., Spettell, C., Lee, J. L., et al. (2011). Full coverage for preventive medications after myocardial infarction. *New England Journal of Medicine*, 365(22):2088–2097.

Decker, S. L. (2005). Medicare and the health of women with breast cancer. *Journal of Human Resources*

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Implementation of the health screening program

- Nationwide program
  - Target: all the citizens covered by National Health Insurance Service (NHIS)
  - History: (1980) Beginning of the program $\rightarrow$ (2004) Current system
- How can I receive subsidized screenings
  - Providers: public health clinics / private clinics and hospitals designated by the NHIS
    $\Rightarrow$ (Dec 2023) 6,600 screening centers for general screening $\rightarrow$ 4600 people per center
  - Appointment: normally required but varies by hospitals and type of screenings
- Do people know about the screening program and the subsidies?
  - Even-odd subsidy rule has been used throughout the study period
  - Reminder mails (and mobile notifications)
    - Sent to those eligible for subsidies
    - Mail contains the type of screenings to receive and screening providers in the neighborhood

Back

High risk group for liver screening

1. Individuals with the following diseases
   - Cirrhosis
   - Chronic liver disease
2. Individuals who were diagnosed with positive results in the previous year general health screening
   - Hepatitis B surface antigen test
   - Hepatitis C virus HCV antibody test

   $\Rightarrow$ can be found through blood test
3. Individuals who used medical services for the following diseases in the past two years are excluded
   - Liver cell carcinoma, hepatocellular carcinoma and liver cancer (C22.0)
   - Intrahepatic bile duct carcinoma and Cholangiocarcinoma (C22.1)

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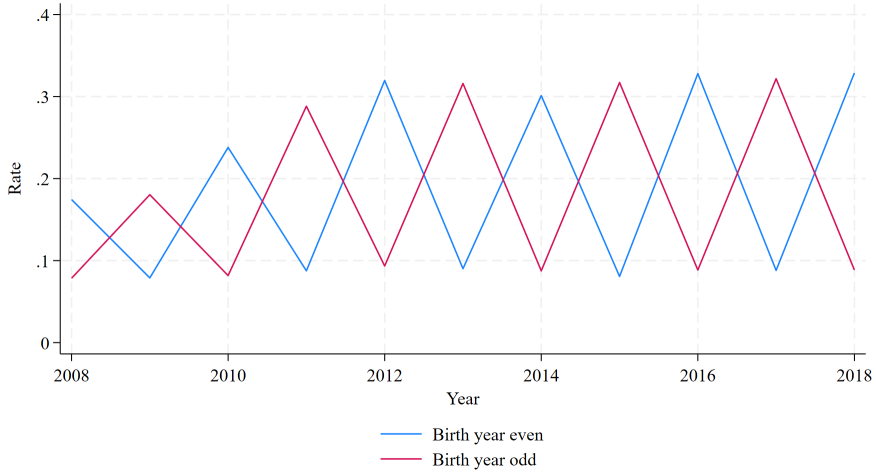
Stomach screening by birth year



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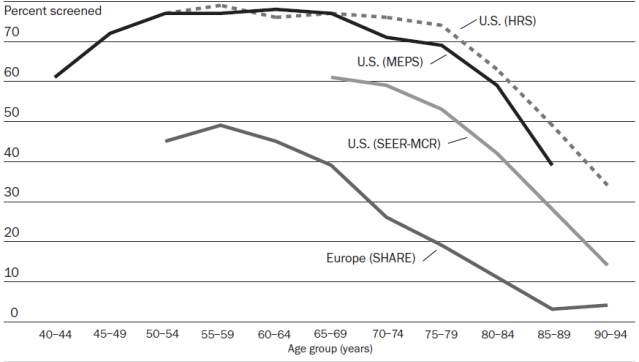
Breast screening in the US and Europe (Howard et al., 2009)

EXHIBIT 3
Receipt Of Mammography In The Past Two Years Among Women Ages 44–94 In Europe And The United States, By Age Group, 2004



SOURCES: U.S. screening rates are from the Medical Expenditure Panel Survey (MEPS), the Health and Retirement Study (HRS), and Surveillance, Epidemiology, and End Results (SEER)–Medicare data (SEER-MCR). European rates are from the Survey of Health, Ageing, and Retirement in Europe (SHARE).

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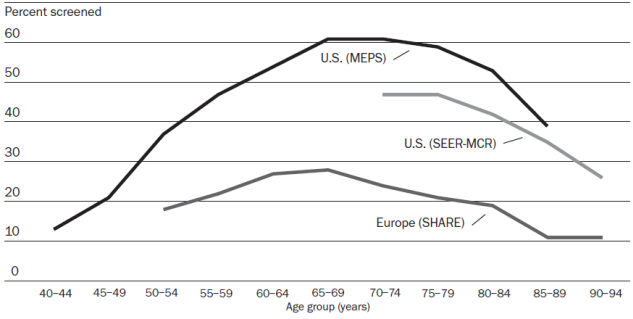
Colorectal screening in the US and Europe (Howard et al., 2009)

EXHIBIT 4
Receipt Of Colonoscopy, Sigmoidoscopy, And Fecal Occult Blood Tests Among Women And Men Ages 44–94 In The Past Ten Years In Europe And In The Past Five Years In The United States, By Age Group, 2004



SOURCES: U.S. screening rates are from the Medical Expenditure Panel Survey (MEPS); and Surveillance, Epidemiology, and End Results (SEER)–Medicare data (SEER-MCR). European rates are from the Survey of Health, Ageing, and Retirement in Europe (SHARE).

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Full balance table with unconditional difference

	(1)	(2)	(3)	(4)
	Even age group	Odd age group	Unconditional difference	Conditional difference
Age	58.697	59.240	–0.543***	-
	(12.532)	(12.353)	(0.026)	-
Female	0.530	0.532	–0.002**	–0.002*
	(0.499)	(0.499)	(0.001)	(0.001)
Currently married	0.799	0.798	0.0009	–0.0011
	(0.401)	(0.402)	(0.0009)	(0.0008)
Years of education	10.320	10.227	0.093***	–0.003
	(4.510)	(4.538)	(0.009)	(0.008)
Working status	0.610	0.608	0.001	–0.003*
	(0.488)	(0.488)	(0.002)	(0.001)
Individual income	1446.3	1425.7	20.607***	2.762
	(2081.6)	(2068.1)	(5.508)	(5.185)
Household income	4104.4	4086.7	17.735	3.221
	(3708.6)	(3737.9)	(14.555)	(14.267)
Own a house	0.734	0.737	–0.002*	–0.0002
	(0.442)	(0.441)	(0.001)	(0.0011)
Number of household members	3.067	3.051	0.016***	–0.004
	(1.317)	(1.317)	(0.003)	(0.003)
N	54274	52909		
Share	(0.51)	(0.49)		
F(8, 15939)				1.65
				(0.10)

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Robustness check for balance table with different intervals

	(1)	(2)	(3)
	3 years	5 years	7 years
Female	–0.002*	–0.002*	–0.002*
	(0.001)	(0.001)	(0.001)
Currently married	–0.001*	–0.001	–0.001
	(0.001)	(0.001)	(0.001)
Years of education	–0.003	–0.003	–0.003
	(0.008)	(0.008)	(0.008)
Working status	–0.003**	–0.003*	–0.003*
	(0.002)	(0.001)	(0.001)
Individual income	1.1	2.8	1.2
	(5.3)	(5.2)	(5.2)
Household income	0.6	3.2	–4.5
	(15.4)	(14.3)	(14.1)
Own a house	–0.000	–0.000	0.000
	(0.001)	(0.001)	(0.001)
Number of household members	–0.004	–0.004	–0.004*
	(0.003)	(0.003)	(0.003)

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Bounding estimates for balance check

	(1)	(2)	(3)
	Age $\in [39, 89]$	Age $\in [40, 89]$	Age $\in [41, 89]$
Age	0.521***	−0.543***	0.562***
	(0.026)	(0.026)	(0.025)
Female	−0.001	−0.002**	−0.001
	(0.001)	(0.001)	(0.001)
Currently married	−0.0009	0.0009	−0.0018**
	(0.0009)	(0.0009)	(0.0009)
Years of education	−0.094***	0.093***	−0.107***
	(0.009)	(0.009)	(0.010)
Working status	−0.006***	0.001	−0.007***
	(0.001)	(0.002)	(0.002)
Individual income	−16.235***	20.607***	−24.789***
	(5.470)	(5.508)	(5.618)
Household income	−23.153	17.735	−31.182**
	(14.766)	(14.555)	(14.995)
Own a house	0.003***	−0.002*	0.003**
	(0.001)	(0.001)	(0.001)
Number of household members	−0.027***	0.016***	−0.034***
	(0.003)	(0.003)	(0.003)
N	110121	107183	104153

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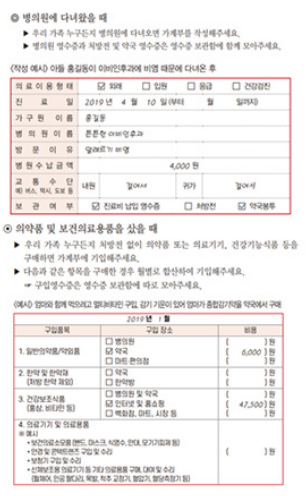
Health care usage data collection

- Recording health care usage
  - Survey participants are asked to keep health diary and store receipts from every visit to hospitals and pharmacies
- No gap
  - During annual interviews, enumerator goes through health diary from the last time of interview

Health diary



◐ 건강가계부 작성방법 ◑

◉ 병의원에 다녀왔을 때

▶ 우리 가족 누구든지 병의원에 다녀오면 가계부를 작성해주세요.
▶ 병의원 영수증과 처방전 및 약국 영수증은 영수증 보관함에 함께 모아주세요.

(작성 예시) 아들 홍길동이 이비인후과에 비염 때문에 다녀온 후

의 료 이 용 형 태	☑ 외래	☐ 입원	☐ 응급	☐ 건강검진
진 료 일	2019년 4월 10일(부터	월	일까지)	
가 구 원 이 름	홍길동			
병 의 원 이 름	푸른숲 ○○이비인후과			
방 문 이 유	알레르기 비염			
병 원 수 납 금 액	4,000 원			
교 통 수 단 (택시, 버스, 도보 등)	내원	걸어서	귀가	걸어서
보 관 여 부	☑ 진료비 납입 영수증	☐ 처방전	☑ 약국봉투	

◉ 의약품 및 보건의료용품을 샀을 때

▶ 우리 가족 누구든지 처방전 없이 의약품 또는 의료기기, 건강기능식품 등을 구매하면 가계부에 기입해주세요.
▶ 다음과 같은 항목을 구매한 경우 합쳐서 기입해주세요.
☞ 구입영수증은 영수증 보관함에 따로 모아주세요.

(예시) 엄마와 함께 약국에서 멀티비타민 구입, 감기 기운이 있어 엄마가 종합감기약을 약국에서 구매

2019년 7월

구입품목	구입 장소	비용
1. 일반의약품/약입품	☐ 병의원 ☑ 약국 ☐ 마트 편의점	(6,000) 원 ( ) 원
2. 한약 및 한약재 (처방 한약 제외)	☐ 약국 ☐ 한약방	( ) 원 ( ) 원
3. 건강보조식품 (홍삼, 비타민 등)	☐ 병의원 및 약국 ☑ 인터넷 및 홈쇼핑 ☐ 백화점, 마트, 시장 등	( ) 원 (47,500) 원 ( ) 원
4. 의료기기 및 의료용품 ※ 예시 • 밴드/인공소창용 밴드, 마스크, 식염수, 안대, 모기기피제 등) • 안경 및 콘택트렌즈 구입 및 수리 • 보청기 구입 및 수리 • 의학보조 및 의료기기 등 기타 의료용품 구매, DME 및 수리 (휠체어, 인공 혈관지, 목발, 척추 교정기, 혈압기, 혈당측정기 등)		( ) 원

<How to write health diary>

- Visit to hospital
  - Record it for all the household members
  - Store hospital receipts, prescriptions and pharmacy receipts in a box

<Example> After a visit to ENT for allergy

Type	□Outpatient □Inpatient □ Emergency □ Screening			
Date	From: April 10, 2019 To:			
Name	John Doe			
Name of the hospital	Dr. Jane M. Doe, MD			
Purpose	Allergy			
Hospital bills	$40			
Transportation	To	Walking	From	Walking
Receipts	□ Hospital □ Prescription □ Pharmacy			

- Purchase of OTC drugs, oriental medicine, dietary supplements
  - Record it for all the household members
  - Store hospital receipts, prescriptions and pharmacy receipts in a box

<Example> Purchase of multivitamin and Tylenol

January 2019		
Item	Place	Cost
OTC drugs	□ Hospital □ Pharmacy □ CVS	{ } KRW { } KRW { } KRW
Oriental medicine	□ Pharmacy □ Acupuncture clinic	{ } KRW { } KRW
Dietary supplement (ginseng, vitamin, etc)	□ Hospital or pharmacy □ Internet shopping □ Department store	{ } KRW { } KRW { } KRW
Any other medical products (e.g.) - Bandage, mask, insect repellent - Glasses, contact lenses - Hearing aid		{ } KRW

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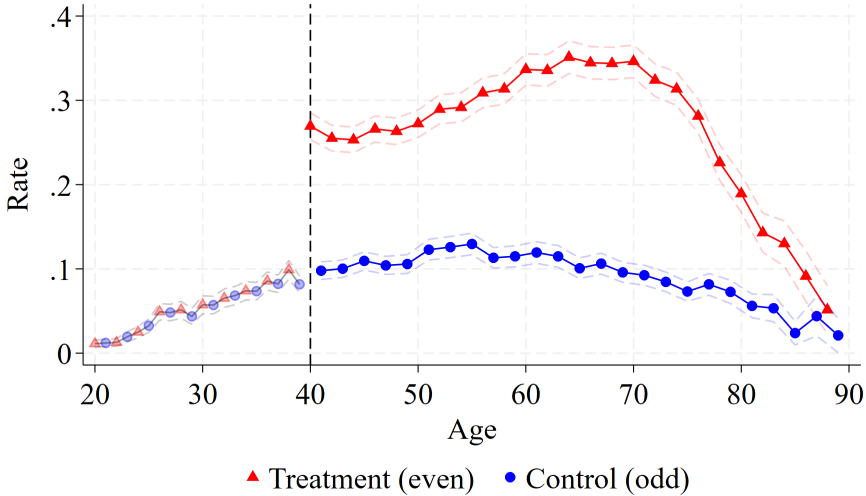
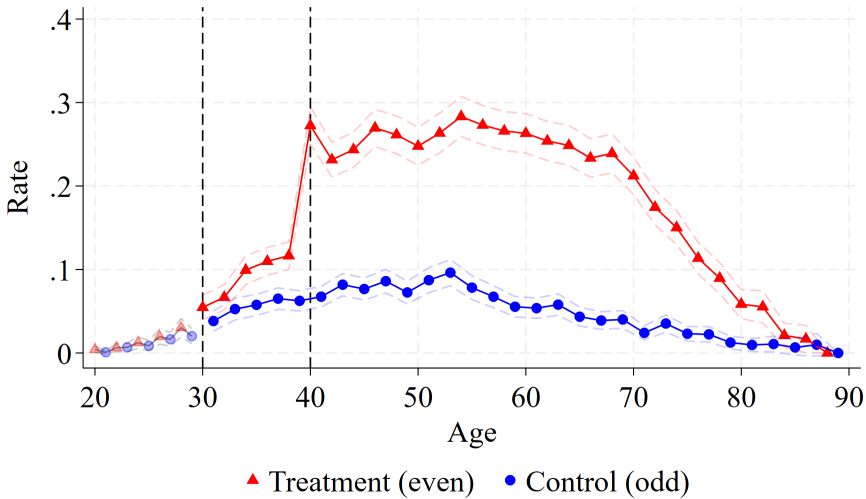
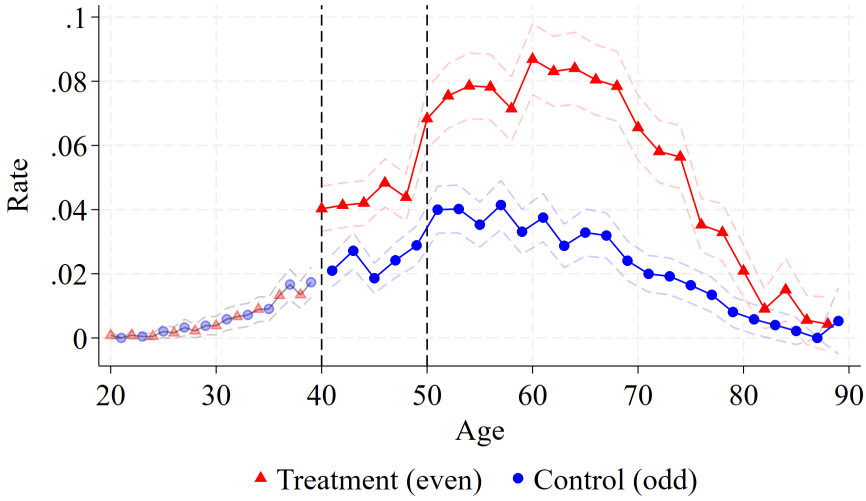
General screening



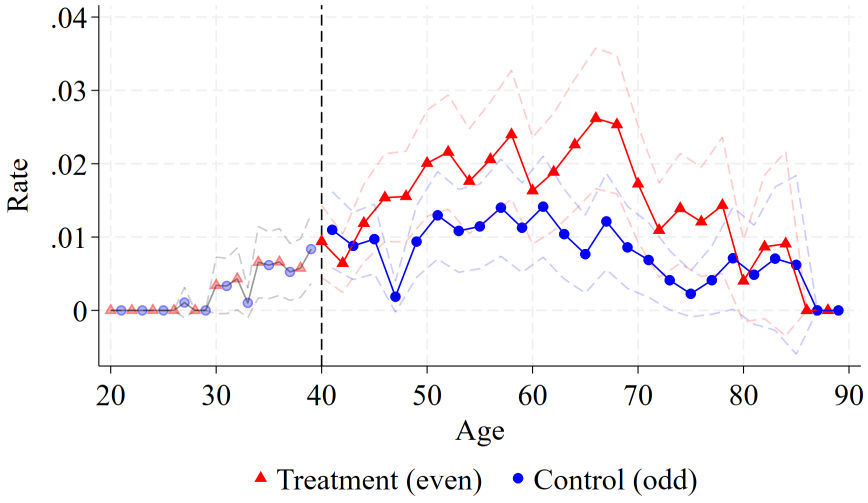
Cervical screening



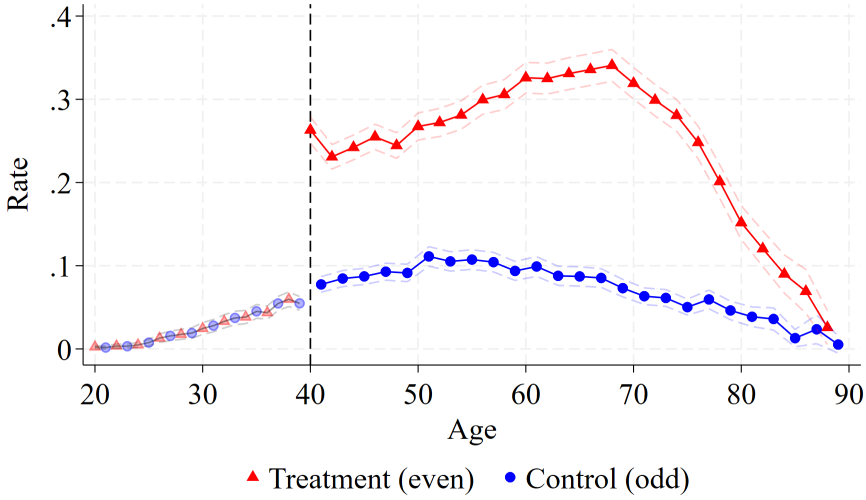
Colorectal screening



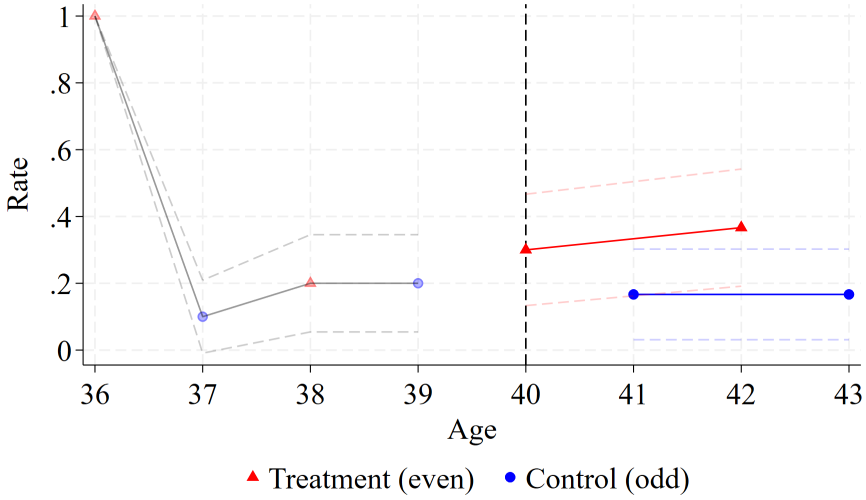
Prostate screening



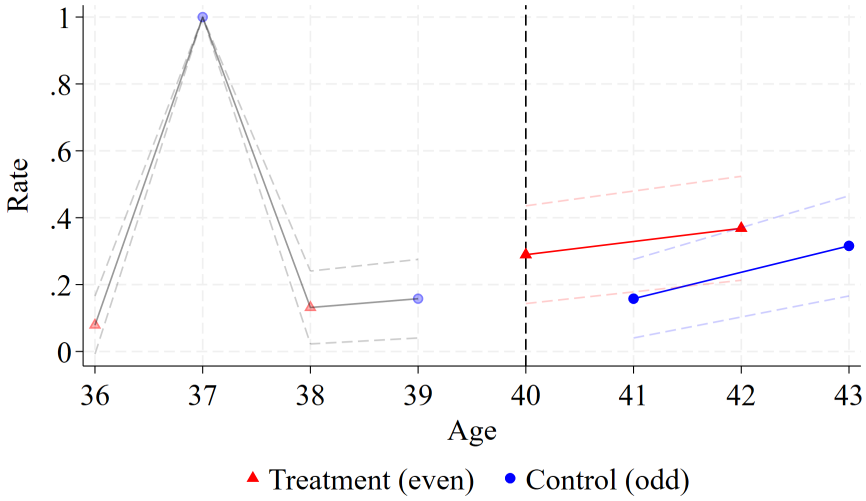
Net increase in screening participation at age 40



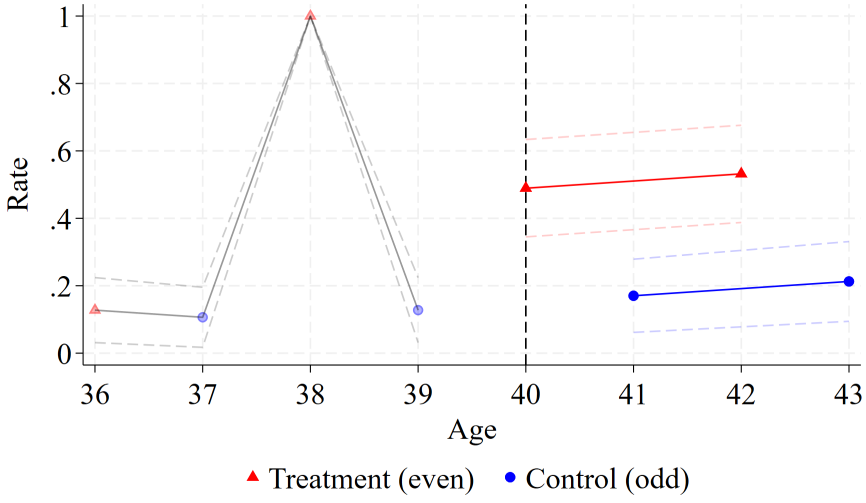
No substitution for participants at age 36



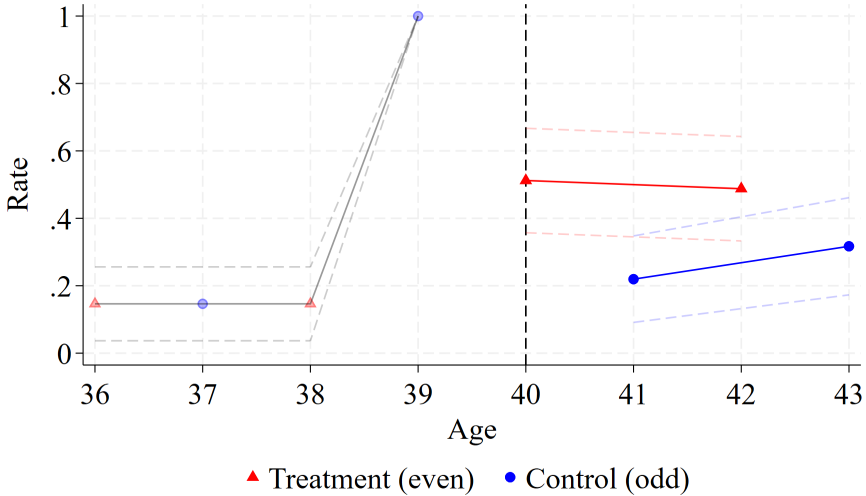
No substitution for participants at age 37



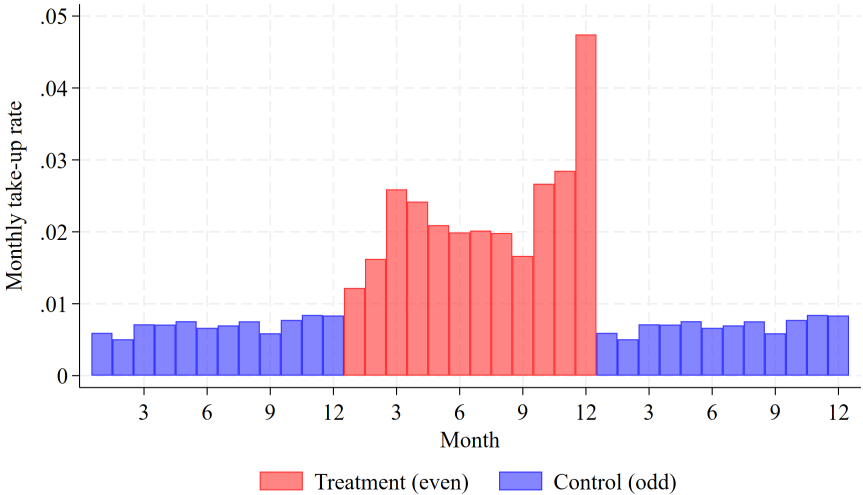
No substitution for participants at age 38



No substitution for participants at age 39



People get screening earlier before subsidies expire



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Multiple screenings on the same day

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Stomach	Breast	Cervical	Liver	Colorectal	Prostate	Lung
$\Pr(\text{general} = 1 \mid \text{screen} = 1)$	0.878	0.861	0.834	0.844	0.799	0.786	0.699
$\Pr(\text{same day} \mid \text{screen} = 1, \text{general} = 1)$	0.964	0.947	0.899	0.948	0.856	0.960	0.937
If not on the same day							
$\Pr(\text{general first} \mid \text{screen} = 1, \text{general} = 1)$	0.028	0.037	0.053	0.035	0.111	0.024	0.043
$\Pr(\text{general later} \mid \text{screen} = 1, \text{general} = 1)$	0.007	0.015	0.032	0.009	0.178	0.004	0.005

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Women do not show stronger cross spillover

	(1)	(2)	(3)
	Liver	Colorectal	Lung
Age even	0.025***	0.036***	0.007***
	(0.002)	(0.002)	(0.001)
Age even × Female	0.003	–0.005*	–0.002
	(0.003)	(0.003)	(0.001)
Female	–0.017***	–0.012***	–0.0078***
	(0.002)	(0.002)	(0.0009)
N	107183	107183	107183
Control group mean	0.028	0.027	0.009
Age range	[40, 89]	[40, 89]	[40, 89]

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Screening results

- Screening results
  - Find any disease? $\Rightarrow$ Which disease? (ICD-10)
  - Multiple answers allowed
  - Not available for never-takers

Screening	Take-up	Disease diagnosis
Stomach	17.9%	22.8%
Breast	16.4%	2.2%
Cervical	13.9%	6.7%
Colorectal	4.3%	22.3%

Back

Disease classifications for stomach

- (K29) Gastritis and duodenitis
- (K52) Other noninfective gastroenteritis and colitis
- (K21) Gastro-oesophageal reflux disease
- (K25) Gastric ulcer
- (B98) Helicobacter pylori
- (K31) Other diseases of stomach and duodenum
- (K20) Esophagitis
- (C16) Malignant neoplasm of stomach
- (K26) Duodenal ulcer

Back

Disease classifications for breast

- (N63) Unspecified lump in breast
- (N64) Other disorders of breast
- (D24) Benign neoplasm of breast
- (N60) Benign mammary dysplasia
- (C50) Malignant neoplasm of breast

Back

Disease classifications for female genital

- (N76) Other inflammation of vagina and vulva
- (N71) Inflammatory disease of uterus, except cervix
- (N85) Other noninflammatory disorders of uterus, except cervix
- (N83) Noninflammatory disorders of ovary, fallopian tube and broad ligament

Back

Disease classifications for colon and rectum

- (K63) Other diseases of intestine
- (D12) Benign neoplasm of colon, rectum, anus and anal canal
- (D13) Benign neoplasm of other and ill-defined parts of digestive system
- (R19) Other symptoms and signs involving the digestive system and abdomen
- (C18) Malignant neoplasm of colon

Back

1. Estimate Always- and Never-takers characteristics

- Individually identifiable always- and never-takers

	Even age (treatment)	Odd age (control)
Always-takers	Yes	Yes
Compliers	Yes	No
Never-takers	No	No

- Estimating equation

$$y_{it} = \beta_0 + \beta_1 treat_{it} + \beta_2 screen_{it} + \beta_3 treat_{it} \times screen_{it} + \nu_{it} \quad (3)$$

- Average characteristics
  - Always-takers: $g_{AT}(y) = \hat{\beta}_0 + \hat{\beta}_2$
  - Never-takers: $g_{NT}(y) = \hat{\beta}_0 + \hat{\beta}_1$

2. Back out complier characteristics

- Treated compliers in the treatment group, untreated compliers in the control group

	Even age (treatment)	Odd age (control)
Always-takers	Yes	Yes
Compliers	Yes	No
Never-takers	No	No

- Estimating equation

$$y_{it} = \beta_0 + \beta_1 treat_{it} + \beta_2 screen_{it} + \beta_3 treat_{it} \times screen_{it} + \nu_{it} \tag{4}$$

- Those getting screened in the treatment group

$$\begin{aligned} g_T(y) &= \frac{\pi_{AT}}{\pi_{AT} + \pi_C} g_{AT}(y) + \frac{\pi_C}{\pi_{AT} + \pi_C} g_C^1(y) \\ &= \hat{\beta}_0 + \hat{\beta}_1 + \hat{\beta}_2 + \hat{\beta}_3 \end{aligned}$$

- Those not getting screened in the control group

$$\begin{aligned} g_U(y) &= \frac{\pi_{NT}}{\pi_{NT} + \pi_C} g_{NT}(y) + \frac{\pi_C}{\pi_{NT} + \pi_C} g_C^0(y) \\ &= \hat{\beta}_0 \end{aligned}$$

3. Compare compliers to always- and never-takers

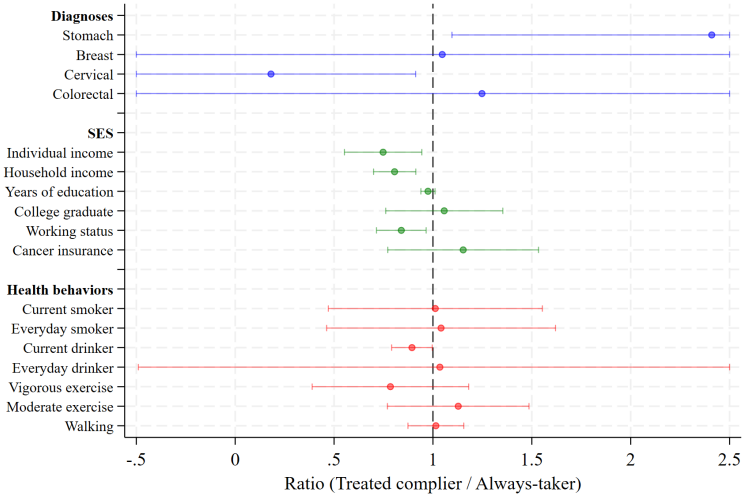
- Taking ratios
  - Treated compliers to always-takers: $g_C^1(y)/g_{AT}(y)$
  - Untreated compliers to never-takers: $g_C^0(y)/g_{NT}(y)$

- Why differentiate between treated and untreated compliers?
  - Characteristics in the same year
  - Unclear pre-determined characteristics
  - Difference between treated and untreated complier characteristics = LATE

- Minor details in estimation
  - Age = 60
  - Standard error calculated with bootstrap with clustering at individual level (500 replications)

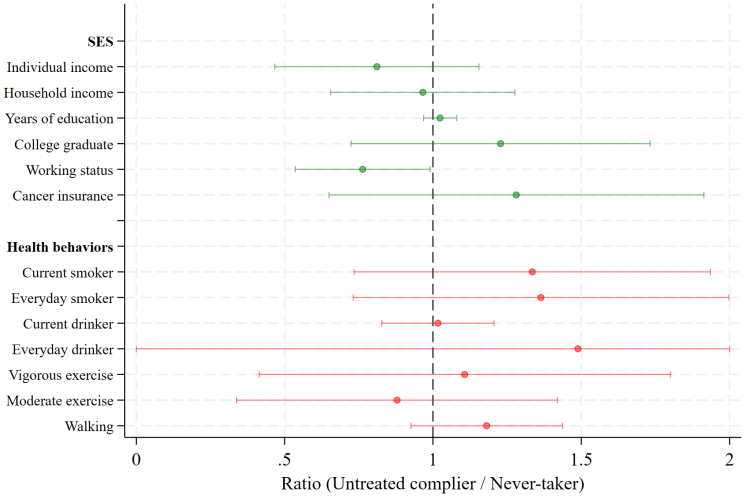
Back

Compliers vs Always-takers using age 40 discontinuity



Even/Odd Cervical

Compliers vs Never-takers using age 40 discontinuity



Even/Odd

Stomach diseases and cancer

- Unlike in US, stomach cancer is common in South Korea
  - % of all new cancer cases: 1.3% (US 2024) 11.5% (SK 2019)
  - % of all cancer deaths: 1.8% (US 2024) 9.4% (SK 2019)

- There is high returns to early detection of stomach cancer
  - 5-year relative survival rate
  - Stomach: localized (97.4%) $\longrightarrow$ distant (6.6%)
  - Breast: localized (98.9%) $\longrightarrow$ distant (45.2%)

- Stomach screening (upper endoscopy)
  - Cause: Helicobacter Pylori (Uemura et al., 2001)
  - Symptoms: inflammation (gastritis), ulcer (peptic ulcer), cancer
  - Diagnosed through endoscopy
  - Treatment: 2 weeks of antibiotics and an acid-reducing proton pump inhibitor

Stomach diseases and cancer

	(1)	(2)	(3)
	Average value		Ratio
	Always-takers	Treated compliers	CP_1/AT
Helicobacter Pylori	0.009	0.013	1.498
	(0.002)	(0.002)	(0.360)
Gastritis	0.123	0.210	1.707***
	(0.005)	(0.006)	(0.101)
Stomach ulcer	0.005	0.008	1.444
	(0.001)	(0.001)	(0.529)
Stomach cancer	0.001	0.003	1.909
	(0.001)	(0.001)	(1.924)
Colon polyp	0.070	0.114	1.628*
	(0.007)	(0.016)	(0.359)

Back

Using 10 years of panel to define compliance groups

	Treatment (even)	Control (odd)
Always-takers	Yes	Yes
Compliers	Yes	No
Defiers	No	Yes
Never-takers	No	No

- Analytical sample ($N = 5,701$)
  - Balanced sample without attrition for 10 years (2009-2018)
  - First year age ≥ 40
- Probability of screening at even and odd ages

$$Pr(\text{screen\_even}) = \frac{1}{5} \times \sum_{k=1}^{5} \mathbb{1}\{screen_{ik} = 1\}, \qquad k \ even \tag{5}$$

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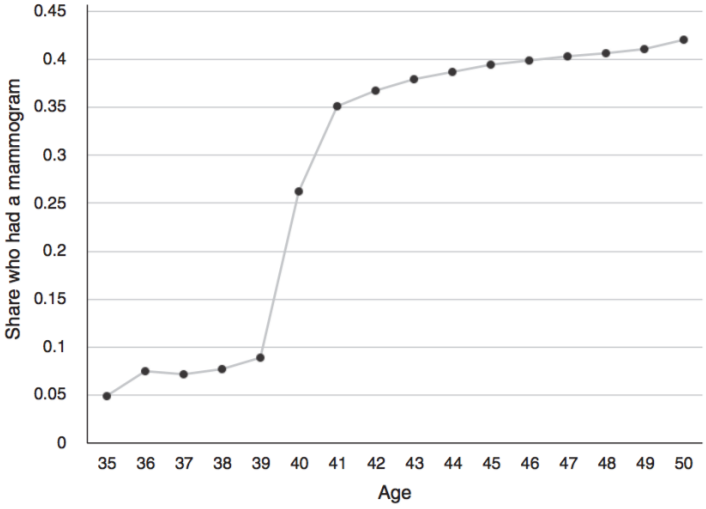
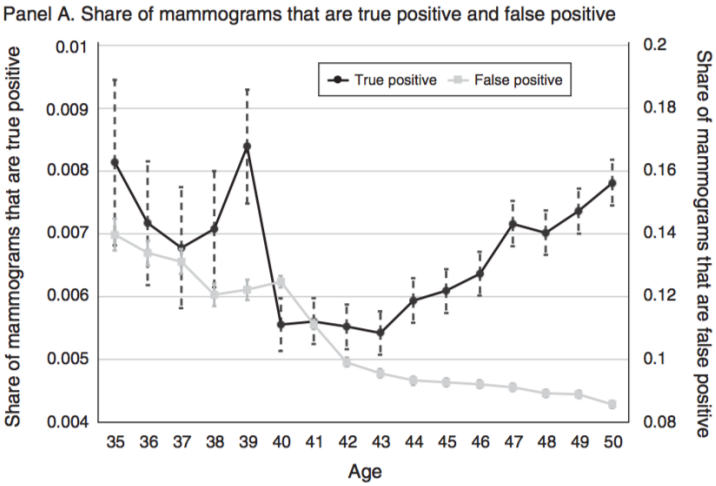
Einav et al. (2020) AER



Einav et al. (2020) AER



Complier vs Always-taker Selection summary

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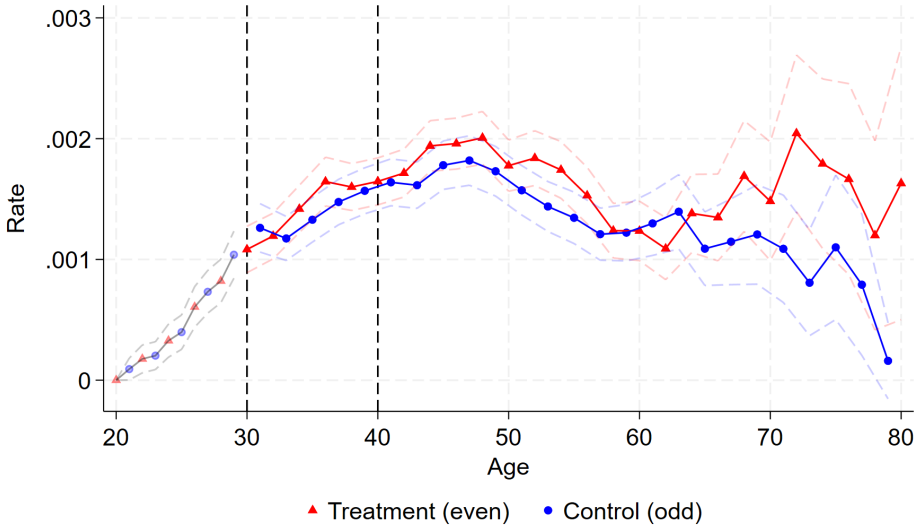
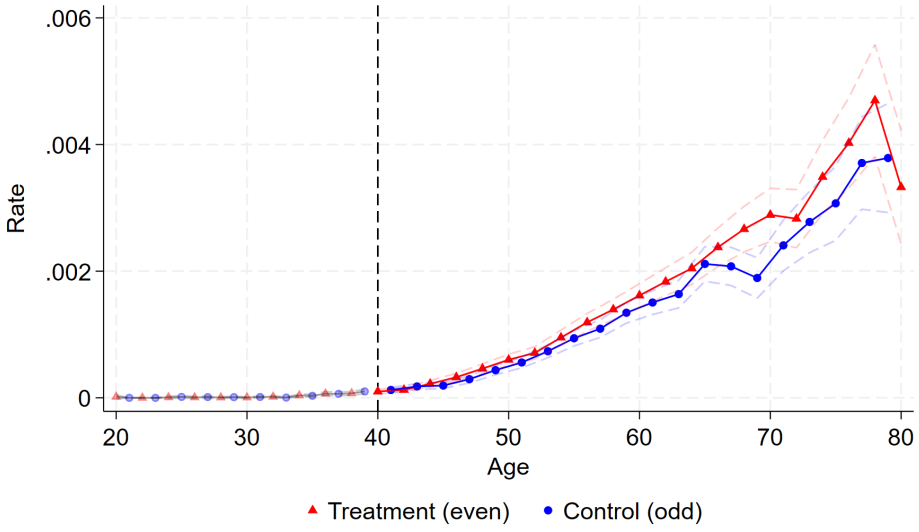
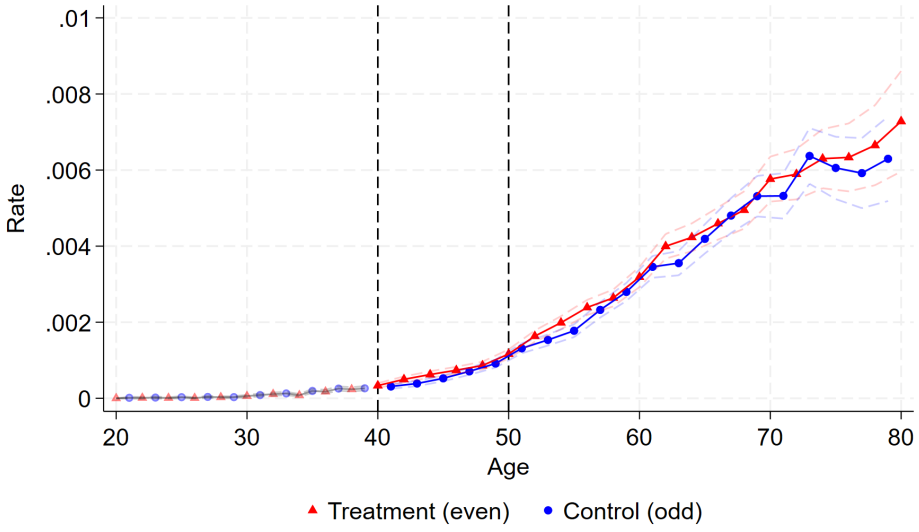
More cervical cancer diagnoses in the treatment group



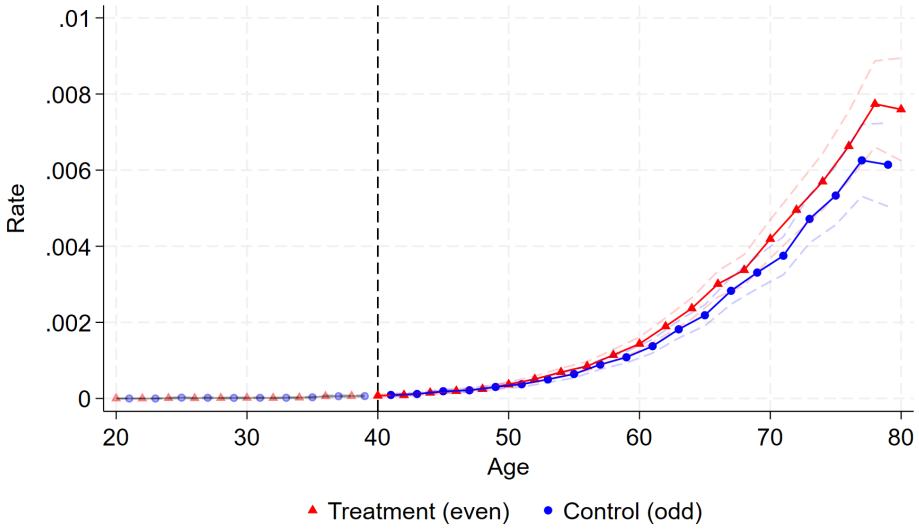
More liver cancer diagnoses in the treatment group



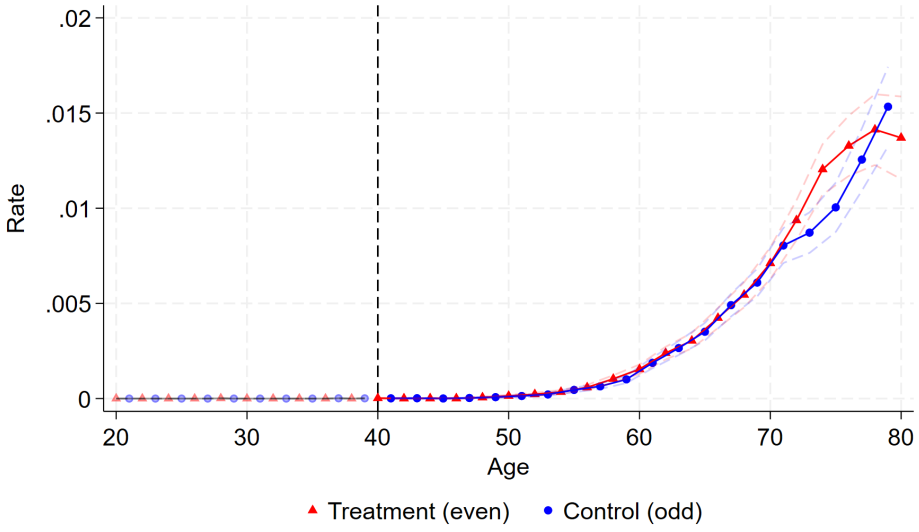
More colorectal cancer diagnoses in the treatment group



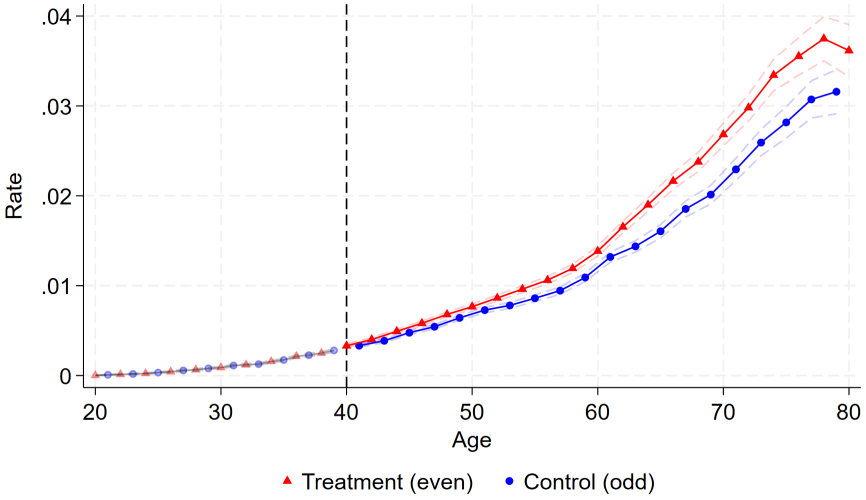
More lung cancer diagnoses in the treatment group



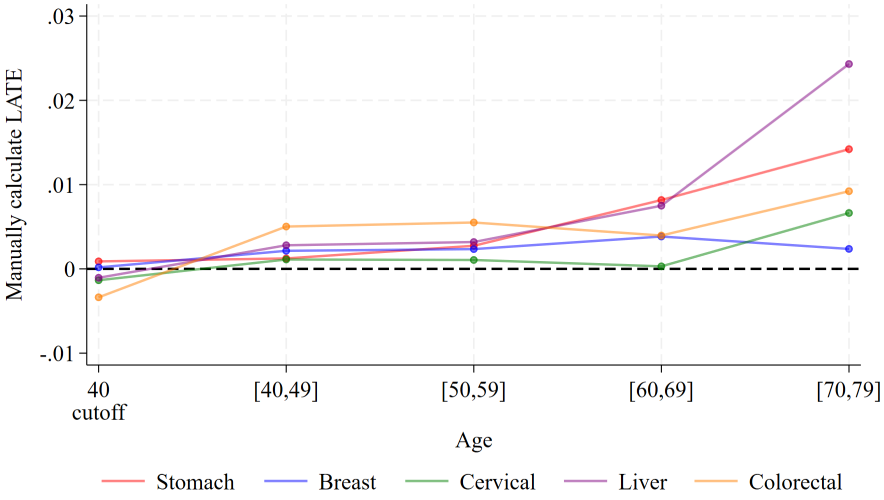
‘Slightly’ more prostate cancer diagnoses in the treatment group



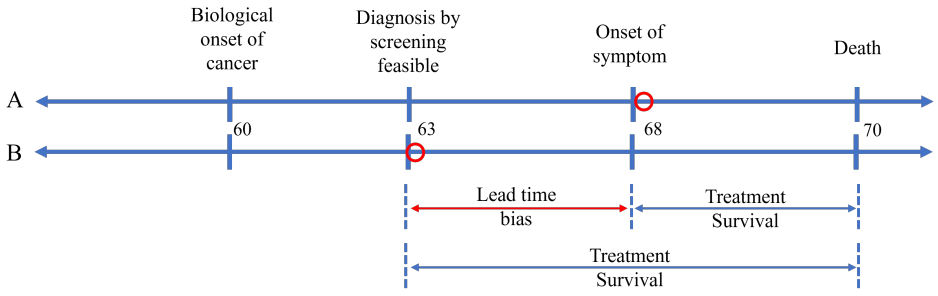
Overall, screening leads to more cancer diagnoses



Manually calculated LATE estimates by age



Lead time bias in survival rate analysis



Back

Screening increases medication use for high blood pressure

	(1)	(2)	(3)	(4)
	Control group mean	ITT	Percent relative to control	N
High blood pressure	0.23884	0.00046***	0.193	8,673,954
		(0.00013)		
ARBs (Angiotensin II Receptor Blockers)	0.10179	0.00038***	0.378	8,673,954
		(0.00009)		
Calcium Channel Blockers (CCBs)	0.09779	0.00021**	0.218	8,673,954
		(0.00009)		
Diuretics (Water Pills)	0.07136	–0.00003	–0.046	8,673,954
		(0.00010)		
Beta-Blockers	0.04289	0.00005	0.121	8,673,954
		(0.00008)		
ACE Inhibitors	0.01357	–0.00003	–0.233	8,673,954
		(0.00004)		
Aldosterone Antagonists	0.00970	–0.00007	–0.705	8,673,954
		(0.00004)		
Alpha-Blockers	0.00768	0.00001	0.109	8,673,954
		(0.00004)		

Back

Screening increases medication use for diabetes

	(1)	(2)	(3)	(4)
	Control group mean	ITT	Percent relative to control	N
Diabetes	0.08918	0.00015**	0.171	8,673,954
		(0.00006)		
Biguanides	0.06832	0.00011*	0.165	8,673,954
		(0.00007)		
Sulfonylureas	0.04318	–0.00006	–0.139	8,673,954
		(0.00006)		
DPP-4 Inhibitors	0.01836	0.00005	0.298	8,673,954
		(0.00004)		
Alpha-Glucosidase Inhibitors	0.00432	0.00001	0.195	8,673,954
		(0.00002)		
Meglitinides	0.00174	–0.00001	–0.303	8,673,954
		(0.00002)		
Insulin (Various Types)	0.00165	0.00001	0.615	8,673,954
		(0.00001)		
GLP-1 Receptor Agonists	0.00014	0.00000	3.127	8,673,954
		(0.00001)		
SGLT2 Inhibitors	0.00202	–0.00000	–0.204	8,673,954
		(0.00002)		
Thiazolidinediones (TZDs)	0.00671	–0.00002	–0.299	8,673,954
		(0.00003)		

Back

Screening increases medication use for high cholesterol

	(1)	(2)	(3)	(4)
	Control group mean	ITT	Percent relative to control	N
High cholesterol	0.13901	0.00419***	3.014	8,673,954
		(0.00011)		
Statins	0.13359	0.00405***	3.033	8,673,954
		(0.00011)		
Fibrates	0.00752	0.00016***	2.076	8,673,954
		(0.00004)		
Ezetimibe	0.00194	0.00006***	3.131	8,673,954
		(0.00002)		

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